

Installation and Operation Manual

Blackmagic MultiView 16

Blackmagicdesign



Mac OS X™

Windows™

November 2015



Welcome

Thank you for purchasing Blackmagic MultiView 16!

We hope you share our dream for the television industry to become truly creative by allowing anyone to have access to the highest quality video.

This instruction manual contains all the information you'll need to install your Blackmagic MultiView 16, although it's always a good idea to ask a technical assistant for help if you are not sure what IP addresses are, or if you're unsure about computer networks. Blackmagic MultiView 16 can be controlled using Videohub Control software which is easy to install, however there are a few slightly technical preferences you will need to set after you install it.

Please check our web site at www.blackmagicdesign.com and visit the support page to download the latest updates to this manual and software. Lastly, please register your Blackmagic MultiView 16 when downloading software updates so we can keep you updated when new software is released. We are constantly working on new features and improvements, so we would love to hear from you!

We hope you get years of use from your Blackmagic MultiView 16 and have lots of fun viewing your video inputs in wonderful Ultra HD!

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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4 Getting Started



Blackmagic MultiView 16

Introducing Blackmagic MultiView 16

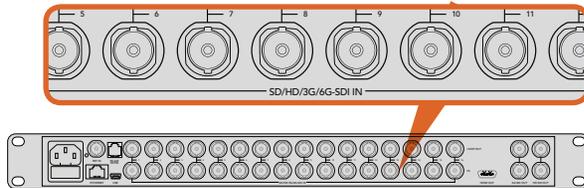
Blackmagic MultiView 16 is a single rack SDI monitoring solution for displaying up to 16 SDI signals simultaneously on a single monitor. This lets you monitor multiple video signals in virtually any video format within studio or portable broadcast environments, for example previewing routed sources in master control, or monitoring incoming feeds during live production. All video formats are auto detected and can be displayed using layouts from solo, 2x2, 3x3 and 4x4 so you can view all 16 inputs together on one screen.

Dedicated Ultra HD and HD multi view outputs let you connect the largest Ultra HD monitors and with the 2x2 layout selected, it means up to four HD signals can be displayed in native 1920 x 1080 pixel high definition. The HDMI multi view output switches between HD and Ultra HD based on the format your monitor supports, so you can plug in any HDMI television and monitor your inputs instantly.

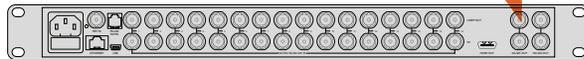
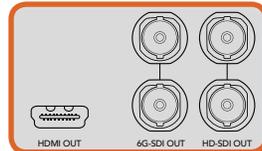
Blackmagic MultiView 16 can be operated using the built in control panel, or remotely via Ethernet or serial connections if mounted in a location where you don't have access to the front panel. Blackmagic Design router controllers, such as Blackmagic Videohub Master Control and Blackmagic Smart Control can control Blackmagic MultiView 16 via Ethernet and you can even use the powerful and intuitive Blackmagic Videohub Control software.

Blackmagic MultiView 16 has a built in power supply with a standard IEC power connector.

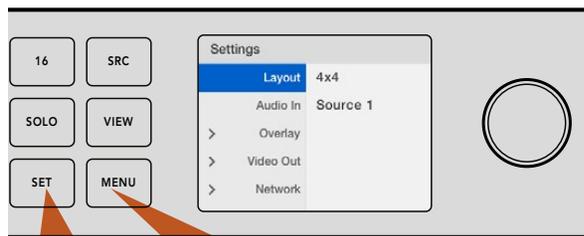
5 Getting Started



Connect your video sources to Blackmagic MultiView 16's SDI video inputs.



Connect your monitor to Blackmagic MultiView 16's HDMI or SDI multi view outputs.



To set your Blackmagic MultiView 16's view layout, press 'menu', select your layout using the rotary knob, then press 'set'. 4x4 lets you see all 16 views on one monitor.

Connecting SDI Sources and Monitors

Getting started with Blackmagic MultiView 16 is very easy. Simply plug your SDI sources into any of the 16 SDI video inputs on the rear panel, and connect a monitor to the HD, 6G-SDI or HDMI multi view outputs. Blackmagic MultiView 16 will automatically detect if your connected video sources are SD, HD, 3G or 6G-SDI and instantly display them on your connected monitor. You can also connect your sources to other video equipment via the loop outputs above each SDI input.

When connecting an HDMI monitor, Blackmagic MultiView 16 will automatically detect whether it supports Ultra HD or HD and switch the HDMI multi view output accordingly. If you want to connect an Ultra HD monitor via SDI, plug directly into the 6G-SDI multi view outputs. If you have an HD monitor, plug into the dedicated down converted HD-SDI multi view outputs. All SDI and HDMI outputs can be used simultaneously for Ultra HD and HD multi view monitoring.

Setting your Multi View Layout

Once your SDI sources and monitors are connected, select your desired multi view layout using the front control panel buttons and rotary knob. You can choose from 2x2, 3x3 or 4x4. You can also monitor any view in full screen mode by pressing the 'solo' and 'view' buttons. To see all you 16 views on your connected monitor, select 4x4 multi view layout.

- Step 1.** Press the ' menu' button on the front control panel to open the settings screen on the LCD.
- Step 2.** Layout is the first setting in the menu, so it is always highlighted when you first enter the settings menu. Press the 'set' button to edit the setting.
- Step 3.** Select 4x4 from the layout setting by turning the rotary knob on the front control panel. Whenever a setting changes, you'll notice the 'set' button and the 'menu' button will start flashing. This means a setting has changed and you can either confirm the setting change by pressing the 'set' button, or cancel by pressing the 'menu' button.
- Step 4.** Press the set button to confirm your setting.

You should now see your connected SDI sources displayed on your monitor using the multi view layout you selected. It's worth selecting the layout to best suit the number of SDI sources you have connected to Blackmagic MultiView 16. This means you will maximize the views for optimum monitoring.

That's all you need to do to start using Blackmagic MultiView 16. Please continue reading the rest of this manual to find out how to use all of Blackmagic MultiView 16's features.

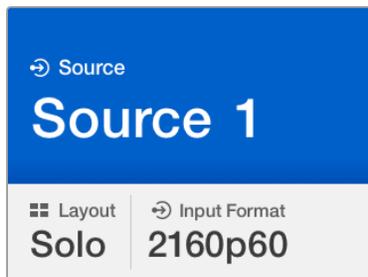
6 Using Blackmagic MultiView 16



The 'home' screen is the default display on Blackmagic MultiView 16's control panel LCD. This screen displays your selected multi view layout, the frame rate for the multi view SDI output, and the selected SDI input used to embed audio into the multi view output.



Blackmagic MultiView 16's front control panel features illuminated control buttons so you can adjust settings.



The solo feature lets you monitor a view in full screen mode.

Front Control Panel

When first powering your Blackmagic MultiView 16 you'll see the 'home' screen displayed on the built in LCD. The home screen is the default display showing a convenient overview of settings, such as:

- **Multi view output frame rate** - Located in the upper left corner, this displays the selected frame rate for your Ultra HD SDI multi view output.
- **Audio input** - This information is located next to the multi view output frame rate and displays which SDI input is being used for embedded audio in the HDMI and SDI multi view output signal.
- **Multi view layout** - This displays your selected multi view layout.

Control Panel Buttons

The illuminated buttons on Blackmagic MultiView 16's built in control panel are used to change settings and access features. See the 'settings' section for more information on how to apply settings on Blackmagic MultiView 16.

Solo Button

You can monitor a view in full screen by pressing the 'solo' button. Now press any view button on the control panel to monitor that view in full screen mode. Press solo again to return to the multi view layout.

Menu Button

Press the 'menu' button to open the settings screen. After confirming a setting, press the menu button again to return to the 'home' screen.

Set Button

Press the 'set' button to select a setting to adjust. After changing a setting, press the set button again to confirm the change.

Source and View buttons

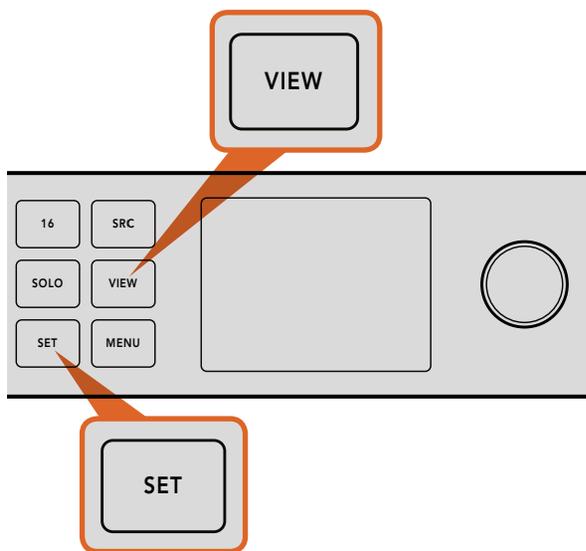
These buttons let you select which input source you want to display in a desired view. When navigating settings menus, the source and view buttons can also be used to move up and down through setting options.

Rotary Knob

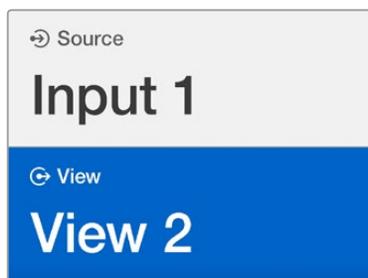
Use the rotary knob to scroll through settings, or to select menu items on the settings screen. If you're unhappy with a selection, you can return to a previously selected setting by pressing the rotary knob.

Turn the rotary knob clockwise or counter clockwise to select between two options in a menu. Settings can also be turned on or off by pressing the rotary knob.

7 Settings



To set a source to a view, press the 'view' button to enter the view setting, make your selection, then press the 'set' button to confirm your setting.



Select your view you wish to assign a source to using the rotary knob or view buttons.

Configuring your Settings

Configuring settings on Blackmagic MultiView 16 is easy. If you have read the Getting Started section, you already know how to enter the settings menu by pressing the menu button, then selecting and confirming your settings by pressing the 'set' button. Changes to your settings can be made using the rotary knob or the view buttons.

The remainder of this section describes common settings for Blackmagic MultiView 16.

Setting your Sources and Views

One of the key features of Blackmagic MultiView 16 is the ability to assign your connected SDI sources to different views. By adjusting these settings you can easily change the arrangement of your views. For example, if you want SDI input 5 to appear on view 1, you can easily configure Blackmagic MultiView 16 to do that.

To set which source appears on a desired view:

- Step 1.** Press the 'view' button on the front control panel to open the view selection screen. The view selection will be highlighted with a blue background.
- Step 2.** Press a numbered view button to select your desired view. Alternatively, you can use the rotary knob to scroll through the views. Confirm your setting by pressing the 'set' button.
- Step 3.** Press the 'src' button. The source section of the LCD will be highlighted.
- Step 4.** Press a numbered view button on the control panel to select your desired input. Alternatively, you can use the rotary knob to scroll through your inputs on the LCD.
- Step 5.** Press the 'set' button to confirm your setting.

Setting your Layout

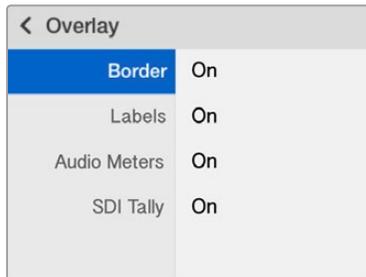
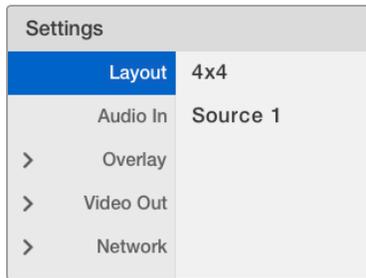
As shown in the getting started section, you can select the number of views that appear on your multi view output. For example, if you have 4 inputs connected, you can easily select the 2x2 layout which displays four views in a vertical x horizontal grid. For optimum monitoring of your inputs, select the view layout to suit the number of inputs connected.

There are four multi view layouts you can choose from:

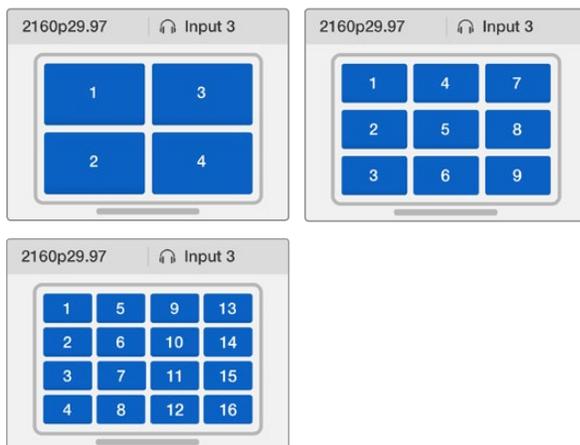
- **2x2** displays 4 views. If you have an Ultra HD monitor connected, each source will be displayed in native HD resolution.
- **3x3** displays 9 views.
- **4x4** displays all 16 views.

You can also monitor a view in full screen mode by pressing the 'solo' button on Blackmagic MultiView 16's control panel, then selecting a view button.

8 Settings



The underlined setting indicates the setting is selected and ready to be adjusted.



You can choose from 3 different multi view layouts to best suit the number of inputs you have connected.

Audio In

This setting is used to select the SDI input from which audio will be taken and embedded into the multi view outputs.

Overlay

This submenu lets you change the appearance of your multi view by turning overlay features on or off.

Overlay features are:

- **Borders:** Lets you separate each view in a grid like pattern.
- **Labels:** Makes 'view' labels visible or hidden. Labels can be changed using Blackmagic MultiView Setup.
- **Audio Meters:** Turns audio VU meters on or off for all the views. The first 2 channels embedded in each SDI signal are displayed in each view, which means you can monitor audio levels together with the picture.
- **SDI Tally:** When Blackmagic MultiView 16 has an ATEM switcher's program SDI output connected to input 16, you can view tally borders around a view when its source is switched to air. You can turn this feature on or off using the SDI tally overlay setting.
- For tally to work properly, make sure you connect your Blackmagic MultiView 16's inputs so they match the input numbers on your ATEM switcher or tally may be displayed on the wrong view.

Video Out

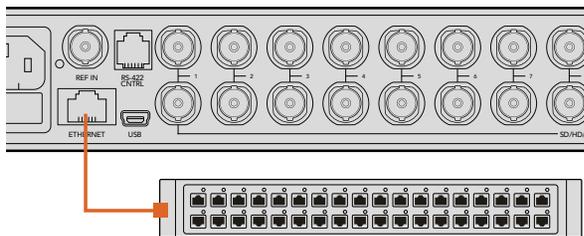
The 'video out' settings let you control output options on your Blackmagic MultiView 16.

- **Video Format** - Use this setting to change your Ultra HD multi view output frame rate to 2160p29.97 or 2160p25. The HD multi view output frame rate will conform to the Ultra HD output. Press the rotary knob if you want to cancel the setting change, or return to the previous menu.
- **HD Output** - Select interlaced or progressive for the HD multi view output. If 2160p29.97 is the selected video format the HD output can be either 1080p29.97 or 1080i59.94. Similarly when 2160p25 is selected the HD output can be either 1080p25 or 1080i50.

Network

The 'network' settings let you set the IP, Subnet and Gateway addresses for your Blackmagic MultiView 16 when connecting to a network. Refer to the 'connecting to a network' section for more information.

9 Settings



Connecting Blackmagic MultiView 16 to an Ethernet network will allow you to control the unit from another location.



Use the rotary knob or the view buttons on Blackmagic MultiView 16's control panel to assign values to your network settings.



Select either 'client' or 'server' when using RS-422 serial control.

Connecting to a Network

Blackmagic MultiView 16 supports the Blackmagic Videohub Ethernet Protocol so if your unit is installed in a rack with limited access, you can easily control it remotely. Once connected to your network via Ethernet, Blackmagic MultiView 16 will be visible to other computers and Videohub panels connected to the network. These devices can then control the unit remotely and make routing changes.

To connect Blackmagic MultiView 16 to your network:

- Step 1.** Power your Blackmagic MultiView 16.
- Step 2.** Use a standard RJ45 Ethernet cable to connect Blackmagic MultiView 16 to your network switch.

Once you have connected to a network, you'll need to make sure your Blackmagic MultiView 16's IP address is different to the other equipment on your network. You can do this using the 'network settings' screen.

To set your Blackmagic MultiView 16's IP address:

- Step 1.** Press the 'menu' button on the front control panel and use the rotary knob to highlight the 'networking' tab on the LCD menu.
- Step 2.** Press the 'set' button to enter the network settings screen.
- Step 3.** Turn the rotary knob to select the "IP address" tab.
- Step 4.** Press the 'set' button to highlight the first field of the IP address. Use the rotary knob to change values.
- Step 5.** Press 'set' to confirm the first field, then repeat the above step for the next three fields. If you need to assign the subnet and gateway address, they can be set using the same method.
- Step 6.** Press the menu button twice to return to the home screen.

Serial Control Settings

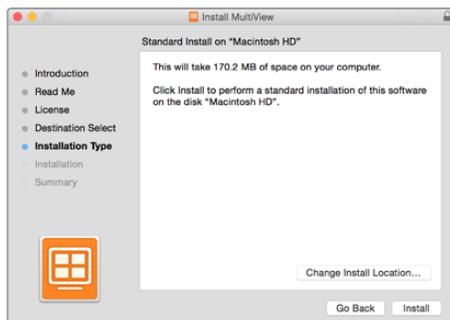
Third party router controllers can control Blackmagic MultiView 16 using the RS-422 serial connection. To set up serial control, connect Blackmagic MultiView 16 to your computer via USB and follow the steps below:

- Step 1.** Launch Blackmagic MultiView 16 setup and select your Blackmagic MultiView 16 by clicking on the product image or the settings icon below it.
- Step 2.** Click on the 'configure' tab and set the "Leitch Protocol" switch to "Leitch Client" if your Blackmagic MultiView 16 is to act as a client of a connected control panel, or "Leitch Server" if your unit is to be controlled from an automation system or third party router control system.
- Step 3.** Click on the 'save' tab to confirm your setting.

10 Using Blackmagic MultiView 16 Setup



To install the Blackmagic MultiView 16 setup, double click the installer and follow the prompts.



Installing Blackmagic MultiView 16 Setup

Blackmagic MultiView Setup runs on 64-bit versions of Windows and on the latest Mavericks and Yosemite versions of Mac OS X.

Windows installation

- Step 1.** Double click the installer file from the supplied media or from your downloads folder if you downloaded the software from the Blackmagic Design website.
- Step 2.** Follow the install prompts and accept the terms in the license agreement and Windows will automatically install the software.

Click the Windows 'start' button and then All Programs>Blackmagic Design>MultiView. The multi view folder contains the Blackmagic MultiView 16 setup application.

Mac OS X installation

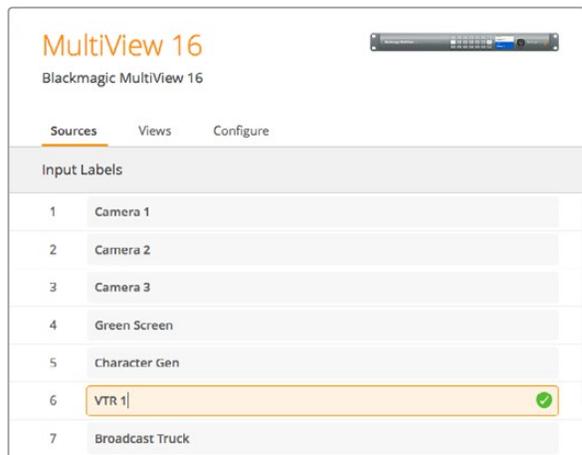
- Step 1:** Double click the installer file from the supplied media or from your downloads folder if you downloaded the software from the Blackmagic Design website.
- Step 2:** Follow the install prompts and Mac OS X will automatically install the software.

A folder called "Blackmagic MultiView" will be created within your applications folder, containing the Blackmagic MultiView 16 setup application.

11 Using Blackmagic MultiView 16 Setup



Blackmagic MultiView Setup lets you change your Blackmagic MultiView 16's settings from a computer when connected via Ethernet or USB.



Use Blackmagic MultiView Setup to customize input labels so you can quickly identify each source within the multi view layout.

Blackmagic MultiView Setup Home Page

The first thing you will see after launching Blackmagic MultiView Setup is the software home page. If you have multiple Blackmagic MultiView 16's connected to your network, you can select them by clicking on the arrows on the left and right side of the home page.

To access settings for your Blackmagic MultiView 16, click on the circular settings icon underneath the product image, or you can click on the image itself.

Changing Settings using Blackmagic MultiView Setup

After you have selected your Blackmagic MultiView 16's settings window from the home page, you will see three tabs named 'sources', 'views' and 'configure'.

- **Sources** - Lets you customize your input labels. This changes how your sources are labelled on your multi view display.
- **Views** - This tab lets you change your output labels, and while these won't be visible on your multi view display, they will be visible within Blackmagic Videohub Control software.
- **Configure** - The 'configure' tab gives you control over settings such as device name customization, video output and overlay settings, plus network settings and serial control adjustments.

Sources

Customizing Input Labels

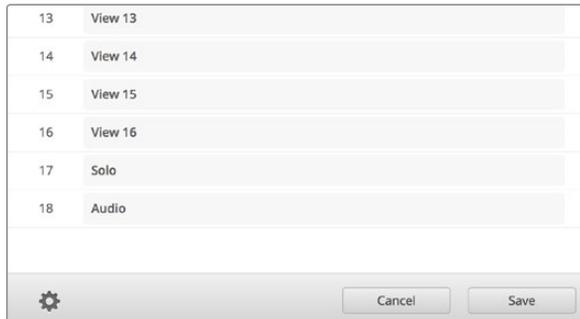
Labeling your sources lets you quickly identify each source within the multi view layout. You can also save and load label sets, so if you regularly use Blackmagic MultiView 16 for different applications, you can quickly load labels without the need to re-enter them.

Labels are visible in the Videohub Control software and also to networked Videohub control panels.

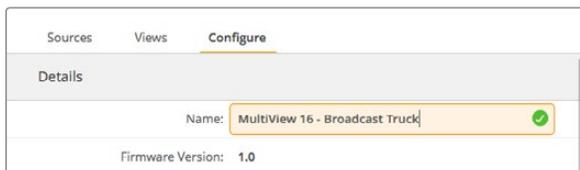
To customize your input labels:

- Step 1.** Click on the 'sources' tab.
- Step 2.** In the 'input labels' setting, click the text box for the input source name you want to change and enter a new label name.
- Step 3.** Click 'save' to confirm your setting.

12 Using Blackmagic MultiView 16 Setup



The inclusion of the "solo" and "audio" output labels lets you change their names so you can customize how they appear when controlling your Blackmagic MultiView 16 using Blackmagic Videohub Control.



Use Blackmagic MultiView 16 setup to name your Blackmagic MultiView 16 so it's easy for network users to identify.

Views

Customizing View Labels

View labels, or 'output labels', can be customized so you can easily identify them when using Blackmagic Videohub Control.

To customize your output labels:

- Step 1.** Click on the 'views' tab.
- Step 2.** In the 'output labels' setting, click the text box for the view you want to change and enter a new label name.
- Step 3.** Click 'save' to confirm your setting.

When the 'view' labels are at their default state, you will notice output 17 is labelled 'solo' and output 18 is labelled 'audio'.

Output 17 lets you change the software label for the 'solo' setting which is controlled using your Blackmagic MultiView 16's front panel. This is beneficial when controlling your MultiView 16 using Blackmagic Videohub Control software. Customizing the 'solo' output label in Blackmagic MultiView Setup lets you change how it appears in Blackmagic Videohub Control.

Output 18 relates to the 'audio in' setting in your Blackmagic MultiView 16's LCD menu, which routes the audio you wish to embed in your multi view output. Similar to the 'solo' output label, you can change the view label so you can customize its appearance when controlling Blackmagic MultiView 16 using Blackmagic Videohub Control.

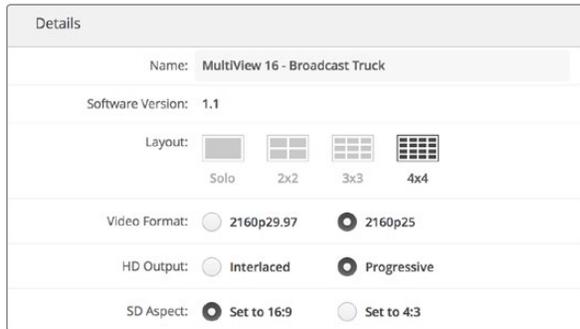
Configure

Naming your Blackmagic MultiView

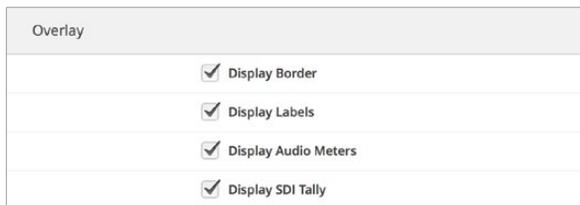
To name your Blackmagic MultiView so it's easy to identify when used remotely:

- Step 1.** Click on the 'configure' tab.
- Step 2.** In the 'details' setting, click the 'name' text box and enter a new label for your Blackmagic MultiView.
- Step 3.** Click 'save'.

13 Using Blackmagic MultiView 16 Setup



In the 'configure' tab you can change the 'details' settings such as the layout of your multi view output, the Ultra HD multi view video format, set the HD multi view to interlaced or progressive, plus change the SD aspect ratio between 4:3 and 16:9 so your SD video source displays correctly.



The overlay settings in the 'configure' tab lets you turn overlay features on or off such as borders, 'view' labels, audio meters and SDI tally borders.

Changing the Multi View Layout

Similar to the 'layout' settings on Blackmagic MultiView 16's control panel LCD menu, you can also change the layout using Blackmagic MultiView Setup. Choose the layout setting you wish to use by clicking on the desired layout icon in the 'details' settings.

Setting the Multi View Video Format

Set your Ultra HD multi view output frame rate by clicking the 2160p29.97 or 2160p25 radio buttons in the 'details' settings.

HD Output Setting

This setting lets you set your Blackmagic MultiView 16's HD-SDI output to interlaced or progressive HD. This gives you maximum compatibility with SDI monitors and equipment.

The frame rate will conform to the 'video format' setting. For example, if 2160p29.97 is selected, the HD output can be either 1080p29.97 or 1080i59.94 depending on whether you have chosen progressive or interlaced. Similarly, when 2160p25 is selected, the HD output can be either 1080p25 or 1080i50.

SD Aspect

If 4:3 SD video is connected to your Blackmagic MultiView 16, check the 'set to 4:3' checkbox. This ensures your 4:3 video displays using the correct aspect ratio.

If 16:9 SD video is connected, check the 'set to 16:9' checkbox to display the image correctly in its view.

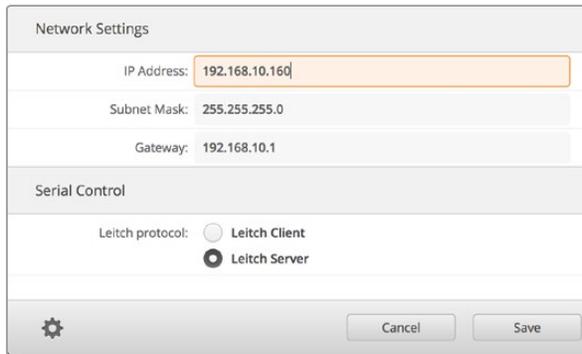
Overlay

The 'border', 'labels', 'audio meters' and 'tally' overlay settings are also available in the front control panel LCD menu. Check the checkboxes in the 'overlay' settings to enable each feature.

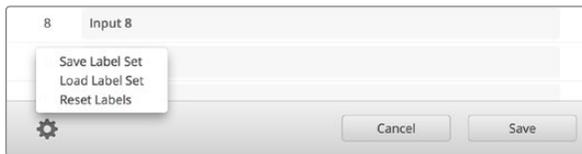
Overlay features are:

- **Borders:** Lets you separate each view in a grid like pattern.
- **Labels:** Makes 'view' labels visible or hidden. Labels can be changed using Blackmagic MultiView Setup.
- **Audio Meters:** Turns audio VU meters on or off for all the views. The first 2 channels embedded in each SDI signal are displayed in each view, which means you can monitor audio levels together with the picture.

14 Using Blackmagic MultiView 16 Setup



When connecting to a network you may need to change your MultiView 16's 'network settings' to suit. 'Serial control' settings lets you set your MultiView 16 for Leitch client or server configuration based on your RS-422 remote control setup requirements.



Use Blackmagic MultiView 16 setup to save and load labels.

- **SDI Tally:** When Blackmagic MultiView 16 has an ATEM switcher's program SDI output connected to input 16, you can view tally borders around a view when its source is switched to air. You can turn this feature on or off using the SDI tally overlay setting.
- For tally to work properly, make sure you connect your Blackmagic MultiView 16's inputs so they match the input numbers on your ATEM switcher or tally may be displayed on the wrong view.

Network and Serial Control Settings

Network and serial control settings can be set using Blackmagic MultiView Setup when your Blackmagic MultiView 16 is connected to your computer via USB. You can also change these settings using the front control panel LCD menu.

To change a setting, simply click in the text box and enter the values with your keyboard, or check the desired checkbox. For configuration information, refer to 'connecting to a network' and 'serial control settings' in the 'settings' section of this manual.

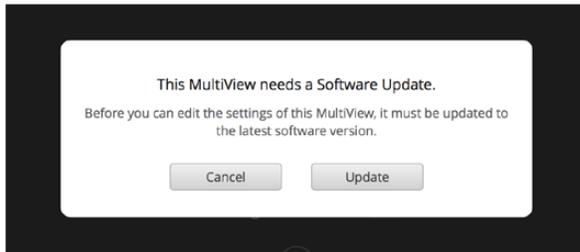
Saving and Loading Label Sets

If you are regularly using a set of labels for a recurring project, you can easily save them to a file and load them later.

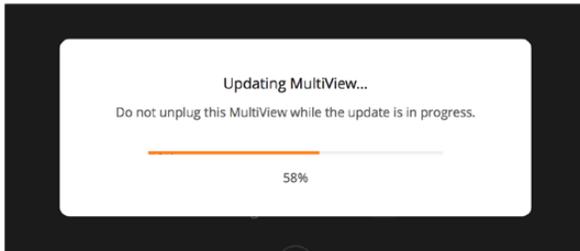
To save your labels, click on the gear icon in Blackmagic MultiView 16 setup to open the 'label set' settings and select "save label set". Choose a location to store the file and click 'save'.

To load your labels, click on the gear icon to open the 'label set' settings and select "load label set". Navigate to your saved label set file and click 'load'.

15 Using Blackmagic MultiView 16 Setup



Click the 'update' button to install new internal software.



Make sure your Blackmagic MultiView 16 is not unplugged while the update is in progress.

Updating the Internal Software

Occasionally, the internal software in your Blackmagic MultiView 16 will need to be updated. Updates to internal software can provide new features, compatibility with new hardware, and support for new formats.

To update your Blackmagic MultiView 16's internal software:

- Step 1:** Connect your Blackmagic MultiView 16 to your computer via USB or Ethernet.
- Step 2:** Launch Blackmagic MultiView 16 setup and it will automatically display any Blackmagic MultiView 16's that are connected to your network.
- Step 3:** Select your Blackmagic MultiView 16 by clicking on the product image or the settings icon below the product name.
- Step 4:** Blackmagic MultiView 16 setup will inform you if an update is required.
- Step 5:** If an update is required, click the 'update' button and allow the software to install. Don't unplug your Blackmagic MultiView 16 while the update is in progress.
- Step 6:** Click the 'close' button when the update is finished.

16 Using Videohub Control Software



You can use Blackmagic Videohub Control to route Blackmagic MultiView 16's sources to different views.



The "solo input" and "audio input" pushbuttons allow you to change the corresponding Blackmagic MultiView 16 settings using Videohub Control.

Controlling Blackmagic MultiView 16 using Blackmagic Videohub Control Software

When you have Blackmagic MultiView 16 connected to a network, you can use Blackmagic Videohub Control on a Mac or Windows computer to route Blackmagic MultiView 16's video inputs to different views within your multi view layout. Your Blackmagic MultiView 16's SDI inputs appear as pushbuttons within the 'sources' panel, while the views appear as pushbuttons within the 'destinations' panel. The Videohub Control application is part of the Videohub software installer which can be downloaded from the Blackmagic Design support center at www.blackmagicdesign.com/support.

Select your MultiView 16

After launching the Videohub Control software, click on the gear icon to open the 'settings' pop up menu, and choose "select Videohub". Select your Blackmagic MultiView 16's name from the list of connected devices. If your inputs are labelled, the names you assigned will appear within the Videohub Control software. If they are not labelled they will display as Input 1, Input 2, Input 3, etc.

Viewing your Inputs

To see which of your Blackmagic MultiView 16's video inputs is routed to a particular view, click a view pushbutton in the destinations panel. The destination, or view, button will illuminate. In the 'sources' panel, the pushbutton of the routed video input will also illuminate, making it clear which input, or source, is routed to the view.

Routing Inputs to Views

To route a video input to a view, click a view pushbutton from the destination panel, then click an input pushbutton in the sources panel to immediately route that input to the view.

Solo Input

Use the "solo input" pushbutton to determine which input is displayed full screen when the "solo" button is enabled on the Blackmagic MultiView 16's front panel. Simply click on the "solo input" pushbutton in the Videohub Control destinations panel, then click an input pushbutton in the sources panel.

Audio Input

Use the "audio input" pushbutton to determine which SDI input's audio is routed to the multi view output. Simply click on the "audio input" pushbutton in the Videohub Control destinations panel, then click an input pushbutton in the sources panel to immediately route that input's audio to the multi view output.

Legend

↵ line feed
 ... and so on

Version 2.3 of the Blackmagic Videohub Ethernet Protocol was released with Videohub 4.9.1 software.

Blackmagic Videohub Ethernet Protocol v2.3

Summary

Blackmagic MultiView 16 is compatible with the Blackmagic Videohub Ethernet Protocol. It is text based and is accessed by connecting to your Blackmagic MultiView 16's IP address and TCP port 9990.

The multi view 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.

Lines sent to the Blackmagic MultiView 16 can be terminated with line feed, carriage return or both.

Upon connection, the multi view sends a complete dump of the state of the device. After the initial status dump, status updates are sent every time the multi view 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 the multi view is always the protocol preamble:

```
PROTOCOL PREAMBLE:↵↵
Version: 2.3↵↵
↵
```

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 Blackmagic MultiView 16 device. If a device is connected, the multi view will report the attributes of the Blackmagic MultiView 16:

```
MULTIVIEW DEVICE:↵↵
Device present: true↵↵
Model name: Blackmagic MultiView 16↵↵
Video inputs: 16↵↵
Friendly name:
Unique ID:
Video processing units: 0↵↵
Video outputs: 16↵↵
Video monitoring outputs: 0↵↵
Serial Ports:
↵
```

This example is for the Blackmagic MultiView 16 which has 16 sources and 18 views including solo which is view 16 and audio which is view 17, referred to here as outputs.

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Initial Status Dump

The next two blocks enumerate the labels assigned to the input and output ports.

```
INPUT LABELS:↵
0 VTR 1↵
1 VTR 2↵
...
↵

OUTPUT LABELS:↵
0 Output feed 1↵
1 Output feed 2↵
...
↵
```

Note: Input and Output labels are always numbered starting at zero in the protocol which matches port one on the chassis.

The next three blocks describe the routing of the view ports.

```
VIDEO OUTPUT ROUTING:↵
0 5↵
1 3↵
...
↵
```

The next block describes the locking status of the views. Each port has a lock status of "O" for ports that are owned by the current client (i.e., locked from the same IP address), "L" for ports that are locked from a different client, or "U" for unlocked.

```
VIDEO OUTPUT LOCKS:↵
0 U↵
1 U↵
...
↵
```

The last block is the configuration block.

```
Layout: SOLO or 2x2 or 3x3 or 4x4
Output format: 50i or 50p or 60i or 60p
Solo enabled: True or False
Widescreen SD enable: True or False
Display border: True or False
Display labels: True or False
Display audio meters: True or False
Display SDI tally: True or False
```

Status Updates

When any route, label, or lock is changed on the multi view by any client, the multi view resends the applicable status block, containing only the items that have changed.

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

```
OUTPUT LABELS:↵
7 New output 8 label↵
10 New output 11 label↵
↵
```

Requesting Changes

To update a label, lock or route, the client should send a block of the same form the multi view sends when its status changes. For example, to change the route of output port 8 to input port 3, the client should send the following block:

```
VIDEO OUTPUT ROUTING:↵
7 2↵
↵
```

The block must be terminated by a blank line. On receipt of a blank line, the multi view 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 the MultiView 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 label change is as follows:

```
OUTPUT LABELS:↵
6 new output label seven↵
↵
ACK↵
↵
OUTPUT LABELS:↵
6 new output label seven↵
↵
```

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 the MultiView and use only these to update its local representation of the server state.

Requesting a Status Dump

The client may request that the MultiView 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 the MultiView resend the output labels:

```
OUTPUT LABELS:↵
↵
ACK↵
↵
OUTPUT LABELS:↵
0 output label 1↵
1 output label 2↵
2 output label 3↵
...
↵
```

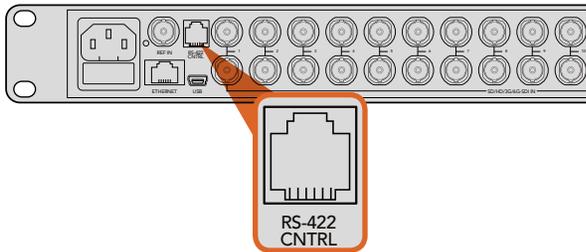
Checking the Connection

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

```
PING:↵
↵
```

If the MultiView is responding, it will respond with an ACK message as for any other recognized command.

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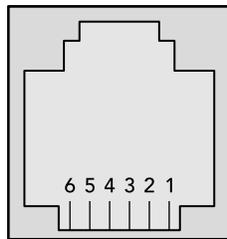


The RS-422 serial port lets you control Blackmagic MultiView 16 from third party routers and automation systems. The connector is an RJ11 connector, the same used in many landline telephone connections. By modifying an RS-422 to USB adapter cable terminated with an RJ11 connector, you can control Blackmagic MultiView 16 using external controllers via USB.



An RS-422 to USB adapter cable and RJ11 connector can be purchased from electronics stores such as Digi-Key.com. Refer to the pinout diagram below for help wiring the RJ11 connector to the adapter cable.

Pin No.	Function
Pin 1	TX +
Pin 2	TX -
Pin 3	GND
Pin 4	GND
Pin 5	RX -
Pin 6	RX +



Pinout diagram for the RJ11 connector.

Blackmagic MultiView 16 RS-422 Protocol

General

The RS-422 protocol can be used to control Blackmagic MultiView 16 as a slave device from third party routers and automation systems.

The "Leitch Server" mode implements the router (server) side of the Leitch Serial Pass Through Protocol as specified in section 4 of Leitch document SPR-MAN revision D. In "Leitch Client" mode, the Blackmagic MultiView 16 implements the controller (client) side of the Leitch terminal protocol. Set the desired leitch mode in the 'configure' settings in the Blackmagic MultiView Setup software.

This document describes the commands and parameters in the protocol that are relevant and supported by Blackmagic MultiView 16. Other commands and parameters specified in the Leitch protocol are accepted but ignored.

The RS-422 serial port is configured as 9600 N81:

9600 is the line speed, or baud rate, at 9600 bits/sec.

N represents no parity check, or 'none'.

8 is the data length.

1 is for stop bits.

To summarize N81, data without a parity check begins with 1 start bit, includes 8 true data bits, and 1 stop bit. There are 10 bits in total.

The protocol is line oriented, with a maximum length of 250 characters per command. Each command from the client should be terminated with a carriage return (\r). Each response from the server will be terminated with a carriage return and line feed (\r\n).

Sources, destinations and levels are always specified in base-16, numbered from zero. Levels are always between 0 and 15 ("F"). Blackmagic MultiView 16 only has one valid level - level zero.

On connecting to the serial port, the client should send a carriage return. Blackmagic MultiView 16 will respond with a > character prompt, which is not followed by a carriage return or line feed. Receiving the prompt indicates that a connection has been established. The same prompt will be issued after each command received by the MultiView.

In the following documentation, commands in orange and values in blue must be typed literally, including any spaces. In the following example of an immediate command using destination port 7 and source port 3, @ X:0/destination,source would be entered as: @ X:0/6,2

Notifications

Once connected, if status reporting is enabled, the client will receive a notification message when a route changes on the MultiView. The notifications take one of two forms:

`S:0destination,source` Routing change

This message indicates that the specified source port is now routed to the specified destination.

`V:0destination,source` Preset routing notification

This message indicates that the current preset includes a route from the specified source to the specified destination.

Global Commands

All pass through commands are preceded by an @ symbol and a space.

The following client commands are supported:

@ ! disable status reporting
 Status reporting is disabled by default.

@ ? enable status reporting
 Status reporting is enabled.

@ Z: reset routing table

Routing is reset so that the first source is routed to all destinations.

Immediate Commands

@ X:0/destination,source change route

@ X:0/destination,source/destination-2,source-2... change multiple routes
 The specified source ports are routed to the specified destinations.
 Any routing changes will trigger S: notifications

@ X?0destination request individual route status
 The source routed to the specified destination will be returned as an S: notification.

@ S?0 request all ports route status
 Each source and destination port pair will be returned as S: notifications

Salvo Commands

@ P:0/destination,source queue route change

@ P:0/destination,source/destination-2,source-2... queue multiple route changes
The specified routing changes are added to the current salvo for later execution.

@ P?0destination request individual port status in salvo
If a routing change for the specified destination port is queued, the route will be returned as a V: notification.

@ V?0 request all ports status in salvo
Each queued routing change in the salvo is reported as a V: notification.

@ B:C clear salvo

@ B:R clear salvo
Any queued changes are discarded and the salvo is reset.

@ B:E execute salvo
Any queued changes are executed and each routing change will be returned as an S: notification.

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 MultiView 16.

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 to email a support request. Alternatively, click on the "find your local support team" button and call your nearest Blackmagic Design support office.

Checking the version currently installed

To check which version of Blackmagic MultiView 16 is installed on your computer, open the Blackmagic MultiView application. From the "Blackmagic MultiView" menu, select "About MultiView" and note the version number.

How to get the latest updates

After checking the version of your Blackmagic MultiView 16 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.

25 Warnings



Caution label

Caution: Risk of Electric Shock

Any devices that connect to the data ports must comply with clause 4.7 of AS/NZS 60950.1.

Limited Warranty

Blackmagic Design warrants that Blackmagic MultiView 16 will be free from defects in materials and workmanship for a period of 36 months from the date of purchase excluding connectors, cables, cooling fans, fiber optic modules, fuses, keyboards and batteries which 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 changes, 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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