

User Manual

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Christie MicroTiles



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Product overview

Christie MicroTiles are modular, high-quality image display units with related accessories which when combined form large display canvases of virtually any size and shape.



The modular design uses rear projection, based on a single TI Digital Micromirror Device™ (DMD) and chipset. High-brightness LEDs provide the illumination source. MicroTiles can be quickly and easily deployed into small display configurations, while providing the additional features required for larger and more complex installations.

MicroTiles consist of several subsystems, including the mechanical housing, screen and Fresnel lens, light engine, Front End Formatter Board (FEFB), IR sensor, internal Low Voltage Power Supply (LVPS) and cooling system. An array of MicroTiles requires at least one ECU (master ECU), acting as a main control unit and input interface for image content distribution through the array.

The self-contained mechanical and optical design allows multiple tiles to be connected 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 through an External Control Unit (ECU). This signal is buffered and converted into a high speed (five Gbps) serial stream and relayed to every tile in the array. Each tile 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 with all connected tiles to form a canvas.

Terminology

Learn the terms used to describe the components of a MicroTiles array.

Term	Definition
MicroTiles	Refers to multiple tiles.
Tile	Consists of a display unit and a screen.
External Control Unit (ECU)	Controls MicroTiles arrays, video input source.

Term	Definition
Master ECU	Only one master ECU can be assigned to a canvas. This master supplies the global video source.
Slave ECU:	Supplies local video sources in multiple ECU configurations.
Canvas	A group of tiles and ECUs that are connected together electronically. To constitute a canvas, tiles do not need to be physically adjacent to one another. The maximum number of tiles in a canvas is 200, and the maximum number of ECUs is 16.
Array	A group of tiles that are physically connected to each other. A canvas may include multiple arrays. Video sources are mapped to arrays of tiles. Each array represents a new source mapping.
Sub-array	A group of tiles within an array that are configured to display either the local or global video source. A single array may contain multiple subarrays.
Media Source	Provides the source for the input signal.
Global Source	The media source connected to the master ECU also functions as a "global source". The global source can be displayed on any group of tiles connected to the local source input (HSSL-1) side of the master ECU. In a closed loop canvas, all tiles can display the global source.
Local Source	The media source connected to an ECU as a "local source", feeding the local set of tiles connected to its local source output (HSSL-2).
Open/Closed Loop	An open loop canvas terminates with the last tile in the canvas, which is not connected back to the first ECU. In a closed loop canvas, the last tile in the canvas is connected back to the first ECU. There are no unused Display Port connections in a closed loop canvas.

Related documentation

Additional information on the MicroTiles is available in the following documents.

- *Christie MicroTiles Installation and Setup Manual (P/N: 020-100329-XX)*
- *Christie MicroTiles Specifications and Application Guide (P/N: 020-100334-XX)*
- *Christie MicroTiles Serial Command Guide (P/N: 020-101547-XX)*
- *Christie MicroTiles Service Manual (P/N: 020-100332-XX)*

Configuring the array

MicroTiles can be controlled remotely, typically at a controller such as a PC, through a web user interface (WebUI) on an Ethernet network.

If there are concerns about network security, run the WebUI on a local area network only and install a firewall. The WebUI is only functional on a master External Control Unit (ECU), and does not communicate with slave ECUs.

In a browser, access the WebUI by going to the IP address of the master ECU. Users are prompted to login on start up using admin for both the user name and password. From the top toolbar of each screen in the WebUI, you can do the following:

- Select and setup an active input source
- Manipulate the appearance of video content (size, position, color, and sharpness)
- Perform firmware upgrades
- Display a test pattern
- Configure the array
- View system information and alerts
- View current time and date

System requirements for the WebUI

Understand the requirements for accessing the WebUI.

- One of the following browsers: Mozilla Firefox, Safari, Microsoft® Internet Explorer, or Google Chrome
- Adobe® Flash Player™ Plug-In version 10.0 or higher

Automatically configure the array

Array configuration is required to organize the display and to ensure each tile knows its physical arrangement within the array.

MicroTiles are equipped with neighbor detection circuitry. When power is applied to the array, 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.

Configuration is checked approximately every 10 seconds. By default, **Automatic Array Configuration** 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 sub-image portion, and scale the sub-image to display in full screen.

1. Select **Canvas Management > Layout > Configure**.
2. In the **Automatic Array Configuration** list select **Enabled**.
With this feature enabled, the software detects changes in the array's setup and configures the array accordingly. For example, it detects and reconfigures the array when a tile is added or removed, tiles are moved, subarrays are changed, or manually mapped tiles are changed.
3. To update the array and ensure the most current information is displayed, click **Refresh**.
4. To force an array reconfiguration manually, click **Reconfigure Array**.

Creating a subarray

A subarray can increase the input resolution by combining multiple inputs and display two images on an array. Multiple ECUs must be connected to the array and automatic array configuration must be enabled.

Multiple ECUs must be connected to the array and automatic array configuration must be enabled.

Related information

Connecting the cables between the ECUs and MicroTiles

Manually adding a subarray

Select the specific tiles to include in the subarray.

1. Select **Canvas Management > Layout > Subarray Configuration**.
2. To get a reading of any subarray regions that have already been created click **Refresh**.
3. Ensure you are in **Add Mode**.
4. Click the top left or top right tile within the new subarray.
5. Press **Shift** and click the bottom right or bottom left tile in the subarray.
You must select tiles in a diagonal configuration (opposite corners) to configure a subarray.
6. When the subarray region has been selected, click **Add**.
All the subarrays saved on the master ECU are shown in the table.

Automatically adding a subarray

Allow the system to automatically group the tiles into a subarray.

Creating an automatic subarray erases all existing subarrays.

1. Select **Canvas Management > Layout > Subarray Configuration**.
2. To put all tiles between ECUS into separate subarrays, click **Auto Subarray**.
3. In the warning dialog, click **OK**.

Editing a subarray

Change the settings for the subarray.

Automatic array configuration must be enabled for changes to take affect. Edit Mode is grayed out if no subarray is selected in the table.

1. Select **Canvas Management > Layout > Subarray Configuration** .
All the subarrays saved to the master ECU are shown in the table.
2. To edit an existing subarray, select it from the table and click **Edit Mode**.
Once selected, the bottom portion of the window changes to display the subarray properties.
3. To change the width and height of the subarray use the scroll bars to adjust the **X/Y Offsets**.
The display window changes as you make the adjustments.
4. To define the Video Source for the subarray, select **No Video, Global, or Local** (default).
5. When the changes are correct, click **Apply**.

Prioritizing the ECUs in the array

Identify the ECUs in the array as a slave or master.

All ECUs are shipped as slaves from the factory. In a multiple ECU array, one ECU acts as the master ECU, while all remaining ECUs act as slave ECUs. The master ECU sends configuration information to all slave ECUs.

When replacing ECUs in the field, ensure at least one ECU is a master. If you have two masters, one of them must be set as a slave.

1. Select **Canvas Management > Layout > ECU Priority**.
2. To load the information from the ECUs connected to the array, click **Refresh**.
3. Select an ECU from the table.
4. Use the Priority scroll bar or the up and down arrow keys to manually set a priority to the ECU.
The priorities are from 0-255 in descending order, where 0 is the highest priority. The master ECU has the highest priority.
5. Click **Apply**.

Related information

External Control Unit

Configuring the IP address of the ECU

Manually update the IP address of an ECU.

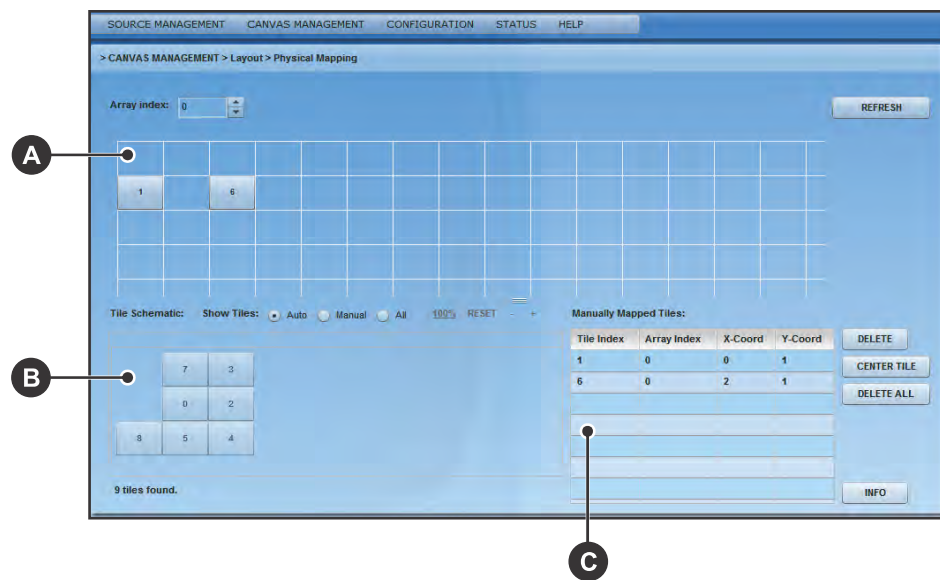
1. Select **Configuration > Ethernet**.
2. Select the ECU.
3. To manually enter an IP address for the ECU, disable DHCP and type the IP Address.
4. Click **Apply**.

Manually adding tiles to the canvas

When configuring a canvas that includes a group of tiles not physically connected, you must add the tile to the grid and specify the X and Y coordinates.

Use the rows (y-coordinates) and columns (x-coordinates) of the grid to manually map tiles; the input image automatically stretches spanning across all manually mapped tiles. The top left is 0,0. Each array index corresponds to a unique mapping of the input image.

The image on the array is automatically configured and mapped once the tile is dropped into the main grid. All blue colored tiles indicate they have been manually mapped and non-mapped tiles are gray. All manually mapped tiles are displayed in the Manually Mapped Tiles table.



A	Main grid
B	Physical layout or map of all tiles
C	Manually mapped tiles

1. Ensure *Automatic Array Configuration* is enabled (on page 8).
2. Select **Canvas Management > Layout > Physical Mapping**.
3. In the Tile Schematic section click a tile.
4. Drag and drop the tile into the main grid to manually map it.
5. To center the main grid on the currently selected manually mapped tile, click **Center Tile**.
For example, if you want to manually map a tile to location x=20 and y=20, select a manual mapping from the table and click **Center Tile** to make the main grid reposition the tile to the center of the main grid.
6. To bring up the properties of each tile, click **Info**.
Use the tile system information screen to see the number of each tile.

Viewing the array as a wire map

Display the wiring of the ECU and tiles as text. Use the wire map to verify the cabling between the ECU and the tiles, and to diagnose issues with the array.

1. Select **Canvas Management > Diagnostics and Calibration > Wire Map**.
2. Read the wire map.
The left column identifies the coordinates of the output tile and, and the right column is the input tile.
3. To save the wire map as a .csv file, click **Export**.

Creating a custom video resolution

Customize Extended Display Identification Data (EDID) allows you to create a custom video resolution to send to the graphics card for one or more ECUs.

The default settings are 1920 horizontal pixels x 1200 vertical lines at a vertical frame rate of 59.94 Hz. The maximum input resolution supported per ECU is 1920 x 1200 @60Hz.

1. From the top menu bar select **Source Management > Customize EDID**.
2. To select each ECU connected to the array click **Select All**, or click a specific ECU from the table.
3. If using an ASCII file provided by Christie, click **Load File**.
4. If the ECU cannot detect or display a good video source, to return to the default values click **Restore**.
This can occur when connecting different types of input sources to the ECU, which can cause the EDID information to be incorrect.
5. Customize the EDID elements.

Field	Description	Minimum value	Maximum value	Default value
Horizontal Size	Adjust the horizontal size of the display.	64	4088	1920
Vertical Size	Adjust the vertical size of the display.	64	4095	1200
Frame Rate	Adjust the frame rate of the display.	1	75	60

6. Click **Apply**.

Setting the date and time

Ensure the date and time match your location.

1. Select **Configuration > 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.
2. Set the date and time.
3. To see changes take effect click **Refresh**.

4. Click **Apply**.

Switching the display mode

Switch the display mode between Video, OSD, and OSD (Unscaled with Overscan) modes. Video is used for most applications.

1. Select **Canvas Management > Display Mode**.
2. Select the appropriate display mode.
 - **Video (All Tiles)**—Displays video from the ECU input source (HSSL-1 or HSSL-2). One or both ports must be enabled.
 - **OSD (All Tiles)**—Displays a 800 x 600 image, scaled to approximately 720 x 540, which is the viewable area of the screen.
 - **OSD (Unscaled with Overscan) (All Tiles)**—Displays test patterns in overscan resolution (800 x 600).

The display mode is applied as soon as it is selected from the menu.

3. Click **Apply**.

Powering all tiles on or off through the WebUI

Selecting Power ON Canvas and Power OFF Canvas affects the entire array, regardless of how many tiles have been selected through the WebUI.

- To turn on all tiles in the array, select **Configuration > Power > Power On Canvas**.
To turn off all tiles in the array, select **Configuration > Power > Power Off Canvas**.
Wait approximately ten seconds between powering the canvas off and on.

Saving tile and ECU settings

To move the tile and ECU settings to additional devices, save the settings to an external location.

1. Select **Configuration > Save & Restore > Save & Restore Settings**.
2. To download and save the specific settings file, click **Save**.
3. Name the file, and navigate to a storage location.
The settings are saved as a .mct file. All settings for the tiles or ECUs are included in the saved files.

Restoring tile and ECU settings

Restore settings backed up from another tile or ECU.

1. Select **Configuration > Save & Restore > Save & Restore Settings**.
2. For ECUs, select the settings to be restored.
Only the selected settings are restored. All tile settings are restored during this process.
3. To upload a saved settings file to the tiles or ECUs, click **Restore**.

Restoring factory defaults

Reset the ECU(s) and tile(s) back to their default settings.

This is typically done when setting up a new configuration or when swapping master ECUs from one configuration to another. Restoring factory settings applies to all ECUs and tiles in the array. Factory settings cannot be restored on an individual ECU or tile.

1. Select **Configuration > Save & Restore > Restore Factory Settings**.
2. Click **Restore**.
3. In the confirmation dialog, type **CONFIRM** in all capital letters and click **OK**.
All defaults are restored.
4. (Optional) *Restore the ECU and tile settings from a backup* (on page 13).

Adjusting the image settings

Ensure the content displayed on the MicroTiles canvas has a high quality appearance by manipulating the source and canvas settings.

Changing the size and position of video content

Manually adjust the X/Y offsets and the width and height of the display to accommodate the particular application.

1. Ensure *Automatic Array Configuration is enabled* (on page 8).
2. Select **Source Management > Size and Position**.
3. Verify the input source is recognized.

If necessary, to scan the properties of the input source detected by the ECU click **Refresh**.

The System Master Input Source Properties include:

- **DVI Clock Detected** must state true to view video content on the tiles. When this input reads false, check the connection between the ECU(s) and the video source, and try again.
- **Input Stable** indicates the stability of the input source. 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 of the incoming video.

4. Adjust the display window settings.

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, where the top left of the array represents 0,0. The sum of **X-Offset** and **Width** must be \geq to 0 and less than 100%. The sum of **Y-Offset** and **Height** must be \geq to 0 and less than 100%.

These settings are only applied to the global video source of the master ECU.

5. Click **Apply**.

Adjusting image contrast and gamma

Manually adjust the image contrast and gamma of the ECU video input.

1. Select **Source Management > Image Settings**.

2. Click **Select All** or select a specific ECU from the table.
3. If necessary, to update the table, click **Refresh**.
4. To manually change the **Contrast** and **Gamma** settings, use either the scroll bar or the up/down arrow keys to change the value.
5. To send the changes to the ECU(s) and view the results on the tiles, click **Apply**.

Configuring the color and brightness of the array

Manually adjust the nits of the entire array and enable or disable color matching of the array.

The ECU periodically polls all attached tiles to determine the optimal colorimetry and brightness setting for the array as a whole. This optimal operating point is transmitted to all attached tiles. The individual tiles must meet the requested colorimetry.

Adjusting the color correction and temperature

1. Select **Canvas Management > Canvas Settings > Color and Luminance**.
2. Select the model of screen being used in the array.
This setting must be specified before adjusting any of the color and luminance features to ensure the settings applied to the array are accurate.
3. From the Calibration Model list, set Version 2 as the color correction model.
Only select Version 1 in installations that are already configured for Version 1.
4. Select the Automatic Color Matching setting.
 - **ON (Recommended)**—The ECU reads the settings of each tile, calculates the average, and applies that reading to each tile in the array.
 - **Tiles ONLY**—Color matching is done at the tile level, meaning the tiles make their best attempt to meet user commanded color/brightness points. In this mode, the ECU is not actively maintaining color points across the array.
5. Manually adjust the color temperature of the 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. Color temperature settings for **Version 2 (Recommended)** range from 3200-9600K, and the settings for **Version 1** range from 5500-8500K.
A mode of color correction must be selected from the **Mode** list to adjust color temperature.
6. Select the Color Space.
The selections of this field change according to the Calibration Model selected. For Version 2 (Recommended) the selections include:
 - **Maximum Gamut (default)**—Applies the maximum available RGB color spectrum. This option is not available when Tiles ONLY is selected from Automatic Color Matching.
 - **sRGB**—Applies the standard RGB color space to the array.
 - **Custom Gamut**—Manually adjusts the XY coordinates of the RGB color spectrum.For Version 1 the selections include sRGB and Custom Gamut.

Adjusting the color and luminance of individual tiles

Change the color and luminance of any tile that doesn't appear as bright as the other tiles, or has a different color tone.

MicroTiles are designed for automatic image alignment and color matching. Christie does not recommend overriding individual settings and only performing overrides after proper training.

Changes made to the tile color and luminance are applied as the changes are made.

1. Select **Canvas Management > Canvas Settings > Advanced > Tile Color and Luminance**.
2. Click **Select All**, or select the tiles manually from the Tile Schematic section of the screen. To make multiple selections hold the **Shift** key down.
3. To turn the display white click **Clear**.
4. Select the appropriate display mode.
 - **Set Video**—Switches all selected tiles to display video from the ECU input source (HSSL-1 or HSSL-2).
 - **Set OSD**—Switches all selected tiles to display a 800 x 600 image, scaled to approximately 720 x 540, which is the viewable area of the screen.

The display mode is applied as soon as it is selected.

5. When using the OSD display mode, click **Test Pattern** and select the color appropriate for the color being adjusted.
For example, if blue values are being adjusted, select the Blue test pattern.
6. Click **Identify**.
A black dot appears on each of the selected tiles.
7. Using the scroll bars or the arrow keys adjust the red, green, blue, and luminance settings as needed.
Changes made to the tile color and luminance are applied as the changes are made.
8. To return the values to the default settings click **Reset**.

Configuring the brightness threshold of the weakest tile

The ECU calculates the maximum brightness of the weakest tile in the array, and uses that value as the overall brightness of the array.

The Weakest Tile Limit is the percentage of the calculated maximum brightness that the weakest tile must be above for it to be used when setting the overall brightness of the array.

If the brightness of the weakest tile drops below the Weakest Tile Limit percentage, the tile is ignored in the overall brightness of the array and the second-weakest tile is used to calculate the maximum brightness. The ignored tile appears dimmer than the rest of the tiles in the array.

1. Select **Canvas Management > Canvas Settings > Color and Luminance**.
2. Select the model of screen being used in the array.
This setting must be specified before adjusting any of the color and luminance features to ensure the settings applied to the array are accurate.
3. Set the **Weakest Tile Limit** percentage.
The default value is 30 percent.

Setting the brightness of the array

Select the brightness intensity mode appropriate for the array.

1. Select **Canvas Management > Canvas Settings > Color and Luminance**.
2. Select the model of screen being used in the array.
This setting must be specified before adjusting any of the color and luminance features to ensure the settings applied to the array are accurate.
3. Select the brightness intensity mode.
 - **Fixed Brightness**—The array displays the brightness specified in the Luminance (nits) field. If the tiles cannot display the nits specified, the tiles display their maximum brightness while maintaining the color and brightness matching. The value displayed in the Luminance field is the value set with the slider.
 - **Maximum Brightness**—The ECU calculates the maximum brightness of the weakest tile in the array. The tiles then display at the percentage specified as the Brightness Limit of the maximum brightness. The value displayed in the Luminance field is the real-time nits displayed by the array as the page is refreshed.
 - **Economy Brightness**—The ECU calculates the lowest brightness possible for the array, and runs as dim as possible while maintaining color and brightness matching. The value displayed in the Luminance field is the real-time nits displayed by the array as the page is refreshed.

The selections of this field change according to the Calibration Model selected. For Version 2, the options include **Economy Brightness**, **Fixed Brightness** and **Maximum Brightness**. For Version 1, the options include **Fixed Brightness** and **Off**.

4. Set the specific brightness parameters for the array.

Adjusting brightness levels at the edge of the tiles

Mullion reduction adjusts the brightness level to the edges of the tiles until the edges appear smaller.

Christie recommends playing video on the array when adjusting mullion to see the changes take effect.

1. Select **Canvas Management > Canvas Settings > Canvas Image Settings**.
2. Select between **OFF**, **0 to 12 Feet**, **12 to 24 Feet**, and **More than 24 Feet**.
When a selection is made, the effect on the video content is displayed on the array. Feet refers to the recommended viewing distance.

Modifying tile uniformity

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 the brightness is the same.

Have a video playing on the array when adjusting the settings to see the changes take effect.

1. Select **Canvas Management > Canvas Settings > Canvas Image Settings**.
2. Turn the Tile Uniformity **ON** or **OFF**.
When a selection is made, the effect on the video content is displayed on the array immediately.

Sharpening the image

Adjust the sharpness levels to display a crisper image or video.

To see the changes take effect, Christie recommends playing a video on the array when adjusting the settings.

1. Select **Canvas Management > Canvas Settings > Canvas Image Settings**.
2. To adjust sharpness levels use the **Sharpness** scroll bar or the up/down arrows.
When a selection is made, the effect on the video content is displayed on the array.

Displaying a test pattern

While adjusting how content appears when displayed on the array, or troubleshooting an issue, a test pattern provides an image that can be used to compare the results across the tiles in the array.

1. Select **Canvas Management > Diagnostics and Calibration > Test Pattern**.
2. Select a tile in the Tile Schematic section.
3. From the **Set Display Mode** list, select from **Video**, **OSD**, or **OSD (Unscaled with Overscan)**.
To display internal test patterns, Display Mode must be set to OSD or OSD (Unscaled with Overscan). OSD is the preferred mode if checking mechanical alignment or electronic geometry alignment.
4. From the **Set Test Pattern** list, select which type of test pattern to display.
Choices include: **13 Point Optical**, **Checkerboard**, **Checkerboard Inverted**, **Color Bars**, **Grayscale**, **Grid**, and **Solid Color**. When using the Solid Color test pattern, select a specific color to use.
5. To adjust the width and height of the test pattern, click the up/down arrow keys or enter a specific value in the designated fields. Width and height values are only valid for the Checkerboard, Checkerboard Inverted, and Grid test patterns.
6. To return to displaying video content, from the **Set Display Mode** list select **Video**.

Correcting the image alignment for individual tiles

Applying extreme tile image alignment values may corrupt the video display in some MicroTiles. To resolve this issue, reduce the image alignment adjustment values.

1. Select **Canvas Management > Canvas Settings > Advanced > Tile Image Alignment**.
2. Click **Select All**, or select the tiles manually from the Tile Schematic section of the screen.
To make multiple selections hold the **Shift** key down.
3. *Display the **Grid** test pattern* (on page 19).
The array displays the selected and unselected tiles in the colors specified.
4. To adjust the XY offsets of the top-left, top-right, bottom-left and bottom-right values, click the arrow buttons or use keyboard controls.

Customize the XY offsets with the Step Increments scroll bar. XY adjustment values are limited to -10 and +10.

5. Click **Apply**.

To immediately send value changes to the ECU use **Instant Update**, otherwise you must click Apply each time you make changes.

6. If you have selected multiple tiles, type the text confirmation the first time you attempt to apply values to multiple tiles.

Any other changes applied still display the warning message.

7. Click **OK**.

To return to the default settings click **Reset**.

Monitoring and maintaining the array

Learn the information and procedures for performing MicroTiles 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.

Related information

Related documentation (on page 7)

Safety warnings and guidelines

Monitor system information and log files

Review the ECU and tile system information to ensure the components of the array are running properly. If issues are detected in the array, use the log files to identify the problem.

Viewing the ECU system information

The ECU table lists information on all the ECUs connected to the master ECU.

1. Select **Status > System Information**.
2. From the available screen selections select **External Control Unit**.
Each of the master and slave ECUs connected to the array are listed in the table. The master ECU always states true in the System Master column. The ECU you are currently logged into appears highlighted in the table.
3. To save the ECU table as a .csv file, click **Export**.

Viewing the ECU log files

Log files can help you identify and correct issues with the ECU.

1. Select **Status > System Information**.
2. From the available screen selections select **External Control Unit**.
3. In the table, select the tiles to include in the log.
4. Click **Generate Log(s)**.
This opens a new window with the master ECU error logs, which are used for technical support to troubleshoot any problems occurring with the master ECU.

5. To open previously generated logs, click **Log Viewer**.

Viewing the tile system information

Display the operating information for each tile in the array.

1. Select **Status > System Information**.
2. From the available screen selections select **Tiles**.

The Tile table displays operating information for each tile in the array, including:

- **Tile #**—Number of the tile in the array. This column appears at the left and right side of the table.
- **Array**—Array number, where multiple arrays are controlled from one ECU.
- **XY**—XY coordinates of the tile in the array. Arrays are counted in the XY-axis, starting from the top-left corner of the array.
- **Temperatures**—Current temperature settings for the LEDs, the FEB, and formatter. If any of the three LEDs reaches its maximum temperature tolerance, the LED drive levels dim the tiles gradually until the minimum LED drive level is reached. If the LED temperature remains high, when the minimum drive level is reached the light engine shuts down. The tiles remain on and continues to communicate with the ECU.
- **Red/Green/Blue DAC**—Drive levels of the LEDs.
- **Fan 0/Fan 1**—Current speed for both fans. The lower the speed and quieter the fans are running.
- **Err**—Number of errors associated with the tile.
- **Serial**—Internal light engine serial number for the tile.
- **Tile RunTime**—Number of runtime hours for the tile.
- **LED RunTime**—Number of LED runtime hours.
- **Application Version**—Current version of firmware installed.
- **FPGA/LE**—Internal serial number for FPGA and light engine.
- **Dropped Status**—Displays whether or not the tile has been ignored when determining overall canvas brightness.

3. To save the Tile table as a .csv file, click **Export**.

Viewing the tile log files

Log files can help you identify and correct issues with the ECU.

1. Select **Status > System Information**.
2. From the available screen selections select **Tiles**.
3. In the table, select the tiles to include in the log.
4. Click **Generate Log(s)**.

This opens a new window with the tile logs, which are used for technical support to troubleshoot any problems occurring with the master ECU.

5. To open previously generated logs, click **Log Viewer**.

Reviewing the ECU video input and output quality

Display the video input and output quality between the ECU and the tiles over HSSL1 and HSSL2. Use the HSSL information to diagnose issues with the array.

1. Select **Canvas Management > Diagnostics and Calibration > HSSL Info**.
2. Review the HSSL results.
3. To save the HSSL info as a .csv file, click **Export**.

LED status indicators

Identify the LED state colors and meaning.

ECU LED indicators

The ECU is equipped with a status LED built into the Power button.

LED Mode	Description
OFF	No Power
Green	Slave ECU (Only one ECU can be the Master ECU)
Green: Flashing	Master ECU
Red: Solid	ECU in Standby mode or booting on power up

Tile LED indicators

Each tile is equipped with a tricolor LED, located on the back of the tile, which indicates power status.

LED Mode	Description
OFF	No Power
Amber	Power ON, Hardware is Good, No Firmware
Green	Power ON, Hardware is Good, Firmware is Good
Green	Flashing Power ON, Hardware is Good, Firmware is Good, Communicating with ECU
Red: Solid	Power ON, No Hardware

Upgrading the main software

Read the following points before upgrading the main software.

- Ensure the ECUs and MicroTiles have the same software version.
- Software upgrades take approximately 35 minutes to complete.
- Adobe® Flash Player™ Plug-In version 10.0 or higher must be installed to initiate the upgrades.
- Christie recommends performing the FPGA hardware upgrade at the same time as a firmware upgrade.

- During a software upgrade, the web server becomes unresponsive for several minutes and video may be interrupted or temporarily disabled.
- During a software upgrade do not attempt to use the WebUI or open another web browser.

Related information

Upgrading the Field Programmable Gate Array (FPGA) (on page 25)

Checking the current software version from the WebUI

Verify the version of the software running on the MicroTiles

1. Select **Status > System Information**.
2. From the System Information screen, select either **External Control Unit** or **Tiles**.
The current software version is displayed in the table under **Firmware Version**.
3. Go to www.christiedigital.com to view the latest available software version.
If the version found on the website does not match the version on the product, *upgrade the software* (on page 24).

Upgrading the tile, ECU, and Light Engine software

Upgrade the MicroTiles to use the latest software.

Begin with the software upgrade and then the *FPGA upgrade* (on page 25).

1. Download the latest software from www.christiedigital.com and save it to a computer that will be connected to the array for the upgrade.
2. Open the MicroTiles WebUI.
3. Upgrade the ECU software.
 - a) Select **Configuration > Firmware Upgrade > ECUs**.
 - b) Select an ECU from the table or click **Select All**.
 - c) Click **Firmware** and locate the software upgrade file on the computer.
 - d) When the upgrade is completed, reset the tiles to make sure the new upgrades are active. To reset the tiles select **Configuration > Power > Reset > ECUs**.
If the web browser does not recognize the new WebUI application from the ECU, clear the web browser cache.
4. Upgrade the MicroTiles software.
 - a) Select **Configuration > Firmware Upgrade > Tiles**.
 - b) In the **Tile Schematic** area, select the tiles to upgrade or click **Select All**.
 - c) Click **Firmware** and locate the software upgrade file on the computer.
 - d) When the upgrade is completed, reset the tiles to ensure the new upgrades are active. To reset the tiles select **Configuration > Power > Reset > Tiles**.
5. Upgrade the Light Engine:
 - a) Select **Configuration > Firmware Upgrade > Tiles**.
 - b) To upgrade the software for the light engine in all of the selected tiles, select **Light Engine**.
 - c) In the **Tile Schematic** area, select the tiles to upgrade or click **Select All**.

- d) Click **Firmware** and locate the software upgrade file on the computer.
- e) When the upgrade is completed, reset the tiles to make sure the new upgrades are active. To reset the tiles select **Configuration > Power > Reset > Tiles**.
After upgrading the light engine software, a message may be displayed stating some tiles failed to update due to hardware mismatch. This indicates that those tiles did not require the update.

Upgrading the Field Programmable Gate Array (FPGA)

Christie recommends performing the FPGA hardware upgrade at the same time as a software upgrade. Adobe® Flash Player™ Plug-In version 10.0 or higher must be installed to initiate the upgrades.

1. Upgrade the MicroTiles FPGA:
 - a) Select **Configuration > Firmware Upgrade > Tiles**.
 - b) Select **FPGA** and then locate the software upgrade file on your PC.
 - c) To initiate the upgrade click **Open**.
FPGA hardware upgrades take approximately three minutes to complete for a single tile or 35 minutes for 100 connected tiles.
 - d) When the upgrade is completed, reset the tiles to make sure the new upgrades are active. To reset the tiles select **Configuration > Power > Reset > Tiles**.
2. Upgrade the ECU FPGA:
 - a) From the WebUI, select **Configuration** from the top menu bar and then **Firmware Upgrade > ECUs**.
 - b) Select **FPGA** and locate the software upgrade file on your PC.
 - c) To initiate the upgrade click **Open**.
 - d) When the upgrade is completed, reset the tiles to make sure the new upgrades are active. To reset the tiles select **Configuration > Power > Reset > ECUs**.

Correcting a failed software upgrade

On ECUs using software version 1.0.10 or older, when attempting to simultaneously upgrade the software for a MicroTiles canvas with a large number of ECUs the upgrade may fail. Complete the following steps to correct this issue.

1. Update the master ECU to the latest software version.
2. Reset all ECUs.
3. Upgrade the software on all other ECUs.
4. Upgrade the software on all MicroTiles.
5. Reset all ECUs.
6. Reset all MicroTiles.
7. Select **Status > System Information**.
8. Verify the **Application Version** field reflects the upgrade.
The **Reset All Tiles and ECUs** selection is not available until all MicroTiles and ECU(s) are upgraded to the latest software version. During the initial upgrade, use **Configuration > Power > Reset > ECUs**.

Resetting selected tiles and ECUs

The tiles and ECU(s) must be reset after a software upgrade for the changes to take effect.

1. Select **Configuration > Power > Reset Tiles** or **Configuration > Power > Reset ECU**.
2. Select the tiles or ECUs to reset.
3. Click **Apply**.

Resetting all tiles and ECUs in the array

For the changes to take effect after a software upgrade, the tiles and ECU(s) must be reset.

1. Select **Configuration > Power > Reset All Tiles and ECUs**.
2. After the ECU has restarted refresh the WebUI.

Monitoring the MicroTiles array

The MicroTiles SNMP application enables you to monitor one or more MicroTiles installations.

Simple Network Management Protocol (SNMP) enables network administrators to monitor their network devices from a single location. For information on the MicroTiles Object Identifiers (OIDs), refer to the MIB files.

Events logged by SNMP can be recorded in SNMP Setting up SNMP communication includes specifying the SNMP community strings and trap IP addresses that the MicroTiles send traps to. Notification of SNMP events can also be sent to specified email addresses.

Viewing SNMP system information

The System Information screen contains the system information settings, including Contact Information, System Name, and System Location.

1. Select **Configuration > SNMP > System Information**.
2. To query the system for the current settings, click **Refresh**.
3. Modify the system information.
The Contact Information field can have a maximum of 128 characters, and the System Name and System Location fields can have a maximum of 32 characters.
4. Click **Apply**.

Specifying what events create notifications

Events that require investigation and troubleshooting can be recorded in SNMP traps or emailed to select addresses.

The action taken for each event can be configured to be recorded in a trap, emailed, both recorded in a trap and emailed, or ignored.

1. Select **Configuration > SNMP > Notification Configuration**.
2. For each event, identify what action should be taken.
 - Ignore the event (Disabled)
 - *Record the event in the trap (Trap)* (on page 27).

- *Send the event details in an email (Email)* (on page 27) See Identify where notification emails are sent on page 57.
 - Record the event in the trap and send an email (Trap+Email)
3. Click **Apply**.

Recording event notifications in an SNMP trap

When the selected events occur within the MicroTiles array, the details of the event can be recorded in an SNMP trap.

Traps are usually captured on a server outside of the array. Up to three trap IP addresses can be configured.

1. Select **Configuration > SNMP > Communication Setup > Communities & Trap IPs**.
2. Specify the access string for the **SNMP Trap Community** and the **SNMP Read Community**. The default setting for SNMP Read Community and SNMP Trap Community is private.
3. Type the IP address for the server where trapped events are to be recorded.
4. Click **Apply**.

Identifying where notification emails are sent

To send event notifications by email, the IP address of the SMTP email server and up to three email addresses must be identified.

1. Select **Configuration > SNMP > Communication Setup > Emails**.
2. Type the IP address of the SMTP server.
3. Type the email addresses that should receive notification of events.
4. To verify the emails are correctly delivered to the specified recipients, click **Test E-mail**.
5. Click **Apply**.

Cleaning the tiles

Learn how to clean the MicroTiles array.



Warning! Failure to comply with the following could result in death or serious injury.

- SHOCK HAZARD! Disconnect the product from AC before moving, servicing, cleaning, removing components, or opening any enclosure.



Notice. Failure to comply with the following may result in property damage.

- Only use cleaning solutions recommended by Christie. All other cleaning solutions may cause product damage and will void the warranty.

Cleaning the inside surface of the screen

To clean the interior of the S100, S200, and S300/S310 model screens use a dry, clean, soft cloth with a low lint count to remove any specks from the back of the Fresnel.

You must use clean, filtered compressed air to remove any loose particles. Typically, dirt on the back of the Fresnel appears as a defect on the screen.

Cleaning the outside surface of the screen

The procedure for cleaning the exterior of the MicroTiles screen is different depending on the tile model.

1. Clean the S100 and S300/S310 tiles.
 - a) To clean the front surface of the S100, S300, or S310 screen, spray Windex™ or an equivalent window cleaner onto a clean cloth and gently wipe the screen surface.
 - b) Use a dry, clean, soft cloth to remove any streaks.
Do not spray cleaner directly onto the screen surface.
 - c) If absolutely necessary, use clean, filtered compressed air to remove any loose particles.
2. Clean the S200 tiles.
 - a) To remove light dust from the front surface of the S200 screen use a feather duster or similar.
 - b) For heavier dirt, stains from fingers etc, wash the surface with a mild soap solution in lukewarm water, using a clean, soft cloth with a low lint count.
 - c) Use a dry, clean, soft cloth to remove any streaks.

Cleaning the lens

To avoid the risk of scratching the lens, clean the lens only if absolutely required.

Removing dust from the 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, see the *Christie MicroTiles Service Manual* (P/N: 020-100332-xx).

Cleaning the air filter

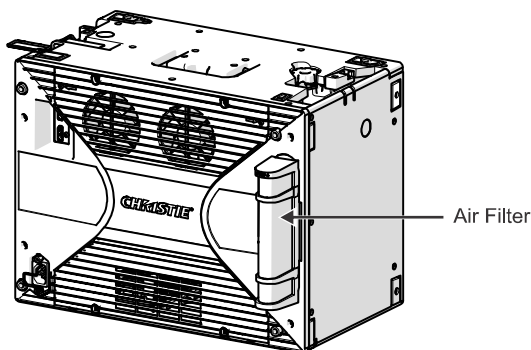
In dusty environments check the filters monthly, otherwise check them every three to four months.



Notice. Failure to comply with the following may result in property damage.

- Only use compressed air with the appropriate guarding and protective equipment.

1. Slide out the air filter.



2. Blow off dust using filtered, compressed air at 30 psi.
3. Replace, vacuum, or wash the filter with mild soap and water.
4. If you wash the filter, dry it thoroughly before you reinstall it.

Troubleshooting

The following topics cover common projector issues and their solutions. If an issue cannot be resolved, contact a Christie qualified technician.

Images on the tiles are flickering

The images on the tiles are flickering, and solid video is not displayed.

Resolution

- Ensure the latest firmware is installed.
- Restore the factory defaults.

Video signal is lost

The video signal has been lost, and is not being displayed on the array.

Resolution

Check the DVI connections for the following:

- The DVI connection has been removed or is loose.
- The DIV source is powered off (no DVI sync).
- The ECU is defective.

If the lost signal is due to a failed ECU, call Christie technical support.

Video is not displaying

No video is being displayed on the array.

Details

Possible causes for this issue include:

- The firmware version installed on the ECU and the tiles may not be the same.
- The pixel limitations have been exceeded.
- There is a problem with the source.

Resolution

- Ensure all tiles are selected.
- Ensure the array is operating in Video mode. To turn on Video mode, access the WebUI and select **Canvas Management > Display Mode > Video (All Tiles)**.
- *Ensure the firmware on both the ECU and tiles match* (on page 24).
- *Change the resolution* (on page 13).
- Check to see if the ECU is registering a DVI source:
 1. From the WebUI, select **Source Management > Size and Position**.
 2. In the **System Master Input Source Properties** section, verify the **DVI Clock Detected** input is set to **True**.
If the input is reading **false**, check the connection between the ECU and the video source and try again.

Extra pixels and ghosting in the image

The array has extra pixels or ghosting in the displayed video.

Details

Extra pixels and ghosting appears when the sharpness is set too high.

Resolution

Change the sharpness to $\sim .50$ (on page 19).

Color matching is not working

Colors cannot be matched across the tiles.

Details

Possible causes for this issue include:

- Color matching is not enabled.
- There is a problem with the version of firmware installed.
- The light engine is defective.

Resolution

- *Enable color matching* (on page 16).
- *Update to the latest firmware version* (on page 24).
Before updating the firmware, check online at www.microtiles.com to ensure the latest firmware version is installed. Failure to install the latest version can affect system performance.
- Replace the light engine.

For details on light engine replacement, see the *Christie MicroTiles Service Manual* (P/N: 020-100332-xx). If light engine replacement still does not correct the problem the tile is defective and needs to be repaired.

The same image is replicated on each tile in the array

Each tile in the array displays the same image.

Details

Possible causes for this issue include:

- Automatic array configuration is not enabled.
- The XY offsets of the array are not set correctly.

Resolution

- *Enable the automatic array configuration* (on page 8).
- *Change the XY offsets* (on page 19).
 1. From the WebUI, select **Canvas Management > Canvas Settings > Advanced > Tile Image Alignment**.
 2. Set the X-Offset to 0, the Y-Offset to 0, the X-Width to 1, and the Y-Width to 1 (the default settings).
 3. Ensure the display window is set correctly.

One or more tiles fail to power on

After plugging the power for a MicroTiles array into a power source, one or more tiles fail to power on.

Resolution

If the tile fails to power on, do the following:

- Check to ensure each cable is properly connected.
- Cycle power to the failed tile(s) or the entire array using the switch on the power bar.
- Check the LED on the back of each tile. A flashing green light indicates power is enabled.

Fan failure

The fan is not running for one or more of the MicroTiles.

Resolution

A fan failure likely occurs if the fan is defective or degraded, or if the fan connector is loose. If the fan is defective or has degraded over time contact Christie technical support.

LED over-temperature shutdown

The tiles have shut down because the LED temperature has passed the threshold.

Details

This is caused by either insufficient cooling or a fan failure.

Resolution

Collect logs of the failed tiles and contact Christie technical support.

LED temperature warning

When the LEDs reach the maximum temperature, the tiles dim.

Details

If any of the three LEDs reaches its maximum temperature tolerance, the LED drive levels will dim the tiles 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 tiles remain ON and continue to communicate with the ECU.

Resolution

Collect logs of the failed tiles and contact Christie technical support.

Tile or ECU is added or removed from the array

A tile or ECU has been added or removed from the array without any action by the administrator.

Details

Possible causes for this issue include:

- HSSL removed
- Defective tile
- Power loss or power regained

Resolution

- Check to ensure the ECU display port cable is properly connected to the HSSL-1 and HSSL-2 ports on the back of the tile.
- If the tile is defective, contact Christie technical support.

Cannot assign an IP address to the tile

An IP address cannot be assigned to the tile using DHCP static IP assignment.

Details

The IP address range 192.168.1.xxx is reserved and used internally by the ECU.

Resolution

Assign another IP address outside of this range; for example, 192.168.3.xxx.

Cannot connect to the WebUI

Accessing the WebUI through a web browser is unsuccessful.

Resolution

- Ensure the network configuration on your computer is set up correctly. If it is and you still cannot connect, try a different computer.
- Reset the ECU.
- If the problem still persists, the ECU is defective and needs to be repaired. Contact Christie technical support.

System is not responding

The WebUI times out before it can be loaded.

Details

If the alert "Web GUI timed out waiting for response. Please try again." appears, it indicates the ECU is busy either handling input detection, handling active image inputs, or monitoring tiles, etc.

Resolution

Wait a few seconds and try again.

The system finds unmapped tiles

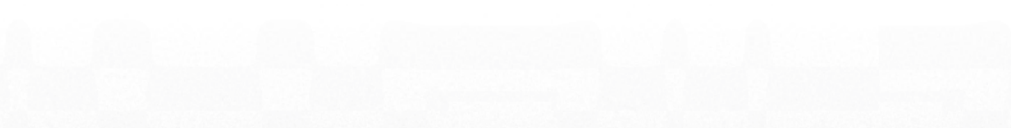
An alert is displayed when the ECU detects unmapped tiles on initial start-up.

Resolution

Waiting a minute after seeing video should clear this error; however, if it remains, complete the following steps:

1. Select **Canvas Management > Layout > Configure**.

2. Ensure **Automatic Array Configuration** is **Enabled**.
3. Click **Reconfigure Array**.



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