

Christie® MicroTiles™

User Manual

020-100554-01

CHRISTIE®

Christie® MicroTiles™

User Manual

020-100554-01

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For complete information about Christie's limited warranty, please contact your Christie Dealer. In addition to the other limitations that may be specified in Christie's limited warranty, the warranty does not cover:

- (a) Damage occurring during shipment, in either direction.
- (b) Problems caused by combination of the equipment with non-Christie equipment, such as distribution systems, cameras, video tape recorders, etc., or use of the equipment with any non-Christie interface device.
- (c) Damage caused by misuse, improper power source, accident, fire, flood, lightening, earthquake or other natural disaster.
- (d) Damage caused by improper installation/alignment, or by equipment modification, if by other than Christie service personnel or a Christie authorized service provider.
- (e) Failure due to normal wear and tear.
- (f) Damage due to operating beyond the products specified environment. This product is designed to operate in an environment of 5°C to 40°C (41°F to 104°F) and a relative humidity between 35% to 85% non-condensing.
- (g) Avoid setting up the arrays in environments where the module temperature exceeds 50°C (122°F). This is especially true when exposing the screens to direct sunlight. Layers of the screen assembly will delaminate if exposed to environments where this temperature is exceeded.

PREVENTATIVE MAINTENANCE

Preventative maintenance is an important part of the continued and proper operation of your Christie® MicroTiles™. Please see the Maintenance section for specific maintenance items. Failure to perform maintenance as required, and in accordance with the maintenance schedule specified by Christie, will void the warranty.

SPECIAL DISCLAIMER

The AC Y-Power Harnesses (001-111279-01 & 001-111074-01) are NOT certified by Underwriters Laboratories Inc. for use with the Christie® MicroTiles™ products.

The AC Y-Power Harnesses are certified and approved for use with Christie® MicroTiles™ products where CSA, CE, C-Tick and GoST regulations apply.

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1 Product Overview

1.1 Using this Manual

This manual contains the following sections:

- *Section 1 Product Overview*
- *Section 2 Installation and Setup*
- *Section 3 Operation*
- *Section 4 Maintenance*
- *Section 5 Troubleshooting*
- *Section 6 Specifications*
- *Appendix A: OSD Menu Tree*

Disclaimer: Every effort has been made to ensure the information in this document is accurate and reliable. However, due to constant research, the information in this document is subject to change without notice. Christie Digital Systems assumes no responsibility for omissions or inaccuracies. Updates to this document are published regularly, as required. Please contact Christie Digital Systems for availability.

1.1.1 Labels and Markings

⚠ DANGER Danger symbols indicate a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING Warning symbols indicate a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION Caution symbols indicate a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE! Information provided with this heading alerts users to key points of interest not related to personal injury.

1.1.2 Typographical Notations

- References to specific areas of the document appear italicized and highlighted in blue. For example, *Section 3 Operation*. When viewing the document online these references provide direct links to the specified section.
- References to other documents appear italicized and bold, such as *Service Manual*.
- References to software menus and available options appear bold, such as **Source Management** or **Status**.
- User input or messages that appear on screen, in status display units or other control modules appear in Courier font. For example, No Signal Present.
- Operational states of modules appear capitalized, such as power ON/OFF.

1.2 Safety Warnings and Guidelines



When the screen is removed, directly viewing the beam with an optical instrument (for example, an eye loupe, magnifier or microscope) from a distance of less than 100mm may pose an eye hazard. Christie® MicroTiles™ (Christie MicroTiles) is a class 1M source of visible and invisible LED radiation with a maximum power rating of 3.61mW @ 400-700nm.

⚠ WARNING Always power down and disconnect/disengage all power sources to the Christie MicroTiles before servicing or cleaning. Read and understand all product safety labels before installing/operating this product.

⚠ WARNING Electrical Shock Hazard: Disconnect from AC when servicing.

⚠ CAUTION A minimum 2" (50mm) gap must be left at the back of all tile arrays to ensure proper air flow and cooling. If the array is installed in an enclosed area additional cooling may be required to limit the maximum temperature of the inlet air, in order to comply with safety regulations and local codes. Each tile requires 70 CFM (33 L/s) of input cooling air. Maximum cooling load is 110W (375 BTUs/hr) per tile, when operating at full brightness. The inlet air temperature cannot exceed the maximum operating temperature. For details, refer to 6.1.7 Operating Specifications, on page 6-2.

1.3 Purchase Record and Service Contacts

Whether the Christie MicroTiles (Christie MicroTiles) are under warranty or the warranty has expired, Christie's highly trained and extensive factory and dealer service network is always available to quickly diagnose and correct tile malfunctions. Complete service manuals and updates are available for the tiles. Should a problem be encountered with any part of the Christie MicroTiles, contact your dealer. In most cases, servicing is performed on site. If you have purchased Christie MicroTiles, keep a copy of the packing slip, shipped with your purchase for your records. The packing slip contains the serial numbers for each tile. The serial number can also be found on the licence label located on the back of the Christie MicroTiles, as well as on the front chassis.

1.4 Order Guide

For a detailed overview visit www.microtiles.com.

1.4.1 Standard Components

The items listed in **Table 1.1** will be ordered with every system.

Table 1.1 Standard System Components

Item	Part Number	Part Description	Details
Display Unit	123-001102-01	MicroTiles Display Unit D100	Each display unit includes a one meter display port cable.
Screen	123-102104-01	MicroTiles Screen S100	Ordered separately from display unit.
External Control Unit	123-101103-01	MicroTiles ECU E100	Includes a three meter display port cable, Y power cord and line cord.
User Kit	123-103105-01	MicroTiles User Kit	Includes: R100 Remote Control, screen removal tool, Christie MicroTiles Quick Setup Guide, Christie MicroTiles User Manual and Christie MicroTiles Service Manual.
Setup Kit	123-104106-01	MicroTiles Setup Kit	One kit supports up to nine tiles. Each kit includes nine Y-power cords, a line cord, roll of light seal trim, nine power cord security clips and screws for fine optimization of screen gaps.

1.4.2 Optional Accessories

The items listed in **Table 1.2** are optional, but in many cases may be required or recommended. To order additional kits and hardware go to www.microtiles.com.

Table 1.2 Optional Accessories

Item	Part Number	Part Description	Details
End Foot Kit	123-105107-01	MicroTiles Foot/Ends (includes left and right end feet)	Leveling feet are recommended to help level the bottom row when building on a supporting structure. Order one end foot kit per array.
Center Feet	123-106108-01	MicroTiles Foot/Center (3-pack)	Order one center foot in between each column.
Mounting Bracket	123-107109-01	MicroTiles Mounting Bracket (2-pack)	One required for every tile that is added to rows 6 and above in an array.

1.4.3 Sample Ordering Quantities

The items in **Table 1.3** list a sample bill of materials for a floor mounted 9x9 Christie MicroTiles array, which in this example consists of 81 tiles and three ECUs.

Table 1.3 Order Quantities for a 9x9 Array

Part Number	Part Description	Qty.	Calculation Notes
123-001102-01	MicroTiles Display Unit D100	81	
123-102104-01	MicroTiles Screen S100	81	One per display unit.
123-101103-01	MicroTiles ECU E100	See note	The number of ECUs is a design choice and affects the maximum content resolution of the display. For help in determining the number of ECUs, access the online calculator at www.microtiles.com .
123-103105-01	MicroTiles User Kit	1	One per system.
123-104106-01	MicroTiles Setup Kit	9	1 kit supports 9 tiles. For a 9x9 array 9 Setup Kits are required.
123-105107-01	MicroTiles Foot/Ends	1	1 kit (includes left/right) per bottom row.
123-106108-01	MicroTiles Foot/Center (3-pack)	3	Count bottom row = 9 tiles Subtract 1 = 8 joints = 8 feet required
123-107109-01	MicroTiles Mount Bracket (2-pack)	18	Count above five high = $9 \times 4 = 36$ tiles

1.5 Christie MicroTiles Overview

Christie MicroTiles is a modular, high-quality image display unit with related accessories, which, when combined form large arrays of virtually any size and shape. The modular display unit uses rear projection, based on a single TI Digital Micromirror Device™ (DMD) and chipset. High brightness LEDs provide the illumination source. Christie MicroTiles can be quickly and easily deployed in small display configurations, while providing the additional features required for larger and more complex installations.

Suitable applications for Christie MicroTiles include:

- Retail signage, fixtures and displays
- Architectural displays
- Event production and trade shows
- Video walls (control rooms, television studios)
- Sports venue displays and signage



Figure 1-1 Christie MicroTiles Display Unit

1.6 How Christie MicroTiles Work

Christie MicroTiles are self contained display units. The mechanical and optical design allows multiple tiles to be stacked together into an array of any size or configuration. Custom electronics allow the array to be completely self configuring without any external hardware. The video signal to be displayed is fed into the array via an External Control Unit (ECU). This signal is buffered and converted into a high speed (5 Gbps) serial stream and relayed to every unit in the array. Each Christie MicroTiles captures a portion of the image and applies scaling as required, which results in a single picture. The ECU also acts as the main system controller and coordinates all Christie MicroTiles.

1.6.1 System Overview

Display units consist of several subsystems, which include the mechanical housing, screen and Fresnel, light engine, Front End Formatter Board (FEFB), IR sensor, internal power supply and cooling system. An array of display units requires at least one ECU, acting as a main control unit and input interface for image content distribution through the array.

Christie MicroTiles consist of the following primary elements:

- Rear Projection Screen
- Light Engine
- Mechanical Housing
- Front End Formatter Board (FEFB)
- Low Voltage Power Supply (LVPS)
- Fans

1.6.2 System Master

NOTICE! The Web User Interface (webUI) is only functional on a main ECU. It does not communicate with local ECUs.

Each display unit and ECU contains a microprocessor. One ECU in the entire array acts as the main system, while all other units act as local devices. Multiple main systems can occur when a system is powered up with more than one ECU attached. On start-up, all ECUs assume they are the main system and begin the self organization process. When two main units encounter each other, one of the units is chosen to be the main ECU. If immediately prior to the last power down, one of the two units had been acting as main and the other as local, then the unit who was last main remains so. If both units had been main, or neither then the next level of priority is based on firmware revision, with the unit with the newest firmware taking precedence. For more information, refer to [1.8 External Control Unit \(ECU\)](#), on page 1-8.

1.6.3 Mechanical Housing

NOTICE! Christie MicroTiles can be mounted in a variety of orientations, but there are some limitations:

- **Angle Mounting: Brackets can be installed on each tile to allow angle mounting. The maximum incline supported at this time is $\pm 20^\circ$.**
- **Floor Mounting (facing up): This is supported; however, the tiles cannot bear weight in this orientation.**
- **Ceiling Mounting (facing down): Not supported at this time.**

The mechanical housing comes equipped with internal supports, which are designed to support small arrays. For larger arrays, external supports are required. Christie MicroTiles are optimized to operate in an upright, landscape orientation; however, they can be operated in many other orientations (except ceiling mount), as long as the cooling requirements are met. Product cooling and mechanical support in any orientation other than upright landscape is the responsibility of the end user. For information on installation specifications for simple and complex structures, refer to *Section 2 Installation and Setup*.

1.6.4 Rear Projection Screen

NOTICE! Avoid touching the screen surface. Always handle the screen from the sides. Remove all hand jewelry before handling the screens.

The screen is designed to display high-quality images under a wide range of viewing angles and high ambient lighting conditions. The screen has a matte non-glare front surface that reduces specular reflections from adjacent light sources and maintains the contrast and luminance uniformity of the displayed image. The screen is designed to display a sharp image formed close to the screen edge to allow for image blending from screen to screen when tiled in an array. The screen material has expansion characteristics that are low and closely matched for the screen elements. This allows the screen to retain its dimensions in various operational environments and prevent separation between the screen elements that would induce unwanted image artifacts. The screen is attached magnetically to the housing. The screen can be easily removed by applying suction with a screen removal tool (supplied). In the event that the magnets fail to retain the screen, for instance due to extreme vibration of the housing, an integral tether ensures the screen remains attached to the housing. For proper cleaning instructions, refer to *4.1.2 Cleaning Outside Screen Surface, on page 4-1*.



Figure 1-2 Christie MicroTiles Screen

1.7 User Interface Overview

Christie MicroTiles incorporates two basic user interface systems; the On Screen Display (OSD) and the Web User Interface (WebUI), which both come standard with the External Control Unit (ECU). For the most part, the OSD and WebUI contain the same features and functionality; however, the WebUI is faster to operate, but also requires an Ethernet connection, PC, web browser software and an Adobe® Flash Player™ Plug-in. The WebUI also enables you to update the software (firmware/FPGA) and select individual tiles, where the OSD does not. The OSD is accessed via the R100 Remote Control. For more information about the OSD, refer to *3.4 R100 Remote Control, on page 3-3* and *3.5 Using the On Screen Display (OSD), on page 3-7*. For more information about the WebUI, refer to *3.6 Using the Web User Interface (webUI), on page 3-13*. Each application gives clients access to the configuration, control and diagnostics of the Christie MicroTiles.

A sophisticated external software application is also available to clients, which provides a graphical method of viewing the installation where the on screen layout of the Christie MicroTiles matches the physical installation. Users are able to arrange/change the configuration and view the results via the on screen layout of the software. For more information, go to www.microtiles.com and click on MicroTiles Designer.

1.8 External Control Unit (ECU)

A Christie MicroTiles array requires an ECU (**Figure 1-3**) in order to display an image across the entire array. End users connect a PC or media player to the array using a DVI-D cable. The ECU then ensures the supplied video signal is properly displayed across the entire array. For more complex arrays, multiple ECUs can be used. The ECU is able to communicate with all tiles in the array and with any other controller using Christie's proprietary HSSL interface. Each Christie MicroTile and ECU has a unique IP address, allowing full communication between tiles and ECUs across the network. The address of each tile is assigned using DHCP. For more information, refer to *2.5 Connecting Sources, on page 2-13*.



Figure1-3

Christie MicroTiles ECU

2 Installation and Setup

2.1 Safety Guidelines



When the screen is removed, directly viewing the beam with an optical instrument (for example, an eye loupe, magnifier or microscope) from a distance of less than 100mm may pose an eye hazard. Christie® MicroTiles™ (Christie MicroTiles) is a class 1M source of visible and invisible LED radiation with a maximum power rating of 3.61mW @ 400-700nm.

⚠ DANGER Electrical Hazard! Up to nine tiles may be connected per daisy chain when hooking up the power supply. This is the maximum power carrying capability of the power cord.

⚠ WARNING Always power down and disconnect/disengage all power sources to the Christie MicroTiles before servicing or cleaning. Read and understand all product safety labels before installing/operating this product.

NOTICES!

- When constructing a Christie MicroTiles array always complete the first row and ensure it is aligned properly before continuing on to the next. DO NOT attempt to construct the array column by column.
- DO NOT remove the lens guard from the Christie MicroTiles or the dust cap from the lens until assembly is complete.
- It is advised that when an array is setup near a wall to connect the cables row by row. When setting up an array where the back is exposed, first setup the entire array and then connect.
- Always ensure the top latches on the Christie MicroTiles are open before assembling the array.

2.1.1 Before Constructing an Array

NOTICE! The configuration of each array varies between each installation; therefore, the following instructions are a guideline **ONLY**.

NOTICE! When constructing any size array always complete the first row and ensure it is flat before continuing with the next row. **DO NOT** attempt to construct the array column by column.

NOTICE! Power up each tile to ensure it is functioning. Check the LED on the back of the tile. A green light indicates power is enabled. Should the tile fail to power up, refer to Section 5 Troubleshooting for more information.

NOTICE! **DO NOT** remove the lens guard from the Christie MicroTiles or dust cap from the lens until the array is constructed.

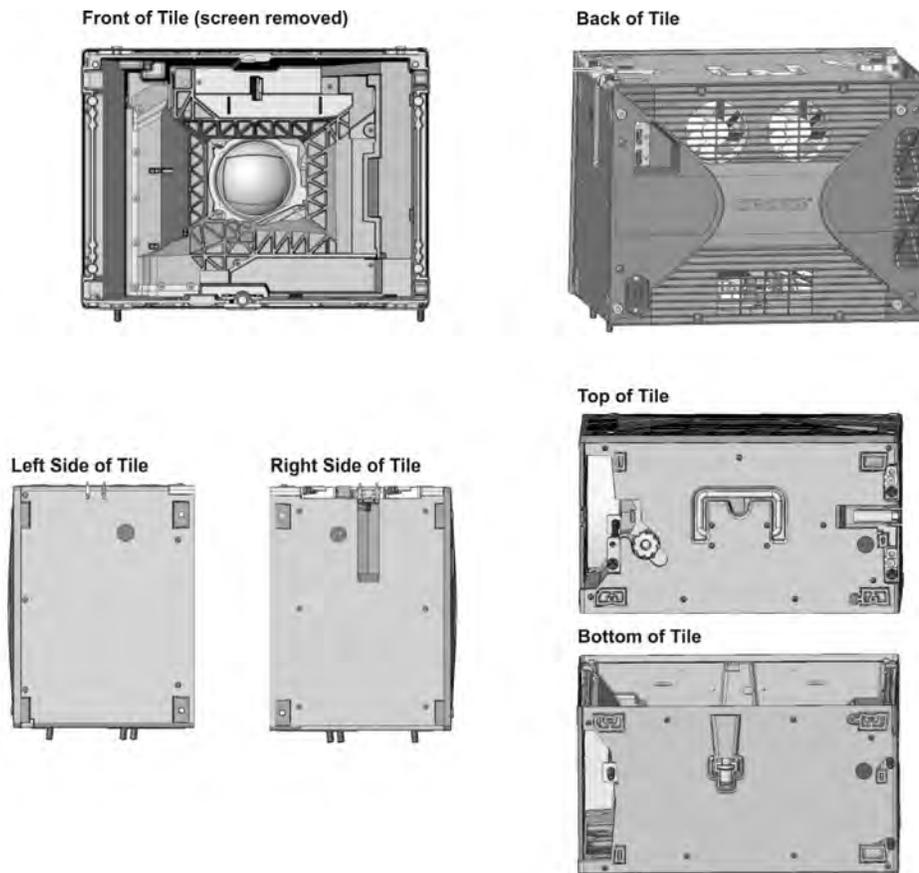


Figure 2-1 Christie MicroTiles without Screen

2.2 Christie MicroTiles Installation

These instructions explain how to install, connect and optimize the Christie MicroTiles for smooth operation. Before installing, it is important to fully understand all site requirements and characteristics. This document outlines installations which are no higher than five rows and no wider than 10 columns.

⚠ CAUTION A minimum 2" (50mm) gap must be left at the back of all Christie MicroTiles arrays to ensure proper air flow and cooling. If the array is installed in an enclosed area additional cooling may be required to limit the maximum temperature of the inlet air, in order to comply with safety regulations and local codes. Each tile requires 70 CFM (33 L/s) of input cooling air. Maximum cooling load is 110W (375 BTUs/hr) per tile, when operating at full brightness. The inlet air temperature cannot exceed the maximum operating temperature. For details, refer to 6.1.7 Operating Specifications, on page 6-2.

NOTICE! DO NOT remove the lens guard from the Christie MicroTiles or the dust cap from the lens until the array is assembled.

2.2.1 Required Tools and Hardware

For every Christie MicroTiles system you will need Display Units, Screens (one per display unit), External Control Units (ECUs) and Setup Kits (one per nine display units) and a User Kit. This combination provides the tools and hardware shown in **Figure 2-2**. For a complete overview of the available kits, refer to [1.4 Order Guide, on page 1-3](#). For detailed information, go to www.microtiles.com.

1. Assembly Tool M6 Screw
(for installations three rows high, but recommended for all installations)
 2. Screen Removal Tool
 3. Vertical Screws x3
 4. Screen Assembly
 5. Display Port Cable *(one per tile)*
 6. End and Center Leveling Feet *(optional)*
 7. Y-Power Cord
 8. External Control Unit (ECU)
 9. Grille with Hardware *(optional)*
- Not Shown:
 - Display Unit
 - Straight Edge *(not provided)*
 - 5mm hex key *(not provided)*
 - Light Seal Trim

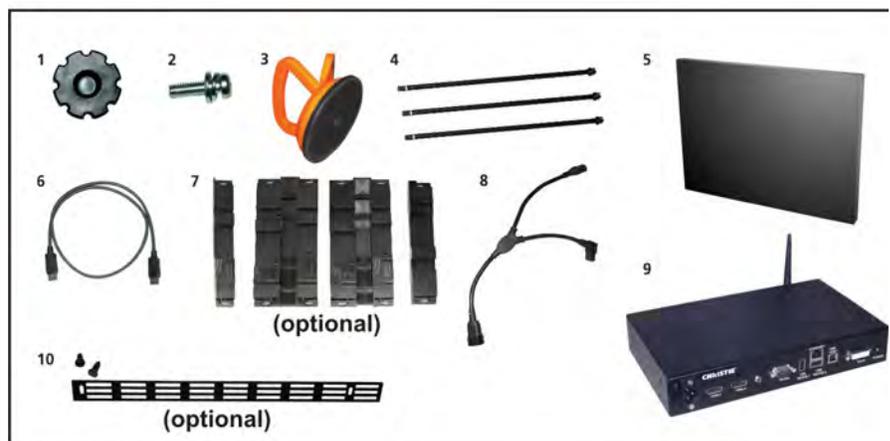


Figure 2-2 Tools and Hardware

2.2.2 Light Seal Trim Application

The light seal trim is supplied with the Setup Kit (P/N: 123-104106-01) and is used to prevent light leakage between the tiles in the array. It is typically used for applications where there is lighting in the space behind the tiles. If required, apply the light seal trim, as shown in **Figure 2-3** onto each tile before adding it to the array.



Figure 2-3 Apply Light Seal Trim

2.2.3 Mount to Leveling Feet (Optional)

⚠ DANGER If the array is mounted to the leveling feet it is mandatory they are fastened to an adequately ballasted base structure anytime the array is two rows or higher to prevent tipping and provide stability. The leveling feet come equipped with machined points for bolting the array down to a base, but the hardware is not supplied. Use M6 or 1/4" hardware and follow all local area standards and safety regulations when bolting the array.

Optional leveling feet are available for use with the Christie MicroTiles. Typically, the leveling feet are used when constructing an array two rows or higher to bolt the array down to prevent tipping, and to level and tilt small arrays. The leveling feet come equipped with machined points for bolting the array down, but the fastening hardware is not supplied. Use either M6 or 1/4" hardware. Follow all local area standard and safety regulations when bolting the array. **NOTICE! Ensure the surface underneath the array is flat.**

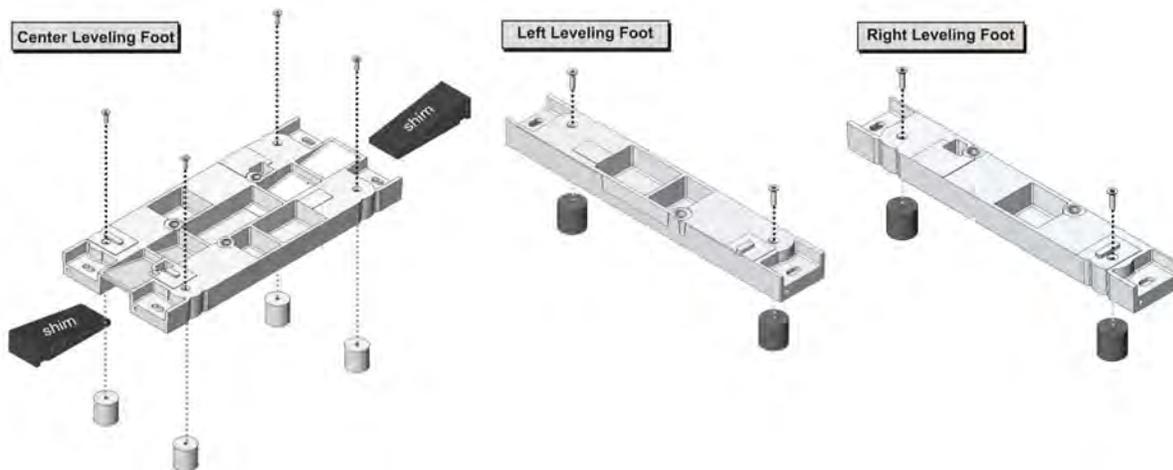


Figure 2-4 Leveling Feet

2.2.4 Assemble First Row

1. Ensure the latches on each tile are open before beginning (**Figure 2-5**).
2. Assemble the first tile in the array to a left and center leveling foot (**Figure 2-5**).
3. Insert the three vertical screws that are shipped with the Christie MicroTiles into the three positions indicated in **Figure 2-5**.
4. Detach the assembly tool from the top of the Christie MicroTiles and hand-tighten the three vertical screws to mount the tile to the feet (**Figure 2-5**). **DO NOT** completely tighten the screws at this point to allow for adjustments. **NOTICE! DO NOT use power tools to tighten the vertical screws. DO NOT use the vertical screws as anchors to hang the array.**

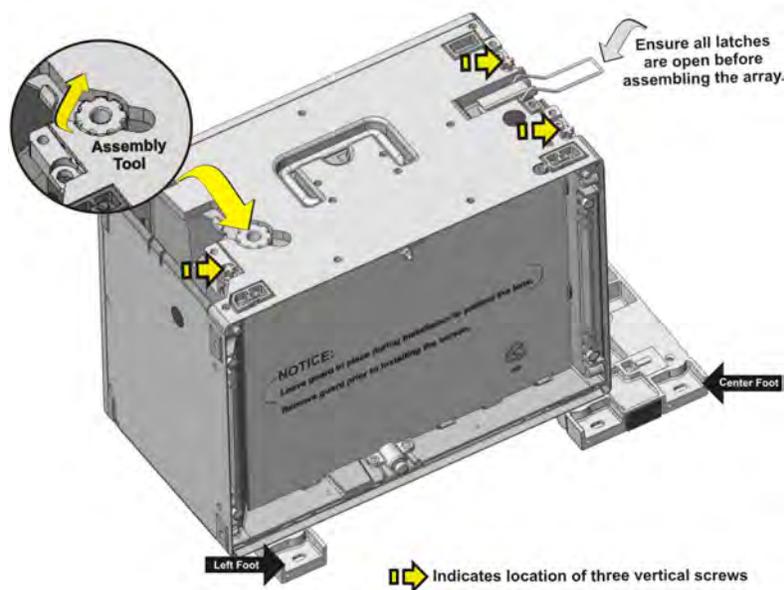


Figure 2-5 Assembly Tool and Leveling Feet

- Assemble the next tile in the array to a center leveling foot only (**Figure 2-6**). Using the assembly tool, hand-tighten the two vertical screws to mount the tile to the center foot. **DO NOT** completely tighten the screws to allow for adjustments. Line the tile with the center foot to the previous tile with left and center feet (**Figure 2-6**). Using the assembly tool, hand tighten the vertical screw on the second tile to secure it onto the center foot of the previous tile.

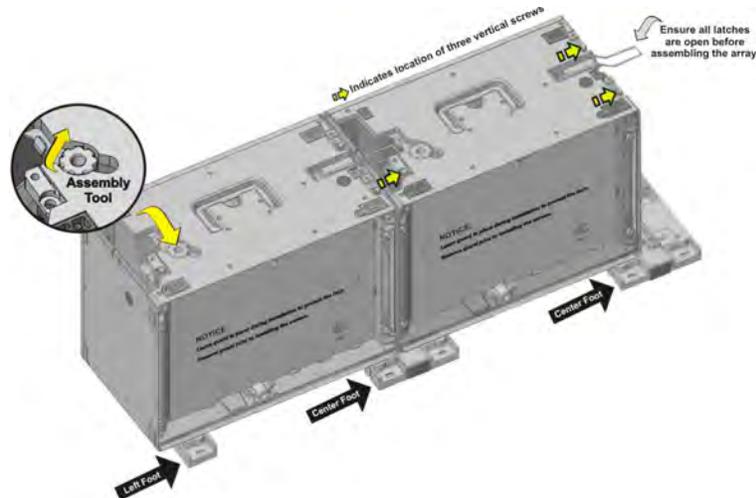


Figure 2-6 Assemble Second Tile in First Row

- Repeat Step 5 for all remaining Christie MicroTiles that are to be used in the first row, except for the last tile.
- Assemble a right leveling foot to the final tile in the row and secure it to the last tile in the first row (**Figure 2-7**). **INSTALLATIONS WITHOUT LEVELING FEET:** When installing an array without leveling feet ensure the surface underneath the array is flat. **DO NOT** use the vertical screws in the bottom row of installations without leveling feet to ensure the tiles sit flat.

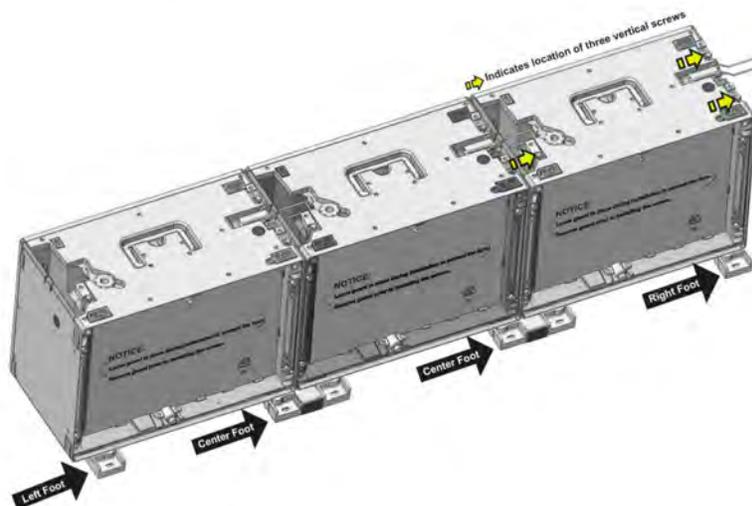


Figure 2-7 Assemble Final Tile in First Row

8. Hand thread an M6 screw (**Figure 2-8**) into the mounting points between the first two Christie MicroTiles (**Figure 2-8**). DO NOT completely tighten until the entire row is complete to allow for adjustments. **NOTICE! The M6 screw is optional and is provided to aid in the fine optimization of the seams.**
9. Repeat Step 10 for every tile added to the first row. **NOTICE! It is recommended that M6 screws be installed on all other rows when assembling an array higher than three rows to ensure fine optimization of seams. For arrays that are three rows or less it is not necessary to install M6 screws; however, if you require fine optimization of the seams, M6 screws are recommended on all rows.**

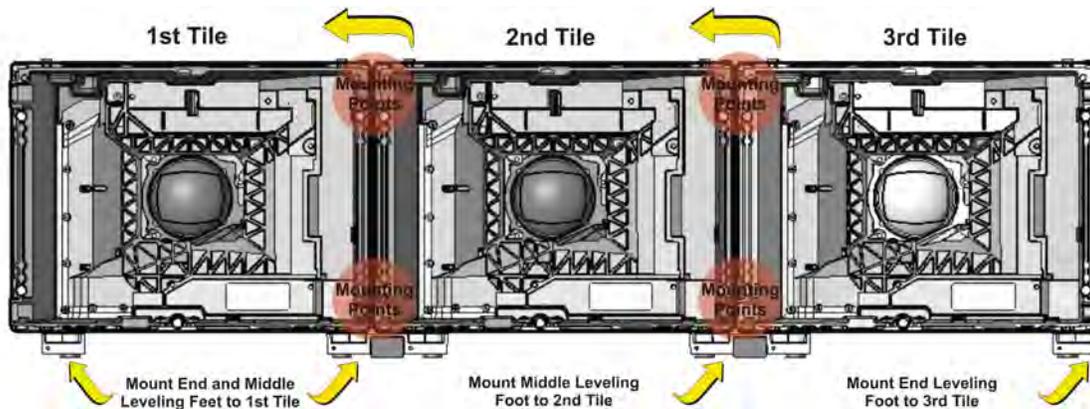


Figure 2-8 Construct the First Row of Christie MicroTiles

10. Once the first row is assembled, place a straight edge onto the interface pads, along the tops of the tiles to ensure the row is flat (**Figure 2-9**). If needed, adjust the vertical screws (if mounted to leveling feet) and M6 screws. **NOTICE! Poor alignment of the first row limits the size of the array that can be built.**

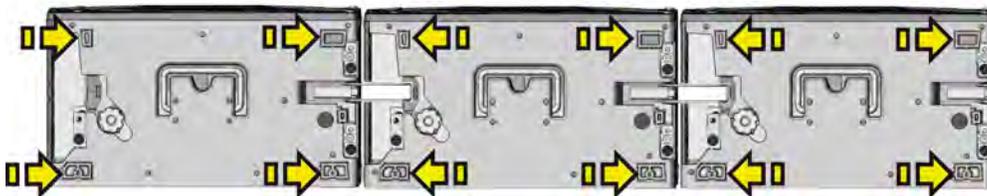


Figure 2-9 Interface Pads Along Top of Christie MicroTiles

11. Snap and lock the side latch onto the adjacent tile. Repeat for every tile in the row.
12. If the array is mounted to leveling feet, use the assembly tool to completely tighten all vertical screws. Failure to properly tighten the vertical screws causes the tiles to be misaligned, making screen installation difficult.
13. Using a 5mm hex key, completely tighten all M6 screws.
14. For instructions on how to add additional rows, refer to [2.2.5 Assemble Additional Rows, on page 2-8](#).

15. If the array is mounted to the leveling feet, insert shims into either the front or the back (or both) of each leveling foot to tilt the array or provide additional security. If necessary, fasten the leveling feet down.
16. **Optional:** Fasten the grilles to the leveling feet, using the supplied fasteners. Refer to **Figure 2-2 Tools and Hardware**, on page 2-3.

2.2.5 Assemble Additional Rows

⚠ DANGER TIP LOAD! If the array is two rows or higher additional hardware for tip resistance must be used in order to comply with safety regulations and local codes. Either use the rear tie points on the array or bolt the leveling feet into the ground.

⚠ DANGER If the array is mounted to the leveling feet it is mandatory they are fastened to an adequately ballasted base structure anytime the array is two rows or higher to prevent tipping and provide stability. The leveling feet come equipped with machined points for bolting the array down to a base, but the hardware is not supplied. Use M6 or 1/4" hardware and follow all local area standards and safety regulations when bolting the array.

NOTICE! It is advised that when an array is setup near a wall to connect the cables row by row. When setting up an array where the back is exposed, first setup the entire array and then connect the wires. For more information, refer to 2.2.8 Cable Routing, on page 2-10.

When building an array two rows or higher additional support is mandatory to offset the tip load. It must be supported to a rear structure in such a way that the weight of each tile is individually supported. To accomplish this amounting bracket can be purchased from Christie (P/N: 123-107109-01).

1. Ensure the latches on each tile are open before beginning (**Figure 2-5**).
2. Place a tile on top of the first tile in the bottom row (**Figure 2-10**).

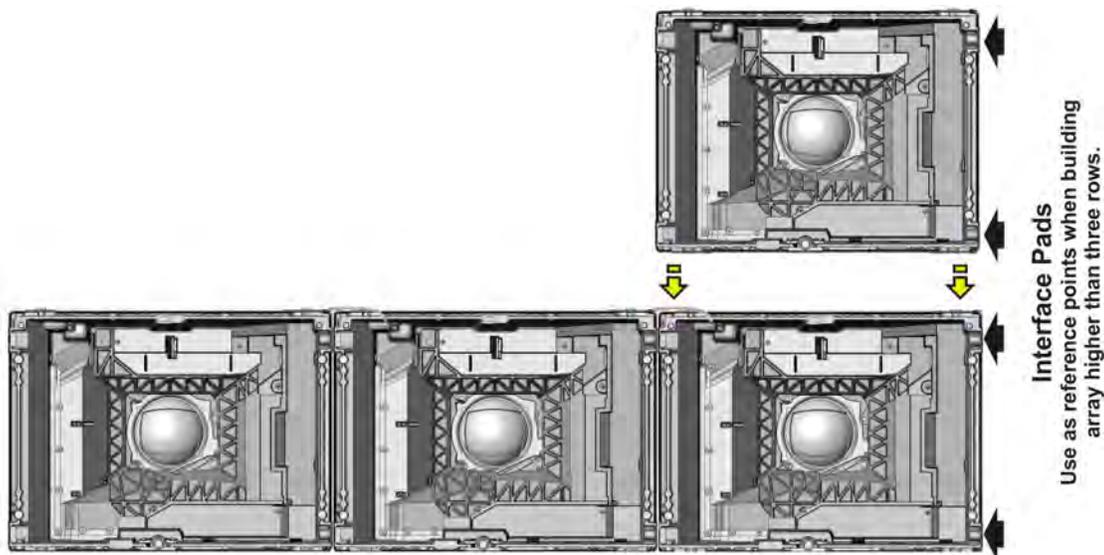


Figure 2-10 Assemble the Second Row

3. Push the tile back until the front edge is lined up with the front edge of the tile below.

4. Once the tile is in place, use the assembly tool to hand-tighten the three vertical screws. DO NOT completely tighten at this point to allow for adjustments.
5. Continue to add the remaining Christie MicroTiles to the second row.
6. Repeat Step 4 for every tile added to the second row.
7. Once the second row is in place, use the assembly tool to completely tighten the vertical screws on the tiles in the second row. Failure to properly tighten the vertical screws and M6 screws causes the tiles to be misaligned, making screen installation difficult.
8. It is recommended that M6 screws be installed on all other rows when assembling an array higher than three rows. For arrays that are three rows or less it is not necessary to install M6 screws; however, if you require fine optimization of the seams, M6 screws are recommended on all rows.
9. Place a straight edge on the four interface pads along the side of the column to ensure the top and bottom tiles are straight (**Figure 2-10**). If needed, readjust the top tile or the first row until they are straight.
10. Snap and lock the side latches onto the adjacent tile.
11. Repeat the steps outlined above for every additional row added to the array.

2.2.6 Install Screens

NOTICES! 1) Before installing the screens remove the lens guard from the Christie MicroTiles and the dust cap from the lens. Replace the lens guard and dust cap anytime the array is disassembled and shipped. 2) Avoid touching the screen surface. Always handle from the sides. Remove all hand jewelry before handling the screens. For cleaning instructions, refer to [Section 4 Maintenance](#).

1. Pull the screen tether out of the top of the tile housing and hook it into the locking latch on the screen (**Figure 2-11**). The tether ensures the screen does not fall if subjected to excessive force/vibrations.
2. To attach a screen, line up the two mounting holes on the screen with the two pins on the tile and carefully press onto the tile. Magnets on the housing secure the screen to the tile.
3. It is recommended that the screens be installed starting from the bottom of the array.

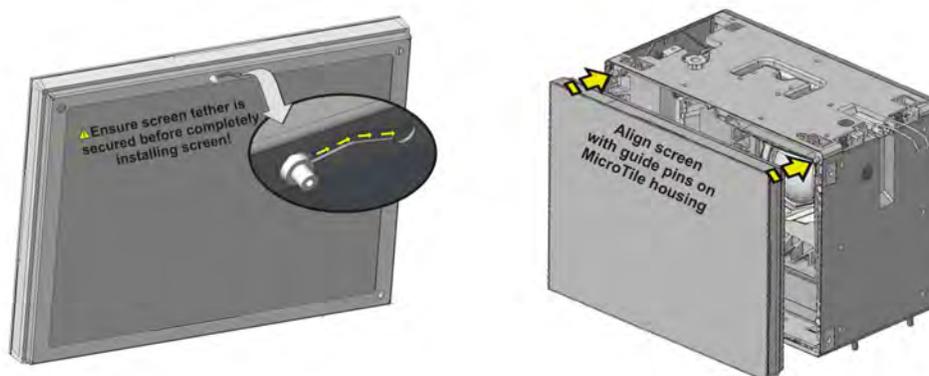


Figure 2-11 Screen Installation

2.2.7 How to Remove Screens

NOTICE! To avoid damaging the screen ensure the surface of the screen removal tool is clean and free of debris.

1. Open the handle on the screen removal tool (**Figure 2-12**) and gently place it in the center of the screen.
2. Carefully, push the screen removal tool towards the screen using moderate pressure.
3. Close the handle on the screen removal tool to apply suction.
4. To remove the screen, carefully pull on the screen removal tool.



Figure 2-12
Screen Removal Tool

2.2.8 Cable Routing

NOTICES! 1) It is not necessary to make a complete loop; however, if you create a complete loop, communication to the entire Christie MicroTiles array is not lost if one tile fails. 2) It is advised to connect the cables row by row when an array is setup near a wall. When setting up an array where the back is exposed, first setup the entire array and then connect the cables. 3) Ensure sufficient slack in the cable to allow servicing of the Christie MicroTiles from the front. **DO NOT** tie wrap or secure the cabling if the array is setup near a wall. .

1. Plug the display port cables into any of the two ports on the back of the Christie MicroTiles (**Figure 2-13**). Either port is acceptable on both the ECU and the Christie MicroTiles unless connecting multiple ECUs. When using multiple ECUs ensure the local ECU is connected to HSSL-1 (input) and the main ECU is connected to HSSL-2 output).
2. Daisy chain the cable from one tile to the next and plug the last one back into the ECU (**Figure 2-14**). **NOTE:** The display port cable has a built in retention latch. When disconnecting the cable, the latch must be pressed down in order to avoid damaging the cable (**Figure 2-13**).



Figure 2-13 Display Port Cable

Cable Routing for a Simple Array

The illustration below is a sample and is to be used for reference only. For a detailed overview of cable routing, go to www.microtiles.com to download the MicroTiles Designer™ software. .

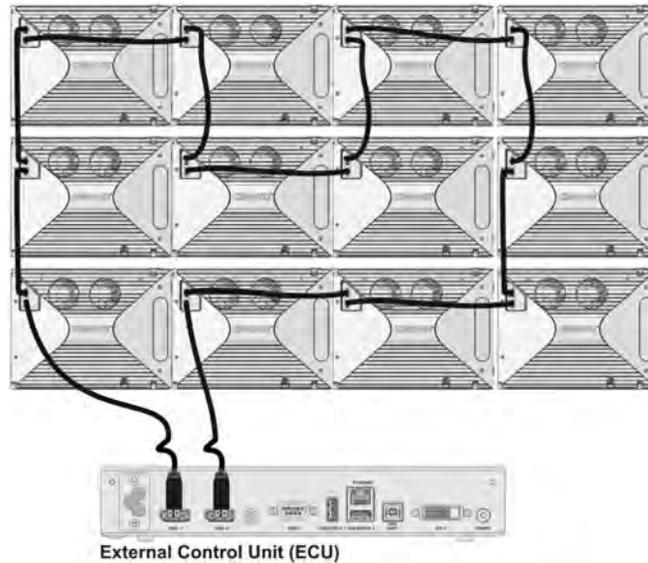


Figure 2-14 Cable Routing for a Simple Array (Complete Loop)

Cable Routing for Multi-Source

The illustration below depicts cable routing for the most common application, which is used to display images with a higher resolution.

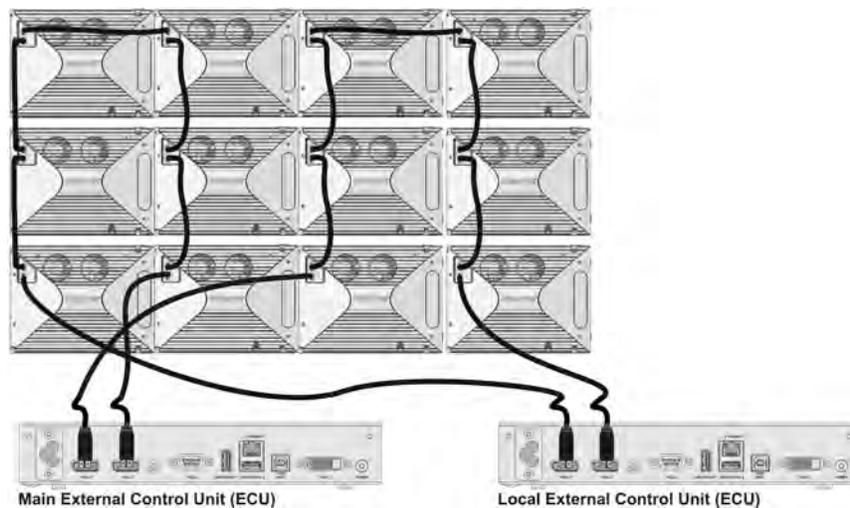


Figure 2-15 Cable Routing for Multi-Source

2.3 Cooling

⚠ CAUTION A minimum 2" (50mm) gap must be left at the back of all Christie MicroTiles arrays to ensure proper air flow and cooling. If the array is installed in an enclosed area additional cooling may be required to limit the maximum temperature of the inlet air, in order to comply with safety regulations and local codes. Each tile requires 70 CFM (33 L/s) of input cooling air. Maximum cooling load is 110W (375 BTUs/hr) per tile, when operating at full brightness. The inlet air temperature cannot exceed the maximum operating temperature. For details, refer to 6.1.7 Operating Specifications, on page 6-2. If proper air flow is not provided the tiles continue to operate for a limited time. Temperature limitations can be adjusted through the Web User Interface (webUI). If the tiles exceed the preset temperature, it will dim. If it operates at or above that temperature for too long, the tile will power down. For details, refer to 3.11.3 System Information - Tiles, on page 3-38.

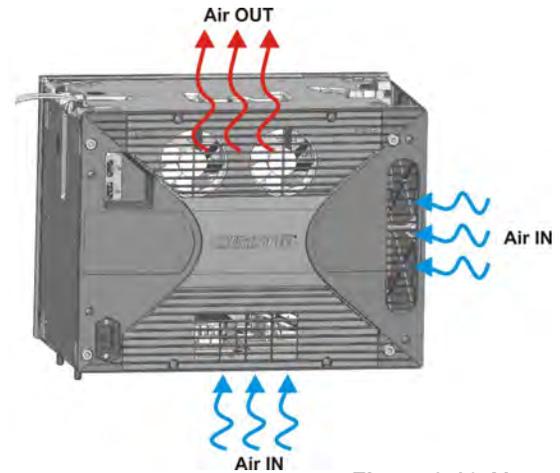


Figure 2-16 Air Intake/Outtake

2.4 Wall Mounting

NOTICE! Christie MicroTiles can be mounted in a variety of orientations, but there are some limitations:

- **Angle Mounting:** Brackets can be installed on each tile to allow angle mounting. The maximum incline supported is $\pm 20^\circ$.
- **Floor Mounting (facing up):** This is supported; however, the tiles cannot bear weight in this orientation.
- **Ceiling Mounting (facing down):** Not supported.

Four M6 female threaded bosses are located on the back of each tile for wall mounting purposes (Figure 2-17). A thread engagement of 16-18mm is required. **NOTE: 1)** *The hardware for this is not supplied. Follow all local area standards and safety regulations.*

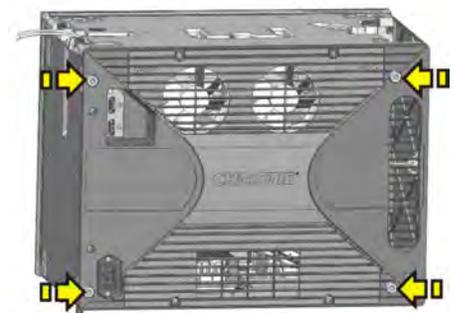


Figure 2-17 Wall Mounting Points

2.5 Connecting Sources

NOTICE! The Web User Interface (webUI) is only functional on a main ECU. It does not communicate with local ECUs. An array of Christie MicroTiles requires an ECU (Figure 2-18). This product allows the end user to display an image using a source connected via a DVI-D cable. It acts as the controller and ensures the supplied video signal is properly displayed across the entire array. Once the ECU is connected and powered up the video content is enabled by default, as long as the video source is connected to the DVI-D connection. It also monitors the health of the array. In the event of an error or failure, it can report that fault either locally through a USB device port, or remotely through Ethernet. In a more complex setup, multiple ECUs can be utilized. For details on controlling an array with multiple ECUs, refer to [2.5.2 Connect to Power, on page 2-15](#). When multiple ECUs are connected into a single array, an arbitration scheme is used to ensure only one ECU acts as the main system controller. All other ECUs in the network act as local controllers.

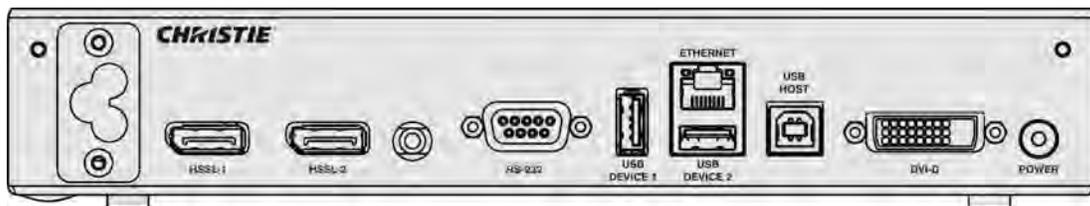


Figure 2-18 External Control Unit (ECU) ECU Features

NOTICE! Up to 7m (20 ft.) of long distance communication between the ECU and the tiles is supported at this time.

- **Power Connector:** Each ECU comes with a universal power supply (110V-240V, 50Hz/60Hz) power splitter cable, which forms a T-junction. One end of the ‘T’ plugs into the back of the ECU and the other two ends form a daisy chain with either another ECU or with a tile.
- **Power Switch:** Switch ON to toggle the ECU and any attached array of Christie MicroTiles between the ON and STANDBY states. The bicolored LED flashes green when the system is in an ON state and red when the system is in STANDBY. If any error occurs the LED flashes red.
- **HSSL-1 and HSSL-2:** These two bi-directional ports are capable of carrying 5Gbps of video and data in both directions, simultaneously. The ECU is connected via the HSSL interface directly to a tile. The order in which system elements are connected is not significant unless you are connecting multiple ECUs. When connecting multiple ECUs HSSL-1 is used to supply the local video (input) and HSSL-2 (output) is used to supply the main video. The self-configuration capabilities of the Christie MicroTiles account for the sequence.
- **RS-232:** Connect with a laptop or PC for access to all controls and all system status information serially.
- **USB Device 1/USB Device 2:** Reserved for future use.
- **Ethernet:** A host computer connected to this interface has full access to all controls and all system status information. All firmware can be updated through this port. This interface supports 10-BaseT and 100-BaseT. A web client interface is available through this port and is used as the primary human interface for remote PC based control of a Christie MicroTiles installation.
- **USB Host:** Reserved for future use.

- **DVI-D:** Connect a variety of progressive video and graphics sources to the DVI-D port. The bandwidth of the input is limited to 165 MHz.

2.5.1 Displaying Content

1. Connect the DVI-D output from video source (i.e., media player) to the DVI-D input on the ECU (**Figure 2-19**).
2. Once the DVI-D is connected and the ECU is powered up the video is enabled by default. Use the R100 Remote Control to control the video content through the On Screen Display (OSD). For details, refer to [3.4 R100 Remote Control, on page 3-3](#).

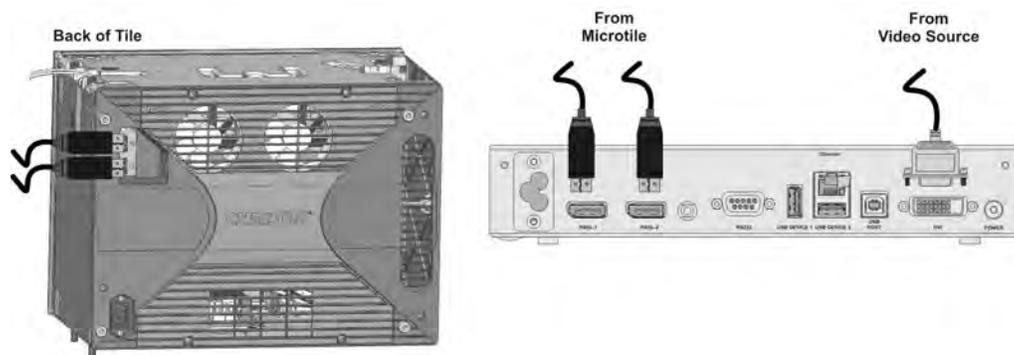


Figure 2-19 Connecting Sources

2.5.2 Connect to Power

⚠ WARNING The North American rated line cord is provided with each MicroTiles Setup Kit (P/N:123-104106-01). For all regions ensure you are using a line cord, power plug and socket that meet the appropriate rating standards. Connect the line cord to the AC receptacle at the lower corner, on the rear of the Christie MicroTiles and to proper AC. **DO NOT** attempt operation if the AC supply and cord are not within the specified voltage and power range. The appropriate ratings for the Christie MicroTiles are listed on the licence label (located on the back of the Christie MicroTiles).

⚠ WARNING Electrical Hazard! A maximum of nine Christie MicroTiles may be connected per daisy chain. This is the maximum power carrying capability of the power cord. In an array of 12 Christie MicroTiles, two outlets and two power bars should be used.

Power Distribution

NOTICES! 1) Local or national regulations may not allow the use of Y power cords and may require standard individual power cords for each tile. This may include Japan, China and Korea. 2) If you are constructing an array without the leveling feet, directly onto an existing surface you must connect the standard connection to the tile and not the 90° connection. **Plugging the 90° connection interferes with the mounting surface.**

- Each tile comes equipped with a captive “Y-Splitter” power cord. A quantity of nine cords are shipped with each Setup Kit (P/N: 123-104016-01).
- Multiple Christie MicroTiles are daisy chained to a single power feed.
- Up to nine tiles per chain can be supported.

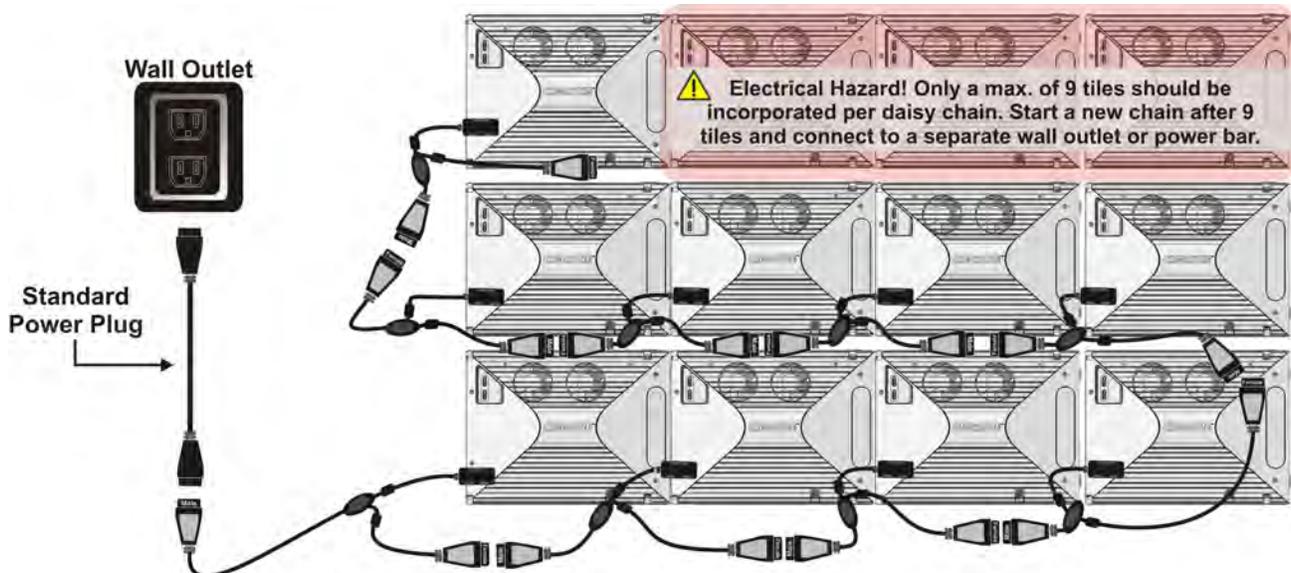


Figure 2-20 Connecting to Power Using Y-power Cords

Install Security Clip onto Power Connection

To ensure the power cord is secured at the Christie MicroTiles power connection a security clip, supplied with the Setup Kit (P/N: 123-101106-01) must be installed. To install insert the end of the clip into the two machined holes on the two posts (Figure 2-21). If connecting the 90° connection to the tile ensure the clip locks from the left-side and if using the standard connector ensure it locks from the right-side. See Figure 2-21.

Power ON

1. Connect the power plug from the ECU into an outlet or power bar.
2. Daisy chain the 'Y' power cords into each tile in the array and connect the standard power plug into an outlet or power bar (Figure 2-20).
3. Apply electrical tape or tie wraps to secure the inline connection between the Y-power cords.
4. Push the **Power** button ON at the ECU. The LED status light on the button turns green when the system is ready.
NOTE: *It is recommended that a power bar with an in-line power switch be used to simplify switching the array ON and OFF. If any of the Christie MicroTiles fail to power up check each connection.*

Power Down

1. Turn the **Power** button OFF at the ECU.
2. Switch OFF power at the power bar or disconnect the power plug from the outlet.

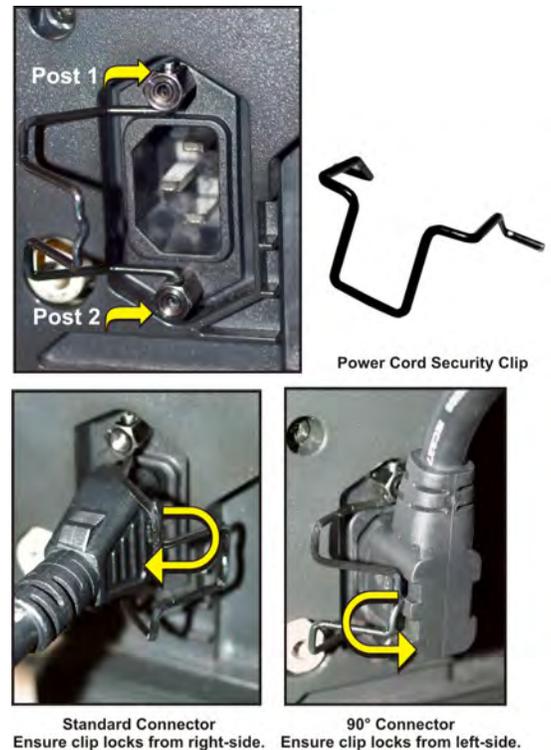


Figure 2-21 Power Cord Security Clip

2.6 Disassembling a Christie MicroTiles Array

⚠ CAUTION Always replace the lens guard and dust cap when tearing down a tile array.

1. Power down and disconnect all power cables and display port cables.
2. Use the supplied suction cup to remove the screens from each tile and release the screen tether. For details, refer to [2.2.7 How to Remove Screens, on page 2-10](#).
3. Replace the lens guard and dust cap.
4. Loosen the three vertical screws from the top row using the assembly tool.
5. Unhinge all the latches from the top row.
6. Remove each of the Christie MicroTiles from the top row.
7. Repeat Steps 2 to 6 for all remaining rows. **NOTE:** *If M6 screws were used in building the array ensure they are removed. If necessary, remove the leveling feet.*

3 Operation

3.1 Powering Up the Christie MicroTiles Array

⚠ WARNING A North American rated line cord is provided with each MicroTiles Setup Kit (P/N: 123-104106-01). For all other regions, ensure you are using a line cord, power plug and socket that meet the appropriate rating standards. Connect the line cord to the AC receptacle at the lower-corner on the rear of the Christie® MicroTiles™ (Christie MicroTiles) and to proper AC. The outlet must be near the equipment and easily accessible. Use the line cord provided with the Christie MicroTiles or a power cord of appropriate ratings that comply with regional standards. DO NOT attempt operation if the AC supply is not within the rated voltage range, as specified on the licence label (found on the back of the tile and on the front chassis). **NOTICE!** A maximum of nine Christie MicroTiles may be connected per daisy chain. In an array of 12 Christie MicroTiles, two outlets and two power bars should be used.

1. Connect the power plug from the ECU into an outlet or power bar.
2. Daisy chain the ‘Y’ power cords onto each of the Christie MicroTiles in the array and connect the standard power plug into an outlet or power bar. For more information on how to connect the power cords refer to [2.5.2 Connect to Power, on page 2-15](#).
3. Apply electrical tape or tie wraps to secure the inline connection between the Y-power cords. The LED status light on the ECU **Power** button is red for a few minutes as it powers up and then turns green.
NOTE: *It is recommended that a power bar with an in-line power switch is used to simplify switching the array ON and OFF. If any of the MicroTles fail to power up, check each connection.*
4. Once the LED turns green do any one of the following to start the ECU it up:
 - Press the **Power** button on the ECU.
 - Press the **Power** button on the R100 Remote control.
 - Select **Power On All Tile(s)** from the web user interface (webUI)
5. Once the system is powered up the LED light on the ECU **Power** button flashes green. **NOTE:** *It is recommended that a power bar with an in-line power switch is used to simplify switching the array ON and OFF. If any of the MicroTles fail to power up, check each connection.*
6. Refer to [2.5 Connecting Sources, on page 2-13](#) for information on how to display content onto the Christie MicroTiles array.

3.1.1 If a Tile Fails to Power Up

- Check to ensure each cable is properly connected.
- Power cycle the failing Christie MicroTiles or the entire array using the switch on the power bar.
- Check the LED on the back of each Christie MicroTiles. A flashing green light indicates power is enabled.

3.2 Powering Down the Christie MicroTiles Array

1. Push the **Power** button OFF at the ECU.
2. Switch OFF power at the power bar or disconnect the power plug from the outlet.

3.3 Status Indicator

Each Christie MicroTiles is equipped with a tri-color LED, located on the back of the tile, which indicates power status.

Table 3.1 LED Indicator

LED Mode	Description
OFF	No power
Amber	Standby Mode (stays on for one minute before turning green)
Green	ON
Green: Flashing	Indicates the main ECU.
Red: Solid	Electronics failure. No diagnostics available.
Red: Flashing	Failure detected. Refer to <i>Section 5 Troubleshooting</i> .

3.4 R100 Remote Control

This radio frequency remote control is used to navigate menu commands on the On Screen Display (OSD) from up to 100m (328ft) away.

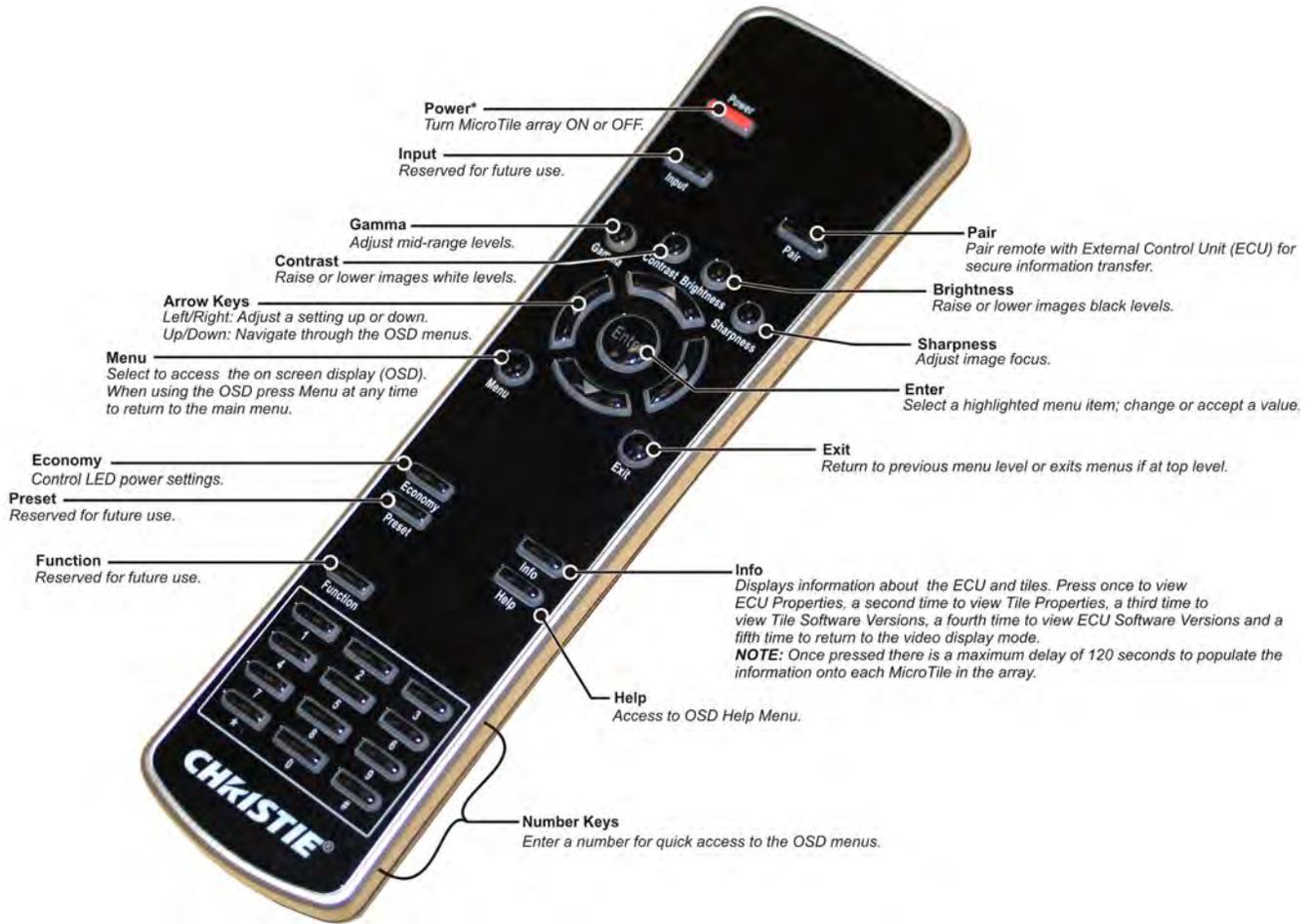


Figure 3-1 R100 Remote Functionality

3.4.1 Guide to Keypads

Press keys one-at-a-time; there are no simultaneous key combinations. Press the arrow keys down once for each continuous adjustment/movement in one direction. If a key is pressed while the Christie MicroTiles are still responding to a previous action, such as during power up, the second key press may not take effect. These are toggle keys, which require you to press and hold or press twice or use the up/down arrow keys. The remote keypad controls the Christie MicroTiles, via communication from a battery-powered RF transmitter.

NOTES: 1) *Two triple A batteries are required. 2)* *The keypad on the remote remains lit up when the batteries are running low.*

3.4.2 Keypad Commands

Power

Press the **Power** button on the R100 Remote Control to toggle the array ON. The LED light on the ECU turns green when power is enabled. Press again to turn the array OFF. The LED light on the ECU turns red when the array is OFF. **NOTE:** *This is not a complete powered down state. To completely disable power turn the array OFF at the power source.*

Input

Reserved for future use.

Pair

Press to pair the remote with the ECU for secure information transfer. For more information, refer to [3.4.3 Pairing the Remote to the ECU via the OSD, on page 3-6](#).

Contrast

Changes the level of peak white in your images. Use the **Left/Right Arrow** keys to reach the desired level of contrast—for best results, start low and increase so that whites remain bright, but are not distorted or tinted and that light areas do not become fully white (i.e., “crushed”). Low contrast causes dim images. Press **Enter** to see the changes take affect.

Brightness

Increases or decreases the black level in the image. Use **Left/Right Arrow** keys to reach the desired level of brightness. For best results, start high and decrease so that dark areas do not become fully black (i.e., “crushed”). Overly high brightness changes black to dark gray, causing washed-out images. Press **Enter** to see the changes take affect.

Gamma

Determines how gray shades are displayed between minimum input (black) and maximum input (white) for a given amount of signal. The proper setting helps maintain optimized blacks and whites while ensuring a smooth transition for the “in-between” values utilized in grays. Unlike brightness and contrast controls, the overall tone of an image can be lightened or darkened without changing the two extremes and your images will be more vibrant yet with good detail in dark areas when using the Gamma control. The nominal setting for Gamma Correction of 2.22 is correct for most signals and conditions. If excess ambient light washes out the

image and it becomes difficult or impossible to see details in dark areas, increase the gamma correction setting to compensate. Once the gamma level is set press **Enter** to see the changes take affect.

Sharpness

Press **Sharpness** for a shortcut to the ON Screen Display **Source Management> Image Settings** menu, which is used to adjust image focus, brightness, gamma and contrast. For details, refer to [3.5.4 OSD Source Management Menu, on page 3-8](#).

Arrow Keys

Use the **Left/Right arrow** key to change a slide bar value.

Enter

Press **Enter** to send any changes made through the OSD to the array.

Menu

Press **Menu** to enter the On Screen Display (OSD). Once you are working within the OSD you can press **Menu** at any time to return to the main menu.

Exit

Press **Exit** to return to the previous level, such as the previous menu.

Economy

Press **Economy** for a shortcut to the Array Management>**Array Settings** menu, which is used to control the LED power settings. For details, refer to [3.5.5 OSD Array Management Menu, on page 3-9](#).

Info

Press once to display the ECU Properties, a second time to display Tile Properties, a third time to display Tile Software Versions and a fourth time to display ECU Software Versions. Once pressed there is a maximum delay of 30 seconds to populate the information onto each tile in the array.

Preset

Reserved for future use.

Number Keys

Use the number keys for quick access to the OSD menus.

Function

Reserved for future use.

Help

Press **Help** to access the Help menu.

3.4.3 Pairing the Remote to the ECU via the OSD

The remote must be paired to the main ECU in order for it to communicate with the Christie MicroTiles array. Pairing does not function with local ECUs. The following instructions outline how to pair the remote through the OSD. Only one remote can be paired to the main ECU. For information on how to pair the remote using the webUI, refer to *Remote Pairing via the WebUI, on page 3-34*.

Remote Pairing via the OSD

1. Press and hold the **Power** button on the ECU for approximately five seconds until the screen shown in **Figure 3-2** appears.

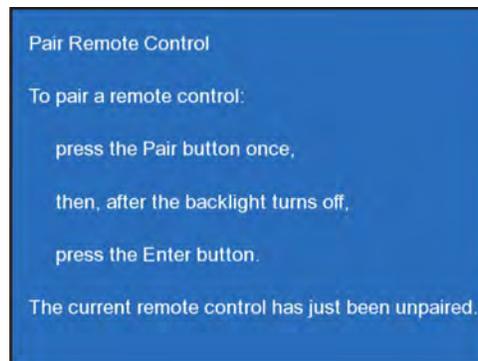


Figure 3-2 Pair Remote Control

2. If the remote is not paired within 30 seconds the application times out and the message **A Remote Could Not Be Detected** appears on screen.
3. Press the **Pair** button from the R100 Remote Control and then the **Enter** button. Once pairing was successful the screen shown in **3**, appears on the OSD. **NOTE:** *If the Pair button is accidentally pressed on the remote when the array has been paired press Pair again to toggle pairing mode OFF.*

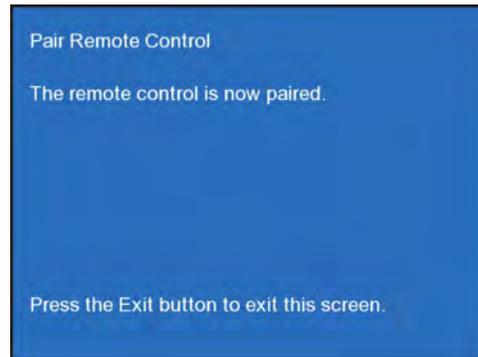


Figure 3-3 Remote is Paired

3.5 Using the On Screen Display (OSD)

3.5.1 OSD Functionality

- Adjust display window offsets
- Specify Video or OSD display mode
- Disable and enable automatic mapping/configuration of the array
- View input properties, which includes:
 - DVI Clock
 - Input
 - Pixel Width
 - Pixel Height
 - Frames per Second
- Display a test pattern
- Select all Christie MicroTiles in an array
- Calibrate all Christie MicroTiles in an array
- Turn the Christie MicroTiles array ON and OFF
- Reset the ECU
- Set date and time
- View the status of the tiles and ECU (i.e., properties, software versions, IP address)
- Help menu

3.5.2 OSD Guidelines

- Press keys one-at-a time; there are no simultaneous key combinations required or allowed.
- Pause briefly between key presses to allow the tile(s) to respond to the previous action.
- Press **Exit** once to cancel a selection or go back one level in the menu.
- If the back light turns OFF, push any key to turn it ON again.

3.5.3 Navigating the OSD Menus

To access the OSD press **Menu** from the R100 Remote Control. For a detailed overview, refer to *Appendix A: OSD Menu Tree*. Most basic controls of the Christie MicroTiles are accessed from within the OSD menu system. When the OSD is activated it appears on the top-left tile in a mapped array and anywhere if the array is unmapped. All other tiles in the array remain on video. With the Main menu displayed (**Figure 3-4**), either use the arrow keys on the remote to highlight the desired option and press **Enter**, or use the number keypad on the remote to make the selection. The corresponding menu will appear. To scroll through a list of items, use the up/down arrow keys. Press **Exit** once to return to the previous level of options. Press **Menu** at any time to return to the Main menu.

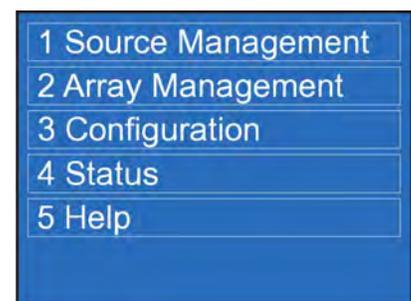


Figure 3-4 OSD Main Menu

3.5.4 OSD Source Management Menu

The Source Management menu (**Figure 3-5**) allows users to enable/disable the active input source, view and edit the properties of the active input source and display window, and adjust image brightness, color temperature, contrast, gamma and sharpness. To access the **Source Management Menu** press **Menu** from the R100 Remote Control, use the arrow keys to highlight **Source Management** from the main menu and press **Enter** to access the Source Management menu selections (**Figure 3-5**). For quick access to this menu press **Menu** from the remote and then **1** from the numeric keypad. For a detailed description of the same controls accessible from the webUI, refer to [3.8 WebUI Source Management Menu, on page 3-15](#).

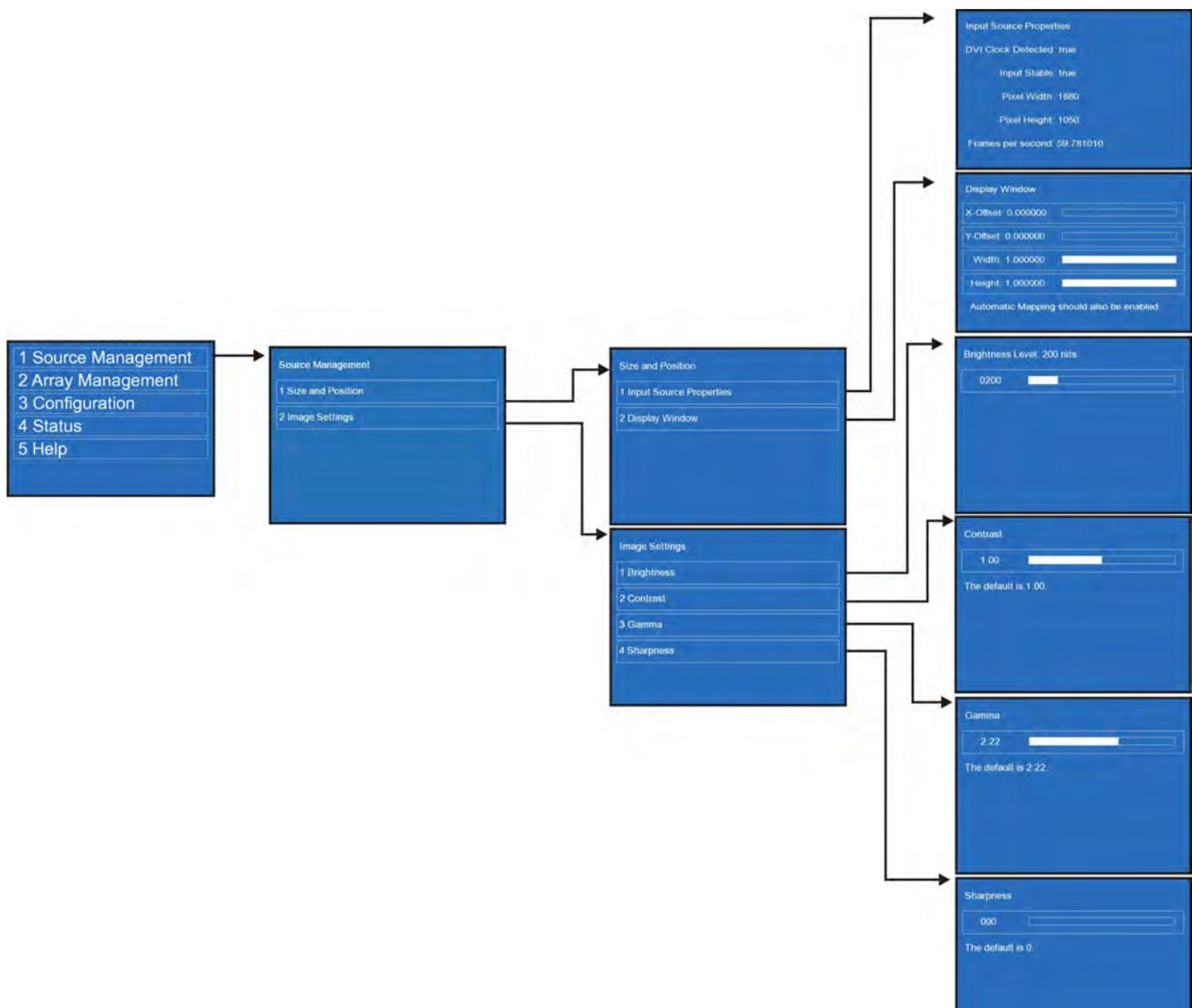


Figure 3-5 OSD Source Management Menu

3.5.5 OSD Array Management Menu

The Array Management menu (**Figure 3-6**) enables users to select the video signal for displaying content onto the Christie MicroTiles. It also enables users to enable or disable automatic mapping. It also enables users to adjust display settings, such as intensity, color matching, mullion reduction and uniformity correction. Use the **Diagnostics and Calibration** menu (**Figure 3-7**) selection to select from a list of test patterns used for troubleshooting and setup purposes. To access the **Array Management Menu** press **Menu** from the R100 Remote Control, use the arrow keys to highlight **Array Management** from the main menu and press **Enter**. For quick access to this menu press Menu from the remote and then 2 from the numeric keypad. For a detailed description of the same controls accessible from the webUI, refer to [3.9 WebUI Array Management Menu, on page 3-18](#).

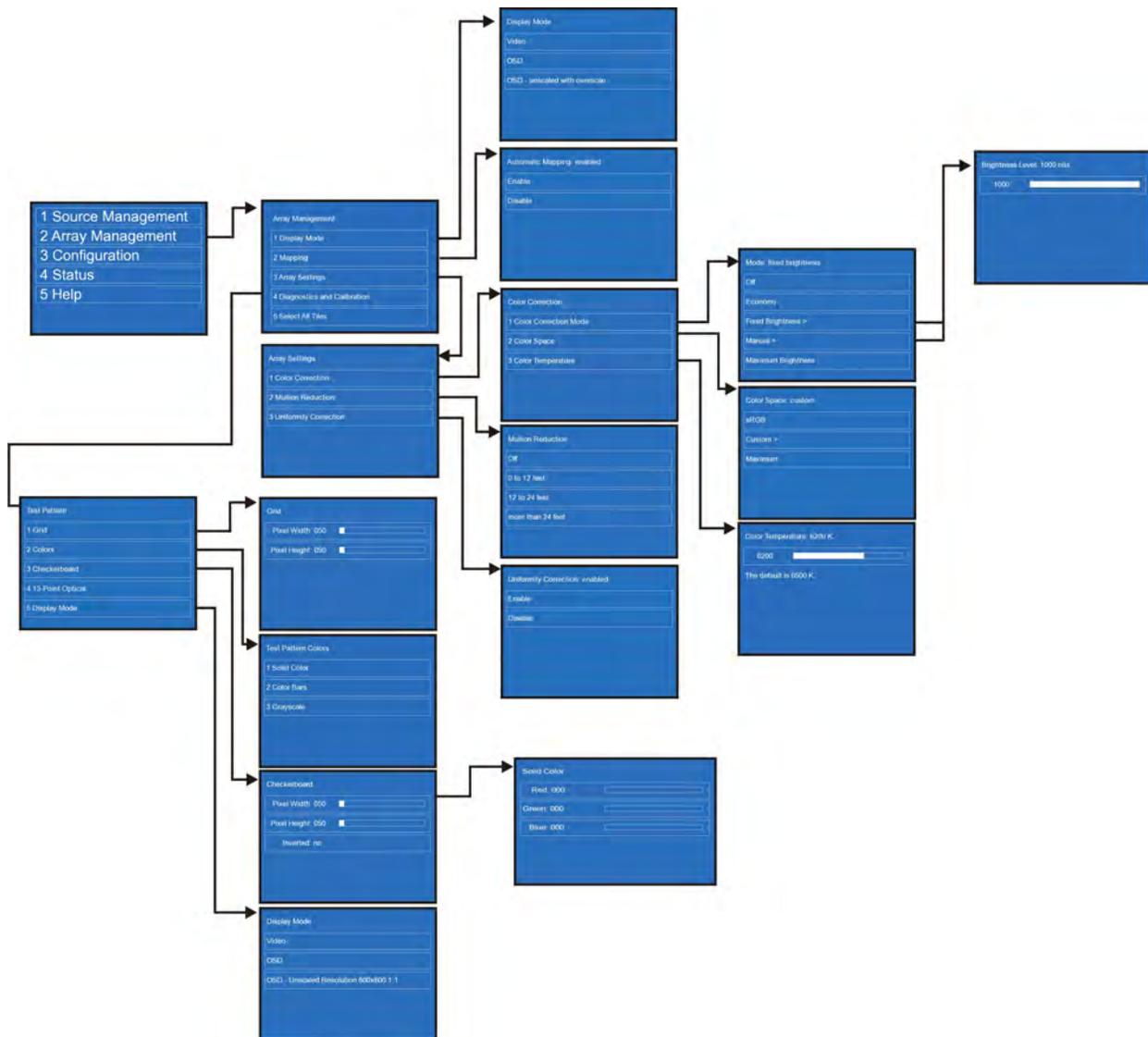


Figure 3-6 OSD Array Management Menu>Display Mode, Mapping and Array Settings

3.5.6 OSD Array Management Menu continued

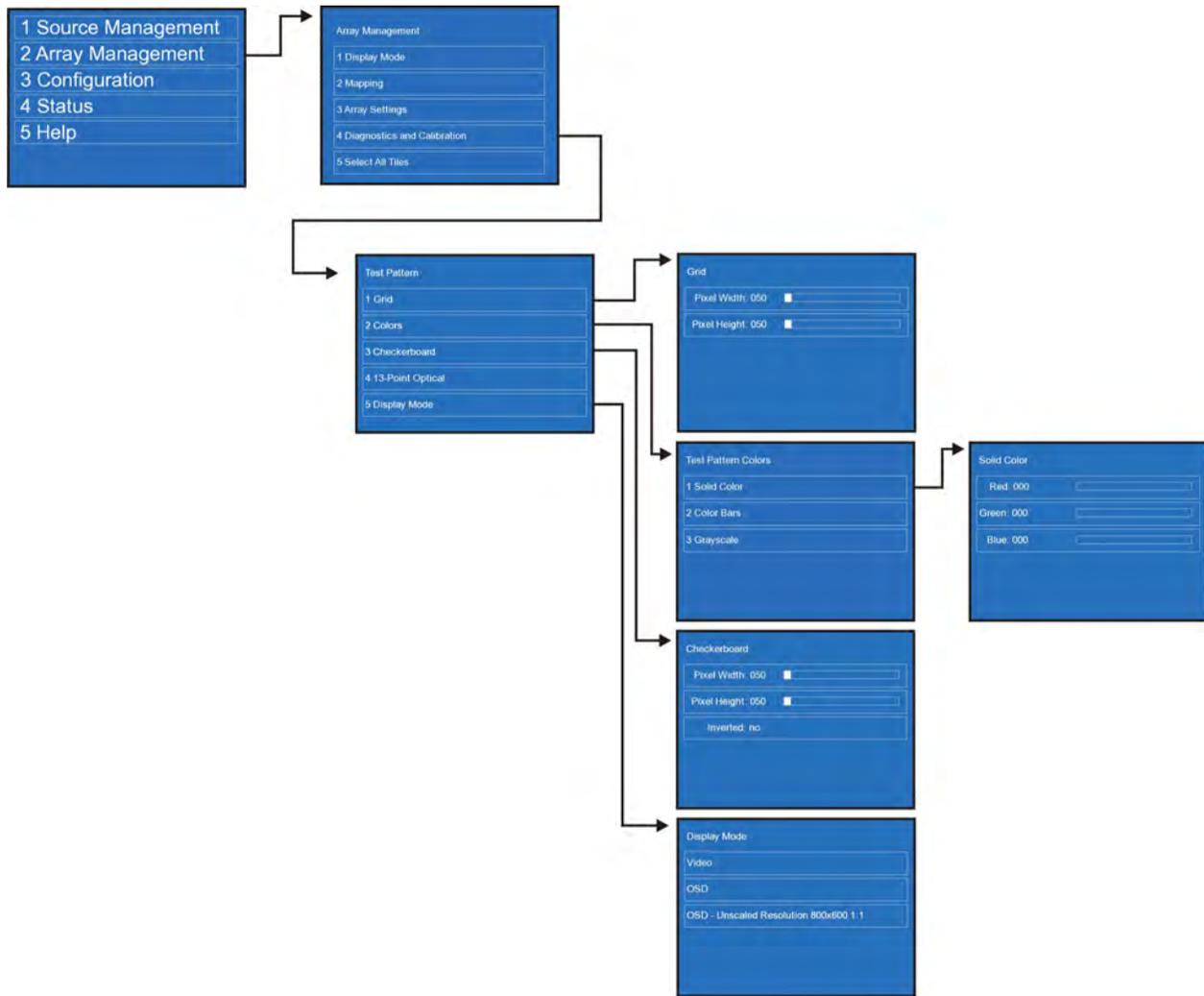


Figure 3-7 OSD Array Management Menu>Diagnostics and Calibration

3.5.7 OSD Configuration Menu

The Configuration menu (**Figure 3-8**) enables users to control power and to reset the ECU and Christie MicroTiles. Typically, the Christie MicroTiles and ECU need to be reset after a firmware upgrade. **NOTE:** *Local ECUs cannot be reset, powered ON or OFF from the software or the remote control.* The date and time settings can also be changed through this menu. Use the left/right arrow keys on the R100 Remote Control to adjust the date/time fields. For a detailed description of the same controls accessible from the webUI, refer to [3.10 Configuration Menu, on page 3-28](#).

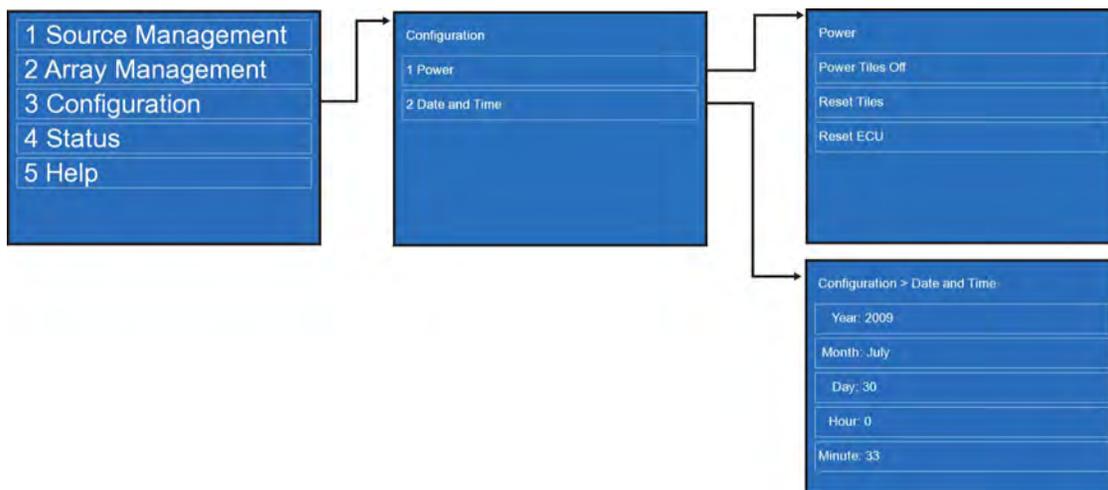


Figure 3-8 OSD Configuration Menu

NOTE: If the ECU was disconnected the message shown in **Figure 3-9** appears on the OSD. To avoid going into STANDBY mode connect the ECU.

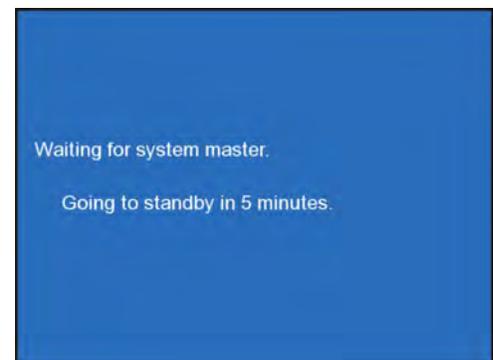


Figure 3-9 System Standby

3.5.8 OSD Status Menu

The Status menu (**Figure 3-10**) enables users to view the properties and software versions of the ECU and the Christie MicroTiles. In all applications the OSD appears only on one tile in an array of multiple tiles; however, when **Tile Properties** and **Tile Software Versions** is selected from the Status Menu the information is displayed on each of the Christie MicroTiles. For a description of the same controls accessible from the webUI, refer to *3.11 Status Menu, on page 3-36*.

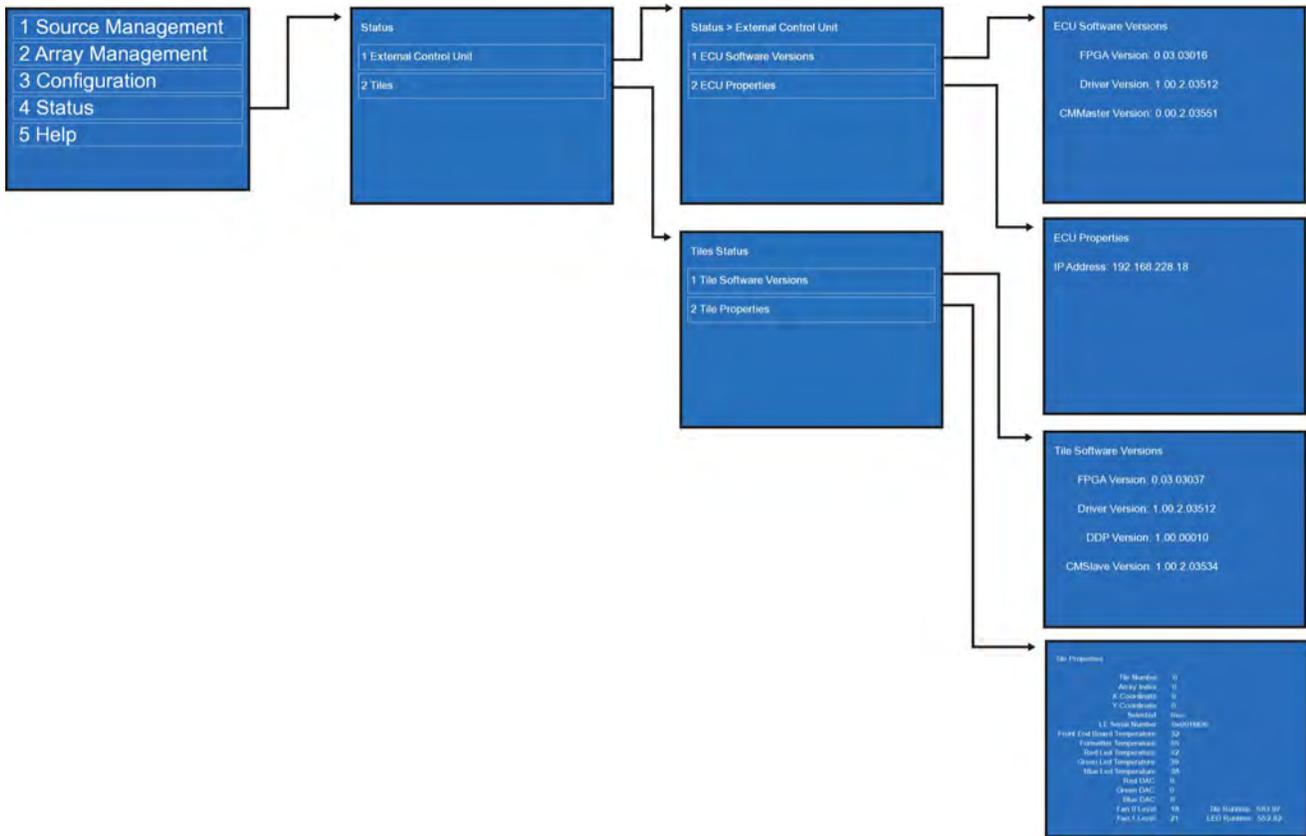


Figure 3-10 OSD Status Menu

3.5.9 OSD Help Menu

The Help menu (Figure 3-11) provides additional support for the OSD menu system. The **About MicroTiles OSD Software** selection provides software licence information.



Figure 3-11 OSD Help Menu

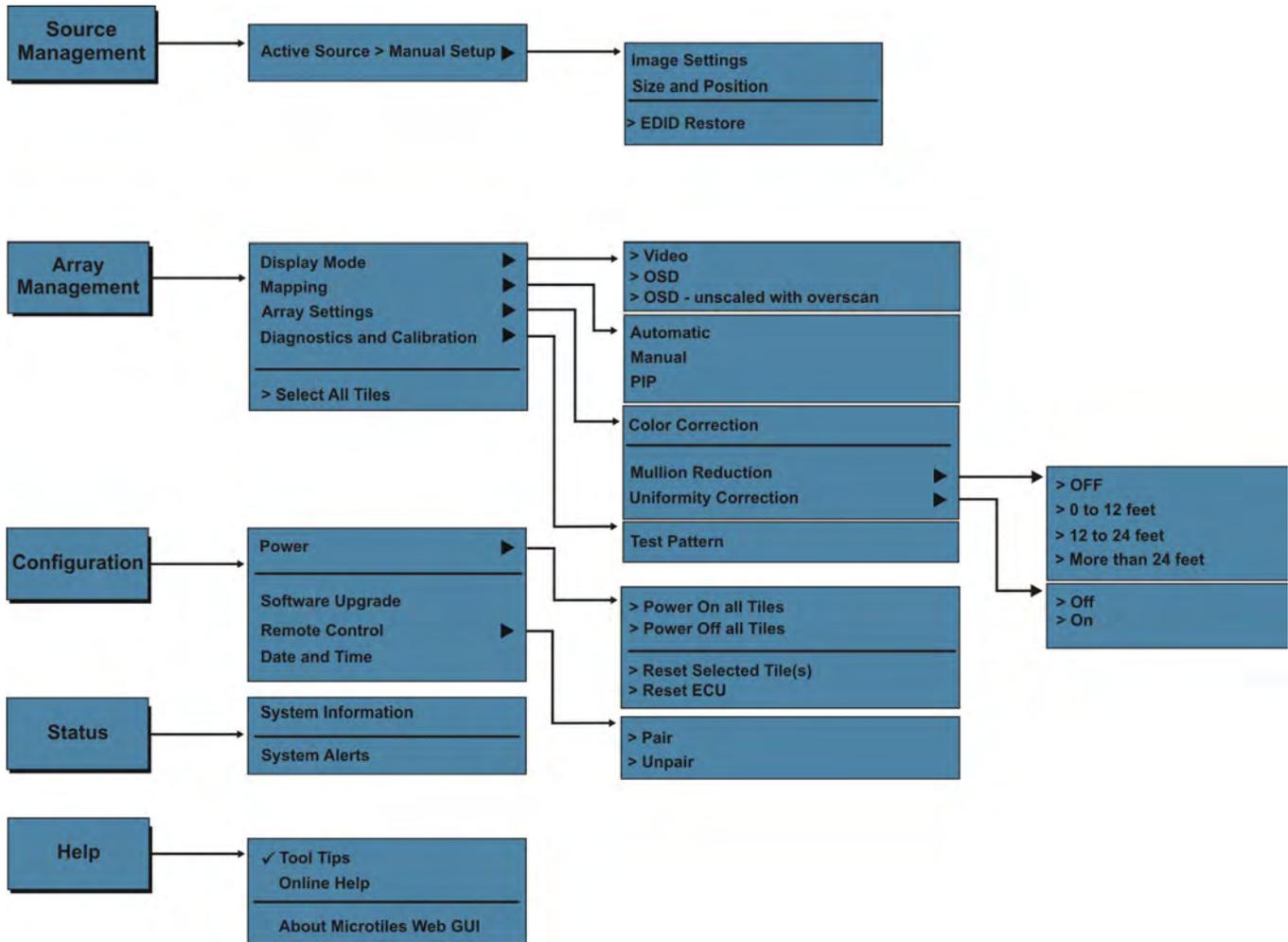
3.6 Using the Web User Interface (webUI)

In addition to using the OSD, Christie MicroTiles can also be controlled remotely, typically at a controller such as a PC, via a web user interface on an Ethernet network. If there are concerns about network security run the webUI on a local area network only and install a firewall.

3.6.1 Recommended System Requirements

- 1.6 GHz Intel Atom CPU
- 1 GB RAM
- Graphics adapter with 1024 x 768 resolution *** must support application window size of 800 x 600*
- Ethernet connection *** minimum recommended speed of 1.5 Mbps*
- Supported operating system, such as:
 - Microsoft Windows XP or Vista,
 - MAC OS X Leopard
 - Linux
- Supported web browser, such as:
 - Microsoft Internet Explorer version 7 and higher
 - Apple Safari version 3 or higher
 - Mozilla Firefox version 3 or higher
 - Adobe™ Flash Player Plug-In 9 or higher

3.6.2 WebUI Menu Tree



NOTE: Menu items tagged with the > symbol indicate that once the selection is made the information is sent in real time. Typically, the entire array is affected.

Figure 3-12 Christie MicroTiles WebUI Menu Tree

3.7 Navigating the WebUI

On start-up users are prompted to login. Use **admin** for both the user name and password. Each screen available through the webUI has the same top toolbar from which the following can be done:

- Select and setup an active input source
- Manipulate the appearance of video content (i.e., size, position, color, sharpness)
- Select between video and OSD display modes
- Perform software upgrades
- Display a test pattern
- Array Mapping
- View system information and alerts
- View current time and date
- Access online help

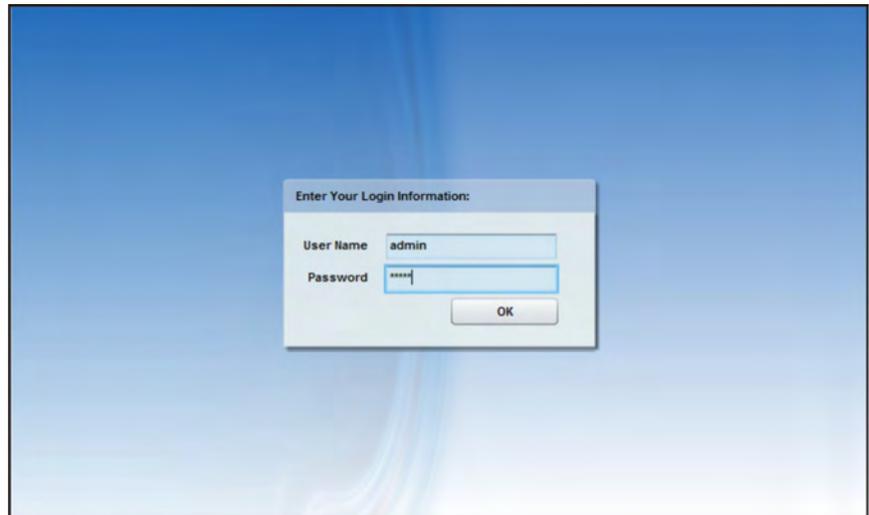


Figure 3-13 WebUI Login Screen

3.8 WebUI Source Management Menu

The Source Management menu (**Figure 3-14**) enables users to select and setup an active input source either manually or automatically. This includes setting up the size and position of the display window and adjusting image settings. The video source compatible with Christie MicroTiles is DVI-D. **NOTE:** *The maximum input resolution supported per ECU is up to 1920 x 1200 @60Hz.*

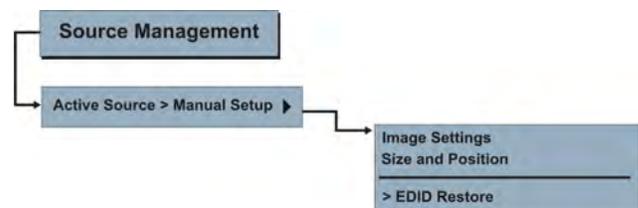


Figure 3-14 WebUI Source

3.8.1 Adjust Image Settings

To access the Image Settings screen click **Source Management** from the top menu bar and select **Active Source > Manual Setup** from the drop-down menu that appears and then **Image Settings (Figure 3-16)**. This screen enables users to manually adjust image sharpness, contrast, brightness and gamma of the individual Christie MicroTiles or the entire array.

1. Either click **Select All** to select each tile in the array or click on an individual Christie MicroTiles in the Tile Schematic window. The Tile Schematic window displays the physical layout or map of all the Christie MicroTiles (**Figure 3-15**). Clicking and dragging the background pans the view. Clicking on an individual tile selects it. Click the +/- keys to zoom in and out. Click **Reset** to return to the original view. Click **Refresh** to re-sync the view to the latest information from the server.
2. To check the status of a particular tile, hover over the specific tile to display its schematics (**Figure 3-15**).
3. Click the **Read** button beside the **Brightness** section to query the ECU for the current brightness setting of the array (**Figure 3-16**). **Brightness**, **Contrast** and **Gamma** settings can be **Set/Read** only to the entire array and not to individual tiles. If you attempt to **Set/Read** to individual tiles the warning message; Please select a tile; this command cannot be broadcast to all tiles is generated. However, **Sharpness** settings can be **Set** for both the array and for individual tiles, but only **Read** for individual tiles.

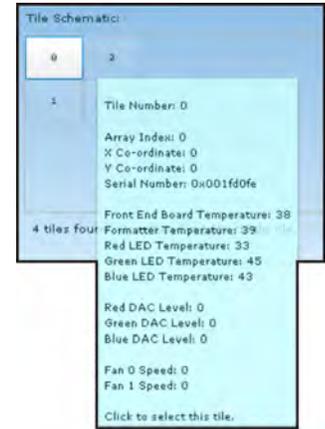


Figure 3-15 Tile Schematic

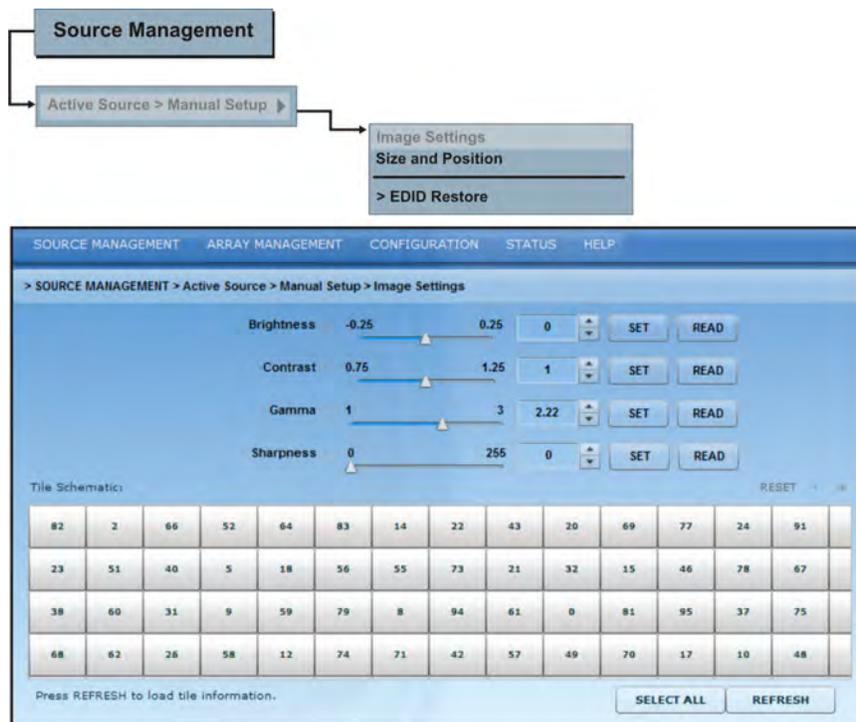


Figure 3-16 Image Settings

4. To manually change settings use either the scroll bar or the up/down arrows to change the value.
5. Click **Set** to send the changes to the ECU and view the results on the Christie MicroTiles.

3.8.2 Changing the Size and Position of Video Content

To access the Size and Position screen (Figure 3-17) click **Source Management** from the top menu bar and select **Active Source>Manual Setup>Size and Position**. The Size and Position screen enables users to manually adjust the X/Y Offset, width and height of the display to accommodate the particular application.

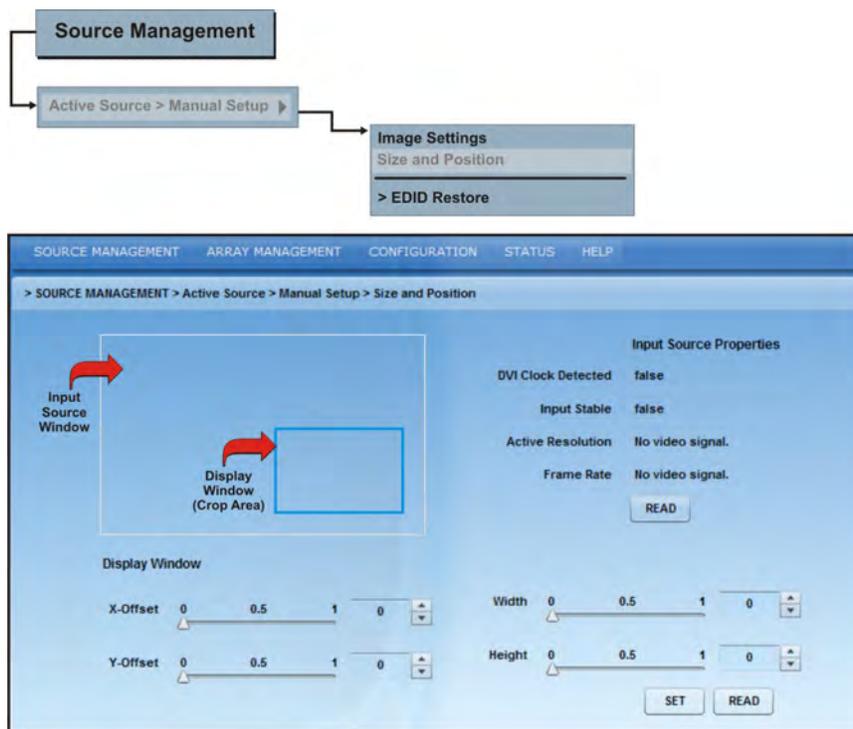


Figure 3-17 Size and Position>Automatic Input Configuration

Input Source Properties

Click **Read** to scan the properties of the input source detected by the ECU. **DVI Clock Detected** must state **True** in order to view video content on the Christie MicroTiles. When this input reads **False** check the connection between the ECU and the video source, and try again. **Input Stable** indicates the stability of the input. If this field states false ensure the video source is operating and ensure the video file is not corrupt. **Active Resolution** displays the width and height of the array in pixels. **Frame Rate** displays the frames per second.

Display Window

Adjusting the display window settings changes the capture size of the active input window. The **X-offset**, **Y-offset**, **Width** and **Height** values are expressed as a percentage of the active input. The top left represents 0,0. The sum of **X-offset** and **Width** must be greater than or equal to 0 and less than the width of the active input

source. The sum of **Y-offset** and **Height** must be greater than or equal to 0 and less than the height of the active input source. Once the changes you require have been made click **Set** to apply the current configuration to the array. Click **Read** to display the current settings of the display window.

3.8.3 EDID Restore

When connecting different types of input sources to the ECU, the EDID information of the input source may be incorrect. If the ECU cannot detect or display a good video source, use the EDID Restore to re-write the default information. See **Figure 3-18**.

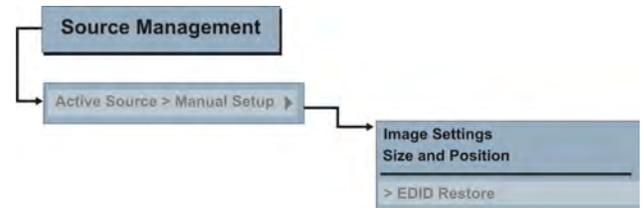


Figure 3-18 EDID Restore

3.9 WebUI Array Management Menu

Through the Array Management menu (**Figure 3-19**) the Christie MicroTiles can be automatically and manually mapped, picture-in-picture (PIP) can be set up, array settings can be adjusted and a test pattern can be displayed. Users can also switch the display mode between **Video**, **OSD** and **OSD - unscaled with overscan** . Typically, for most applications **Video** is used.

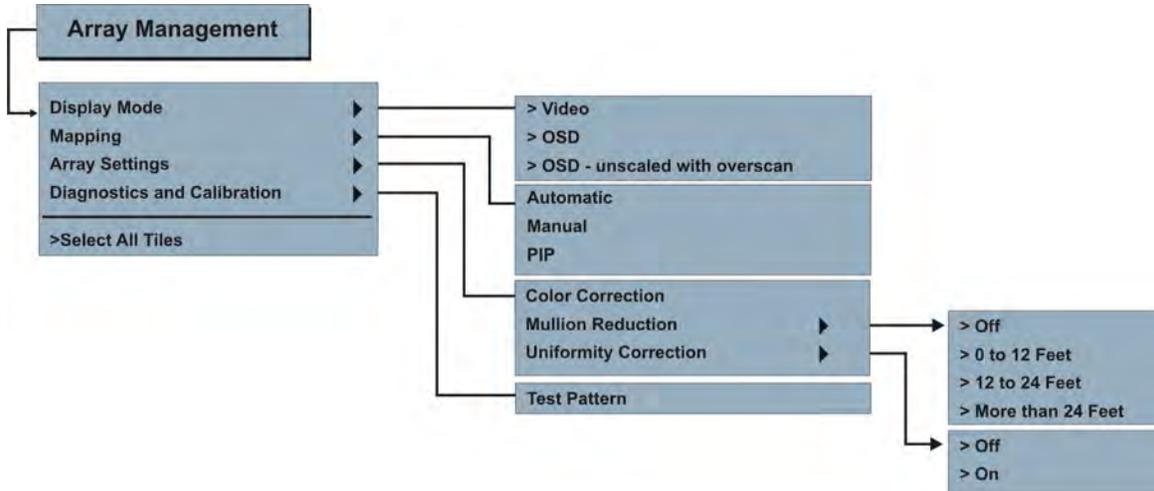


Figure 3-19 WebUI Array Management Menu

3.9.1 Select a Display Mode

From the top menu bar of the webUI click on the **Array Management** menu and select **Display Mode** from the drop-down menu (**Figure 3-20**). Select between **Video**, **OSD** and **OSD - unscaled with overscan** to display the content on the Christie MicroTiles. If a display mode is activated when only one tile is selected the signal is sent only to the active tile and the warning; Not all tiles are selected appears onscreen. To select the entire array click **>Select All Tiles** from the **Array Management** drop-down menu.

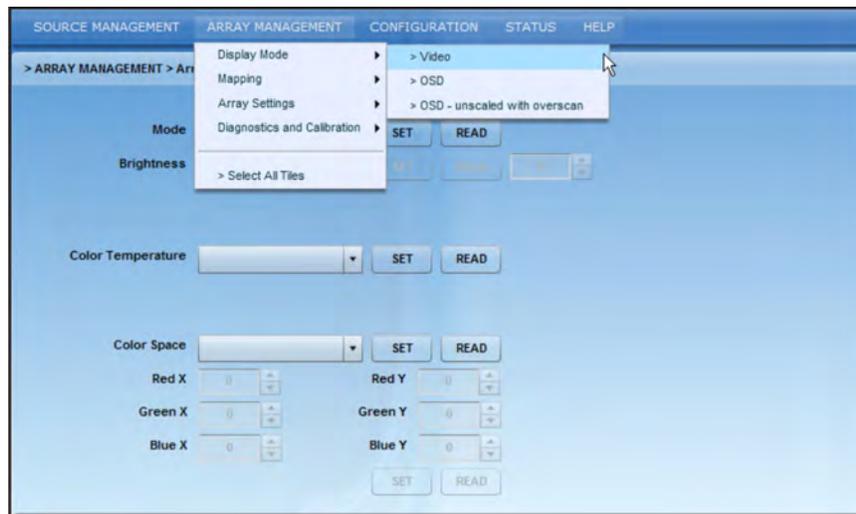


Figure 3-20 Array Management>Display Mode

Display Mode Options

- **Video:** Select to display video from the ECU input source (HSSL-1 or HSSL-2). One or both ports must be enabled.
- **ON Screen Display (OSD):** Select this to display a 720 x 540 image, upscaled to approximately 800 x 600, which forces the image to touch the edge of the screen.
- **OSD - unscaled with overscan:** Typically, overscan resolution (800x600) is used to display test patterns.

3.9.2 Mapping Tiles

Christie MicroTiles are equipped with neighbor detection circuitry. Once the array is powered up the ECU uses the neighbor detection circuitry to determine the configuration of the array. It then relays the total dimensions of the array and the exact physical location of the array back to each tile. Mapping is required to organize the display in the array and to ensure each tile knows its physical arrangement within the array. Mapping is checked approximately every 10 seconds. By default, mapping is enabled. Each tile, knowing its own position within the array and the video source characteristics, is required to crop the active input source, select its own subimage portion and scale the subimage to display in full screen.

Automatically Mapping

NOTICE! *When Automatic Mapping is disabled any changes made using Manual Mapping and PIP will not take effect.*

1. From the **Array Management** drop-down menu select **Mapping> Automatic** (Figure 3-21).
2. Once the screen shown in **Figure 3-21** appears select **Enabled** from the **Automatic Mapping** drop-down menu and click **Set**. Each tile within the array crops the active input source, selects its own sub-image portion and scales the sub-image to display on the full screen (array).
3. Click **Read** at anytime to update the array and ensure the most current information is displayed.



Figure 3-21 Automatic Mapping

Manual Mapping

NOTICE! When *Automatic Mapping* is disabled any changes made using *Manual Mapping* and *PIP* will not take effect.

Manual mapping is a useful tool when building an array that does not have neighboring tiles, such as a staircase configuration. Each MicroTile, knowing its own position within the array and the video source characteristics, is required to crop the active input source, select its own subimage portion and scale the subimage to display in full screen.

1. Ensure **Automatic Mapping** is enabled. For information, refer to *Automatically Mapping, on page 3-20*.
2. From the **Array Management** drop-down menu select **Mapping>Manual** (**Figure 3-22**).
3. Click **Read** from the Manually Mapped Tiles section to load all previously saved information from the main ECU.
4. Click **Read** underneath the **All Tiles** section of the screen. This section of the screen is then populated with all the source tiles.
5. Select a tile(s) from the **All Tiles** section of the screen.
6. Click and drag the selected tile into the main grid (**Figure 3-22**).
7. The image on the array is automatically configured and mapped once the tile is dropped into the main grid.
8. Click the **Info** button two times to bring up the properties of each tile.

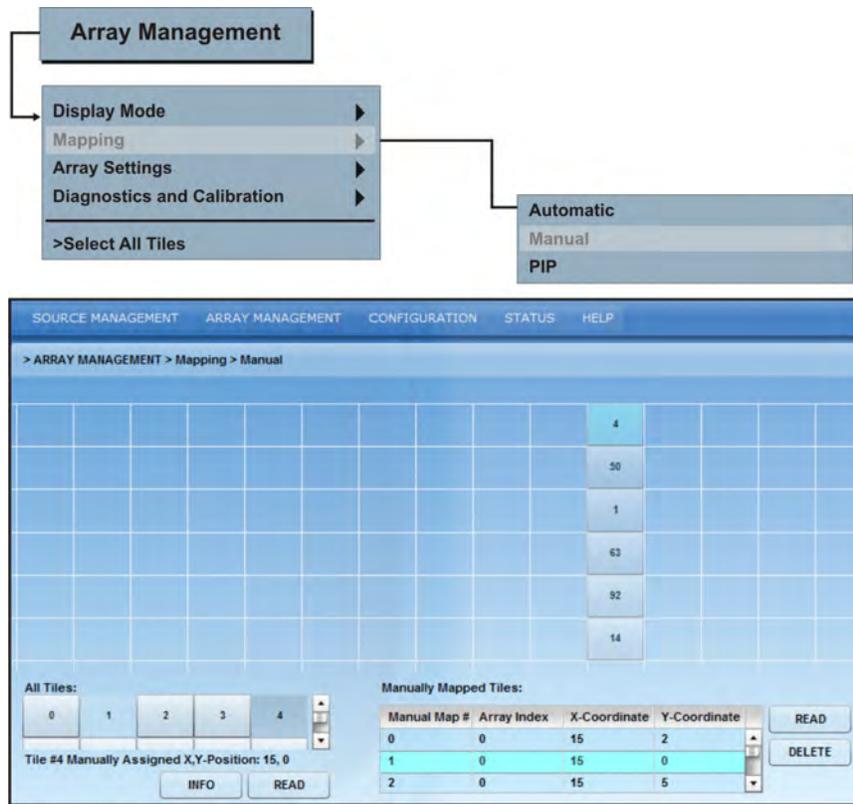


Figure 3-22 Manual Mapping

Picture-In-Picture (PIP)

NOTICE! When Automatic Mapping is disabled any changes made using Manual Mapping and PIP will not take effect.

PIP enables users to display two images on an array or to increase the input resolution. In order for PIP to function multiple ECUs must be connected to the array and automatic mapping must be enabled. For information on how to connect multiple ECUS, refer to **2.2.8 Cable Routing, on page 2-10**. **NOTE:** PIP is not available via the OSD.

1. From the **Array Management** drop-down menu select **Mapping>PIP** (Figure 3-23).

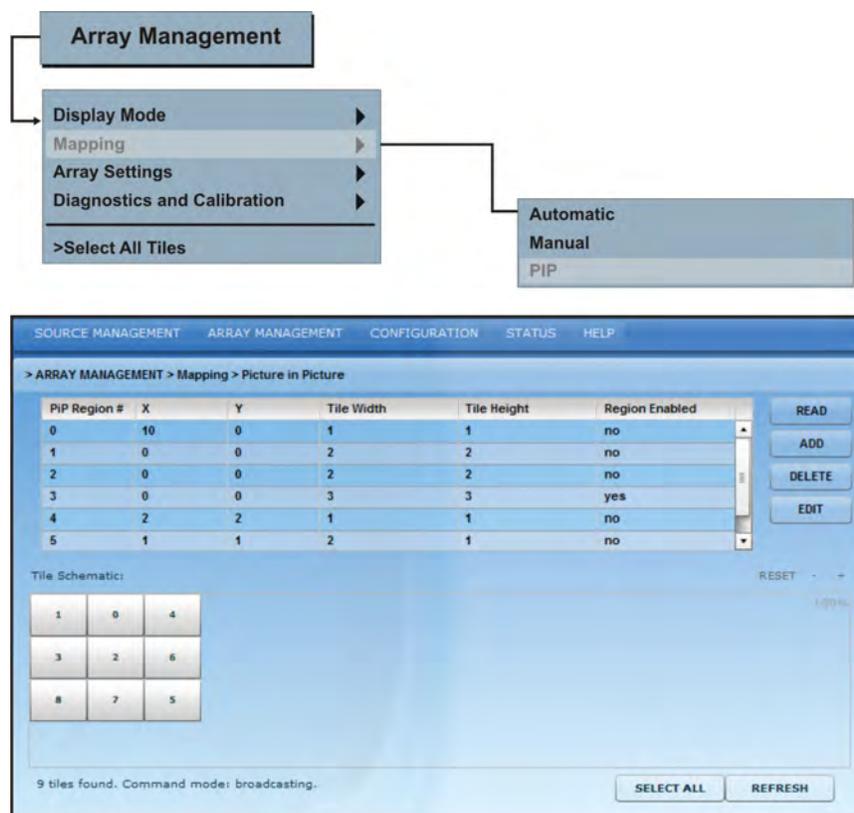


Figure 3-23 Picture-In-Picture

2. Click **Read** to get a reading of any PIP regions that have already been created.
3. To create a new PIP region select a tile from the **Tile Schematic** area. Press **Shift** to select additional tiles.
4. Click **Add** once the PIP area has been selected. The chart listing the PIP regions will be updated to include the new defined area. If the chart did not automatically update click **Read** to refresh the list.
5. To delete a region select it from the chart and click **Delete**.
6. Click **Read** to ensure the deletion was executed.

Editing a PIP Region

1. To edit an existing PIP region select the region from the chart and click **Edit (Figure 3-24)**.
2. Use the scroll bars to adjust the X/Y Offsets and to change the width and height of the PIP region. The display window will change as you make the adjustments. Click **Set** once you are satisfied with the changes.
3. From the **Enabled** drop-down menu you can chose enable or disable PIP.
4. The Video Source for the PIP region can be defined from the **Video Source** drop-down menu (**Figure 3-24**). Select from **No Video**, **Main**, **Local**, and **Main or Local**. **NOTE:** *When both Main and Local video are present the software selects Main. This setting defaults to Local.*

NOTE: *To change width and height of PIP regions already defined you must first delete the region and add the new region in order for the changes to take effect. Clicking Read does not automatically update the region.*

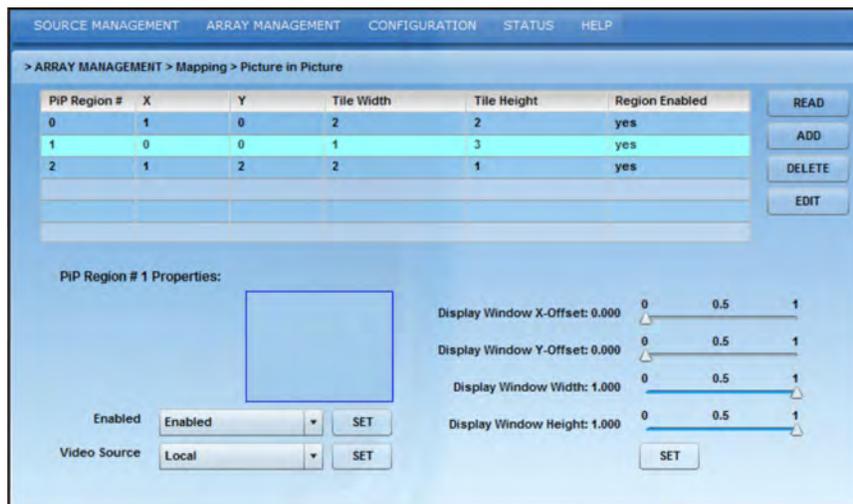


Figure 3-24 Editing PIP

3.9.3 Array Settings

Color Correction

The ECU periodically polls all attached Christie MicroTiles for their native colorimetry and brightness capabilities. The ECU combines this information to determine the optimal colorimetry and brightness setting for the array as a whole. This optimal operating point is transmitted to all attached Christie MicroTiles. It is the responsibility of the individual Christie MicroTiles to ensure they actually meet the requested colorimetry. The **Array Settings** screen enables users to manually adjust the nits of the entire array and to enable or disable color matching of the array. To access this screen select **Array Management** from the top menu bar and then select **Array Settings** and **Color Correction** from the drop-down menu (**Figure 3-25**).

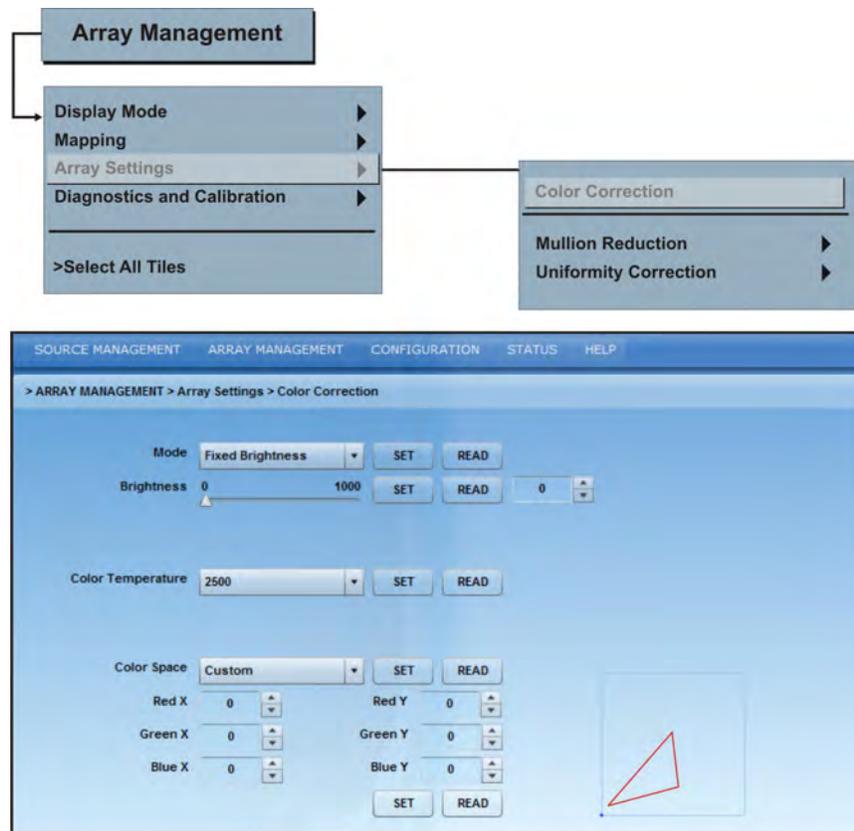


Figure 3-25 Array Management>Array Settings>Color Correction

Color Correction Mode

When **Color Matching** is enabled the ECU reads the settings of each tile, calculates the average and applies that reading to each tile in the array. Click **Set** to apply any changes that were made. Click **Read** to view the current settings.

1. From the **Mode** drop-down menu select the brightness mode to adjust. The ECU supports five modes of brightness:
 - **Economy:** In this mode the ECU determines which tile is the brightest, sets LED power to minimum and commands all other tiles to match it in brightness. As the environment changes (e.g., ambient temperature) this value may change. The ECU continually monitors the attached Christie MicroTiles and updates their settings to ensure a uniform image.
 - **Fixed Brightness:** In this mode the user sets the minimum LED power level, in nits, which all the tiles in the array strive to achieve to. As the environment changes (e.g., ambient temperature) this value may change. The ECU continually monitors the Christie MicroTiles and updates their settings to ensure a uniform image.
 - **Manual:** This mode is similar to **Fixed Brightness**; however, it allows you to change the brightness to individual tiles. Ensure a specific tile is selected before working in this mode.
 - **Maximum Brightness:** In this mode the ECU determines which tile is the dimmest, set its LED power to maximum and commands all other tiles to match it in brightness. As the environment changes (e.g., ambient temperature) this value may change. The ECU continually monitors the attached Christie MicroTiles and updates their settings to ensure a uniform image. use slide bar to set brightness set between 0 - 1000
 - **OFF:** In this mode the current settings remain and no changes take affect.
2. Click **Set** to apply any changes.

Brightness Levels

Use the scroll bar to adjust brightness levels of the array. **NOTE:** *A mode of color correction must be selected from the Mode drop-down in order to adjust brightness levels.*

Color Temperature

This selection enables users to manually adjust the color temperature of the Christie MicroTiles array. Color temperature dictates how warm or cool the video output on the array appears. The higher the color temperature the cooler and bluer the image. The lower the color temperature the warmer and redder the image. Click **Set** to apply any changes. Click **Read** to query what the current setting is or to refresh the array. Color temperature settings range from 3200 to 9600K. **NOTE:** *A mode of color correction must be selected from the Mode drop-down in order to adjust color temperature.*

Color Space

This selection enables user to apply the type of color decoding. The setting defaults to maximum.

- **sRGB:** Select this option to apply standard RGB color space to the array.
- **Custom:** Select this option to manually adjust the XY coordinates of the RGB color spectrum.
- **Maximum:** This is the default setting. When selected the maximum color space obtainable by the array is applied. For details, refer to [6.1.4 Display Specifications, on page 6-1](#).

3.9.4 Mullion Reduction

Use mullion reduction to adjust the brightness level to the edges of the Christie MicroTiles until they appear smaller. It is recommended to have video playing on the array when adjusting mullion to see the changes take effect. To access mullion reduction select **Array Management** from the top menu bar and then **Array Settings>Mullion Reduction** from the drop-down menu (Figure 3-26). Select between **OFF**, **0 to 12 Feet**, **12 to 24 Feet** and **More than 24 Feet**. When a selection is made you will see the changes take affect to the video content showing on the array.

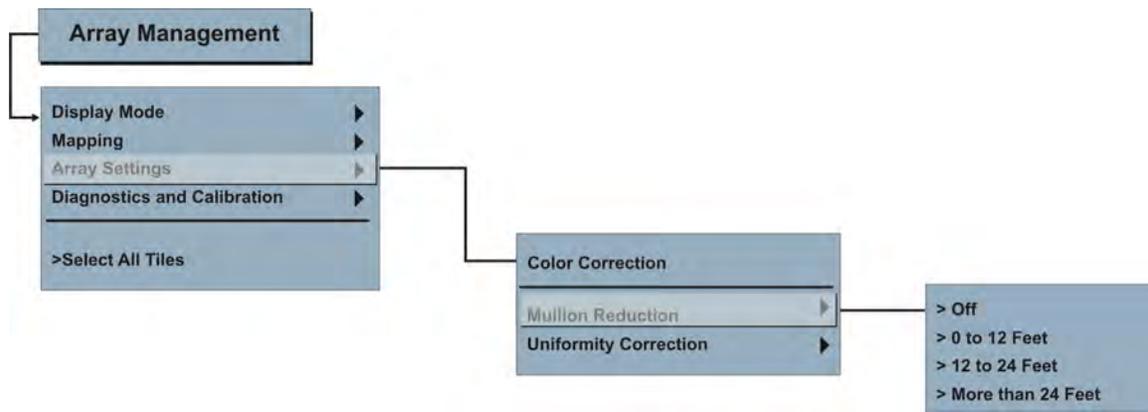


Figure 3-26 Mullion Reduction Menu

3.9.5 Uniformity Correction

Uniformity correction is enabled by default and ensures the light source in the center of the tile (known as the hot spot) is dimmed to ensure brightness is uniform. To access uniformity correction select **Array Management** from the top menu bar and then **Array Settings>Uniformity Correction** from the drop-down menu (Figure 3-27).

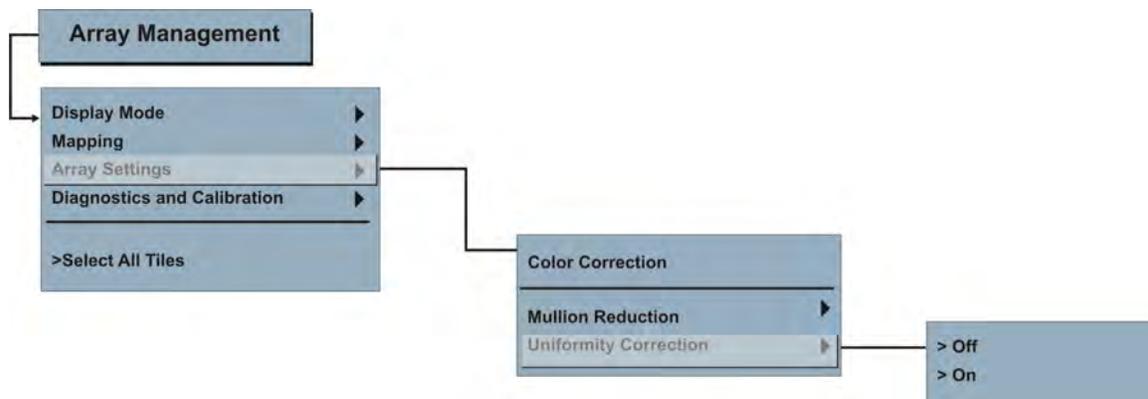


Figure 3-27 Uniformity Correction Menu

3.9.6 Display a Test Pattern

The Test Pattern screen (Figure 3-28) enables users to select from a list of test patterns used for troubleshooting and setup purposes. Certain test patterns are ideal for certain procedures. For instance, the **13 Point Optical** test pattern is ideal for setting up focus.

1. From the **Array Management** drop-down menu, select **Diagnostics and Calibration>Test Pattern** to access the screen shown in Figure 3-28.
2. Click on a particular tile in the **Tile Schematic** area to apply the change to a specific tile only or click **Select All**.
3. From the **Display Mode** drop-down menu, select between **Video**, **OSD** and **OSD - unscaled with overscan**. In order to display internal test patterns, **Display Mode** must be set to **OSD - unscaled with overscan**.
4. From the **Test Pattern** drop-down menu, select which type of test pattern to display. Choices include; **Solid Color**, **Color Bars**, **Grayscale**, **Checkerboard**, **Checkerboard Inverted**, **Grid**, **13 Point Optical**. **NOTE:** When using the *Solid Color* test pattern select a specific color to use from the *Color* fly-out menu.
5. If necessary, adjust the width and height of the test pattern by clicking on the up/down arrow keys or entering a value in the designated fields. **NOTE:** *Width and Height* values are only valid for the *Checkerboard*, *Checkerboard Inverted* and *Grid* test patterns.
6. To return to displaying video content ensure **Video** is selected from the **Display Mode** drop-down menu.

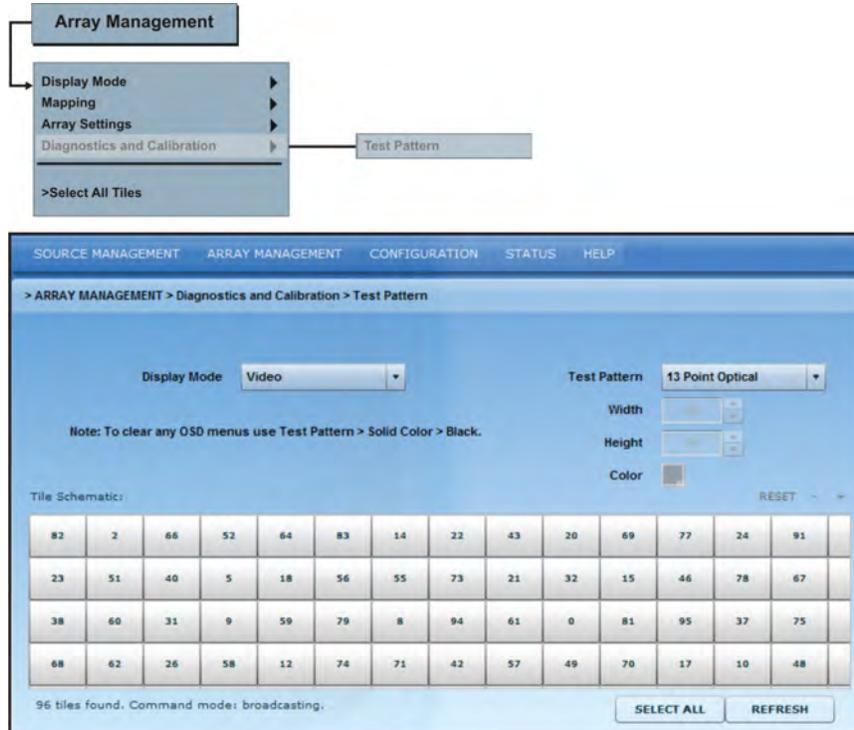


Figure 3-28 Diagnostics and Calibration>Test Pattern

3.10 Configuration Menu

The Configuration menu (**Figure 3-29**) enables users to enable/disable power to the Christie MicroTiles, reset the tiles and ECU, upgrade the software, and update the date and time.

3.10.1 Tile(s) ON/OFF

Selecting Tile(s) ON and Tile(s) OFF affects the entire array, regardless of how many tiles have been selected through the software application.

NOTE: *Wait approximately 10 seconds between powering the array OFF and ON.*

3.10.2 Resetting Selected Tile(s) and ECU

The Christie MicroTiles and ECU must be reset after a firmware upgrade in order for the changes to take affect. This function affects the tiles that have been selected through the software application. For more information, refer to [3.10.3 Upgrading Main Software, on page 3-29](#).

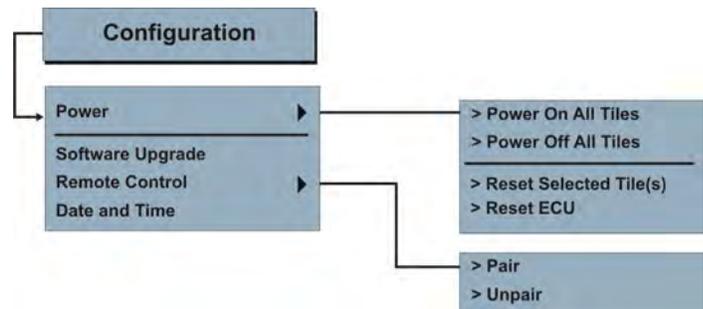


Figure 3-29 Configuration Menu

3.10.3 Upgrading Main Software

NOTICES! 1) Before updating the software check online at www.microtiles.com to ensure the latest software version is being installed. Failure to install the latest version can affect system performance. 2) During a software upgrade the web server is unresponsive for several minutes and video may be interrupted or temporarily disabled. 3) During a software upgrade DO NOT attempt to use the OSD, the webUI or open another web browser.

Check Current Software Version from OSD

1. To check the current version of software press **Menu** on the R100 Remote Control to access the OSD.
2. Select **Status** from the OSD Main Menu.
3. From the Status Menu select from either External Control Unit or Tiles to view the current software versions installed on each. For details, refer to *3.5.8 OSD Status Menu, on page 3-12*.
4. Go to www.microtiles.com to check for the latest available software version (**Figure 3-30**). If the version found on the web does not match the version on the product ensure the web version is downloaded.

Check Current Software Version from webUI

1. To check the current version of software from the webUI, select **Status** from the top menu bar and then **System Information** from the drop-down menu.
2. From the System Information screen select from either **External Control Unit** or **Tiles** to view the current software versions installed on each.
3. Go to www.microtiles.com to check for the latest available software version (**Figure 3-30**). If the version found on the web does not match the version on the product ensure the web version is downloaded.



Figure 3-30 Christie MicroTiles Website Firmware Upgrade Link

Upgrade Software

1. From the webUI, select **Configuration** from the top menu bar and **Software Upgrade** from the drop-down menu that appears (**Figure 3-31**).

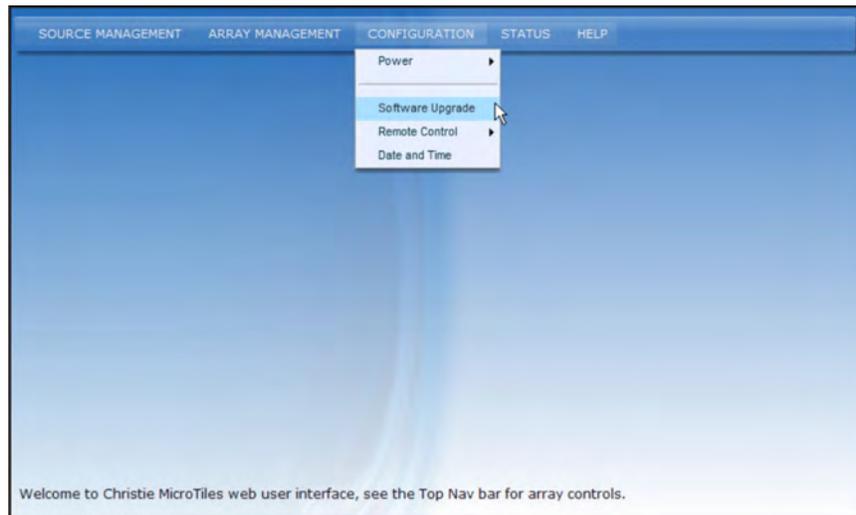


Figure 3-31 Software Upgrade

2. Through the Software Upgrade screen (**Figure 3-32**) users can choose to upgrade the software or hardware of the ECU or a group of selected Christie MicroTiles. For information on hardware upgrades, refer to [3.10.4 Hardware Upgrades, on page 3-32](#).
3. If you upgrade the Christie MicroTiles ensure the specified tiles are selected in the **Tile Schematic** section of the user interface. Select **Firmware**, from the **Selected Tile(s)** drop-down menu (**Figure 3-32**).

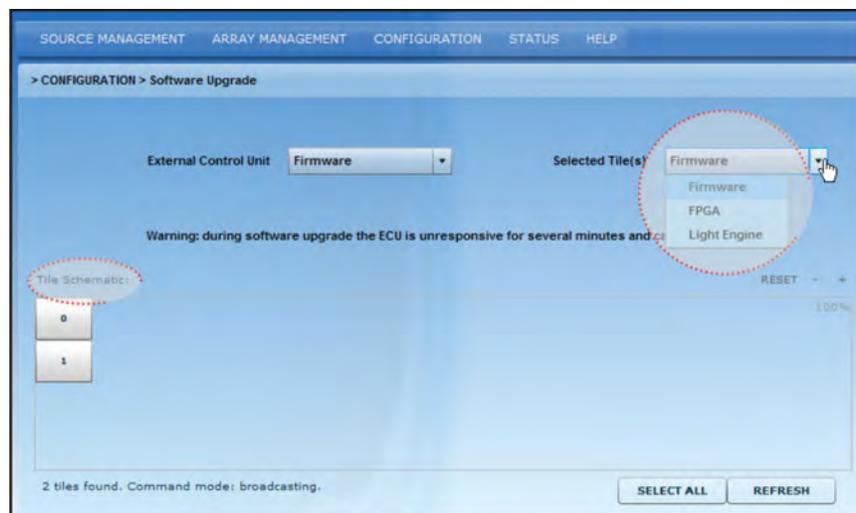


Figure 3-32 Upgrading Selected Tile(s)

4. If upgrading the ECU, select **Firmware** from the **External Control Unit** drop-down menu (**Figure 3-33**).

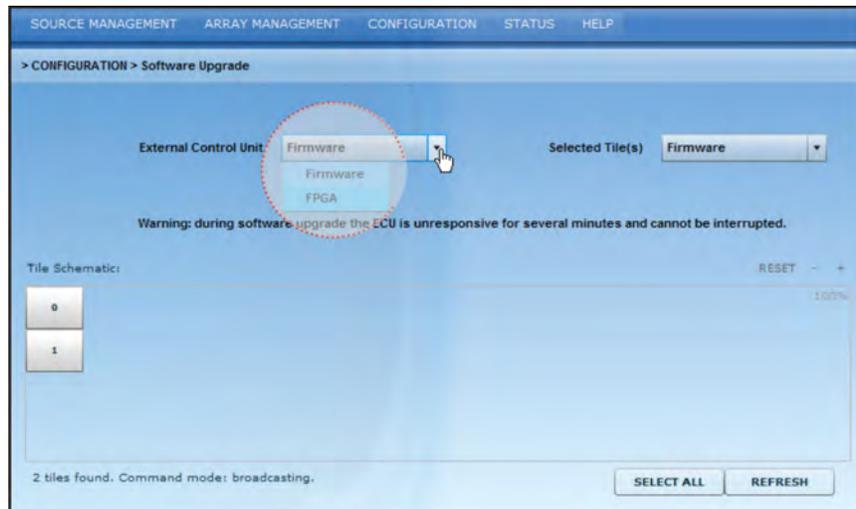


Figure 3-33 Upgrading External Control Unit

5. Once you click on one of the upgrade selections an Explorer window opens up. Search for the upgrade file and click **Open** to initiate the upgrade.
6. Software upgrades take approximately three minutes to complete. If you are using Windows[®], Adobe[®] Flash Player™ Plug-In version 9.0, must be installed in order to initiate upgrades. If using Mac[®] and Linux[®], Adobe[®] Flash Player Plug-In™ version 10.0 or higher is required.
7. For software upgrades to take effect use the OSD or webUI to reset the ECU and tiles, or turn power OFF/ON at the external power source. **NOTICE! The version of software on the ECU and tile(s) must match before resetting or the changes will not take affect.**

3.10.4 Hardware Upgrades

Upgrading FPGA

It is recommended the hardware upgrade for the FPGA be performed at the same time as a firmware upgrade.

1. From the webUI, select **Configuration** from the top menu bar and **Software Upgrade** from the drop-down menu that appears (Figure 3-34).
2. Through the Software Upgrade screen (Figure 3-35) users can choose to upgrade the software or hardware of the ECU or a group of selected Christie MicroTiles.
3. If you upgrade the Christie MicroTiles ensure the specified tiles are selected in the **Tile Schematic** section of the user interface. Select

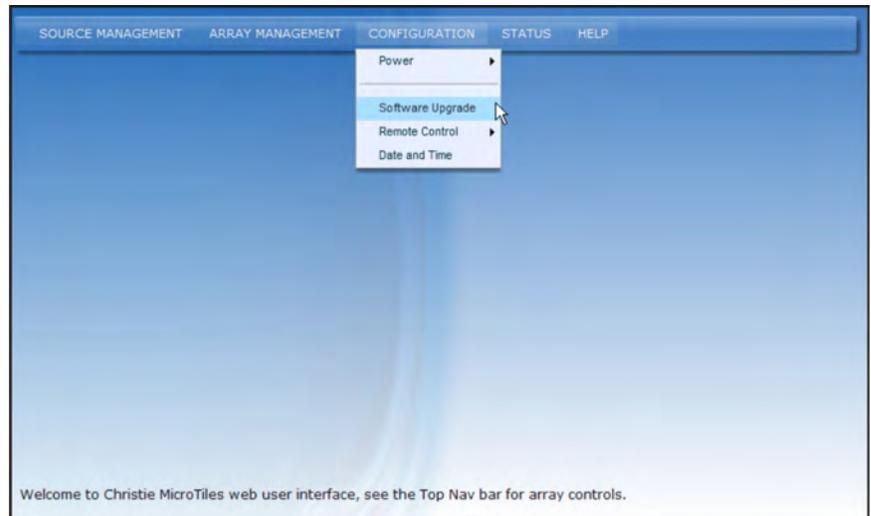


Figure 3-34 Software Upgrade

between **FPGA** from the **Selected Tile(s)** drop-down menu (Figure 3-35). **NOTICE! DO NOT initiate a light engine upgrade unless an upgrade is posted at www.microtiles.com. Light engine upgrades take approximately 15 minutes for each tile in the array.**

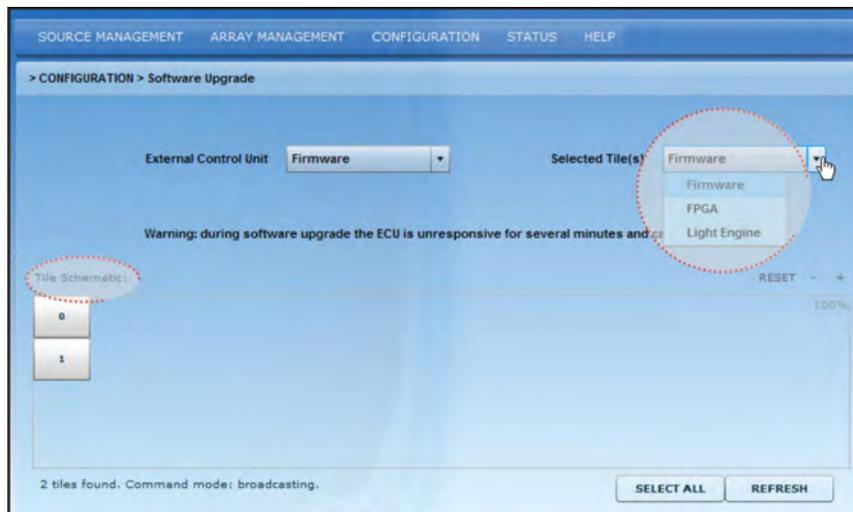


Figure 3-35 Upgrading Selected Tile(s)

4. If upgrading the External Control Unit, select **FPGA** from the **External Control Unit** drop-down menu (Figure 3-36). **NOTICE! DO NOT initiate a light engine upgrade unless an upgrade is posted at www.microtiles.com. Light engine upgrades take approximately 15 minutes for each tile in the array.**



Figure 3-36 Upgrading External Control Unit

5. Once you click on one of the upgrade selections an Explorer window opens up. Search for the upgrade file and click **Open** to initiate the upgrade.
6. FPGA hardware upgrades take approximately three minutes to complete. If you are using Windows®, Adobe® Flash Player™ Plug-In version 9.0, must be installed in order to initiate upgrades. If using Mac® and Linux®, Adobe® Flash Player Plug-In™ version 10.0 or higher is required.
7. For hardware upgrades to take effect power the ECU and array OFF and ON from its external power source.

3.10.5 Remote Control

Remote Pairing via the WebUI

Pairing the remote via the webUI is typically done when you are unable to physically access the ECU. Only one remote can be paired to the main ECU. Pairing does not function with local ECUs.

1. From the webUI select **Configuration** from the top menu bar.
2. From the drop-down menu click on **Remote Control** and then **Pair** (Figure 3-37).

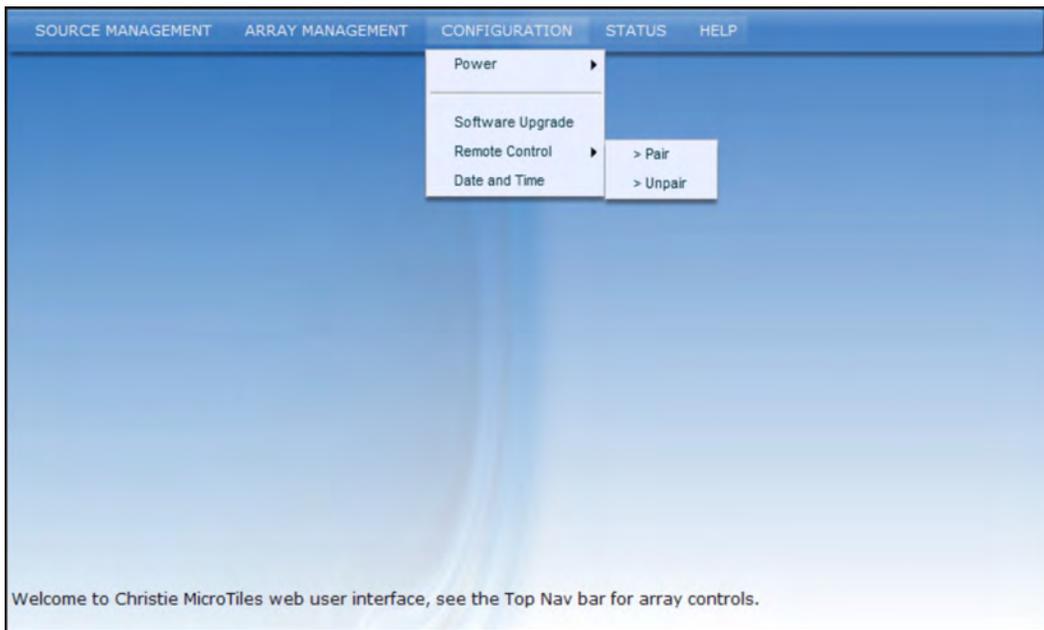


Figure 3-37 Pairing the Remote via the WebUI

3. The screen shown in **Figure 3-38** appears on the OSD.
4. Press the **Pair** button from the R100 Remote Control and then **Enter**.

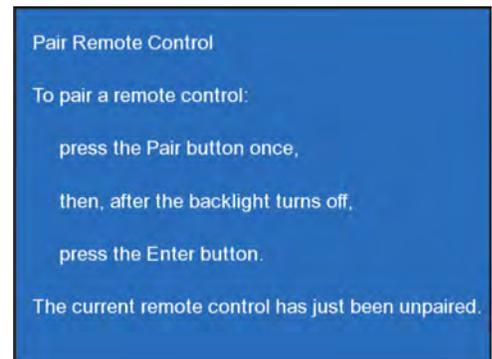
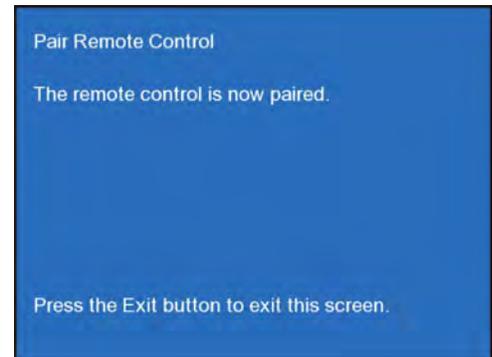


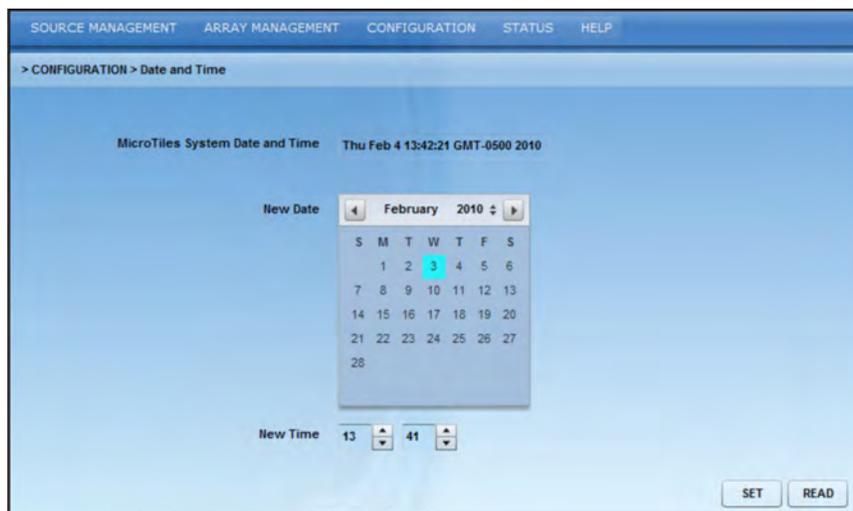
Figure 3-38 Pair Remote Control

5. The message `The Remote Control is now Paired` appears on each tile in the array once the process is complete (**Figure 3-39**). To return to video press **Exit** on the remote.
6. To unpair the remote select **Unpair** from the drop-down menu.

**Figure 3-39 Remote Paired**

3.10.6 Set Date and Time

This screen enables users to set the current system date and time. The date displayed in the **MicroTiles System Date and Time** field is processed from the ECU, while the date in the **New Time** field is updated to the time on the computer. Click **Read** to see any changes take effect and click **Set** to store the changes.

**Figure 3-40 Configuration > Date and Time**

3.11 Status Menu

The Status menu (**Figure 3-41**) enables users to view the system information for the web application, ECU and the Christie MicroTiles. It also provides a breakdown of the current system alerts. For information on the most common alerts and how to troubleshoot, refer to [Section 5 Troubleshooting](#).

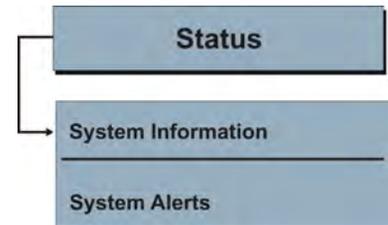


Figure 3-41 Status Menu

3.11.1 System Information - Web Application

1. Click **Status** from the top menu bar.
2. Select **System Information** from the drop-down menu.
3. Select **Web Application** from the available screen selections (**Figure 3-42**).
4. The **Date and Time** field displays the information from the ECU. The **Plug-in Version** field displays the version of Adobe® Flash Player™ used for the array.



Figure 3-42 Status >System Information>Web Application

3.11.2 System Information - External Control Unit

This screen provides software version information for the ECU. The ECU spreadsheet lists information on all the ECUs connected to the main ECU. To view the latest version information, click **Read All**. For information on how to upgrade the software, refer to [3.10.3 Upgrading Main Software, on page 3-29](#).

1. Click **Status** from the top menu bar.
2. Select **System Information** from the drop-down menu.
3. Select **External Control Unit** from the available screen selections (**Figure 3-43**).
4. To view the latest version information for the ECU, click **Read All**.
5. Click **Read** from the bottom of the screen to populate the ECU spreadsheet. This will display each of the ECUs connected to the array, both main and local. The main ECU will always state **true** in the **Main Video** column. Whichever ECU you are currently logged into will appear highlighted in the spreadsheet.
6. To view ECU logs click **ECU Log**. This will populate a new window in Explorer containing the ECU error logs, which are used for technical support to troubleshoot any problems occurring with the ECU.



The screenshot shows the 'External Control Unit' status page. At the top, there is a navigation bar with 'SOURCE MANAGEMENT', 'ARRAY MANAGEMENT', 'CONFIGURATION', 'STATUS', and 'HELP'. Below the navigation bar, the breadcrumb path is '> STATUS > System Information > External Control Unit'. On the right side, there is a 'Web Application' section with 'External Control Unit' selected and a 'Time' button. The main content area displays the following software versions:

- FPGA Software Version: 1.00.03880
- Driver Software Version: 1.00.2.03991
- CMECU Software Version: 1.00.3.03889

Below the versions are two buttons: 'READ ALL' and 'ECU LOG'. At the bottom right is a 'READ' button. A table at the bottom of the page lists ECU details:

ECU #	Serial	Priority	Source	Width	Height	Frame Rate	Main Video
0	0x0022f2ba	0	0	1280	1024	1907.38	false
1	0x0023e14e	1	0	1280	1024	1907.38	true

Figure 3-43 Status>System Information>External Control Unit

3.11.3 System Information - Tiles

Tile Properties

1. Click **Status** from the top menu bar.
2. Select **System Information** from the drop-down menu. Select **Tiles** from the available screen selections (Figure 3-44).



Figure 3-44 Status > System Information > Tiles

3. The screen shown in Figure 3-45 appears. The Tile Properties screen provides the user with system status information for each of the Christie MicroTiles used in the array.



Figure 3-45 Tile Properties

- By selecting a **Tile #** from the **Tile Spreadsheet** (Figure 3-46) and clicking the **Read** features above, users are able to gain information on either the brightness values of the tiles LED sensors, runtime values and CRC values of the selected tile. **NOTE:** *Select Read ALL to import each of the features simultaneously.*

Source Management | Array Management | Configuration | Status | Help

> STATUS > System Information > Tiles

Web Application | External Control Unit | Tiles

Properties | Software Versions | Logs

LED Sensors Red: 189961, Green: 98306, Blue: 98029 READ CRC 0x341c1444 READ

Runtime Tile: 815.945007, LED: 782.578918 READ

READ ALL

Tile Spreadsheet:

Tile #	Array	X	Y	LE Serial	Red Temp.	Green Temp.	Blue Temp.	FEB Temp.	Formatter Temp.	Red DAC	Green I
0	0	0	0	0x001fd0fe	33	39	38	33	35	0	0
1	0	1	0	0x001fd4a9	35	43	46	36	33	0	0
2	0	1	1	0x001fd927	34	48	40	34	35	0	0
3	0	0	1	0x00225df7	33	42	38	35	35	0	0

4 tiles found. Command mode: single tile.

PRINT REFRESH

Figure 3-46 Tile Spreadsheet

- The **Tile Spreadsheet** displays the specific operating information for each tile used in the array (use the bottom scroll bar to view additional items), such as:
 - Tile #:** Displays the number of the tile in the array.
 - Array:** The array number corresponds to the array number. It is possible to have multiple arrays running off one ECU.

- **XY:** Displays the XY coordinates of the tile in the array. Arrays are counted in the XY-axis and always starts from the top-left corner of the array. See **Figure 3-47**

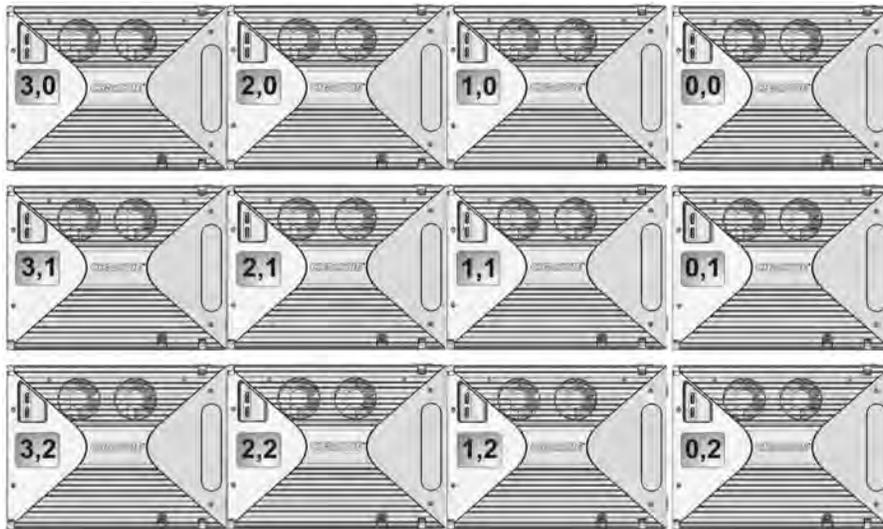


Figure 3-47 Tile Numbering Sequence (Back View)

- **LE Serial:** Displays the serial number of the light engine.
- **Temperatures:** Displays current temperature settings for the LEDs and the FEB and formatter. If any of the three LEDs reaches its maximum temperature tolerance the LED drive levels will dim the Christie MicroTiles gradually, until the minimum LED drive level is reached. If the temperature remains hot, upon reaching the minimum drive level the light engine shuts down. The Christie MicroTiles remain ON and continue to communicate with the ECU.
- **Red/Green/Blue DAC:** These fields indicate the drive levels of the LEDs.
- **Fan 0/Fan 1:** Displays the current operating temperature for both fans. The lower the temperature the slower and quieter the fans are running.
- **Read All:** Read the **LED Sensors**, **Runtime** and **CRC** values simultaneously.
- **Print:** Click to print a spreadsheet of the tile schematic.
- **Refresh:** Click to update the spreadsheet information from the server.

Tile Software Versions

1. Click **Status** from the top menu bar.
2. Select **System Information** from the drop-down menu.
3. Select **Tiles** from the available screen selections.
4. The screen shown in **Figure 3-48** appears. Click on **Software Versions**. This screen enables users to view the software versions for a specific tile. First, select the specific tile from the **Tile Spreadsheet** and click **Read All** to update the screen values.

Web Application | External Control Unit | Tiles
Properties | **Software Versions** | Logs

FPGA 0.03.03037 DDP 1.00.00010
Driver 1.00.2.03512 CMSlave 1.00.2.03534

READ ALL

Tile Spreadsheet:

Tile #	Array	X	Y	LE Serial	Red Temp.	Green Temp.	Blue Temp.	FEB Temp.	Formatter Temp.	Red DAC	Green I
0	0	0	0	0x001fd0fe	33	39	38	33	35	0	0
1	0	1	0	0x001fd4a9	35	43	46	36	33	0	0
2	0	1	1	0x001fd927	34	48	40	34	35	0	0
3	0	0	1	0x00225df7	33	42	38	35	35	0	0

4 tiles found. Command mode: single tile.

PRINT REFRESH

Figure 3-48 Status>System Information>Tiles>Software Versions

Tile Logs

1. Click **Status** from the top menu bar.
2. Select **System Information** from the drop-down menu.
3. Select **Tiles** from the available screen selections.
4. Select **Logs**. The screen shown in **Figure 3-49** appears.
5. To generate a log file from the Christie MicroTiles to the ECU, click **Read**.
6. Click **View** to generate the log file from a selected tile to the ECU. The file appears in a pop-up window through Explorer. Save this file to your PC. Log files are useful for technical support to troubleshoot any problems occurring with the tiles in the array.

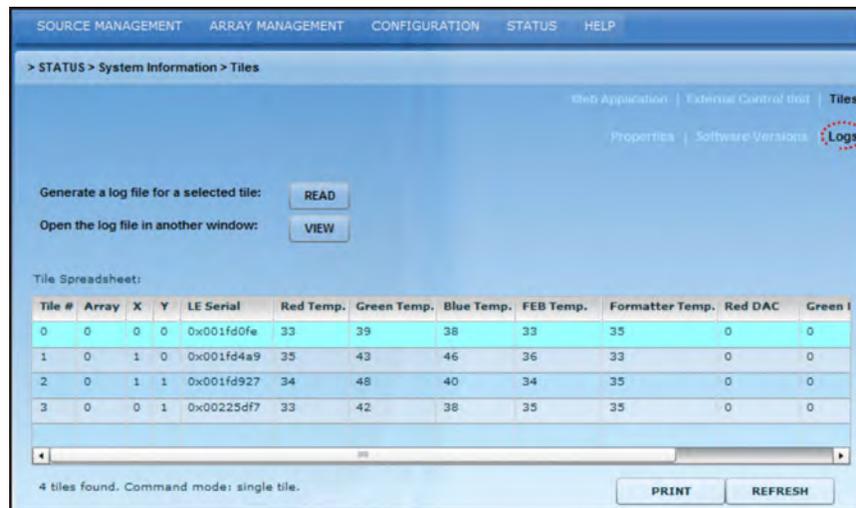


Figure 3-49 Status>System Information>Tiles>Logs

3.11.4 Help Menu

When **Tool Tips** is disabled the rollover menu tips throughout the software application are disabled. Select **About MicroTiles Web GUI** to view software licence information. Select **Online Help** to access the webUI online help.



Figure 3-50 Help Menu

4 Maintenance

Installers and all other users must maintain a safe operating environment at all times. Read through this section in its entirety and understand all warnings and precautions before attempting to operate the Christie MicroTiles. For additional information, refer to the *Christie® MicroTiles™ Service Manual (P/N: 020-100332-xx)*.

4.1 Cleaning Procedures

⚠ WARNING It is critical the tile array be powered OFF and disconnected from AC before the lens or any of the covers are loosened or removed. Maintaining the cleanliness of all internal components during any service procedure is critical. A MINIMUM amount of cleaning—hopefully none—should be required during and after servicing.

4.1.1 Cleaning Inside Screen Surface

Use a soft/low lint cloth to remove any specks from the back of the Fresnel. If absolutely necessary, use compressed air to remove any loose particles. **NOTE:** Typically, dirt on the back of the Fresnel appears as a defect on the screen.

4.1.2 Cleaning Outside Screen Surface

To clean the front surface of the screen, spray Windex™ or an equivalent window cleaner onto a clean cloth. Use a dry, clean, cloth to remove any streaks. DO NOT spray cleaner directly onto the screen surface. If absolutely necessary, use compressed air to remove any loose particles.

4.1.3 Lens

⚠ CAUTION The projection lens should never be handled. DO NOT attempt to clean with commercial cleaners, such as Windex™ or equivalent cleaners.

The projection lens should never need to be cleaned; however, if it is absolutely necessary, use compressed air to remove any loose particles.

4.1.4 Light Engine Heat Sinks

In dusty environments check the heat sinks regularly to ensure airflow is not restricted. If needed, blow off dust using filtered, compressed air. The light engine must be removed to access the heat sinks. For more information, refer to the Christie® MicroTiles Service Manual (P/N: 020-100332-xx). **NOTICE!** If airflow to the heatsinks is restricted they will begin to overheat. Software is designed to reduce the brightness of the tile(s) when this occurs to keep the temperature level. If they continue to overheat the software eventually turns the LEDs OFF to prevent damage.

5 Troubleshooting

If the software or the Christie MicroTiles themselves do not appear to be operating properly, note the symptoms and use the following section for assistance. If the problem cannot be resolved, contact your dealer/service representative for assistance.

5.1 Failed to Power Up

In some instances one or more Christie MicroTiles may not power up. If that occurs, the failing Christie MicroTiles needs to be power cycled. The easiest solution is to power cycle the entire array using the switch on the power bar; however, if the power cabling is accessible, only the failing tile (and any tiles downstream from it) can be power cycled by disconnecting the daisy chain and trying again.

5.2 WebUI Common Errors

5.2.1 Unmapped Tiles Found

The alert, illustrated in **Figure 5-1** appears on the WebUI if unmapped Christie MicroTiles were detected by the ECU.

To troubleshoot:

1. Select **Array Management** from the top menu bar and click on **Mapping>Automatic** from the drop-down menu (**Figure 5-2**).
2. Ensure **Automatic Mapping** is **Enabled**
3. Click **Set**.

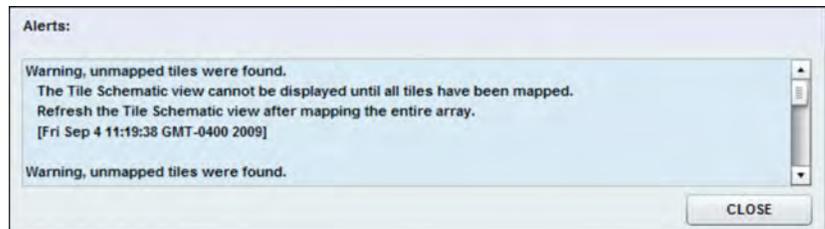


Figure 5-1 Unmapped Tiles Where Found



Figure 5-2 Troubleshooting: Unmapped Tiles

5.2.2 System Not Responding

If the alert shown in **Figure 5-3** appears it indicates the ECU is busy either handling input detection, handling active image inputs, monitoring tiles, etc. Wait a few seconds and try again.



Figure 5-3 System Did Not Respond, Please Try Again

5.2.3 EDID Restore

In some instances users may need to change the EDID information through an external source in order to get the hardware to work with the Christie MicroTiles. The alert shown in **Figure 5-4** appears when an EDID Restore was attempted, but the EDID information is invalid. When the EDID information is invalid simply perform another EDID Restore to update the information. For details, refer to [3.8.3 EDID Restore, on page 3-18](#).

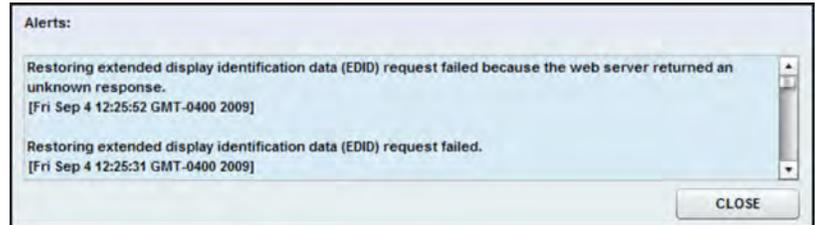


Figure 5-4 EDID Restore

6 Specifications

6.1 Technical Specifications

6.1.1 Model Numbers

- Display Unit: D100
- Screen: S100
- External Control Unit (ECU): E100
- Remote Control: R100

6.1.2 Display Unit Dimensions

- Height: 306mm (12.05")
- Width: 408mm (16.06")
- Depth: 260mm (10.24")
- Weight with Screen: 9.2kg (20.3 lbs.)
- Weight without Screen: 7.9kg (17.4 lbs.)

6.1.3 ECU Dimensions

- Height: 50mm (1.97")
- Width: 259mm (10.20")
- Depth: 191mm (7.52")
- Weight: 1.6kg (3.6 lbs.)

6.1.4 Display Specifications

- Screen Size (diagonal): 510mm (20")
- Native Resolution per Tile: 720 x 540
- Pixel Pitch: 0.567mm x 0.567mm
- Maximum Calibrated Brightness: 800 Nits (cd/m²)
- LED Lifespan (50% brightness): 65,000 hours
- Peak White Color Temperature: 6500K
- Adjustable Gamma: Yes
- Color Space (CIE 1931): 115%
- Optical System: DLP® 0.55" SVGA

6.1.5 Processing and Control

- Input Signal Compatibility: Single-link DVI
- Maximum Video Bandwidth: 165M pixels per second
- Color Depth: 24 bits per pixel
- Video Processing: 13 bits
- Refresh Rate: 47-63Hz frame-locked
- Control Interface: Ethernet, USB 2.0, Serial

6.1.6 Power

- Christie MicroTiles Display Unit D100 Input Rated: 100-240V; 1.3 - 0.54A; 50/60Hz
- Maximum nine Christie MicroTiles on a single circuit (10A total)
- Power Consumption per Tile at Full Brightness: 110W typical*/130W maximum
- Heat Load per Tile at Full Brightness: 375 BTUs/hr typical*/443 BTUs/hr maximum

6.1.7 Operating Specifications

- Operating Temperature: 5°C (41°F) minimum/40°C (104°F) maximum
- Humidity: 35-85% non-condensing
- Clearance for Ventilation (rear): 50mm (2") minimum
- Vibration/Motion Limit: 0.5G
- Noise Level per Tile at Full Brightness: 45dB at 25°C (77°F) ambient
- Runtime: 24/7

6.1.8 Accessories

- Mounting brackets with each tile above five rows high
- Base feet for leveling the bottom row

6.1.9 Regulatory Approvals

- 2002/95/EC RoHS CAN/CSA C22.2 No. 60950-1-03 First Edition
- Certifications Pending

6.1.10 Limited Warranty

- Two years parts and labor
- Contact an authorized Christie representative for full details of our limited warranty

Appendix A: OSD Menu Tree

Corporate offices

USA – Cypress
ph: 714-236-8610
Canada – Kitchener
ph: 519-744-8005

Worldwide offices

United Kingdom
ph: +44 118 977 8000
Germany
ph: +49 2161 664540
France
ph: +33 (0) 1 41 21 44 04

Hungary/Eastern Europe
ph: +36 (0) 1 47 48 100
Singapore
ph: +65 6877 8737
Shanghai
ph: +86 21 6278 7708

Beijing
ph: +86 10 6561 0240
Korea
ph: +82 2 702 1601
Japan
ph: +81 3 3599 7481

