

# Blackmagic Studio Converter

Blackmagic Studio Converter provides a fast, simplified SMPTE fiber style setup with Blackmagic Studio Camera 4K Pro. This means you can use one single Ethernet cable to power the studio camera and supply all video and audio feeds, including talkback, tally and camera control.

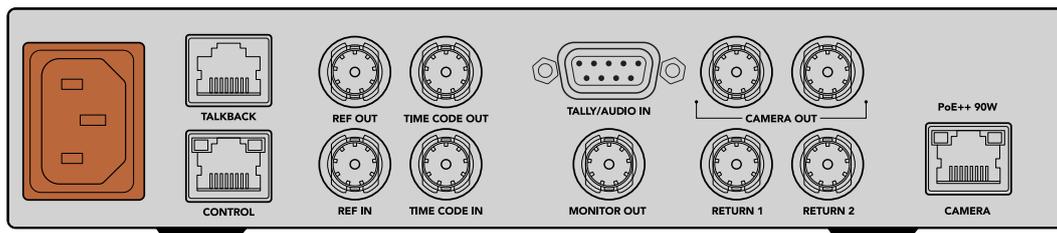


## Getting Started with Blackmagic Studio Converter

To get started, all you need to do is connect Blackmagic Studio Converter to power, connect to a Blackmagic Studio Camera 4K Pro via Ethernet and then connect to an ATEM switcher.

### Plugging in Power

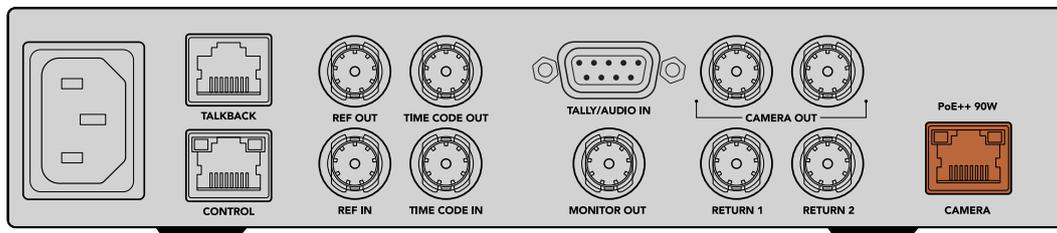
Plug a standard IEC power cable into the power connector on your Blackmagic Studio Converter's rear panel.



Connect power to your Blackmagic Studio Converter via a standard IEC power cable

### Connecting your Camera

Connect one end of a standard CAT 6 network cable to the 'camera' Ethernet port on the rear panel of your Blackmagic Studio Converter and the other end to the Blackmagic Studio Camera 4K Pro. In general, a CAT 6 cable will work fine, however, for longer cable runs we recommend a well shielded CAT 6A S/FTP cable.



The Ethernet connector locks securely to each unit ensuring that the cable is not accidentally disconnected during broadcast.

With the Blackmagic Studio Camera power switch set to the 'on' position, Blackmagic Studio Converter will detect the camera and power the unit instantly. Establishing video will take

approximately 20-30 seconds. When video is confirmed, the image will appear with a 'standby' indicator to let you know the studio camera is standing by and ready to go to air.



When power and video is connected, the PoE indicator will illuminate green, followed soon after by the video image and 'standby' indicator

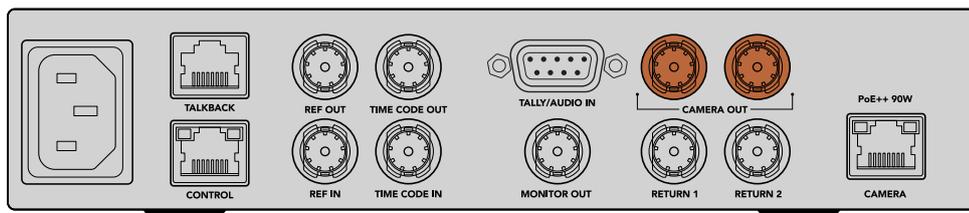
The studio camera image will now appear on your Blackmagic Studio Converter's LCD. You can see the video format your camera is set to and the audio meters will display the strength of the audio signal.

### Connecting to an ATEM Switcher

The next step is to connect your Blackmagic Studio Converter to an ATEM switcher.

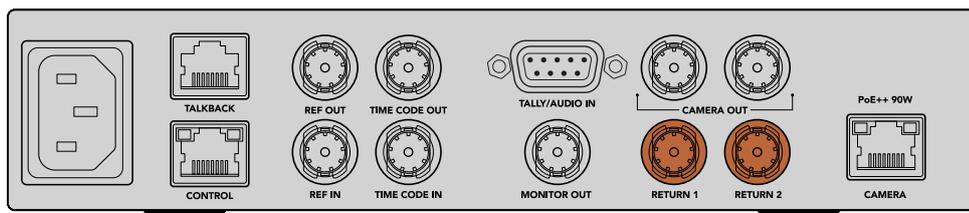
- 1 Connect a BNC cable from one of your Blackmagic Studio Converter's 'camera out' SDI connectors to one of the ATEM switcher's SDI inputs.

Both camera outputs are exactly the same so it doesn't matter which one you use. Two are provided in case you want to send the camera signal to other video equipment, for example ISO recording on a HyperDeck.



Plug one of Blackmagic Studio Converter's camera SDI outputs into any of the ATEM switcher's SDI inputs

- 2 Connect a BNC cable from your ATEM switcher's program return output to the 'return 1' BNC input on the studio converter's rear panel.



Plug return sources into the 'return' inputs

- 3 If you require any other return feeds to be sent to your camera such as a teleprompter feed, an ISO feed from another camera, graphics or any other signal then plug this feed into 'return 2'.

You don't need to plug in audio cables as audio is embedded in the SDI video signal.

**TIP** SDI based ATEM switchers have many SDI outputs, however, if you need more you can run the program return feed from the switcher through an optional Teranex Mini SDI Distribution 12G or a Smart Videohub.

## Checking the Return Feeds

Press the return 1 and return 2 buttons to monitor the return feeds. Press the 'cam' button to monitor the camera image.



Press the camera, return 1 and return 2 buttons to check the camera signal and return feeds

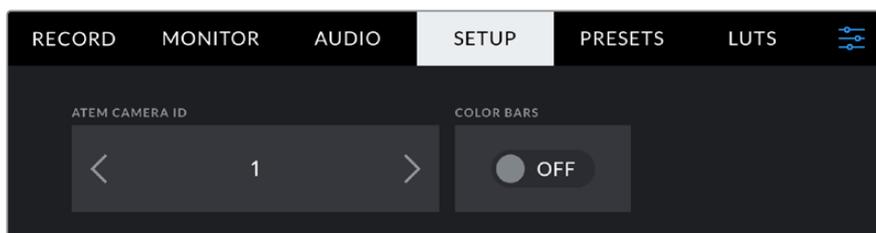
## Confirming Program Return on Blackmagic Studio Camera

Press and hold the program button on the Blackmagic Studio Camera. You should now see the video that is connected to Blackmagic Studio Converter's return 1 input displayed on the studio camera's viewfinder. Release the program button to return to the live camera image.

## Setting the ATEM Camera ID on Blackmagic Studio Camera

The ATEM camera ID is a setting in your camera's menu settings that determines which SDI input your studio camera is connected to on the ATEM switcher. When the camera ID corresponds to the switcher's input number, your camera will detect tally data for that input and the tally light will work correctly on your camera.

For more information on changing the ATEM camera ID, refer to the 'menu settings' section.



Change the ATEM camera ID using your studio camera's 'setup' settings

## Checking the Return 2 Feed

Blackmagic Studio Camera will output the return 2 source via its HDMI connector. For example, you could connect a teleprompter feed, a scorecard, or a pre-keyed video feed that is being fed up from the Blackmagic Studio Converter. This can be used for presenters, or crew to view on set on a large screen TV.

## Checking Talkback

When using an ATEM switcher with built in talkback, the talkback audio is embedded in channels 15 and 16 of the SDI signal and carried over the Ethernet cable to your camera.

With headsets connected to the camera and the ATEM switcher, check that the camera operator can communicate with the switcher operator.

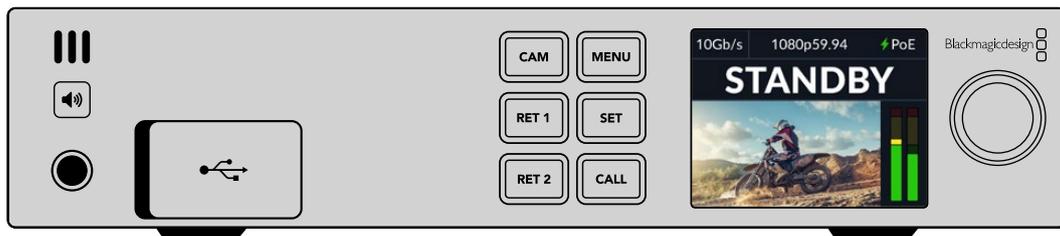
That's all there is to getting started and you are now ready to start your live production!

The next section of the manual will describe the additional connectors and how to use the front panel.

## Connectors

This section contains information on each of Blackmagic Studio Converter's front and rear panel connectors.

### Front Panel



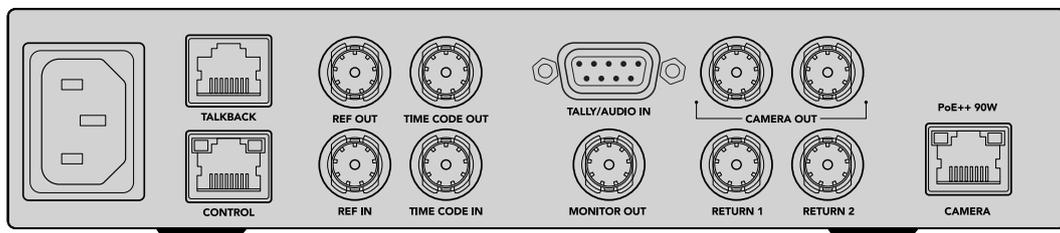
### Headphones

Plug a set of headphones into the audio jack to monitor audio via headphones.

### USB

Plug your Blackmagic Studio Converter into a computer via the USB port to update the internal software. Pull back the rubber dust cap to access the USB port.

### Rear Panel



### Talkback

If you need to plug in a third party analog talkback system, you can connect via the 'talkback' RJ-45 connector on the rear panel. Use the menu settings to change the talkback source setting between embedded SDI and analog talkback.

### Control

This connector is not enabled in this software release.

## Reference and Timecode

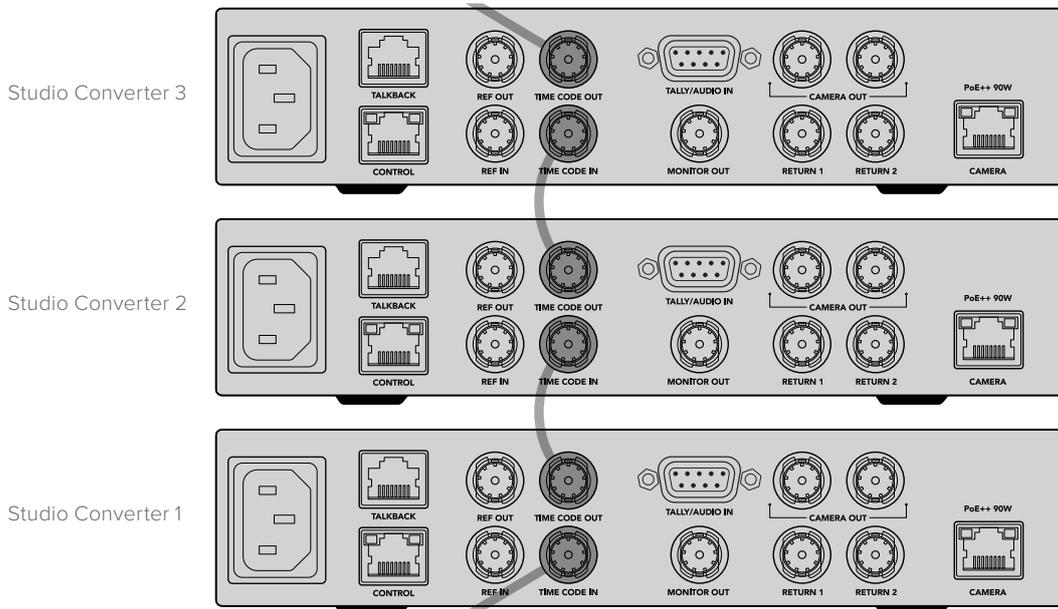
The reference and timecode connectors let you plug in timecode and reference from external sources, or send external timecode and reference to other video equipment.

Traditional broadcast equipment often uses analog timecode and reference signals for syncing all the devices. While Blackmagic Studio Cameras and Blackmagic Studio Converter use reference and timecode embedded in the signal coming from the ATEM switcher, you can also use a more traditional analog signal for referencing your camera or for inserting timecode.

This also means that if you are not connecting to a switcher at all and are operating in a multicam environment where you may not have a switcher connected to the 'Ret 1' SDI input, you can still sync all your cameras and make sure their timecode matches.

## Looping Timecode and Reference

The reference out and timecode out connectors provide an analog loop through so if you have multiple Blackmagic Studio Converters in a rack together you can just run a single analog reference or timecode signal into the first unit and then loop through to each subsequent converter to make sure they are all synced to the same analog reference or timecode source.



# Using the Front Panel

When using Blackmagic Studio Converter, any information you need to know is displayed on the unit itself via the built in LCD. Information displayed includes the image for the studio camera, return 1 or return 2, audio meters, Ethernet connection status, current power source, video format and timecode, plus on air status and camera name.

## Camera Connection Status

Indicates whether the camera is powered via Ethernet or locally, plus the status of the Ethernet connection.

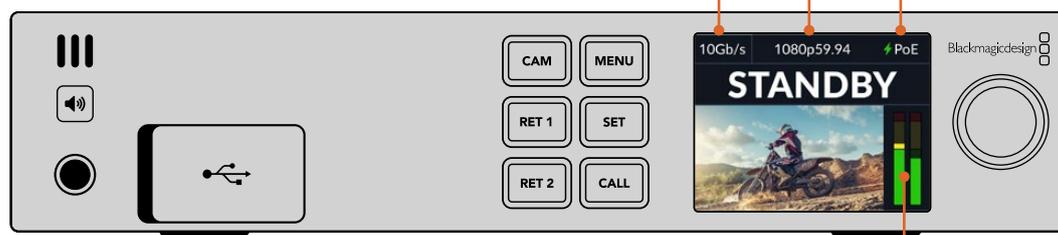
-  - Connection established with power and video.
-  - Camera powered locally with video connection established.
-  - Camera not powered and video not connected via Ethernet.

## Video Format

Indicates the video format currently being viewed on the LCD.

## Ethernet Connection Type

The Ethernet connection type shows you the speed of the link that you are connected at, for example 10Gb/s or 1Gb/s.



## Audio Meters

Displays the audio levels of the selected source.

## Camera and Return Buttons

When you select a source, its image is displayed on the LCD and the levels for embedded audio will be shown on the audio meters.

## Speaker Button

Check the camera audio or any audio embedded in each return feed using the built in speaker or by plugging in headphones. To listen, press and hold the speaker button and rotate the settings dial to adjust the volume. A volume indicator will appear on the LCD home screen. Release the button to mute the speaker.

Double press the speaker button to keep the speaker enabled. Press again to disable.

**TIP** If you are using multiple studio converters in a multi camera setup, the speaker button is a helpful way to quickly confirm the audio from each camera.

## Call Button

Holding down the 'call' button will flash the tally light on the studio camera. This lets you seek the camera operators' attention, or to let your operators know you are about to go live.

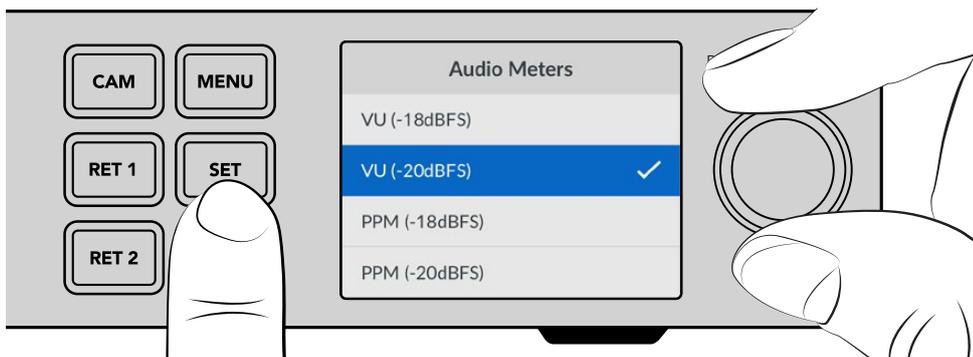
# Menu Settings

All the settings for your Blackmagic Studio Converter are available in the LCD menu. To change a setting:

- 1 Press the 'menu' button to open the settings menu.



- 2 Rotate the settings dial to select the desired menu page and press the 'set' button to confirm.



- 3 Rotate the settings dial to select the settings you want to change and press 'set' to confirm the change.

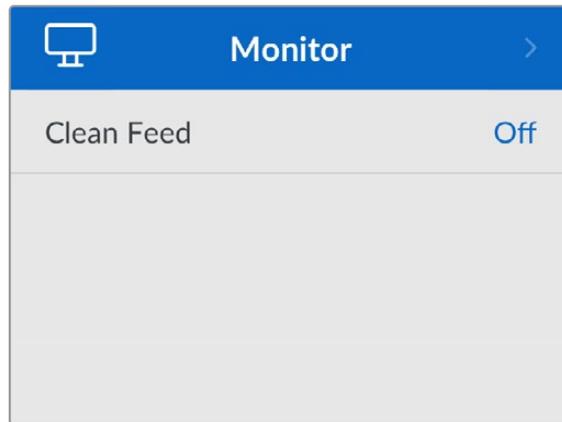
Your new settings are now applied. Press the 'menu' button to step back through the menu and return to the home screen.

The next section of the manual describes each setting.

## Monitor

### Clean Feed - On/Off

Setting clean feed to 'on' will remove the status text from the monitor output so only the source image is visible, for example the camera image or return feeds. For more information on the monitor output, refer to the 'using the monitor output' section later in this manual.



## Audio

### Audio Meters

To change the meter type, open the audio meters setting and select your preferred audio meter display from the options. You can select between PPM and VU meters.



### Headphone and Speaker Level

In addition to holding the speaker button down on the front panel and rotating the settings knob, you can also adjust the speaker and headphones volume via the headphone and speaker level setting. The default level is 50%.

### Program Audio

Set the program audio to SDI or analog.

**SDI** - Uses the program audio from the SDI return feed plugged into the return 1 BNC connector.

**Analog** - Uses analog audio connected to the DE-9 serial connector. For example, you could take an analog feed off a sound desk or a version of the audio with a different language commentary mixed on top of the program audio.

### Talkback Source

Set the talkback source to SDI or analog.

**SDI** - Uses the talkback embedded in the SDI program return feed plugged into the return 1 BNC connector. Select this setting when connected to an ATEM switcher with talkback embedded in the video feed.

**Analog** - Uses analog talkback audio connected to the 'talkback' RJ-45 connector. The analog setting is what you will want to use if you are integrating a third party talkback system, for example ClearCom, RTS or Reidel.

## Setup

Setup	
Name	Studio Converter
Language	English
Software	Version 1.1
Front Panel	Light Appearance
Ethernet Power	On
Tally	
Source	SDI
Analog Tally Type	Contact Closure
Network	
Protocol	Static IP
IP Address	192.168.24.100
Subnet Mask	255.255.255.0
Gateway	192.168.24.1
Timecode	
Input	SDI
Reset	
Factory Reset	

### Name

Displays the name of your Blackmagic Studio Converter.

### Language

Blackmagic Studio Converter supports multiple languages, including English, Chinese, Japanese, Korean, Spanish, German, French, Russian, Italian, Portuguese, Turkish, Ukrainian and Polish.

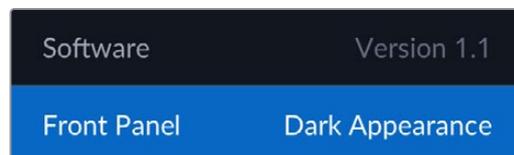
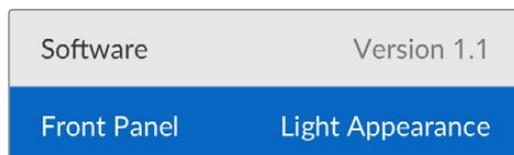
To select the language, open the setup menu and scroll down using the settings knob. Press 'set' to confirm. Once selected you will automatically return to the setup menu.

### Software

Displays the current software version for your Blackmagic Studio Converter.

### Front Panel

Set your Blackmagic Studio Converter's front panel to 'light' mode for a brightly illuminated LCD. Use 'dark' mode for dimly lit environments where a bright LCD may be distracting, for example multiple studio converter units mounted in a rack in a production facility.



### Ethernet Power

Allows you to switch Ethernet power to your studio camera on or off.

As the quality of Ethernet cables can vary over long cable runs, setting Ethernet power to 'off' and powering your camera locally can increase performance over longer distances. The default setting is 'on'.

## Tally Settings

### Source

Select SDI for embedded tally from an ATEM switcher, or 'analog' for third party tally systems connected via the DE-9 serial connector.

### Analog Tally Type

Set the analog type to contact closure or voltage depending on the third party tally system connected via the DE-9 serial connector.

Tally	
Source	SDI
Analog Tally Type	Contact Closure

## Timecode Settings

### Input

There are three timecode input options available.

**Auto** - When set to 'auto' the camera will automatically lock to the external timecode signal being sent via the return 1 SDI input. If an analog timecode signal is also connected to Blackmagic Studio Converters timecode input BNC, it will over override the timecode signal sent via the return 1 SDI input.

**Analog** - Select analog to manually use analog timecode input.

**SDI** - Select SDI to manually use return 1 SDI input for your timecode source.

Timecode	
Input	SDI

## Reset

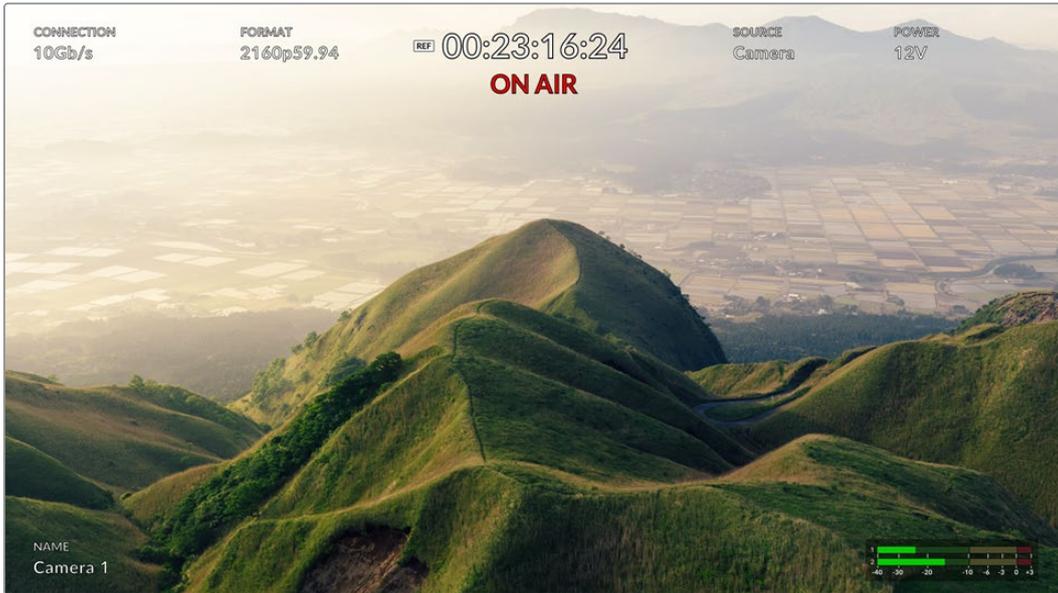
Reset	
Factory Reset	↺

### Factory Reset

'Factory reset' restores your Blackmagic Studio Converter to its factory default settings. Press 'set' and confirm the setting when prompted.

# Using the Monitor Output

The monitor output is a fast way to visually check the camera image, plus return 1 and 2, with overlays displaying important information such as the Ethernet connection type, video format and frame rate, camera timecode, input source, on air status, PoE status, camera name and audio levels.



Below is a description of the information displayed.

**Connection** - Displays the current Ethernet connection type.

**Format** - Displays the video format of the current source you are viewing.

**Reference Icon** - Appears when an analog external reference signal is connected.

**Timecode** - Camera timecode.

**Status** - Displays when the camera has been switched to the program or preview output on an ATEM switcher.

**Source** - Displays the current source you are viewing, for example camera, return 1 or return 2.

**Camera Power** - Displays 12 V when the camera is powered locally, or PoE when powered over Ethernet.

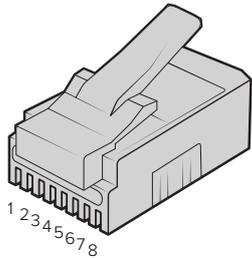
**Name** - Displays the ATEM Camera ID of the connected camera.

**Audio Meters** - Displays the audio meters relevant to the source you are viewing.

# Adapter Cables for Talkback and Tally

## Talkback Pin Connections

The 'talkback' connector on the back panel of Blackmagic Studio Converter is for routing engineering talkback and production talkback. You can make an adapter cable with an RJ45 connector using this pinout diagram.



Eng TX+	Eng TX-	Prod TX+	Prod RX+	Prod RX-	Prod TX-	Eng RX+	Eng RX-
1	2	3	4	5	6	7	8

RJ45 pinout for 'talkback' connector on the back panel of Blackmagic Studio Converter.

## DB-9 Tally / Audio in connector pinout diagram

The DB-9 tally connector lets you connect to third party tally systems. A pin out diagram is provided below if you need to build a custom cable.

External view	Pin	Signal
	1	PGM Audio in Ch 1 +
	2	PGM Audio in Ch 1 -
	3	PGM Audio in Ch 2 +
	4	PGM Audio in Ch 2 -
	5	PGM Audio GND
	6	Green tally on/off
	7	Green tally ground
	8	Red tally on/off
	9	Red tally ground