User Guide

020-102717-03

Christie E600 LED Display Controller

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Content

Product overview

Velvet Apex tiles are modular, high-quality image display units that can be configured to achieve an HD display, depending on the pixel pitch of the tile being installed.

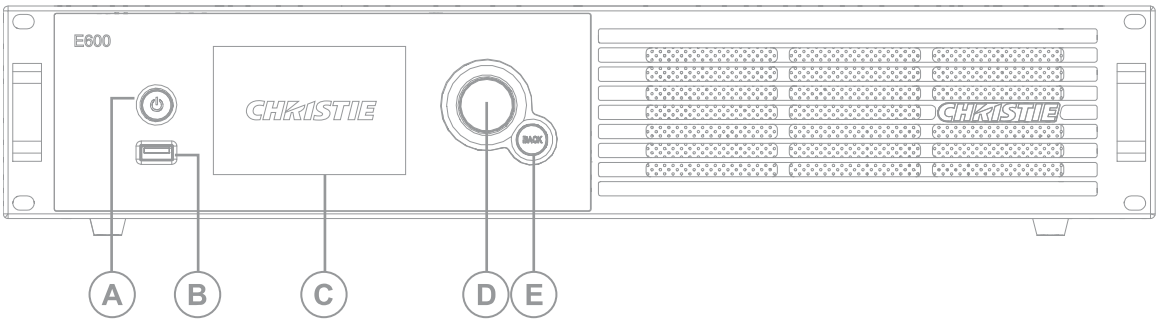
E600 controller interface and ports

Learn about the interface and physical ports on the E600 controller.

The E600 controller behaves as two independent controllers, displaying 3840 x 2160 pixels at 30 Hz with each virtual controller. The images of both DVI1 and DVI2 input sources can be displayed on the tiles simultaneously, but the inputs must be configured independently.

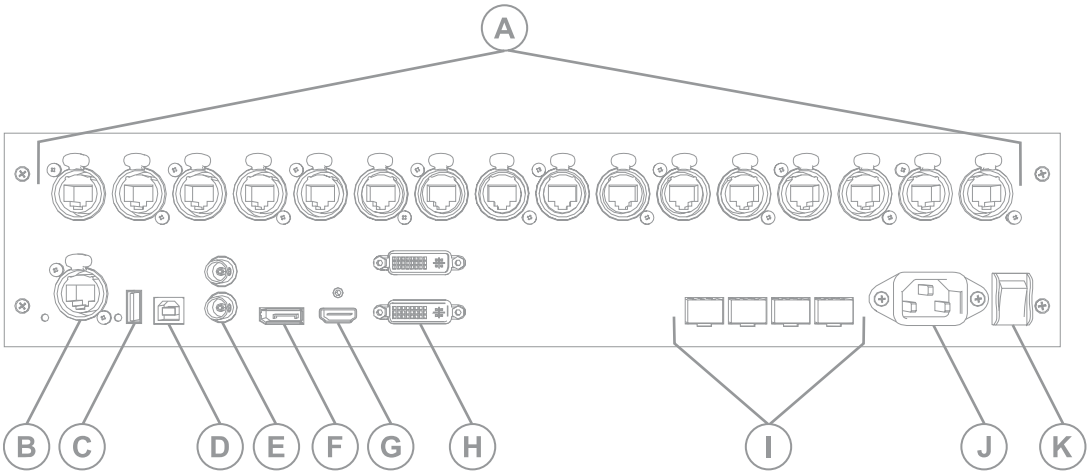
DVI1 corresponds to Ethernet ports 1-8, and DVI2 corresponds to Ethernet ports 9-16.

Front



A	Power button
B	USB interface for communication with a UDISK
C	LCD screen
D	Menu dial for interacting with the menu
E	Back button for exiting from the current operation or option in the menu

Rear



	Inputs/Outputs		Description
A	Outputs	RJ45 (Qty. 16)	16-channel Gigabit Ethernet interface, with each channel supporting up to 1G bandwidth Total loading capacity: 8.8 million pixels Low latency is not supported
B	Control	Ethernet	USB, RJ45 (with SNMP support), and USB cascading
C		USB Out	
D		USB In	
E	Genlock	BNC (Qty. 2)	Support Genlock IN & LOOP
F	Inputs	DisplayPort	Standard DisplayPort 1.2 input The maximum user-definable resolution is 7680 x 1080 @ 60Hz or 1080 x 6000 @ 60Hz.
G		HDMI	Standard HDMI 2.0 input Supports 8 bit, 10 bit, and 12 bit; refer to the table below.
H		DVI (Qty. 2)	Dual-link DVI, user-definable resolution • Horizontal resolution maximum: 3840 pixels • Vertical resolution maximum 3840 pixels
I	OPT Output		Fiber optic ports for connecting to the FE600 fiber optic extender
J	Power		Power supply port: AC 100-240V~ 50/60hz
K			Power switch

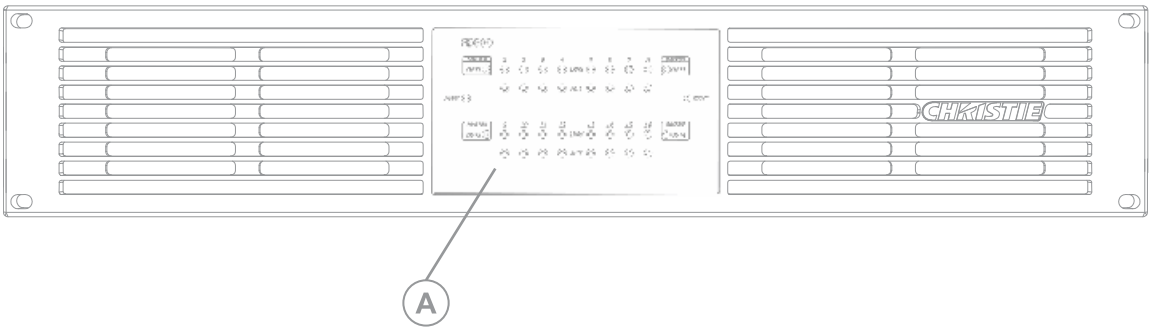
HDMI 8 bit, 10 bit, and 12 bit support

Color depth		Input source		
		3840 x 2160 @ 60Hz (HDCP)	3840 x 1080 @ 60Hz (HDCP)	1920 x 1080 @ 60Hz (HDCP)
8 bit				
	RGB444	Yes	Yes	Yes
	YCbCr444	Yes	Yes	Yes
	YCbCr422	Yes	Yes	Yes
	YCbCr420	Yes	Yes	Yes
10 bit				
	RGB444	No	Yes	Yes
	YCbCr444	No	Yes	Yes
	YCbCr422	Yes	Yes	Yes
	YCbCr420	Yes	Yes	Yes
12 bit				
	RGB444	No	Yes	Yes
	YCbCr444	No	Yes	Yes
	YCbCr422	Yes	Yes	Yes
	YCbCr420	Yes	Yes	Yes

FE600 controller extender interface and ports

Learn about the interface and physical ports on the E600 controller.

Front

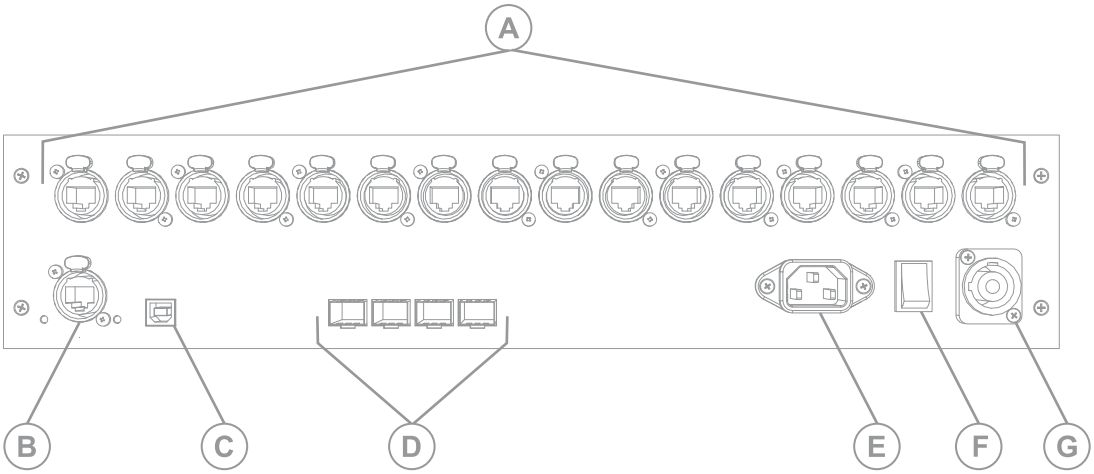


A	Status display

Rear

Caution! If not avoided, the following could result in minor or moderate injury.

- FIRE HAZARD! Always connect the Neutrik PowerCON cable to the device before connecting it to the wall. The PowerCON connector is not intended to be hot pluggable.
- SHOCK HAZARD! Power supply uses double pole/neutral fusing.



	Inputs/Outputs		Description
A	Outputs	RJ45 (Qty. 16)	16-channel Gigabit Ethernet interface, with each channel supporting up to 1G bandwidth Total loading capacity: 8.8 million pixels Low latency is not supported
B	Control	Ethernet	USB, RJ45 (with SNMP support), and USB cascading
C		USB In	
D	OPT Output (Qty. 4)		Fiber optic ports for connecting to the E600 controller • OPT1 is used for transferring the data of port 1-8 • OPT2 is used for transferring the data of port 9-16 • OPT3 is the backup channel of OPT1 • OPT4 is the backup channel of OPT2 Either Gigabit Ethernet port or optical fiber port can be used at the same time, but cannot be used to connect devices simultaneously.
E	Power		IEC 60320-C18 power supply port: AC 100-240V~ 50/60hz
F			Power switch
G			Neutrik PowerCON power supply port: AC 100-240V~ 50/60hz

Connecting the FE600 fiber optic extender to power

Connect the power cable between the wall and the FE600 fiber optic extender.

Caution! If not avoided, the following could result in minor or moderate injury.

- FIRE HAZARD! Always connect the Neutrik PowerCON cable to the device before connecting it to the wall. The PowerCON connector is not intended to be hot pluggable.
- SHOCK HAZARD! Power supply uses double pole/neutral fusing.

1. Connect the IEC 60320-C18 cable.
   a) Flip the switch between the two power connectors to the down position.
   b) Connect the cable to the PowerCON connector on the device.
   c) Plug the other end of the cable into the wall outlet.
2. Connect the Neutrik PowerCON cable.
   a) Flip the switch between the two power connectors to the up position.
   b) Connect the cable to the PowerCON connector on the device.
   c) Plug the other end of the cable into the wall outlet.

Terminology

Learn about the components of the LED display system.

Term	Definition
Tile	A cabinet that contains several LED modules.
Array	A group of connected tiles that form a larger display.
Controller	Controls the LED display system array and video input source. Sometimes referred to as the control unit.
Pixel	A group of one red, one green, and one blue dot.
Subpixel	A pixel is comprised of three subpixels, one for each color: red, green, and blue. Each subpixel in LED display technology is an LED chip.
Pixel pitch	Specifies the distance from the center of one pixel to the center of the next pixel.
SMD package size	A technical supplier specification related to the pixel size, and denotes the size of the surface-mounted diode (SMD) itself.
Fill factor	Indicates the ratio between the area covered by pixels and the area not covered by pixels.

Related documentation

Additional information on the Velvet Apex is available in the following documents.

Additional information may also be available in the documentation included with Christie products the E600 controller will be used with.

- *E500 User Guide (P/N: 020-102222-XX)*
- *E500 Serial Commands Guide (P/N: 020-102222-XX)*

Technical support

Technical support for Christie Enterprise products is available at:

- North and South America: +1-800-221-8025 or *Support.Americas@christiedigital.com*
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Configuring the array

Perform these tasks when configuring the array.

To configure the array, the computer running the E600 controller software must be connected to the controller with a USB A to B cable.

Installing/Accessing the E600 controller software

The E600 controller software controls the configuration of the array.

1. On the Christie website, navigate to the *E600 product page*.
2. Switch to the **Downloads** tab and click **Software Downloads**.
3. Download and unzip the Christie LED Control Unit E600 Software zip file.
4. Double-click the `Christie Controller Software Setup <version>.exe` file, and follow the on-screen instructions and install the E600 controller software.

Logging into the controller software

To access the configuration features of the controller software, log in to the system.

1. Ensure the computer running the controller software is on the same network at the controller.
2. Connect a USB cable between the controller and the computer running the controller software.
3. Launch the controller software and log in as the administrator.
   a) Click **User** > **Advanced User Login**.
   b) Login with the password **admin**.

Setting the input resolution

Set the resolution for the home page display of interface, which must be consistent with the output resolution of the video source.

1. Connect a USB cable between the controller and the computer running the controller software.
2. Launch the controller software and log in as the administrator.
   a) Click **User** > **Advanced User Login**.
   b) Login with the password **admin**.
3. Click **Screen Configuration**.
4. Select **Configure Screen** and click **Next**.
5. Switch to the **Sending Card** tab.
6. In the Set the Sending Card Display Mode section, select the resolution of the video source from the Resolution list.

7. Click **Set**.
8. Click **Save**.

Identify the screen cabling path

Verify the cabling between tiles is mapped correctly, and adjust as necessary.

1. Connect a USB cable between the controller and the computer running the controller software.
2. Launch the controller software and log in as the administrator.
   a) Click **User** > **Advanced User Login**.
   b) Login with the password **admin**.
3. Click **Screen Configuration**.
4. Select **Configure Screen** and click **Next**.
5. Switch to the **Screen Connection** tab.
6. Select **Standard Screen** and specify the number of columns and rows of tiles in the array.
   Each tile in the array spans two columns of the grid, one section for each receiver card in the tile.
7. Specify the receiving card size.

Tile	Receiving card size (width x height in pixels)
LED012-A2L	240 x 270
LED016-A2L	192 x 216
LED019-A2L	160 x 180
LED025-A2L	120 x 135

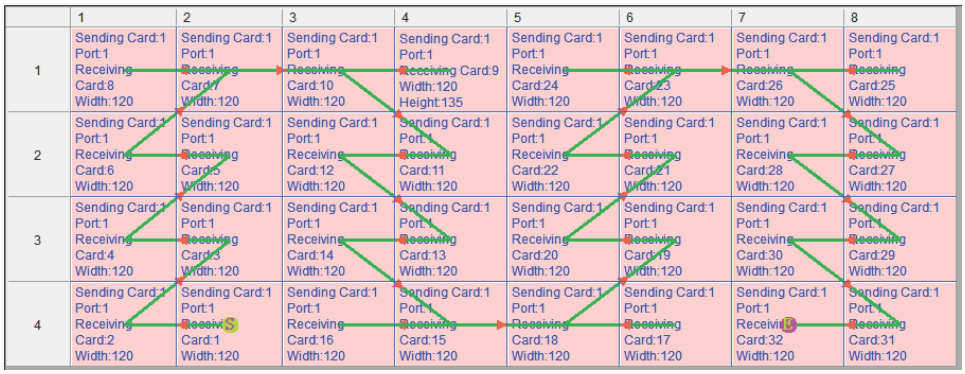
Tile	Receiving card size (width x height in pixels)
LED012-CP-I	192 x 432
LED014-CP-I	160 x 360
LED019-CP-I	120 x 270
LED024-CP-I	96 x 216
LED030-CP-I	80 x 180
LED040-CP-I	60 x 135

Tile	Receiving card size (width x height in pixels)
LED012-CP-R	192 x 432
LED014-CP-R	160 x 360
LED019-CP-R	120 x 270

Tile	Receiving card size (width x height in pixels)
LED024-CP-R	96 x 216

8. In the Sending Card Number area, select the controller.
9. Starting with the first tile connected to the controller, left-click and drag the mouse along the route the data cables take between the tiles.

   Each tile in the array spans two columns of the grid, one section for each receiver card in the tile. When dragging the path, ensure that each receiver card in the tile is selected before moving on to the next tile.



10. Click **Send to HW**.
11. Repeat steps 8 to 10 for each controller in the array.

Adjusting the initial picture coordinates

Adjust the initial coordinates of the pictures on the screen.

1. On the front of the controller, press the menu dial.

   When using the menu dial, rotate the dial to move through the items in the menu. To select a menu item or to set a value, push in the menu dial.

   To return to the previous menu, press the button to the bottom right of the menu dial.
2. Select **Screen Settings** > **Image Offset**.
3. Select **Start X** and push the menu dial.
4. Rotate the dial and set the horizontal offset.
5. Select **Start Y** and push the menu dial.
6. Rotate the dial and set the vertical offset.

Adjusting the image brightness

Change the brightness level of each tile to create a uniform brightness across the array.

1. In the controller software, click **Brightness**.
2. Use the **Brightness Adjustment** slider to adjust the brightness.

3. If the brightness is uneven across the tiles, set all brightness values to zero and raise them to the desired brightness to re-sync the tiles.
4. Click **Save To HW**.

Adjusting the image quality

Change the darker and lighter tones of the source video.

1. In the controller software, click **Brightness**.
2. In the Contrast section of the Brightness Adjustment dialog, use the **Gamma** slider to adjust the darker and lighter tones of the source video.
3. Click **Save To HW**.

Setting the redundancy backup

If the connection to one tile is lost, the redundancy backup passes information to the other tiles so the display continues to work normally.

1. Connect a USB cable between the controller and the computer running the controller software.
2. Launch the controller software and log in as the administrator.
   a) Click **User** > **Advanced User Login**.
   b) Login with the password **admin**.
3. Click **Screen Configuration**.
4. Select **Configure Screen** and click **Next**.
5. Switch to the **Sending Card** tab.
6. In the Redundancy section, click **Add**.
   Only tiles in the same cascade chain can have a primary-secondary redundancy backup relationship.
7. Set the serial number of the primary sending card and port number.
8. Set the serial number of the backup sending card and port number.
   A backup tile can not be set as a primary if it is part of a redundancy backup relationship.
9. Click **Add**.
10. Repeat steps 5 to 7 for any additional redundancy relationships.
11. Click **Close**.
12. Click **Save**.

Testing the communication between the controller and tiles

Verify that the array is connected to and recognized by the E600 controller.

1. Connect a USB cable between the controller and the computer running the controller software.
2. Launch the controller software and log in as the administrator.

a) Click **User** > **Advanced User Login**.

b) Login with the password **admin**.

3. To confirm the display is connected to and recognized by the controller, in the Local System Info area, ensure **Control System** has a value of **1**.

   If the controller is not recognizing the tiles, select **System** > **Reconnect**.

4. Select **Screen Control**.
5. To confirm the controller is communicating with all tiles, select a color from the Self Test list and click **Send**.

   If the controller is communicating with all the tiles, each display changes to the selected color.

6. Reset the Self Test to **Normal** and click **Send**.
7. Click **Close**.

Reviewing the tile configuration

Review the tile configuration reported in the E600 controller software.

1. Connect a USB cable between the controller and the computer running the controller software.
2. Launch the controller software and log in as the administrator.
   a) Click **User** > **Advanced User Login**.
   b) Login with the password **admin**.
3. Click **Screen Configuration**.
4. Select **Configure Screen** and click **Next**.
5. Switch to the **Screen Connection** tab.
6. Click **Read from HW**.
7. Review the configuration of the tiles in the array, and modify as needed.

   The cable layout for the tiles in the array is identified with an **S** where the first cable starts, and the green line shows the path of the daisy chain of cables. **E** identifies the end of the daisy chain.

Loading a cabinet configuration file

After the screen is powered on, if the tile fails to display normally, you must load the cabinet files. The cabinet files are sent to the controller through the software.

1. Connect a USB cable between the controller and the computer running the controller software.
2. Launch the controller software and log in as the administrator.
   a) Click **User** > **Advanced User Login**.
   b) Login with the password **admin**.
3. Click **Screen Configuration**.
4. Select **Configure Screen** and click **Next**.
5. Switch to the **Receiving Card** tab.
6. Click **Load from File**.

7. In the Open dialog, navigate to the .rcfg file and click **Open**.
8. Click **Send To Receiving Card**.
9. Click **Save**.

Adjusting dark and light lines between tiles

To blend two tiles together, change the brightness of the lines between two tiles.

1. Connect a USB cable between the controller and the computer running the controller software.
2. Launch the controller software and log in as the administrator.
   a) Click **User** > **Advanced User Login**.
   b) Login with the password **admin**.
3. Select **Tools** > **Quickly Adjust Dark or Bright Lines** > **Adjust Dark or Bright Lines**.
4. At the bottom of the dialog, select the method and color to display on the array.
5. Select the line to adjust.
   - To select more than one line, select each line.
   - To adjust only specific pixels, double-click the selected line and choose the pixels to adjust.

   Each tile in the array spans two columns of the grid. To select the right edge of the top left tile, select the bar at the right of the row 1, column 2 sector.
6. Move the Adjust slider until the selected line matches the surrounding LEDs and disappears.

   Adjustments are made in real-time, but depending on the size of the area being adjusted it may take a few seconds for the tiles to refresh.
7. After the line adjustment is complete, click **Save to HW**.
8. In the confirmation dialog, click **OK**.
9. Repeat steps 5 to 8 for each line that needs to be adjusted.

Displaying a picture when there is no signal

Configure the controller to display a picture when there is no source signal to the controller.

1. Ensure the the main display is showing on the array.
2. In the controller software, select **Settings** > **Prestore Screen**.
3. In the Prestore Picture Settings area, click **Browse** and navigate to the picture to display when there is no signal to the controller.
4. In the Prestore Picture Settings area, select **Save to HW**.

   A confirmation message is displayed when the save is completed.
5. For Disconnect Cable select **Prestore Picture**.
6. For No DVI Signal select **Prestore Picture**.
7. In the Function Settings area, select **Save to HW**.

Changing the display to black when there is no signal

Configure the controller to display black when there is no source signal to the controller.

1. Ensure the main display is showing on the array.
2. In the controller software, select **Settings** > **Prestore Screen**.
3. For Disconnect Cable select **Black**.
4. For No DVI Signal select **Black**.
5. In the Function Settings area, select **Save to HW**.

Restoring the factory settings

Return the configuration back to the factory default settings.

1. Connect a USB cable between the controller and the computer running the controller software.
2. Launch the controller software and log in as the administrator.
   a) Click **User** > **Advanced User Login**.
   b) Login with the password **admin**.
3. Click **Screen Configuration**.
4. Select **Configure Screen** and click **Next**.
5. Switch to the **Sending Card** tab.
6. Click **Restore Factory Settings**.
7. At the confirmation dialog, click **OK**.
   The system is returned to its factory settings.
8. At the completion dialog, click **OK**.

Locking and unlocking the controller

Disable the ability to navigate the menu and modify the settings from the front of the controller.

1. To disable access to the controller menu, press and hold the menu dial and back button until the controller screen flashes.
2. To re-enable access to the controller menu, press and hold the menu dial and back button for approximately 15 seconds.
3. Test if the controller is unlocked by using the menu dial to navigate the menu.
   If the controller is still locked, press and hold the menu dial and back button for a longer period of time.

Color matching LED modules

Adjust the color of an LED module to match the modules around it.

1. Connect a USB cable between the controller and the computer running the controller software.
2. Launch the controller software and log in as the administrator.
   a) Click **User** > **Advanced User Login**.
   b) Login with the password **admin**.
3. Click **Calibration**.
4. Switch to the **Manage Coefficients** tab, and click **Adjust coefficients**.
5. Select the receiver card to adjust.
6. Ensure **Select by Topology** is selected.
7. Select the area to adjust.
   a) Double-click the receiver card to be adjusted.
   b) Enter the module size.
   c) Select the module to adjust.
8. Click **Next**.
9. Select **Adjust its own effect**.
10. In the confirmation dialog, select **OK**.
    The array turns white.
11. Adjust the color sliders to match the surrounding LED modules.
    Adjustments are made in real-time, but depending on the size of the area being adjusted it may take a few seconds for the tiles to refresh.
12. After the adjustments are completed, click **Next**.
13. Click **Save**.
14. In the confirmation dialog, select **OK**.
15. Click **Finish**.

Calibrating replacement LED modules

After replacing a defective LED module, import the calibration information for the new module.

1. Before installing the replacement LED module, record the ID and serial number of the module.
2. In the controller software, click **Settings** > **Module Flash**.
3. Click **Check coefficients in modules**.
4. After the information is loaded to the modules, click **Save calibration coefficients on receiving cards**.

Configuring HDR

The E600 controller supports High Dynamic Range (HDR), presenting more vivid and clearer images.

1. On the front of the controller, press the menu dial.
2. Select **Advanced Settings** > **HDR**.
   If an HDR source cannot be detected on the HDMI input, the option is grayed out and disabled.
3. Select **HDR** and press the menu dial.
4. Select **Enable** and press the menu dial.
5. Set the **Peak Luma** and **Ambient Light** settings.

Troubleshooting

Learn about common issues and their solutions.

Line adjustments do not appear on the module edges

When darkening and lightening the lines between modules, the adjustments appear beside the joints and not on the joints.

Resolution

- In the Control Panel, ensure the display text size and the DPI are both set to 100%

Text displays beyond the button outline

The text on buttons extends beyond the edges of the button.

Resolution

- In the Control Panel, ensure the display text size and the DPI are both set to 100%

An image remains on the display after I disconnect the source

When the source is disconnected, the last image remains on the display.

Resolution

- Configure the display to show a picture or to change to a black screen when the source is disconnected.

Related information

Displaying a picture when there is no signal (on page 15)
Changing the display to black when there is no signal (on page 16)

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