



Operations Manual

Ultimatte 12

May 2018

English, 日本語, Français, Deutsch, Español, 中文,
한국어, Русский, Italiano, Português and Türkçe.

Languages

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Welcome

Thank you for purchasing your Blackmagic Ultimatte 12.

Ultimatte has been the premiere keyer used in the film and television industries for decades and no other keyer comes close to the performance that Ultimatte can achieve. It's powerful enough to handle fine detail on key edges as well as retaining stronger colors, even when those foreground colors are close to the key color. Even uneven green and blue screen backdrops can be handled.

However, what makes Ultimatte so powerful is its ability to map shadows onto the new background layer combined with its color spill management that lets you create extremely realistic environments. In many ways, Ultimatte is much more than a keyer as it's really a real time advanced compositor for creating photorealistic virtual environments. Ultimatte lets you move your talent to any location at the click of a button and the results look real.

Ultimatte 12 is the latest model of Ultimatte and this new model includes entirely new algorithms and color science, incredible edge handling, greater color separation, amazing color fidelity and better spill suppression than previous models.

The new Ultimatte 12 is also Ultra HD as it includes advanced 12G-SDI design, however the 12G-SDI connections also switch between all SD, HD and Ultra HD formats up to 2160p60. This means Ultimatte 12 has the flexibility to work in HD today but then switch to Ultra HD whenever you need.

This instruction manual contains information you need to get started with Ultimatte 12 as well as also containing detailed instructions on how to operate Ultimatte 12 from the Smart Remote 4 control panel.

Also, please check the support page on our website at www.blackmagicdesign.com for the latest version of this manual and for updates to your Blackmagic Ultimatte 12's software.

Keeping your software up to date will ensure you get all the latest features! We are continually working on new features and improvements, so we would love to hear from you!

A handwritten signature in black ink that reads "Grant Petty". The signature is written in a cursive, flowing style.

Grant Petty

CEO Blackmagic Design

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Ultimatte 12

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Getting Started

Getting started with your Blackmagic Ultimatte 12 is as simple as plugging in power, connecting your foreground, background and layer SDI video sources, and plugging the SDI outputs into video equipment such as a switcher, monitor or recording deck.

This section of the manual will show you everything you need to know to get started using your Blackmagic Ultimatte 12.

Plugging in Power

To power Ultimatte 12

Plug a standard IEC power cable into any of the two power inputs on the rear panel.

NOTE Blackmagic Ultimatte 12 is equipped with two power supplies. This means you can connect an alternative power supply for redundancy. Ultimatte 12 will automatically switch to the second power source if your main power source fails.

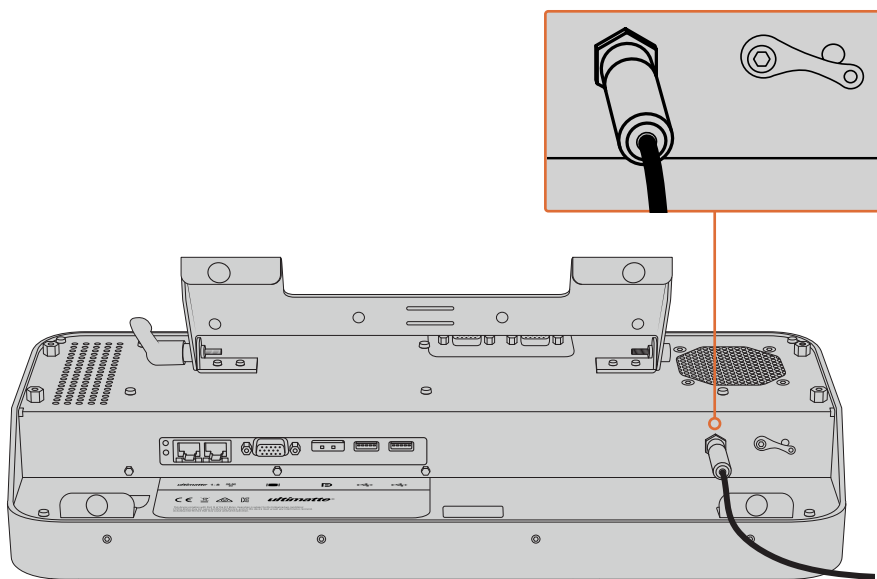


Plug power into any of the two power inputs on the main unit's rear panel.

To control your Ultimatte 12 main unit, you will need to connect to a Smart Remote 4 control panel. Up to 8 Ultimatte 11 or Ultimatte 12 main units can be controlled by a single Smart Remote 4 control panel.

To power Smart Remote 4

Plug the included power adapter into the DC power input on the rear panel. The screw ring is used to secure the connector to the port.

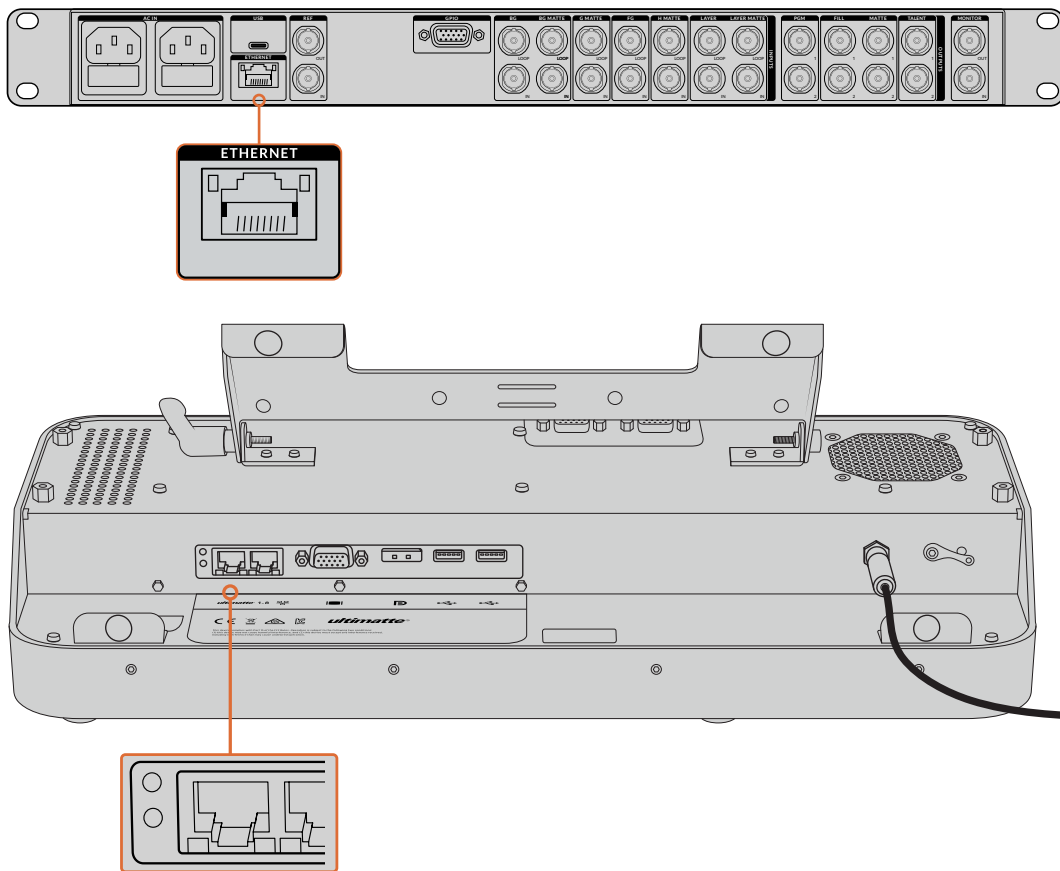


Plug the power adapter into Smart Remote 4's power input

TIP The power adapter's outside screw ring also serves as the negative contact, with the positive contact being the center pin of the connector. If you want to secure a ground connection to the chassis of your Smart Remote 4, you can attach it to the terminal lug located next to the power input.

Connecting the Smart Remote 4 to your Ultimatte

Connect the Smart Remote 4 to your Ultimatte 12 via Ethernet using a standard CAT 5e or CAT 6 Ethernet cable. We recommend using a CAT 6 shielded cable as it will prevent any potential interference from nearby equipment.



Plug your Ultimatte main unit into the Smart Remote 4's left side Ethernet port using a CAT6 Ethernet cable

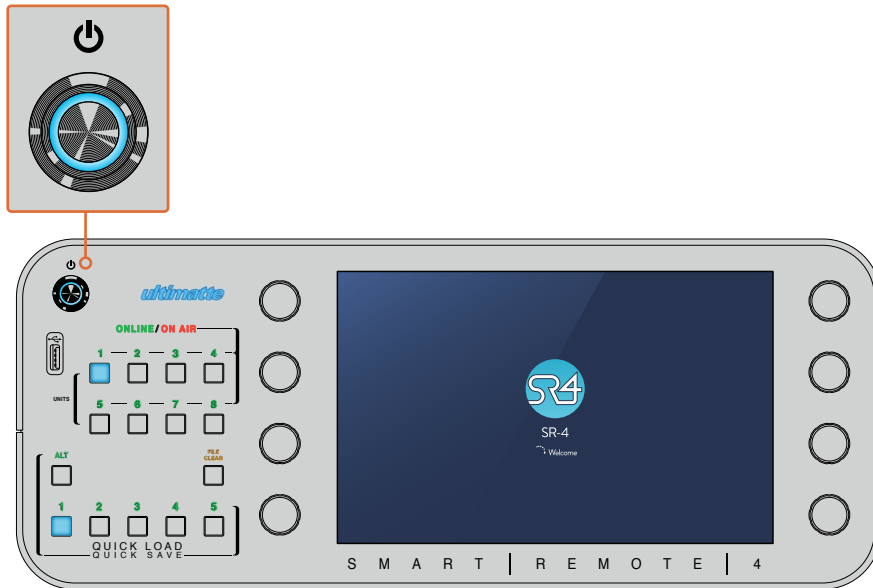
The Ultimatte 12 main unit has a default IP address of 192.168.10.220. If you are using a new smart remote with your Ultimatte 12, then the smart remote will automatically detect the main unit so you won't need to change any IP settings.

If you are connecting an Ultimatte 12 to a network that uses a different IP address, subnet mask and router, you can change the IP settings for your Ultimatte to suit your network. Refer to the 'connecting to a network' section for more information.

TIP If you are adding an Ultimatte 12 to an existing system that includes Ultimatte 11, you will need to update your Smart Remote 4 to the latest SR4 internal software. Refer to the 'updating your Smart Remote 4' section for more information.

Turning On the Smart Remote 4

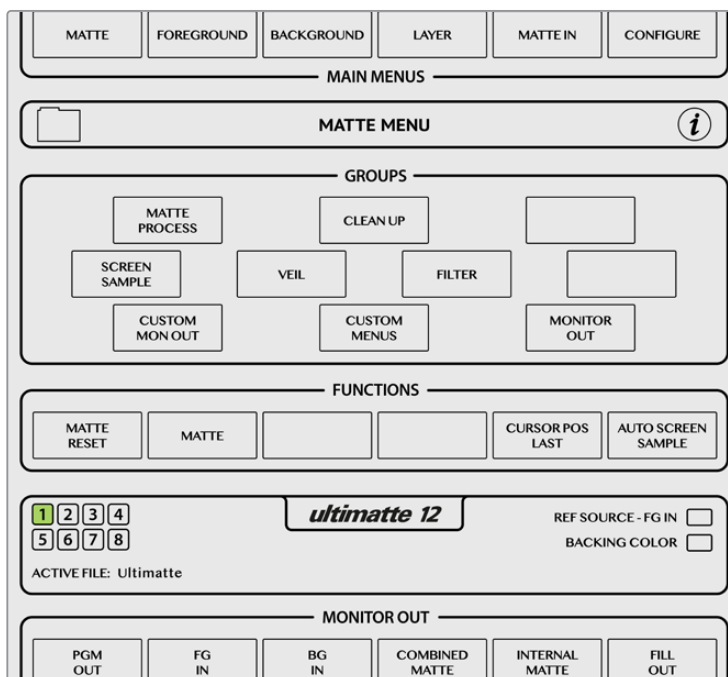
To turn the smart remote on, press the power button located at the top left corner of the control panel.



When power is activated, the power button will illuminate blue and the smart remote will initiate the software start up sequence

At its heart, Smart Remote 4 is a small portable computer running the Windows® operating system. When the start up sequence is complete, the Ultimatte control software will launch and the control panel will appear on the touchscreen.

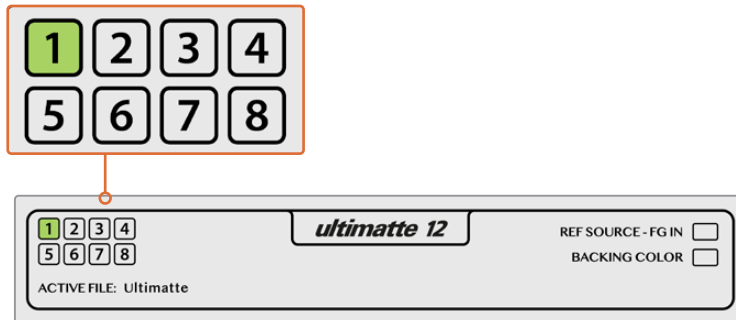
The status bar near the bottom of the touchscreen will prompt you to select an Ultimatte main unit.



When the Smart Remote 4 start up sequence is complete, the Ultimatte control software will launch and the status bar will prompt you to select an Ultimatte main unit

The Smart Remote 4 Status Bar

You can see all the Ultimatte units being controlled by your smart remote by glancing at the status bar on the touchscreen. Up to 8 units can be controlled, and each unit icon will illuminate green when identified on your network. When a unit is selected for control, the icon will illuminate blue. For more information on how to set up and control multiple units over a network, refer to the 'connecting to a network' section.



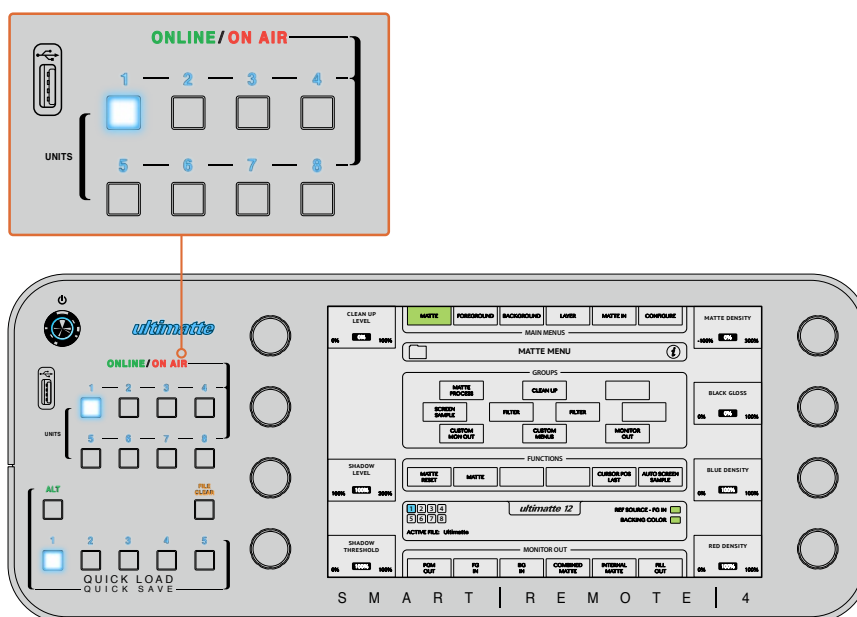
Refer to the 'connecting to a network' section for information about how to set up and control multiple Ultimatte units on your network

TIP If your Ultimatte 12 is connected to the Smart Remote 4 but its unit indicator is not illuminated in the status bar, check your IP settings are configured correctly for the main unit and Smart Remote 4. Refer to 'connecting to a network' for more information.

Selecting the Ultimatte Main Unit

With the Ultimatte unit icon illuminated green in the status bar, you can now select that unit to control. Simply press the corresponding unit button on the left side of the control panel.

When selected, the unit button will illuminate blue and the touchscreen will now reveal all the controls for that unit.



Press a unit button to select the desired Ultimatte main unit you want to control

Connecting Video Sources and Outputs

With power connected and both units running, you can now plug your SDI video sources into the BNC inputs, and plug your switcher, monitor and recording equipment into the BNC outputs.

The SDI input sources will generally be made up of your background, foreground, mattes and any additional layers required to create your composite. Each input has its own loop output so you can connect each source to a monitor or recording equipment.

Ultimatte 12 has resynchronizers on each input, so you don't need to genlock all your sources. The foreground source provides the reference, and all other inputs will automatically lock to that input. However, an analog reference input is provided if you want to sync all sources to an external reference source.

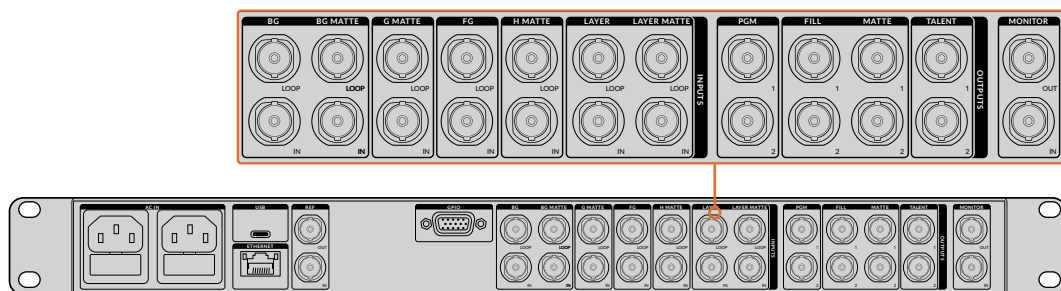
NOTE The foreground input determines the video format for all other inputs.

For example, if you have 2160p59.94 video connected to the foreground input, ensure that all of your sources have 2160p59.94 video connected to their respective inputs.

Ultimatte will detect a level A or level B 3G-SDI input automatically. The output is set to level B by default, but you can change it to level A if needed.

To change the 3G-SDI output to level A or B:

- 1 Go to the 'configure' menu on your Smart Remote 4.
- 2 Tap on the 'system' button.
A window will appear with checkboxes for level A and Level B 3G-SDI.
- 3 Tap the desired level checkbox, then tap 'apply' to confirm the setting.
Tap 'close' to exit the window.



The SDI outputs on the right side of the rear panel let you connect the final composite output to a switcher. Embedded audio and timecode will be passed through from the foreground input to all outputs. You can also monitor each fill and matte output, plus connect the talent output to a monitor so the talent can see the composited output in your studio or on location.

TIP The loop outputs are helpful when making a fast assessment of all your sources and associated mattes. For example, connecting each loop output to a multiview via an ATEM switcher, or a Blackmagic MultiView 16 is a powerful way to monitor all your sources simultaneously.

For more information about all the inputs and outputs on your Ultimatte, refer to the 'connecting sources and outputs' section of this manual.

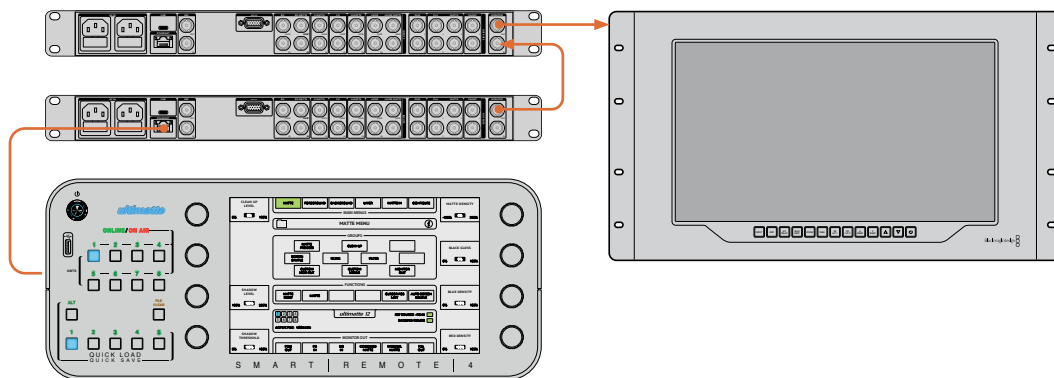
Monitor Cascade Feature

The powerful monitor cascade feature lets you view the monitor output from up to 8 Ultimatte 12 units via one single unit.

8 Ultimatte 12 units can be daisy chained via their monitor inputs and outputs, with the last unit plugged into a monitor. Then when you select any of the 8 units on your smart remote to control, the monitor output for that particular unit can be viewed from the monitor output on the last unit.

TIP To enable the monitor cascade feature on the touchscreen control panel, tap on the 'info' icon in the files and information section, and check the 'monitor cascade' checkbox in the 'options' tab.

Below is an example showing how 2 Ultimatte 12 units are daisy chained for cascade monitoring.



With cascade monitoring, you can monitor the output of the currently active unit being controlled by your Smart Remote 4

For more information on cascade monitoring, refer to the 'configure settings/monitor cascade' section.

Setting an Auto Composite using the File Clear Button

With all your inputs and outputs connected, Ultimatte 12 will perform an automatic composite. This is a starting composite that is set by default based on all your connected sources. This starting composite can be reset at any time by pressing the 'file clear' button.

NOTE The file clear button will set an automatic composite with green selected as the backing color by default. If you are using a different backing color, for example red or blue, then you will need to set your Ultimatte to use that color. Refer to the 'quick guide to building a composite' section for more information.

If your lighting is optimized and your green screen environment has been carefully set up, the automatic composite generated by Ultimatte can be all you need to achieve the desired effects. You can now refine the background, foreground, and layer settings if you need to, and generally finesse your composite to make the illusion of combining the virtual and live action even more convincing!

Please keep reading this manual for more information on how to use all the settings and features on your Ultimatte 12.

Connecting Sources and Outputs

Each source input used in a composite should be carefully planned, so the elements that build your shot can be arranged into specific layers. Each source should be connected to its determined source input so you always know where everything is, and you can manage your composite more effectively.

SDI Inputs

Background Input

Plug the background image into the BG IN connector. This is the image you want to use as the background for your composite.

Background Matte Input

If you want to extract a section of the background to use as a foreground element, plug the background matte source into the BG MATTE IN connector.

TIP Refer to the next section of the manual to find more information on the different mattes you can use, including how to extract an element from the background to composite over the foreground using a background matte.

Garbage Matte Input

Plug a source containing an externally generated garbage matte into the G MATTE IN connector.

Foreground Input

Plug the foreground image you want to composite over the top of the background into the FG IN connector. The foreground image is typically the talent in front of a green screen.

Holdout Matte Input

Plug a source containing an externally generated holdout matte into the H MATTE IN connector.

Layer Input

The layer input is for any additional video or graphics you want to add to your composite.

Layer Matte Input

Similar to other matte inputs, this input lets you connect an externally generated matte so you can precisely add the layer input source into your composite.

SDI Outputs

Below is a description of each output on your Ultimatte 12 main unit.

Source Loop Outputs

Each source input has its own dedicated loop SDI output.

Program Outputs 1 and 2

Plug a program output, marked PGM into an SDI switcher or recording deck, for example an ATEM switcher or HyperDeck Disk Recorder.

Fill Outputs 1 and 2

Plug the fill outputs into a recording deck, and into a switcher for final compositing.

Matte Outputs 1 and 2

Plug the matte outputs into a recording deck, and into a switcher for final compositing. The matte output includes the internal matte, plus the garbage matte and holdout matte if enabled.

Talent Out 1 and 2

The talent output lets your talent monitor the final composite so he or she can position themselves in the frame and coordinate their actions to the composited image.

TIP The talent output has a 'mirror' setting that lets you flip the talent output horizontally. Using this feature, the talent can see his or her positioning without needing to compensate for reversed camera left and right staging. Refer to the 'configure settings/talent mirror' section for more information.

Monitor Output

Plug the monitor output marked MONITOR OUT into a monitor or recording deck. This connector is also used for daisy chaining to other Ultimatte 12 units when using the powerful monitor cascade feature. Refer to the 'configure settings' section for more information.

Monitor Input

The monitor input is important for daisy chaining to other Ultimatte 12 units when using the powerful monitor cascade feature. Refer to the 'configure settings' section for more information.

What is a Matte?

Before looking at how to use all the features and settings on your Ultimatte, it's worth taking a moment to look at the types of mattes you can use, and how they are arranged in your composite.

When a section of an image is intended to be composited over another image, it requires an accompanying matte, either generated internally by Ultimatte, or supplied via an external source. A matte is also known as an 'alpha', or 'key', and is displayed as a grayscale image. The matte determines what will be visible in the accompanying source image that is being composited. The source image to be composited is called the 'fill'.

Black regions in the matte will allow those regions in the corresponding 'fill' image to be visible in the composited output, and any areas that are white will be cut out, or removed, showing the image behind it. Variations of gray means those areas of the corresponding fill image will be partially transparent.

Types of Mattes

Different matte types are used for specific purposes, to separate areas of the corresponding image into foreground and background elements, or to include or exclude sections of the matte you want to keep or discard.

Below is a description of the types of mattes used.

Background Matte

The background matte is a powerful way to extract a section from the background and place it over the foreground.

For example, you may have a virtual set as your background image. Inside the virtual set is a row of tall marble pillars. Using a background matte that precisely matches the pillars in your virtual set, you can extract the pillars from the background and the talent can walk behind them. This is an excellent way to create a foreground element using the background image and keeps the layer input free for additional foreground items. It's important to note that elements to be extracted from the background must be completely opaque.

Matte

This is the primary matte you will be working with in your composite. This matte is derived using the source connected to the foreground input. Typically a presenter in front of a green screen. The matte is generated internally by analyzing the backing color in the source video and will determine what is visible in the foreground image.

TIP Objects that obscure the backing color, either partly or completely, will be visible in the composited image. In the matte, fully opaque black means the corresponding areas in the fill image will be completely visible. Shades of grey means partially transparent.

Garbage Matte

A garbage matte excludes areas of a source you don't want to include in your composite.

For example, there may be lights and gripping equipment visible around the edges of your foreground image. If you want to mask out these unwanted areas, a garbage matte lets you do that. Garbage mattes can be generated externally so they precisely match shapes in your source video, and connected to the garbage matte input.

TIP An internal mask can be created using the 'window' controls. This can be a great tool for creating a fast, rough garbage matte. For more information on how to setup window masks, refer to the 'matte input settings/window' section.

Holdout Matte

This matte is similar to a garbage matte, however, it lets you mask out areas from within the visible foreground so they are ignored by the matte.

For example, imagine a portion of a virtual set needs to appear green in the foreground. This will present a challenge because anything green will key out and reveal the background underneath. A holdout matte can be created to exclude that particular area within the set, which will prevent it from being keyed.

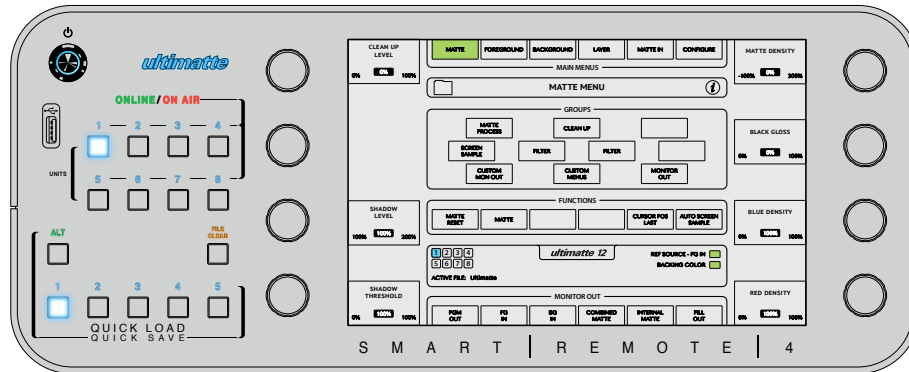
Layer Matte

The layer matte lets you add more foreground elements to the scene. For example, if you want to add graphics over the top of the composite.

You can swap the layer positioning in the final composite. For example, you may want to change the layer order during your production so the layer input appears in front of, then behind, the talent. You can even set a transition rate so the order change is a smooth mix transition.

For more information, refer to the 'Matte input settings/setting the layer order' section.

Controlling Ultimatte with Smart Remote 4



All the matte generation and compositing features of your Ultimatte 12 are controlled using the Smart Remote 4.

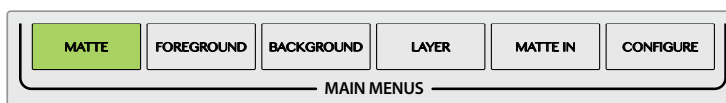
The controls and settings are accessed via the smart remote touchscreen, control buttons and knobs. The settings for each soft control knob changes depending on which menu you have selected on the touchscreen.

The Control Panel Layout

Touchscreen menus are displayed in sections, and although the interface can look intimidating at first glance with all the different buttons and settings, it won't take long before you will be moving between settings instinctively as you build your composite.

Main Menu Buttons

Tap the menu buttons along the top of the touchscreen to select the different input sources you want to adjust, plus select the matte for making adjustments to the primary matte, and generally configure your Ultimatte 12.

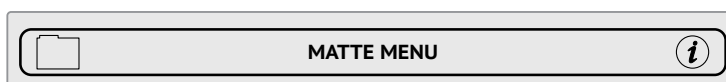


Information and File Control

This section of the interface lets you save preset files and configure certain settings for your Ultimatte.

To save a preset file, tap on the folder icon and use the dialog box edit functions to name and save a file. Refer to the 'saving and loading preset files' section for more information.

To view status information and various configuration settings for your Ultimatte and Smart Remote 4, tap on the information icon.



The available information and configuration settings are described below:

About

Displays detailed status information about your Ultimatte, including:

- Model name
- Software version
- Video format
- IP address
- Subnet mask
- Default gateway.

Smart Remote 4 Information is also included, such as:

- Remote version
- Flash version
- Temperature
- Fan speed
- Blackmagic Design contact information should you need support.

Configuration

Provides an overview of connected SDI sources and will tell you whether they are locked or not.

Control Board Settings

Lets you customize the brightness of the Smart Remote 4's LEDs and set the the internal fan speed.

Options

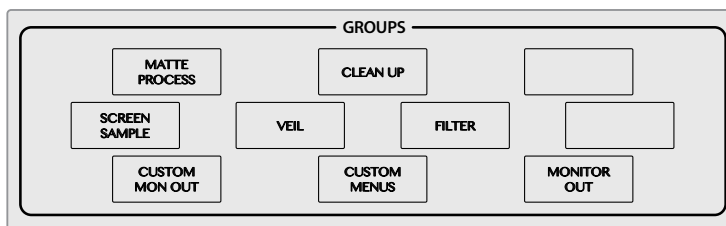
Turns the mouse pointer on or off if you have a mouse connected to your smart remote.
Enables the monitor out cascade feature.

Groups

This section of the interface contains the majority of the setting menus. For example, if you wanted to adjust the foreground 'flare' controls:

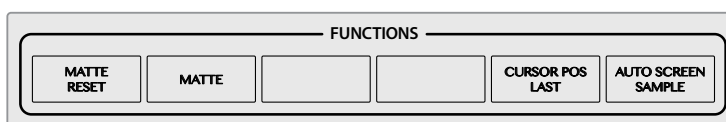
- 1 Tap on the 'foreground' main menu button to open the foreground settings.
- 2 Tap on the 'Flare 1' button in the groups section to select the flare controls.

The flare controls will now be visible on each side of the panel and you can adjust them using the control knobs.



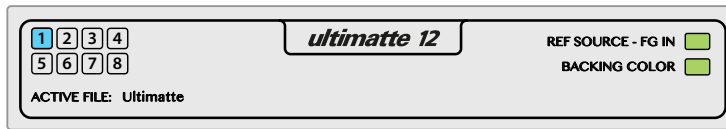
Functions

The functions section provides specific settings that can be selected, enabled or disabled. For example, the reset button is located in this section if you need to restore particular settings to their default state.



Status Bar

You can see all the Ultimatte units being controlled by your smart remote by glancing at the status bar on the touchscreen. Up to 8 units can be controlled, and each unit icon will illuminate green when identified on your network. When a unit is selected for control, the icon will illuminate blue.



The indicator for the Ultimatte unit being controlled will illuminate blue to let you know it is the active unit

Ultimatte Main Unit Indicators

The 8 small box indicators on the left side show you which main units are connected on the network, and which unit is currently being controlled. If tally is connected via the GPIO input, the boxes will illuminate red when a unit is on air.

Reference Source - Foreground In

This indicator will illuminate red when a reference source is absent, and green when a reference source is present. The reference signal can be connected via the foreground source connected to the foreground input, or via the reference input.

Backing Color

The default backing color is green and will be reflected by this indicator. When the backing color is changed, the indicator will also change to show the backing color being used.

Active File

When you have loaded a preset file using the information and file control section, the preset name will be displayed in the active file area. If no preset is loaded, the active file displays the Ultimatte default preset.

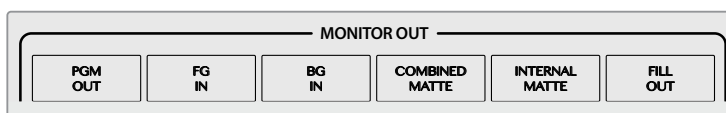
In addition, the status bar also notifies you with messages. For example, if a specific control is currently locked and you need to enable another setting to access it, the status bar will notify you.

Monitor Out

The soft buttons in this section of the interface will select 1 of 6 images to be displayed on a video monitor connected to your Ultimatte's monitor output.

The default selections are listed below.

- **Program Out** – Final composited image.
- **Foreground In** – Source image connected to the foreground input.
- **Background In** – Source image connected to the background input.
- **Combined Matte View** – Internal Matte + Garbage Matte + Holdout Matte.
- **Internal Matte View** – Screen matte only.
- **Fill Out** - Foreground image with spill removed, colorizers added, and the screen color suppressed to black.



Connecting to a network

Setting the IP Address for Ultimatte 12

Your Ultimatte 12 main unit is shipped with a default IP address of 192.168.10.220 but you can change this address if you want to connect to a network. This is also important when sharing multiple Ultimatte units on your network and controlling them using a single Smart Remote 4.

To change the IP address for an Ultimatte main unit, you will first need to download and install the latest Blackmagic Ultimatte Setup software from the Blackmagic Design support center at www.blackmagicdesign.com/support. For installation information refer to the 'updating the internal software' section in this manual.

After installation:

- 1 Connect the desired Ultimatte 12 main unit to your computer via USB.
- 2 Launch Blackmagic Ultimatte Setup.
- 3 Click on the unit icon for your Ultimatte to open the setup settings.
- 4 In the 'configure' tab, enter the IP address, subnet mask and gateway settings.
- 5 Click 'save' to confirm the settings.

Repeat the same process for each main unit you want to control. The subnet mask and gateway should match your network settings and stay the same between all units, but make sure each unit has its own unique IP address.

Setting the IP Address for your Smart Remote 4

Now that each Ultimatte main unit has a new IP address, you will need to configure the IP address of your Smart Remote 4 so you can control the main units on your network.

To set the IP address on your Smart Remote 4:

- 1 Reveal the Windows desktop by tapping on the info icon in the Smart Remote touchscreen information and file control section. Now tap on the 'options' settings and tap exit to desktop.
- 2 Navigate to the Windows network settings.
- 3 In the Ethernet related settings, select 'change adapter options'.
- 4 Double tap on the 'Ultimatte' network to open the Ultimatte status window.
- 5 Tap on 'properties'.
- 6 In the properties window, double tap on 'internet protocol version 4 (TCP/IPv4) to open its setting properties.
- 7 Select the 'obtain an IP address automatically' setting to let your Smart Remote find its own IP address to join the network you are connected to. Or if you want to enter the IP address, subnet mask and default gateway settings, select 'use the following IP address' and set it manually.
- 8 Tap 'OK' to confirm the settings.

Double tap on the SR4 smart remote software icon to return to the touchscreen control panel.

Setting the Main Unit's IP Address on Smart Remote 4

With your Smart Remote 4 now ready to control your Ultimatte main units, you will need to tell the smart remote where they are by setting their unit IP addresses in the Smart Remote 4 control panel.

To do this:

- 1 In the status bar, tap on a unit ID number to open the unit IP configuration window.
- 2 In the 'model' column, tap on the desired unit number's drop down menu and select Ultimatte 12.
- 3 Now set the IP address for the desired main unit using the software keyboard.
- 4 Tap 'apply' to confirm the settings.

If you look at the status bar, you will now see that unit number illuminated green. This means the unit is online and ready to be controlled.

Repeat the same steps to set the IP address for each unit on your network.

Ultimatte Compositing Workflow

Now that you're familiar with using the Smart Remote 4 to control your Ultimatte 12, and have pressed the file clear button to set an automatic starting composite, you can start finessing and refining your composite using Ultimatte's features and settings.

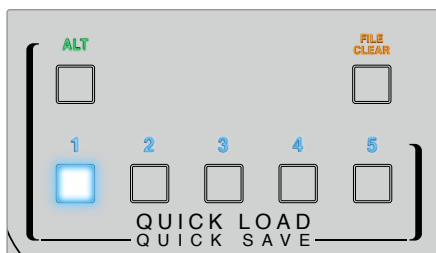
As you refine your composite, it is helpful to move back and forth between monitoring the combined matte view and the program output so you can optimize the matte, plus see how it is working in the final composite.

When adjusting controls, it's worth mentioning that you can restore any control back to its default state by double tapping the respective control.

You can also save your workflow to quick save points. As you change settings and make improvements, it's helpful to switch between save points to compare and assess what has changed in order to achieve the best possible settings.

To save a quick save, hold down the 'alt' button and press a quick save button. To load a quick save, simply press the desired quick save button.

TIP The quick save and quick load points are stored in volatile memory so they are available only until you power down your Ultimatte. To store settings permanently, you can save a file that can be loaded again after power cycling. Refer to the 'saving and loading preset files' section for more information.



Use the quick load and quick save buttons to make fast comparisons between composites throughout your workflow

Quick Guide to Building a Composite

This is a basic introduction to performing a fast composite with Ultimatte 12 and Smart Remote 4.

With all sources connected to the main unit, the first step is to make sure the backing color is correctly set. The default backing is color is green, but you can set it to red or blue, depending on which color you are using on set.

If you are using a green screen, you don't need to change the backing color as green is already set by default. Pressing the 'file clear' button will perform an automatic composite and generate a matte from your green screen.

TIP An automatic composite will also take place when power cycling your Ultimatte 12.

Setting the Foreground Backing Color

The backing color defines the color Ultimatte will use to generate the matte. Typically, the color used for most screens for compositing is green, and this is why green is the default backing color. However, there are occasions on set where red or blue may be a better choice based on the color of the foreground objects. In this event, you will need to tell Ultimatte to use a different backing color.

To set the backing color:

- 1 Tap the 'configure' menu button to open the configure settings.
- 2 In the functions area, tap one of the red, green or blue backing buttons to select your desired backing color. You will now see the backing color indicator in the status bar change to the corresponding backing color.

When the backing color is set, Ultimatte will perform an automatic composite and you will see the results on the program output. In the monitor out buttons, tap the button marked 'PGM OUT' to select the program output and the image will appear on the monitor connected to the monitor output.

Setting Screen Correction

Screen correction can be helpful if there are strong variations in your backing screen, or the lighting on the backing screen is uneven.

If your camera is static and you can remove all the foreground objects from the scene, you can perform a screen correction. This shows Ultimatte what the screen looks like by itself, and then once all elements are replaced, Ultimatte can then analyze what has changed in the foreground and will generate an optimized matte. This can help tidy up any areas that are not behaving in your matte.

To perform a screen correction:

- 1 Remove all the foreground elements in your scene so only the backing screen is visible.
- 2 Select the 'matte' settings from the main menu buttons.
- 3 In the 'groups' section, select 'matte process'.
- 4 Press the 'screen capture' button. This stores a snapshot of the green screen which Ultimatte uses to generate the screen correction.
- 5 Now replace all the foreground elements into your scene.
- 6 Press the 'screen correct' button.

Your Ultimatte will now analyse the foreground elements against the captured image and determine the optimized matte.

NOTE When using the screen correction feature, it's best to perform this function once the camera is set and in place, because once the camera moves, screen correction will no longer be effective and you will need to reapply the screen correction.

Setting the Matte Density

If the matte needs some refinement, the first step is to adjust the matte density. This improves the black areas of the matte so it is opaque. Any gray areas inside the black matte will cause the background to show through the foreground in those areas.

To adjust the matte density:

- 1 Tap the 'matte' menu button to open the matte settings.
- 2 Rotate the matte density control knob counterclockwise to decrease the matte density until you start seeing the gray areas inside the black silhouette.
- 3 Now increase the matte density setting until the gray areas are no longer visible. Be sure to stop adjusting as soon as the gray areas disappear. This is because the least amount of adjustment will result in a more convincing composite. This is true for most controls when refining your composite.

You should now see a near perfect composite on the program output. Now you can use the additional matte settings, foreground, background, and layer settings to refine your composite.

Changing Settings

Adjusting Matte Controls

Matte Density

When refining your composite, the matte density setting should always be adjusted first. This setting strengthens the general opacity of the black areas of the matte, preventing areas of the background to show through the foreground.

To adjust the matte density:

- 1 Select 'matte' in the main menu buttons.
- 2 In the 'monitor out' section, press 'combined matte'. You will see the foreground subject appear as a black silhouette on a white field.
- 3 Using the control knob, decrease the matte density until you see details within the black start to become gray. Now increase the setting until the gray areas change to black.
- 4 Select the program output in the monitor out settings.

Any show through that was present prior to adjusting matte density should now be almost, or completely, gone.

Black Gloss

Sometimes there may be dark areas of your foreground that have bright highlights which are reflecting the backing color. These highlights can appear gray in your matte, which will cause those areas in your foreground image to become transparent in your composite. The black gloss setting helps to remove these areas from the matte.

Increase the black gloss setting while observing the combined matte output until these reflective areas are no longer visible in the matte.

TIP If the matte is already opaque and there are no highlights showing, it's worth decreasing the black gloss level until you see the highlights, then increasing and stopping as soon as they are no longer visible. This is because the lowest setting that can be achieved will result in the cleanest, most convincing composite. This is true for many of the matte controls.

Red, Green and Blue Density

As matte density and black gloss settings are increased, dark edges can form around foreground objects. To compensate, the density of the color channels surrounding the edge of the foreground objects can be adjusted.

For example, if your backing color is green, the colors available to adjust are red and blue. If your backing color is red, the adjustable colors are green and blue. Adjusting these fine color density controls can help clean up dark edges.

Matte Reset

Tap this button to restore all the matte controls that affect the foreground elements to their default settings. The matte settings that affect the green screen area, for example clean up and veil settings, will not be changed.

Clean Up Settings

Imperfections in your blue or green screen such as scuff marks, seams, unwanted shadows, electronic noise, and screen residue are visually the same as fine details in the foreground. As a result, these imperfections will also be visible in your final composited picture.

Adjusting the following controls will electronically clean your screen, but at the expense of the finest detail on the edges of the foreground elements. We recommend using these controls sparingly as they can produce a hard edged, cutout look to the final composited image.

TIP Switch your monitor view between combined matte and program out to determine the best settings.

To adjust the clean up settings:

- 1 While viewing combined matte, the screen area is represented as white. Adjust the clean up controls so that the screen area is as close to white as possible without eliminating important detail.
- 2 View program out to make sure that you haven't eliminated too much of the fine detail.

The goal is to set these controls to the lowest possible value while ensuring the final picture is not missing subtle details such as fine wisps of hair, shadows, or reflections.

TIP Don't get too focused on getting a perfect clean matte. Some imperfections like slight scuff marks or electronic noise might actually look appropriate in the final composited image, particularly if the background scene is a computer generated, pristine image.

The clean up settings are interactive. Therefore, increasing one might allow you to decrease one or more of the others. You'll notice the greatest effect in the green screen area, but you might also see a slight effect on the foreground elements.

- **Clean Up Level**
Increase or decrease to reduce or eliminate imperfections in the blue or green screen.
- **Clean Up Dark Recover**
Use this control to recover shadows or edge detail on darker colored elements that were reduced or eliminated by clean up level.
- **Clean Up Light Recover**
Increase this setting to recover edge detail on lighter colored elements that were reduced or eliminated by clean up level.
- **Clean Up Strength**
Use this control to add more strength to clean up light recover.
- **Clean Up Reset**
Press the clean up reset soft button to restore all clean up controls to their default settings.

Veil Settings

At this point while you are optimizing your matte, you may notice a fine white haze over your final composited image. The haze can sometimes appear as a general haze, or localized in patches corresponding to the screen area of the foreground source.

The white haze is known as 'veil' and you can minimize it by adjusting the veil settings.

- **Master Veil**

Increase or decrease to remove neutral colored veil over your program or fill output.

- **Red, Green, and Blue Veil**

Adjust these controls respectively when you see a colored haze over the program output.

TIP Switch your monitor view between the fill output and program out to determine the best veil settings.

NOTE Veiling can become more pronounced over the course of the day as your blue or green floor gets dirtier or dustier. We recommend wearing slippers when not shooting if crew and talent are walking on the blue or green screen. Repainting of the screen may become necessary to remove permanent dirt and marks.

Shadow Level and Shadow Threshold

If you want your shadows in the foreground source to be more or less pronounced in your final composite, increase or decrease the shadow level. The shadow threshold setting is used to help separate unwanted dark screen areas from shadows.

Matte Process/Screen Correction

Depending on the conditions of your green screen, the backing color may not be consistent which can reduce the effectiveness of the matte. If you are seeing noise or artifacts in your matte that you can't solve using the general matte settings, and you have access to an image of just the green screen without foreground objects, then you can use screen correction to improve the matte.

To set screen correction:

- 1 Remove all the foreground objects in your scene so only the green screen is visible.
- 2 Tap the 'screen capture' button so Ultimatte can store a snapshot of the green screen.
- 3 Now replace all the foreground objects in your scene.
- 4 Tap the 'screen correct' button.

You should now see a general improvement in your matte and final composite.

NOTE Screen correction only works with static camera shots. This feature is the best choice for improving areas in the backing screen, and clean up controls can be used as a last resort if areas still need improvement.

Matte Correct Horizontal Size

'Matte correct H size' analyzes all horizontal matte transitions, based on the size selected in number of pixels, and applies the appropriate amount of correction to the horizontal transitions which may need modification.

Unlike regular matte sizing, which slightly reduces the overall size of the matte, the 'matte correct' control selectively corrects only transitions which are not optimally corrected.

The 'matte correct H size' setting indicates the number of pixels within which the system will analyze every transition. When the size is set to 0, no correction is applied.

Matte Correct Vertical Size

'Matte correct V size' analyzes all vertical matte transitions, based on the size selected in number of lines, and applies the appropriate amount of correction to the vertical transitions which need modification.

The 'matte correct V size' display indicates the number of lines within which the system will analyze every transition. When the size is set to 0, no correction is applied.

Screen Sample

When Ultimatte creates the matte for the foreground, it automatically samples the backing color in the foreground image to achieve the best matte. If varying shades remain visible in the matte, you can set your Ultimatte to use single or dual sampling which can help achieve better results.

Single Sampling

Single sampling lets you manually select a single area of the foreground green screen with a small box cursor. Ultimatte then assesses the color in that region and optimizes the sampling of the backing color using that region.

To use single sampling:

- 1 Go to the screen sample settings in the 'matte' menu.
- 2 Tap on the wall cursor position button. Your view will change to the foreground input and a small box cursor will appear on the screen.
- 3 Adjust the cursor horizontal and vertical position using the control knobs to move the cursor to a spot on the wall near important detail. This can often be hair. Be sure to avoid areas that contain detail that you want to retain.
- 4 Tap on the 'sample wall' button to save these screen values as your new reference. Your view will switch back to the monitor out setting you were last using.

Dual Sampling

Depending on the lighting conditions and your green screen, the floor area may appear at a different luminance or shade of green compared to the walls which may affect the quality of your matte when using the default auto sampling or manual single sampling.

To help Ultimatte achieve the best matte, you can select dual sampling and position two separate cursors.

To use dual sampling:

- 1 Go to the screen sample settings in the 'matte' menu and tap on 'dual cursor' to enable dual sampling mode.
- 2 Tap on the wall cursor position button. Your view will change to the foreground input and two small box cursors will appear on the screen.

- 3 Adjust the horizontal and vertical position of the first cursor using the control knobs to move the cursor to a spot on the wall near important detail. This can often be hair. Be sure to avoid areas that contain detail that you want to retain.
- 4 Tap 'sample wall'. Notice that 'floor cursor position' is now enabled and the floor cursor position is automatically available for you to adjust. Make your desired changes to the second cursor position.

TIP For the best results, select an area on the floor where you see lighting glare or veiling, and avoid shadow areas that you want to retain in the matte.

- 5 Tap 'sample floor'. Your selection will save these screen values as your new reference and the view will switch back to the monitor out setting you were last using.

Filter

The filter settings let you remove ringing artifacts that may appear in the transition edges, plus provides noise reduction and noise generation settings to help blend foreground and background elements together.

4:2:2 Correction level

In a Y,Cb,Cr 4:2:2 video image, objects with high contrast and sharp transitions can exhibit a small edge artifact when used for green screen compositing. This is due to the reduced bandwidth of the Cb and Cr color difference channels.

For example, a dark colored foreground object with sharp transitions shot against a bright green screen will show an overshoot and an undershoot at the transitions. This is known as ringing. These ringing artifacts are shades of black and white and will be treated as foreground objects when processed, similar to gray strands of hair. When the green screen color is removed and replaced by a dark background, a dark foreground object will show bright gray edges at the transitions.

The 4:2:2 correction feature eliminates or reduces the ringing artifacts. No foreground object detail is lost in this process.

4:2:2 correction is set to 100% by default. To make an adjustment, decrease the setting while monitoring the program output until you notice the ringing artifact appear in the composite, then gradually increase until it is no longer visible.

Noise Reduction/Generation

All video recorded using a video camera will contain a minor level of noise in the image. When composited with pristine, noise free graphics generated by a computer, the difference between sources can be noticeable.

To help blend elements, Ultimatte has noise reduction and noise generation settings that let you clean noise from the foreground, and add noise to the clean areas of your composite. For example, noise can be generated in the background or layer source, or areas of the foreground that have been masked by a garbage matte.

There are two types of noise reduction. Median, and average.

To reduce noise:

- 1 Toggle between the average and median noise reduction types by tapping the selection button on the left side of the functions section.
- 2 Now tap the corresponding setting next to the selection button to set a noise reduction level. Tap multiple times to gradually increase the level. There are 4 levels of noise reduction to choose from.

To generate noise:

- 1 Tap the 'noise cursor' button in the functions section to enable the cursor on the foreground source.
- 2 Using the cursor position controls, place the cursor on an area of the foreground that displays the most prominent noise.
- 3 Tap the 'noise select' button.
- 4 Tap the 'noise gen' button to enable noise generation.
- 5 Increase or decrease the amount of noise generation using the 'noise gen level' control.

Matte Reset

Tapping the matte reset button restores all matte controls, including matte density, black gloss, color density, and shadow settings to their default settings. These default settings could be factory set or user set values. For more information on customizing your Ultimatte, refer to the 'saving and loading preset files' section.

NOTE Matte reset does not sample the backing for new reference color values. The current values are used to recalculate spill suppression with any adjusted background settings.

Matte Button

Tap this button to disable or enable the matte generation and flare settings. The default setting of this button is 'enabled'.

Cursor Position Last

When this button is enabled, the cursor will return to the horizontal and vertical positions where it was last used. This mode is helpful when studio cameras are mounted on robotics systems and could be programmed to go to the same starting position, thus allowing the same exact sampling locations to be used again. When you save a preset file, cursor location is also saved.

When disabled, the location of the cursor will always return to a default horizontal and vertical position toward the top left hand corner of the image, regardless of the previously used sampling location.

Auto Screen Sample

Auto screen sample is the default method of scanning, analyzing, and determining reference backing color levels. Using this method, the matte signal is analyzed to detect the most predominant highest level, which will correspond to the brightest and purest area of the backing. Auto screen sample will also be performed during all of the functions listed below:

Main unit power up, system reset, backing color select, file clear, and ALT file clear.

Adjusting Foreground Flare Controls

Your Ultimatte 12 automatically analyzes the backing color reflecting onto foreground objects and removes the effect of the bounce color in the final composite. This is called spill suppression. The process of spill suppression can affect certain colors in the foreground. The colors affected will vary depending on the backing color you are using. If you need to make color adjustments to restore the original color of foreground elements, the results of spill suppression can be adjusted using the flare controls.

Flare 1 Settings

Cool

Restores cooler colors, such as blue, green and cyan.

Skin Tone

Restores the color of natural skin tones that may have been changed by spill suppression.

Light Warm

When advanced flare is enabled, this setting recovers lighter, warmer colors, such as red, yellow and orange. This setting interacts with the skin tones setting.

Black, Gray and White Balance

Use this setting to color correct the spill suppression in the tonal regions of the foreground, such as the shadows, mid tones and highlights.

Flare Level

When advanced flare controls are enabled, this setting adjusts the overall amount of spill suppression for certain foreground colors.

Holdout Matte Flare Button

When a holdout matte is used to stop the compositing process in portions of the foreground scene, spill suppression on the foreground becomes slightly more complicated. In some situations, removing spill suppression from the entire scene would result in a more convincing look. In other situations, no spill suppression in the holdout matte area would be the best choice.

When holdout matte flare is disabled, spill suppression is not performed in the holdout matte region. When enabled, spill suppression is removed from the entire foreground scene.

Flare 2 Settings

Flare Correct Horizontal or Vertical Size

Flare correction analyzes the spill suppression in the transition areas and lets you make subtle corrections. For example, neutralizing small color discrepancies, or luminance variations that may be affecting fine edges in the transition area.

You can adjust the size of the area around the pixels of interest that Ultimatte will use to analyze the spill suppression. This area is defined via pixel width and line height. When the size is set to 0, no flare correction is applied.

Dark Warm

When advanced flare is enabled, this control can help to restore brown colors, for green screen, and purple colors, for blue screen. This control interacts with skin tones settings.

Flare Reset

Tap this button to reset all flare controls to their default settings, depending on the backing color selected.

Advanced Flare

If you are adding Ultimatte 12 to an existing system using Ultimatte 11 units and you want to maintain a consistent look between them, you can disable the advanced flare features in Ultimatte 12 and use standard flare processing. This sets the flare controls and spill suppression in Ultimatte 12 to match the standard features in Ultimatte 11 units which will maintain consistency in the image when switching between multiple units.

Adjusting Foreground Ambiance Controls

To make a composite more convincing, it is important that the foreground subject fits seamlessly into its new background environment. The 'ambiance' feature in Ultimatte 12 analyzes the colors of the background and foreground layers, and automatically adds subtle color influences from the background into the foreground layer. This feature is enabled by default.

The ambiance controls also allow you to set the amount of influence that the background has on the foreground layer, and finesse the color balance.

Making Foreground Ambiance Changes

- 1 Select 'foreground' in the main menu buttons.
- 2 In the 'groups' section, press 'ambiance 1' or 'ambiance 2' to access these menus.

Ambiance reset

Tap the 'ambiance reset' button to reset all ambiance controls to their default settings.

Ambiance

Tap this button to disable or enable the ambiance feature. The default setting of this button is 'enabled'.

Ambiance 1 Settings

The ambiance controls will add very subtle amounts of color from the background, simulating reflected ambient light from the background source.

Ambiance Level Red, Green, Blue

Adjust these settings to increase or decrease effects of the red, green and blue components of the background ambiance that will influence the foreground color levels.

Ambiance Level Master

This setting adjusts the overall level of the ambiance that will influence the foreground color levels. When adjusting this control, the relative difference between the ambiance red, green, and blue components will be maintained.

Ambiance Strength

This setting adjusts the strength of the ambiance that will influence the main area of the foreground subject, compared to the transition areas from the foreground subject to the background scene. At its maximum setting, the ambiance will have full influence on the main area as well as the transition region, while at the minimum setting, the ambiance will have no influence in the main area while having a stronger influence in the transition regions.

Direct Light Mix

This setting controls the proportion by which the foreground subject will be influenced by the ambiance colors and user adjustable direct lighting. At the maximum setting, the foreground subject is influenced entirely by the direct light controls, and at its minimum setting, the foreground subject is influenced entirely by the ambiance colors.

Vertical Blur

This setting determines the number of averaged lines in the background used in ambiance calculations. Depending on the background scene, reducing this control could introduce streaking on the foreground layer.

Ambiance 2 Settings

The direct light controls will make more aggressive changes to the foreground image, simulating light that is directly from a position in the front of the foreground subject.

Direct Light Red, Green, Blue

Adjust these settings to increase or decrease the impact of red, green and blue components of the direct light that will influence the foreground color levels.

Adjusting Brightness, Color, Contrast and Saturation

As you build your composite, you will likely want to make adjustments to the luminance, color, contrast, and saturation levels for your sources which can help improve your composite. For example, if the foreground, background and layer elements seem to differ in levels compared to accompanying composited layers, you can perform an independent color adjustment using the master controls for each source. All the same luminance, color balance, contrast, and saturation settings are available for each source.

White Level Master

If a source seems too bright or too dark for the adjoining scene in the composite, adjust the white level control to alter the brightness of the source rather than adjusting the original input source level. Altering the level at the input source, for example the camera exposure, can adversely affect the generation of the matte signal.

The default setting of the white level control is neutral at 100%. The range of the control is from 0% to 200%. The main unit will clip the output so the signal cannot exceed standard limits. When adjusting the white level master, the relative difference between the white level red, green, and blue components will be maintained.

Black Level Master

The master black control adjusts the level of black in the source image without altering the white level. Adjusting the black level can often produce a more convincing composite image, if the black levels in the background scene differ from those in the foreground.

When adjusting the black level master, the relative difference between the black level red, green, and blue components will be maintained. Ultimatte 12 will clip black levels at zero so they do not exceed standard broadcast limits.

Contrast Master

The contrast master control adjusts the overall contrast level of the source in the composite without affecting the quality of the composite. For example, if the lighting contrast in the foreground scene does not match that of the background scene, adjusting this control may produce a more convincing composite image.

The contrast setting does not affect the strength of black and white levels, but only changes the contrast of the gamma, or mid level gain, in the source image.

When adjusting the contrast master, the relative difference between the contrast red, green, and blue components will be maintained.

Saturation Master

The saturation master control adjusts the saturation level of the selected source colors without affecting the generation of the matte signal. For example, if the saturation of the colors in the background scene does not appear to match the saturation of the foreground colors, adjusting this control may produce a more convincing composite.

The saturation master control can completely remove all color from the source image and produce a monochrome, or black and white, foreground composited with a color background image.

When adjusting the saturation master, the relative difference between the saturation red, green, and blue components will be maintained.

Advanced Contrast Crossover Master

When the 'advanced contrast' button is enabled in the functions section, contrast adjustment characteristics will acquire an "S" shape curve. The crossover point of the "S" shape can be moved by the source 'contrast crossover' master control.

Fade Control

A fade control is available for the foreground, background and layer sources. This setting lets you fade the foreground or layer source, if enabled, until it is no longer visible.

When the primary matte is disabled in the matte settings, you can use this feature to fade between the foreground source and background source to line up props or set items in the foreground with the background source.

When adjusting the fade or fade-mix control from 0% to 100%, the selected source will gradually fade until no longer visible.

Color Correcting Black and White Levels

The 'black/white level' menu for each background, foreground and layer source lets you make specific color corrections to the black level and white level. By adjusting the respective red, green and blue color correction controls you can adjust each respective color level without altering the overall gain.

TIP Any adjustments to color for the black and white level will only occur after the matte signal generation and will not affect the source.

Adjusting Color Contrast and Saturation

The 'contrast/saturation' menu provides controls to adjust contrast for each color channel in the selected source. Adjusting the contrast control for each channel will increase or decrease the amount of contrast in the gamma, or mid level gain.

When the 'advanced contrast' button is enabled in the functions section, contrast adjustment characteristics will acquire an "S" shape curve. The crossover point of the "S" shape can then be moved by the source 'contrast crossover' control. This gives you greater control over how contrast affects the gamma tonal region.

Color Reset

If at any time you want to restore the color correction back to its default state, simply tap the color reset button in the functions section.

Source Freeze Button

If you are working with still graphics as your sources, this feature allows for greater flexibility. You can take a still image from each source by tapping the respective 'freeze' button in the functions section. This stores a still frame in temporary memory which you can use as the source.

The freeze feature can be helpful if you have limited playback equipment. For example, you can save a still from a playback source graphic, then on the same playback deck, load a different source and plug it into a different source input on your Ultimatte. This effectively doubles the amount of sources you can use with your playback equipment.

Additional Background Settings

Background Filter

In many situations, particularly with computer generated backgrounds, the graphics will appear too sharp compared to the foreground subjects. Sometimes, this sharpness can cause aliasing artifacts if the antialiasing filters are not set properly in the background rendering system.

Advancing the background filter control will gradually apply a horizontal low pass filter to the background scene, minimizing aliasing artifacts.

Background Gradient

Enabling this button will replace the background video with an internally generated horizontal gradient signal. This gradient signal can be used to better demonstrate the impact of background color controls on the background image.

Test Signal

This setting lets you use a colored field as the background in the final composite.

Additional Layer Settings

Test Signal

This setting lets you use a colored field as the layer source in the final composite.

Lighting

Green screens are best optimized when lit flat in neutral light so there are minimal changes in colour and brightness. This can add interesting challenges if you want to create lighting effects on the set as the lighting can spill onto the green backing affecting the strength of your key.

As a helpful and convincing alternative, you can use the lighting feature to simulate lighting effects in your composite. For example, you may have pillars of atmospheric spotlights shining down on your talent. By using an image connected to the layer input that is designed for a spotlight effect, you can blend that image into the foreground layer. You can even create an animated image that lets you create dynamic moving lighting effects that are very realistic.

TIP The lighting feature is most realistic when the lighting image used for the foreground lighting effect is also integrated into the background layer when designing your background image. This lets both the foreground and background share the effect which makes the overall simulation more convincing.

To enable the lighting feature, select 'layer' from the main menu and then 'lighting' from the 'groups' menu. Now select 'lighting' from the 'functions' menu.

Lighting Control Knobs

Minimum Level

This control determines a mixture of the level of the 'lighting' input and an internal lighting level setting. The range of the minimum level control is from 0% to 100%, with the default setting at 25%.

At 0%, the lighting of the foreground subjects is entirely controlled by the 'lighting' input image. At 100%, the lighting of the foreground subjects is entirely controlled by the lighting level R/G/B and Master Controls settings.

Color can be added to the Minimum Level by adjusting the Lighting Level Red/Green/Blue and Master controls.

Lighting Level – Red/Green/Blue

This controls the red/green/blue components of the ‘minimum lighting’ as it is applied to the foreground subjects. The control range is from 0% to 200%, with the default setting at 100%.

Lighting Level – Master

The master control adjusts all three ‘minimum lighting’ level R/G/B controls simultaneously while maintaining their individual setting relationships.

Layer Color Controls

When the ‘lighting’ feature is enabled, the ‘layer white level, Black Level, Contrast, and Saturation controls will make corresponding adjustments to the Lighting Input image.

For a detailed description of these controls, see Adjusting Brightness, Color, Contrast and Saturation section of the manual.

Layer Input

Enabling this function allows the layer elements to be added to the composite scene.

Layer Input Realistic/Linear/Additive

This function selects between three modes of combining the layer input elements with the foreground objects and the background scene in the composite image.

Realistic

Most accurate method of combining colored transparent and semi transparent layer elements, as well as opaque layer elements, with the foreground objects and the background scene.

NOTE When using a layer source graphic in realistic layer mode with semi transparent objects, the image source background needs to be 100% white. The RGB elements in the source layer should not be premultiplied by its matte. All feathering of transition regions along edges of the matte should be within the boundaries of the layer elements. For example, make sure feathered edges do not extend into the white backing region of the source image.

Linear

Traditional method of combining opaque layer elements with the foreground objects and the background scene in the composite image. This method will not produce accurate results with transparent colored layer elements. This method should be selected if the layer elements are not premultiplied.

Additive

Traditional method of combining opaque layer elements with the foreground objects and the background scene in the composite image. This method will not produce accurate results with transparent colored layer elements and should be selected if the layer elements are premultiplied.

TIP Pressing the ‘file clear’ button will not change the layer input mode.

Matte Input Settings

Blackmagic Ultimatte 12 can accept 4 different matte inputs, each assigned to a specific function.

These 4 matte inputs are:

- Background matte
- Garbage matte
- Holdout matte
- Layer matte

Background Matte

The background matte is associated with certain elements in the background scene that need to be treated as their own layer. By converting these background elements into layer elements, they can be moved in the layering order in front of the foreground objects. These background elements that are converted to layer elements can only be opaque elements.

Garbage Matte

The garbage matte is associated with the boundaries of the foreground screen. It is used to artificially extend the screen area, so that the background scene can be added in these areas. The garbage matte should have a large soft transition area, from black to white, so that the garbage matte blends better with the real screen area.

If foreground objects enter these soft transition areas of the garbage matte, these objects will gradually become transparent and mixed with the background scene until they are fully faded out.

In an alternate process, Blackmagic Ultimatte 12 can gradually apply the garbage matte clean up function in the soft transition areas so that the foreground objects can still enter these transition areas without becoming transparent.

Holdout Matte

The holdout matte is associated with elements of foreground objects which have similar colors as the screen color. The holdout matte can be used to prevent these portions of foreground object areas with similar color as the screen from becoming partially or fully transparent.

Additionally, the holdout matte can be used to retain or remove the foreground object colors that are similar to the screen color.

Layer Matte

The layer matte is associated with the 'layer in' elements. The layer matte is used to determine the opacity of the corresponding 'layer in' source. The layer elements associated with the layer matte could be opaque or can have varying levels of transparency with different colors.

Window

The window setting lets you create internally generated mattes with rectangular proportions. The resulting window can be used as a rough garbage matte, allowing you to exclude certain areas from the foreground image. Enable window by tapping the 'window' button, then set the input source you want to apply the window to by tapping on the respective matte button in the functions section of the touchscreen.

Adjust the positioning of the window edges using the following controls:

Window Position Top, Bottom, Left and Right

These knobs adjust the position of the top, bottom, left and right edges of the window. The default position is beyond the edge of the frame. As it is dialed in, the edge moves into the frame and goes all the way to the opposite position of the frame.

Window Softness Top, Bottom, Left and Right

Sometimes you may want to reduce the harshness of a window edge in the garbage matte. To do this, increase the softness control for the window edge you want to adjust. The default position is beyond the edge of the frame. As it is dialed in, the edge moves into the frame and goes all the way to the opposite position of the frame.

Window Skew

The window skew function allows you to create an internally generated window matte with non-rectangular proportions. Using the skew controls, you can tilt and rotate each edge of the window independently to create a rough garbage matte, to exclude certain areas from the foreground image.

Enable window skew by tapping the 'window skew' button, then adjust the skew for each edge using the control knobs.

Adjust the skew of the window edges using the following controls:

Window Skew Top, Bottom, Left, Right

These knobs adjust the skew of the top, bottom, left and right edges of the window.

Window Skew Offset Top, Bottom, Left, Right

As it is dialed in, the skewed window edge moves into the frame and goes all the way to the opposite position of the frame.

Transition Rate

This control sets the rate, in number of frames, by which the objects in the background scene, defined by the background matte and the layer input elements, will move in front of or behind each other in the composited image.

When the transition rate is set to 1, the changes in the layering order will be an abrupt cut. When the rate is increased, the transition will be a smooth mix dissolve. The maximum transition rate is 120 frames.

The transitions are initiated by selecting one of up to six different layering orders defined in the functions section.

Setting the Layer Order

In the functions section you will see buttons that indicate the layer order. These buttons determine the order of how the foreground source, background source, and the layer source elements are arranged in your composite. The buttons available will depend on which mattes you have enabled.

The first name in a button is the top element in the layering order, and the last name is bottom element. For example, you'll notice that the background is always the bottom element in the scene.

When both background matte elements and layer source elements are used, the 6 possible combinations are:

FG / LY IN / BG LY / BG

Foreground source as the top layer, followed by the layer source elements, followed by the background layer elements separated from the background source, then followed by the background source.

LY IN / FG / BG LY / BG

The layer source is the top layer, followed by the foreground source, followed by the background layer separated from the background source, then followed by the background source.

LY IN / BG LY / FG / BG

The layer source is the top layer, followed by the background layer elements separated from the background source, followed by the foreground objects, then followed by the background source.

BG LY / LY IN / FG / BG

The background layer elements separated from the background source are the top layer, followed by the layer source, followed by the foreground source, then followed by the background source.

BG LY / FG / LY IN / BG

In this combination, the background layer elements separated from the background source are the top layer, followed by the foreground source, followed by the layer source, then followed by the background source.

FG / BG LY / LY IN / BG

In this combination, the foreground source is the top layer, followed by the background layer elements separated from the background source, followed by the layer source, then followed by the background source.

When only the background layer is used via a background matte, the 2 possible combinations are:

FG / BG LY / BG

The foreground source is the top layer, followed by the background layer elements separated from the background source, then followed by the background source.

BG LY / FG / BG

In this combination, the background layer elements separated from the background source are in the top layer, followed by the foreground source, then followed by the background source.

When only the layer input is used, the 2 possible combinations are:

FG / LY IN / BG

The foreground source is the top layer, followed by the layer source, then followed by the background source.

LY IN / FG / BG

In this combination, the layer source is in the top layer, followed by the foreground source, then followed by the background source.

System

Video Format

Select your video format from the drop down menu, or set it to 'auto detect'.

3G SDI Outputs

Ultimate will detect a level A or level B 3G-SDI input automatically. The output is set to level B by default, but you can change it to level A if needed.

To change the 3G-SDI output to level A or B:

- 1 Go to the 'configure' menu on your Smart Remote 4.
- 2 Tap on the 'system' button. A window will appear with checkboxes for level A and Level B 3G-SDI.
- 3 Tap the desired level checkbox, then tap 'apply' to confirm the setting. Tap 'close' to exit the window.

Color Space

Ultimate 12 can be set to use the Rec.709 or Rec. 2020 color gamut. While both can be used for Ultra HD, HD only uses Rec.709. For this reason, Rec. 709 is Ultimate 12's default color gamut, but you can set the color space setting to Rec. 709 or Rec. 2020 for Ultra HD. When Rec. 2020 is selected, all input signals must comply with Rec. 2020, and all output signals will conform accordingly. When your Ultimate 12 detects standard definition, it will automatically set the color gamut to Rec. 601 so you don't have to change the setting when using SD video.

To set the color space:

- 1 Go to the 'configure' menu on your Smart Remote 4.
- 2 Tap on the 'system' button. A window will appear with checkboxes for Rec. 709 and Rec. 2020
- 3 Tap the color space checkbox, then tap 'apply' to confirm the setting. Tap 'close' to exit the window.

Configure Settings

Inputs

The inputs menu gives you access to the timing controls if you need to delay the foreground input to be synced with the background signal and to make subtle timing corrections to a source input signal.

Frame Delay Foreground Input

This control will set the number of frame delays to the foreground input. The control range is from 0 frames to 14 Frames.

In a 4:2:2 signal, the relative timing samples between luma and the chroma, or Y and UV respectively, are well defined. However, some cameras might have some amount of relative luma or chroma timing error. When viewed on a monitor as red, green or blue only, the image will look like an 'embossed' picture. This timing error will cause unnatural transitions and off color edges.

If there are no adjustments in the camera to correct the timing, Ultimatte 12's inputs menu gives you access to the timing controls if you need to make subtle timing corrections to a source input signal.

Foreground Input U Position

This control will only adjust the U timing relative to Y in sub pixel values. The maximum range of adjustment is +/- 2 pixels.

Foreground Input V Position

This control will only adjust the V timing relative to Y in sub pixel values. The maximum range of adjustment is +/- 2 pixels.

Foreground Input UV Position

This control will adjust both the U and V timing relative to Y in sub pixel values. The relative difference between U and V will be maintained. The maximum range of adjustment is +/- 2 pixels.

Outputs

The output configuration settings lets you customize the appearance of the outputs and route certain outputs to help your workflow. For example, setting the talent output to mirror, or routing the monitor output to the program output.

You can also enable the powerful cascade monitoring feature which lets you view the program output for multiple Ultimatte 12 units via one single unit as soon as you select a unit to control on your Smart Remote 4.

Talent Highlight Level

This control adjusts the amount of highlight applied to the image viewed on the talent output areas where background mattes, garbage mattes, holdout mattes and layer mattes are used.

Matte Out Level

Internal to the unit, the matte signal is set so that fully opaque foreground objects are at 0% black and peak backing areas are at 100% white. The matte out level of 100% white is set at 940 for a 10-bit output. Similarly, 0% black is set at 64.

NOTE The 'matte out invert' function will invert the polarity of the matte out.

The matte out level adjusts the level of the matte out from the white end. This control can lower the matte out level to 0% or push it into the legal ceiling.

Monitor to Program

In most situations, it is advantageous and safe not to be able to switch the program output to other views. However, there are times when the program out view needs to be changed from the composited image to another view. For example, the matte view. For these few instances, it is possible to route the monitor output to the program output.

When 'monitor to program' is enabled, the program output will show the same view selections made in the monitor output. Disabling monitor to program will return the program output to its previous setting.

Fill Linear Mix Correct

If the system you are using to combine the matte and fill outputs does not have an 'additive mix' capability, for example linear mix only, the composite image can have dark edges due to a second processing of the processed foreground image. Enabling the setting marked 'Fill Lin Mix Cor' will minimize potential artifacts caused by the second processing of the foreground image. Use this setting when you are sending the matte and fill to an external device for final mixing, for example a broadcast switcher.

Talent Mirror

Selecting this option will horizontally mirror the program image viewed on the talent output.

The talent monitor output is used for the foreground subjects on the set to see themselves inserted in the new background scene. By providing the capability to horizontally mirror the viewed image, the talent can have a more natural feedback when seeing themselves on the monitor.

Monitor to Talent

When 'monitor to talent' is enabled, the talent output will show the same view selections made in the monitor output. Disabling the monitor to talent will return the talent output view to its previous setting.

Monitor Cascade

The monitor cascade feature can be accessed from the 'information' symbol on the right side of the menu name section of the Smart Remote 4. You can find the setting under the 'options' tab.

When the monitor cascade feature is disabled, the monitor output will be the view selected by the monitor out options. For a single Blackmagic Ultimatte 12 unit, the monitor output can be connected to a video monitor directly. Typically, if there are multiple Blackmagic Ultimatte 12 units, the monitor output for each unit can be connected to a routing switcher for monitoring multiple outputs.

Alternately, with multiple Blackmagic Ultimatte 12 units, they can be daisy chained via their monitor inputs and outputs, with the last unit plugged into a monitor. Then when you select a unit on the Smart Remote to control, the monitor output for that unit can be viewed on that monitor. This is an efficient and powerful way to monitor the output from up to 8 Ultimatte 12 units via one single unit.

To connect 4 units for cascade monitoring:

- 1** Connect the first unit's monitor output to the monitor input of the second unit.
- 2** Connect the monitor output of the second unit to the monitor input of the third unit.
- 3** Connect the monitor output of the third unit to the monitor input of the fourth unit.
- 4** Connect the monitor output of the fourth unit to a monitor.

When the monitor cascade feature is enabled, the viewed image on the video monitor will be of the unit that is selected by the Smart Remote 4 as the currently active unit. When the unit selection is changed, the image viewed on the video monitor will change to the monitor out of the selected unit.

Matte Out Invert

Enabling this function will invert the polarity of the matte out signal.

On Air Settings

The on air settings let you enable on air indicators for the status bar, and set your Ultimatte to lock its controls when the unit is on air.

NOTE These controls only work when tally signals are connected to the GPIO input and properly configured from the external tally generator.

On Air

When this button is enabled, the unit indicator in the Smart Remote status bar will illuminate red when on air. The unit identification number above its selection button will also illuminate red.

On Air Lock

When enabled, the on air lock feature will lock all the controls for the unit currently on air. This helps to prevent any accidental changes to a unit that is live on air.

GPI and Tally Settings

These settings enable or disable tally signals when connected to an external GPI and tally interface. Tally lets you monitor on air indicators so you know when an Ultimatte unit is currently on air. GPI inputs and outputs let you trigger Ultimatte preset files as GPI events, similar in nature to loading and running macros.

GPIO MENU

The GPI inputs allow external devices to trigger saved setup files in each input in a pre-determined order. The maximum number of events is defined by the number of GPI inputs, therefore the number of events you can use is 5.

It is also possible for the main unit to trigger events in other devices using the GPI output. This triggering can be done manually, or upon loading a file if the GPI output was saved as part of that file.

CONTROL KNOBS

GPI OUT Delay Frames

This control sets the delay, in number of frames, between triggering the event and the execution of the GPI output switch closure. The maximum delay is 120 Frames.

GPI Functions Buttons

GPI Output Save

In order to initiate a GPI output upon loading a file, the appropriate instructions must be saved as part of that file. When 'GPI out save' is selected, the instructions to trigger a GPI output will become part of the current workspace settings. When the current workspace settings are saved as a setup file, the instructions to trigger the GPI output are saved with this file.

When the saved file, which includes the triggering instructions, is loaded into the current workspace, the triggering instructions will initiate the proper GPI output sequence.

GPI Out Low/High

Pressing this button toggles the GPI output state between low and high.

GPI Out

This provides a programmable state output, whose width and level are dependent on the GPI out low/high setting and GPI out delay adjustment.

GPI Setup Menu

From the GPI setup menu, you can choose GPI files from the list of previously saved setup files and load them into each GPI input. You can step through each file to verify that the selected files were the correct ones, and that the sequence by which these files were listed was correct. If needed, you can edit each GPI list by removing, adding, or inserting any number of files.

GPI 1 to 5

These windows allow the user to set up the files in the order by which they will be loaded when triggered by the signal connected to each respective GPI input.

Add

With each press, this button will add the highlighted file in the files list to the selected GPI events list.

Remove

Press this button to remove a highlighted file from the selected GPI events list.

Remove All

This button will remove all the files from the selected GPI events list.

Step

Press this button to move down through the highlighted file selection and automatically load the selected file into the current work space. Any file on the GPI events list can be highlighted and loaded in the current work space by touching the corresponding file name.

Reset

Pressing this button will select the top file from the GPI files list without loading the first file. The first file will be loaded when the first GPI pulse is detected.

GPI Input Enable

This checkbox enables or disables individual GPI inputs separately based on the setting of the GPI input select control.

GPI High Enable

Enables the software to detect either low to high or high to low transitions of the GPI inputs.

The GPI inputs are triggered by the logic level of the input signal, not by the transition edges. If GPI high enable is checked, the selected input will be triggered by a high logic state. If GPI high is not checked, the selected input will be triggered by a low logic state.

GPI IN Delay

This is a delay between detecting a GPI input and that of actual execution of the GPI list. The GPI input delay can be set at different values for each input. The maximum delay is 120 Frames.

Close

Selecting this button will close the window and exit the GPI setup menu.

Setting Up a GPI Event List

To set up an event list, preset files must be previously created and saved. Refer to the 'saving and loading preset files' section for more information.

- 1** Tap the 'configure' menu button to go to configuration settings and select 'GPI setup' in the groups section. The GPI setup window will be displayed.
- 2** From the tabs, select a GPI number from 1 to 5 to be used. If the selected GPI number was used before, the event list will show the previously selected files. The existing event list can be edited by removing, adding or inserting files. Alternately, select 'remove all' to remove all the files from the event list.

- 3 Select the file to be added to the event list. When selected, the file will be highlighted.
- 4 Press the 'add' button to add the file to the event list.
- 5 To add more files to the event list, repeat steps 3 and 4.

When the event list is complete, press 'reset' to move the pointer to the beginning of the event list. Adjust GPI input delay if necessary. This is the delay, in frames, when loading the files from the time the GPI pulse is received.

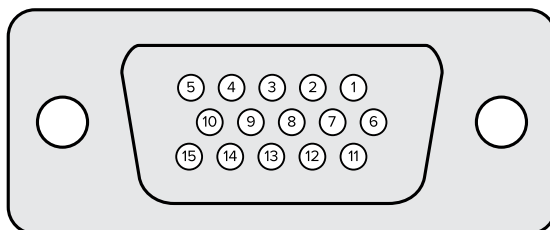
- 1 For high GPI input logic state, select the 'GPI high enable' checkbox. Leave deselected if using a low logic state.
- 2 Enable GPI by tapping the GPI input enable checkbox.
- 3 Repeat these steps for each GPI input.

To edit an existing events list:

- 1 Tap the GPI event number to be edited.
- 2 Select a file to be deleted by tapping the file name on the display and tapping the 'remove' button.
- 3 To insert a new file into the event list, tap the file below the area in the list you want to insert the new file. Now tap the 'insert' button.
- 4 When editing is completed, tap 'reset' to select the beginning file of the event list, then tap 'close' to exit the GPI setup window.

GPIO Pinout

The female GPIO connector on your Ultimatte 12's rear panel is a DE-15 connector. If you want to build a cable for your own custom GPI and tally solution, a pinout chart is provided below.



| GPIO PIN CONFIGURATION | |
|------------------------|-----------------------------------|
| Signal Input Pins | Return Output Pins and Ground Pin |
| 1 = GPI 0 | 6 = GPI 0 R |
| 2 = GPI 1 | 7 = GPI 1 R |
| 3 = GPI 2 | 8 = GPI 2 R |
| 4 = GPI 3 | 9 = GPI 3 R |
| 5 = GPI 4 | 10 = GPI 4 R |
| 11 = Tally | 12 = Tally R |
| 13 = GPO | 14 = GPO R |
| | 15 = GND |

Monitor Out Settings

This selection will show all the viewing options available. The button name will be changed to 'return' which you can press to go back to the previous menu.

Monitor Highlight Level Control

This control adjusts the amount of highlight applied to the image viewed on the monitor output in the areas where background mattes, garbage mattes, holdout mattes and layer mattes are used.

Monitor Setting Buttons

Matte View Range

The quality of images viewed on video monitors depends on the monitor's brightness and contrast setup. In many situations, the detail information in the very dark and very bright portions of an image is sacrificed so that the rest of the image can have a more pleasant look. The levels in a matte image cover the whole brightness gamut and most of the matte controls are adjusted while observing matte levels near the darkest or the brightest end.

For this reason, it is difficult to adjust the matte accurately while looking at a monitor and observing the darkest and brightest portions of the images.

Enabling the 'matte view range' function will raise the black level and reduce the white level of the matte signal so that detail information in the blackest and whitest sections of the matte can be viewed accurately on a monitor.

Reducing the range of the matte on the monitor output has no effect on any internal processing or the signal levels of the matte out.

Matte View Invert

When combined matte view or internal matte view is selected as the monitor output, the matte polarity can be reversed by the matte view invert function.

Monitor Out RGB

When selected, the monitor output will show all three color channels of the image viewed.

Monitor Out Red, Green and Blue

All three color channels can also be viewed independently. When the respective color channel button is enabled, the monitor output will only show that particular color channel as a black and white image. This can be helpful to spot noise, which is predominantly in the blue channel.

Custom Monitor Output Menu

The monitor out section of the Smart Remote 4 touchscreen provides 6 soft buttons which switch the view on Ultimatte 12's monitor output. These 6 soft buttons can be customized using the 'custom monitor out' settings.

The first two soft buttons in the functions area of the touchscreen are labeled 'standard' and 'inputs'. These let you set the labels of the buttons to the standard default Ultimatte monitor output buttons, or you can match the buttons to the respective inputs. When inputs is selected, you can easily monitor every source by pressing the respective input button.

Below is the configuration for each setting:

Standard

- PGM Out
- FG In
- BG In
- Combined Matte
- Internal Matte
- Fill Out

Inputs

- BG In
- Layer In
- BG Matte In
- Garbage Matte In
- Holdout Matte In
- Layer Matte In

You can also create up to 4 custom monitor out buttons. These can be set to show your favorite views in the order of your choosing.

To configure a custom monitor output button:

- 1 In the 'matte' settings, tap on the 'custom monitor out' soft button in the groups Section.
- 2 Tap on the 'configure' soft button in the groups section.
- 3 In the dialog box, tap on any of the tabs labeled MONITOR OUT 1, 2, 3, and 4.
- 4 From the drop down menus, choose which of the following potential monitor outputs you would like to assign to each of the buttons.
 - Program
 - FG In
 - BG In
 - Combined matte
 - Internal matte
 - Fill Out
 - Layer In
 - Background matte in
 - Garbage Matte In
 - Holdout Matte In
 - Layer matte in
 - Processed L M. Layer matte with adjustments applied.
 - Processed H M. Holdout matte with adjustments applied.
 - Processed G M. Garbage matte with adjustments applied.
 - Processed B M. Background matte with adjustments applied.
 - Screen correction capture. Image captured and used for screen correction function.

NOTE You do not necessarily need to assign a function to each button. If 'none' is chosen, that button will simply appear blank.

- 5 Tap on 'apply' to save your choices.

To load a custom monitor configuration, tap on 'custom monitor out' in the groups section, and then tap on one of the custom monitor buttons.

Saving and Loading Preset Files

Touching the folder symbol in the files and information section will open the files window which gives access to all file management functions. Additionally, an on screen keyboard will appear under the files window so you can enter file names. If you want to use an external keyboard, you can plug in a USB keyboard via the USB ports on the Smart Remote 4.

To save a file:

- 1 If the new file name is a modification of an existing one, select that file name from the list by highlighting it.
- 2 Touch the display in the filename box inside the files window. The prompter will appear.
- 3 Using the on screen keyboard, or an external keyboard, make the desired file name changes.
- 4 If a completely new name will be added, press the backspace key on the keyboard to erase the existing file name. Alternately, touching and moving a finger or a stylus across the file name will highlight the name so that it can be over written.
- 5 Using the on screen keyboard, or an external keyboard, type the desired file name.
- 6 Press the 'save' button inside the files window. The status bar will display 'saving' until the process is completed. The new name will appear in the saved files list.
- 7 Press the close button to exit the files window.

To load a saved file:

- 1 From the saved files list, touch the file name to be loaded. The name will be highlighted, and will be displayed in the filename box.
- 2 If the timing settings need to be loaded as part of the selected file, select the 'with timing' checkbox.
- 3 Press the load button to load the selected file into the current settings.
- 4 The selected file name will appear in the status bar as the 'active file'.
- 5 Press the close button to exit the files window.

When a file is saved, all setup parameters are saved in it, including system timing settings. When these timing settings are loaded, the system will use these settings to adjust its timing. The process of adjusting the system timing will cause interruptions to the output video signals. In most studio setups, once the entire system timing is adjusted, it does not change. Therefore, once Blackmagic Ultimatte 12's timing is set, there is no need to adjust it in day to day operations.

When loading a file, if the saved timing settings are ignored, your Blackmagic Ultimatte 12 will maintain its current timing setup, and the output video signals will not be interrupted. The process of loading or ignoring the saved timing settings is controlled by the checkbox, named 'With Timing', next to the load button.

If the 'with timing' checkbox is not checked, then the selected file will not change the system timing when loaded. After loading the file, the checkbox will be cleared.

To delete a file

- 1 From the saved files list, touch the file name to be deleted. The name will be highlighted and will appear in the filename box.
- 2 Press the delete button to remove the selected file from the files list.
- 3 A prompt will ask for you to confirm the action. Select 'yes' to delete, or 'no' to cancel.
- 4 Repeat the process to delete other files.
- 5 Press the close button to exit the files window.

To rename a file

- 1 If the new file name is a modification of an existing one, select that file name from the list by highlighting it. The selected file will appear in the filename box.
- 2 Touch the display in the filename box inside the files window. The prompter will appear.
- 3 Using the on screen Keyboard, or an external keyboard, make the desired file name changes.
- 4 Press the rename button inside the files window. The button will display 'renaming', until the process is completed. The new name will replace the old one in the saved files list.
- 5 Press the close button to exit the files window.

Assigning a File

This process assigns additional uses to a saved file. A saved file can be assigned to:

Custom Power Up

On standard power up, Ultimatte 12 will be set to factory default setting. If a different power up setting is needed, a saved file with these settings can be used as a custom power up default. The 'custom power up enabled' box must be checked in order to use the selected file settings as power up defaults.

User Default

When the file clear button on your Smart Remote 4 is pressed, most of the controls and buttons of Blackmagic Ultimatte 12 are set to default settings. If an alternate set of default settings is desired, a saved file with these settings can be used as a user default file. Pressing 'ALT file clear' will use the assigned file to set the custom default settings.

Quick Save

The quick save files are temporary files easily accessed from the Smart Remote 4. At any time, a setup can be stored as a quick file, and then recalled when needed directly from the dedicated buttons on the Smart Remote 4. Additionally, any of the saved files in the system can be loaded into any one of the 5 quick files by assigning the selected file to the desired quick save location number.

To assign a file:

- 1 From the saved files list, select the file name to be assigned. The name will be highlighted and will appear in the filename box.
- 2 From the 'assign to' drop down box, select the assignment for the highlighted file.
- 3 Repeat steps 1 and 2 for additional assignments.
- 4 If needed, check the 'custom power up enable' box.
- 5 Press the close button to exit the files window.

Customizing the Menu

You can change the assignment of the Smart Remote 4 control knobs and buttons in the 'configure/custom menus' settings.

To set a custom menu:

- 1 Go to the configure settings menu.
- 2 Tap the 'custom menus' button.
- 3 Tap on one of the 4 custom menu presets you want to set.
- 4 A new 'configure' button will appear just above the custom menu preset buttons. Tap this 'configure' button. The custom menu setup dialog box will appear.

The control knob functions are in the left side column, and you can set a function from that column to each of the 8 slots on the right side column. The 8 slots correspond to the control knobs as follows:

- Item 1 = Top left control.
- Item 2 = Left second control down.
- Item 3 = Left third control down.
- Item 4 = Left bottom control.
- Item 5 = Top right control.
- Item 6 = Right second control down.
- Item 7 = Right third control down.
- Item 8 = Right bottom control.

To assign functions to each control knob:

- 1 From the 'knobs' list, scroll up and down the list of functions and select a function from the list.
- 2 Press the right arrow icon in the middle column that corresponds to the desired slot. You will see the name of the selected control appear in the blank slot.

TIP If you change your mind and want to assign a different function to that slot, simply press the left arrow to remove that function from the slot and assign a different function.

- 3 Repeat steps 1 and 2 as you progress through all the slots to assign your custom functions to each control knob.
- 4 Tap on the 'buttons' tab to assign the buttons. Follow the same procedure as shown above to set the buttons controls.
- 5 When you are happy with your selections, tap 'apply'.

You will now see all your customized controls on the touchscreen.

If you are moving through other menus and want to return to your custom menus, you can enable them by tapping 'custom menus' in the groups section, then tapping on the desired custom menu button. You will now see all the controls and functions buttons change back to your custom selection.

Updating the Internal Software

From time to time Blackmagic Design will release new software for your Ultimatte 12 and Smart Remote 4, with updated features and settings.

To update your Ultimatte 12, first download the latest Blackmagic Ultimatte Setup software from the Blackmagic Design support center at www.blackmagicdesign.com/support.

Before installing any software, you will need administrator privileges. It is also a good idea to uninstall any previous versions of Blackmagic Ultimatte Setup software present on your computer.

Installing Ultimatte 12 Setup Software on Mac OS

- 1 Open the “Blackmagic Ultimatte” folder from the disc or downloaded disk image and launch the Blackmagic Ultimatte installer software.
- 2 Click ‘continue’, ‘agree’ and ‘install’ buttons and the software will be installed on your system.

Installing Ultimatte 12 Setup Software on Windows

- 1 Open the “Blackmagic Ultimatte” folder and launch the Blackmagic Ultimatte installer software.
- 2 Click ‘continue’, ‘agree’ and ‘install’ buttons and the software will be installed on your system.

Updating your Ultimatte 12 Main Unit

Blackmagic Ultimatte Setup will check your Ultimatte main unit’s internal software and will ask if you wish to update if you have a newer version installed on your computer.

Always update the Ultimatte Smart Remote 4 and Ultimatte main units at the same time so they are all running the latest version of Blackmagic Ultimatte software.

To perform an update;

- 1 Connect your Ultimatte 12 to the computer via USB-C.
- 2 Launch Blackmagic Ultimatte Setup and click on the Ultimatte unit icon to open the setup settings for the main unit.
- 3 Click on the ‘about’ tab. If your Ultimatte 12’s internal software requires updating, you will be prompted with a message asking if you would like to update the software. Click ‘update’ to initiate the update process, which may take a few minutes. It’s important you don’t unplug the power from your Ultimatte 12 main unit during the software update.

Updating your Smart Remote 4

If you have SR4 software 1.0.5 or earlier installed, you will need to first uninstall the SR4 software from your smart remote using the built in Ultimatte maintenance tool.

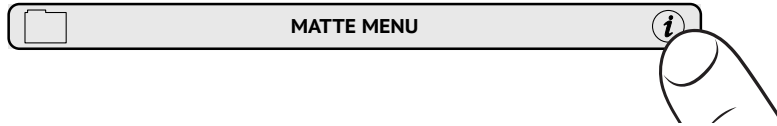
NOTE If you have previously installed Smart Remote 4 software using the Ultimatte Smart Remote Setup installer from the Blackmagic Design support center, then you can skip this uninstall process and go straight to the ‘installing Ultimatte Smart Remote Setup’ section.

Uninstalling Ultimatte SR4 v1.0.5

The first step to uninstalling the SR4 software is to ensure the application is not running.

To quit the SR4 software:

- 1 Tap on the 'info' icon in the smart remote 4 file control section in the control panel.



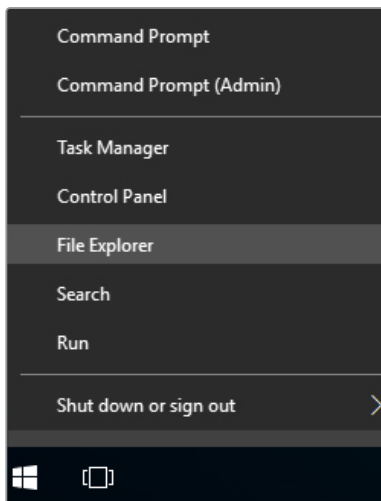
- 2 In the 'options' tab, tap on the 'exit to desktop' button.
- 3 Now that the desktop is visible, tap on the 'up' arrow in the Windows tray.



- 4 Tap and hold the Ultimatte SR4 icon for 2 seconds then release. The 'quit' icon will appear. Simply tap on the 'quit' icon to close the application.

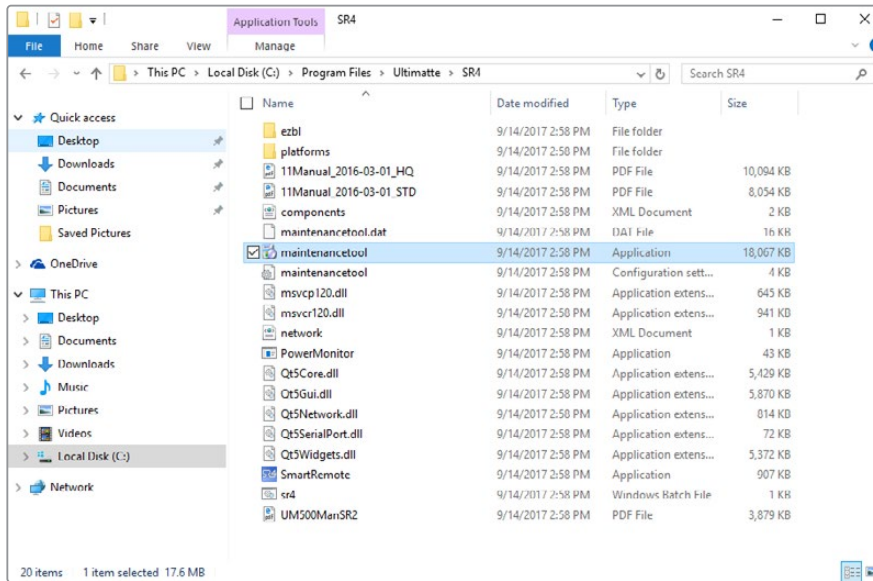
To uninstall SR4 v1.0.5 or earlier:

- 1 Tap and hold the Windows logo in the bottom left corner, then tap on 'file explorer'.



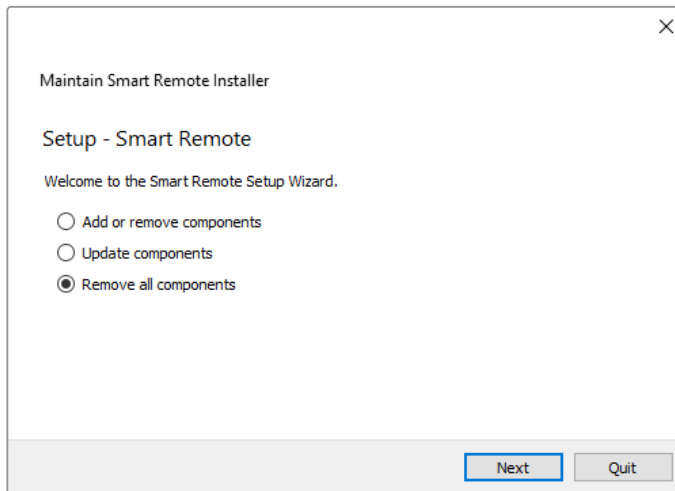
Tap and hold on the Windows logo, then tap file explorer

- In file explorer, navigate to: C:\Program Files\Ultimatte\SR4, and double tap on the maintenance application labelled, 'maintenancetool.exe'



Browse 'local disk C:\' and double tap on the required folders to open their contents

- In the maintenance application window, select 'remove all components' and tap 'next'.



Select 'remove all components' and tap 'next'

- The maintenance application will now let you know it is ready to uninstall. Tap 'uninstall' and allow the application to make changes to your Smart Remote 4 by tapping 'yes'.
- Tap 'finish' on the 'completing the smart remote wizard' window.

The Ultimatte Smart Remote 4 software has now been uninstalled.

Installing Ultimatte Smart Remote Setup

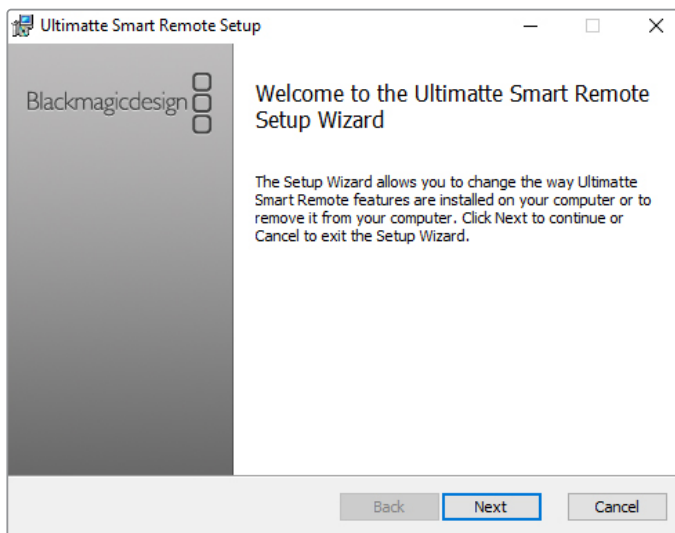
The first step is to download the latest Ultimatte Smart Remote 4 Setup software from the Blackmagic Design support center at www.blackmagicdesign.com/support. Copy and paste the Smart Remote .msi file onto a portable USB storage unit, for example a USB flash drive.

Plug the USB drive into the USB port on the front of your Smart Remote 4. Smart Remote 4 will automatically read the USB drive and open the file explorer.

NOTE The portable storage drive used to install the software on your smart remote must be formatted as the master boot record using one single partition. Your Smart Remote 4 recognizes NTFS, exFAT and FAT32 formats.

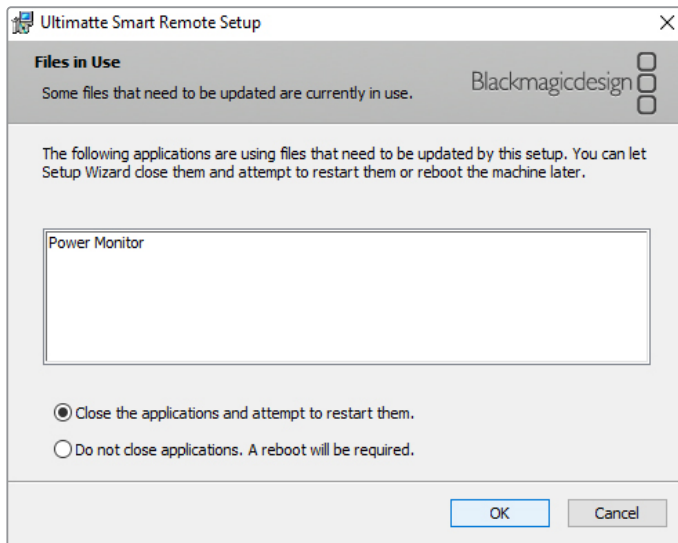
To install the software:

- 1 Double tap on the smart remote installer icon in the storage drive.
- 2 Tap 'next' in the setup wizard and follow the prompts until you reach the 'install' option.

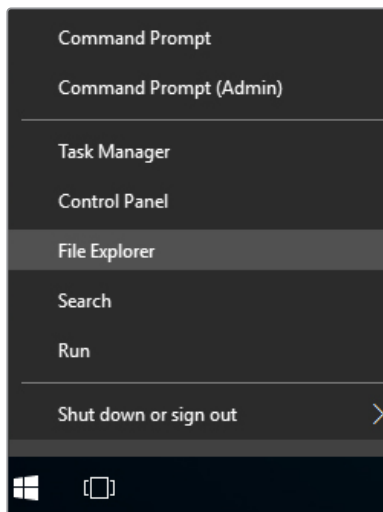


NOTE If you are updating from a previous version of Ultimatte Smart Remote Setup from the Blackmagic Design support center, you will see 'remove' and 'repair' options. In this case, keep following steps 3 onwards. If updating after uninstalling SR4 1.0.5, skip to step 9.

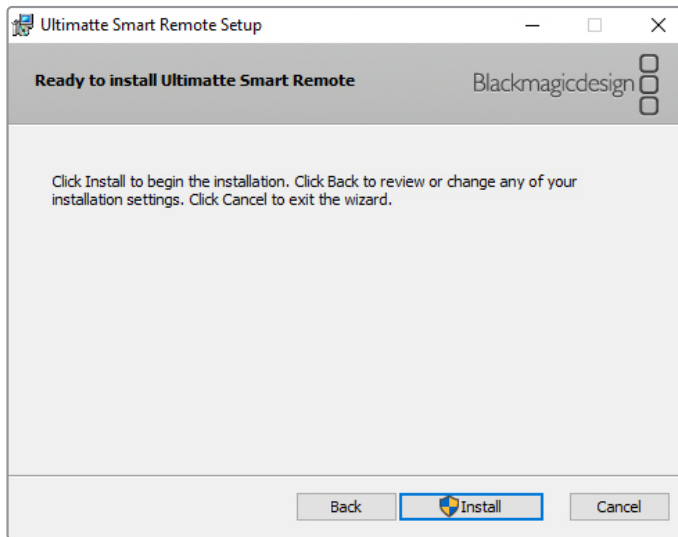
- 3 Select 'remove' to uninstall the smart remote software. Tap 'remove' again when prompted. A progress bar will briefly appear as the uninstall process begins.
- 4 When prompted, ensure the radio button labelled 'close the applications and attempt to restart them' is enabled, and tap 'OK'.



- 5 When asked if you want to allow the application to make changes to your device, tap 'yes'.
- 6 A progress bar will appear as the uninstallation process completes. Tap 'finish' and then tap 'yes' to restart your Smart Remote 4.
- 7 When Smart Remote 4 has restarted, tap and hold the Windows icon at the bottom left of the desktop, and open the 'file explorer'. Navigate to the Smart Remote 4 Setup installer on your USB drive and launch the installer.



- 8 When the installation wizard appears, tap 'next' and follow the prompts until you reach the 'install' button.
- 9 Tap 'install' and allow the installer to make changes to your Smart Remote 4 by tapping 'yes' when prompted.



- 10 Tap 'finish' to complete the installation and 'yes' to restart your Smart Remote 4.

Your Smart Remote 4 will restart and automatically launch the latest version of the Ultimatte Smart Remote 4 control panel.

Connecting a USB Keyboard and Mouse

If you want to control your Ultimatte Smart Remote 4 using a keyboard and a mouse, simply plug them into the USB ports on the rear panel. Your Smart Remote 4 will automatically detect the keyboard and mouse as a plug and play device and you can control your Smart Remote 4 as if using a Windows PC.

Developer Information

Controlling Ultimatte using Telnet

The Blackmagic Ultimatte 12 Ethernet Protocol gives you the freedom to build your own custom control solutions for your Ultimatte 12. For example, you can create your own software application and control your Ultimatte 12 via Ethernet from your computer.

The first step is to connect your Ultimatte to your computer via Ethernet. You can do this by connecting Ultimatte to the same network your computer is connected to, or you can connect Ultimatte directly to your computer.

NOTE If Ultimatte 12 is connected directly to your computer, set your computer to a manual static IP address. Set the first three blocks of numbers in the IP address to match your Ultimatte 12 and set the subnet mask to 255.255.255.0. You can leave the gateway or router setting blank as it will not be used in a direct connection between your computer and Ultimatte 12.

If your network settings are set correctly, you can now open the Terminal application on Mac OS, or enable Telnet command line utilities on Windows and enter Ultimatte control protocol commands. These commands can be programmed into your application and triggered by related items on a custom user interface of your own design.

Below is a basic example of using Telnet to change the backing color, restore to factory defaults, and adjust the matte density control.

- 1** In the Terminal application, type the following:
telnet (IP address of main unit (space) port number)(enter)
For example: telnet 192.168.10.220 9998
Press 'enter'.
A list of status information will appear and you are ready to control your Ultimatte.
- 2** Now type the following:
control: (press enter)
backing color: blue (press enter twice)
Terminal will acknowledge the action with 'ack' and confirm it so you know your setting has been performed.
You have now changed Ultimatte 12's backing color to blue.
- 3** To restore to factory defaults, type the following:
control: (press enter)
factory defaults: yes (press enter twice)
This restores your Ultimatte to factory default settings and performs an automatic composite.
- 4** To adjust the matte density setting, type the following:
control: (press enter)
matte density: 273 (press enter twice)
Terminal will acknowledge and confirm the action.
You have now adjusted the matte density setting.
- 5** To exit Telnet:
Hold down the control button and press the ']' key. The Telnet prompt will appear.
Type the following:
quit(press enter)

A status message will appear confirming the connection is closed.

Blackmagic Ultimatte 12 Ethernet Protocol

Version 1.2

If you are a software developer you can use Ultimatte 12 Ethernet Protocol to construct devices that integrate with our products. Here at Blackmagic Design our approach is to open up our protocols and we eagerly look forward to seeing what you come up with!

Overview

The Blackmagic Ultimatte Ethernet Protocol is a text based protocol that is accessed by connecting to TCP port 9998 on an Ultimatte.

Ultimatte sends information in blocks which each have an identifying header in all caps, followed by a full colon. A block spans multiple lines and is terminated by a blank line. Each line in the protocol is terminated by a newline character.

Upon connection, Ultimatte sends a complete dump of the state of the device. After the initial status dump, status updates are sent every time Ultimatte's status changes.

To be resilient to future protocol changes, clients should ignore blocks they do not recognize, up to the trailing blank line. Within existing blocks, clients should ignore lines they do not recognize.

Protocol Preamble

The first block sent by Ultimatte is always the protocol preamble:

```
PROTOCOL PREAMBLE:↵
Version: 1.2↵
↵
```

The version field indicates the protocol version. When the protocol is changed in a compatible way, the minor version number will be updated. If incompatible changes are made, the major version number will be updated.

Device Information

The next block contains general information about the connected Ultimatte device.

```
DEVICE:↵
Model Name: Blackmagic Ultimatte 12↵
Friendly Name: Ultimatte 12↵
Software Version: 1.0↵
Video Format: 1080p60↵
Reference Source: Foreground↵
BG In: Locked↵
BG MATTE In: Locked↵
G MATTE In: Locked↵
FG In: Locked↵
MONITOR In: Locked↵
H MATTE In: Locked↵
LAYER In: Locked↵
LAYER MATTE In: Locked↵
REF In: Locked↵
↵
```

Network Information

```
NETWORK:↵
DHCP: Off↵
IP Address: 10.0.0.2↵
Subnet Mask: 255.255.255.0↵
Gateway: 10.0.0.1↵
↵
```

Initial Status Dump

The next nine blocks provide the control values, control default values, current file, file list and the GPI lists.

```
CONTROL:↵
Matte Density: 0↵
Red Density: 0↵
Green Density: 0↵
...(Full list in Controls section)
↵
```

```
CONTROL DEFAULT:↵
Matte Density: 0↵
Red Density: 0↵
Green Density: 0↵
...(Full list in Controls section)
```

```
↵
```

```
CURRENT FILE:↵
```

```
Filename↵
```

```
↵
```

```
FILE LIST:↵
```

```
File 1↵
```

```
File 2↵
```

```
↵
```

```
GPI LIST:↵
```

```
ID: 1↵
```

```
Index: 0↵
```

```
File 1↵
```

```
File 2↵
```

```
↵
```

NOTE Ultimatte 12 supports 5 GPI inputs so there would be 5 GPI List blocks dumped with ID's 1-5

End Prelude

The final block of the status dump sent by Ultimatte is always end prelude:

```
END PRELUDE:↵
```

```
↵
```

Status Updates

When any Control is changed on Ultimatte by any client, Ultimatte replies with the applicable status block, containing only the items that have changed. For example, if Matte Density has been changed, the following block will be sent:

```
CONTROL:↵
```

```
Matte Density: 0↵
```

```
↵
```

If multiple items are changed, multiple items may be present in the update:

```
CONTROL:↵
```

```
Matte Density: 0↵
```

```
Red Density: 0↵
```

```
↵
```

Requesting Changes

To update a Control the client should send a block of the same form Ultimatte sends when its status changes. For example, to change Matte Density to 100, the client should send the following block:

```
CONTROL:↵
```

```
Matte Density: 100↵
```

```
↵
```

The block must be terminated by a blank line. On receipt of a blank line, Ultimatte will either acknowledge the request by responding:

```
ACK↵  
↵
```

or indicate that the request was not understood by responding:

```
NAK↵  
↵
```

After a positive response, the client should expect to see a status update from Ultimatte showing the status change. This is likely to be the same as the command that was sent, but if the request could not be performed, or other changes were made simultaneously by other clients, there may be more updates in the block, or more blocks. Simultaneous updates could cancel each other out, leading to a response that is different to that expected.

In the absence of simultaneous updates, the dialog expected for a simple control change is as follows:

```
CONTROL:↵  
Matte Density: 0↵  
↵
```

```
ACK↵  
↵
```

```
CONTROL:↵  
Matte Density: 0↵  
↵
```

The asynchronous nature of the responses means that a client should never rely on the desired update actually occurring and must simply watch for status updates from Ultimatte and use only these to update its local representation of Ultimatte's state.

A client may also request Ultimatte to change a control by a relative amount. For example, to change Matte Density by 10, the client should send the following block:

```
CONTROL:↵  
Offset Matte Density: 10↵  
↵
```

Only controls with numerical ranges support this relative mode.

Requesting a Status Dump

The client may request that Ultimatte resend the complete state of any status block by sending the header of the block, followed by a blank line. In the following example, the client requests Ultimatte resend the control status:

```
CONTROL:↵  
↵
```

```
ACK↵  
↵
```

```
CONTROL:↵  
Matte Density: 0↵  
Red Density: 0↵  
Green Density: 0↵  
...(Full list in Controls section)  
↵
```

File System

The client may request that Ultimatte load, save, delete, or rename a file. To load a file the client should send the following block:

```
FILE:↵
Load: <filename>↵
↵
```

Ultimatte will respond with an ACK followed by a Current File block or a Message block.

To save, delete, or rename a file the client should send one of the following blocks:

```
FILE:↵
Save: <filename>↵
↵
```

```
FILE:↵
Delete: <filename>↵
↵
```

```
FILE:↵
Rename: <filename>↵
To: <filename>↵
↵
```

In each case Ultimatte will respond with an ACK followed by a File List block or a Message block.

GPI Event List

The client may request that Ultimatte add, insert or remove an event to a GPI Event List by sending an Insert GPI Event or Remove GPI Event command, followed by a blank line.

For example, to insert an event, the client should send the following block:

```
GPI:↵
ID: 1↵
Insert: <filename>↵
At: -1↵ {The insertion index. A '-1' represents the end of the list}
↵
```

To remove an event a client would send the following block:

```
GPI:↵
ID: 1↵
Remove: 1 ↵ {Event index to remove. A '0' will delete all events}
↵
```

To set the current event index a client would send the following block:

```
GPI:↵
ID: 1↵
Index: 1↵
↵
```

Ultimatte will respond with an ACK message followed by either a GPI List Block or a Message Block.

```
GPI LIST:↵
ID: 1↵
Index: 0↵
File 1↵
File 2↵
...
↵
```

Or

```
MESSAGE:↵  
Warning: Event limit exceeded↵  
↵
```

Checking the Connection

While the connection to Ultimatte is established, a client may send a special no-operation command to check that Ultimatte is still responding:

```
PING:↵  
↵
```

If Ultimatte is responding, it will respond with an ACK message.

Quit

The Quit command will end the telnet session.

```
QUIT:↵  
↵
```

Controls

| | |
|-------------------------------|---------|
| Matte Density | 0-10000 |
| Black Gloss | 0-10000 |
| Blue Density | 0-10000 |
| Green Density | 0-10000 |
| Red Density | 0-10000 |
| Shadow Level | 0-10000 |
| Shadow Threshold | 0-10000 |
| Matte Correct Horizontal Size | 0-6 |
| Matte Correct Vertical Size | 0-3 |
| Cursor X | 0-10000 |
| Cursor Y | 0-10000 |
| Cursor 2 X | 0-10000 |
| Cursor 2 Y | 0-10000 |
| Veil Master | 0-10000 |
| Veil Red | 0-10000 |
| Veil Green | 0-10000 |
| Veil Blue | 0-10000 |
| Veil Correct Horizontal Size | 0-6 |
| Veil Correct Vertical Size | 0-3 |
| Wall Color Red | 0-10000 |
| Wall Color Green | 0-10000 |
| Wall Color Blue | 0-10000 |
| Floor Color Red | 0-10000 |
| Floor Color Green | 0-10000 |

| | |
|--------------------------------------|---------|
| Floor Color Blue | 0-10000 |
| Cleanup Level | 0-10000 |
| Cleanup Dark Recover | 0-10000 |
| Cleanup Light Recover | 0-10000 |
| Cleanup Strength | 0-10000 |
| GM Cleanup Level | 0-10000 |
| GM Cleanup Dark Recover | 0-10000 |
| GM Cleanup Light Recover | 0-10000 |
| GM Cleanup Strength | 0-10000 |
| Correction Level | 0-10000 |
| Noise Level | 0-10000 |
| Black Balance | 0-10000 |
| Gray Balance | 0-10000 |
| White Balance | 0-10000 |
| Flare Level | 0-10000 |
| Cool | 0-10000 |
| Skin Tone | 0-10000 |
| Light Warm | 0-10000 |
| Dark Warm | 0-10000 |
| Flare Correct Horizontal Size | 0-6 |
| Flare Correct Vertical Size | 0-3 |
| Ambiance Master | 0-10000 |
| Ambiance Red | 0-10000 |
| Ambiance Green | 0-10000 |
| Ambiance Blue | 0-10000 |
| Ambiance Strength | 0-10000 |
| Direct Light Red | 0-10000 |
| Direct Light Green | 0-10000 |
| Direct Light Blue | 0-10000 |
| Direct Light Mix | 0-10000 |
| Vertical Blur | 0-10000 |
| FG Saturation Red | 0-10000 |
| FG Saturation Green | 0-10000 |
| FG Saturation Blue | 0-10000 |
| FG Saturation Master | 0-10000 |
| FG Contrast Red | 0-10000 |
| FG Contrast Green | 0-10000 |
| FG Contrast Blue | 0-10000 |

| | |
|------------------------------|---------|
| FG Contrast Master | 0-10000 |
| FG Black Red | 0-10000 |
| FG Black Green | 0-10000 |
| FG Black Blue | 0-10000 |
| FG Black Master | 0-10000 |
| FG White Red | 0-10000 |
| FG White Green | 0-10000 |
| FG White Blue | 0-10000 |
| FG White Master | 0-10000 |
| FG Contrast Crossover | 0-10000 |
| Fade Mix | 0-10000 |
| BG Saturation Red | 0-10000 |
| BG Saturation Green | 0-10000 |
| BG Saturation Blue | 0-10000 |
| BG Saturation Master | 0-10000 |
| BG Contrast Red | 0-10000 |
| BG Contrast Green | 0-10000 |
| BG Contrast Blue | 0-10000 |
| BG Contrast Master | 0-10000 |
| BG Black Red | 0-10000 |
| BG Black Green | 0-10000 |
| BG Black Blue | 0-10000 |
| BG Black Master | 0-10000 |
| BG White Red | 0-10000 |
| BG White Green | 0-10000 |
| BG White Blue | 0-10000 |
| BG White Master | 0-10000 |
| BG Contrast Crossover | 0-10000 |
| BG Filter | 0-10000 |
| Test Signal Master | 0-10000 |
| Test Signal Red | 0-10000 |
| Test Signal Green | 0-10000 |
| Test Signal Blue | 0-10000 |
| LY Saturation Red | 0-10000 |
| LY Saturation Green | 0-10000 |
| LY Saturation Blue | 0-10000 |
| LY Saturation Master | 0-10000 |
| LY Contrast Red | 0-10000 |

| | |
|----------------------------------|---------------------------|
| LY Contrast Green | 0-10000 |
| LY Contrast Blue | 0-10000 |
| LY Contrast Master | 0-10000 |
| LY Black Red | 0-10000 |
| LY Black Green | 0-10000 |
| LY Black Blue | 0-10000 |
| LY Black Master | 0-10000 |
| LY White Red | 0-10000 |
| LY White Green | 0-10000 |
| LY White Blue | 0-10000 |
| LY White Master | 0-10000 |
| LY Contrast Crossover | 0-10000 |
| LY Filter | 0-10000 |
| LY Test Signal Master | 0-10000 |
| LY Test Signal Red | 0-10000 |
| LY Test Signal Green | 0-10000 |
| LY Test Signal Blue | 0-10000 |
| LY Fade Mix | 0-10000 |
| Lighting Level Red | 0-10000 |
| Lighting Level Green | 0-10000 |
| Lighting Level Blue | 0-10000 |
| Lighting Level Master | 0-10000 |
| Lighting Minimum Level | 0-10000 |
| Window Position Top | 0-{Based on Video Format} |
| Window Position Bottom | 0-{Based on Video Format} |
| Window Position Left | 0-{Based on Video Format} |
| Window Position Right | 0-{Based on Video Format} |
| Window Softness Top | 0-10000 |
| Window Softness Bottom | 0-10000 |
| Window Softness Left | 0-10000 |
| Window Softness Right | 0-10000 |
| Window Skew Top | 0-10000 |
| Window Skew Bottom | 0-10000 |
| Window Skew Left | 0-10000 |
| Window Skew Right | 0-10000 |
| Window Skew Offset Top | 0-10000 |
| Window Skew Offset Bottom | 0-10000 |
| Window Skew Offset Left | 0-10000 |

| | |
|---------------------------------|---------|
| Window Skew Offset Right | 0-10000 |
| Transition Rate | 1-120 |
| BM Process Horizontal | 0-3 |
| BM Process Vertical | 0-3 |
| BM Filter | 0-10000 |
| BM Input Level | 0-10000 |
| BM Input Offset | 0-10000 |
| GM Process Horizontal | 0-3 |
| GM Process Vertical | 0-3 |
| GM Filter | 0-10000 |
| GM Input Level | 0-10000 |
| GM Input Offset | 0-10000 |
| HM Process Horizontal | 0-3 |
| HM Process Vertical | 0-3 |
| HM Filter | 0-10000 |
| HM Input Level | 0-10000 |
| HM Input Offset | 0-10000 |
| LM Process Horizontal | 0-3 |
| LM Process Vertical | 0-3 |
| LM Filter | 0-10000 |
| LM Input Level | 0-10000 |
| LM Input Offset | 0-10000 |
| Noise Cursor X | 0-10000 |
| Noise Cursor Y | 0-10000 |
| FG Input Frame Delay | 0-14 |
| FG Input U Position | 0-10000 |
| FG Input V Position | 0-10000 |
| FG Input UV Position | 0-10000 |
| Talent Highlight Level | 0-10000 |
| Monitor Highlight Level | 0-10000 |
| Matte Out Level | 0-10000 |
| GP Out Delay | 1-120 |
| GP 1 Input Delay | 1-120 |
| GP 2 Input Delay | 1-120 |
| GP 3 Input Delay | 1-120 |
| GP 4 Input Delay | 1-120 |
| GP 5 Input Delay | 1-120 |
| Matte Enable | On/Off |

| | |
|-------------------------------------|--------|
| Screen Correct | On/Off |
| GM Cleanup Enable | On/Off |
| Noise Enable | On/Off |
| Noise Cursor | On/Off |
| FG Freeze | On/Off |
| FG Advanced Contrast Enable | On/Off |
| Advanced Flare Enable | On/Off |
| HM Flare Enable | On/Off |
| Ambiance Enable | On/Off |
| BG Gradient Enable | On/Off |
| BG Freeze | On/Off |
| BG Advanced Contrast Enable | On/Off |
| BG Test Signal Enable | On/Off |
| LY Input Enable | On/Off |
| LY Advanced Contrast Enable | On/Off |
| LY Freeze | On/Off |
| LY Test Signal Enable | On/Off |
| Lighting Enable | On/Off |
| Window Enable | On/Off |
| Window BM Enable | On/Off |
| Window GM Enable | On/Off |
| Window HM Enable | On/Off |
| Window LM Enable | On/Off |
| Window Invert | On/Off |
| Wall Cursor Position Enable | On/Off |
| Floor Cursor Position Enable | On/Off |
| Dual Cursor | On/Off |
| Manual Color Enable | On/Off |
| Custom Powerup | On/Off |
| BM Enable | On/Off |
| BM Invert | On/Off |
| BM Process Invert | On/Off |
| BM Freeze | On/Off |
| GM Enable | On/Off |
| GM Invert | On/Off |
| GM Process Invert | On/Off |
| GM Freeze | On/Off |
| HM Enable | On/Off |

| | |
|-----------------------------------|--------|
| HM Invert | On/Off |
| HM Process Invert | On/Off |
| HM Freeze | On/Off |
| LM Invert | On/Off |
| LM Process Invert | On/Off |
| Monitor To Program | On/Off |
| Monitor To Talent | On/Off |
| Fill Linear Mix Correction | On/Off |
| Talent Mirror | On/Off |
| Monitor Cascade | On/Off |
| Matte Out Invert | On/Off |
| On Air Enable | On/Off |
| On Air Lockout | On/Off |
| Matte View Range | On/Off |
| Matte View Invert | On/Off |
| Monitor Out RGB | On/Off |
| Monitor Out Red Only | On/Off |
| Monitor Out Green Only | On/Off |
| Monitor Out Blue Only | On/Off |
| GP Out Save | On/Off |
| Quickload 1 | On/Off |
| Quickload 2 | On/Off |
| Quickload 3 | On/Off |
| Quickload 4 | On/Off |
| Quickload 5 | On/Off |
| Quicksave 1 | On/Off |
| Quicksave 2 | On/Off |
| Quicksave 3 | On/Off |
| Quicksave 4 | On/Off |
| Quicksave 5 | On/Off |
| GP 1 Input Enable | On/Off |
| GP 2 Input Enable | On/Off |
| GP 3 Input Enable | On/Off |
| GP 4 Input Enable | On/Off |
| GP 5 Input Enable | On/Off |
| GP 1 High Enable | On/Off |
| GP 2 High Enable | On/Off |
| GP 3 High Enable | On/Off |

| | |
|---------------------------|--|
| GP 4 High Enable | On/Off |
| GP 5 High Enable | On/Off |
| Tally Active | On/Off {Read Only} |
| 3G SDI level | A/B |
| Color Space | Rec.709/Rec.2020 |
| Filter Mode | Median/Average |
| Filter Median | 0/1/2/3/4 |
| Filter Average | 0/1/2/3/4 |
| LY In Mix Mode | Realistic/Linear/Additive |
| Backing Color | Red/Green/Blue |
| Cursor Position | Default/Last |
| GP Out Level | High/Low |
| Monitor Out | Program, FG, BG, Combined Matte, Internal Matte, Fill, Layer In, Background Matte In, Garbage Matte In, Holdout Matte In, Layer Matte In, Processed LM, Processed HM, Processed GM, Processed BM, Screen Correction |
| Layer Order | FG/Layer/BG Layer/BG, Layer/FG/BG Layer/BG, Layer/BG Layer/FG/BG, BG Layer/Layer/FG/BG, BG Layer/FG/Layer/BG, FG/BG Layer/Layer/BG, FG/BG Layer/BG, BG Layer/FG/BG, FG/Layer/BG, Layer/FG/BG |
| Video Format | Auto Detect, 525i59.94 NTSC 4:3, 625i50 PAL 4:3, 720p60, 720p59.94, 720p50, 1080i60, 1080i59.94, 1080i50, 1080p60, 1080p59.94, 1080p50, 1080p30, 1080p29.97, 1080p25, 1080p24, 1080p23.98, 1080PsF30, 1080PsF29.97, 1080PsF25, 1080PsF24, 1080PsF23.98, 2160p60, 2160p59.94, 2160p50, 2160p30, 2160p29.97, 2160p25, 2160p24 and 2160p23.98 |
| Factory Defaults | Yes ¹ |
| User Defaults | Yes ¹ |
| Auto Screen Sample | Yes ¹ |
| Screen Capture | Yes ¹ |
| Noise Select | Yes ¹ |
| Sample Wall | Yes ¹ |
| Sample Floor | Yes ¹ |
| Matte Reset | Yes ¹ |
| Cleanup Reset | Yes ¹ |

| | |
|-----------------------------------|------------------|
| GM Cleanup Reset | Yes ¹ |
| FG Color Reset | Yes ¹ |
| BG Color Reset | Yes ¹ |
| Flare Reset | Yes ¹ |
| Ambiance Reset | Yes ¹ |
| BG Test Signal Color Reset | Yes ¹ |
| LY Color Reset | Yes ¹ |
| LY Test Signal Color Reset | Yes ¹ |
| Window Reset | Yes ¹ |
| Window Skew Reset | Yes ¹ |
| GP Out | Yes ¹ |

These controls represent functions. Send 'Yes' to execute the function. Ultimatte will respond with a 'Yes' to indicate the function is complete.

Glossary

| | |
|-----------|------------------|
| FG | Foreground |
| BG | Background |
| LY | Layer |
| GM | Garbage Matte |
| BM | Background Matte |
| HM | Holdout Matte |
| LM | Layer Matte |

Help

Getting Help

The fastest way to obtain help is to go to the Blackmagic Design online support pages and check the latest support material available for your Blackmagic Ultimatte 12 or Smart Remote 4.

Blackmagic Design online support pages

The latest manual, software and support notes can be found at the Blackmagic Design support center at www.blackmagicdesign.com/support.

Contacting Blackmagic Design support

If you can't find the help you need in our support material, please use the "Send us an email" button on the support page to email a support request. Alternatively, click on the "Find your local support team" button on the support page and call your nearest Blackmagic Design support office.

Checking the version currently installed

To check which version of Blackmagic Ultimatte Setup software is installed on your computer, launch Blackmagic Ultimatte Setup and click on the 'about' tab. The software version number will be displayed in the 'software information' section.

How to get the latest updates

After checking the version of Blackmagic Ultimatte Setup software installed on your computer, please visit the Blackmagic Design support center at www.blackmagicdesign.com/support to check for the latest updates. While it is usually a good idea to run the latest updates, it is a wise practice to avoid updating any software if you are in the middle of an important project.

Regulatory Notices and Safety Information

Regulatory Notices

Disposal of waste of electrical and electronic equipment within the European union.



The symbol on the product indicates that this equipment must not be disposed of with other waste materials. In order to dispose of your waste equipment, it must be handed over to a designated collection point for recycling. The separate collection and recycling of your waste equipment at the time of disposal will help conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city recycling office or the dealer from whom you purchased the product.



This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this product in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at personal expense.

Operation is subject to the following two conditions:

- 1 This device may not cause harmful interference.
- 2 This device must accept any interference received, including interference that may cause undesired operation.

Safety Information

This equipment must be connected to a mains socket outlet with a protective earth connection.

To reduce the risk of electric shock, do not expose this equipment to dripping or splashing.

This equipment is suitable for use in tropical locations with an ambient temperature of up to 40°C.

Ensure that adequate ventilation is provided around the product and is not restricted.

When rack mounting, ensure the ventilation is not restricted by adjacent equipment.

No operator serviceable parts inside. Refer servicing to your local Blackmagic Design service centre.



Use only at altitudes not more than 2000m above sea level.

Warnings for Authorized Service Personnel



Disconnect power from both power inlets before servicing!



Caution - Double Pole/ Neutral Fusing

The power supply contained in this equipment has a fuse in both line and neutral conductors and is suitable for connection to the IT power distribution system in Norway.

Warranty

12 Month Limited Warranty

Blackmagic Design warrants that this product will be free from defects in materials and workmanship for a period of 12 months from the date of purchase. If a product proves to be defective during this warranty period, Blackmagic Design, at its option, either will repair the defective product without charge for parts and labor, or will provide a replacement in exchange for the defective product.

In order to obtain service under this warranty, you the Customer, must notify Blackmagic Design of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. The Customer shall be responsible for packaging and shipping the defective product to a designated service center nominated by Blackmagic Design, with shipping charges pre paid. Customer shall be responsible for paying all shipping charges, insurance, duties, taxes, and any other charges for products returned to us for any reason.

This warranty shall not apply to any defect, failure or damage caused by improper use or improper or inadequate maintenance and care. Blackmagic Design shall not be obligated to furnish service under this warranty: a) to repair damage resulting from attempts by personnel other than Blackmagic Design representatives to install, repair or service the product, b) to repair damage resulting from improper use or connection to incompatible equipment, c) to repair any damage or malfunction caused by the use of non Blackmagic Design parts or supplies, or d) to service a product that has been modified or integrated with other products when the effect of such a modification or integration increases the time or difficulty of servicing the product. THIS WARRANTY IS GIVEN BY BLACKMAGIC DESIGN IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED. BLACKMAGIC DESIGN AND ITS VENDORS DISCLAIM ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. BLACKMAGIC DESIGN'S RESPONSIBILITY TO REPAIR OR REPLACE DEFECTIVE PRODUCTS IS THE WHOLE AND EXCLUSIVE REMEDY PROVIDED TO THE CUSTOMER FOR ANY INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES IRRESPECTIVE OF WHETHER BLACKMAGIC DESIGN OR THE VENDOR HAS ADVANCE NOTICE OF THE POSSIBILITY OF SUCH DAMAGES. BLACKMAGIC DESIGN IS NOT LIABLE FOR ANY ILLEGAL USE OF EQUIPMENT BY CUSTOMER. BLACKMAGIC IS NOT LIABLE FOR ANY DAMAGES RESULTING FROM USE OF THIS PRODUCT. USER OPERATES THIS PRODUCT AT OWN RISK.

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