



---

# Wirecast 7.3 User Guide for Mac

---



# Contents

## Preface 9

Copyright and Trademark Notice	9
MPEG-2 License Requirements	9
Customer Support	10
We'd Like to Hear from You!	10
Limited Warranty and Disclaimers	10
Warranty Remedies	10
Software Updates	11
Restrictions and Conditions of Limited Warranty	11
Limitations of Warranties	11

## Introduction 13

Introduction	13
Topics	13
Editions and Options	13
Editions	13
Options	14
Wirecast Workflow	14
Tutorials	16
Two Ways to Use this Application	16
Presenter Is Operator	17
Presenter Plus Operator	17
Startup	18
Using AutoLive	18
Main Window Layout	19
Preview	21
Master Audio	22
Main Shot List	23
Control/Status Bar	23
Layers	25
Layer Windows	25

## Installation 27

- Introduction 27
  - Topics 27
- Installing 27
- Activating 28
- Uninstalling 29
- System Requirements 29

## Tutorials 31

- Introduction 31
  - Tutorials 31
- Tutorial 1: Basic Concepts 32
  - Tutorial Prep 32
  - The Main Window 33
    - What Is a Shot? 33
    - Switching Between Shots 34
  - Transitions 35
    - Transition Speed 36
    - Go Button 36
  - Layers 37
  - Auto Live 38
    - Turn AutoLive Off 39
    - Multiple Changes 40
  - Preview 40
- Tutorial 2: Editing Shots 43
- Tutorial 3: Broadcasting 45
  - Streaming 45

## Main Window 49

- Introduction 49
  - Topics 49
- Overview 49
- Control/Status Bar 50
- Preview/Live Broadcast Area 51
- Countdown Clock Display 52
- Transition Controls 53
  - Changing Transitions 53
  - Transition Speed 54
  - Go Button 54
  - Transition Editing 54
- Source Input Menu 55
- Shot Selection Area 64
  - Changing Shots 65
  - Moving a Shot to Another Layer 67
  - Resizing the Shot Icons 67



Layers	68
What is a Layer?	68
Changing Layers	69
Moving a Shot to Another Layer	69
AutoLive	69
Live Icons	70

## Keyboard Shortcuts 71

Introduction	71
General Shortcuts	71
Wirecast Menu	71
File Menu	72
Edit Menu	72
Switch Menu	72
Media Menu	72
Output Menu	72
Layout Menu	72
Replay Menu	72
Twitter Menu	72
Window Menu	72
Help Menu	72

## Adding Media 75

Introduction	75
Topics	75
Images/Opacity	75
GIF and Transparency	75
Keynote Movies	76
Using Movies	76
Windows Media	76
Real Media	76
Supported Codecs	76

## Shot Editor 79

Introduction	79
Topics	79
Overview	80
Shot Layers Tab	81
Shot Layer Properties Tab	83
Audio Properties Tab	85
Chroma Key Properties Tab	85
Build-in/Build-out Properties Tab	86
Additional Properties Tab	87
Capture Devices Properties	87
Screen Capture Properties	88

Image Carousel Properties	89
Web Stream Properties	90
Wirecast Cam Properties	93
Solid Color Properties	94
Text Shot Properties	95
Remote Desktop Presenter Properties	97
Scoreboard Properties	98
Web Display Properties	100
Media File Properties	101
Titles Properties	102
New Virtual Set Properties	105
Twitter Feed Properties	107

## **Playlist 111**

Introduction	111
Topics	111
Creating a Playlist	112
Adding Clips	113
Playing Playlists	116
Playlist Controls	116
Countdown Clock Options	118

## **Twitter 121**

Introduction	121
Topics	121
Message Feed	121
Create Shot	123
Settings	123

## **Replay + ISO 125**

Introduction	125
Topics	125
Replay + ISO Menu	126
Configuring Replay	128
Replay Activation	129

## **Preferences 133**

Introduction	133
Topics	133
Accessing Preferences	133
Resetting Preferences	134
General	135
Performance	136
Licenses	136

- Serial Numbers 137
- Manual Activation 137
- Deactivate Serial Numbers 137
- Demonstration Mode 138
- Software Update 138
- Hot Keys 138
- Advanced 140

## **Audio Mixer 143**

- Introduction 143
- Topics 143
- Overview 143

## **Asset Manager 149**

- Introduction 149
- Topics 149
- Documents 149
- Reassigning Media 149

## **Menus and Windows 151**

- Introduction 151
- Topics 151
- Wirecast Menu 151
- File Menu 152
- Edit Menu 152
- Switch Menu 153
- Media Menu 154
- Output Menu 154
- Layout Menu 156
- Replay + ISO Menu 157
- Twitter Menu 159
- Window Menu 159
- Help Menu 160

## **Broadcasting 163**

- Introduction 163
- Topics 163
- Canvas Size 164
- Virtual Camera 165
- Output Settings 166
- Multiple Output Settings 167
- Configuration 167
- Encoder Presets 168
- Multicast and Unicast 171

Flash RTMP Server 172

CDN Partners 173

Flash To Bambuser, Churchstreaming.tv, Dailymotion, DaCast Streaming Services, Lightcast, make.tv, Meridix Live Sports Network, Onstream media, Streaming-church, Streamshark.io, Streamspot, Streaming Media Hosting, StreamVu, Stretch Internet, Sunday Streams, The cube, Titled globe, Tulix Streaming, Us-stream 173

Flash To Azure Media Services, Brightcove, Limelight, Sermon.net, Verizon Digital Media Services. 175

Flash To Akamai 176

Flash To TwitchTV 177

Flash To Wowza Streaming Engine. 178

Flash To Zixi 179

Flash To Facebook 180

Flash To YouTube 182

Streaming 187

Record To Disk 188

## Encoder Presets 191

Introduction 191

Topics 191

The Encoder Presets Window 192

Creating New Presets 193

Profile Options 193

MainConcept H.264 194

x264 197

## Making Great Broadcasts 201

Introduction 201

Topics 201

Overview 201

High Quality Audio 202

Good Lighting 202

Triangular Lighting 203

Broadcast Settings 204

Bandwidth 204

Motion 204

Encoder Settings 204

## Acknowledgments 205

Acknowledgments 205

Overview 205

Steinberg VST Plug-In SDK Licensing Agreement  
(Version "3.6.6- 17.06.2016") 205

FFmpeg Project 207

# Preface

## Copyright and Trademark Notice

Copyright 2017 Telestream, LLC. All rights reserved. No part of this publication may be reproduced, transmitted, transcribed, altered, or translated into any languages without written permission of Telestream, LLC. Information and specifications in this document are subject to change without notice and do not represent a commitment on the part of Telestream.

Telestream, CaptionMaker, Episode, Flip4Mac, FlipFactory, Flip Player, Lightspeed, ScreenFlow, Switch, Vantage, Wirecast, Gameshow, GraphicsFactory, MetaFlip, and Split-and-Stitch are registered trademarks and MacCaption, e-Captioning, Pipeline, Post Producer, Tempo, TrafficManager, and VOD Producer are trademarks of Telestream, LLC. All other trademarks are the property of their respective owners.

QuickTime, Mac OS X, Final Cut Pro, and Safari are trademarks of Apple, Inc. Bonjour, the Bonjour logo, and the Bonjour symbol are trademarks of Apple, Inc.



All other brand, product, and company names are property of their respective owners, and are used only for identification purposes.

## MPEG-2 License Requirements

Telestream has obtained a license from MPEG LA, to produce MPEG-2 video, to meet the following requirement on behalf of its FlipFactory and Pipeline licensees: The use of this product in any manner that complies with the MPEG-2 standard is expressly prohibited without a license under applicable patents in the MPEG-2 patent portfolio, which license is available from MPEG LA, L.L.C., 250 Steele Street, Suite 300, Denver, Colorado 80206.

## Customer Support

Telestream offers technical support through our Website and Email.

Email contacts:

- Sales: [sales@telestream.net](mailto:sales@telestream.net)
- Support: [desktopsupport@telestream.net](mailto:desktopsupport@telestream.net)

Website Links:

- How to Buy: <http://www.telestream.net/purchase/store.htm>
- Support: <http://www.telestream.net/telestream-support/wire-cast/support.htm>

## We'd Like to Hear from You!

Telestream welcomes comments, feedback, and suggestions about your experience with Wirecast. You can reach us at [support@telestream.net](mailto:support@telestream.net).

If you have suggestions about improving the tutorials or this guide, other Telestream documents, or our Website, please Email us at [techwriter@telestream.net](mailto:techwriter@telestream.net).

## Limited Warranty and Disclaimers

Telestream, LLC. (the Company) warrants to the original registered end user that the product will perform as stated below for a period of one (1) year from the date of shipment from factory:

**Hardware and Media.** The Product hardware components, including equipment supplied but not manufactured by the Company but NOT including any third party equipment that has been substituted by the Distributor for such equipment (the "Hardware"), will be free from defects in materials and workmanship under normal operating conditions and use.

**Software.** If software is supplied as part of the product, the software will operate in substantial conformance with specifications set forth in its product user's guide. The Company does not warrant that the software will operate uninterrupted or error-free, will meet your requirements, or that software errors will be corrected.

## Warranty Remedies

Your sole remedies under this limited warranty are as follows:

**Hardware and Media.** The Company will either repair or replace (at its option) any defective Hardware component or part, or Software Media, with new or like new Hardware components or Software Media. Components may not be necessarily the same, but will be of equivalent operation and quality.

**Software.** If software is supplied as part of the product and it fails to substantially conform to its specifications as stated in the product user's guide, the Company shall, at its own expense, use its best efforts to correct (with due allowance made for the nature and complexity of the problem) such defect, error or nonconformity.

## Software Updates

If software is supplied as part of the product, the Company will supply the registered purchaser/licensee with maintenance releases of the Company's proprietary Software Version Release in manufacture at the time of license for a period of one year from the date of license or until such time as the Company issues a new Version Release of the Software, whichever first occurs. To clarify the difference between a Software Version Release and a maintenance release, a maintenance release generally corrects minor operational deficiencies (previously non-implemented features and software errors) contained in the Software, whereas a Software Version Release adds new features and functionality. The Company shall have no obligation to supply you with any new Software Version Release of Telestream software or third party software during the warranty period, other than maintenance releases.

## Restrictions and Conditions of Limited Warranty

This Limited Warranty will be void and of no force and effect if (i) Product Hardware or Software Media, or any part thereof, is damaged due to abuse, misuse, alteration, neglect, or shipping, or as a result of service or modification by a party other than the Company, or (ii) Software is modified without the written consent of the Company.

## Limitations of Warranties

THE EXPRESS WARRANTIES SET FORTH IN THIS AGREEMENT ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. No oral or written information or advice given by the Company, its distributors, dealers or agents, shall increase the scope of this Limited Warranty or create any new warranties.

**Geographical Limitation of Warranty.** This limited warranty is valid only within the country in which the Product is purchased/licensed.

**Limitations on Remedies.** YOUR EXCLUSIVE REMEDIES, AND THE ENTIRE LIABILITY OF TELESTREAM, LLC. WITH RESPECT TO THE PRODUCT, SHALL BE AS STATED IN THIS LIMITED WARRANTY. Your sole and exclusive remedy for any and all breaches of any Limited Warranty by the Company shall be the recovery of reasonable damages which, in the aggregate, shall not exceed the total amount of the combined license fee and purchase price paid by you for the Product.

**Damages.** TELESTREAM, LLC. SHALL NOT BE LIABLE TO YOU FOR ANY DAMAGES, INCLUDING ANY LOST PROFITS, LOST SAVINGS, OR OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF YOUR USE OR INABILITY TO USE THE PRODUCT, OR THE BREACH OF ANY EXPRESS OR IMPLIED WARRANTY, EVEN IF THE COMPANY HAS BEEN ADVISED OF THE POSSIBILITY OF THOSE DAMAGES, OR ANY REMEDY PROVIDED FAILS OF ITS ESSENTIAL PURPOSE.

Further information regarding this limited warranty may be obtained by writing:

Telestream, LLC.  
848 Gold Flat Road  
Nevada City, CA 95959

You can call Telestream, LLC. via telephone at (530) 470-1300.





# Introduction

## Introduction

This guide is intended to help you understand how each feature of Wirecast operates and to provide you with information to help you make the best presentations possible.

## Topics

- *Editions and Options*
- *Wirecast Workflow*
- *Tutorials*
- *Two Ways to Use this Application*
- *Using AutoLive*
- *Main Window Layout*

## Editions and Options

Wirecast is available in multiple editions. The editions of Wirecast, each with its own set of features, are presented in this guide. The term “Wirecast” is used, generally, to describe all major features.

## Editions

Wirecast is available in two editions: *Studio* and *Pro*.

Wirecast *Studio* allows an unlimited number of cameras and inputs, titling overlays, chroma keys, multiple layers, shot editing, and the ability to preview shots prior to broadcast.

Features that pertain specifically to Wirecast *Studio* are indicated by the *Studio* icon (shown below):

STUDIO

Wirecast *Pro* is the professional edition of Wirecast and includes all the features of Wirecast *Studio*. It adds advanced audio controls, virtual sets, scoreboards, and many other professional features. Wirecast *Pro* also provides full HD video capability. Features that pertain specifically to Wirecast *Pro* are indicated by the *Pro* icon (shown below):

PRO

## Options

STUDIO

Wirecast *Studio* provides support for multiple cameras and inputs, selected Blackmagic, Osprey by Variosystems, and Matrox Multi capture cards and LiveU video-over-cellular backpack. Users can broadcast their computer desktop (including computer audio) using Desktop Presenter. Other key features include chroma key support, 3D graphics, titles, transitions and up to 35 layers of live compositing. Additionally, you can use HDV when you purchase an HDV option license. Without the license you can still experiment with HDV input, but all HDV output is water-marked.

PRO

Wirecast *Pro* provides Virtual Sets (a library of professionally designed 3D sets), a powerful Audio Mixer with sync delay, Web stream support, and integration with Teradek Cube, and ISO (Isolated Output) recording. Wirecast *Pro* also provides live scoreboards and includes the HDV option license which adds support for HDV codec encoding.

---

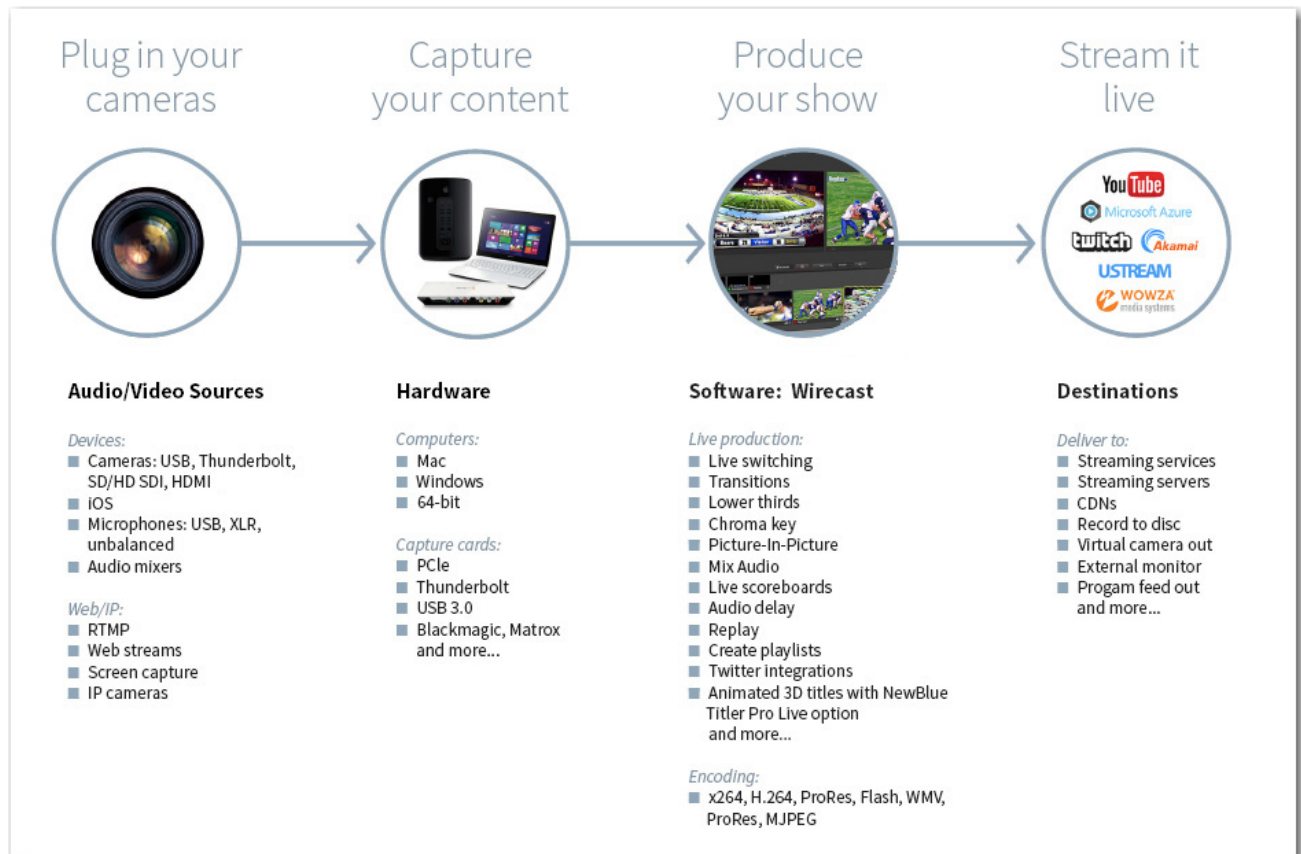
**Note:** If you do not have a Wirecast *Pro* or *Studio* license, Wirecast still enables you to experiment with *Pro* or *Studio* features, but all Wirecast *Pro* and *Studio* output is water-marked. Additionally, you can not save a document that has *Pro* or *Studio* features enabled.

---

## Wirecast Workflow

Wirecast is a powerful cross-platform live video switching, production, and encoding software. Because of its versatility in handling a variety of inputs and outputs, it typically fits in the middle of your broadcasting workflow. Wirecast can take the place of more traditional *T-bar* hardware switchers, graphics and title generators, or simply act as the back-end encoder for large switching systems.

Below is a diagram of the basic Wirecast workflow. In general, you will capture your live input devices (such as live camera feeds, iOS cameras, computer desktop, web feeds and more), produce your show using the full range of Wirecast production features (chroma key, graphics, titles, scoreboards, etc.), and then stream it live to web, LAN, or record locally.



Wirecast works with cameras, capture cards, and audio devices. It prepares media and then outputs it either by streaming to the Internet, CDNs, multicast/unicasts via LAN, locally via virtual output or second display.



## Tutorials

It is suggested that you first work through the tutorials in the [Tutorials](#) section. They are quick, informative, and the easiest way to become familiar with Wirecast.

Wirecast also provides a built-in tutorial environment that corresponds with the tutorials provided in [Tutorials](#). The tutorials take about thirty minutes and provide a brief overview of how to set up a basic presentation and create your own broadcast.

It is also suggested that you read [Making Great Broadcasts](#). This topic shows you how you can easily make changes in your setup and improves the quality of your presentations.

## Two Ways to Use this Application

There are two different ways you can use Wirecast:

- **Presenter Is Operator** The person conducting the presentation also operates Wirecast.

- **Presenter Plus Operator** The presenter concentrates on the content and someone else operates Wirecast. In this mode, the presenter never needs to know in detail how Wirecast works.

## Presenter Is Operator

In this mode of operation, the person conducting the presentation simultaneously operates Wirecast.

Here are some suggestions for using Wirecast when you are both the presenter and operator:

- **Keep it simple** Set up Wirecast to make it easy for you to be the operator and the presenter. Set up your logo and titles so that you need to make very few changes during your presentation. Use a minimum number of shots so it's easy for you to see which shot to choose.
- **Keep the AutoLive feature on** This enables you to present your shots with just one click. Though this limits your ability to perform complex presentations, it is the best way when the presenter is also the operator. To turn AutoLive on or off, select it under the Switch menu.
- **Pre-configure your shots** Make sure that all the shots are created prior to your presentation. Do not try to create or modify shots while broadcasting them.
- **Use hot-keys for switching shots** Wirecast provides a hotkey editor that enables you to easily assign hotkeys to your shots.

## Presenter Plus Operator

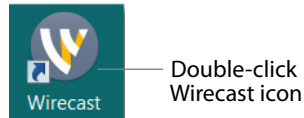
In this mode of operation, an engineer (or operator) is responsible for using Wirecast, and the presenter concentrates on the content of the presentation.

Here are some suggestions for using Wirecast when you have both an operator and a presenter:

- **Keep the AutoLive feature off** This enables you to make several changes at one time before taking the changes live. However, to quickly make a shot live, press the Command+Ctrl keys and click the shot. The AutoLive control is located under the Switch menu
- **Open the Preview window** The operator should use Preview mode to examine everything before it becomes live. The Preview display control is located under the Layout menu.
- **Use the Layer Windows to make more shots available** Select New Layer Window from the Window menu to open additional layer windows so you can quickly flip between shots on several layers.

## Startup

To start Wirecast, double-click the Wirecast icon that was placed on your desktop during installation.



When Wirecast starts up, optionally view the new features then click Continue.



## Using AutoLive

Some users of Wirecast may want to single-click a shot to make it become live. Other users may want to make several changes to the broadcast before making them live. You can use both methods in Wirecast.

The AutoLive feature is designed to offer a single-click operation for those users who want to simply click from shot to shot. The Edit window (or other windows) is not affected by the status of AutoLive.

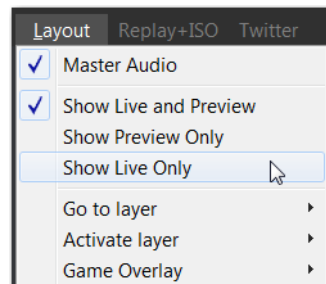
When AutoLive is on, clicking a shot in the Main Window makes it become live. As a result, the Go button becomes inactive.



When AutoLive is off, you click on a shot in the Main Window to display it in Preview, then the Go button is required to make the shot live.

## Main Window Layout

Wirecast enables you to select which functions are displayed in the Main window. These functions are added or removed from the main window using the Layout menu.



**Master Audio** displays or hides the master audio controls. (A check mark to the left of the menu item indicates that the audio controls are displayed.)



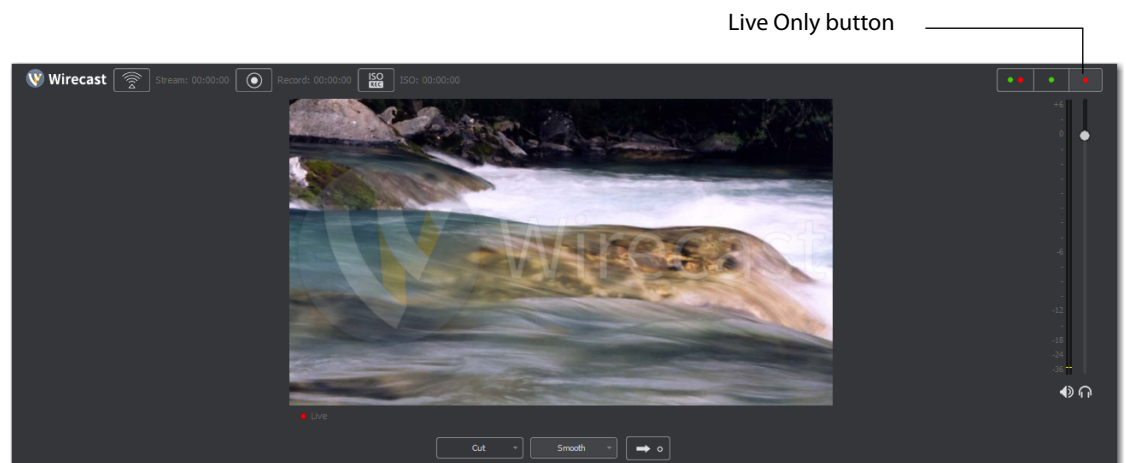
Master Audio controls

**Show Live and Preview** Enables you to select between displaying the Preview Window only or the Live Window only or both. A check mark to the left of the menu item indicates which of these three modes are active. You can also select one of these three modes by clicking on the mode selection buttons in the top right corner of the screen.

**Show Preview Only** selection:

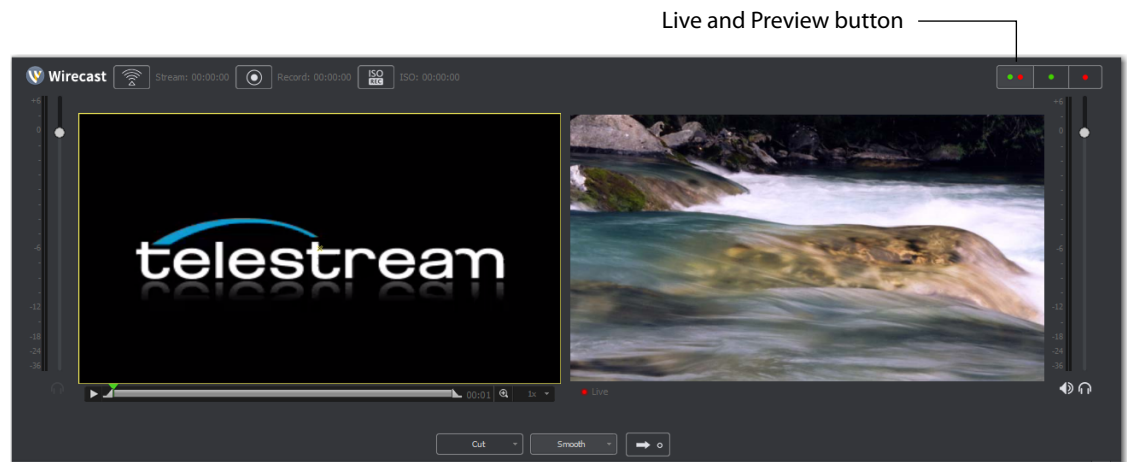


**Show Live Only** selection:



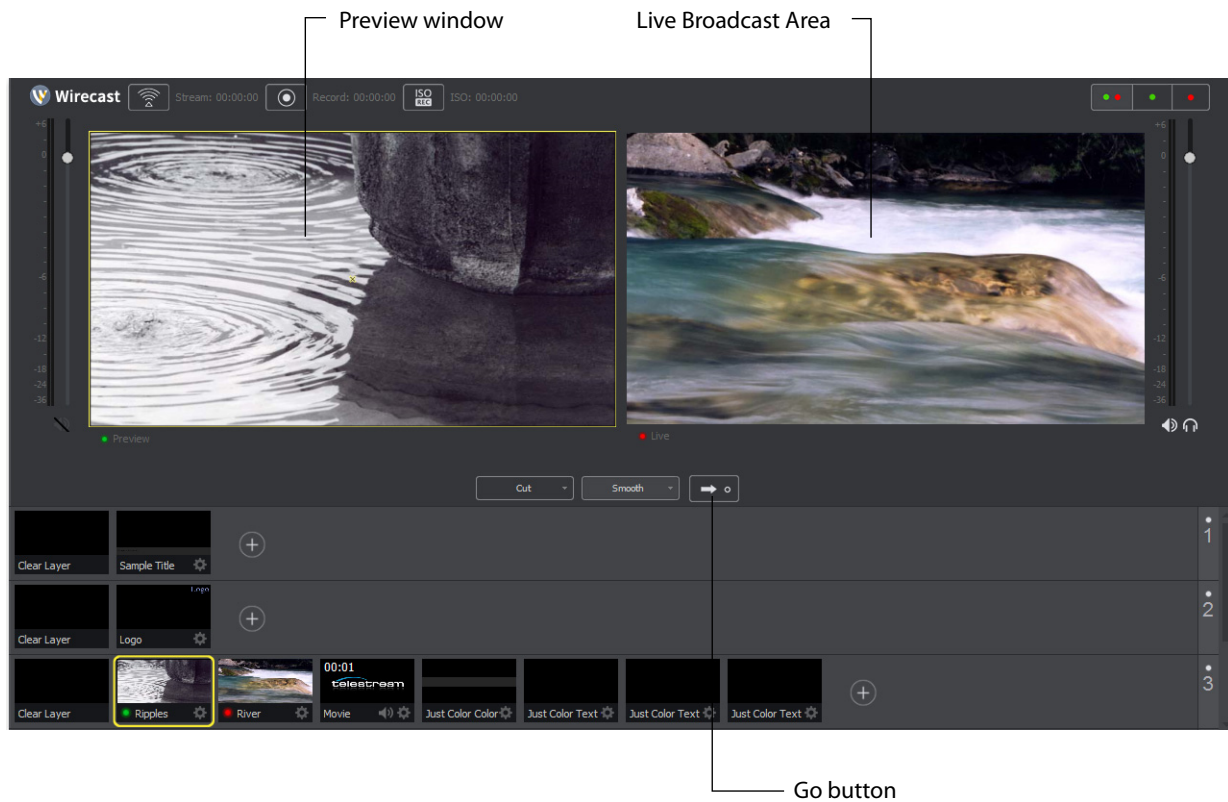


**Show Live and Preview** selection:



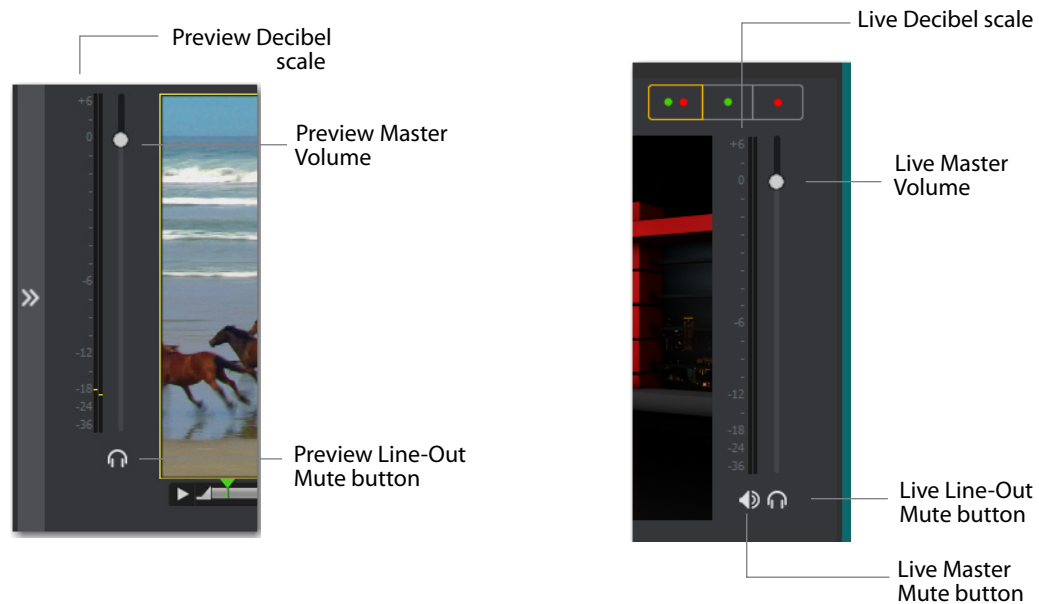
## Preview

Preview displays what the broadcast will look like when you click the Go button. (The Go button is only active when AutoLive is off.) To display the Preview window, click select *Layout > Show Live and Preview*. or *Layout > Show Preview Only*.



## Master Audio

The Master Audio panel enables you to control the output volume level, mute audio output, and mute the line-out feed for Preview and Live displays. To display Master Audio for Preview and Live displays, click *Layout > Master Audio*. Click again to hide the Master audio controls.



The Preview and Live Master Volume control enables you to adjust the master audio volume for Preview and Live separately. Click and drag the slider control up or down to set the volume. The decibel scale next to the slider indicates the audio level. When you take a Preview shot live, the Live audio controls are set to the levels set in Preview.

The Master Mute button controls the mute of the Live master audio (what your viewers hear). Even when you mute the output, the encoder still generates audio but it is silent. If you do not want to broadcast audio, modify the Encoder Presets to not process audio through the encoder.

The Preview and Live Line-Out Mute buttons control what you hear locally. When line-out is muted, audio is not sent to your headphones or speakers, but your viewers still hear it. The two controls are mutually exclusive -- you cannot have both on at the same time, but you can mute both.

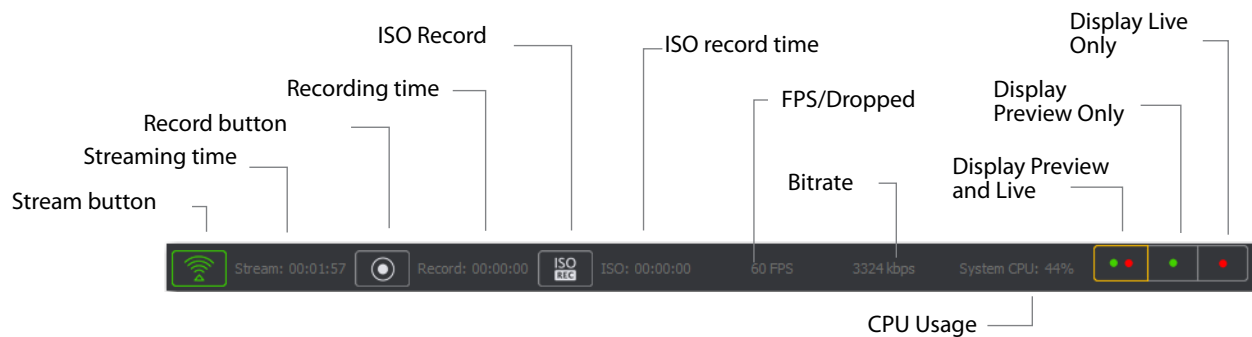
## Main Shot List

Main Window displays the Shot List at the bottom of the window.



## Control/Status Bar

Control buttons and status information are displayed at the top of the Main window.



Wirecast displays the following controls and statistics:

- **Stream button** Click to begin streaming.
- **Streaming time** This displays how long you have been streaming. This value does not reset when you start/stop the broadcast. It is cumulative. This enables you to save portions of a broadcast to disk and still know the total amount of time.
- **Record Button** Click to begin recording.

- **Recording Time** This displays how long you have been recording. This value does not reset when you start/stop the broadcast. It is cumulative.
- **ISO Record** Click to begin ISO recording.
- **ISO Record Time** Displays the ISO recording time.
- **FPS/Dropped** Displays the current FPS rate or the number of frames dropped while streaming. Click on display to toggle between FPS and Dropped. (Displayed only while streaming.)
- **Bitrate** Displays the streaming bitrate. (Displayed only while streaming.)
- **CPU Usage** Displays the usage of the CPU in percent. (Displayed only while streaming.)
- **Display Buttons** These three buttons enable you to choose to display the Preview window, the Live window, or both in a divided display.

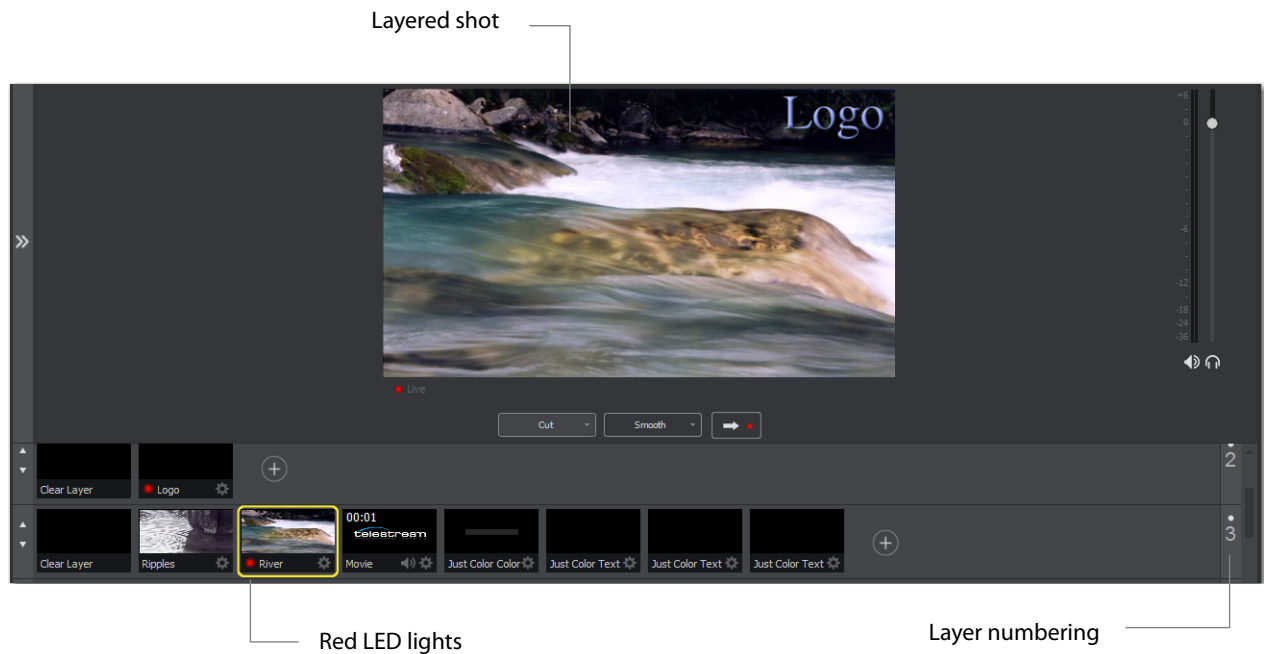
---

**Note:** To avoid decrease in video quality, Wirecast should not be used at CPU usage above 80%. See the Telestream Website for suggested configurations. You can also view streaming statistics by selecting *Output > Show Statistics*.

---

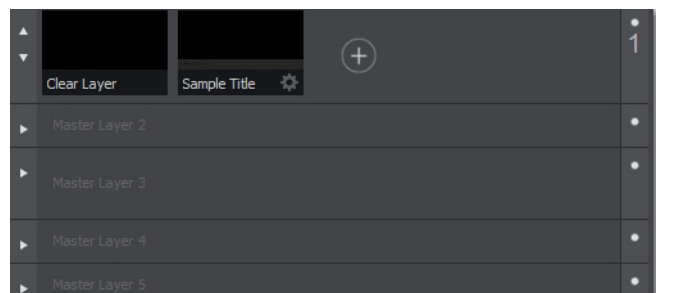
## Layers

Wirecast displays five layers in the Main Shot List window. They are numbered 1 through 5 along the right side of the window. Each layer contains shots that can be selected by clicking them. A red LED light indicates that a shot is Live. (If AutoLive is turned on, when a shot is selected it is displayed in the Live window.) If you select multiple shots -- by selecting shots on multiple layers -- they will all be displayed in the Live window. But the shots are displayed in a layering manner, where layer 1 is on top and layer 5 is at the bottom (and layers 2 through 4 are layered in between). In the example below, the Logo in layer 2 is displayed on top of the River shot in layer 3.



## Layer Windows

You can also open the Shot List in a separate window. Select *Window > New Layer Window* to display a list of the layer windows you can open (Master Layer 1 through 5). Select the layer you want to open and a new, separate layer window is displayed.



This panel works exactly like the Shot List panel in the Main window, but enables you to open multiple layer panels. You can change which layer is displayed on each panel by selecting the *Windows* menu and selecting a different layer.

# Installation

## Introduction

This topic guides you through installing (or upgrading) and activating Wirecast.

## Topics

- *Installing*
- *Activating*
- *Uninstalling*
- *System Requirements*

## Installing

To install Wirecast, follow these steps:

1. Download the installer from the Website at: <http://www.telestream.net/wirecast/overview.htm>

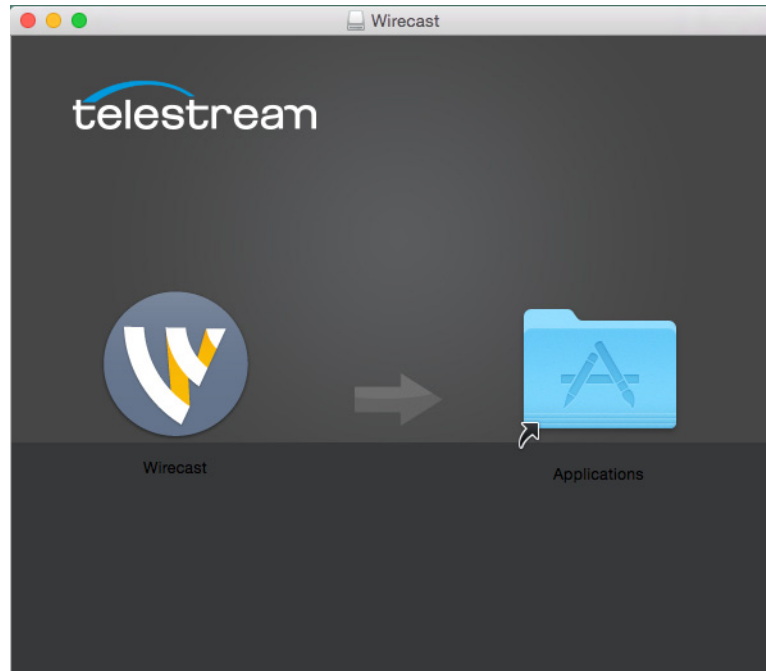
---

**Note:** During installation, you will be asked if you want to install the Virtual Microphone feature. If you do (recommended), check the displayed check box and continue the installation. Installing Virtual Microphone requires administrative rights.

---

2. Run the installer (.dmg) program.
3. Click Agree to the license terms.

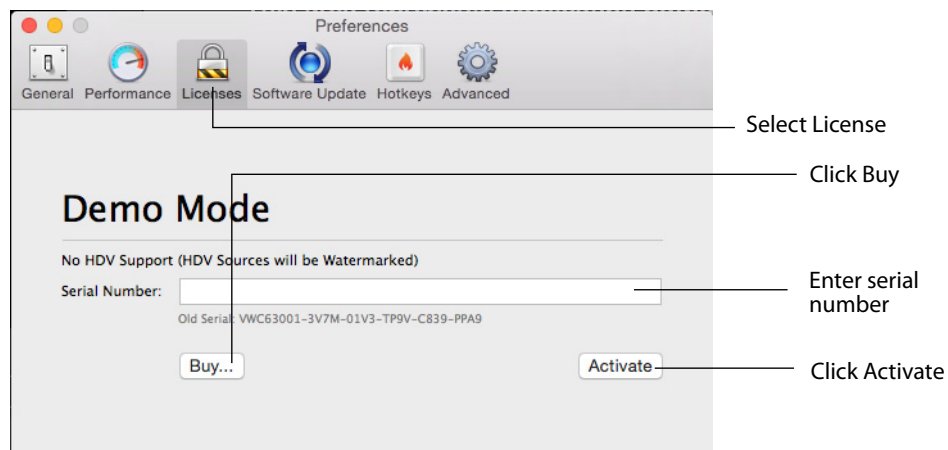
4. Open the Wirecast in the downloads folder, then click and drag the icon into the Applications folder. If a version of Wirecast already exists, the installer asks you if you want to replace the previous version.



## Activating

When you purchased Wirecast a serial number was provided. This serial number must be registered in the Wirecast program to unlock the features of Wirecast. To register Wirecast follow these steps:

1. Run the Wirecast program.
2. Select *Preferences* from the Wirecast menu, select *Licenses*, then click *Buy*. Once you purchase and obtain your license number, enter it into the Serial Number field and click *Activate*.





3. Close the Preferences window.

Your Wirecast program should now be fully activated.

## Uninstalling

1. To uninstall Wirecast, place the Wirecast program in the Trash folder.

## System Requirements

### Wirecast

- Operating Systems: OS X 10.9 Mavericks, 10.10 Yosemite and 10.11 El Capitan (Wirecast does not support OS X 10.8 or previous versions)
- Mac computer with Intel Core 2 Duo processor
- Core i5 or later recommended for 720p streaming
- Core i7 recommended for 1080p streaming
- 2GB RAM minimum
- 4GB recommended for 1080p streaming
- 300MB free hard disk space for installation
- Hard disk space for recording to disk
- Compatible Flash streaming server, or account with a supported Flash streaming portal required for Flash H.264 streaming
- 512 MB PCI-Express graphics card with 3D acceleration
- GeForce or Radeon class card recommended
- Sufficient upload speed for streaming
- Minimum recommended is twice the bandwidth of the total bit rate of the stream

### Desktop Presenter

- Use the remote version of Desktop Presenter 2.0.7 with Wirecast; it's available as a separate download at: <http://dynamic.telestream.net/downloads/download-desktop-presenter.asp?prodid=desktoppresenter>.



# Tutorials

## Introduction

The best way to get started using Wirecast is to quickly work through all its main features. This tour presents a series of three tutorials, each designed to help you understand how to create and broadcast presentations using Wirecast.

As you work through these tutorials, you will also become familiar with important Wirecast concepts and how you can use them to deliver high quality broadcasts. The more you know about Wirecast, the better it will serve your broadcasting objectives.

Because each tutorial builds on the skills and knowledge you learn in the previous tutorials, it is recommended that you take the tutorials in succession. Working through all the tutorials takes about thirty minutes.

As you gain hands-on experience creating video and audio presentations - which leads to a working knowledge of Wirecast and its components and architecture - you will gain proficiency in using Wirecast.

## Tutorials

- *Tutorial 1: Basic Concepts*
- *Tutorial 2: Editing Shots*
- *Tutorial 3: Broadcasting*

---

**Note:** You can run all of the tutorials without a license. However, a watermark on the video and an occasional voice-over on the audio are present until a valid license is activated.

---

---

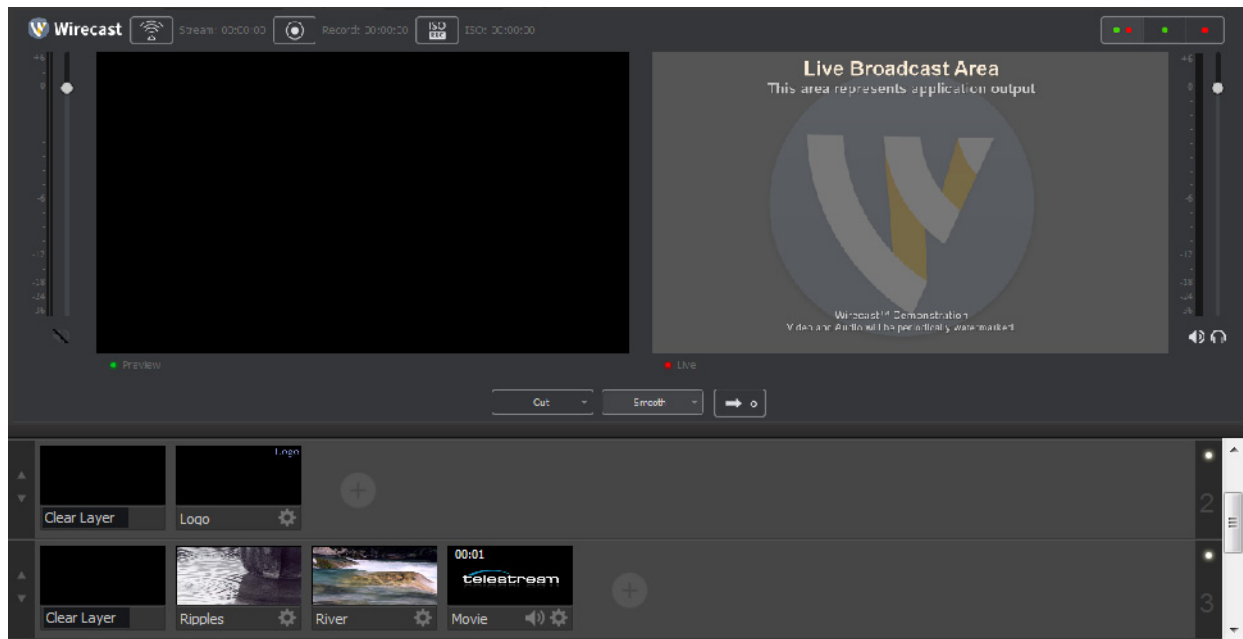
**Note:** For licensing information, select Preferences from the Wirecast menu, select *License*, then click *Buy*. Or, you can contact Telestream at: [desktopsales@telestream.net](mailto:desktopsales@telestream.net).

---

## Tutorial 1: Basic Concepts

The goal of this tutorial is to provide you with a quick but successful experience creating and broadcasting a presentation using Wirecast.

This tutorial requires that you open the tutorial document in Wirecast. To do this, select *Create Document for Tutorial* from the Help menu in Wirecast.



---

**Note:** If you are running the tutorial with Wirecast in demonstration mode, the Wirecast logo appears from time to time and audio output has a periodic voice-over.

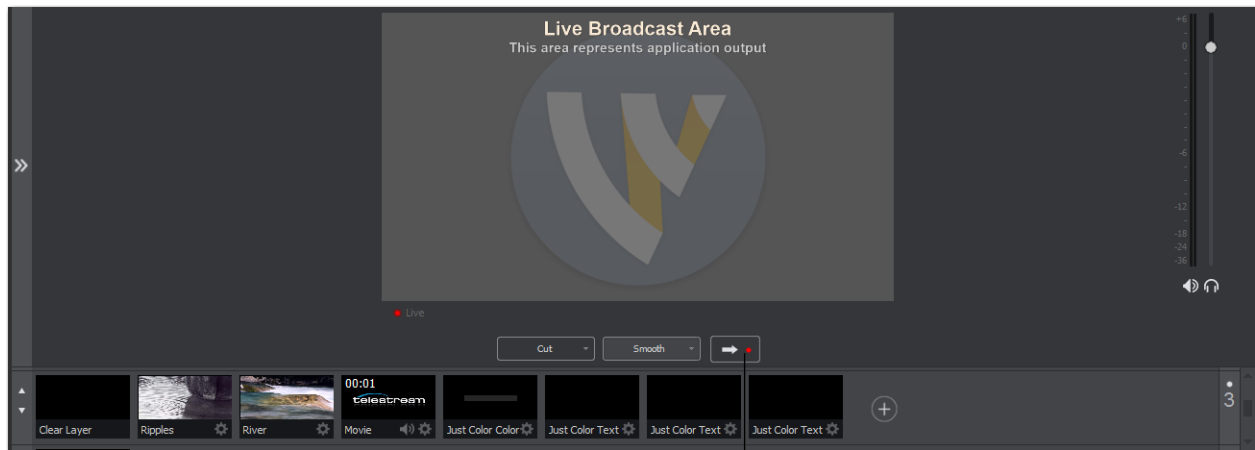
---

## Tutorial Prep

To prepare for this tutorial you need to make two changes.

First, select *Switch > Auto Live* to turn on the Auto Live option. But also select *Layout > Show Live Only* to turn off the Preview option. Both of these options will be changed back later in the tutorial.

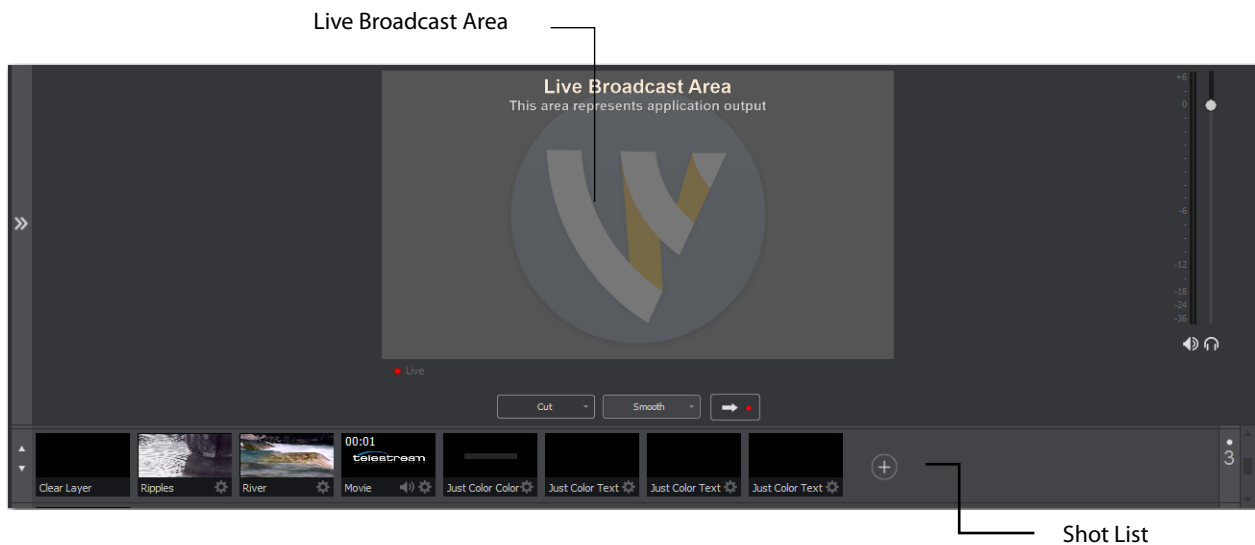
The Wirecast Main Window shows the AutoLive LED as turned on.



AutoLive LED on

## The Main Window

Wirecast has two main display areas: Live Broadcast and Shot List. The Live Broadcast area is in the upper portion of the window displaying what Wirecast broadcasts to your viewers (or what it records to disk). The Shot List, in the lower half of the window, displays the shots available for broadcast.



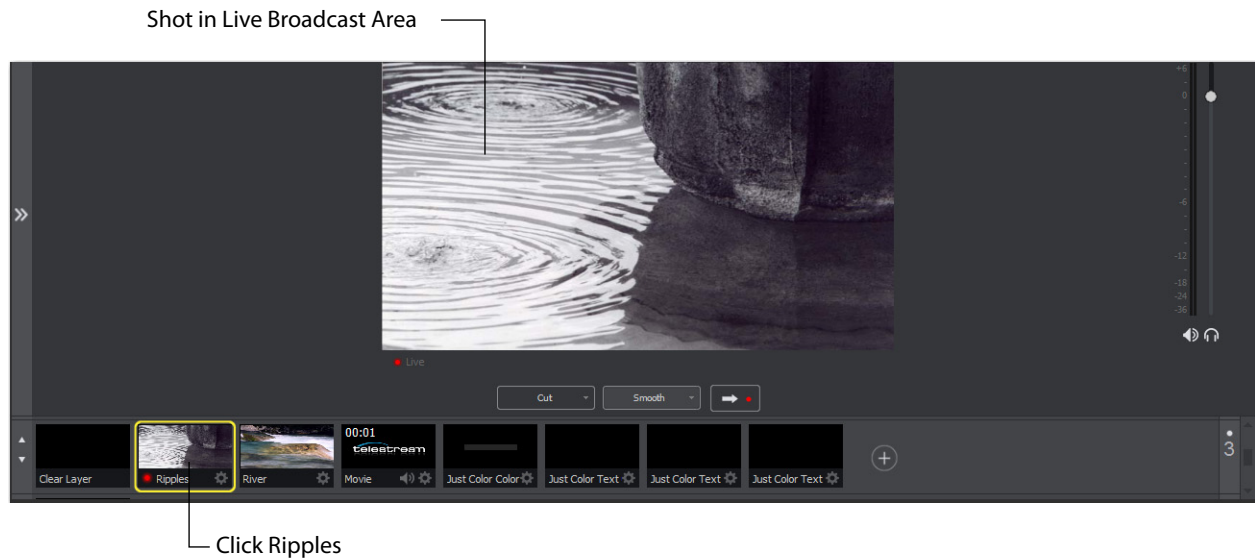
## What Is a Shot?

Wirecast uses the concept of a shot to construct presentations. A shot contains media, along with the settings for that media. In its simplest form, a shot contains one piece of media such as a photo or a video clip. But it can also be something more complex, like a live camera with a title, and background music, or even a Playlist of shots.

A shot can be edited and its settings can be changed (See [Tutorial 2: Editing Shots](#)). Shots are important because they enable you to configure a lot of information before you broadcast your presentation. This enables you to concentrate on creating a good production during your broadcast.

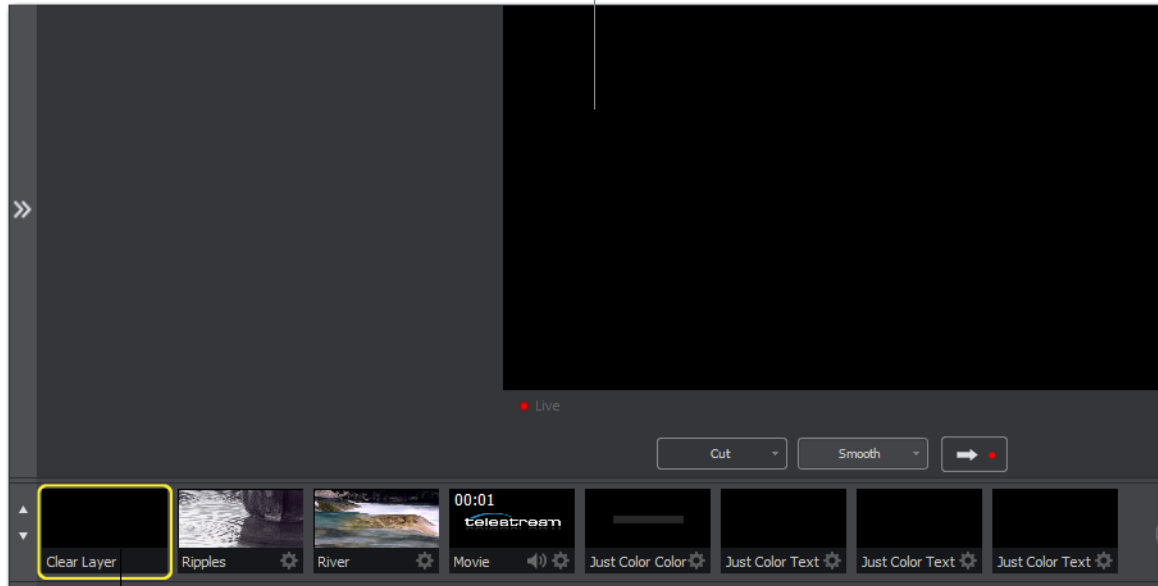
## Switching Between Shots

Individual shots are displayed in the Shot List. Click the Ripples shot in the Shot List area and the image fades into the Live Broadcast Area display. This is called “taking a shot live”.



Click the shot labeled Clear Layer and the Ripples image fades to a blank screen. The Clear Layer shot enables you to display nothing, which is sometimes needed.

Blank screen in Live Broadcast Area

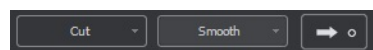


Click Clear Layer

## Transitions

In the previous examples, a fade occurred when you clicked on a shot. This is because a smooth transition is the default.

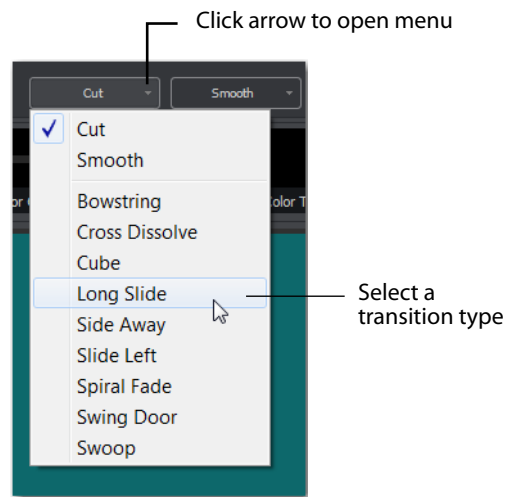
Transition controls are located just below the Live Broadcast Area where two kinds of transitions are shown: Cut and Smooth.



When Cut is selected, transitions are immediate. When Smooth is selected, transitions fade in (as demonstrated above).

There are more than just two kinds of transitions to choose from, but only two can be assigned to the Transition Panel. To select a different transition type, click the small arrow on the right side of either transition button. When the list appears, select a new

transition to assign to the button. You can also click the transition button and drag the mouse downward until the menu of selections is displayed.



For example, to change the first transition button from Cut to Swoop, click the Cut button and drag downward until the menu appears. select *Swoop* from the menu. Swoop should now be selected for the first button.

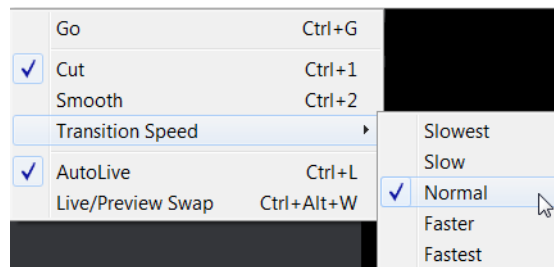


Now click back and forth between River and Ripples using Swoop.

These two transition buttons can also be selected by using the following key combinations: Command+1 and Command+2.

## Transition Speed

You can also control how fast a transition occurs, by selecting the *Switch > Transition Speed*. Your choices range from *Slowest* to *Fastest*.



## Go Button

The Go Button (or Command+G) enables you to make a transition.





Clicking the Go button does nothing when Wirecast is in AutoLive mode. The only exception is that it will update a live shot if you have made changes to it using the Shot Editor. Later in this tutorial you will discover how to use the Go button to transition between different shots when AutoLive is off.

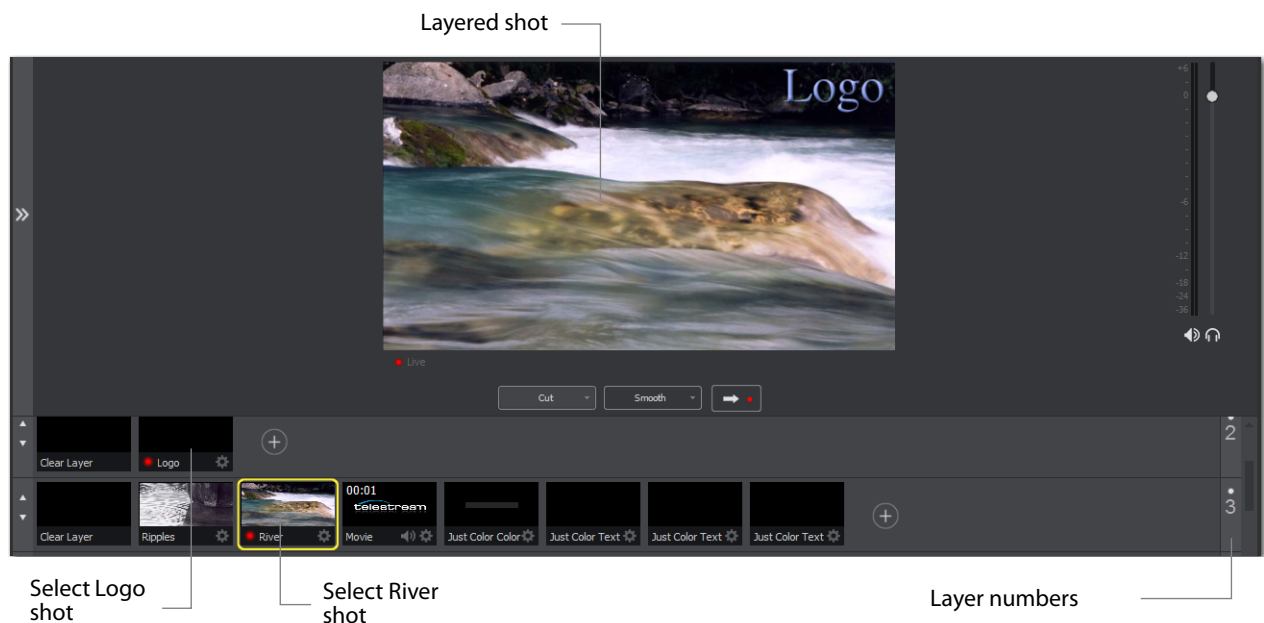
## Layers

**Note:** Before you start this section, please select Smooth as your transition.

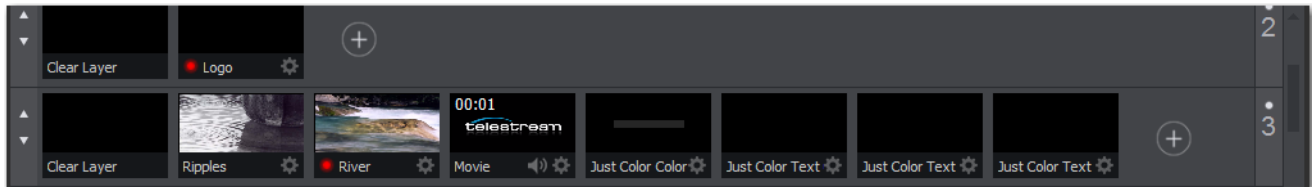
Wirecast enables you display several shots in the Preview and Live windows at the same time by rendering them one on top of another according to Wirecast's Layer system. This is an excellent way to add and remove objects in your broadcast.

Wirecast displays five layers in the Main Shot List window. They are numbered 1 through 5 along the right side of the window. Each layer contains shots that can be selected by clicking it. A red LED light indicates that a shot is selected. When a shot is selected it is displayed in the Live Broadcast window. If you select multiple shots (by selecting a shot on more than one layer) they will all be displayed in the Live Broadcast window. The shots are displayed in a layering manner, where layer 1 is on top and layer 5 is at the bottom (and layers 2 through 4 are layered in between).

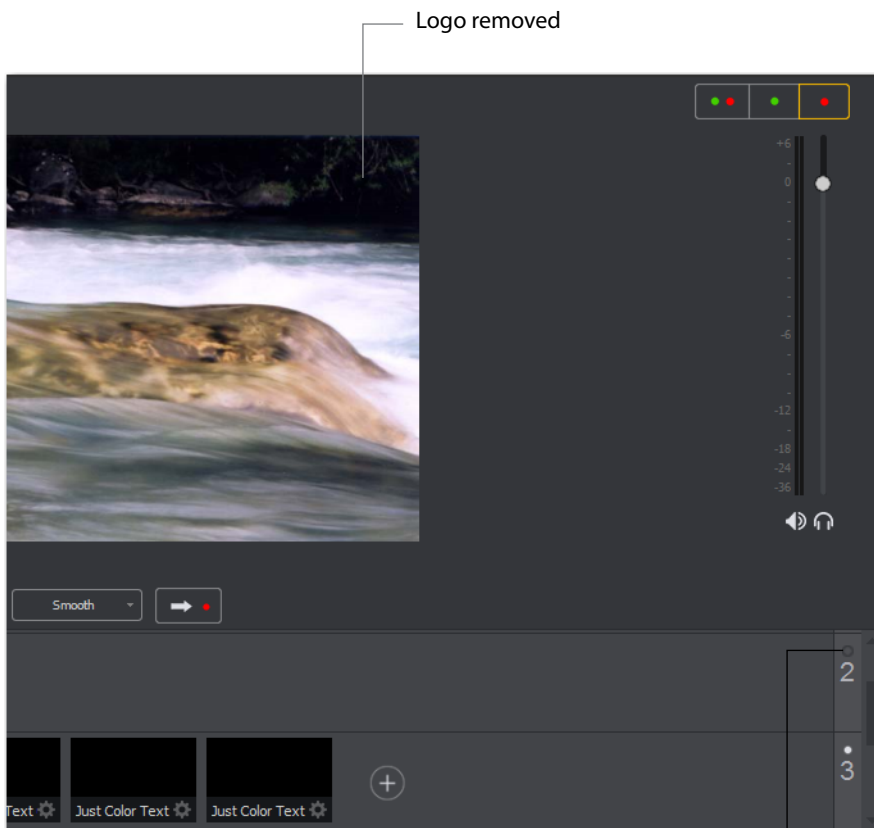
Select the Logo shot in layer 2 and the River shot in layer 3. The result is a layered shot containing both images.



Layers are displayed in a particular order: Layer 1 is on top, Layer 2 below it, Layer 3 below Layer 2, etc. This tutorial, so far, has been operating on Layer 3. Clear Layer, Ripples, River shots (and more) are on Layer 3, but Layer 2 has only a logo and a Clear Layer shot.



Each layer can be turned on or off by clicking the white LED light on the far right side of the layer window. Click the Layer 2 LED to remove the Logo shot.



Click to turn Layer 2 off

Click the LED again to turn Layer 2 back on.

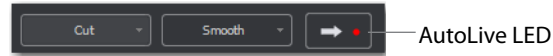
## Auto Live

So far in this Tutorial, Wirecast has been running in AutoLive mode. What this means is that any change you make in the Shot List is automatically made live in your Broadcast.

This mode is very useful for those users who want to set up all of their shots at once and then single-click them as they run their presentation. But the disadvantage of this single-click method is that you can only see one shot change at a time. Once you click a shot, your viewers also see it (with no preview of how it looks on your part).

## Turn AutoLive Off

An LED light, next to the Go button is lit when you are in AutoLive mode.



Make sure AutoLive is off by unchecking *AutoLive* in the Switch menu. A dialog box is shown informing you that AutoLive is off and transitions must be made using the Go button. Click OK in the dialog box to continue.

Try clicking the Ripples and River shots. Nothing happens because AutoLive is off. Now click the Ripples shot and click the Go Button. The Ripples shot is taken live in the Live Broadcast window. Click the River shot and, as expected, nothing happens. Click the Go button again and the River shot becomes Live.

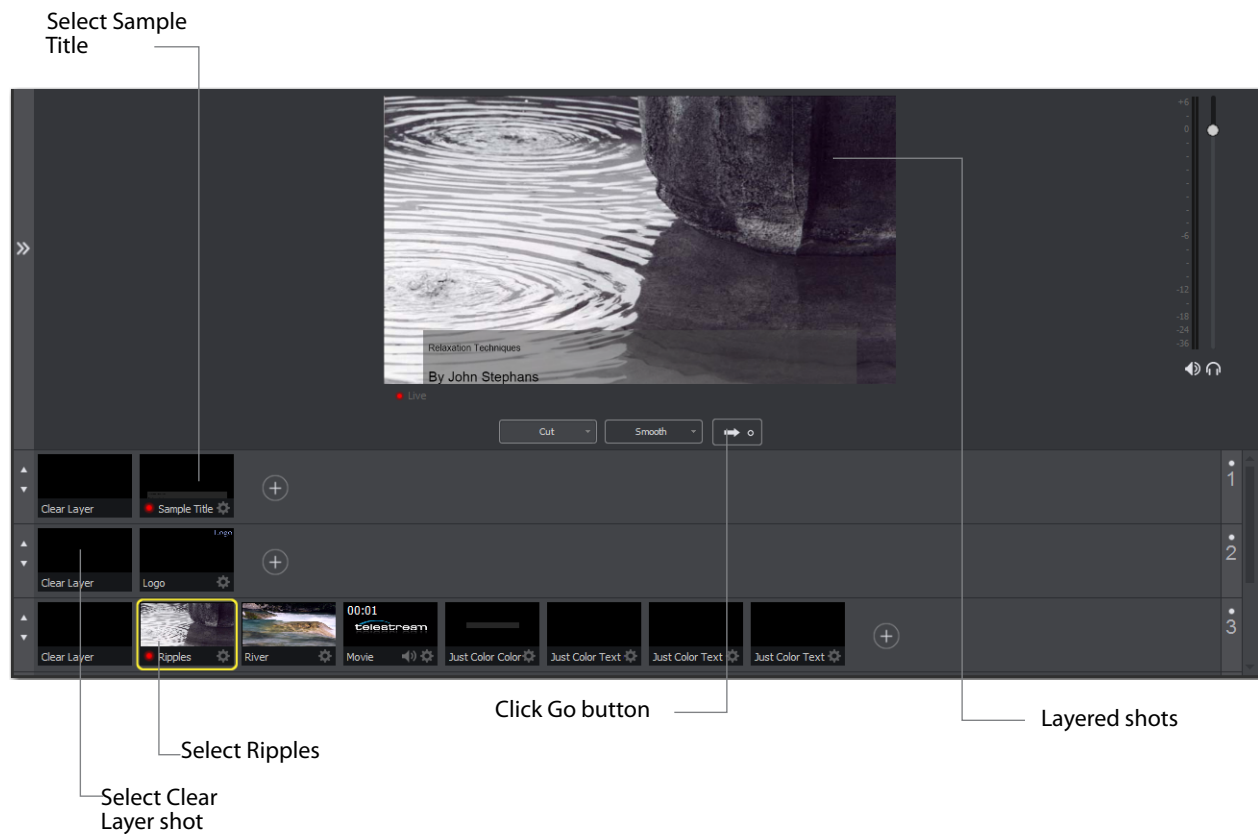
---

**Note:** When AutoLive is off, you must always click the Go button (or press the Command+G keys) to display the selected shot in the Live Broadcast Area.

---

## Multiple Changes

The benefit of having AutoLive off is that you can make several changes first and then have them occur all at the same time. To do this, first verify that AutoLive is off. Click *Sample Title* in layer 1, click *Clear Layer Shot* in Layer 2, and click the *Ripples* Shot in Layer 3. Click the Go button (or Command+G) to make the *Ripples* and *Sample Title* shots live at the same time.

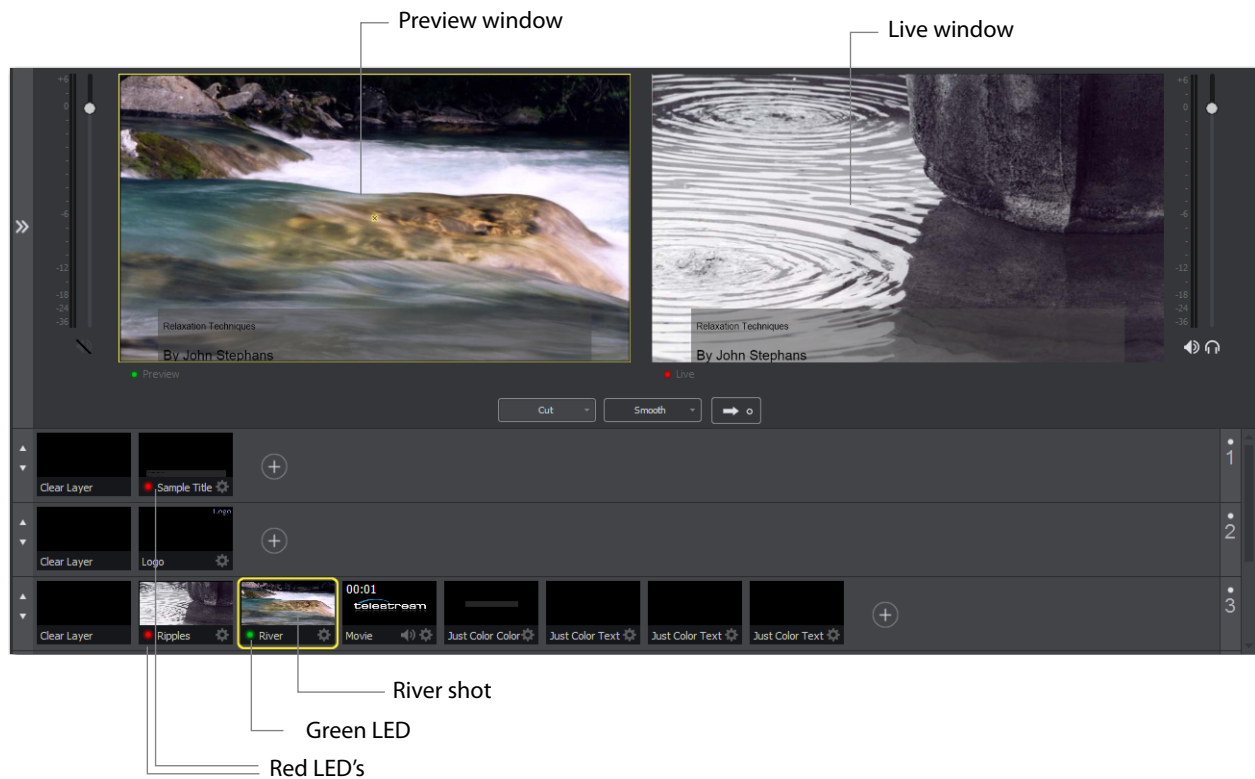


## Preview

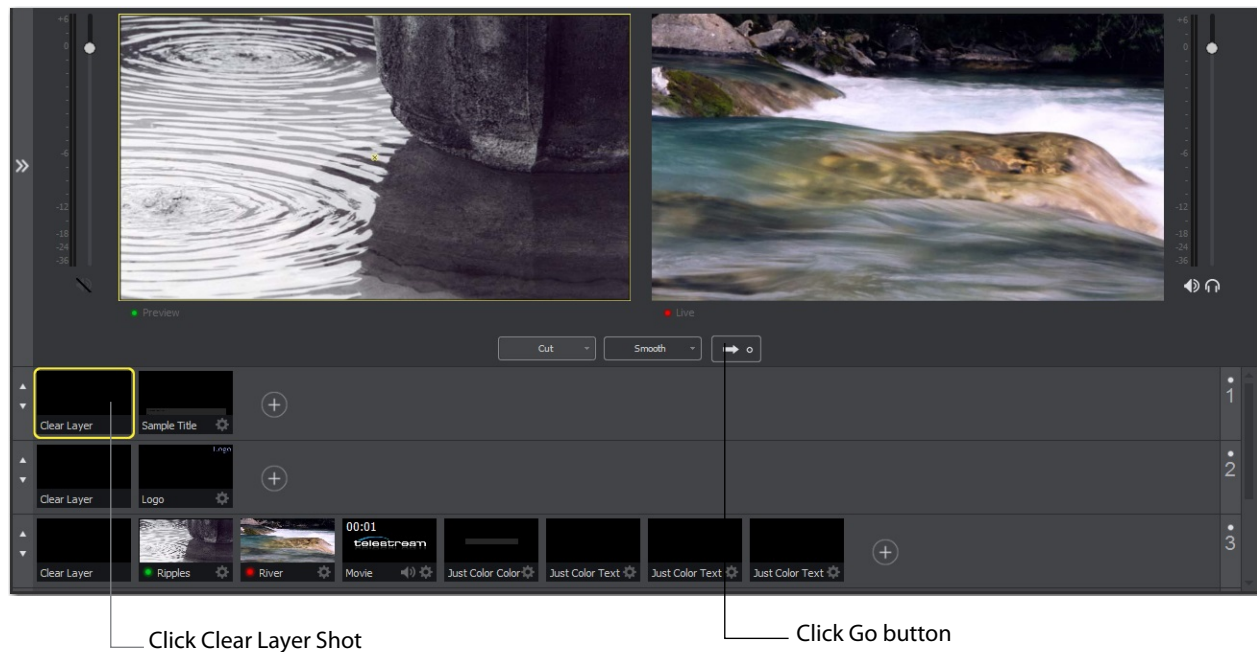
One problem you may have noticed while running this tutorial is that you cannot see the changes you are making before broadcasting them. To solve this problem, Wirecast enables you to see a preview of what you broadcast.

Select *Layout > Show Live and Preview* from the Layout menu. A preview window is displayed to the left of the Live Broadcast window.

Click the River shot on Layer 3. The River shot is displayed in the Preview window. The Preview windows uses a green LED light to identify it. The Live Broadcast window uses a red LED. When shots are selected they display a green or red LED to indicate selection for preview or live broadcast.



Click the Go button to make the River shot live. Click the Clear Layer shot in Layer 1 to remove the title from the ripples shot.

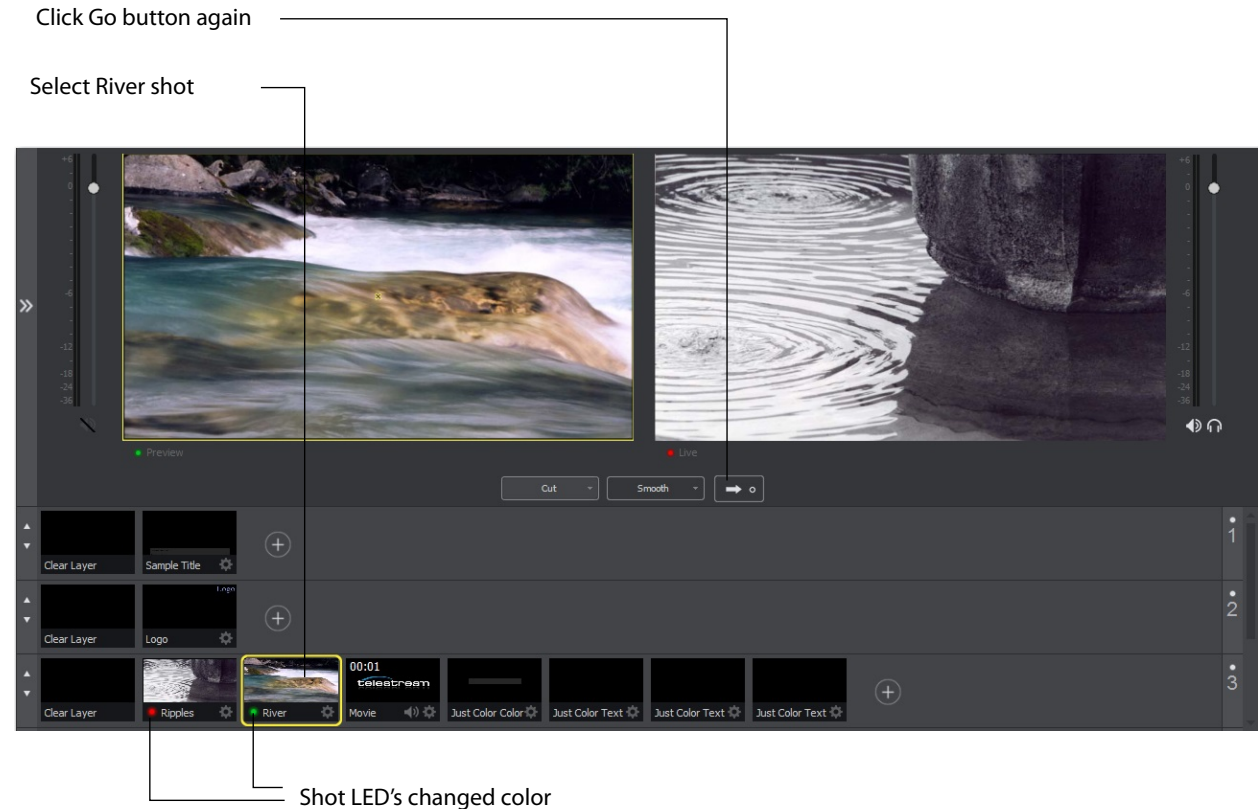


---

**Note:** Taking a shot live will set the Master volume slider to the value of the Preview volume slider.

---

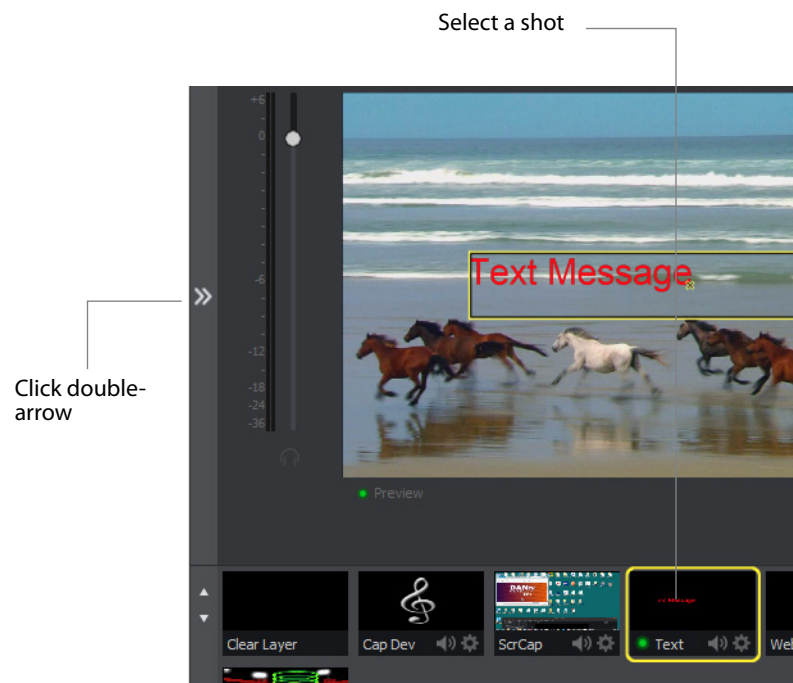
Click the Go button again to make the Ripples Shot live, then click the River shot to select it. Notice that the Ripples and River shots LED's have change color because the Preview and Live windows exchanged images. This lets you know what your last live window looked like as you prepare your next shot in the Preview window.



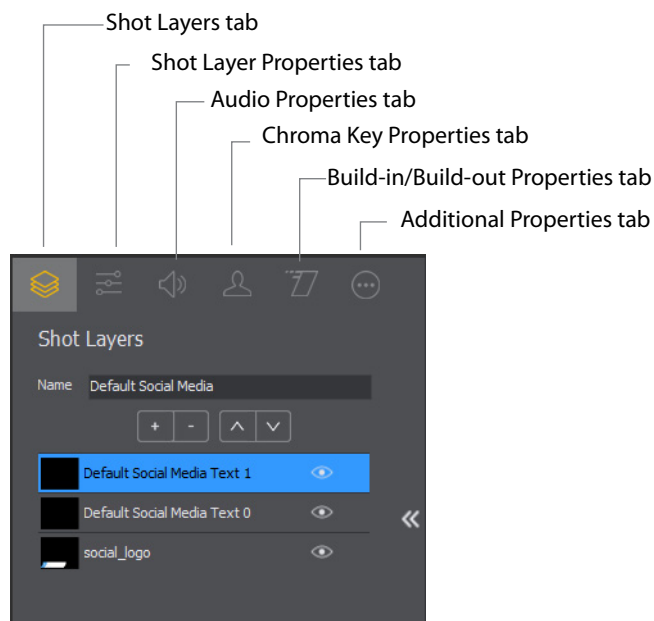
## Tutorial 2: Editing Shots

The first tutorial used only the Main window, and explained various ways in which you can use an existing shot. But shots can also be created and edited. This tutorial demonstrates how to edit your shots.

To edit a shot, click it to select it, then click the double-arrow on the left to open the shot editor panel. You can also double-click the shot to open the shot editor.



The shot editor has six tabs: Shot Layers, Shot Layer Properties, Audio Properties, Chroma Key Properties, Build-in/Build-out Properties, and Additional Properties.





**Shot Properties** Enables you to add and delete sources and to change the display order (layering within the shot).

**Shot Layer Properties** Enables you to change the size, position, and other properties of a shot source. The sources in a shot are selected for editing by clicking it, or by selecting it in the Shot Properties tab.

**Audio Properties** Enables you to set and monitor audio level.

**Chroma Key Properties** If a source in your shot uses a chroma key, this tab enables you to configure the chroma key settings. Each source in a shot can have its own chroma key settings.

**Build-in/Build-out Properties** Enables you to control how objects are added to and removed from your broadcast.

**Additional Properties** Enables you to set any additional properties for a source in your shot: System device properties, screen display properties, Twitch Widgets (Chat and Followers), etc.

## Tutorial 3: Broadcasting

This tutorial demonstrates how to setup and broadcast your Wirecast presentations. You can broadcast to a specific computer (Unicast), multiple viewers (Multicast), or even record your broadcast to disk.

There are two main components for broadcasting your presentation (or saving it to disk): Encoding and Destination.

You need to decide how you are going to encode the broadcast. Encoding is the type of compression used (JPEG, MPEG4, etc.). Wirecast comes configured with many common encoding options. (see [The Encoder Presets Window](#))

A destination for the broadcast must be selected. You can send it to a server for broadcast or save it to disk.

## Streaming

You can stream your broadcast to any streaming service provider you choose. The Broadcast section of this user guide provides details on how to do this for many popular providers. This tutorial will show how to stream to Bambuser.

To stream to Bambuser (as an example), follow these steps:

1. Select Output > Output Settings.
2. Select *Bambuser* from the Destination menu.
3. Select an encoder.
4. Enter your Bambuser username.
5. After you have entered your username, click *Authenticate* to enter your password and generate the RTMP URL. You only need to do this one time because Wirecast

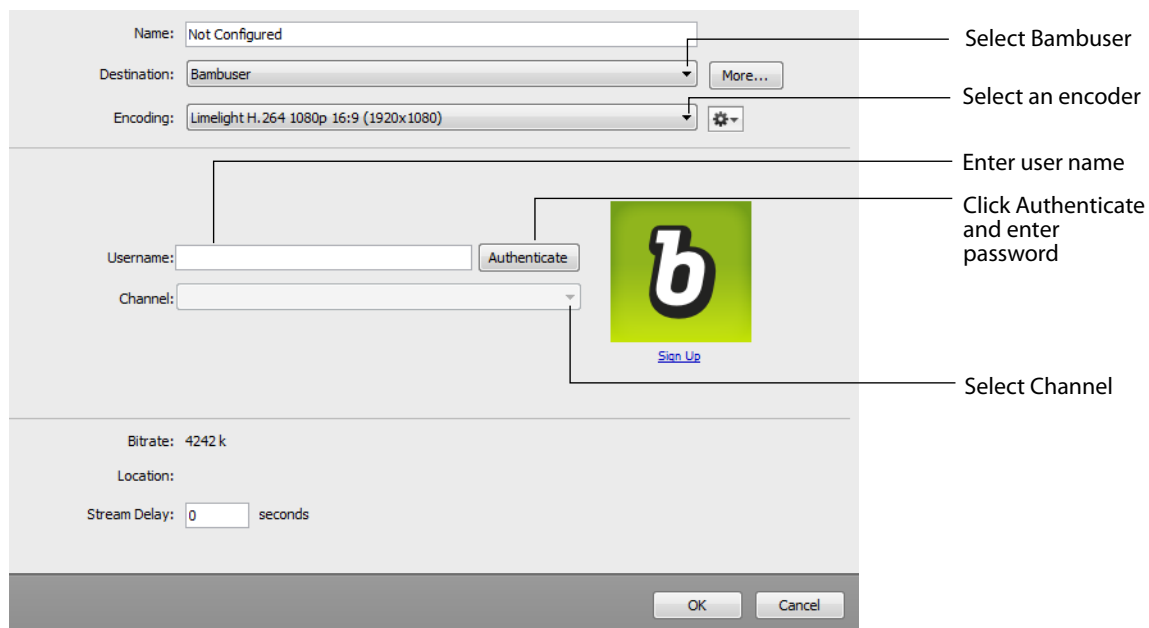
stores the channel information for future streams. The default RTMP port is 1935. You may need to configure your firewall to enable connections on this port.

---

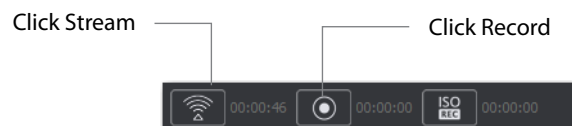
**Note:** If you do not have a username and password, you can sign up with Bambuser by clicking the Bambuser icon or by clicking *Sign Up*.

---

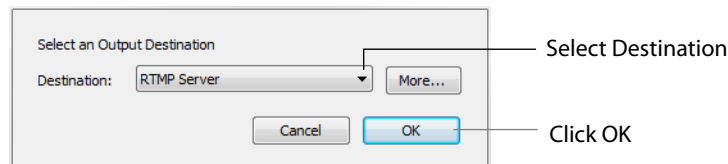
6. Select your Bambuser channel.
7. Optionally, enter a Stream Delay value. This provides a time buffer between your live stream from Wirecast and the actual broadcast itself. You can set the delay from 0 to 999 seconds. However, greater delays require greater memory use. The amount of memory used is displayed when you enter the amount of delay.
8. Click OK.



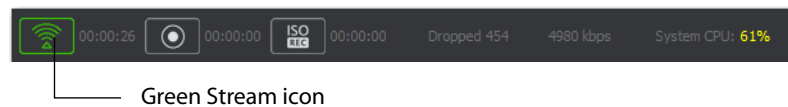
You can stream your broadcast to your service provider. To do this, click the *Stream* button at the top of the Main window. You can also record your streaming by clicking the *Record* button.



If you have not already selected a destination and logged into it, a dialog box displays. Select a destination, log in when asked to do so, then click OK.

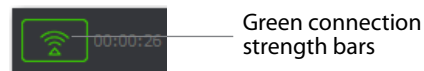


The Stream icon will blink until a connection is made. Once you are connected the Stream icon turns green. If you cannot connect an error message will display.

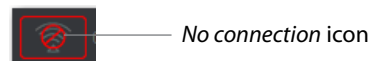


Green Stream icon

Connection strength is indicated by how many bars are displayed in the Stream icon. Fewer bars indicates a weaker (slower) connection.

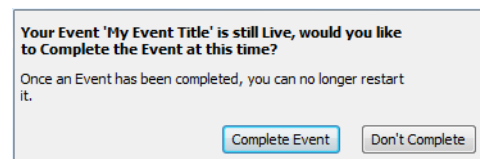


If the connection is ever broken, a *no connection* icon is displayed in place of the bars.



When the connection is recovered, the *no connection* icon is replaced with the green bars.

Click *Stream* again to stop streaming. You can also record your broadcast by clicking *Record*. When you stop streaming, if your event is still live, you will be asked if you want to complete the event.





# Main Window

## Introduction

This section describes in detail how to use Wirecast's main window.

## Topics

- *Overview*
- *Control/Status Bar*
- *Preview/Live Broadcast Area*
- *Countdown Clock Display*
- *Transition Controls*
- *Source Input Menu*
- *Shot Selection Area*
- *Layers*
- *AutoLive*
- *Live Icons*

## Overview

Wirecast's main window is comprised of these display areas:

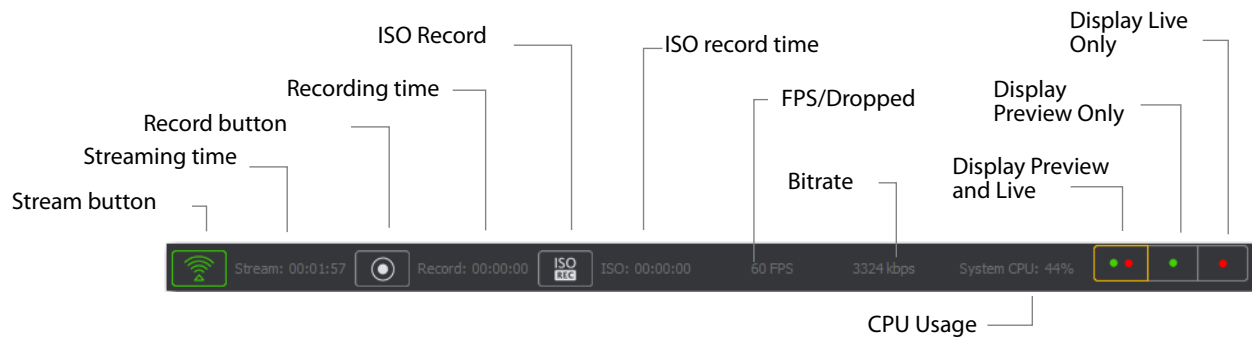
- **Controls/Status Area** The top area with the Stream and Record buttons.
- **Preview/Live Broadcast Area** The large area in the center.
- **Transition Controls** The area with the Transition (Cut and Smooth) and Go buttons.

- **Shot Selection Area** The area displaying the shot icons (available shots).



## Control/Status Bar

Control buttons and status information are displayed at the top of the Main window.



Wirecast displays the following controls and statistics:

- **Stream button** Click to begin streaming.

- **Streaming time** This displays how long you have been streaming. This value does not reset when you start/stop the broadcast. It is cumulative. This enables you to save portions of a broadcast to disk and still know the total amount of time.
- **Record Button** Click to begin recording.
- **Recording Time** This displays how long you have been recording. This value does not reset when you start/stop the broadcast. It is cumulative.
- **ISO Record** Click to begin ISO recording.
- **ISO Record Time** Displays the ISO recording time.
- **FPS/Dropped** Displays the current FPS rate or the number of frames dropped while streaming. Click on display to toggle between FPS and Dropped. (Displayed only while streaming.)
- **Bitrate** Displays the streaming bitrate. (Displayed only while streaming.)
- **CPU Usage** Displays the usage of the CPU in percent. (Displayed only while streaming.)
- **Display Buttons** These three buttons enable you to choose to display the Preview window, the Live window, or both in a divided display.

---

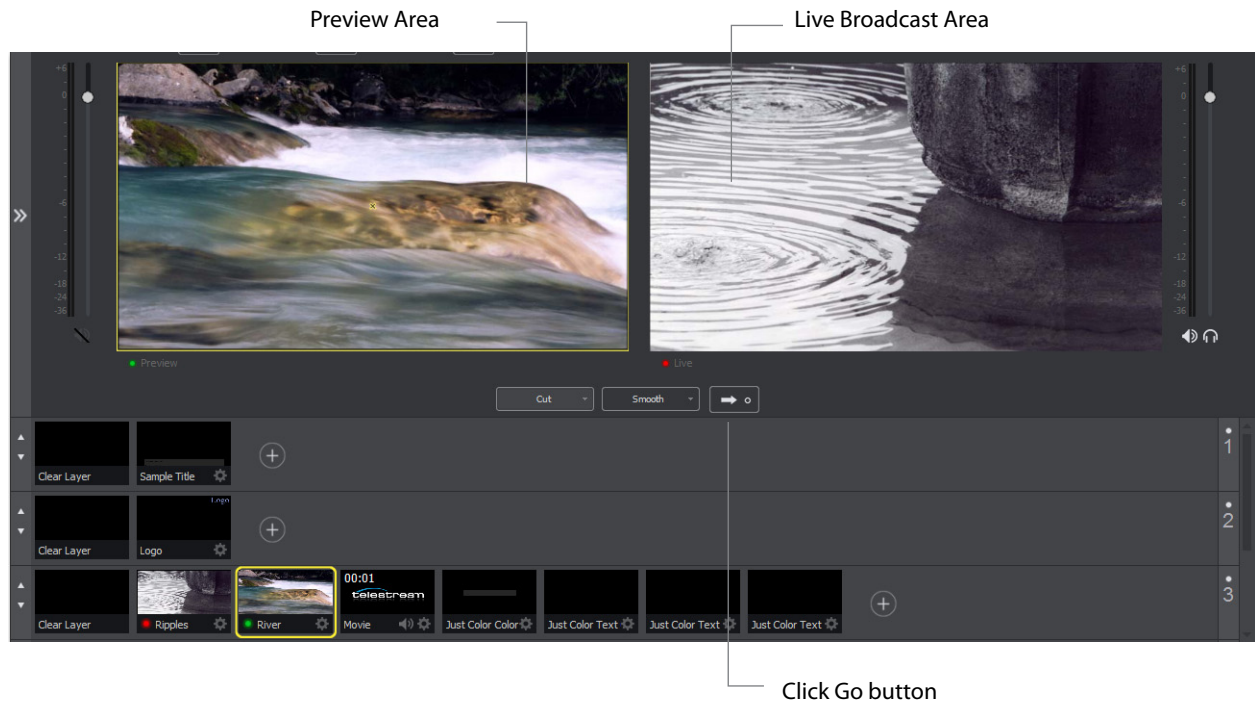
**Note:** To avoid decrease in video quality, Wirecast should not be used at CPU usage above 80%. See the Telestream Website for suggested configurations.

---

## Preview/Live Broadcast Area

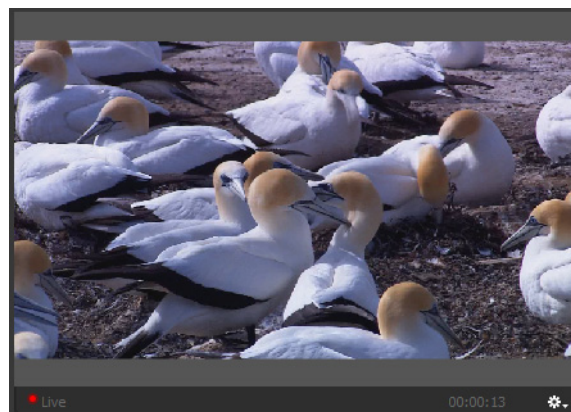
When you open a new document, the Live area shows what is broadcast to your viewers before the encoding or compression. When AutoLive is off, you can make several changes without your viewers seeing the change. This is most useful when you are using an engineer to run your broadcast. When you are making changes to your broadcast, you may want to see those changes before broadcasting them. Preview allows you to do this.

To see the preview, select *Preview* from the Layout menu. This sets up the Main Window with the Preview Area on the left and the Live Broadcast Area on the right. Clicking the Go button makes the preview shot become Live.



## Countdown Clock Display

The Main window displays a countdown clock whenever a video shot is playing. If you have multiple video shots playing, click the gear menu icon to select which shot will be associated with the countdown clock.



Countdown clock

Gear icon



# Transition Controls

The transition area is in the middle of the Main Window:



There are two Transition buttons, but each can be configured to present one of many possible transition types. In the image above, the two configured transitions are: Cut and Smooth. Since Smooth is selected (button darkened), any transition executed by clicking Go is a smooth transition.

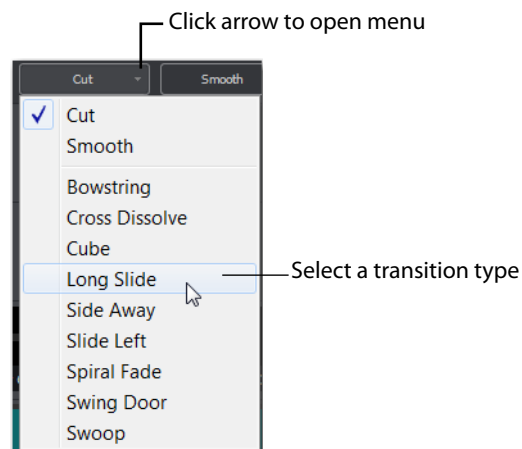
## Changing Transitions

If you click the Cut button, it becomes selected and making it the current transition type:



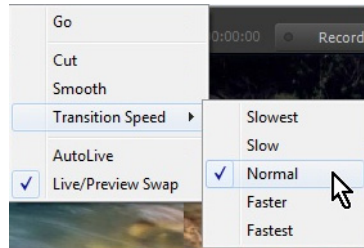
You always have two different transition types available. You can also select one of the two buttons by pressing Command+1 or 2 keys for the two transition types displayed.

If you click the down-arrow on the right side of either transition button, you can select a new transition to assign to that button.



## Transition Speed

The transition speed is set by selecting *Switch > Transition Speed*. There are five settings: Slowest, Slow, Normal, Faster, and Fastest.



## Go Button

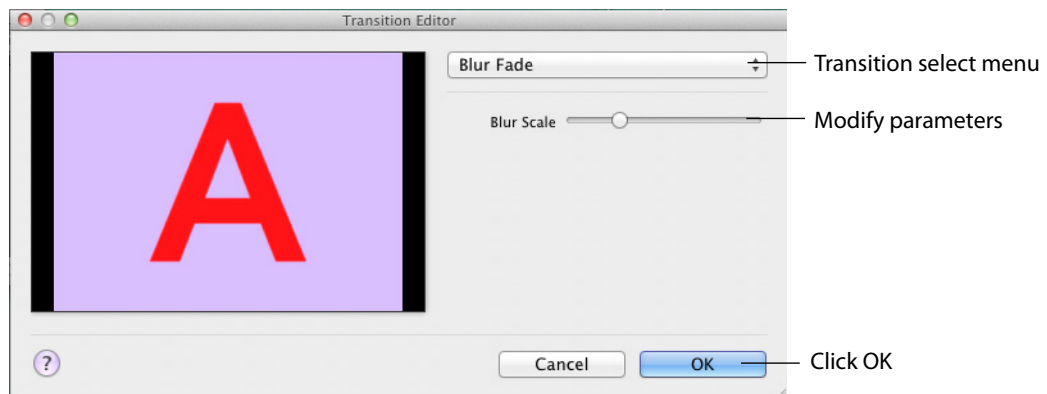
The Go Button (or Command+G) enables you to make a transition occur at any time.



Clicking the Go button does nothing when Wirecast is in AutoLive mode, except to update a live shot if you have made changes to it using the Shot Editor.

## Transition Editing

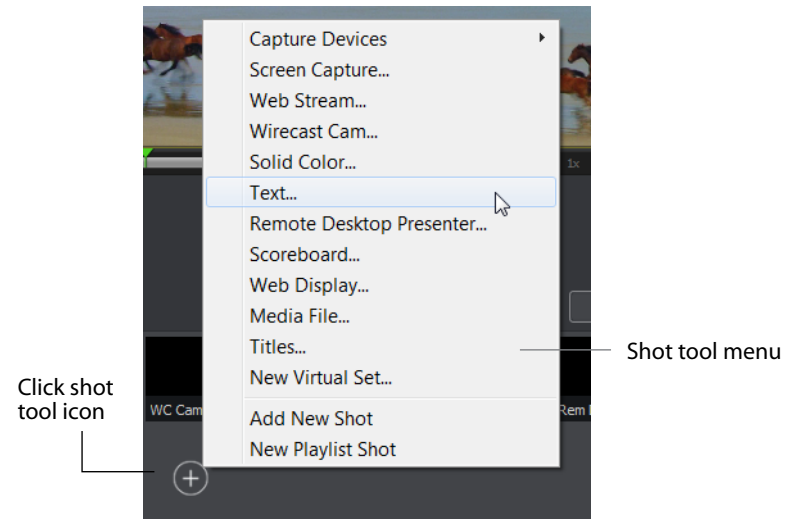
Some transitions have parameters that can be changed. To edit these parameters, select *Edit Transitions* from any of the three transition button drop-down menus (Cut, Smooth, etc.). Select the transition you wish to edit from the drop-down menu. Modify the displayed parameters as required. Each transition type has its own set parameters. Click OK when finished.



## Source Input Menu

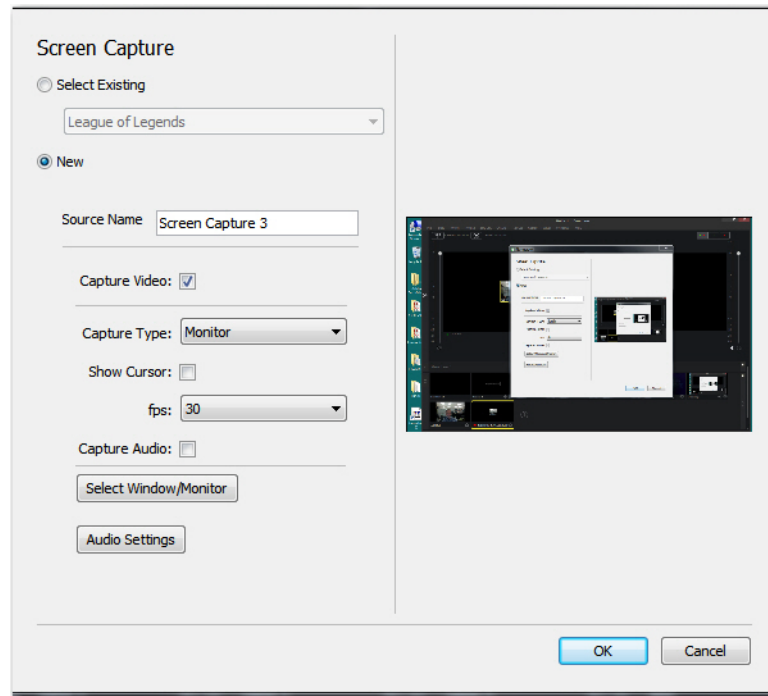
The Source Input Menu provides a way to open live sources, file sources, the Desktop Presenter program, shot graphics, shot audio, and shot templates. The Shot Tool Menu is the circle to the right of the shot icons.

Click on the shot tool icon to display the shot tool menu.



**Capture Devices** This is how you bring in new sources: System Audio Capture, Capture Cards, and System Devices. (See [Capture Devices Properties](#)).

**Screen Capture** Creates a new Screen Capture shot of any monitor or window on your computer. You can also select an existing Screen Capture shot. To do this, click *Select Existing*, then select an existing Screen Capture shot from the drop-down menu. To create a new Screen Capture shot, select *New* and enter a source name (shot name). Set all new settings and click OK when finished. (See [Screen Capture Properties](#)).



---

**Note:** Some apps, when screen captured, take control of your mouse and the cursor is not displayed. You can, at any time, press command + Tab keys to reduce the capture window size and enable you to use your mouse.

---

You can also capture your iPhone or iPad in Wirecast by connecting your device using an Apple certified lightening cable, and then adding it as a source by selecting *Screen Capture* from the Source menu.

---

**Note:** You must be using an iOS device running 8.x connected to your Mac OSX 10.10 Yosemite computer with a lightening cable. The cable should be Apple certified to guarantee proper detection. You will need to "trust" the computer in order for it to be detected.

---

**Web Stream** Creates a new Web Stream shot. You can also select an existing Web Stream shot. To do this, click Select Existing, then select an existing Web Stream shot from the drop-down menu. To create a new Web Stream shot, select New and enter a source name (shot name). Set all new settings and click OK when finished. (See [Web Stream Properties](#)).

**Web Stream**

☐ Select Existing

Web Stream Source 0

☒ New

Source Name: Web Stream Source 1

Discovery Method: N/A

Username:

IP Camera Profile:

Protocol: RTMP

Stream Options: Generic RTMP

Format Options: Auto Detect

Ignore Timestamp: ☐

Live Stream: ☐

URI:

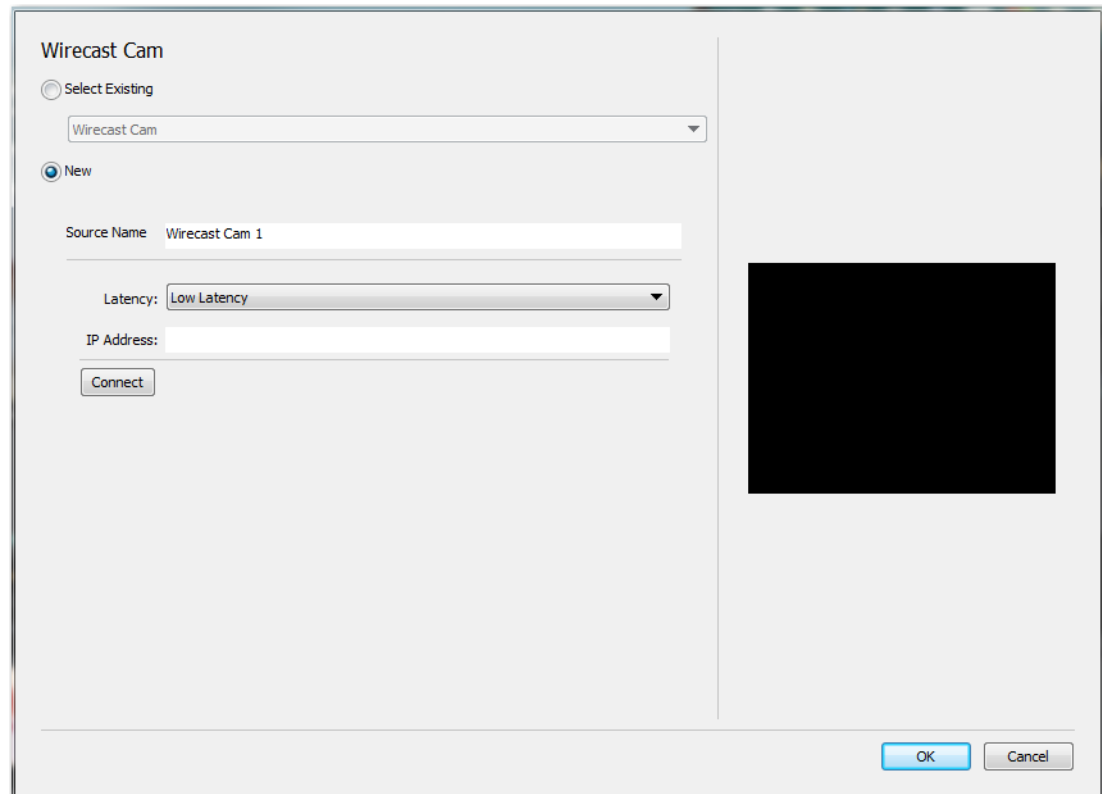
Video Codec:

Size:

FPS:

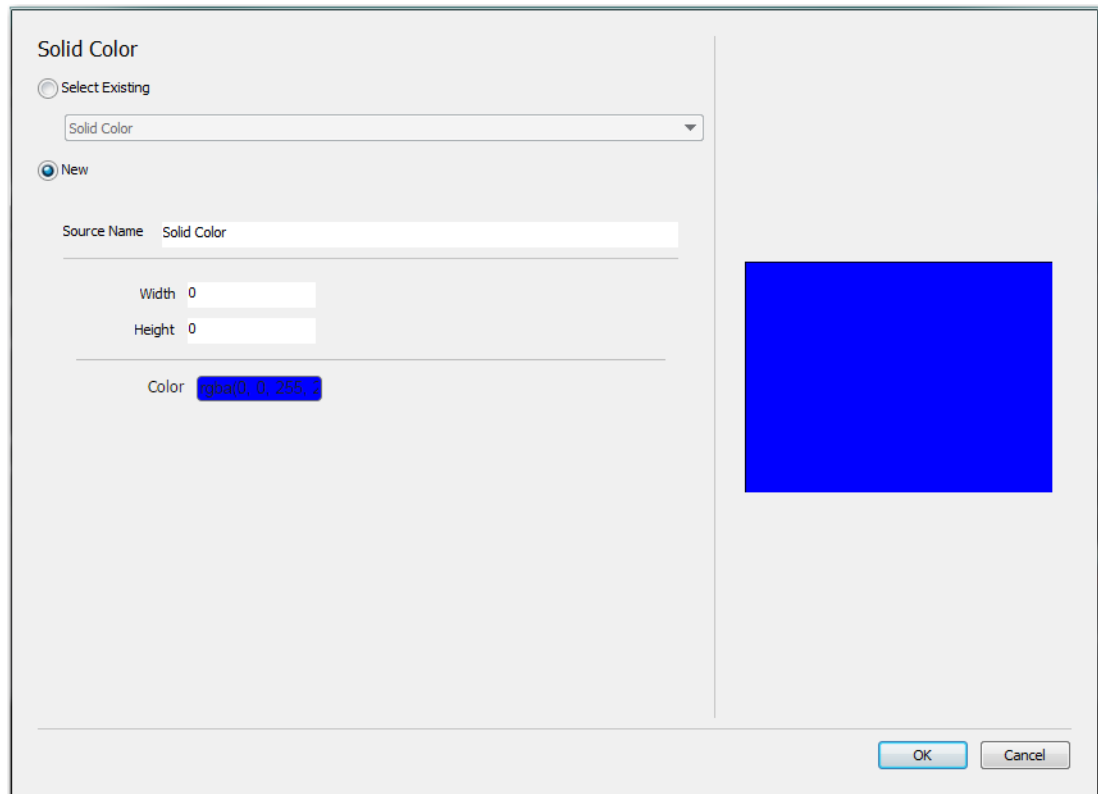
OK

**Wirecast Cam** Creates a new Wirecast Cam shot. You can also select an existing Wirecast Cam shot. To do this, click *Select Existing*, then select an existing Wirecast Cam shot from the drop-down menu. To create a new Wirecast Cam shot, select *New* and enter a source name (shot name). Set all new settings and click OK when finished. (See [Wirecast Cam Properties](#)).



The image shows a 'Wirecast Cam' dialog box with two main sections. The left section contains settings for creating a new shot. It has two radio buttons: 'Select Existing' (unselected) and 'New' (selected). Below the 'Select Existing' option is a dropdown menu showing 'Wirecast Cam'. Below the 'New' option is a text field for 'Source Name' containing 'Wirecast Cam 1'. Below that is a 'Latency' dropdown menu set to 'Low Latency'. Below that is an 'IP Address' text field. At the bottom of this section is a 'Connect' button. The right section of the dialog box is a large black rectangle, likely a video preview area. At the bottom right of the dialog box are 'OK' and 'Cancel' buttons.

**Solid Color** Creates a new Solid Color shot. You can also select an existing Solid Color shot. To do this, click *Select Existing*, then select an existing Solid Color shot from the drop-down menu. To create a new Solid Color shot, select *New* and enter a source name (shot name). Set all new settings and click OK when finished. (See [Solid Color Properties](#)).



The image shows a 'Solid Color' dialog box with two main sections. The left section contains settings for creating a new shot. It has two radio buttons: 'Select Existing' (unselected) and 'New' (selected). Below the 'Select Existing' button is a dropdown menu showing 'Solid Color'. Below the 'New' button is a text field for 'Source Name' containing 'Solid Color'. Further down are input fields for 'Width' (0), 'Height' (0), and 'Color' (rgba(0, 0, 255, 1)). The right section of the dialog is a large square area displaying a solid blue color. At the bottom right of the dialog are 'OK' and 'Cancel' buttons.

Solid Color

☐ Select Existing

Solid Color

☒ New

Source Name Solid Color

Width 0

Height 0

Color rgba(0, 0, 255, 1)

OK Cancel

**Text** Creates a new Text shot. You can also select an existing Text shot. To do this, click Select Existing, then select an existing Text shot from the drop-down menu. To create a new Text shot, select *New* and enter a source name (shot name). Set all new settings and click OK when finished. (See [Text Shot Properties](#)).

**Text**

☒ Select Existing

Text

☐ New

Source Name: Text

☐ Width: 640

☐ Height: 480

Source: text file rss

Line Wrap: ☒

Align: [Left] [Center] [Right]

Justify: [Left] [Center] [Right]

☐ On Change: Fade

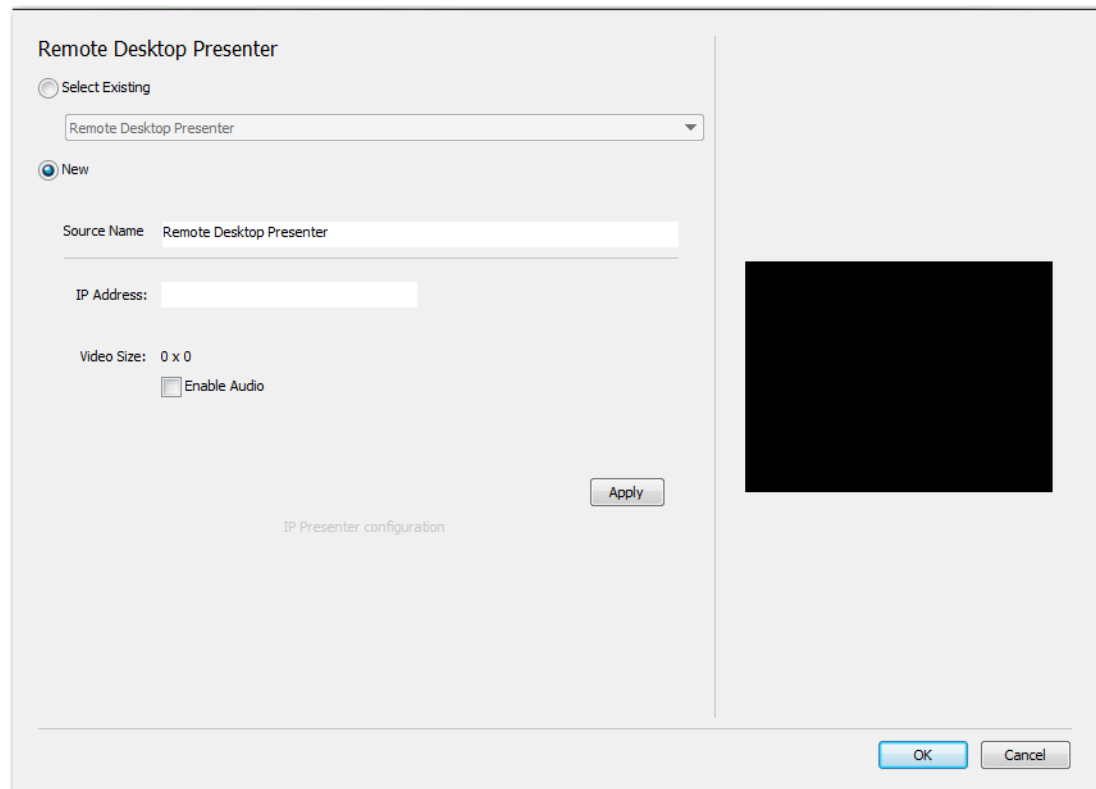
☐ Scroll: Non Stop

OK Cancel

**cjcar5**



**Remote Desktop Presenter** Creates a new Remote Desktop Presenter shot. You can also select an existing Remote Desktop Presenter shot. To do this, click *Select Existing*, then select an existing Remote Desktop Presenter shot from the drop-down menu. To create a new Remote Desktop Presenter shot, select *New* and enter a source name (shot name). Set all new settings and click OK when finished. (See [Remote Desktop Presenter Properties](#)).



The screenshot shows a dialog box titled "Remote Desktop Presenter". It has two radio buttons: "Select Existing" (unselected) and "New" (selected). Below "Select Existing" is a dropdown menu showing "Remote Desktop Presenter". Below "New" is a text field for "Source Name" containing "Remote Desktop Presenter". Below that is a text field for "IP Address:". Below that is a text field for "Video Size:" containing "0 x 0". Below that is a checkbox for "Enable Audio" which is unchecked. At the bottom right of the main area is an "Apply" button. At the bottom right of the dialog are "OK" and "Cancel" buttons. The text "IP Presenter configuration" is faintly visible at the bottom center.

**Scoreboard** Creates a new Scoreboard shot. You can also select an existing Scoreboard shot. To do this, click *Select Existing*, then select an existing Scoreboard shot from the drop-down menu. To create a new Scoreboard shot, select *New* and enter a source name (shot name). Set all new settings and click OK when finished. (See [Scoreboard Properties](#)).

Scoreboard

☐ Select Existing

Untitled Scoreboard

☒ New

Source Name: Untitled Scoreboard

Scoreboard: Metal Pipe Basic

Data Look

Team Name	Score
Home: Home	0
Visitor: Visitor	0

Field 1: Field 1

Field 2: Field 2


Field 3: Field 3

Field 4: Field 4

Use the '+', '=', '[', ']' keys from Wirecast's main window to change the scores of a live scoreboard.

OK Cancel

**Web Display** Creates a new Web Display shot. Fill in the information needed and click OK. (See [Web Display Properties](#)).

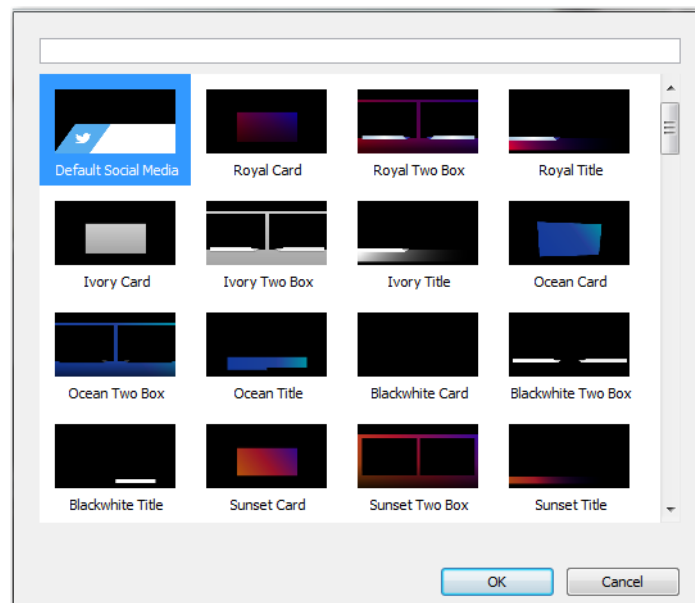


The Web Display dialog box is used to create a new Web Display shot. It contains the following fields and options:

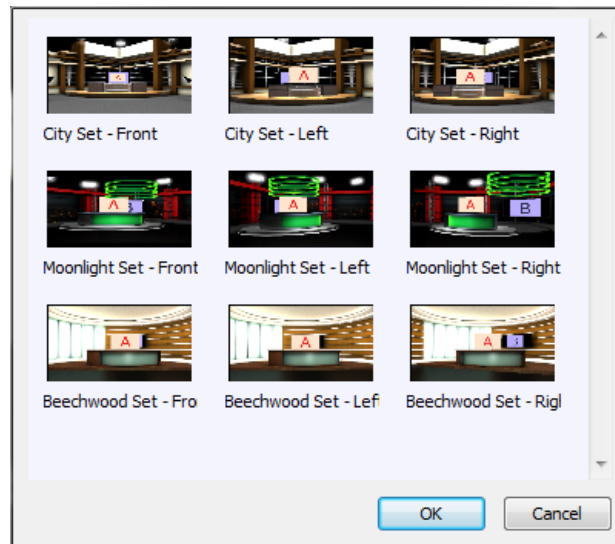
- Source Name:** A text field containing "Untitled Web Display".
- Address:** A text field containing "www.stream.net".
- Video Width:** A text field containing "640".
- Video Height:** A text field containing "480".
- Transparent Background:** A checkbox that is currently unchecked.
- Override CSS:** A large text area for entering custom CSS.
- Preview:** A small window on the right showing a preview of the Web Display shot. It displays a blue background with a hand holding a glowing sphere and the text "Bringing Vision to Life".
- Buttons:** "Apply", "OK", and "Cancel" buttons.

**Media File** Creates a Media File shot (video clip or picture). When selected, a navigation window displays. Navigate to a media file location, select a media file, and click *Open*. (See [Media File Properties](#)).

**Titles** Creates a new Title shot. When the window of titles displays, select a title and click OK. (See [Titles Properties](#)).

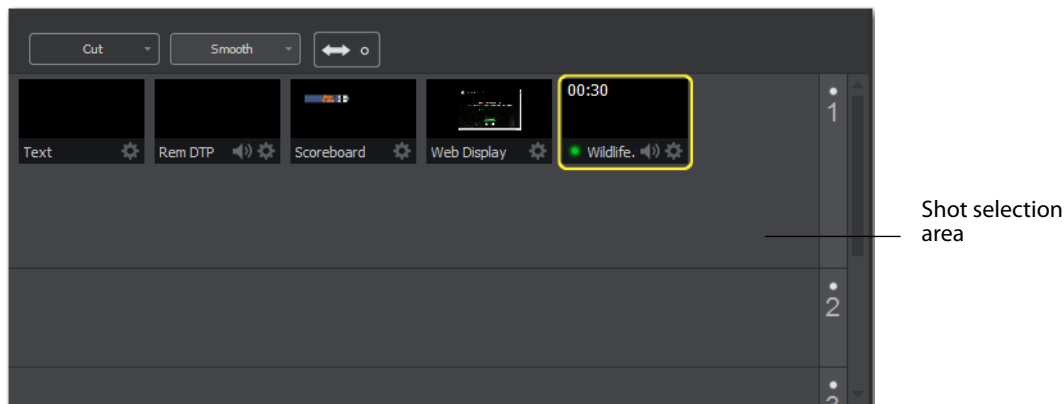


**New Virtual Set** Creates a new Virtual Set shot. When the window of sets displays, select a set and click OK. (See [New Virtual Set Properties](#)).



## Shot Selection Area

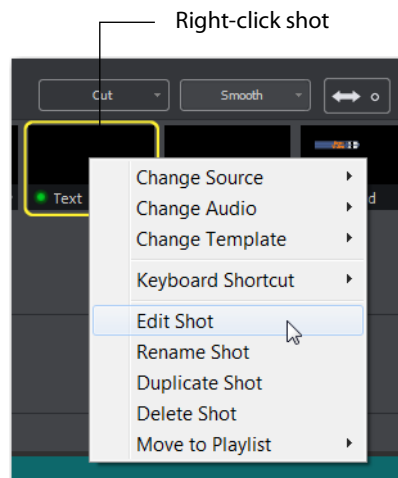
The bottom part of the Main Window contains the Shot Selection Area, also called the Shot List.



The shot icons can be made to display any live activity in the source it represents (cameras, streaming, etc.). See [Performance](#) in the Preferences section for turning on Live Icons.

## Changing Shots

Right-click on any shot to display the shot menu.

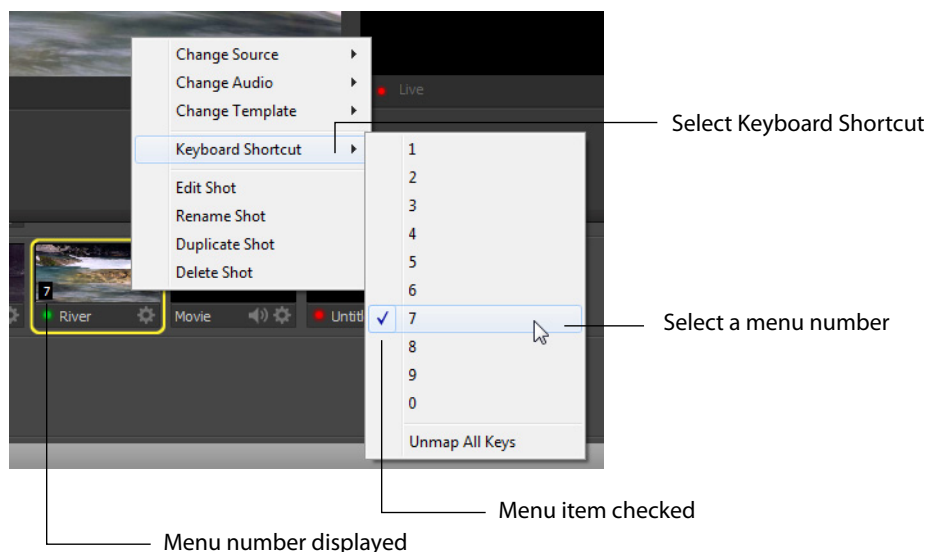


**Change Source** Select Change Source to change the source of your shot. Upon selection, a menu of sources will display enabling you to make a selection.

**Change Audio** Select Change Audio to change the audio of your shot. Upon selection, a menu of audio sources will display enabling you to make a selection.

**Change Template** Select Change Template to change the template of your shot. Upon selection, a menu of templates will display enabling you to make a selection.

**Keyboard Shortcut** You can create a keyboard shortcut to any shot. To do this, select *Keyboard Shortcut*, then select a menu number to associate with that shot. After you have selected a menu number, that menu item is checked and the number is displayed in the shot icon.



To take a shot using the assigned hotkey, press the number key assigned to that shot.

You can assign multiple shots to the same menu number as long as they are on different layers. When you use the assigned hotkey all the shots assigned to it will be taken. Selecting a checked menu item will uncheck it and unassign the shot.

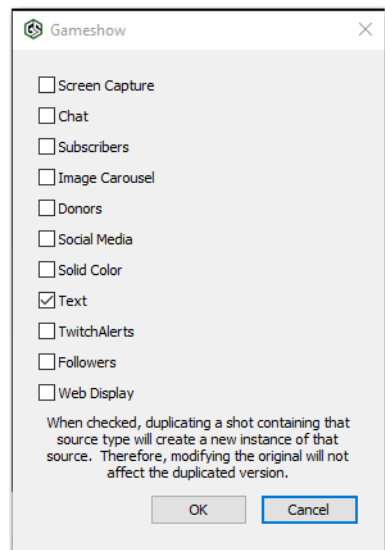
Select *Unmap All Keys* to remove all hotkey assignments.

**Edit Shot** You can edit a shot by clicking the double arrows (located on the left side of the Preview window) to the right, revealing the shot editing panel. You can also edit a shot by double-clicking on it, by right-clicking it and selecting Edit Shot, by selecting Edit Shot from the Edit menu, or by selecting it and pressing the Command+E keys.

**Rename Shot** You can rename a shot by right-clicking it and selecting Rename Shot, or by selecting Rename Shot from the Edit menu. You can also rename a shot by selecting it and pressing the Command+R keys.

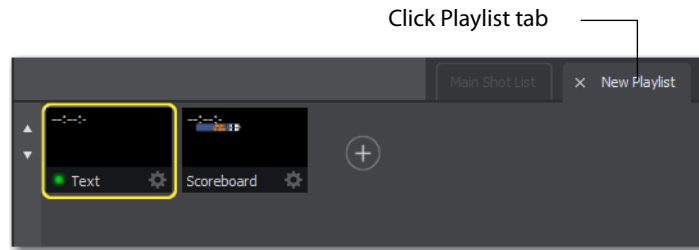
**Duplicate Shot** You can duplicate a shot by right-clicking it and selecting Duplicate Shot, or by selecting Duplicate Shot from the Edit menu. You can also duplicate a shot by selecting it and pressing the Command+D keys.

**Duplicate Shot Options** Check a source to create a new instance of it when duplicating the shot containing it. Multiple selection is allowed.



**Delete Shot** You can delete a shot by right-clicking it and selecting Delete Shot, or by selecting Delete Shot from the Edit menu. You can also delete a shot by selecting it and pressing the Command+Backspace keys.

**Move to Playlist** Moves this shot to the selected playlist. If you have existing playlists, that can be viewed by selecting the Playlist tab. You can move a shot to another playlist, back to the main layer, by right-clicking the shot and selecting *Move to Playlist*.



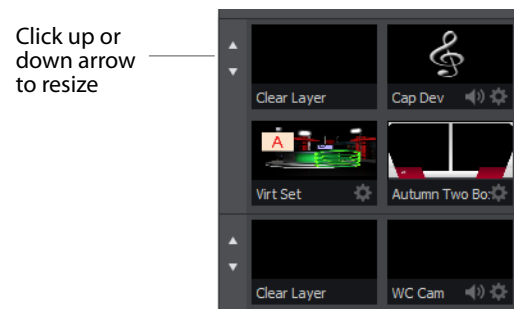
## Moving a Shot to Another Layer

You can move a selected shot to another layer by selecting *Move to Layer* from the Edit menu, then selecting the target layer from the drop-down menu. You can also move the cursor to the bottom of a shot icon (until the cursor becomes a hand), and then drag the shot icon to a different layer.

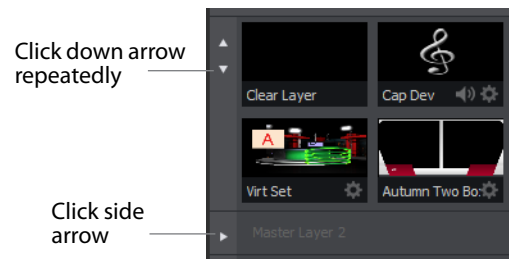
When shots are created, they are assigned to a specific layer. They exist on that layer until they are moved or deleted. (See [Layers](#).)

## Resizing the Shot Icons

You can resize the shot icons on any layer by clicking the up or down arrow on the left side of the layer window. Click the up arrow to make all the icons larger; click the down arrow to make them smaller. Clicking the down arrow when the shot icons are in their smallest state causes the layer window to become hidden.



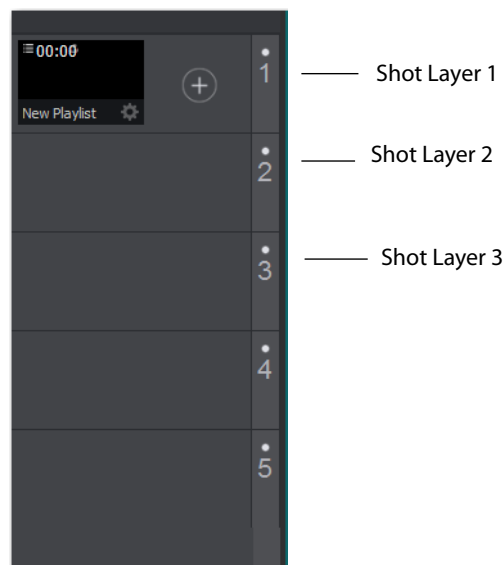
To show or hide a layer, click the down arrow until layer is hidden. To show a layer, click the side arrow that represents a hidden layer.



## Layers

Wirecast allows you to put shots on any of five different layers. Layering shots enables Wirecast to merge them together, from back (lowest layer) to front, to form a single visual image during broadcast.

When Wirecast first opens, two of the five layers of shots are displayed. You must scroll down (or expand the window) to see the other three layers.



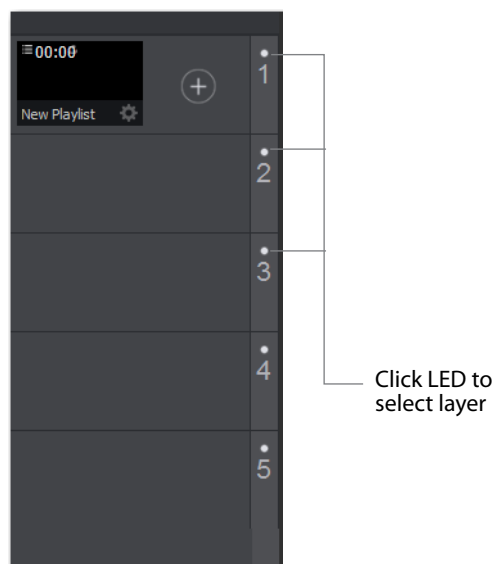
## What is a Layer?

Layers are, by default, named 1 through 5. Layers determine the order when presenting images in the Live Broadcast Area. The Bottom layer (5) is drawn first, then the other layers are added, in order, up to Layer 1. Using multiple layers is a powerful way to show a company logo, a background, or a title, independent from each other.



## Changing Layers

To select a layer, click its LED to turn it on (click it again to turn it off). When a layer is selected, the selected shot in that layer is displayed in the Preview/Live Broadcast area. If multiple layers are selected all selected shots are displayed.



## Moving a Shot to Another Layer

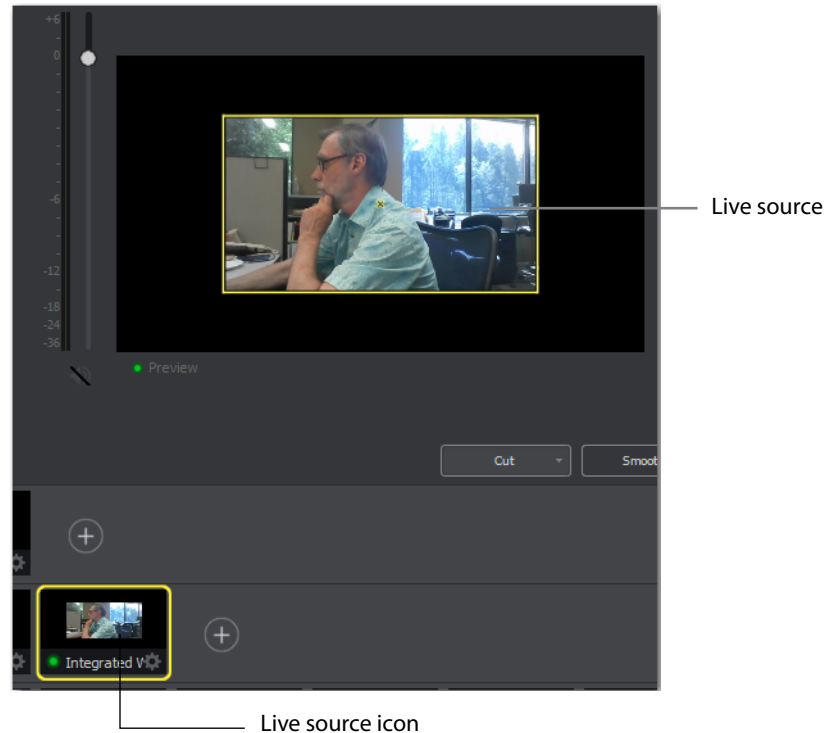
A shot can be moved to another layer by clicking and dragging the shot from one layer to another within the Main Shot window. When shots are created, they are assigned to a specific layer. They exist on that layer until you move them or delete them.

## AutoLive

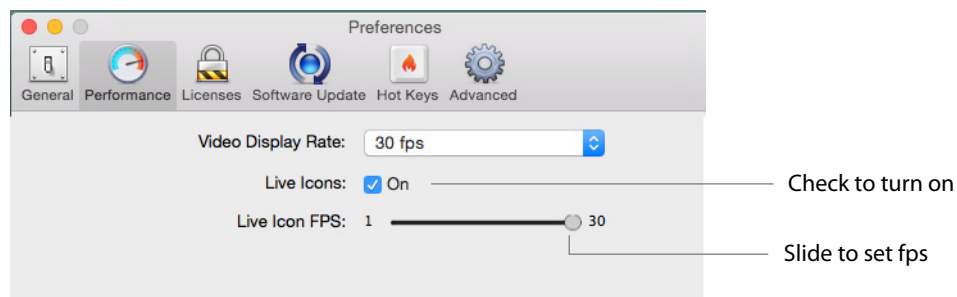
AutoLive is turned on and off by selecting *Switch > AutoLive*. When AutoLive is on, changes made in the Shot List are automatically taken Live in the broadcast (using the current transition and duration). If you click a shot when AutoLive is off, the shot is not sent to live broadcast. In this mode you take the shot live manually, by clicking the Go button, or by pressing the Command+G keys.

## Live Icons

You can, optionally, make your live source icon display its source (camera, Web stream, etc.) in real time. This means that inside the icon, you will see what the live source sees.



To turn on the *Live Icon* option (default is *off*), select the *Performance* tab in Preferences, then check the Live Icons checkbox. You can also adjust the frames per second rate of the display using the slider. Lower fps (frames per second) rates reduce the time taken to adjust the live icon display. Higher fps rates provides a smoother display of the live icon source.



---

**Note:** There tends to be a degrading quality when an icon is live. So, if the CPU is reaching its maximum, turn off Live Icons to reduce CPU usage.

---

# Keyboard Shortcuts

## Introduction

This section provides a list all of keyboard shortcuts used in Wirecast. They are arranged according to how they appear in the drop-down menus in the main window.

### General Shortcuts

Misc Shortcuts	Keyboard Shortcut
Display Shot	<shot number key*>
Enter	Selects left-hand transition button and clicks Go button
Space bar	Selects right-hand transition button and clicks Go button
i	Sets the media IN point
o	Sets the media OUT point
e	Sets the Replay IN point
=	Increments Home score
-	Decrements Home score
]	Increments Visitor score
[	Decrements Visitor score

\* See Keyboard Shortcut in Changing Shots.

### Wirecast Menu

Menu	Keyboard Shortcut
Preferences	command+comma
Hide	command+H
Hide Others	control+command+H
Quit	command+Q

## File Menu

File Menu	Keyboard Shortcut
New	command+N
Open	command+O
Import Media	command+Shft+I
Save	command+S
Save As	command+Shft+S
Close Window	command+W

## Edit Menu

Edit Menu	Keyboard Shortcut
Undo	command+Z
Redo	command+Shft+Z
Cut	command+X
Copy	command+C
Paste	command+V
Select All	command+A
Edit Shot	command+E
Rename Shot	command+R
Duplicate Shot	command+D
Delete Shot	command+Delete

## Switch Menu

Switch Menu	Keyboard Shortcut
Go	command+G
Cut	command+1
Smooth	command+2
AutoLive	command+L
Live/Preview Swap	control+command+W

## Media Menu

Media Menu	Keyboard Shortcut
Start Playing All Movies	command+P
Pause All Movies	command+Shft+P

## Output Menu

Output Menu	Keyboard Shortcut
Output Settings	command+Y
Start/Stop Broadcasting > Start All	command+B
Start/Stop Recording > Start All	command+K

## Layout Menu

Layout Menu	Keyboard Shortcut
Master Audio	control+command+M
Main Shot List	control+command+L
Go to Layer > Master Layer 1	Shift+command+T
Go to Layer > Master Layer 2	Shift+command+F
Go to Layer > Master Layer 3	Shift+command+N

## Replay Menu

Replay Menu	Keyboard Shortcut
	NO SHORTCUTS

## Twitter Menu

Twitter Menu	Keyboard Shortcut
	NO SHORTCUTS

## Window Menu

Window Menu	Keyboard Shortcut
Minimize	command+M
Inspector	command+I
Encoder Presets	control+command+E
Audio Mixer	command+U

## Help Menu

Help Menu	Keyboard Shortcut
	NO SHORTCUTS





# Adding Media

## Introduction

In addition to live video from your cameras, Wirecast enables you to work with media created outside of Wirecast. This section introduces some common media types you can use with Wirecast. You can add media by selecting *Import Media* from the File menu, by pressing the Command+Shift+I keys, or by clicking the plus (+) button in the Shot Editor.

## Topics

- *Images/Opacity*
- *Supported Codecs*

## Images/Opacity

Wirecast supports a wide variety of still images types (TIFF, GIF, JPEG, PNG, etc.). Some of these formats offer some form of opacity (or transparency). This is often called an Alpha Channel. Wirecast works seamlessly with these formats making them the preferred methods for using graphics and logos, which have transparency.

## GIF and Transparency

GIF files are a special case because they only offer transparency and not a true Alpha Channel. The GIF format enables you to define part of the image as transparent (completely invisible), but does not enable you to define it as partially transparent. Some GIF images use transparency for much of the image. However, near the edges of the visible data, transparency cannot be used. This happens quite often when there is a shadow near the edges of the visible data. The author of the GIF often assumes a certain background color (white, for example) and that color becomes embedded in the actual image.

When Wirecast displays these types of images, the edges of the visible data shows the background that was saved in the GIF. This is not a defect in Wirecast and, therefore,

Wirecast can only present the data as it exists in the GIF. The solution is to obtain the original image and re-save the image as either TIFF or PNG. Both of these formats offer full Opacity.

## Keynote Movies

Wirecast supports some special features of Keynote Movies which enable you to move back and forth between the pages from within Wirecast. With this feature you can visually annotate and walk through your Keynote for your viewers.

## Using Movies

To use the movie in Wirecast, follow these steps:

1. Drag & drop the Keynote movie into the Shot List in the Main Window.
2. Click the movie to take it live in the Live Broadcast Window. (Or, if you have AutoLive off, click the Go button.)
3. To go forward in the Keynote movie, select Play to next point from the Media menu (or, press the Command+Right Arrow keys). The Keynote movie plays to the next section using the transition you selected in Keynote.
4. To go backward in the Keynote movie, select Jump to previous point from the Media menu (or, press the Command+Left Arrow keys). All media in the Live area jumps to the previous point.

## Windows Media

Windows Media Files (WMV and WMA) are not supported by Wirecast. The solution is to convert the media into a different type, such as MPEG-4.

## Real Media

Real Media Files (.RM) are not supported by Wirecast. The solution is to convert the media into a different type such as MPEG-4.

## Supported Codecs

Shown below is a list of supported video and audio codecs.

Video Codec	MOV	MP3		MPEG-4		WAV	AIFF		ASF
	(M4V)			ISO (MP4)			(AIFF, AIF)		(WMV)
AVC	YES	NO	YES		NO	NO			NO
H264	YES	NO	YES		NO	NO			NO
DVC25	YES	NO	NO		NO	NO			NO



DVCPRO50	YES	NO	NO	NO	NO	NO
DVCPRO100	YES	NO	NO	NO	NO	NO
MJPEG	YES	NO	NO	NO	NO	NO
ProRes	YES	NO	NO	NO	NO	NO
(mac only)						
Windows Media Video	NO	NO	NO	NO	NO	YES (windows)

**Audio Codecs:**

AAC	YES	NO	YES	NO	NO	NO
MP3	YES	YES	NO	NO	NO	NO
PCM	YES	NO	NO	YES	YES	NO
Windows Media Audio	NO	NO	NO	NO	NO	YES (windows)



# Shot Editor

## Introduction

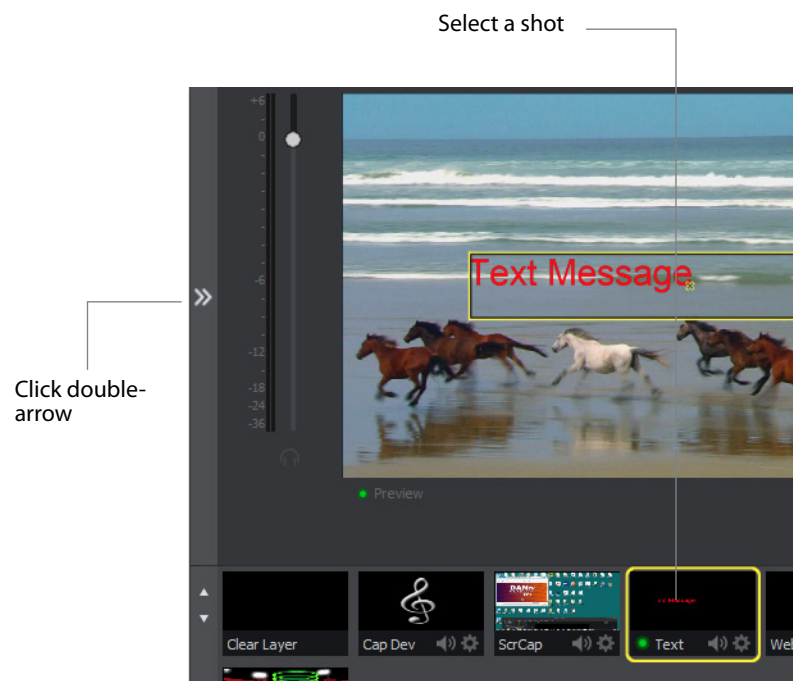
The Shot Editor is used to view a shot, edit it, or create a new one. This section describes how to use the Shot Editor.

## Topics

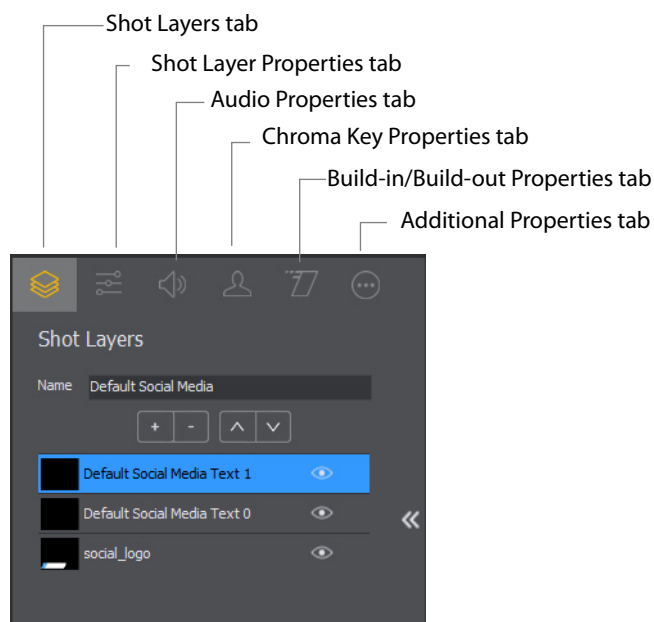
- *Overview*
- *Shot Layers Tab*
- *Shot Layer Properties Tab*
- *Audio Properties Tab*
- *Chroma Key Properties Tab*
- *Build-in/Build-out Properties Tab*
- *Additional Properties Tab*
  - *Capture Devices Properties*
  - *Screen Capture Properties*
  - *Image Carousel Properties*
  - *Web Stream Properties*
  - *Wirecast Cam Properties*
  - *Solid Color Properties*
  - *Text Shot Properties*
  - *Remote Desktop Presenter Properties*
  - *Scoreboard Properties*
  - *Web Display Properties*
  - *Media File Properties*
  - *Titles Properties*
  - *New Virtual Set Properties*
  - *Twitter Feed Properties*

## Overview

To edit a shot, click it to select it, then click the double-arrow on the left to open the shot editor panel. You can also double-click the shot to open the shot editor.



The shot editor has six tabs: Shot Layers, Shot Layer Properties, Audio Properties, Chroma Key Properties, Build-in/Build-out Properties, and Additional Properties.



**Shot Properties** Enables you to add and delete sources and to change the display order (layering within the shot).

**Shot Layer Properties** Enables you to change the size, position, and other properties of a shot source. The sources in a shot are selected for editing by clicking it, or by selecting it in the Shot Properties tab.

**Audio Properties** Enables you to set and monitor audio level.

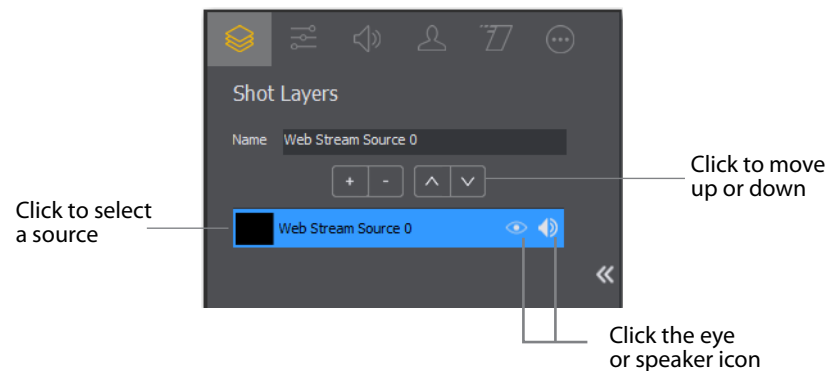
**Chroma Key Properties** If a source in your shot uses a chroma key, this tab enables you to configure the chroma key settings. Each source in a shot can have its own chroma key settings.

**Build-in/Build-out Properties** Enables you to control how objects are added to and removed from your broadcast.

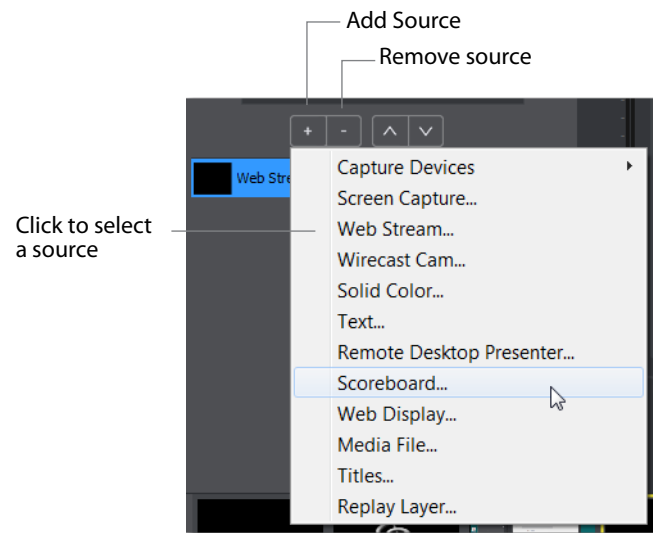
**Additional Properties** Enables you to set any additional properties for a source in your shot: System device properties, screen display properties, Twitch Widgets (Chat and Followers), etc.

## Shot Layers Tab

The Shot Layers tab lists all of the sources in the shot. You can select any source by clicking it. You can also reorder the sources in the list by selecting a source then clicking the up or down arrow to move it. Additionally, you can toggle the visibility or audio of any layer item in the shot by clicking the eye or speaker icon.

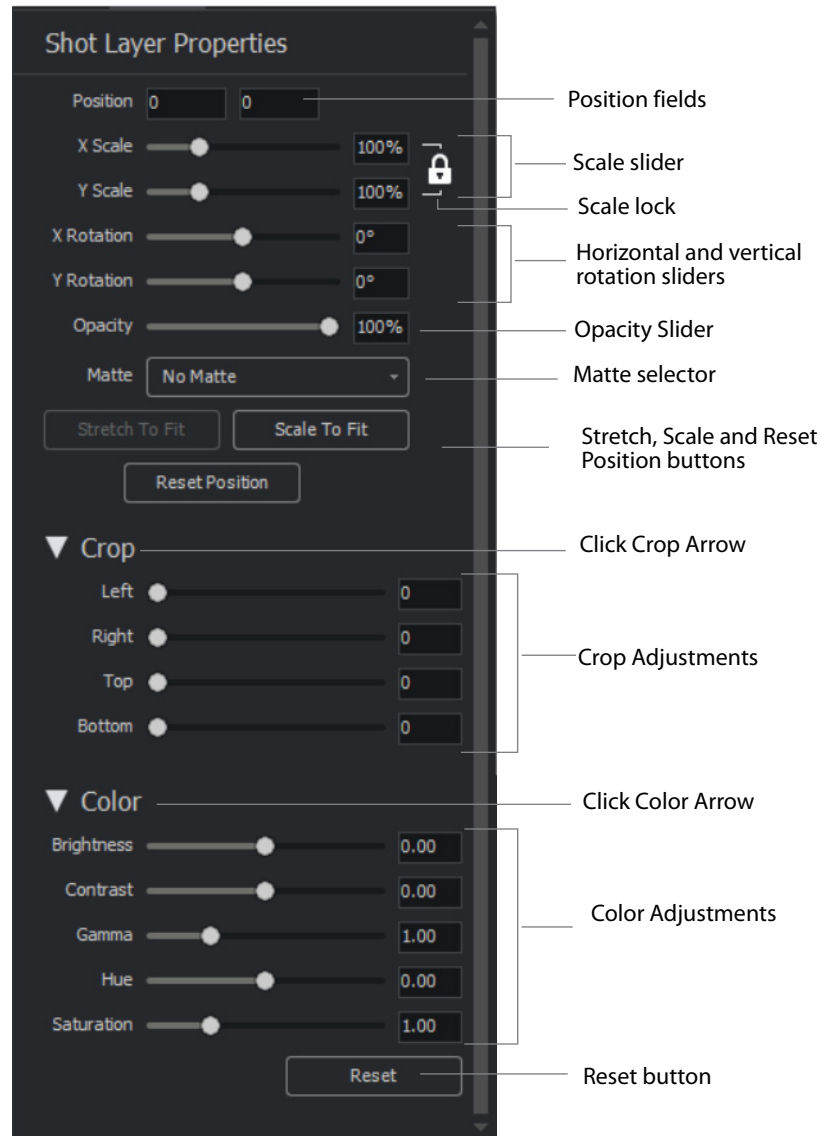


To add a source to your shot, click the plus (+) icon, then select a source from the list of sources. You can remove any source by selecting it, then clicking the minus (-) icon.



# Shot Layer Properties Tab

The Shot Layer Properties tab enables you to make adjustments to the sources in your shot.



**Position** Displays the position of the selected source in your shot. Position 0,0 represents the middle of the shot area. To move a source, click and drag it to a new location in the shot.

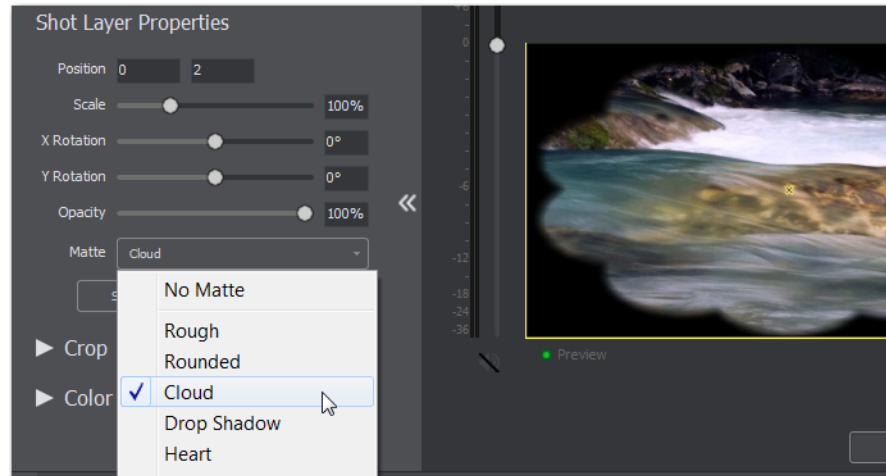
**X and Y Scale** Slide the *Scale* slider to change the size of your source. (See also *Scale To Fit* below).

**Scale Lock** Click the lock icon to lock or unlock (toggle) the X and Y scale controls to possess the same values. When locked, moving one slider move both, keeping the values the same.

**X and Y Rotation** Slide the X (Horizontal) and Y (Vertical) sliders to rotate the source horizontally or vertically or both. (See also *Reset Position* below).

**Opacity** Slide the Opacity slider to adjust the degree of transparency of your source.

**Matte** A Matte is the boarder around a shot. Select matte to be used by clicking the down-arrow on the Matte menu. Default is *No Matte*.



**Stretch to Fit** Click the *Stretch to Fit* button to stretch the source to expand to its maximum size in the shot. This may distort the display of the source.

**Scale to Fit** Click the *Scale to Fit* button to force the source to expand to its maximum size in the shot.

**Reset Position** Click the *Reset Position* button to force the source to return to its original size (scale) and rotation positions. Slide the Left, Right, Top, and Bottom sliders to crop your source image.

**Crop** Click the Crop triangle to open the cropping adjustment pane.

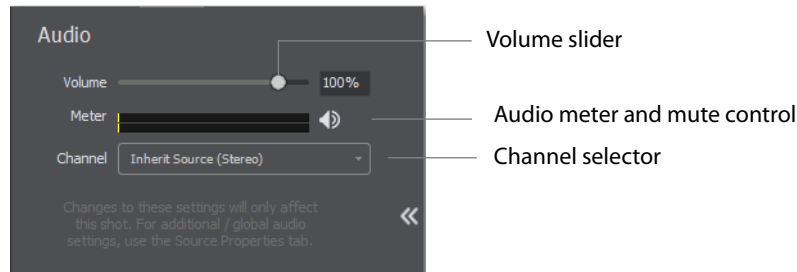
**Color** Click the Color triangle to open the color adjustment pane.

**Reset** Click the *Reset* button to reset the color controls to their default settings.



## Audio Properties Tab

The Audio Properties tab enables you to control and monitor audio. You can set the audio level, mute and monitor the audio, and select channels.



**Volume** Adjust the slider to set the audio volume level.

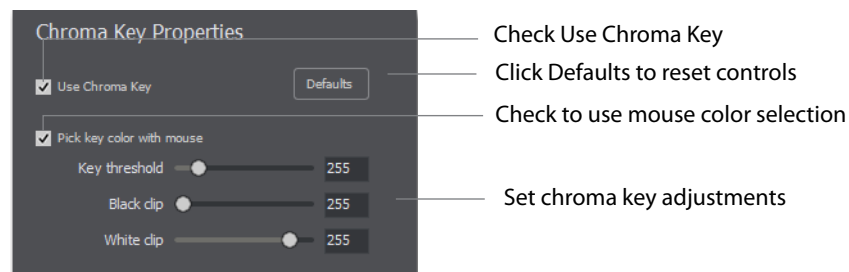
**Meter** Monitors the audio level. You can also mute the audio by clicking the audio icon.

**Channel** Select the audio channel(s) to be used: Inherit Source, Stereo (left and right audio), Left channel only, or Right channel only.

## Chroma Key Properties Tab

Chroma Key (also called “green screen”) enables you to replace all green areas of your display (or any other color you choose) with a background image. For example, if you are in front of the traditional green screen, by “keying out” the green and leaving the background transparent, you will appear to be in front of your background.

The Chroma Key Properties tab enables you to turn on/off chroma keying and make chroma key adjustments.



**Use Chroma Key** Check to turn on chroma keying. Uncheck to turn it off. Click the Defaults button to reset all Chroma Key controls.

**Pick key color with mouse** Check to use your mouse to select a chroma key color. Hover over the a desired color in the selected source, and click the left mouse button to select that color. All adjustments will be made using the selected color as the key.

**Key Threshold** Slide the *Key Threshold* slider to adjust the amount of keying in your source.

**Black Clip** Slide the *Black Clip* slider to adjust the black threshold level (how much black in key result).

**White Clip** Slide the *White Clip* slider to adjust the white threshold level (how much white in key result).

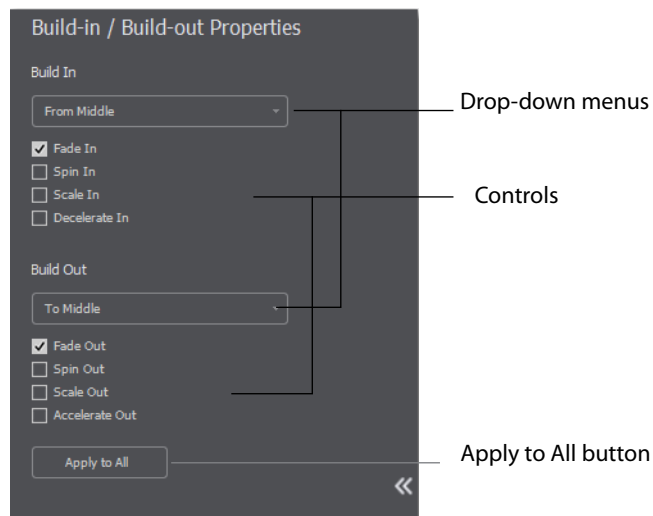
## Build-in/Build-out Properties Tab

When an object is added to your broadcast it is called Build In; When it is removed it is called Build Out. Motion only occurs when an object enters or leaves the Live Broadcast window.

For example, if you have two shots, each with a foreground and the media in the foreground is the same, then a Smooth transition is performed between the foregrounds. However, no motion is performed. Or, if a logo is positioned in the top left corner in an existing shot, and it is in the bottom right corner in a new shot, when you make the new shot Live the logo smoothly transitions from the top left corner to the bottom right corner. But the Build In and Build Out settings are ignored.

However, if you have two shots with a Foreground, but the media in each is different, the Build Out is performed for the existing shot, and the Build In is performed for the new shot.

The Build-in Properties tab enables you to turn on/off chroma keying and make chroma key adjustments.



**Direction Menus** These provide selections of where the Build In comes from (top, bottom, right, etc.) when it is added, and where the Build Out goes when it is removed.

**Fade In / Fade Out** Checking these checkboxes causes an object to be added or removed gradually. If unchecked, the object is instantly added or removed, much like a cut transition.

**Spin In / Spin Out** Checking these checkboxes causes an object to be added or removed in a spinning fashion.

**Scale In / Scale Out** Checking these checkboxes causes an object to be added or removed in a scaled fashion.

**Decelerate In / Accelerate Out** Checking these checkboxes causes all of the above actions to be performed at a slower or faster rate.

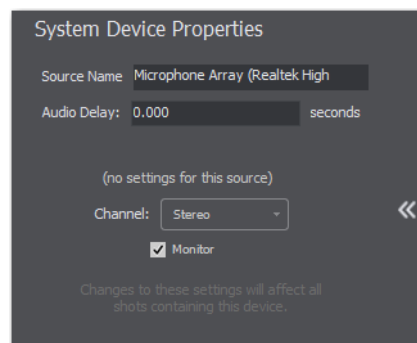
**Apply To All** Click this button to make the Motion Settings the same for all sources in a shot. This is useful if you want to make all of your motion the same for all of the elements in the shot.

## Additional Properties Tab

The Additional Properties tab provides various adjustments to your selected source, depending on the kind of source selected. There are many kinds of sources: System Devices, Screen Captures, Web Displays, Scoreboards, etc.

### Capture Devices Properties

Capture Device enables you to capture just the audio of the output. Capture Devices have a variety of settings. To open a Capture Device source, select *Capture Devices* from the source menu in the shot window. Here is an example of a Realtek High microphone array.



**Source Name** Displays the name of the source. To change the source name, enter a new one.

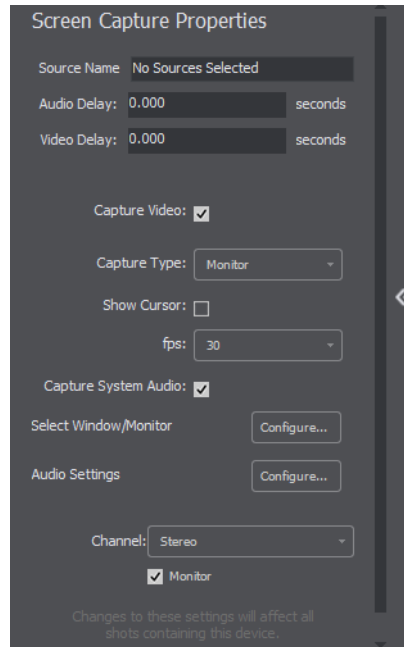
**Audio Delay** Enter the amount of time (in seconds, as short as 1 ms) to delay audio.

**Channel** Select *Stereo*, *Left*, or *Right* to determine the audio source for both channels. *Stereo* sends the left audio source to the left channel and the right audio source to the right channel. *Left* sends the left audio source to the both channels (left and right). *Right* sends the right audio source to the both channels (left and right).

**Monitor** Check the *Monitor* check box to cause audio to play through your monitor output. If the check box is unchecked, audio will not play through the monitor output for this source. The default is check box checked.

## Screen Capture Properties

A Screen Capture displays any monitor or window on your computer. To open a Screen Capture source, select *Screen Capture* from the source menu in the shot window. Screen Captures have the following settings.



**Source Name** Displays the name of the source. To change the source name, enter a new one.

**Audio Delay** Enter the amount of time (in seconds, as short as 1 ms) to delay audio.

**Video Delay** Enter the amount of time (in seconds, as short as 1 ms) to delay video.

**Capture Video** Check to enable Capture Type, Show Cursor, and fps settings (described below).

**Capture Type** Select *Monitor* (captures your entire monitor), *Window* (captures the currently selected window), or *Game* (captures the game currently played on your PC). If you select *Game*, you can also configure how your game is captured by selecting options offered under Select Window/Monitor (described below).

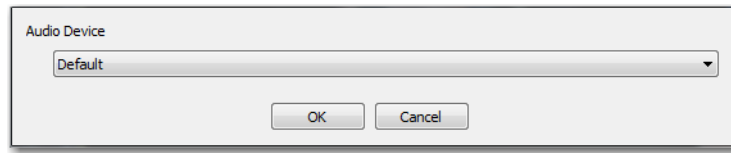
**Show Cursor** Check to show the cursor in your streaming. Uncheck to hide it.

**fps** Select the FPS, from 10 to 60 frames per second as the capture rate. An FPS of 60 is the best frame rate, but it requires greater streaming bandwidth.

**Capture System Audio** Check to capture system audio when streaming. Uncheck to mute the audio.

- **Select Window/Monitor** Click the *Configure* button to display the *Select Window* dialog.

**Audio Settings** Click the *Configure* button to display the *Select Audio Device* dialog, then select an audio device from the drop-down menu.



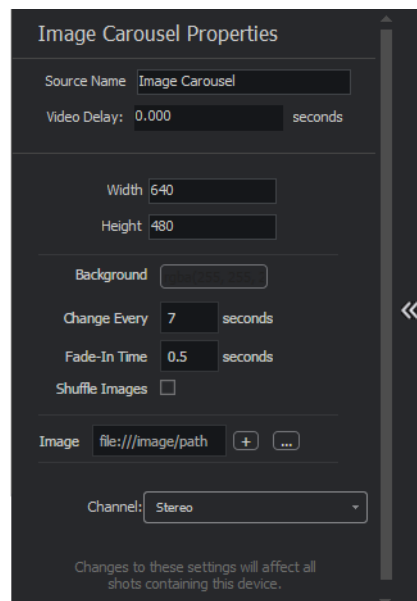
**Note:** Some apps, when screen captured, take control of your mouse and the cursor is not displayed. You can, at any time, press command + Tab keys to reduce the capture window size and enable you to use your mouse.

**Channel** Select *Stereo*, *Left*, or *Right* to determine the audio source for both channels. *Stereo* sends the left audio source to the left channel and the right audio source to the right channel. *Left* sends the left audio source to the both channels (left and right). *Right* sends the right audio source to the both channels (left and right).

**Monitor** Check the *Monitor* check box to cause audio to play through your monitor output. If the check box is unchecked, audio will not play through the monitor output for this source. The default is check box checked.

## Image Carousel Properties

An Image Carousel shot shows a sequence of images. Web Display Properties have the following settings.



**Source Name** Displays the name of the source. To change the source name, enter a new one.

**Video Delay** Enter the amount of time (in seconds, as short as 1 ms) to delay video.

**Width/Height** Displays the width and height of the display source. To change the width or height, enter a new value.

**Change Every** Sets how often the images are changed, in seconds.

**Fade-In Time** Sets how long it takes for each image to fade in, in seconds. Enter zero for instantaneous display of images.

**Shuffle Images** Check to shuffle the display order of the images. When unchecked, images are displayed as they are ordered in the image list.

**Image** Displays Carousel images in a list. Click the plus (+) icon to add an image to the list. To remove an image, click the "X" to the right of the image on the list. You can also click the browse button (...) to navigate to an image to add.

**Channel** Select *Stereo*, *Left*, or *Right* to determine the audio source for both channels. *Stereo* sends the left audio source to the left channel and the right audio source to the right channel. *Left* sends the left audio source to the both channels (left and right). *Right* sends the right audio source to the both channels (left and right).

## Web Stream Properties

The Web Stream option allows RTMP, RTSP, MMS, or HTTP streams to be taken directly into Wirecast. This is useful for incorporating remote IP Cameras or other network streams into a broadcast. Sources are automatically detected and are also identified as

*IP Camera Profile* or *Bonjour* detection. To open a Web Stream source, select *Web Stream* from the source menu in the shot window.

Web Stream Properties have the following settings.

**Source Name** Displays the name of the source. To change the Source Name, enter a new one.

**Audio Delay** Enter the amount of time (in seconds, as short as 1 ms) to delay audio.

**Video Delay** Enter the amount of time (in seconds, as short as 1 ms) to delay video.

**IP Camera Profile** Select a device profile for a network camera. (Only some network cameras provide this).

**Protocol** Select the protocol to use with your incoming stream.

**Stream Options** Select a set of options based on the protocol you selected (the sub-protocol of the stream). RTSP can be transmitted over UDP, TCP, or HTTP. RTMP can be transmitted non-encrypted, over http, encrypted. If unsure what to use, select *Auto Detect*.

**Format Options** Select a video format to use for transcoding. If you select *Auto Detect* (the default) Wirecast will automatically detect the format to use from the incoming stream.

**Ignore Stream Timestamp** When checked, stream timestamps are ignored. Every Audio/Video frame has a Presentation timestamp, a time that tells the player when to show the frame. Checking this box causes the Web Stream to ignore the presentation timestamp set by the video stream and just use the current system clock.

**Live Stream** When checked, specifies that the stream is a live stream and video on demand. For Wowza servers, it does not do anything, but for Adobe Media Servers, Live Stream must be checked for live streams.

**URI** Enter the address of your input stream. (For example: *rtsp://127.0.0.1:8080/my\_stream.sdp*, or *http://10.0.0.1/my\_stream*, or *rtmp://hades.telestream.net:1935/live/myStream*).

**Configure** Click *Configure* to enter your username and password.

**Connect** Click *Connect* to connect to your configured Web Stream.

**Channel** Select the channel to be used for the IOS device audio: Stereo, Left, or Right.

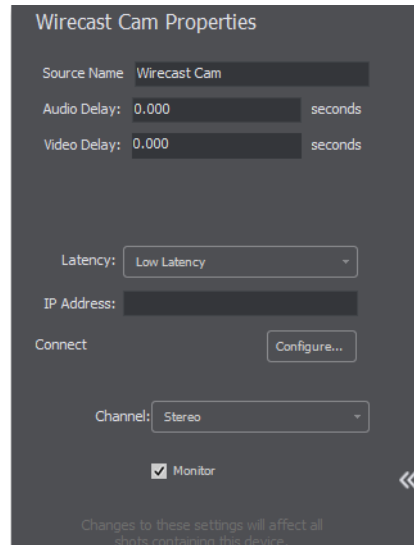
**Monitor** When checked, the audio is enabled in your monitor. When unchecked, audio is still streamed to your audience.



## Wirecast Cam Properties

The *Wirecast Cam* option allows you to use an iOS device (iPhone, iPad, etc.) as a remote camera. You need only to download the Wirecast Cam app from the Apple App Store and make sure your iOS device is on the same network as your Wirecast computer. When you do this, your iOS device shows up as a *source* in Wirecast. To open a Wirecast Cam source, select *Wirecast Cam* from the source menu in the shot window.

Wirecast Cam Properties have the following settings.

The image shows a dark-themed dialog box titled "Wirecast Cam Properties". It contains several settings: "Source Name" is set to "Wirecast Cam"; "Audio Delay" and "Video Delay" are both set to "0.000 seconds"; "Latency" is set to "Low Latency" in a dropdown menu; "IP Address" is an empty text field; there is a "Connect" button and a "Configure..." button; "Channel" is set to "Stereo" in a dropdown menu; and a "Monitor" checkbox is checked. At the bottom, there is a small note: "Changes to these settings will affect all shots containing this device." and a double-left arrow icon.

**Source Name** Displays the name of the source. To change the Source Name, enter a new one.

**Audio Delay** Enter the amount of time (in seconds, as short as 1 ms) to delay audio.

**Video Delay** Enter the amount of time (in seconds, as short as 1 ms) to delay video.

**Latency** Enter the amount of delay, in seconds, that you want to delay streaming from your iOS device.

**IP Address** Enter the IP Address of your iOS device.

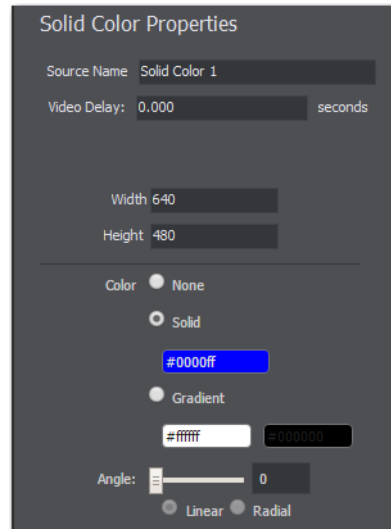
**Configure** Click *Configure* to configure your settings for use of your iOS device as a Camera.

**Channel** Select the channel to be used for the IOS device audio: Stereo, Left, or Right.

**Monitor** When checked, the IOS device audio is enabled in your monitor. When unchecked, audio is still streamed to your audience.

## Solid Color Properties

*Solid Color* displays a solid color background. To open a Solid Color source, select *Solid Color* from the source menu in the shot window. Solid Color Properties have the following settings.

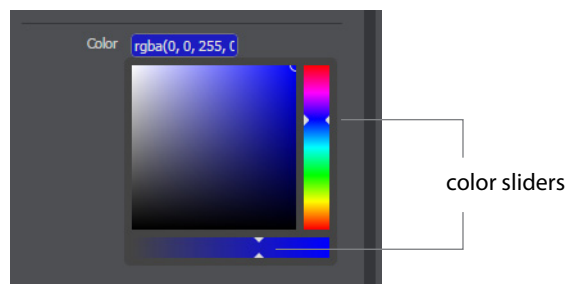


**Source Name** Displays the name of the source. To change the Source Name, enter a new one.

**Video Delay** Enter the amount of time (in seconds, as short as 1 ms) to delay video.

**Width/Height** Displays the width and height of the display source. To change the width or height, enter a new value.

**Color** Select *Solid* and click in the color field to open the color palette. Select a color and luminance by sliding the vertical and horizontal sliders. Click outside the color edit box to close the palette.

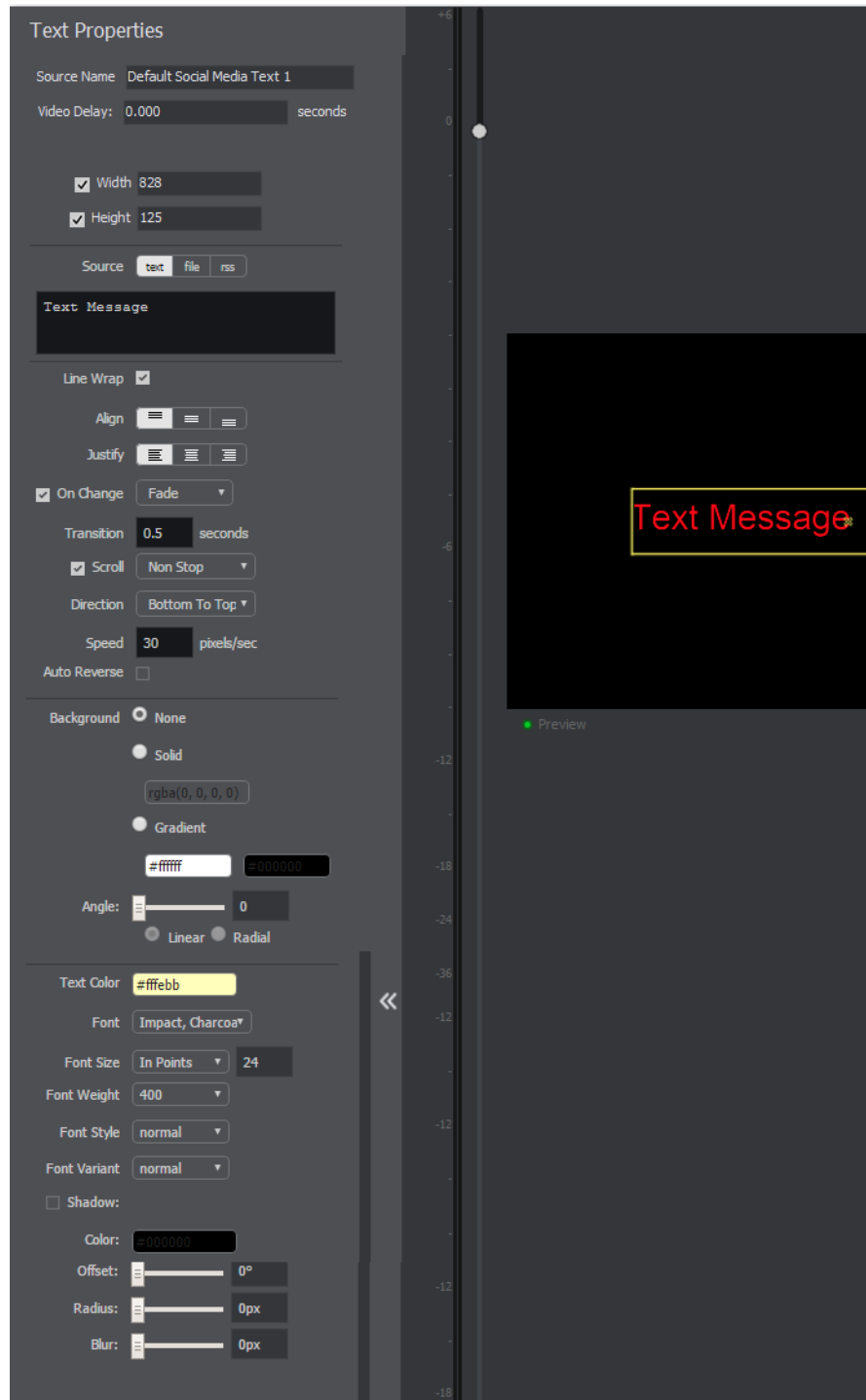


Select *Gradient* and click in the color field to select a new background gradient color from the palette.

**Angle** When Gradient is selected, the Angle slider is activated. Move the slider to change the angle of the gradient display. Select also *Linear* (line) or *Radial* (circle) to change the shape of the gradient display.

## Text Shot Properties

*Text* displays a text phrase. To open a Text source, select *Text* from the source menu in the shot window. Text Properties have the following settings.



**Source Name** Displays the name of the source. To change the Source Name, enter a new one.

**Video Delay** Enter the amount of time (in seconds, as short as 1 ms) to delay video.

**Width/Height** Displays the width and height of the display source. To change the width or height, enter a new value.

**Source** Select the source of your text: *Text* (directly entered) or *File* (navigate to a text file), or *RSS* (ticker tape RSS feed). If you select *Text*, enter your text in the text box below the source selector. If you select *File*, enter a file name in the File Path box displayed, or click the navigation button (three dots) and find your text file. The text from your file will be automatically displayed. The file has to contain UTF-8 encoded text in order for it to be rendered correctly. Only the first 64KB of the text file will be loaded and displayed. If you select *RSS*, enter a URL in the URL box displayed.

**Line Wrap** When checked, the displayed text wraps around to the next line to fit into the window as it is resized.

**Align** Enables you to align the text at the top, middle, or bottom of the display.

**Justify** Enables you to justify the text along the left, center, or right side of the display.

**On Change** When checked, a transition menu is displayed offering a choice of transition types: Fade, Drop In, Drop Out, and Slide. Transitions occur when text is changed.

**Transition** Enter the length (in seconds) of the transition time. This field is displayed only when the *On Change* box is checked.

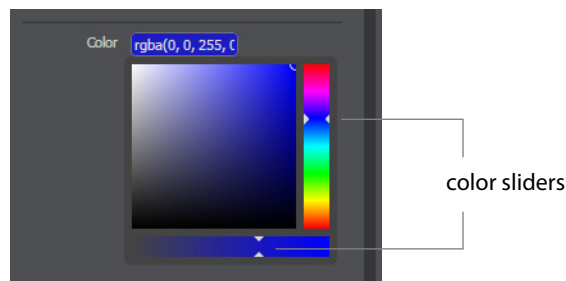
**Scroll** When Scroll is checked, you can enter both a scroll mode and a direction. There are two scroll modes: *Non Stop* and *If it Does Not Fit*.

**Direction** Select the direction of the scrolling: Top to Bottom, Bottom to Top, Left to Right, or Right to Left. This field is displayed only when the *Scroll* box is checked

**Speed** When Scroll is checked, enter the speed (in pixels per second) that you want your message to scroll through the display.

**Auto Reverse** When checked, the display reverses the scrolling direction when it reaches the top or bottom of the list.

**Background** Select *Solid* and click in the color field to open the color palette. Select a color and luminance by sliding the vertical and horizontal sliders. Click outside the color edit box to close the palette.



Select *Gradient* and click in the color field to select a new background gradient color from the palette.

**Angle** When Gradient is selected, the Angle slider is activated. Move the slider to change the angle of the gradient display. Select also *Linear* (line) or *Radial* (circle) to change the shape of the gradient display.

**Text Color** Click the box to open the color selection panel. Select a new text color from the palette.

**Font** Select the desired font used for your messages. If you select Web Font, a Web Font field will display below. You can also select any of the fonts installed on your computer.

**Font Size** Select the type of font size: points, small, medium, large, etc. If *In Points* is selected, a box to enter font size (in points) is displayed.

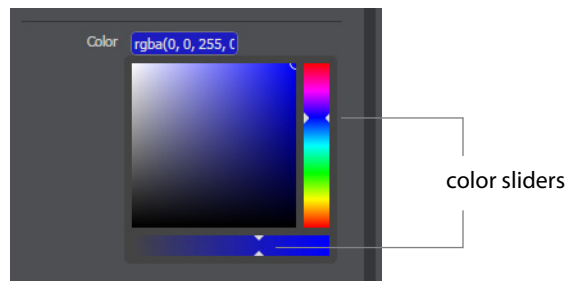
**Font Weight** Select the font weight: 100 to 900.

**Font Style** Enter the font style: Normal, Italic, or Oblique.

**Font Variant** Select a font variant: *Normal* (capital and small characters displayed normally), or *Small-caps* (Capitals with small letters displayed as small capital letters).

**Shadow** Check to activate the text shadow slider controls.

**Color** Click in the color field to open the color palette. Select a shadow color and luminance by sliding the vertical and horizontal sliders. Click outside the color edit box to close the palette.



**Offset** Move the Offset slider to adjust the direction (0 to 360 degrees) the shadow text is offset from the actual text.

**Radius** Move the Radial slider to adjust the distance the shadow text is offset away from the actual text.

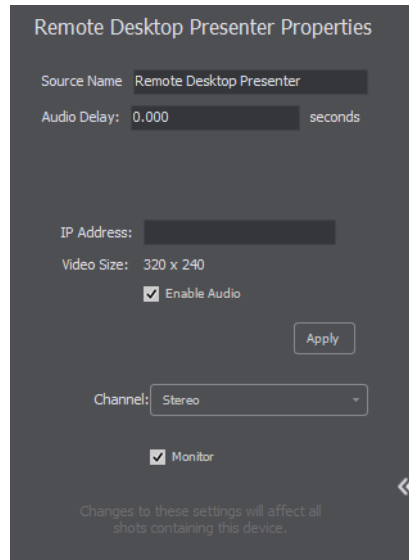
**Blur** Move the Blur slider to adjust the amount of blur in the shadow text

## Remote Desktop Presenter Properties

The Remote Desktop Presenter (RDTP) is a utility application that enables Wirecast to broadcast the desktop of any computer running the Telestream Desktop Presenter program. To open a Remote Desktop Presenter source, select *Remote Desktop Presenter* from the source menu in the shot window.

Desktop Presenter is normally auto-detected by Wirecast and is automatically added to the list of sources. However, if a RDTP is not detected, or if you want to add one in a remote location you can manually add it by selecting *New Remote Desktop Presenter* from the Source menu in the Main window.

Remote Desktop Presenter Properties have the following settings.

The image shows a dark-themed dialog box titled "Remote Desktop Presenter Properties". It contains several settings: "Source Name" is set to "Remote Desktop Presenter"; "Audio Delay" is set to "0.000" seconds; "IP Address" is an empty text field; "Video Size" is set to "320 x 240"; "Enable Audio" is a checked checkbox; "Channel" is a dropdown menu set to "Stereo"; and "Monitor" is a checked checkbox. There is an "Apply" button and a double-left arrow button at the bottom right. A note at the bottom states: "Changes to these settings will affect all shots containing this device."

**Source Name** Displays the name of the source. To change the Source Name, enter a new one.

**Audio Delay** Enter the amount of time (in seconds, as short as 1 ms) to delay audio.

**IP Address** Enter an IP address of the target computer.

**Enable Audio** When checked, the audio from the remote desktop is enabled.

**Apply** Click the Apply button to update any changes.

**Channel** Select the channel of the remote desktop audio used: Stereo, Left only, or Right only.

**Monitor** When checked, the audio is enabled in your monitor. When unchecked, audio is still streamed to your audience.

## Scoreboard Properties

Scoreboards allow you to add a scoreboard graphic to your broadcast that can be dynamically updated. Multiple scoreboards can be added. Unlike most other elements in Wirecast, changes to the Scoreboard go live instantly without requiring a transition. Once the scoreboard is live, the preview image is exactly as it is seen in your broadcast. To open a Scoreboard source, select *Scoreboard* from the source menu in the shot window.

Scoreboards Properties have the following settings.

**Source Name** Displays the name of the source. To change the Source Name, enter a new one.

**Scoreboard** Select how the scoreboard will look using two drop-down menus. The upper menu selects the scoreboard style: Pipe, Shade, Corner, etc. The lower menu selects how the display fields are laid out: Basic, Right Stats, or Bottom.

**Home/Visitor/Score** The Home, Visitor, and Score fields contain the home and visitor team names and their current score. The three icons to the right of these fields control the text alignment, font size, and font color. Click on each icon to open its control window.

**BG Color** Sets the background color for the Home or Visitor field display. Click the color icon to open the control window.

**+1, +2, +3** Click these score increment buttons to increase the Home or Visitor score display.

**Field 1-4** Displays information inside the scoreboard depending on the layout chosen using the Scoreboard menus. The three icons to the right of these fields control the text alignment, font size, and font color. Click on each icon to open its control window.

**Use a Custom Image** Check to enable the *Choose* button.

**Choose** Click to navigate to the location of your custom image.

**Reset** Click to remove a custom image.

---

**Note:** Because Wirecast updates the scoreboards dynamically, It is recommended that you fill in the additional information fields while using a layout that hides them. Then, change to a layout that reveals those fields when ready, otherwise your viewers see you typing in those fields live.

---

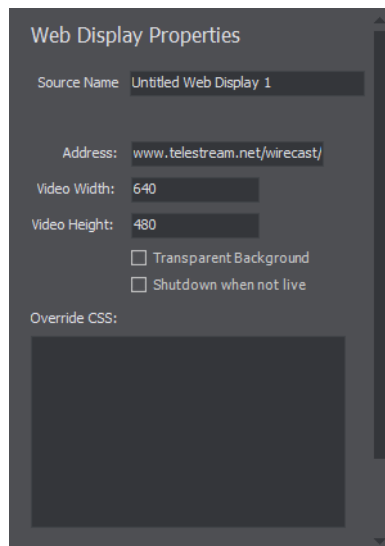
There are four hotkeys associated with the Scoreboard.

=	Increments Home score
-	Decrements Home score
]	Increments Visitor score
[	Decrements Visitor score

In order for these hotkeys to be active, the scoreboard must be displayed in the Live window and the Wirecast main window must be in focus (selected as the active Windows window).

## Web Display Properties

Web Displays show a web source defined by a web address (URL). To open a Web Display source, select *Web Display* from the source menu in the shot window. Web Display Properties have the following settings.



**Source Name** Displays the name of the source. To change the source name, enter a new one.



**Address** Displays the web address (URL) of the source. To change the address, enter a new one.

**Width/Height** Displays the width and height of the display source. To change the width or height, enter a new value.

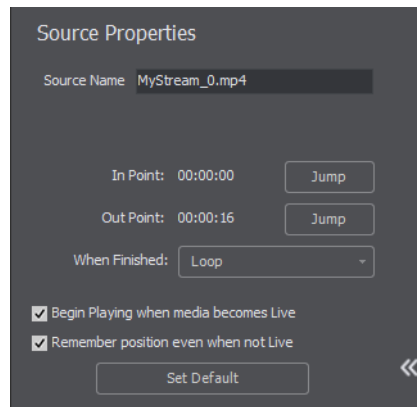
**Transparent Background** Check to make the background transparent in your shot.

**Shutdown when inactive** Check to turn off the audio and disable it from the shot when playing videos.

**Override CSS** Enter Cascading Style Sheet code to override the default code for this web display.

## Media File Properties

A Media File is a video clip or a picture. To open a Media File source, select *Media File* from the source menu in the shot window. Media Files have the following settings.



**Source Name** Displays the name of the source. To change the source name, enter a new one.

**In Point** Click *Jump* to move the play head to the In Point in the media file. The In Point is set by dragging the In Point icon to the desired beginning position on the play bar.

**Out Point** Click *Jump* to move the play head to the Out Point in the media file. The Out Point is set by dragging the Out Point icon to the desired ending position on the play bar.



**When Finished** Select what happens when the media finishes playing. *Loop* causes the media to begin playing again. *Hold* cause the media to stop and hold the last frame in the Live window. *Remove* causes the media to be removed from the Live window when it finishes playing.

**Begin playing when media becomes Live** When checked, the media begins playing as soon as it is made Live.

**Remember position even when not Live** When checked, the media will always start playing where ever it was playing when it was stopped, even if it was removed from the Live window and made Live again. When unchecked, the media will start from the beginning every time it is taken Live.

**Set Default** Click to set the media display to default settings.

## Titles Properties

A Title is a text displayed in a banner window. Wirecast offers a wide variety of title banner templates to use in your streaming. To open a Title source, select *Titles* from the source menu in the shot window.

Titles have the following settings.

**Text Properties**

Source Name: Default Social Media Text 1

Video Delay: 0.000 seconds

☒ Width: 828

☒ Height: 125

Source: text file rss

`{social_media_message}`

☒ Line Wrap

Align: [Icons]

Justify: [Icons]

☐ On Change: Fade

☐ Scroll: Non Stop

Background: ☒ None

☐ Solid

rgba(0, 0, 0, 0)

☐ Gradient

#ffffff 000000

Angle: 0

☐ Linear ☐ Radial

Text Color: rgba(0, 0, 0, 255)

Font: System Font

Font Family: Arial

Font Size: In Points 24

Font Weight: 400

Font Style: normal

Font Variant: normal

☐ Shadow:

Color: 000000

Offset: 0°

Radius: 0px

Blur: 0px

**Source Name** Displays the name of the source. To change the source name, enter a new one.

**Video Delay** Enter the amount of time (in seconds, as short as 1 ms) to delay video.

**Width/Height** Displays the width and height of the display source. To change the width or height, enter a new value.

**Source** Select the source of your text: *Text* (directly entered) or *File* (navigate to a text file), or *RSS* (ticker tape RSS feed). If you select *Text*, enter your text in the text box below the source selector. If you select *File*, enter a file name in the File Path box displayed, or click the navigation button (three dots) and find your text file. The text from your file will be automatically displayed. The file has to contain UTF-8 encoded text in order for it to be rendered correctly. Only the first 64KB of the text file will be loaded and displayed. If you select *RSS*, enter a URL in the URL box displayed.

**Line Wrap** When checked, the displayed text wraps around to the next line to fit into the window as it is resized.

**Align** Enables you to align the text at the top, middle, or bottom of the display.

**Justify** Enables you to justify the text along the left, center, or right side of the display.

**On Change** When checked, a transition menu is displayed offering a choice of transition types: Fade, Drop In, Drop Out, and Slide. Transitions occur when text is changed.

**Transition** Enter the length (in seconds) of the transition time. This field is displayed only when the *On Change* box is checked.

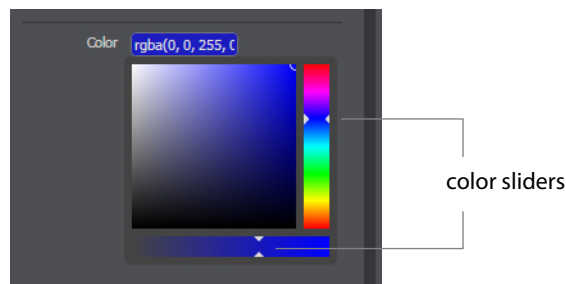
**Scroll** When Scroll is checked, you can enter both a scroll mode and a direction. There are two scroll modes: *Non Stop* and *If it Does Not Fit*.

**Direction** Select the direction of the scrolling: Top to Bottom, Bottom to Top, Left to Right, or Right to Left. This field is displayed only when the *Scroll* box is checked

**Speed** When Scroll is checked, enter the speed (in pixels per second) that you want your message to scroll through the display.

**Auto Reverse** When checked, the display reverses the scrolling direction when it reaches the top or bottom of the list.

**Background** Select *Solid* and click in the color field to open the color palette. Select a color and luminance by sliding the vertical and horizontal sliders. Click outside the color edit box to close the palette.



Select *Gradient* and click in the color field to select a new background gradient color from the palette.

**Angle** When Gradient is selected, the Angle slider is activated. Move the slider to change the angle of the gradient display. Select also *Linear* (line) or *Radial* (circle) to change the shape of the gradient display.

**Text Color** Click the box to open the color selection panel. Select a new text color from the palette.

**Font** Select the desired font used for your messages. If you select Web Font, a Web Font field will display below. You can also select any of the fonts installed on your computer.

**Font Family** Select the style of the font: Arial, Bookman, etc.

**Font Size** Select the type of font size: points, small, medium, large, etc. If *In Points* is selected, a box to enter font size (in points) is displayed.

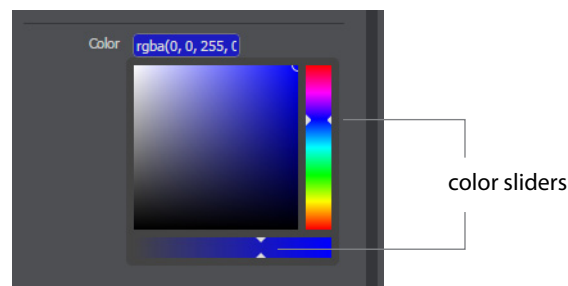
**Font Weight** Select the font weight: 100 to 900.

**Font Style** Enter the font style: Normal, Italic, or Oblique.

**Font Variant** Select a font variant: *Normal* (capital and small characters displayed normally), or *Small-caps* (Capitals with small letters displayed as small capital letters).

**Shadow** Check to activate the text shadow slider controls.

**Color** Click in the color field to open the color palette. Select a shadow color and luminance by sliding the vertical and horizontal sliders. Click outside the color edit box to close the palette.



**Offset** Move the Offset slider to adjust the direction (0 to 360 degrees) the shadow text is offset from the actual text.

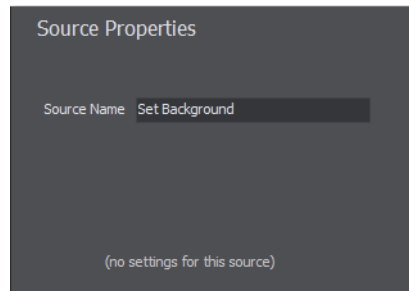
**Radius** Move the Radial slider to adjust the distance the shadow text is offset away from the actual text.

**Blur** Move the Blur slider to adjust the amount of blur in the shadow text

## New Virtual Set Properties

A *Virtual Set* is a pre-built source set, complete with graphics, to simulate a news-anchor desk in various configurations. For example, you can select a two-source virtual set that displays three layers of decor (overhead lighting, a curved desk and a pillared background) with two live sources. Virtual sets can be used as they are, or they can be edited to suit your needs. To open a New Virtual Set source, select *New Virtual Set* from the source menu in the shot window.

Virtual Sets have the following settings.



**Source Name** Displays the name of the source. To change the source name, enter a new one.

## Twitter Feed Properties

Twitter Feed displays a list of Twitter messages. Twitter Feed Properties have the following settings.

## Text Properties

Source Name: **Default Social Media Text 1**

Video Delay: **0.000** seconds

☒ Width: **828**

☒ Height: **125**

Source: **text** file rss

**`\${social\_media\_message}`**

Line Wrap: ☒

Align: **Left**

Justify: **Left**

☒ On Change: **Fade**

Transition: **0.5** seconds

☒ Scroll: **Non Stop**

Direction: **Bottom To Top**

Speed: **30** pixels/sec

Auto Reverse: ☐

Background: ☐ None

☐ Solid

**rgba(0, 0, 0, 0)**

☐ Gradient

**#ffffff** **#000000**

Angle: **0**

☐ Linear ☐ Radial

Text Color: **rgba(0, 0, 0, 255)**

Font: **System Font**

Font Family: **Arial**

Font Size: **In Points** **24**

Font Weight: **400**

Font Style: **normal**

Font Variant: **normal**

☐ Shadow:

Color: **#000000**

Offset: **0°**

Radius: **0px**

Blur: **0px**

**Source Name** Displays the name of the source. To change the source name, enter a new one.

**Video Delay** Enter the amount of time (in seconds, as short as 1 ms) to delay video.

**Width/Height** Displays the width and height of the display source. To change the width or height, enter a new value.

**Source** Select the source of your text: *Text* (directly entered) or *File* (navigate to a text file), or *RSS* (ticker tape RSS feed). If you select *Text*, enter your text in the text box below the source selector. If you select *File*, enter a file name in the File Path box displayed, or click the navigation button (three dots) and find your text file. The text from your file will be automatically displayed. The file has to contain UTF-8 encoded text in order for it to be rendered correctly. Only the first 64KB of the text file will be loaded and displayed. If you select *RSS*, enter a URL in the URL box displayed.

**Align** Enables you to align the text at the top, middle, or bottom of the display.

**Justify** Enables you to justify the text along the left, center, or right side of the display.

**On Change** When checked, a transition menu is displayed offering a choice of transition types: Fade, Drop In, Drop Out, and Slide. Transitions occur when text is changed.

**Transition** Enter the length (in seconds) of the transition time. This field is displayed only when the *On Change* box is checked.

**Scroll** When Scroll is checked, you can enter both a scroll mode and a direction. There are two scroll modes: *Non Stop* and *If it Does Not Fit*.

**Direction** Select the direction of the scrolling: Top to Bottom, Bottom to Top, Left to Right, or Right to Left. This field is displayed only when the *Scroll* box is checked

**Speed** When Scroll is checked, enter the speed (in pixels per second) that you want your message to scroll through the display.

**Auto Reverse** When checked, the display reverses the scrolling direction when it reaches the top or bottom of the list.

**Background** Select *Solid* and click in the color field to open the color palette. Select a color and luminance by sliding the vertical and horizontal sliders. Click outside the color edit box to close the palette.





Select *Gradient* and click in the color field to select a new background gradient color from the palette.

**Angle** When Gradient is selected, the Angle slider is activated. Move the slider to change the angle of the gradient display. Select also *Linear* (line) or *Radial* (circle) to change the shape of the gradient display.

**Text Color** Click the box to open the color selection panel. Select a new text color from the palette.

**Font** Select the desired font used for your messages. If you select Web Font, a Web Font field will display below. You can also select any of the fonts installed on your computer.

**Font Family** Select the style of the font: Arial, Bookman, etc.

**Font Size** Select the type of font size: points, small, medium, large, etc. If *In Points* is selected, a box to enter font size (in points) is displayed.

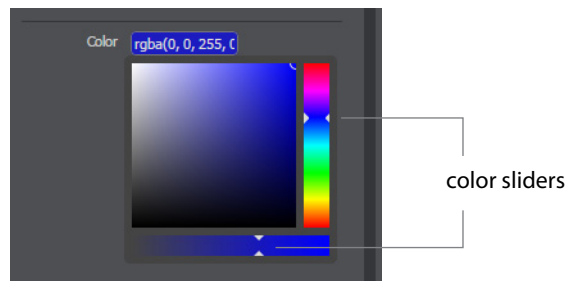
**Font Weight** Select the font weight: 100 to 900.

**Font Style** Enter the font style: Normal, Italic, or Oblique.

**Font Variant** Select a font variant: *Normal* (capital and small characters displayed

**Shadow** Check to activate the text shadow slider controls.

**Color** Click in the color field to open the color palette. Select a shadow color and luminance by sliding the vertical and horizontal sliders. Click outside the color edit box to close the palette.



**Offset** Move the Offset slider to adjust the direction (0 to 360 degrees) the shadow text is offset from the actual text.

**Radius** Move the Radial slider to adjust the distance the shadow text is offset away from the actual text.

**Blur** Move the Blur slider to adjust the amount of blur in the shadow text



# Playlist

## Introduction

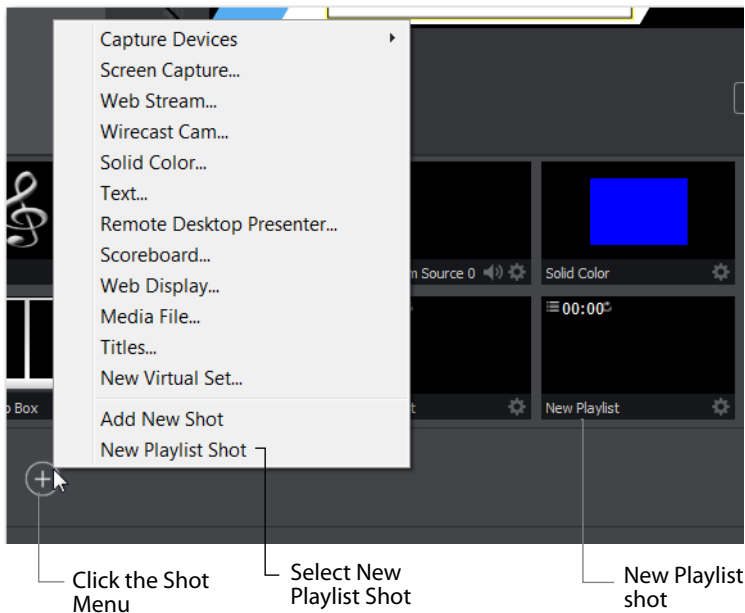
Playlist enables you to create a list of clips and play them as a single group. You can have multiple playlists and edit them as needed after they are created. You can also replay playlists (see [Replay + ISO](#)). This makes the combination of Playlist and Replay a very powerful production tool.

## Topics

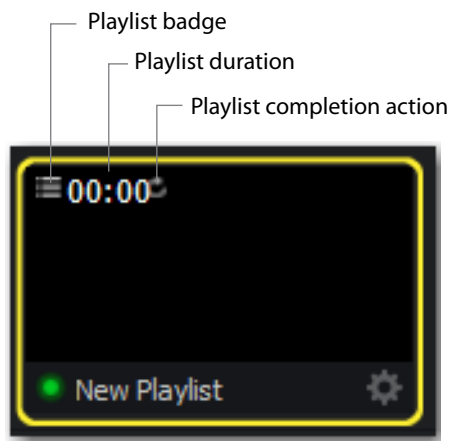
- *Creating a Playlist*
- *Adding Clips*
- *Playing Playlists*
- *Playlist Controls*
- *Countdown Clock Options*

# Creating a Playlist

To create a new Playlist, select New Playlist Shot from the Shot Menu and a new Playlist shot icon is added in the shot window.

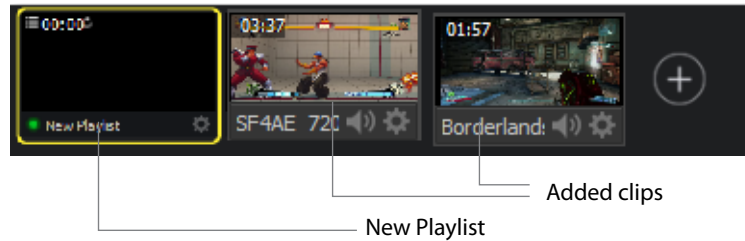


The Playlist shot icon displays a playlist badge, the playlist duration, and the playlist completion action.



## Adding Clips

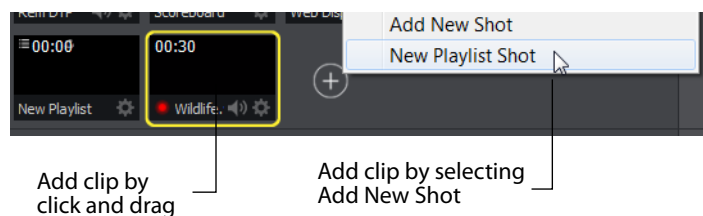
To add clips to the playlist, first click and drag them onto the layer where the new Playlist is located.



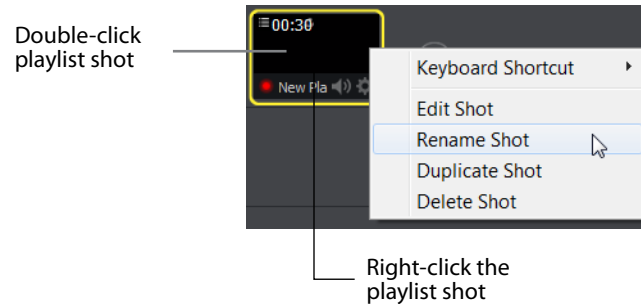
Second, click and drag each shot onto the playlist icon. When you do this you must wait for the playlist icon to obtain a yellow border before releasing the click button.



Double-click the Playlist icon to open the Playlist tab. You can drag and drop more clips directly into the Playlist window when it is open. You can also add clips by selecting Add New Shot from the Shot Menu.

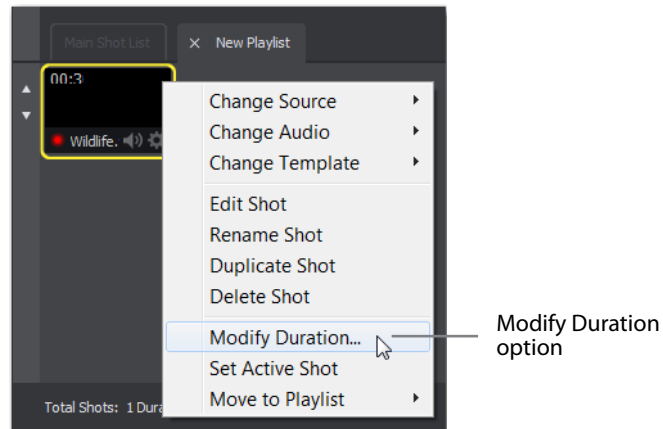


These added shots are now housed in the Playlist. You can still edit shots in the playlist by double-clicking on the playlist shot. You also have all of the Change Shot menu options available by right-clicking on the shot.

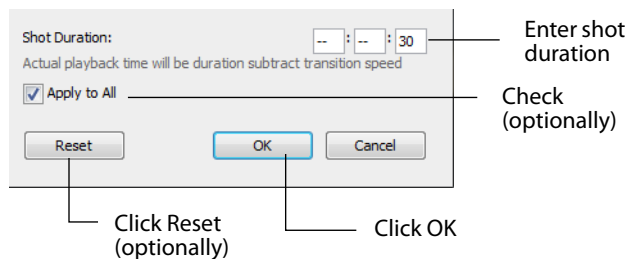


**Note:** Do not delete shots from a playlist while the playlist is live.

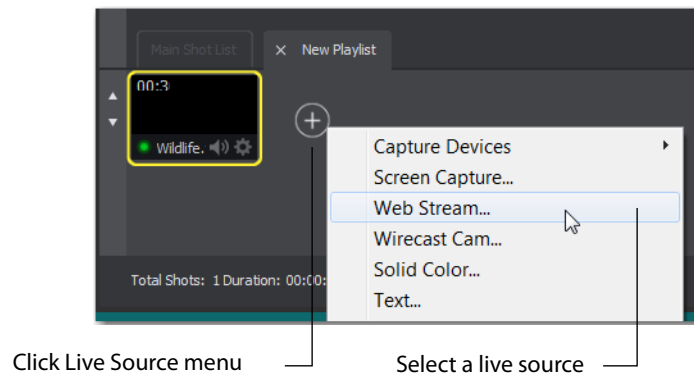
The Change Shot menu for Playlist shots also has a *Modify Duration* option. You can set the shot duration to any value by selecting *Modify Duration*



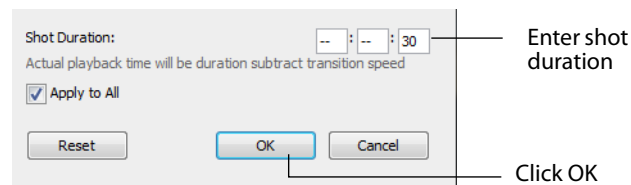
Enter a new duration when the dialog box displays. Optionally, check *Apply to All* if you want this duration applied to all items in the playlist. You can also, optionally, reset the duration to its original value by clicking *Reset*. Click OK when finished.



You can add live sources to the playlist by clicking the Live Sources menu and selecting a live source from the list.



By default, live sources have an infinite duration (since they are not a clip). So, you must assign a duration by selecting *Modify Duration* for the live source and entering a duration when the dialog box displays. Click OK when finished.



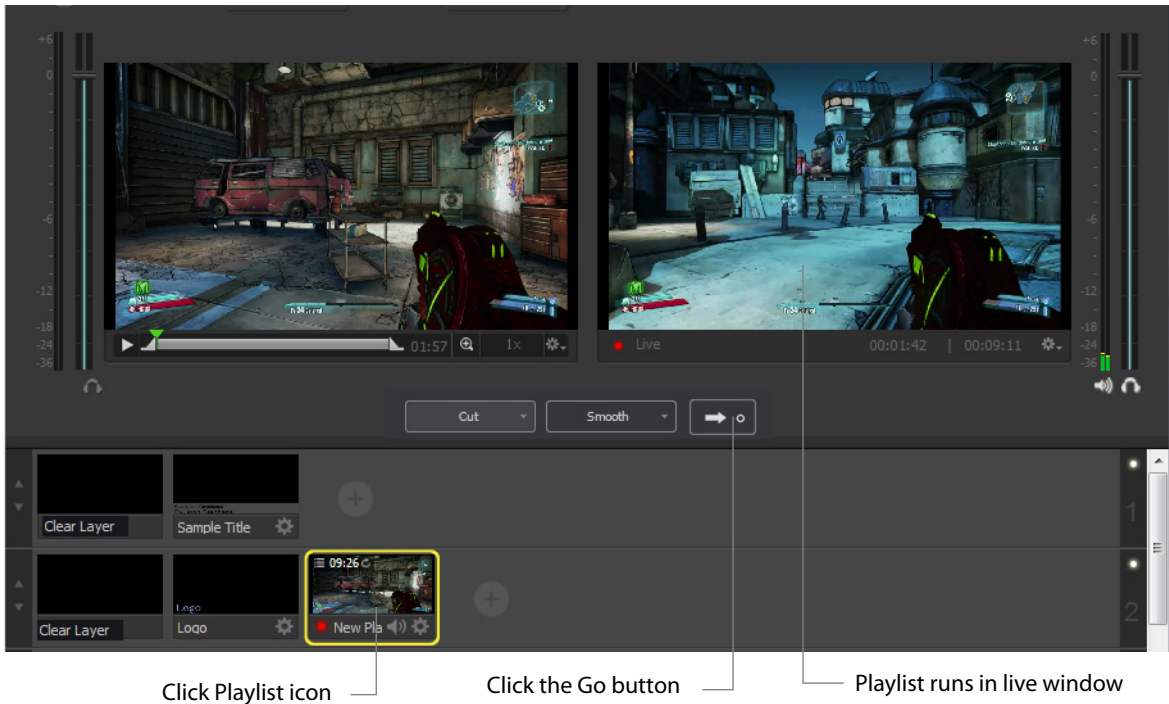

---

**Note:** Wirecast does not support nested playlists (playlists within playlists).

---

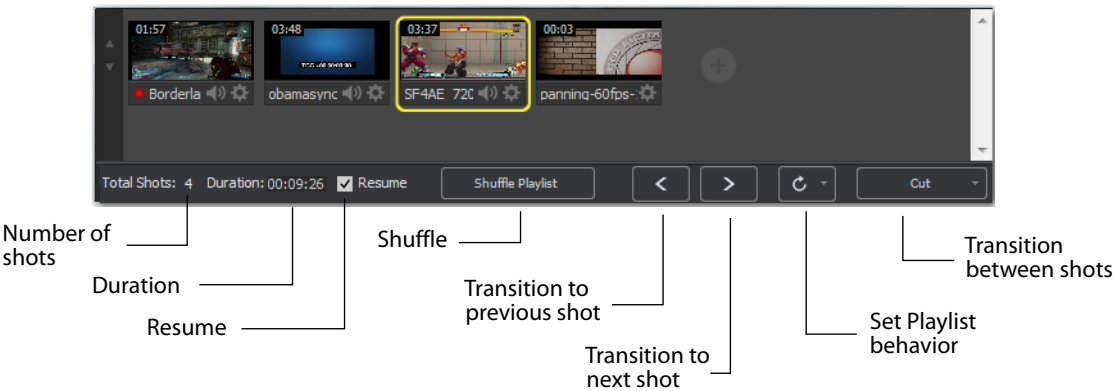
## Playing Playlists

Playing back a playlist is the same as playing any other shot -- click the playlist shot to place it into preview, then click the Go button to take it live.



## Playlist Controls

Playlists provide some basic playback controls. You can transition to the previous or next shot in the list, set playlist behavior, shuffle the playlist order, and more.



**Number of Shots** Displays the current number of shots in the playlist.

**Duration** Displays the duration of the playlist shots.



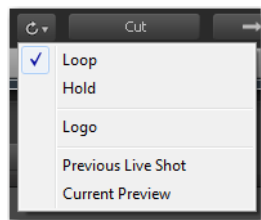
**Resume** When checked, if you exit the playlist, when you return the playlist will resume playing at the location (same shot) as when you exited.

**Shuffle** Click to shuffle the order of the playlist shots.

**Transition to previous shot** Transitions to the previous shot in the playlist if the playlist is currently live.

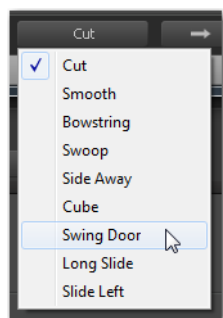
**Transition to next shot** Transitions to the next shot in the playlist if the playlist is currently live.

**Set Playlist behavior** Sets the behavior of the playlist when the last shot in the list has been played. A check mark indicates what menu item (behavior) is selected.



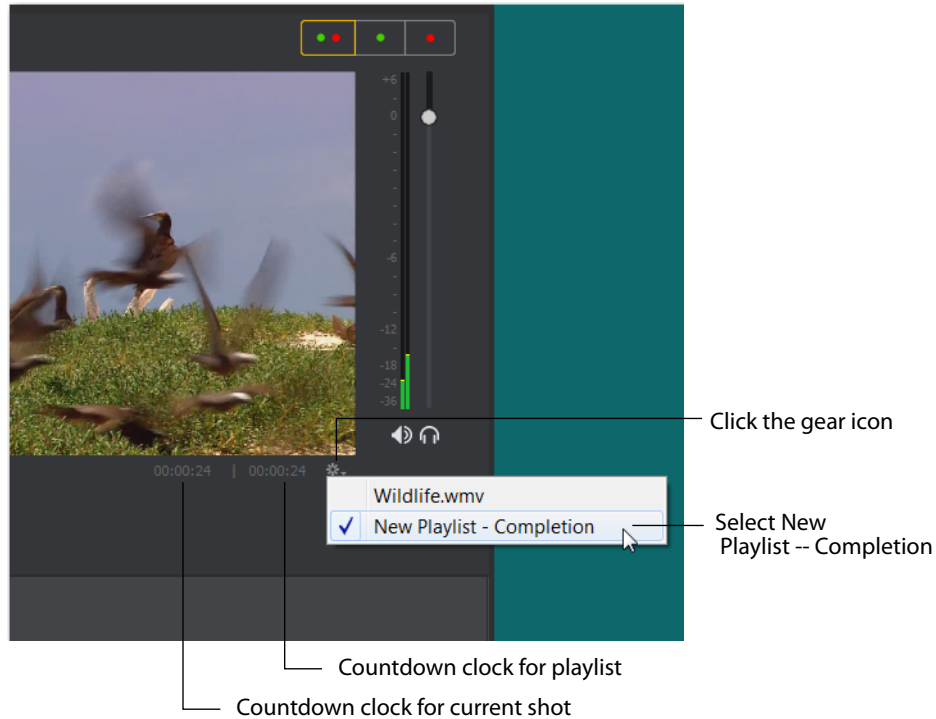
- *Loop* transitions back to the first shot, endlessly.
- *Hold* stays on the last shot. If the last shot is a clip, the last frame in the clip is displayed. If the last shot is a live shot, the live source stays active. If the last shot in a Playlist is a video clip Shot, it will obey the rules set for the video clip in the Media Properties Inspector tab under *Source Properties*. However, it will hold the Playlist on that last Shot if *Set Playlist Behavior* is set to "Hold". Therefore, if you want to see the last video in the Playlist pause on the last frame, you must set *When Finished* to "Hold" under Source Properties, in addition to setting the playlist behavior to "Hold". If you set *When Finished* to "Loop", under Source Properties, the last video in the Playlist will continue to loop.
- *Available Shots* transitions to another shot on the same layer. All available shots are listed as menu selections. (In the example shown, the only available shot is "Logo".)
- *Previous Live Shot* transitions back to the shot that was live before the playlist began playing.
- *Current Preview* transitions the contents of Preview to the live window.

**Transition between shots** Sets the transition to use between shots in the list.



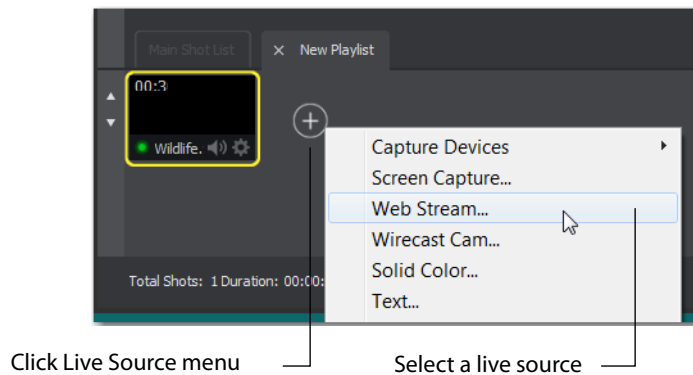
## Countdown Clock Options

Select *New Playlist -- Completion* from the gear menu (displayed only when playlist is playing) to display the countdown clock for both the current shot playing in the playlist as well as the countdown for the playlist itself. When *New Playlist -- Completion* is not selected (not checked) only the current shot countdown clock is displayed.

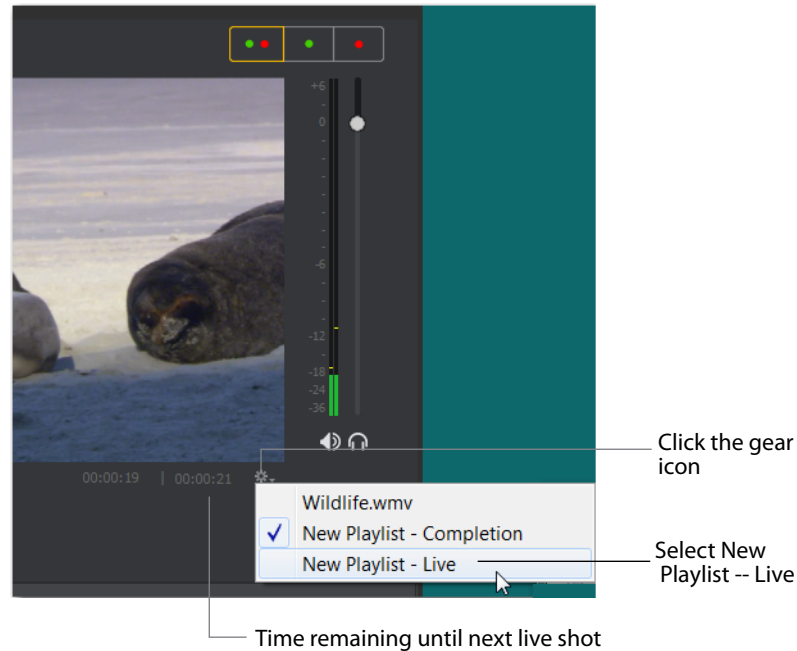


Add a live source to your playlist by selecting a live source from the Shot Source menu.

Add a live sources to the playlist by clicking the Live Sources menu and selecting a live source from the list.



When a live source is in a playlist, a *New Playlist -- Live* option is added to the playlist gear menu. When you select this option, the countdown clock displays the time remaining until the next live source in the playlist begins to play.



The countdown time until the next live shot is the sum of the durations of all the shots preceding it. When the live shot begins, the countdown clock displays the countdown of that live shot. If the live shot does not have a duration, then the playlist is halted and the live shot remains until another shot is taken live or the playlist is replayed.



# Twitter

## Introduction

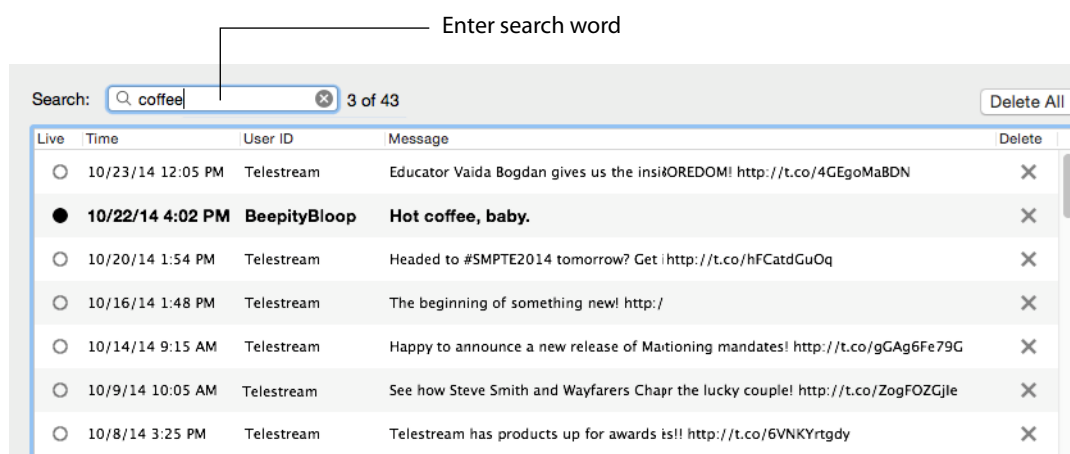
Twitter enables you to add Twitter messages to your broadcast and you can filter what messages are displayed.

## Topics

- *Message Feed*
- *Create Shot*
- *Settings*

## Message Feed

Click Twitter > *Message Feed* to add some Twitter messages to your broadcast. When the message window displays, search (optionally) for the messages you want to broadcast.



To select messages to be rotated in your broadcast, first check *Rotate Selected Every*, and enter the number of seconds of the rotation interval. Select the messages you want rotated by checking the box at the left of each message. Select a starting message.

Enter rotation interval

Check Rotate Selected Every

The screenshot shows the Twitter Message Feed interface. At the top, there is a search bar with the text 'Search' and a 'Delete All' button. Below the search bar is a table with columns: 'Select', 'Live', 'Time', 'User ID', 'Message', and 'Delete'. The table contains several rows of messages. The second row is highlighted with a blue background and has a blue checkmark in the 'Select' column. The bottom of the interface has two checkboxes: 'Auto Refresh Every: 90 seconds' and 'Rotate Selected Every: 5 seconds'. The 'Rotate Selected Every' checkbox is checked. There are also icons for refresh, message, and settings.

Select	Live	Time	User ID	Message	Delete
<input type="checkbox"/>	<input type="radio"/>	10/23/14 12:05 PM	Telestream	Educator Vaida Bogdan gives us the inside scoo.BOREDOM! <a href="http://t.co/4GEgoMa8DN">http://t.co/4GEgoMa8DN</a>	X
<input checked="" type="checkbox"/>	<input checked="" type="radio"/>	10/22/14 4:02 PM	BeepityBloop	Hot coffee, baby.	X
<input type="checkbox"/>	<input type="radio"/>	10/20/14 1:54 PM	Telestream	Headed to #SMPTE2014 tomorrow? Get info abt! <a href="http://t.co/hFCatdGuOq">http://t.co/hFCatdGuOq</a>	X
<input checked="" type="checkbox"/>	<input type="radio"/>	10/16/14 1:48 PM	Telestream	The beginning of something new! <a href="http://t.co/9">http://t.co/9</a>	X
<input type="checkbox"/>	<input type="radio"/>	10/14/14 9:15 AM	Telestream	Happy to announce a new release of MacCaptioning mandates! <a href="http://t.co/gGAg6Fe79G">http://t.co/gGAg6Fe79G</a>	X
<input type="checkbox"/>	<input type="radio"/>	10/9/14 10:05 AM	Telestream	See how Steve Smith and Wayfarers Chapel use for the lucky couple! <a href="http://t.co/ZogFOZGjle">http://t.co/ZogFOZGjle</a>	X
<input checked="" type="checkbox"/>	<input type="radio"/>	10/8/14 3:25 PM	Telestream	Telestream has products up for awards in this ytes! <a href="http://t.co/6VNKYrtgdy">http://t.co/6VNKYrtgdy</a>	X

Select starting message

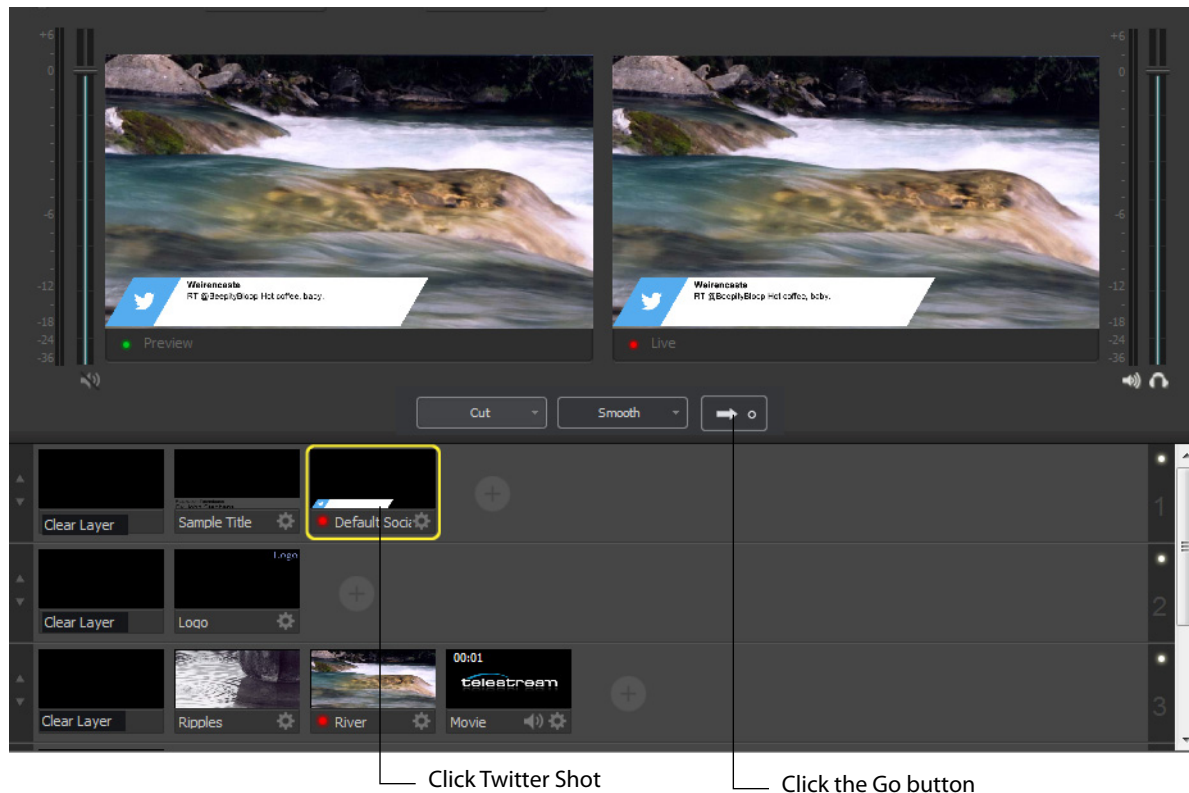
Select messages

optionally check Auto Refresh and enter number of seconds

You can also (optionally) check *Auto Refresh* and enter number of seconds. The gear icon allows you to select or unselect all messages. Once you have selected your messages, close the Message Feed window.

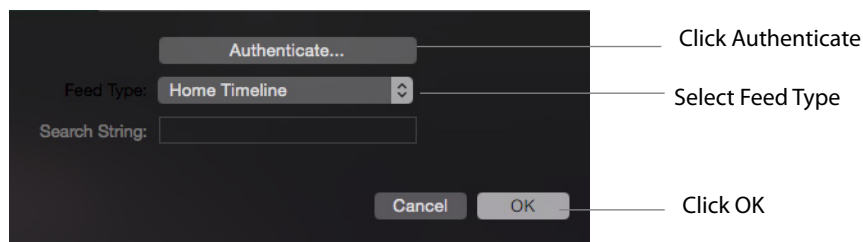
## Create Shot

To create a new Twitter shot, select Twitter > *Create Shot*. When the new shot icon is displayed, click it to place it in the Preview window. You can click and drag the Twitter message box to any location in the shot. Click the Go button to take it live.



## Settings

The first thing you need to do is Authenticate your account with Twitter. To do this click the *Authenticate* button. Enter your pin when the PIN field displays. Select a Feed Type: Home Timeline, User Timeline, Favorites, Search. If you select Search, the Search String field becomes active. Click OK when you are finished.







# Replay + ISO

## Introduction

PRO

Replay enables you to repeatedly play a clip, or even a portion of a clip, any number of times or endlessly. You can also replay playlists (see [Playlist](#)). This makes the combination of Playlist and Replay a very powerful production tool.

ISO (or Isolated Output) allows users to create recordings for system devices (cameras, capture cards, or mics) that are currently not being displayed in the *Live* canvas window. This enables you to be outputting one device while broadcasting with another. ISO's can also be setup as a replay source. This enables you to have all the *Replay* functionality (hotkeys, Mark-in, and Mark-out) in your ISO source but without it being displayed in the *Live* canvas window.

Replay and ISO share the same menu because ISO's have the ability to be setup to use replay functionality. This functionality is toggled in the ISO Settings window. If an ISO is set to use Replay then it will use all the replay settings that have been configured in the *Replay+ISO* window.

---

**Note:** Multiple Replay clips captured during the same replay session will not render correctly when played at the same time on different master layers or different shot layers.

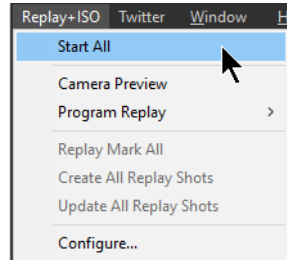
---

## Topics

- [Replay + ISO Menu](#)
- [Configuring Replay](#)
- [Replay Activation](#)

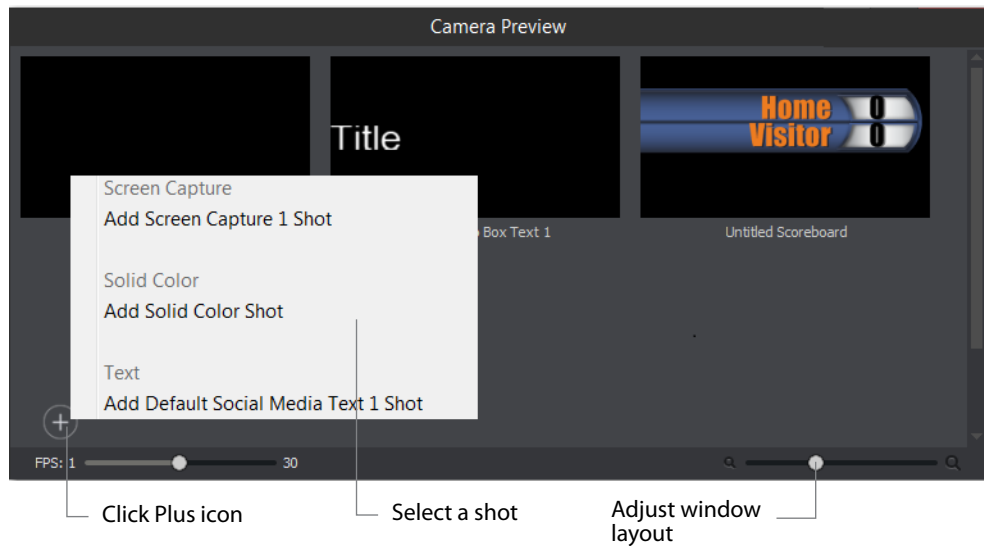
## Replay + ISO Menu

To use Replay and ISO functionality, select the Replay + ISO menu.

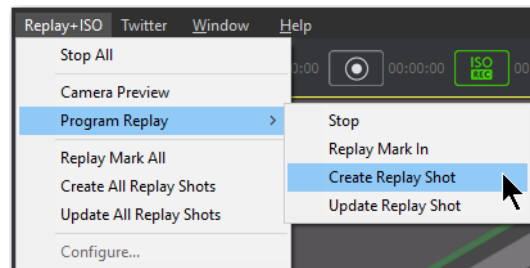


**Start All** Activates the Create Replay Shot system. When activated, the menu item becomes *Stop All*. Click *Stop All* to deactivate the Create Replay Shot system.

**Camera Preview** Displays the Camera Preview window which enables you to add various shots by clicking the plus (+) icon. You can also adjust the Camera Preview window layout (shot icon sizes) by moving the slider.



**Program Replay** Allows you to Stop, Mark In, Create, or Update a relay shot.



PRO

**Replay Mark All** Allows you to tighten up your Replay Shot capture. Select *Replay Mark In* to mark the beginning point of your Replay Shot capture.

PRO

**Create All Replay Shots** Select *Create* to create additional Replay shots.

PRO

**Update All Replay Shots** If no replay shot exists, selecting *Update* creates a new Replay shot. There after, selecting *Update* updates the first Replay shot created.

PRO

**Configure** Displays the Replay Shot settings window (as shown above in *Configure ISO Outputs*).

**Configure** Once ISO outputs are created, all ISO outputs are listed in this menu. To configure an ISO output, click *Configure*, then click the *Add ISO* button.

## Configuring Replay

To use Replay you need to set it up the way you want it to perform. To do this select *Replay+ISO > Configure*. Check the Program Replay box, make your desired settings, and click OK when finished.

Output List

- ☒ Program Replay

Replay Settings

☐ Capture Audio in the Replay

Video Quality: ☒ Standard ☐ High

Estimated write rate: 50.98 MB per second

Folder: C:\Users\cartj\Videos

Create Replay Hotkey:

Save Replay Hotkey:

Mark Replay Hotkey:

Program Replay enables Replaying of content currently displaying in the Live window

**Capture Audio in the Replay** Check the Audio box to capture audio in the Replay you are creating. If unchecked all audio is ignored.

**Video Quality** Set the video quality for Standard or High. Depending on what quality you choose, an estimate of the *write rate* will be displayed.

**Folder** Click Browse and navigate to the location where you want to store your Replay shots.

**Create Replay Hotkey** Select a hotkey from the drop-down menu that will activate the Create Replay function.

**Update Replay Hotkey** Select a hotkey from the drop-down menu that will activate the Update Replay function.

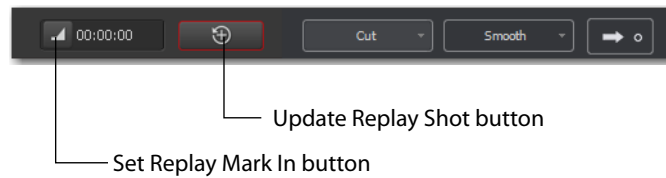
**Mark Replay Hotkey** Select a hotkey from the drop-down menu that will activate the Mark Replay function.

**Manage** Opens the *Preferences > Hotkeys* window so you can add, delete or change your hotkeys. The Global check box must be checked if you want that hotkey to be available in the drop-down menus above.

# Replay Activation

**Note:** When Replay is activated, CPU usage increases.

To activate Replay, select *Replay > Start All*. When you do this, the Start All menu item becomes *Stop All* and several buttons are added to the Wirecast main window: Set Replay Mark In and Update Replay Shot (same as selecting *Replay > Update Replay Shot*).

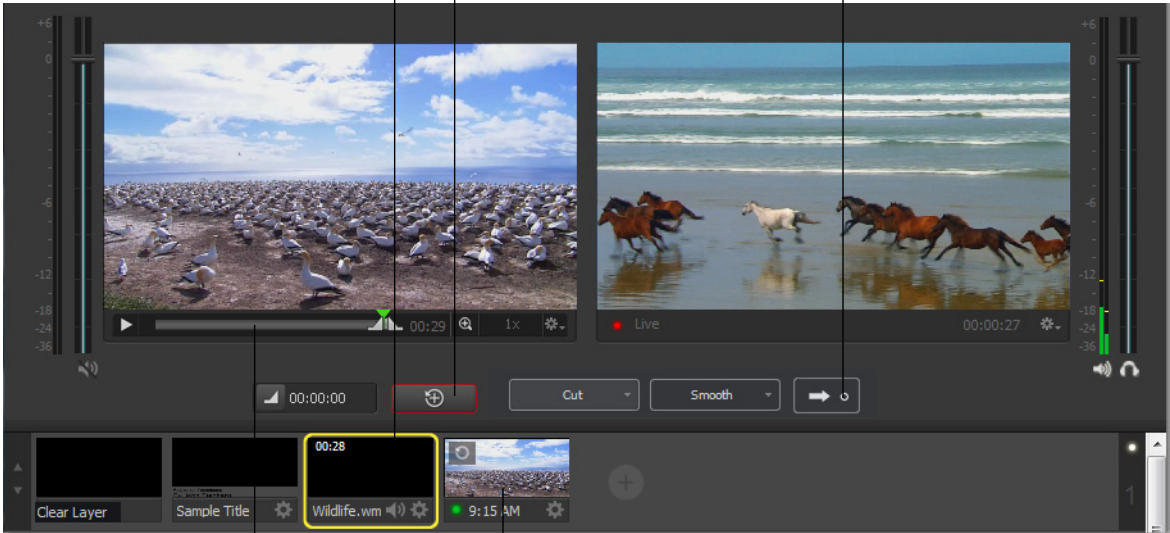


Once Replay has been activated it keeps all shot activity (playing of clips or capturing of live sources) in the Replay buffer on disk. The amount that is saved when the *Create Replay Shot* button is pressed depends on what value was entered into the *Default Replay duration* setting.

Start playing a clip (while Replay is activated), then click the *Create Replay Shot* button. Since the Default Replay Duration is set at 30 seconds, a Replay shot of 30 seconds (backward from when the Create Replays Shot button was pressed) is created. The new

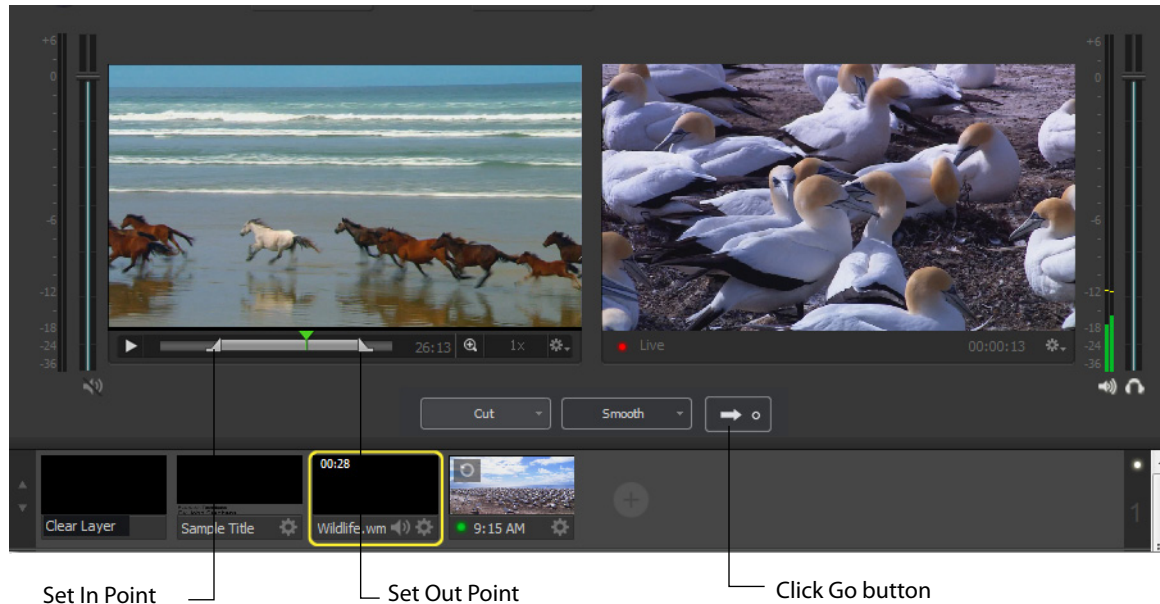
Replay Shot is placed in Layer 1 (as designated in the settings) as an icon and the Replay controls are displayed at the bottom of the Preview window.

- Select a clip to play
- Click Go to play clip
- Click Create Replay Shot

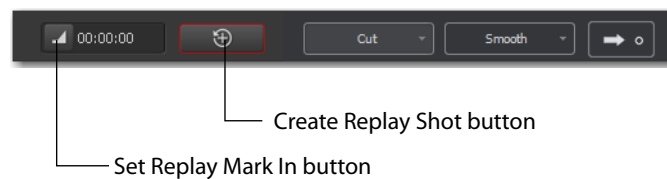


- Replay Shot created
- Replay controls displayed

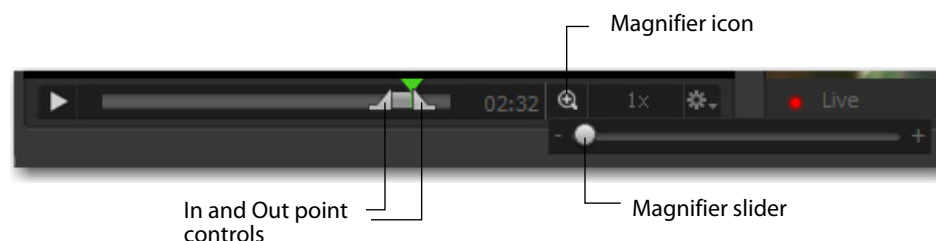
Now that you have a 30-second Replay Shot displayed in the Preview window, you can use the controls to set the Replay In and Out points and then take the Replay Shot live by clicking the Go button.



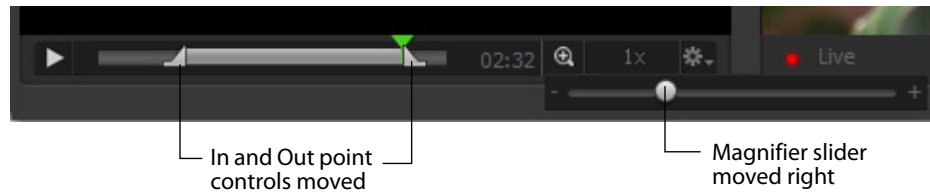
The Replay Mark In button allows you to tighten up your Replay capture. When Replay is active, it captures all past activity of your source (clip or live source) into the buffer. But you can shorten how much of the capture you actually get in a Replay shot by clicking the Mark In button first (to establish when to start your Replay Shot), and then click the *Create Replay Shot* button when you are finished with your Replay shot. Your Replay Shot now has just the content you wanted.



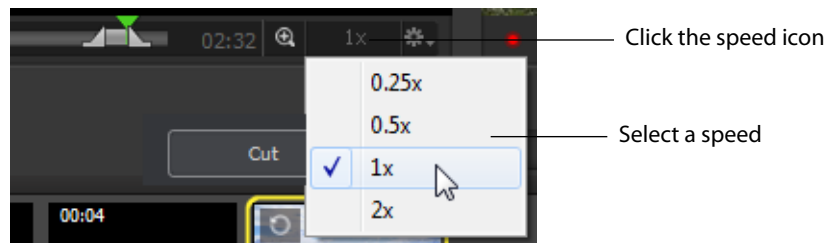
Another control available at the bottom of the Preview window is the Magnification control. Click the magnifier icon (spyglass) to display a magnification slider. Slide the slider to the left for lower magnification of the In and Out controls, and to the right for greater magnification.



For example, if you move the slider to the right, the In and Out controls move farther apart, increasing the magnification, so that you can more easily adjust the location of the In and Out controls. This is very helpful when you have long duration Replay shots. However, the slider will quit sliding when you have reached the maximum size of the Replay Shot.



One more control is available at the bottom of the Preview window. It is the Replay the speed control. You can set the speed of the Replay Shot by clicking the speed icon ("1x") and selecting a speed from the pull-down menu. Your choices are 1x (normal speed), 2x (double speed), .5x (half speed, and .25x (one-fourth speed). The audio is muted for any speed other than normal.





# Preferences

## Introduction

Wirecast is designed so that you can configure most of your options directly in your Wirecast document or the Shot Editor. The Preferences window enables you to set up Wirecast, set Desktop Presenter options, manage your licenses, update your software, and set advanced video options.

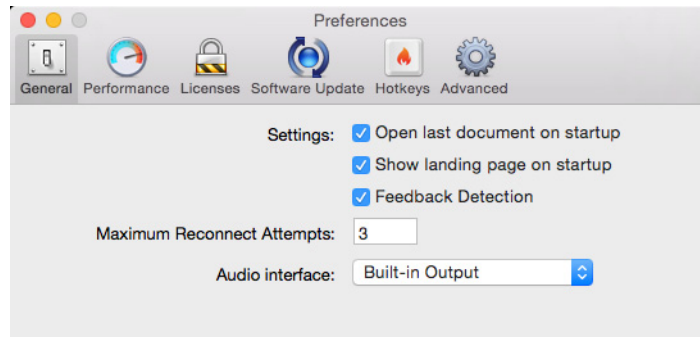
## Topics

- *Accessing Preferences*
- *General*
- *Performance*
- *LicensesSoftware Update*
- *Hot Keys*
- *Advanced*

## Accessing Preferences

To open the Preferences window, select Preferences from the Wirecast menu (or press the Command+ Comma (",") keys). Preferences are grouped under five topics: General,

Performance, Licenses, Software Update, and Advanced. Click one of these topics to view and change its preferences.



Wirecast automatically saves your preferences every time you make a change. The changes are immediately applied.

## Resetting Preferences

To reset your preferences, quit Wirecast and then delete the files located at:

~/Library/Preferences/Vara Software/Wirecast Preferences.

Or, you can use Support Assistant to reset preferences (see *Send Support Information* under [Help Menu](#)).

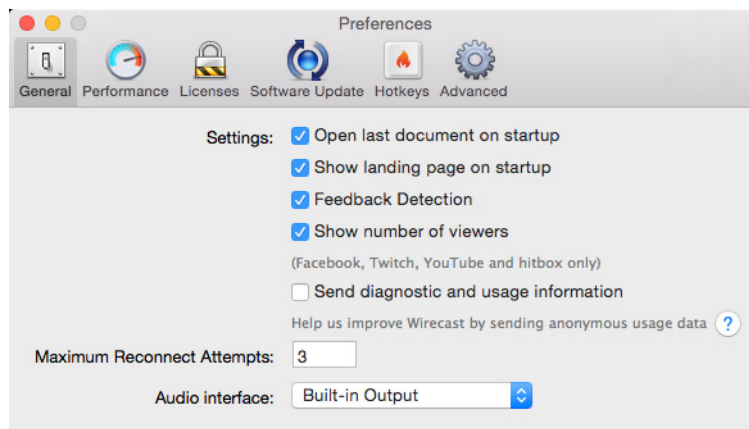
---

**Note:** You should match the output to the canvas size as close as possible to preserve video resolution and quality. For example, a 800x600 source results in significant loss of quality if an aspect ratio of 640x480 is selected. Using 720x576, which is much closer in size, helps preserve video quality.

---

# General

General preferences enable you to setup the Wirecast environment.

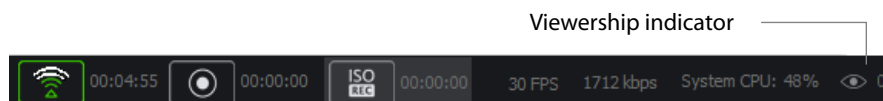


**Open last document on startup** When checked, the last document you used is opened when Wirecast starts up.

**Show landing page on startup** When checked, the Welcome screen is always displayed when Wirecast starts up. You can disable this automatic display by unchecking this option, or by unchecking the box in the corner of the Welcome display. But you can only turn this automatic display back on by checking this box in the *Preferences > Advanced* window.

**Feedback Detection** When checked, the computer audio is disabled (live feed is unaffected) whenever feedback is detected. Checked is the default. When feedback is detected, a warning is displayed with an option to turn off feedback detection.

**Show Number of Viewers** When checked, enables the viewership indicator while streaming.



**Send diagnostic and usage information** When checked, causes diagnostic and usage information to be sent anonymously.

**Maximum Reconnect Attempts** Enter the number of times you want Wirecast to try to reconnect to a host provider. The default is three.

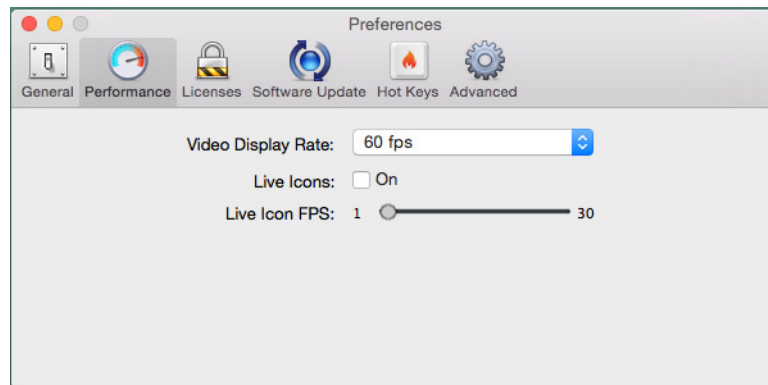
**Audio Interface** Select the audio playback driver used.

## Performance

Performance preferences enable you to select the display rate used for all internal video rendering.

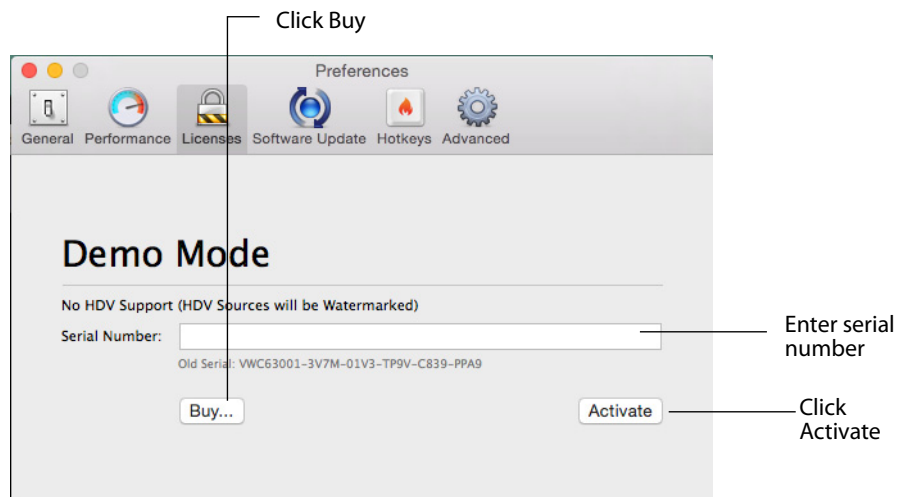
You can set the Video Display Rate to 24, 25, 30, 50 or 60 fps. If using PAL sources, choosing 25 may eliminate dropped or duplicate frames. It is recommended that you set this frame rate to match the frame rate of your output video encoder.

You can turn on the Live Icons feature, which makes all icons in the Shot Area display any live activity in the device it represents (cameras, streaming, etc.). You can also set the fps of the Live Icon display using the slide bar control.



## Licenses

The licenses preferences enable you to register and license Wirecast. To purchase a license, click *Buy*. To activate a license, enter your serial number and click *Activate*.



## Serial Numbers

The Buy Upgrade Preference window displays the products and serial numbers that you have received for Wirecast.

---

**Note:** The serial number is always composed of numbers and upper case letters (excluding upper case letter O), but it never contains quotation marks. When you receive a serial number, it may be enclosed in quotation marks (e.g., "123-456-789").

---

If you wish to purchase a serial number from the web store, click *Buy*. When Wirecast displays the Enter Serial Number window, enter the serial number and click *Activate*. Wirecast validates the serial number and unlocks Wirecast. If you previously purchased a copy of Wirecast and want to use that serial number, enter that serial number to unlock Wirecast.

---

**Note:** If you do not want to purchase a serial number directly in Wirecast, you can also purchase a serial number at [www.telestream.net](http://www.telestream.net).

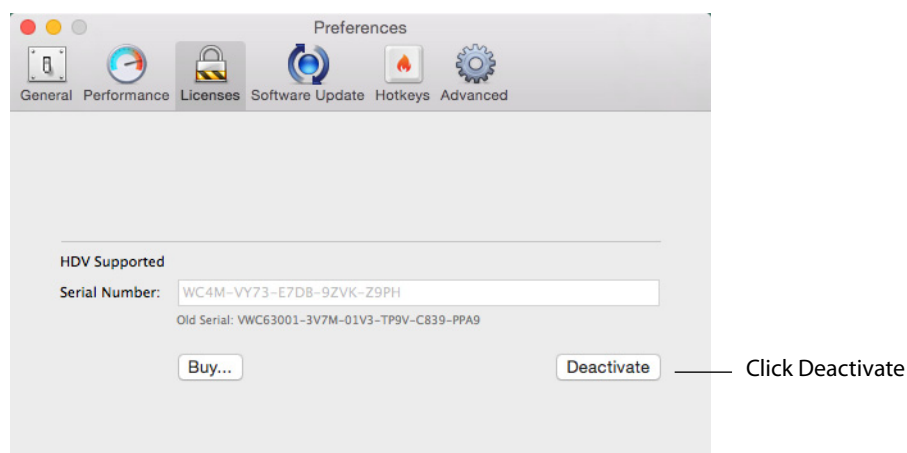
---

## Manual Activation

If your computer is not on the Internet, you can use another computer to activate your license and unlock Wirecast. To manually activate your license, download the Manual Activation Guide at: <http://www.telestream.net/telestream-support/wire-cast/training.htm> and follow the steps in the guide to unlock Wirecast.

## Deactivate Serial Numbers

Deactivating a serial number allows you to re-activate it on another computer. You can always reactivate a serial number by re-entering it. To deactivate a serial number, click the *Deactivate* button on the Licenses tab in Preferences. Wirecast deactivates the serial number and adds water-marking to the video and audio whenever licensed features are used. When you deactivate a serial number, it is removed from the table.

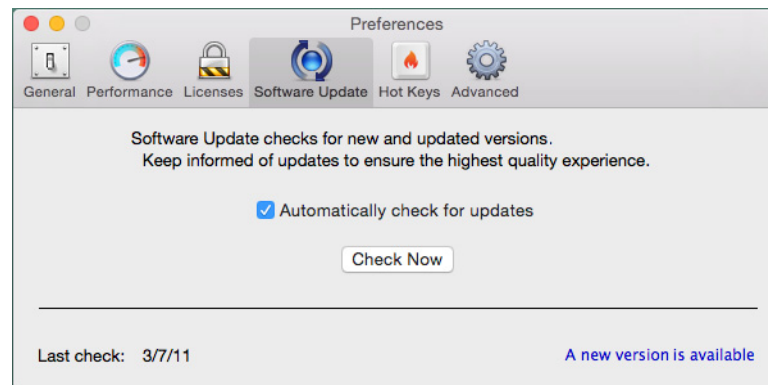


## Demonstration Mode

When no serial number is entered or activated, Wirecast water-marks all output (both to disk and network). The video water-mark is a periodic overlay of the Wirecast logo. Audio water-mark is a periodic voice over. If you have a Wirecast serial number and are using a Wirecast Pro feature without a Pro license, that output is also water-marked.

## Software Update

Software update preferences enable you to obtain Wirecast updates.



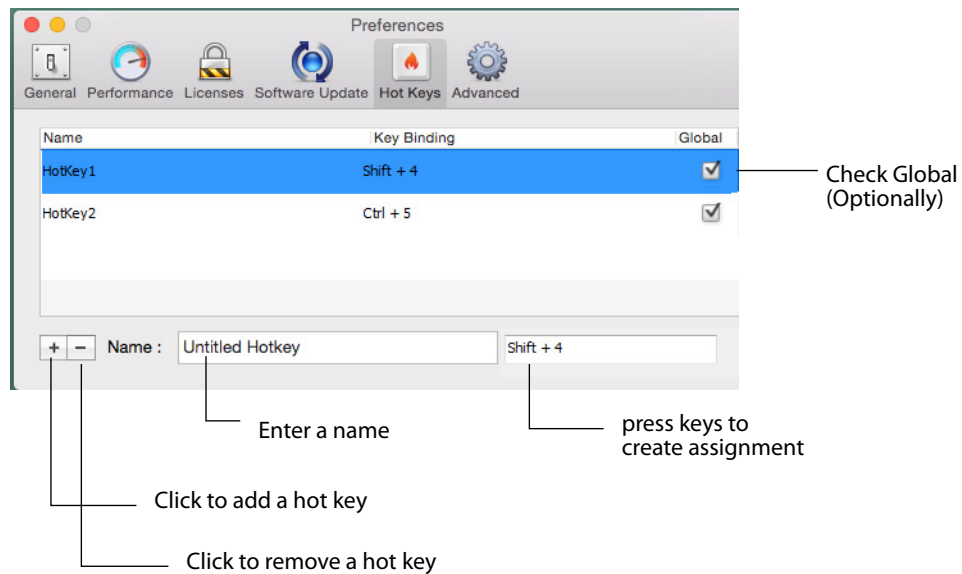
**Automatically Check Updates** Check the Automatically Check For Updates checkbox to cause Wirecast to check for updates on the Telestream Website each time Wirecast is launched. No personal information is transferred to Telestream during this action.

**Check Now** Click *Check Now* to immediately check for updates on the Telestream Website ([www.telestream.net](http://www.telestream.net)). No personal information is transferred to Telestream during this action.

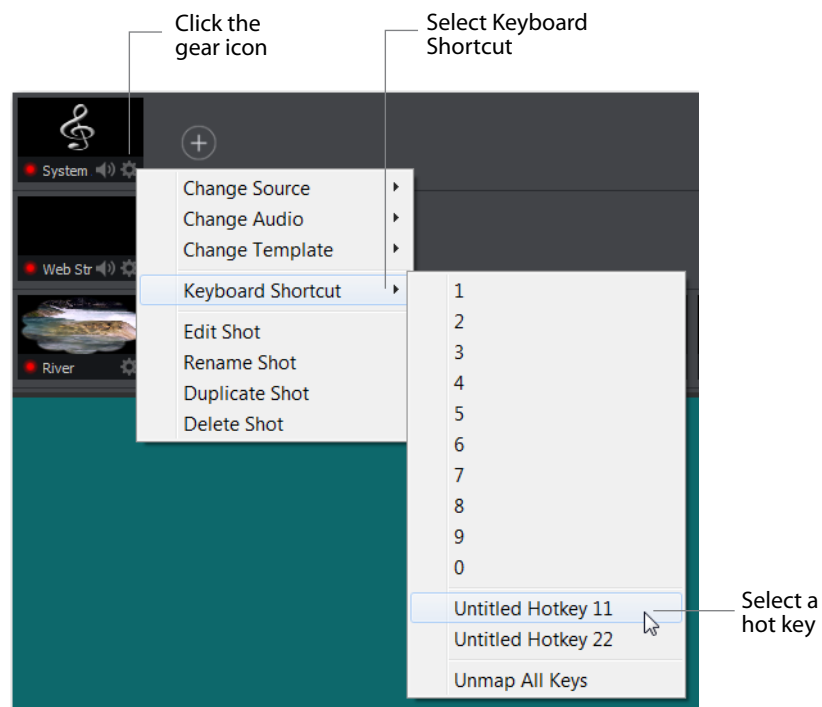
## Hot Keys

Hot Key preferences enable you to create custom hot key assignments. To add a new hot key, click the add (+) button. Press the keys you want to define that hot key and enter a name for your hot key. To remove a hot key, select it in the hot key list and click the remove (-) button. Additionally, you check the Global check box to make your hotkey "global". This means that even if the Wirecast window is not the active window,

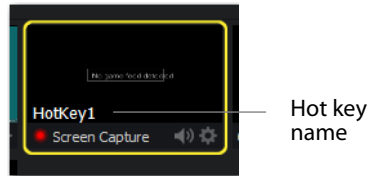
the hot key will still work. Otherwise (if Global is not checked) the window must be selected in order for the hotkey to work.



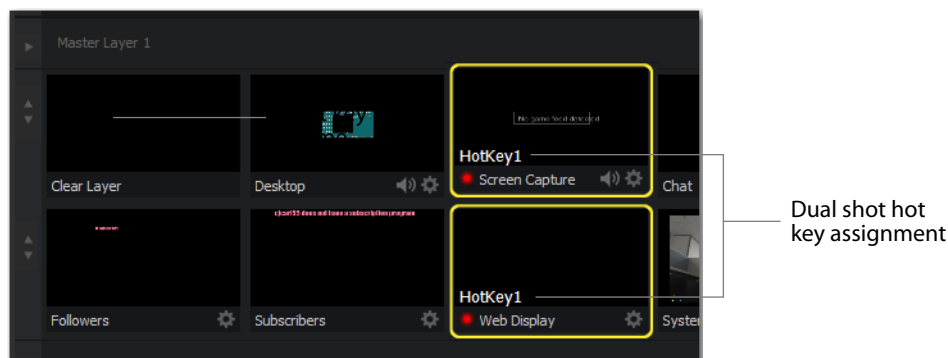
Hot keys are associated with a shot by selecting the Keyboard Shortcuts menu (by clicking the shot gear icon), then selecting a hotkey. This selection binds the hot key to the shot.



Once a hot key is assigned to a shot, the name of the hot key displays in the shot icon.

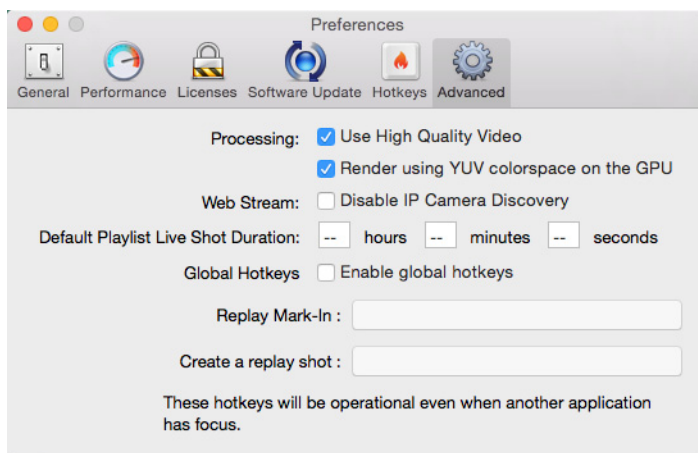


You can assign multiple shots to the same hot key. This is useful when you want different shots on different layers to be activated at the same time using one hot key. To do this, assign the hot key to the first shot (as described above), then assign the same hot key to a second shot on another layer. The shot name will display in both shot icons.



## Advanced

Advanced preferences enable you adjust advanced settings for Wirecast.



### Use High Quality Video

Check the Use High Quality Video checkbox to increase the quality of decoding performed on your source media files. If CPU usage is near 95%, or if the frames per second (fps) is consistently well below your target, uncheck *Use High Quality Video* to remedy this. Checked is the default.



## Render using YUV Colorspace

If *Render using YUV colorspace* is checked, video frames will be rendered on the GPU using YUV rather than RGB. This will typically provide a performance advantage and save on memory. Performance will improve when streaming to most destinations (including Virtual Camera Out). The best way to know if this option is advantageous to use on your system is by trial and error, and observe the results.

## Disable IP Camera Discovery

Check *Disable IP Camera Discovery* to turn off automatic discovery of IP Cameras.

---

### Note:

---

## Global Hot Keys

Check *Enable global hotkeys* to define hotkeys for “Replay Mark-In” and “Create a Replay Shot” functionality. To assign a hot key, first select one of the functions by clicking in its edit box, then press a key stroke sequence to be used as the hot key (i.e. command + 8).

---

**Note:** These Global Hot Key settings are specifically for Replay. This is so you can activate Replay functions when the application window is not in focus while playing games, etc.

---



# Audio Mixer

## Introduction

The Audio Mixer enables you to monitor and control all of the audio sources from a single control panel. This section describes in detail how to use the Audio Mixer.

## Topics

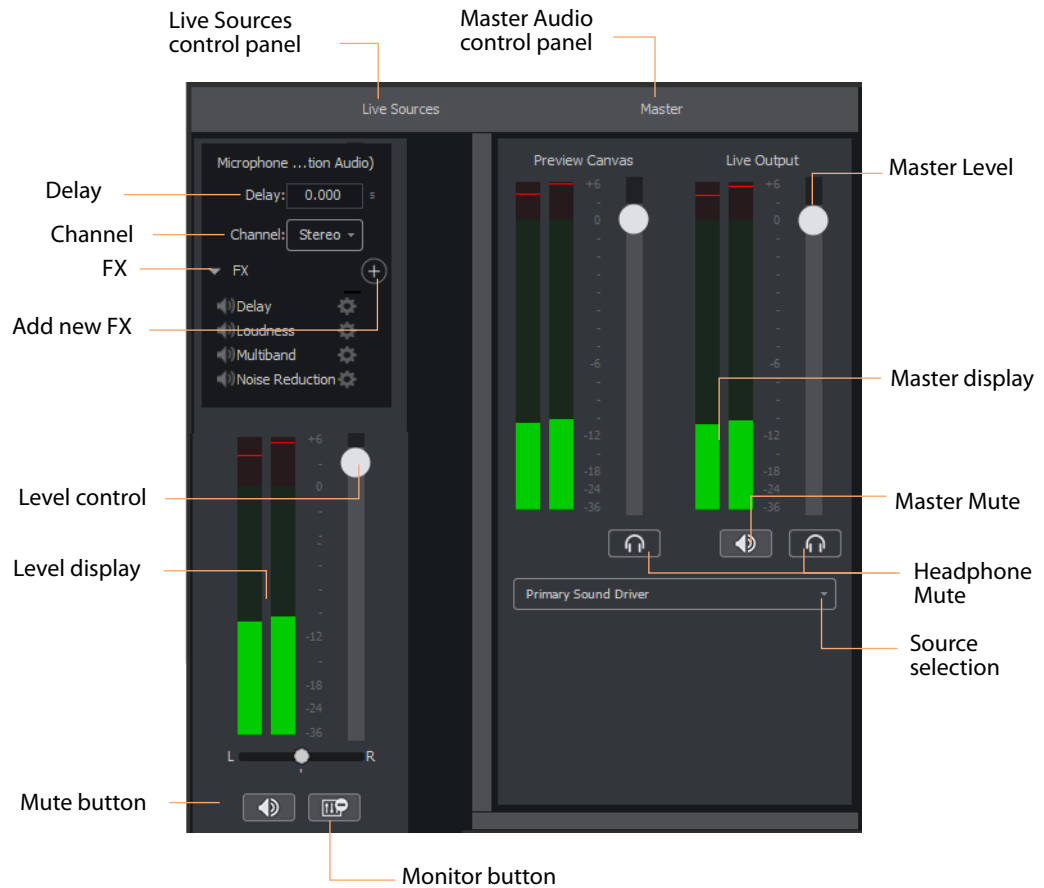
- [Overview](#)

## Overview

To open the Audio Mixer panel, select *Audio Mixer* from the Window menu.

The Audio Mixer separates your audio by hardware and shot. Live Input is always the first section to the right of the Master control, and it contains all hardware audio sources that are live in your streaming event. This includes microphones, audio input

feeds, cameras, capture cards, Web streams, etc. The remaining audio controls are associated with specific shots.



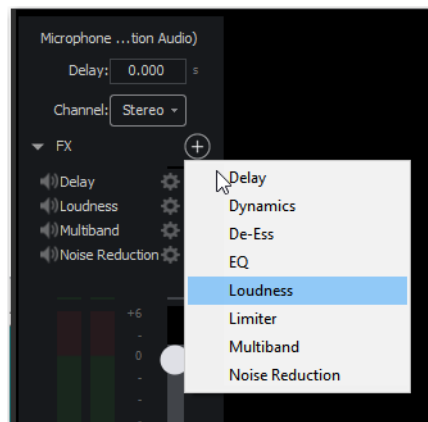
The Monitor button toggles the source audio when monitoring Preview or Live output. This does not remove the audio from the output stream or recording. Delay enables you to delay the audio as needed, in seconds and milliseconds. Channel enables you to select left source only, right source only, or stereo (left and right).

**Delay** Enter the amount of audio delay needed (in seconds and milliseconds).

**Channel** Select the channel to use: Left, Right, or Stereo (both).

**FX** Click the down-arrow to display the audio effects panel.

**Add New FX (+)** Click the plus (+) icon to select an audio effect from the drop-down menu.



- **Delay** L and R Delay adjusts how much delay on each channel. Feedback is how much delay is used. Fb Tone is a frequency setting of highs and lows to be delayed. FX Mix is how much delay will be added to audio output. Output sets the delay output level.



- **Dynamics** Thresh sets the threshold of engaging compression. Ratio sets the compression ratio. Output sets the compression level. Attack sets the manner in which compression is applied. Release sets how compression is released. Limiter sets a max output level on the audio. Gate controls (Thresh, Attack, and Release) sets the noise gate that cuts off noise at the set level. Mix adjusts how much compression is applied to the audio.



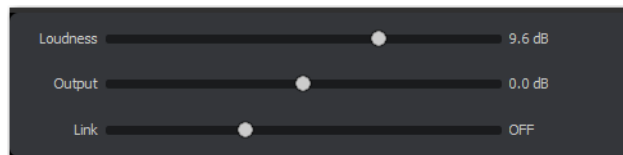
- **De-ess** Thresh sets the threshold of de-essing. Freq selects the frequency at which de-essing will be applied to the audio. HF Drive adjusts the high frequency aspect of de-essing.



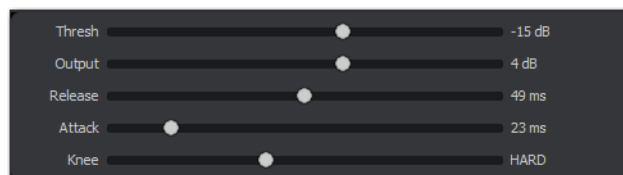
- **EQ** Low, medium, and high adjusts low, mid, and high frequency components in the audio.



- **Loudness** Loudness adjusts the amount of loudness (raising high and low frequencies) in the audio. Output adjusts how much loudness is applied to the audio. Link turns on or off documentation links for Gameshow plug-ins.

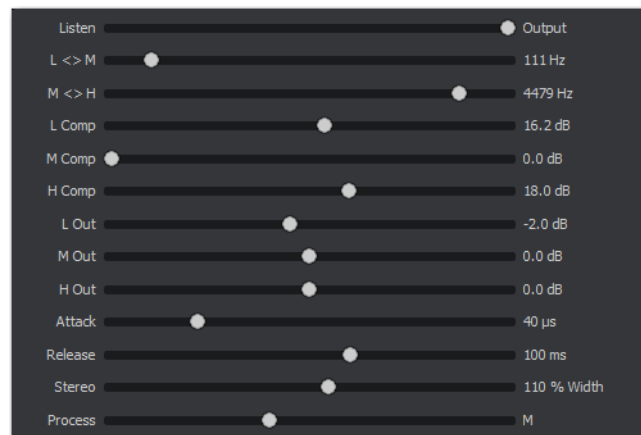


- **Limiter** Thresh sets the minimum threshold of limiting in the audio. Output sets the amount of limiting used in the audio. Release sets the manner in which limiting is released as the audio decreases. Attack sets the manner in which limiting is applied. Knee adjusts the frequency and shape of point where limiting begins.

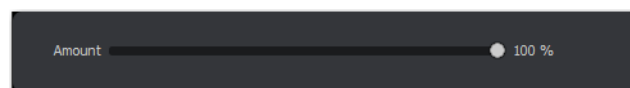


- **Multiband** Listen selects which part of the frequency spectrum to hear: low, mid, high, or all (output). L<>M adjusts the cutoff frequency in the low to mid range (87 to 1020 Hz). M<>H adjusts the cutoff frequency in the mid to high range (111 to 19606 Hz). L, M, and H Comp adjusts the compression for low, mid, and high frequencies. L, M, and H Out adjusts the output for low, mid, and high frequencies. Attack sets the manner in which compression is applied. Release sets the manner in

which compression is released. Stereo adjusts how the left and right channels are separated (width) from 0 to 200%. Process selects stereo or mono mode.



- **Noise Reduction** Amount sets the amount that noise reduction is applied.



**Level Control** Adjusts the audio level of the live audio output.

**Level Display** Displays the levels (left and right) of the live audio outputs.

**Mute** Mutes the live audio output.

**Monitor** Toggles the monitor audio output in the headphones without effecting the live audio output.

**Master Level** Adjusts the audio level of the Master audio output.

**Master Display** Displays the levels (left and right) of the Master audio outputs.

**Master Mute** Mutes the Master audio output.

**Headphone Mute** Toggles the monitor audio output in the headphones without effecting the Master audio output.

**Source Selection** Click the down arrow to select an audio source from the drop-down menu.





# Asset Manager

## Introduction

The Asset Manager is used to change the sources of media in your document. It is accessed by selecting *Media > Show Asset Manager*.

## Topics

- [Documents](#)
- [Reassigning Media](#)

## Documents

Wirecast stores a path to your media in the Wirecast document. If you relocate your media, Wirecast no longer is able to find them. In this case, use the Asset Manager to reassign the new media locations. However, Wirecast does keep track of the relative path to your media. If you move both the document and media to a new position, Wirecast still finds the media.

## Reassigning Media

To reassign media, follow these steps:

1. To open the Asset Manager, select *Show Asset Manager* from the Wirecast Media menu.
2. Select the media you want to assign to another source.
3. Some media assets (i.e. cameras) enable you to set the aspect ratio by displaying a Device Aspect Ratio menu. You can select an aspect ratio from this menu.
4. Select the new media from the *Assign To* menu, or click Browse and locate the replacement media on disk.

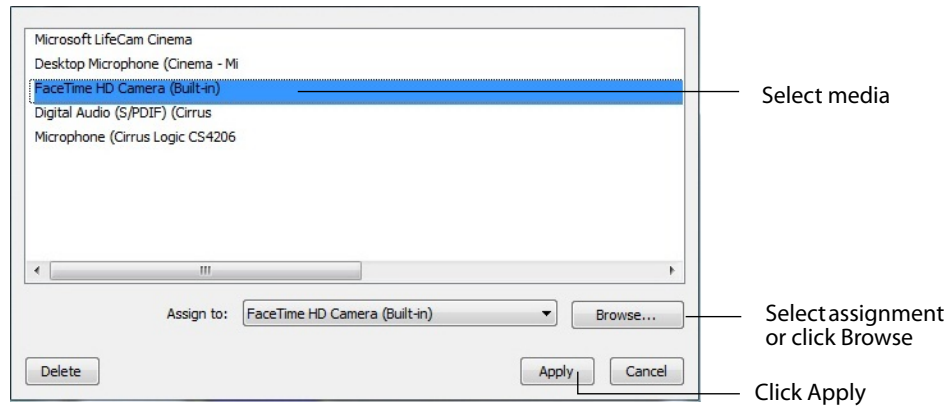
---

**Note:** When Desktop Presenter is selected as the source, you can enter the IP address for the Desktop Presenter. This enables you to build a Wirecast presentation with

place-holders and then reconfigure at a later date to accommodate a new presenter with a new Desktop Presenter as a source. Click Apply, then click the corresponding icon in the Shot Selection.

---

5. Click *Apply* to replace the existing media, then close the Reassign Media window.



# Menus and Windows

## Introduction

These topics describe the menus, menu items, and keyboard shortcuts in Wirecast.

## Topics

- *Wirecast Menu*
- *File Menu*
- *Edit Menu*
- *Switch Menu*
- *Media Menu*
- *Output Menu*
- *Layout Menu*
- *Replay + ISO Menu*
- *Twitter Menu*
- *Window Menu*
- *Help Menu*

## Wirecast Menu

**About Wirecast** Displays the version you are running.

**Preferences** Opens the Preferences window. If the Preferences window is already open, it becomes the active window.

**Services** Presents the Macintosh Services available.

**Hide Wirecast** Hides all of the windows.

**Hide Others** Hides all non-application windows.

**Show All** Shows all non-application windows.

**Quit Wirecast** Closes all documents and exits. If the broadcast is playing, you are asked to stop the broadcast first. If a document has not been saved, you are asked to save it.

## File Menu

**New** Creates a new, empty Wirecast document.

**Open** Displays the Open dialog window for opening a Wirecast document.

**Open Recent** Displays up to fifteen of the most recently accessed documents. Every time a document is opened or saved it is entered into this list.

**Open OBS Scene** Displays the Open dialog window for opening an OBS (.json) document.

**Import Media** Enables you to import media into Wirecast. A new shot is automatically created using the new media.

**Save** Saves the document. If the document has not already been saved, the Save As... dialog window is displayed.

---

**Note:** Wirecast auto-saves your stream/recording every 20 seconds.

---

**Save As** Displays the Save As... dialog window so that the document can be saved using a new file name.

**Close Window** Closes the currently active Wirecast window. If the window is a document, all of its Shot Editor windows are closed as well. If Wirecast is still broadcasting, you are asked to stop the broadcast. If the document has not been saved, you are asked to save the document before closing.

## Edit Menu

**Undo** Reverses your last change in Wirecast. Undo is only available in some windows (such as the Preview window). Wirecast offers an unlimited number of undo actions (within computer memory limitations). Undo information is stored on a per-window basis. Also, if you close a window then reopen it, your undo information is lost.

**Redo** Reverses your last undo action. Redo is only available in some windows (such as the Preview window). Wirecast offers an unlimited number of redo actions (within your computer's memory limitations). Redo information is stored on a per-window basis. Also, if you close a window then reopen it, your redo information is lost.

**Cut** Cuts selected text.

**Copy** Copies selected text to clipboard.

**Paste** Pastes selected text from clipboard to location of cursor.

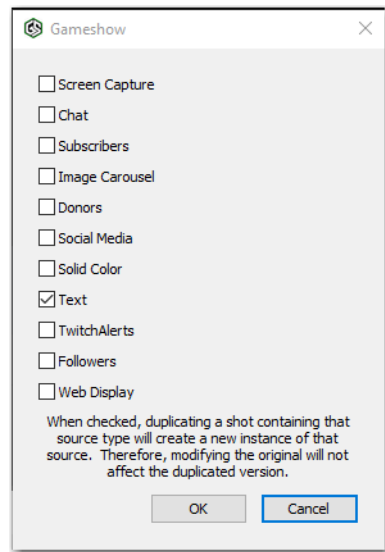
**Select All** Selects all text in the active window.

**Show/Hide Shot Editor** Opens the Shot Editor. (See [Shot Editor](#)). You can also double-click a shot, or right-click and select Edit Shot, to open the Shot Editor.

**Rename Shot** Enables you to rename a shot. You can also right-click a shot and select Rename Shot.

**Duplicate Shot** Duplicates the currently selected shot. You can also right-click a shot and select Duplicate Shot.

**Duplicate Shot Options** Check a source to create a new instance of it when duplicating the shot containing it. Multiple selection is allowed.



**Add Shot** Creates a new empty shot. You can also right-click a shot and select Add Shot.

**Add Playlist Shot** Creates a new Playlist shot. You can also select *New Playlist Shot* from the shot menu in the layer window.

**Delete Shot** Deletes the currently selected shot. You can also right-click a shot and select Delete Shot.

## STUDIO

**Move To Layer** Moves a shot to the selected layer. When shots are created, they are assigned to a specific layer. They exist on that layer until they are moved or deleted. You can also click and drag a shot to another layer.

# Switch Menu

**Go** Performs a transition (same action as clicking the Go button).

**Transitions** Wirecast has two transition buttons that can be assigned any transitions (cut, smooth, etc.) that Wirecast supports. The Switch menu lists the currently assigned

transitions by name. These three transitions can also be selected by pressing the control key and either the 1 or 2 key. (See [Transition Controls](#) to modify which transitions appear in this menu.)

**Transition Speed** Enables you to select one of five transition speeds ranging from Slowest to Fastest.

**AutoLive** Toggles (turns on and off) the AutoLive feature. AutoLive is a fundamental feature of Wirecast which enables you to control how you make shots become part of the live broadcast. (See [AutoLive](#).)

**Live/Preview Swap** Toggles (turns on and off) the Live/Preview Swap feature. When on, the Live Broadcast and Preview windows trade panes (swap) when the Go button is clicked.

## Media Menu

**Start Playing All Movies** Starts playing any movies that are not currently playing.

**Pause All Movies** Pauses all movies that are currently playing.

**Shuffle Playlist** Randomly rearranges the order of media in the playlist.

**Show Asset Manager** Displays devices that can be configured. Some devices (cameras, etc.) may be configurable. For example, you can configure an iSight camera to manually change its focus, contrast, brightness, etc. Other devices have multiple inputs you can choose (AlchemyTV Card, etc.). (See [Asset Manager](#).)

---

**Note:** The Configure Devices menu selection is present only if a device is connected to Wirecast. The configuration user interface is provided by the device maker. It is beyond the scope of this document to describe all of the features available for all devices. See the documentation provided with your device on how to configure it.

---

## Output Menu

**Output Settings** Opens the Output Settings window.

**Start/Stop Broadcasting** Starts (or stops) broadcasting to the network. You can also click the Broadcast button on the Window Bar in the Main Window.

**Start/Stop Recording** Starts (or stops) recording to disk. If you have not yet configured the Output Settings for this document, you are prompted to do so. You can also click the Record button on the Window Bar in the Main Window.

**Show Recordings** Opens all the folders of all the file directories in the Output Settings.

#### STUDIO

**External Display Output** Selects an external display for the output of Wirecast. For example, if you have a second monitor connected to your computer, select it from this menu to display the output of Wirecast.

If you have a dual-head graphics card, you can select the second monitor to display Wirecast Output. However, if you have two graphics cards, Wirecast may not be able to display to any devices (monitors) on the second graphics card.

**Virtual Camera Out** Enables you to present the output of Wirecast as if it were a camera (a virtual camera), allowing it to be automatically detected by other applications when they are launched.

---

**Note:** Active Broadcast, Control Room, and VOD of Last Broadcast are enabled only when you are logged into YouTube.

---

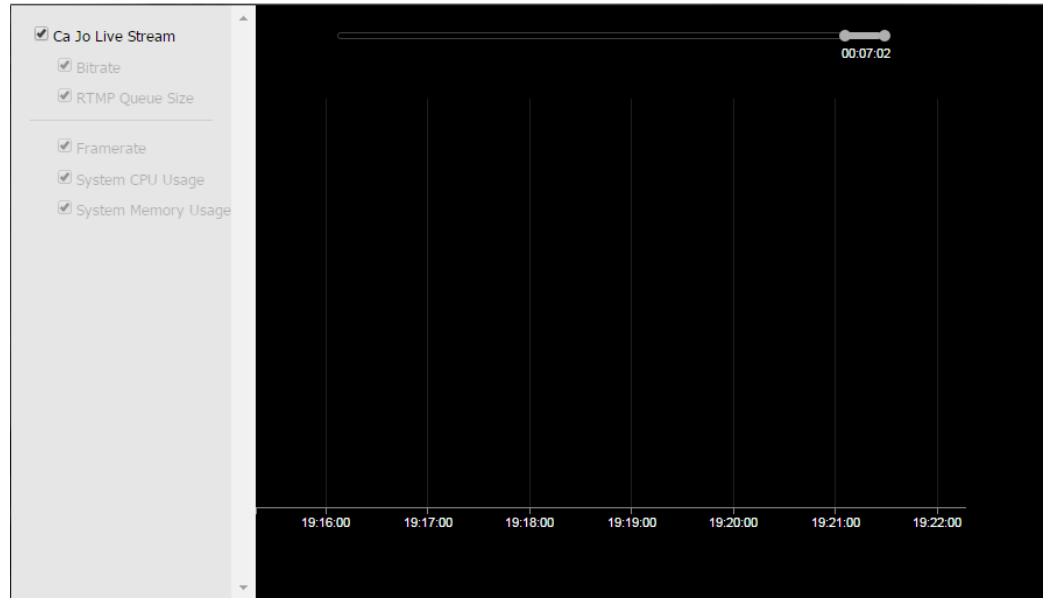
**Canvas Size** Sets the canvas size resolution used when broadcasting a Wirecast document.

---

**Note:** You should match the output to the canvas size as close as possible to preserve video resolution and quality. For example, a 800x600 source results in significant loss of quality if a resolution of 640x480 is selected. Using 720x576, which is much closer in size, helps preserve video quality.

---

**Show Statistics** Displays the statistics window for your broadcast. You can select (for display): Bitrate, RTMP Queue Size, Framerate, System CPU Usage, and System Memory Usage.



## Layout Menu

**Master Audio** Shows (or hides) the Master Audio controls.

**Show Live and Preview** Displays the Live and Preview windows.

**Show Preview Only** Displays the Preview window only.

**Show Live Only** Displays the Live window only.

---

**Note:** The above three controls are the same as the Live/Preview Control buttons at the top of the main window.

---



**Go to Layer** Displays the selected layer. You can also press command + Shift keys with the T, F, N, B, or A keys to select a layer. Each of these letter keys represents a layer name: Title, Foreground, Normal, Background, and Audio.

**Activate layer** Activate (checked) or deactivate (unchecked) a layer. You can also click the LED on the right side of each layer window.

**Enter Full Screen** Toggles between full screen display and sized display.

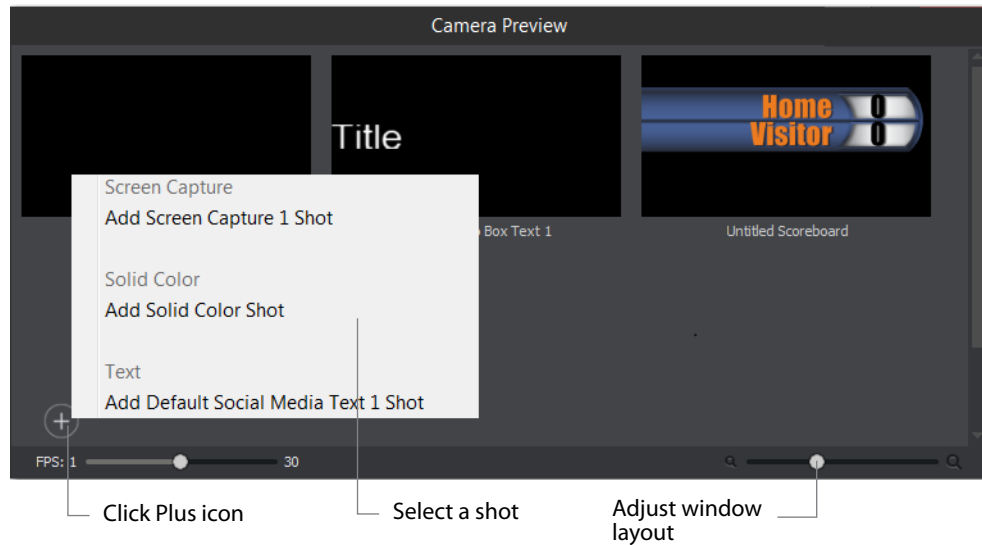


## Replay + ISO Menu

### PRO

**Start All** Activates the Create Replay Shot system. When activated, the menu item becomes *Deactivate*. Click *Deactivate* to deactivate the Create Replay Shot system.

**Camera Preview** Displays the Camera Preview window which enables you to add various shots by clicking the plus (+) icon. You can also adjust the Camera Preview window layout (shot icon sizes) by moving the slider.



**Configure ISO Outputs** Once ISO outputs are created, all ISO outputs are listed in this menu. To configure an ISO output, click *Configure*, then click the *Add ISO* button.

The screenshot shows the 'Configure ISO' dialog box. On the left, the 'Output List' has two items: 'Program Replay' (unchecked) and 'Untitled ISO' (checked). Below this is the 'Replay Settings' section, which is currently empty. The main configuration area on the right includes the following fields and options:

- Name:** Untitled ISO
- Video Source:** Integrated Webcam - Add source to document to use it
- Audio Source:** None
- Format:** MJPEG/QuickTime
- Quality:** High
- Filename:** iso\_file
- Folder:** C:\Users\carl\Videos (with a 'Browse...' button)
- Replay:** ☐ Configure this ISO for Replay
- File Options:** ☒ Single File, ☐ New File Every 0 seconds
- Create Replay Hotkey:** None Assigned
- Save Replay Hotkey:** None Assigned
- Mark Replay Hotkey:** None Assigned
- Manage...** button

At the bottom of the dialog are four buttons: 'Add ISO', 'Remove ISO', 'Cancel', and 'OK'.

**PRO**

**Replay Mark All** Allows you to tighten up your Replay Shot capture. Select *Replay Mark In* to mark the beginning point of your Replay Shot capture.

**PRO**

**Create All Replay Shots** Select *Create* to create additional Replay shots.

**PRO**

**Update All Replay Shots** If no replay shot exists, selecting *Update* creates a new Replay shot. There after, selecting *Update* updates the first Replay shot created.

**PRO**

**Configure** Displays the Replay Shot settings window (as shown above in *Configure ISO Outputs*).

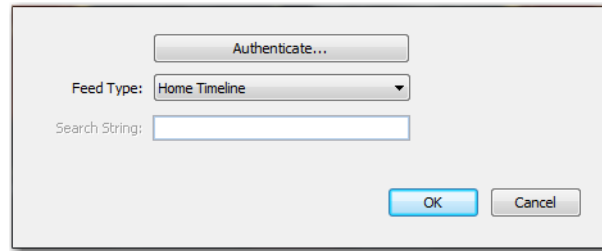
For more information about Replay Shots see [Replay](#).

## Twitter Menu

**Message Feed** Brings up your Twitter feed.

**Create Shot** Creates a shot with a social media title in Master Layer 1.

**Settings** Brings up the Social Media Settings dialog.



- **Authenticate** Click to authenticate your account with Twitter. Enter your pin when the PIN field displays.
- **Feed Type** Select a Feed Type: Home Timeline, User Timeline, Favorites, Search. If you select Search, the Search String field becomes active.
- **Search String** Enter a search string. (Active only when Search is selected in Feed Type above.)

## Window Menu

**Minimize** Minimizes the front-most window.

**Zoom** Maximizes the front-most window (zooms to the full size of the screen).

STUDIO

**Inspector** Opens the Inspector window. There is only one Inspector window for each document. The Inspector is very similar to the Shot Editor, except it always edits the last shot touched.

STUDIO

**Encoder Presets** Opens the Encoder Presets window.

PRO

**Audio Mixer** Opens the Audio Mixer window.

**Show USB Devices** Opens a list of all USB devices.

STUDIO

**New Layer Window** Opens a new Master Layer window for the layer selected.

**Document Windows** All open document windows are listed at the bottom of this menu.

## Help Menu

**Wirecast Help** Opens the online help version of the User Guide.

**Open Wirecast PDF User Guide** Opens the PDF version of the User Guide.

**Open Tutorial HTML** Opens the Wirecast Tutorial in your browser. To follow the tutorial, you'll need to Create a Document for the Tutorial as well.

**Create Document for Tutorial** Creates a new Wirecast Document which contains the media necessary for following the Tutorial.

**Buy/Upgrade** Opens *Buy Upgrade* in the Preferences window. This window allows you to purchase licenses and to activate or deactivate them.

**Provide Feedback** Opens the Telestream Website feedback page where you can enter any feedback you may have about our product or company.

**Send Support Information** Opens a Support Assistant dialog window. To create a new support ticket, select *Create a support ticket*. The information is sent to the Telestream support team for evaluation. If you have been previously issued a case number, select *Link with existing support case #* and enter your case number. You can also select *Do not receive follow-up from Telestream*. This enables you to send support information to Telestream without receiving a response. Click *Save Report* to save the information to a file on your computer. Click *Send Report* to send the information to Telestream.

---

**Note:** You must click *Send Report* to create a ticket. If you click *Save Report*, a ticket will not be created.

---

Contact Information

☐ Create support ticket and receive followup from Telestream support.  
Do not check if you receive your support directly from a dealer.

☐ Link with existing support case #

☒ Do not receive followup from Telestream

E-Mail Address:  \* Required

First Name:  Last Name:

Company:

Description and/or steps to reproduce

s the directory where the Wirecast Scripting examples are located.

**Visit Telestream Website** Opens the Telestream Website home page.

**Visit Wirecast / Desktop Presenter Download Page** Opens the Telestream Website download page for Desktop Presenter.

**Acknowledgments** Opens an on-line help to acknowledgments.



# Broadcasting

## Introduction

---

**Note:** Wirecast will not prevent your computer from entering sleep mode. Therefore, to ensure uninterrupted streaming, you should disable sleep mode on your computer while using Wirecast.

---



---

**Note:** To avoid a decrease in video quality, Wirecast should not be used at CPU usage above 80%. See the Telestream Website for suggested configurations.

---

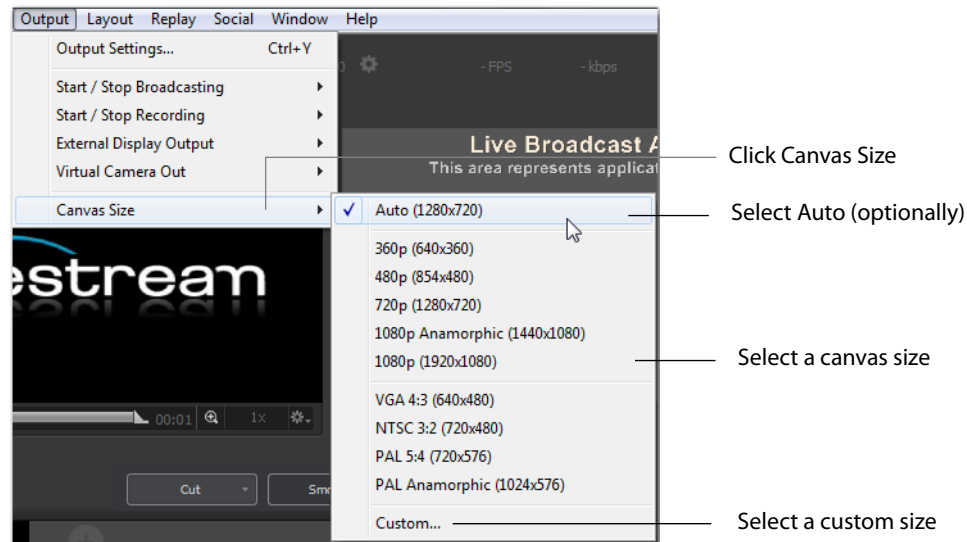
## Topics

- *Canvas Size*
- *Virtual Camera*
- *Output Settings*
- *Encoder Presets*
- *Flash RTMP Server*
- *Flash To Akamai*
- *Flash To Azure Media Services, Brightcove, Limelight, Sermon.net, Verizon Digital Media Services.*
- *Flash To Bambuser, Churchstreaming.tv, Dailymotion, DaCast Streaming Services, Lightcast, make.tv, Meridix Live Sports Network, Onstream media, Streamingchurch, Streamshark.io, Streamspot, Streaming Media Hosting, StreamVu, Stretch Internet, Sunday Streams, The cube, Titled globe, Tulix Streaming, Ustream*
- *Flash To Azure Media Services, Brightcove, Limelight, Sermon.net, Verizon Digital Media Services.*
- *Flash To Zixi*
- *Flash To Facebook*
- *Flash To YouTube*

- *Streaming*
- *Record To Disk*

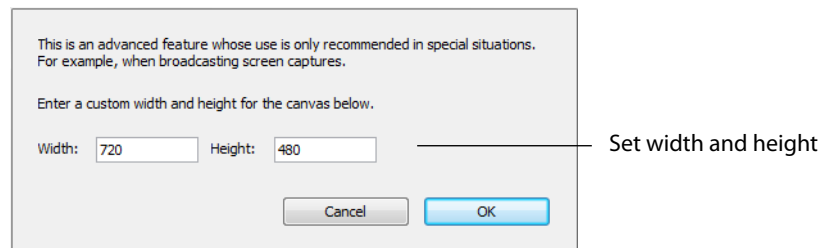
## Canvas Size

The first menu item in the Output menu is Canvas Size. When *Output > Canvas Size* is selected, a drop-down menu with various canvas sizes is displayed allowing you to select the canvas size you want. You can also select *Auto*. This automatically sets the canvas size to the highest resolution that was selected when the encoder was chosen.



**Note:** Canvas size selection *1080p Anamorphic (1440x1080)* is a narrower (1440) display stretched to display as 1080.

There is also a *Custom* option that enables you to set the canvas width and height.



Wirecast can manage a wide variety of input sources, enabling you to have several live camera sources. However, really high-quality video sources can cause more harm than good. For example, an HD camera feed into a Wirecast canvas that is set to HD resolution and then broadcast out in HD, requires a lot of work for the graphics processor. If the frame rate starts to drop but the CPU usage stays steady, it creates a

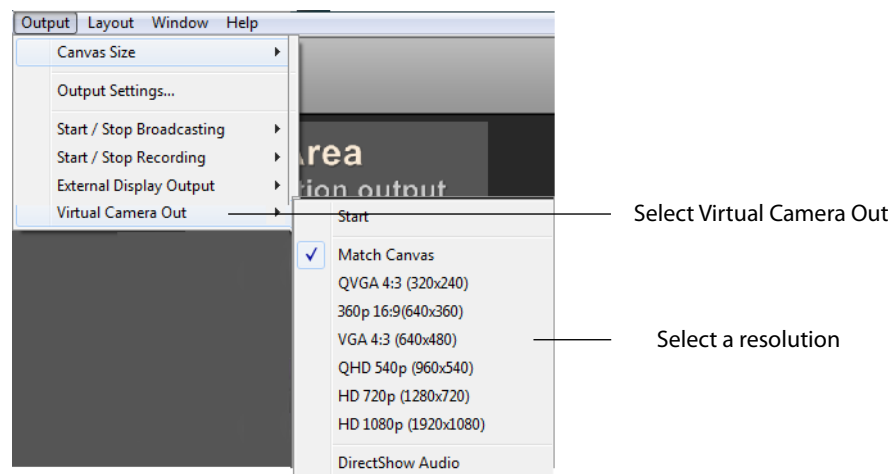


bottleneck. The solution is to reduce the frame size going through Wirecast. Therefore, there is no need to bring input video in at HD resolution if Wirecast is streaming out a lower resolution.

Keep in mind that resizing down is good but resizing up reduces quality. As a rule, you should try to keep your resolution as constant as possible from source to output. There is no benefit from using an HD camera if you're only broadcasting a low resolution stream. This only increases the work your computer must do without any increase in output quality.

## Virtual Camera

Wirecast enables you to present the output of Wirecast as if it were a camera (a virtual camera), allowing it to be automatically detected by other applications when they are launched. To setup Wirecast as a virtual camera, select *Output > Virtual Camera Out*, then select the output resolution to use. You can also select *Match Canvas* to cause the resolution to be the same as the current canvas size.



Once you have selected an output resolution, select *Start* to make Wirecast output available to other applications on your computer.

Some of the applications Wirecast can work with using virtual camera are:

- Google+ Hangouts
- Skype
- GoToMeeting

---

**Note:** Virtual Camera only works with one application at a time.

---

The Virtual Camera menu also provides two additional options: *DirectShow Audio* and *Virtual Microphone*.

**DirectShow Audio** When selected, outputs DirectShow audio.

**Virtual Microphone** When selected, enables you to present the audio output of Wirecast as if it were a microphone (a virtual microphone), allowing it to be automatically detected by other applications when they are launched.

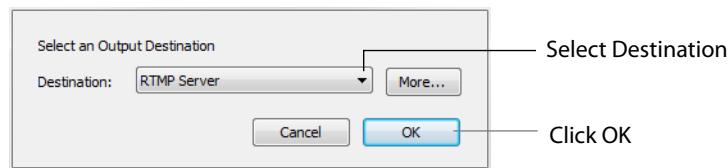
---

**Note:** Virtual Microphone can only be installed during Wirecast installation.

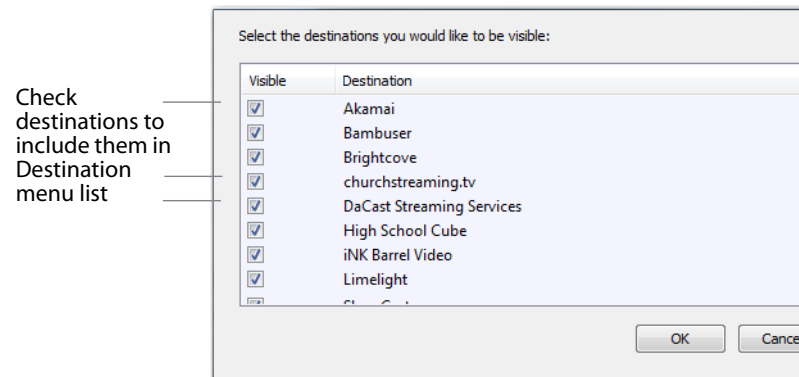
---

## Output Settings

To configure output settings select *Output > Output Settings*. When the dialog box displays, select a destination. Click OK to open the Output Settings window.



You can also click *More* to display a list of all available destinations. Check the checkbox for each destination you want to include in the destination menu list.



The Output Settings window displays the destination you selected. Each destination window has a unique set of controls including a way to authenticate your connection.

## Multiple Output Settings

Wirecast enables you to specify many output settings for your presentation. This means you may configure Wirecast to broadcast multiple data rates simultaneously, or even broadcast and record with different encoders at the same time. You can also broadcast to multiple Flash destinations while recording to disk.

At the top of the Output Settings window is a list of the current settings. Uncheck the checkbox of any setting you want removed from your broadcast. You can add as many output settings as you need, but keep in mind that each additional destination will require more system resources.

Click the Gear icon to access actions that enable you to create reference movies you can distribute to your viewers. Each destination type provides a unique set of actions.

## Configuration

There are two items to configure before broadcasting: Destination and Encoding.

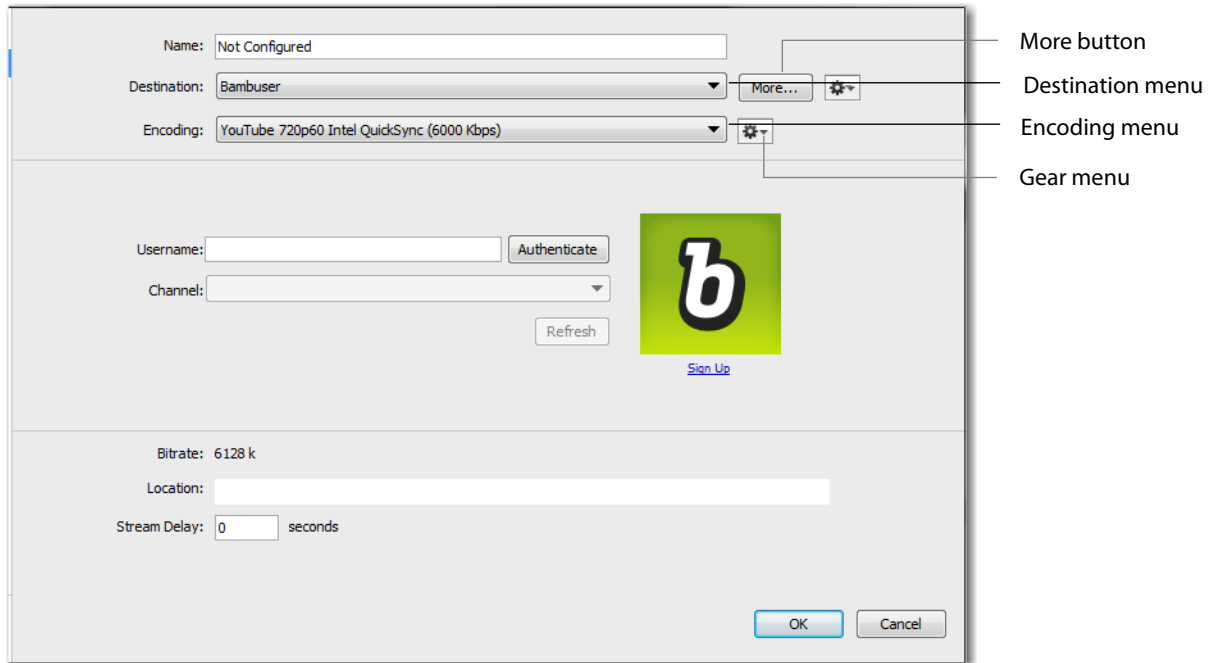
When you broadcast with Wirecast, you must pre-configure at least one destination. A destination can be a broadcast server, content distribution network or local disk recording.

Each encoding preset uses a different broadcast technology (Flash, Windows Media, etc.). The destinations described below depend on the Encoder Presets you have chosen.

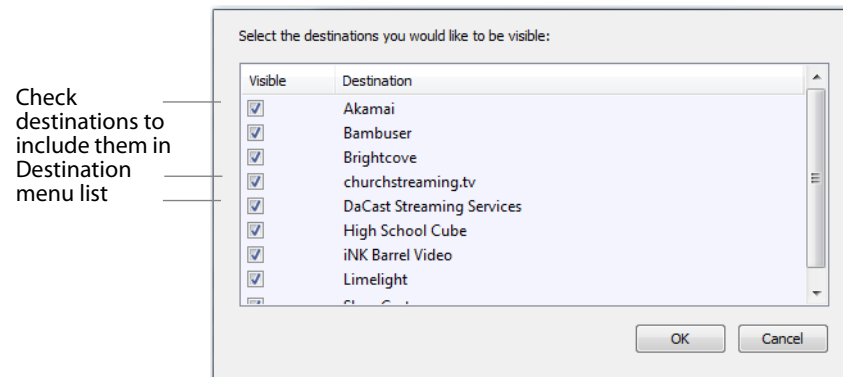
The *Encoder* determines how your presentation is encoded (or compressed). There are many options available. Wirecast simplifies this process by providing several simple presets to choose from. (See also [The Encoder Presets Window](#)).

## Encoder Presets

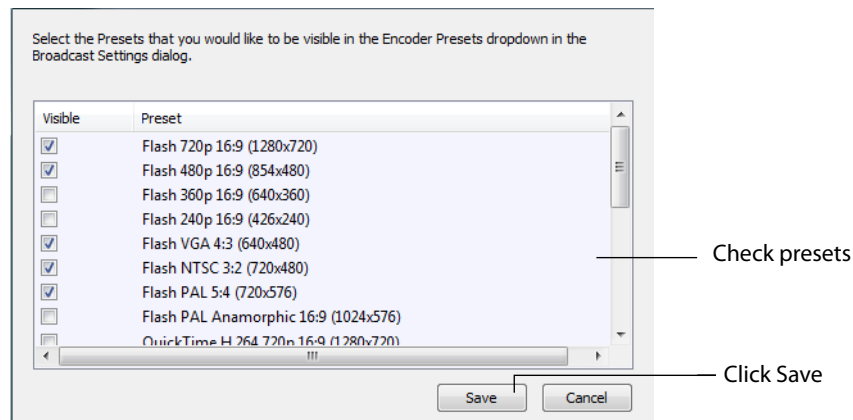
The Encoder menu is located near the top of the Output Settings window. The Destination menu is located above the Encoder menu. The More button and Gear menu provide optional settings.



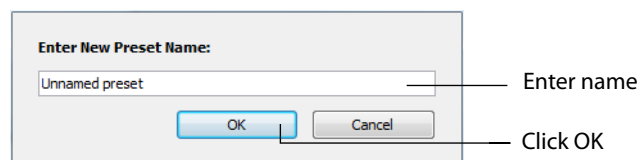
**More** Click *More* to display a list of all available destinations. Check the checkbox for each destination you want to include in the destination menu list.



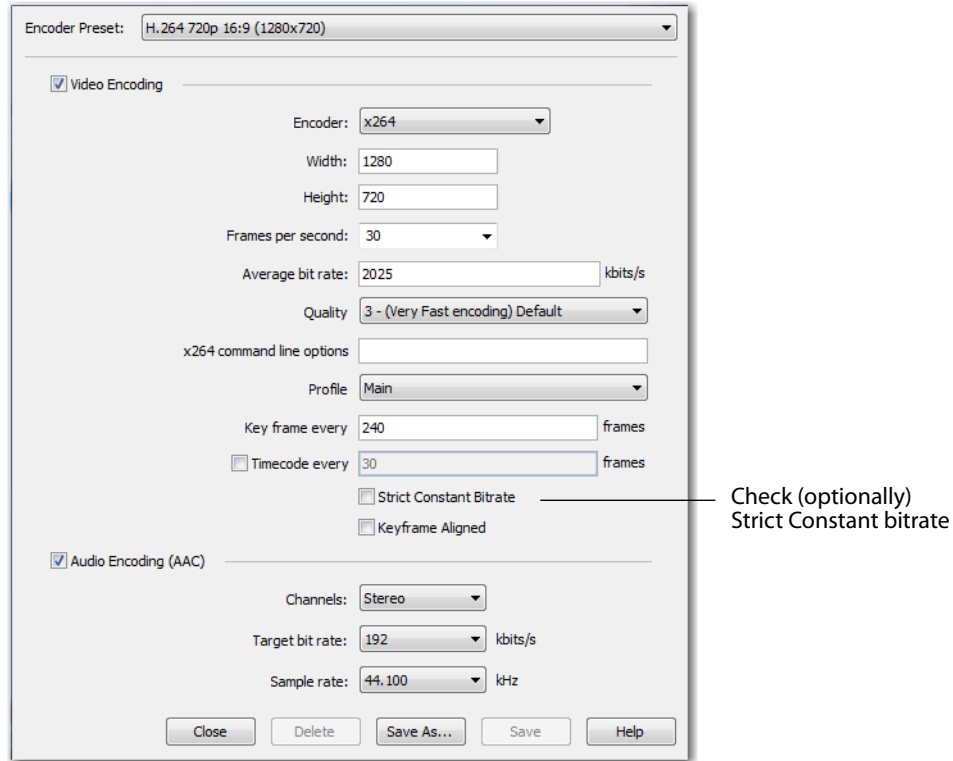
**Filter** Select *Filter* from the Gear menu to display a check list of encoder presets. Check the presets you want to display in the Encoder presets menu. Click *Save* when finished.



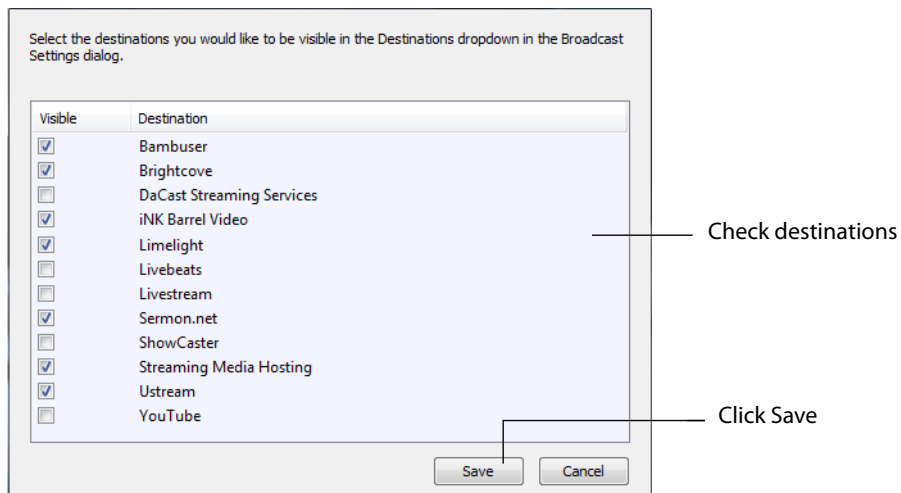
**New Preset** Select *New Preset* from the Gear menu to create a new encoder preset. Enter a name for your new preset and click OK. (See [Creating New Presets](#)).



**View Details** Select *View Details* from the Gear menu to modify an encoder preset. (See *Creating New Presets*). One important option is Strict Constant Bitrate. When checked, the bitrate is strictly held at the bitrate entered in *Average bit rate*.

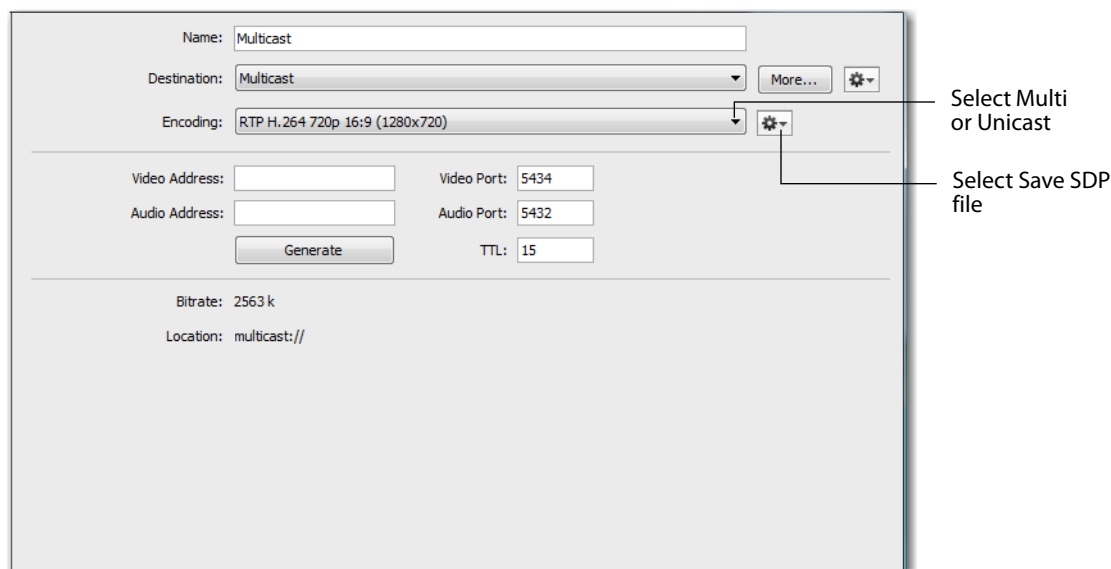


**More** Click the *More* button to display a check list of destinations. Check the destinations you want to display in the Destination menu. Click *Save* when finished.



## Multicast and Unicast

You can select Multicast or unicast from the Destination menu. Multicast lets you broadcast to multiple computers simultaneously. Unicast lets you broadcast to a specific computer.



You need to create an SDP File, and you must do so every time you change any option on this page (including the encoder preset). To create an SDP file click the gear icon and select *Save SDP File*, navigate to the desired location, and click *Save* in the Save File dialog window. The SDP file must be given to the user to place on the computer that receives your broadcast.

During multicast, your broadcasting computer sends data across your local network, identifying it as a broadcast that it has no specific destination. Since many applications could be doing the same thing, the broadcasting computer must have a unique way of defining the data that is being multicast. This enables clients to choose between the available multicast streams.

The multicast protocol uses unique addresses, one for video and one for audio. Although these unique addresses look like TCP/IP addresses, they are not. Instead, they provide a way to define uniqueness among all multicast data flowing over the network. Once the broadcasting computer is streaming this data through the local network, any computer on the network can receive it.

The SDP file becomes the glue between your broadcast computer and the viewer computers. The SDP file contains multicast addresses, encoding format, and other important information.

## Flash RTMP Server

Wirecast can stream to an RTMP/ H.264-compatible streaming server (Flash Media Server, Wowza Media Server, etc.). Flash Players earlier than Flash 9, Update 3 (Dec 2007), may not be able to view the H.264 based streams.

To configure Flash Media Streaming, follow these steps:

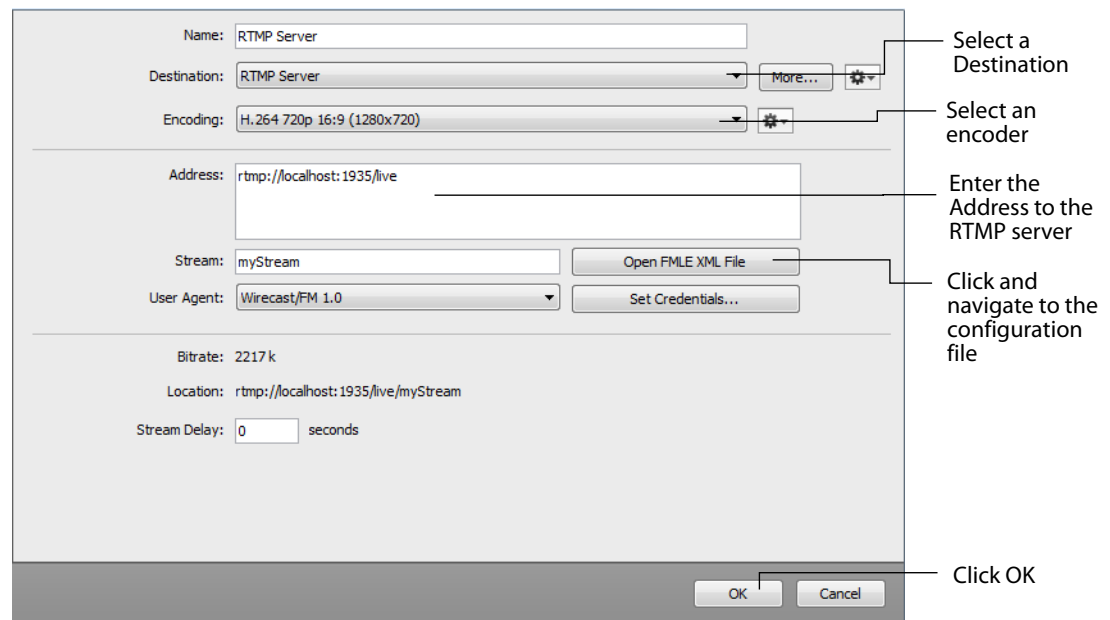
1. Select Destination > RTMP Server.
2. Select an encoder.
3. Enter the Address to the RTMP server. (This is the same as the FMS URL in Flash Media Server.) The default RTMP port is 1935, but you may need to configure your firewall to allow connections on this port.
4. Wirecast can import a Flash Media Encoder configuration file (XML file). Click Open FMLE XML File, and navigate to the configuration file and select either version 2.5 or version 3.0. Wirecast reads the Address and Stream information from that file. Many online streaming services offer FMLE configuration files which Wirecast can use.

---

**Note:** Only the Address and Stream information from the XML configuration file is used. No Encoding information is imported.

---

5. Click OK to save your settings:





## CDN Partners

Listed below are the Content Distribution Network (CDN) partner destinations available in Wirecast. Most destinations share a common user interface and only require a user name and password. Destinations that do not conform to this paradigm, or require additional parameters, are presented separately.

---

**Note:** The list of CDN partners in Wirecast is subject to change at any time.

---

**Flash To Bambuser, Churchstreaming.tv, Dailymotion, DaCast Streaming Services, Lightcast, make.tv, Meridix Live Sports Network, Onstream media, Streamingchurch, Streamshark.io, Streamspot, Streaming Media Hosting, StreamVu, Stretch Internet, Sunday Streams, The cube, Titled globe, Tulix Streaming, Ustream**

To stream to one of these CDN partners, follow these steps:

1. Select a CDN partner from the Destination menu.
2. Select an encoder.
3. Enter your username.
4. Click *Authenticate* to enter your password and generate the RTMP URL. You only need to do this one time because Wirecast stores the channel information for future streams. The default RTMP port is 1935. You may need to configure your firewall to enable connections on this port.

---

**Note:** If you do not have a username and password, you can sign up with a CDN partner by clicking *Sign Up*.

---

5. Select your channel.
6. Optionally, you can refresh your connection by clicking *Refresh*.
7. Optionally, enter a Stream Delay value. This provides a time buffer between your live stream from Wirecast and the actual broadcast itself. You can set the delay from 0 to 999 seconds. However, greater delays require greater memory use. The amount of memory used is displayed when you enter the amount of delay.

8. Click OK when finished.

The screenshot shows a configuration window with the following elements and annotations:

- Name:** Not Configured
- Destination:** Bambuser (An arrow points to the dropdown menu with the label "Select a CDN partner".)
- Encoding:** YouTube 720p60 Intel QuickSync (6000 Kbps) (An arrow points to the dropdown menu with the label "Select an encoder".)
- Username:** (An arrow points to the text input field with the label "Enter user name".)
- Authenticate:** (An arrow points to the button with the label "Click Authenticate and enter password".)
- Channel:** (An arrow points to the dropdown menu with the label "Select Channel".)
- Refresh:** (An arrow points to the button with the label "Click Refresh (optionally)".)
- Sign Up:** (An arrow points to the link with the label "Click Refresh (optionally)".)
- Bitrate:** 6128 k
- Location:** (An arrow points to the text input field with the label "Enter delay (optionally)".)
- Stream Delay:** 0 seconds (An arrow points to the text input field with the label "Enter delay (optionally)".)
- OK:** (An arrow points to the button with the label "Click OK".)
- Cancel:** (An arrow points to the button with the label "Click OK".)

## Flash To Azure Media Services, Brightcove, Limelight, Sermon.net, Verizon Digital Media Services.

To stream to one of these CDN partners, follow these steps:

1. Select a CDN partner from the Destination menu.
2. Select an encoder.
3. Enter the domain name or IP address (this is provided by the CDN partner).
4. Enter the stream name of your broadcast (this is provided by the CDN partner).
5. Click *Set Credentials* to enter your password and generate the RTMP URL. You only need to do this one time because Wirecast stores the channel information for future streams. The default RTMP port is 1935. You may need to configure your firewall to enable connections on this port.

---

**Note:** If you do not have a stream name and password, you can sign up with the CDN partner by clicking *Learn More*.

---

6. Optionally, enter a Stream Delay value. This provides a time buffer between your live stream from Wirecast and the actual broadcast itself. You can set the delay from 0 to 999 seconds. However, greater delays require greater memory use. The amount of memory used is displayed when you enter the amount of delay.
7. Click *OK* when finished.

The screenshot shows the Wirecast configuration window for streaming to a CDN partner. The window is divided into several sections. At the top, there are three dropdown menus: 'Name' (set to 'Not Configured'), 'Destination' (set to 'Brightcove'), and 'Encoding' (set to 'H.264 720p 16:9 (1280x720)'). Below these are two text input fields: 'Address' and 'Stream'. A 'Set Credentials...' button is located below the 'Stream' field. To the right of the 'Stream' field is a 'Learn More...' link. Below the 'Set Credentials...' button are three more fields: 'Bitrate' (set to '2217 k'), 'Location' (empty), and 'Stream Delay' (set to '0 seconds'). At the bottom of the window are two buttons: 'OK' and 'Cancel'. Annotations with lines point to various elements: 'Select host server' points to the 'Destination' dropdown; 'Select an encoder' points to the 'Encoding' dropdown; 'Enter Address' points to the 'Address' text box; 'Enter Stream name' points to the 'Stream' text box; 'Click Set Credentials' points to the 'Set Credentials...' button; 'Enter delay (optionally)' points to the 'Stream Delay' input; and 'Click OK' points to the 'OK' button.

## Flash To Akamai

To stream to Akamai, follow these steps:

1. Select *Akamai* from the Destination menu.
2. Select an encoder.
3. Enter your Akamai Stream ID and Event Name.
4. Enter your Akamai Angle and Video Rate.
5. Enter your user name.
6. Click *Authenticate* to enter your password and generate the RTMP URL. You only need to do this one time because Wirecast stores the channel information for future streams. The default RTMP port is 1935. You may need to configure your firewall to enable connections on this port.

---

**Note:** If you do not have a username and password, you can sign up with Akamai by clicking the Akamai icon, or by clicking *Sign Up*.

---

7. Optionally, enter a Stream Delay value. This provides a time buffer between your live stream from Wirecast and the actual broadcast itself. You can set the delay from 0 to 999 seconds. However, greater delays require greater memory use. The amount of memory used is displayed when you enter the amount of delay.

8. Click OK.

The screenshot shows the Wirecast configuration window for streaming to Akamai. The window is titled "Flash To Akamai" and contains several fields and buttons. The "Name" field is set to "Not Configured". The "Destination" dropdown menu is set to "Akamai". The "Encoding" dropdown menu is set to "Akamai: 1080p 16:9". The "Stream ID" and "Event Name" fields are empty. The "Angle" and "Video Bit Rate" fields are empty. The "Username" field is empty. The "Authenticate" button is visible. The "Stream Delay" field is set to "0" seconds. The "Bitrate" is set to "4242 k". The "Location" field is empty. The "Sign Up" link is visible next to the "Authenticate" button.

Annotations on the right side of the window:

- Select Akamai (points to the Destination dropdown)
- Select an encoder (points to the Encoding dropdown)
- Enter Stream ID and Event Name (points to the Stream ID and Event Name fields)
- Enter angle and video rate (points to the Angle and Video Bit Rate fields)
- Enter a user name (points to the Username field)
- Click Authenticate and enter password (points to the Authenticate button)
- Enter delay (optionally) (points to the Stream Delay field)

## Flash To TwitchTV

To stream to TwitchTV, follow these steps:

1. Select *TwitchTV* from the Destination menu.
2. Select an encoder.
3. Enter your TwitchTV username.
4. Click *Authenticate* to enter your password and generate the RTMP URL. You only need to do this one time because Wirecast stores the channel information for future streams. The default RTMP port is 1935. You may need to configure your firewall to enable connections on this port.

---

**Note:** If you do not have a username and password, you can sign up with TwitchTV by clicking the TwitchTV icon or by clicking *Sign Up*.

---

5. A default path is automatically provided for the RTMP Ingest URL. Use this URL unless you have received a different one from TwitchTV.
6. Optionally, enter a Stream Delay value. This provides a time buffer between your live stream from Wirecast and the actual broadcast itself. You can set the delay from 0 to 999 seconds. However, greater delays require greater memory use. The amount of memory used is displayed when you enter the amount of delay.
7. Click *OK* when finished

The screenshot shows the Wirecast configuration window for streaming to TwitchTV. The window has several sections with labels and arrows pointing to specific elements:

- Name:** Not Configured
- Destination:** TwitchTV (with a dropdown arrow and a "More..." button with a gear icon). An arrow points to this section with the label "Select TwitchTV".
- Encoding:** Twitch 540p30 (with a dropdown arrow and a gear icon). An arrow points to this section with the label "Select Encoder".
- Username:** (empty text field). An arrow points to this field with the label "Enter Username".
- Authenticate:** (button). An arrow points to this button with the label "Click Authenticate and enter password".
- RTMP Ingest Url:** rtmp://live.twitch.tv/app (with a "Find the closest ingest server" link below it). An arrow points to this field with the label "Click Authenticate and enter password".
- Bitrate:** 1596 k
- Location:** rtmp://live.twitch.tv/app :
- Stream Delay:** 0 seconds (with a text input field). An arrow points to this field with the label "Enter delay (optionally)".

There is also a Twitch logo with a "Sign Up" link below it.

## Flash To Wowza Streaming Engine.

To stream to Wowza Streaming Engine, follow these steps:

1. Select Wowza Streaming Engine from the Destination menu.
2. Select an encoder.
3. Enter the domain name or IP address (this is provided by the CDN partner).
4. Enter the stream name of your broadcast (this may be provided by the CDN partner).
5. Click Import Wowza Config to import a Wowza configuration to use.
6. Select User Agent. Default is Wirecast/FM1.0.
7. Click *Set Credentials* to enter your password and generate the RTMP URL. You only need to do this one time because Wirecast stores the channel information for future streams. The default RTMP port is 1935. You may need to configure your firewall to enable connections on this port.

---

**Note:** If you do not have a stream name and password, you can sign up Wowza.

---

8. Optionally, enter a Stream Delay value. This provides a time buffer between your live stream from Wirecast and the actual broadcast itself. You can set the delay from 0 to 999 seconds. However, greater delays require greater memory use. The amount of memory used is displayed when you enter the amount of delay.
9. Click *OK* when finished.

The screenshot shows the 'Flash To Wowza Streaming Engine' configuration dialog box. It contains several fields and buttons, with numbered callouts (1-9) pointing to specific elements:

- 1:** Points to the 'Name' field, which contains 'Wowza Streaming Engine'.
- 2:** Points to the 'Destination' dropdown menu, which is set to 'Wowza Streaming Engine'.
- 3:** Points to the 'Encoding' dropdown menu, which is set to 'YouTube 720p60 Intel QuickSync (6000 Kbps)'.
- 4:** Points to the 'Address' field, which contains 'rtmp://localhost:1935/live'.
- 5:** Points to the 'Stream' field, which contains 'myStream'.
- 6:** Points to the 'User Agent' dropdown menu, which is set to 'Wirecast/FM 1.0'.
- 7:** Points to the 'Set Credentials...' button.
- 8:** Points to the 'Stream Delay' field, which is set to '0' seconds.
- 9:** Points to the 'OK' button.

Other visible elements include the 'More...' button next to the Destination menu, the 'Import Wowza Config' button, the 'Bitrate' field (6128 k), the 'Location' field (rtmp://localhost:1935/live/myStream), and the 'Cancel' button.

## Flash To Zixi

To stream to Zixi, follow these steps:

1. Select *Zixi* from the Destination menu.
2. Select an encoder.
3. Enter Zixi connection information.
4. Enter your Zixi channel name and password.
5. Click *apply* to generate the RTMP URL. You only need to do this one time because Wirecast stores the channel information for future streams. The default RTMP port is 1935. You may need to configure your firewall to enable connections on this port.

---

**Note:** If you do not have a username and password, you can sign up with Zixi by clicking the Zixi icon, or by clicking *Sign Up*.

---

6. Optionally, enter a Stream Delay value. This provides a time buffer between your live stream from Wirecast and the actual broadcast itself. You can set the delay from 0 to 999 seconds. However, greater delays require greater memory use. The amount of memory used is displayed when you enter the amount of delay.
7. Click *OK*.

The screenshot shows the 'Flash To Zixi' configuration window in Wirecast. The window is divided into several sections. At the top, there are three dropdown menus: 'Name' (set to 'Not Configured'), 'Destination' (set to 'Zixi'), and 'Encoding' (set to 'H.264 720p 16:9 (1280x720)'). To the right of these dropdowns are 'More...' and 'Settings' buttons. Below these are input fields for 'Broadcaster Address', 'Broadcaster Port' (set to 2088), 'Latency [milliseconds]' (set to 4000), 'Channel Name', and 'Password'. A large Zixi logo is centered in the middle of the window. Below the logo is a 'Sign Up' link. At the bottom, there are fields for 'Bitrate' (set to 2217 k), 'Location', and 'Stream Delay' (set to 0 seconds). An 'Apply' button is located below the 'Channel Name' and 'Password' fields. Annotations with lines pointing to specific elements are as follows: 'Select YZixi' points to the 'Destination' dropdown; 'Select an encoder' points to the 'Encoding' dropdown; 'Enter Zixi connection info' points to the 'Broadcaster Address' and 'Broadcaster Port' fields; 'Enter Channel Name and Password' points to the 'Channel Name' and 'Password' fields; 'Click Apply' points to the 'Apply' button; and 'Enter delay (optionally)' points to the 'Stream Delay' field.

Name: Not Configured

Destination: Zixi

Encoding: H.264 720p 16:9 (1280x720)

Broadcaster Address:

Broadcaster Port: 2088

Latency [milliseconds]: 4000

Channel Name:

Password:

Apply

Bitrate: 2217 k

Location:

Stream Delay: 0 seconds

Select YZixi

Select an encoder

Enter Zixi connection info

Enter Channel Name and Password

Click Apply

Enter delay (optionally)

## Flash To Facebook

To stream to Facebook, follow these steps:

1. Select Facebook from the Destination menu.
2. Select an encoder.

---

**Note:** If you change the encoding settings while streaming to Facebook, an error will occur. The encoder settings are set by Facebook.

---

3. Click Authenticate and Login to Facebook.
4. Enter Facebook information.
5. Select Post To, Privacy, Places, and With settings.
  - **Places** Puts the live stream on the *Facebook Live Map* and enables everyone to see where people are streaming from.



- **With** Facebook permits users with a verified page (blue check mark) to select a sponsor for branded content within their posts. When the user selects a verified page, they will see a blue check mark badge next to the page selection menu and gain access to the With field. Typing in the With field brings up the same results as you might see when following a normal browser based workflow. Branded content is only supported for *Pages* and is disabled for Groups and Events. Additional information about Branded content restrictions can be found at:  
<https://developers.facebook.com/docs/graph-api/advanced/branded-content>.

6. Select stream type and click *Create*



**Note:** If you do not have a username and password, you can sign up with Facebook by clicking the Facebook icon, or by clicking *Sign Up*.

7. Optionally, enter a Stream Delay value. This provides a time buffer between your live stream from Wirecast and the actual broadcast itself. You can set the delay from 0 to 999 seconds. However, greater delays require greater memory use. The amount of memory used is displayed when you enter the amount of delay.

8. Click *OK*.

The screenshot shows the Facebook Live configuration window. Annotations on the right side point to various fields and buttons:

- Select facebook:** Points to the 'Name' field (currently 'Not Configured').
- Select an encoder:** Points to the 'More...' button next to the 'Destination' dropdown.
- Click Authenticate and login to Facebook:** Points to the 'Authenticate...' button in the 'Username' field.
- Enter Facebook information:** Points to the 'Title' and 'Description' text boxes.
- Select Post and Privacy, Places, and With settings:** Points to the 'Post To' (radio buttons for Pages, Groups, Events), 'My Profile' dropdown, 'Privacy' (Public), 'Places', and 'With' fields.
- Select stream type and click Create:** Points to the 'Stream Type' section with 'Regular' and 'Continuous' radio buttons, and the 'Create' button.
- Enter delay (optionally):** Points to the 'Stream Delay' field (currently 0 seconds).

Additional visible fields include 'Destination' (Facebook Live), 'Encoding' (Default: 720p30 (2Mbps) x264 H.264), 'Bitrate' (2378 k), and 'Location'.

**Note:** You cannot stream to any other destination when Facebook is active.

## Flash To YouTube

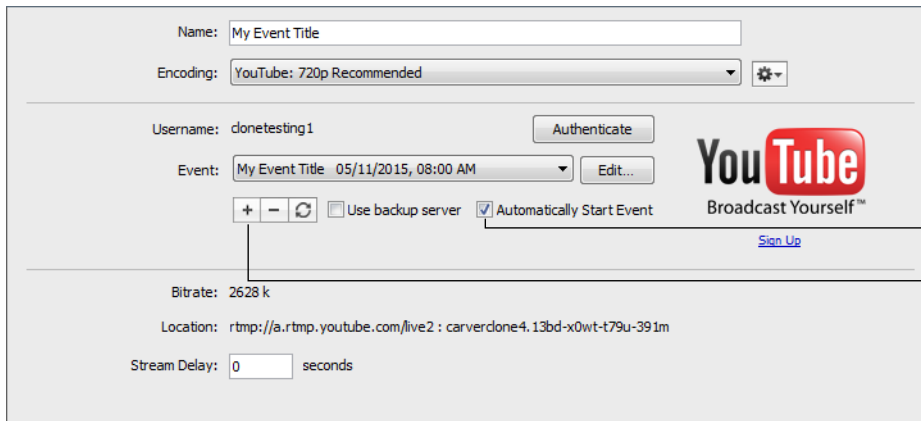
**Note:** Custom encoders cannot be used to stream to YouTube. They may only be used to encode a recording to disk.

To stream to YouTube, follow these steps:

1. Log into your YouTube account using your browser.

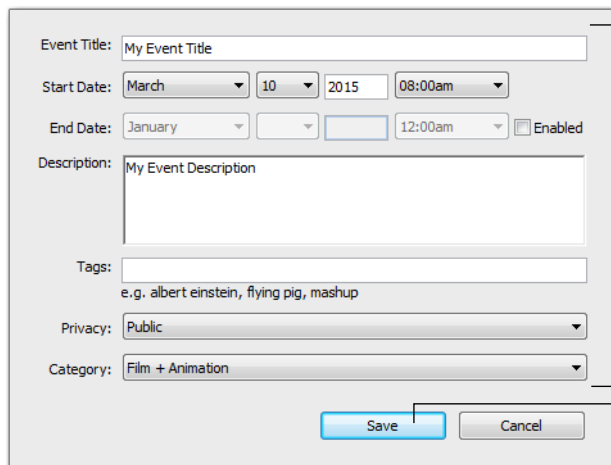
**Note:** If you do not have a YouTube account, click *Sign Up* (or go to [www.youtube.com](http://www.youtube.com)).

2. Check (optionally) *Automatically Start Event* to automatically start your event on YouTube when you start streaming. Click the plus (+) icon to add a new event.



The screenshot shows the YouTube Broadcast Yourself control panel. At the top, there's a 'Name' field with 'My Event Title' and an 'Encoding' dropdown set to 'YouTube: 720p Recommended'. Below this, the 'Username' is 'donetesting1' with an 'Authenticate' button. The 'Event' dropdown also shows 'My Event Title' with a date of '05/11/2015, 08:00 AM' and an 'Edit...' button. To the right is the YouTube logo and 'Broadcast Yourself™' text with a 'Sign Up' link. Below the event dropdown are icons for adding (+), removing (-), and refreshing events, followed by checkboxes for 'Use backup server' (unchecked) and 'Automatically Start Event' (checked). At the bottom, 'Bitrate' is '2628 k', 'Location' is 'rtmp://a.rtmp.youtube.com/live2 : carverdone4.13bd-x0wt-t79u-391m', and 'Stream Delay' is '0 seconds'. Two callout lines point to the '+' icon and the 'Automatically Start Event' checkbox with labels 'Click plus icon' and 'Check Auto Start (optionally)' respectively.

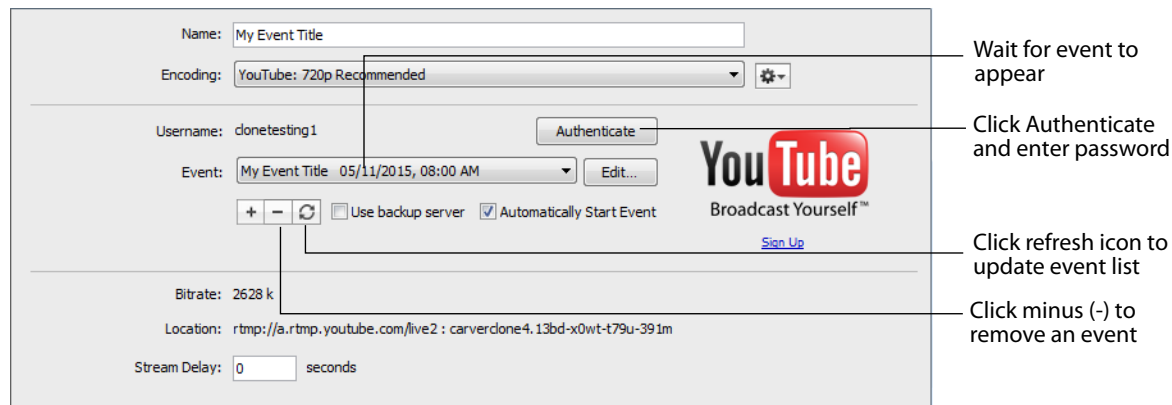
3. Enter all of your event information and click *Save*.



The screenshot shows a dialog box for entering event information. It includes fields for 'Event Title' (My Event Title), 'Start Date' (March 10, 2015, 08:00am), 'End Date' (January, 12:00am), and a description box (My Event Description). There's a 'Tags' field with a hint 'e.g. albert einstein, flying pig, mashup', a 'Privacy' dropdown set to 'Public', and a 'Category' dropdown set to 'Film + Animation'. At the bottom are 'Save' and 'Cancel' buttons. A callout line points to the description box with the label 'Enter event info', and another callout line points to the 'Save' button with the label 'Click Save'.

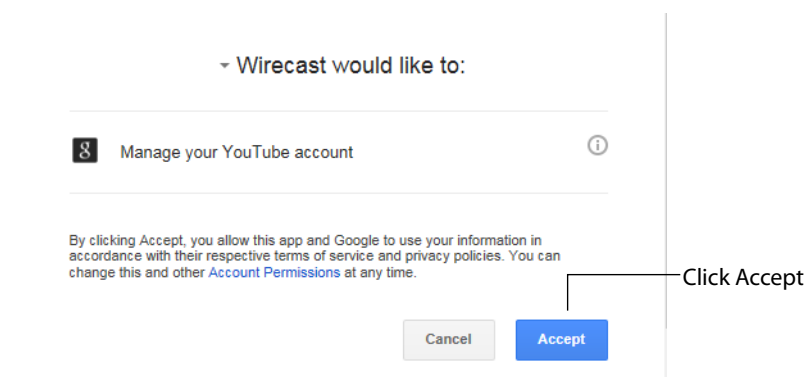
4. When the event you created appears in the Event menu box, you can (optionally), enter a Stream Delay value. This provides a time buffer between your live stream

from Wirecast and the actual broadcast itself. You can set the delay from 0 to 999 seconds. However, greater delays require greater memory use. The amount of memory used is displayed when you enter the amount of delay. You can also click the Refresh icon to update the event menu list, and you can click the minus icon (-) to remove a selected event. Click *Authenticate* when you are finished.

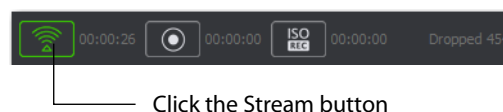


**Note:** If you are not already signed in, an OAuth window is launched enabling you to sign into your YouTube account. Enter your account information and click *Sign In*.

5. When the permission window displays, click *Accept* to authenticate your account.



6. Click the *Stream* button to start streaming.



7. If you did not check the *Automatically Start Event*, then you will have to start your event manually. To do this, select *Output > Control Room* to bring up the YouTube Control Room in a browser. Click the *Preview* button, and then click the play icon in

the preview window to see your stream. (It may take some time for the preview display to show your stream).

Info and Settings

Ingestion Settings

Cards

Live Control Room

My Event

Start Encoder

Preview Stream

You're Live!

Preview

☒ Sync to preview player ?

STREAM STATUS

GOOD

720P STREAM

March 23, 2015 at 1:09 PM (GMT-7)

The health is good.

Manage

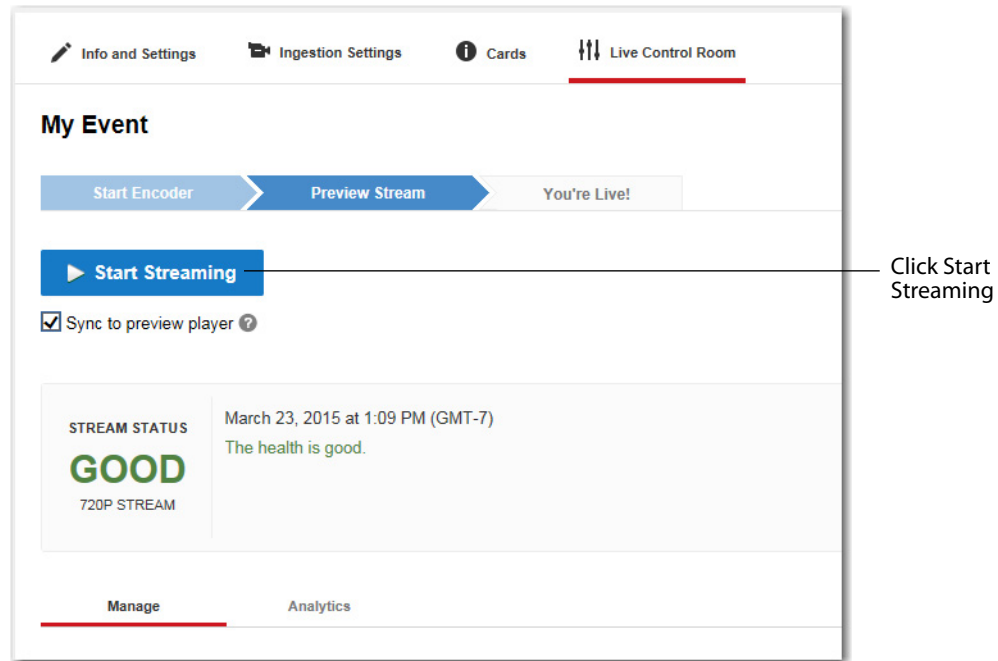
Analytics

PREVIEW

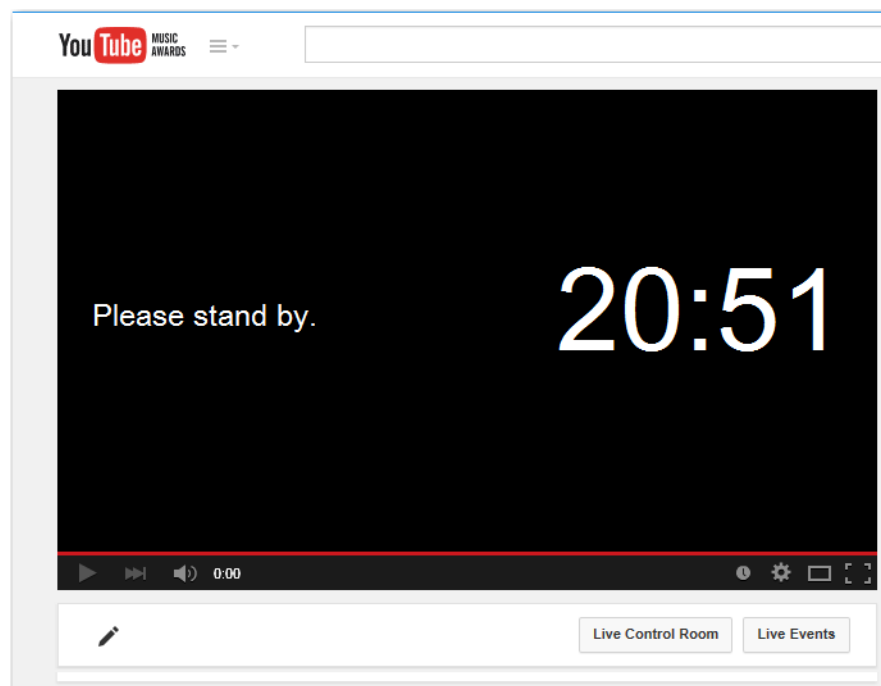
Click the play icon

0:00

8. After you have previewed your stream, click *Start Streaming*.



9. It may take some time for your stream to actually go live as a broadcast, but when it does you can view it by selecting *Output > Active Broadcast*, which opens the YouTube active broadcast window in a browser. If your broadcast has been scheduled for a future time, a standby window with a count down timer will be displayed.

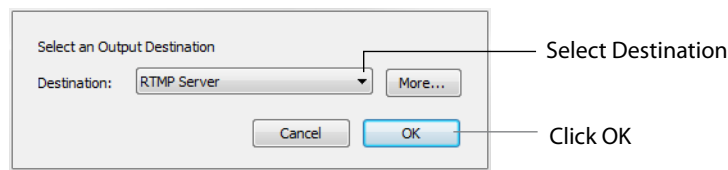


10. Select *Output > VOD of Last Broadcast* to open a YouTube page containing the recording of the last completed broadcast. You may need to wait for the recording to finish processing if it does not begin playing immediately.

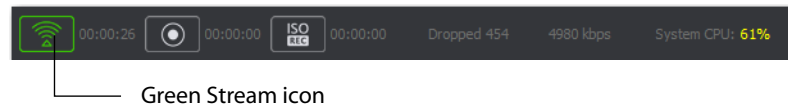
To stream your presentation, click the *Stream* button at the top of the Main window.



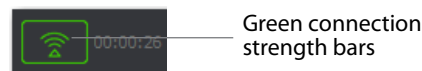
If you have not already selected a destination and logged into it, a dialog box displays. Select a destination, log in when asked to do so, then click OK.



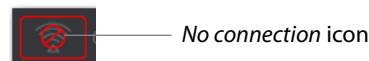
The Stream icon will blink until a connection is made. Once you are connected the Stream icon turns green. If you cannot connect an error message will display.



Connection strength is indicated by how many bars are displayed in the Stream icon. Fewer bars indicates a weaker (slower) connection.

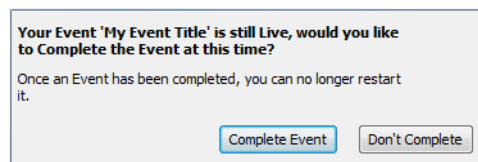


If the connection is ever broken, a *no connection* icon is displayed in place of the bars.



When the connection recovered, the *no connection* icon is replaced with the green bars.

Click *Stream* again to stop streaming. You can also record your broadcast by clicking *Record*. When you stop streaming, if you

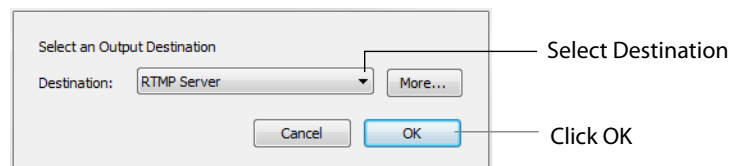


# Streaming

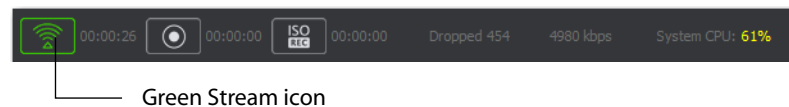
You can stream your broadcast to your service provider. To do this, click the *Stream* button at the top of the Main window. You can also record your streaming by clicking the Record button, or start an ISO Recording by clicking the ISO Record button.



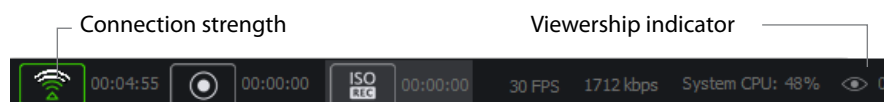
If you have not already selected a destination and logged into it, a dialog box displays. Select a destination, log in when asked to do so, then click OK.



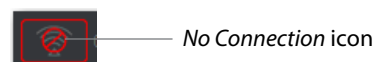
The Stream icon will blink until a connection is made. Once you are connected the Stream icon turns green. If you cannot connect an error message will display.



Connection strength is indicated by how many bars are displayed in the Stream icon. Fewer bars indicates a weaker (slower) connection. The Viewership indicator displays how many viewers are watching.

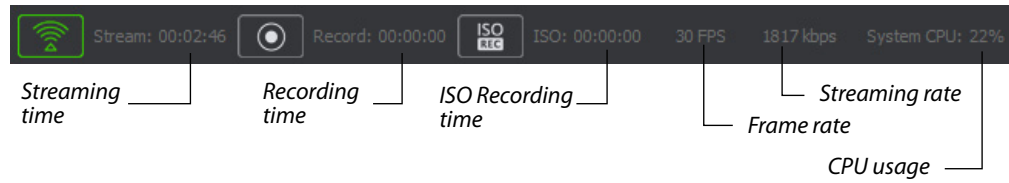


If the connection is ever broken, a *No Connection* icon is displayed in place of the bars.

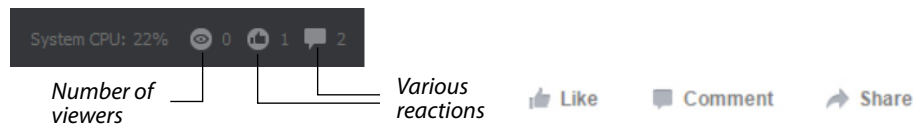


When the connection recovered, the *No Connection* icon is replaced with the green bars once again.

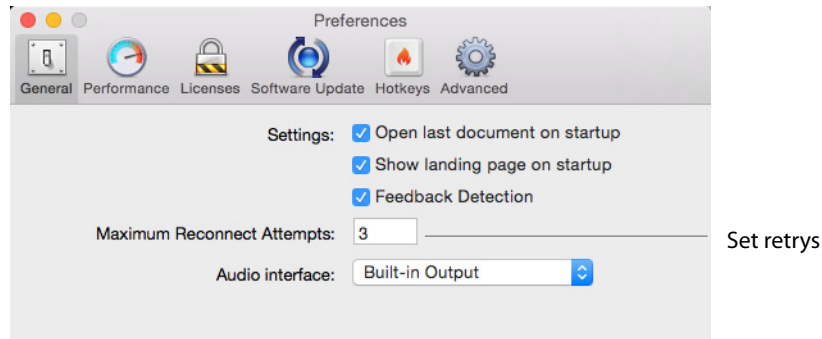
While streaming, status is displayed.



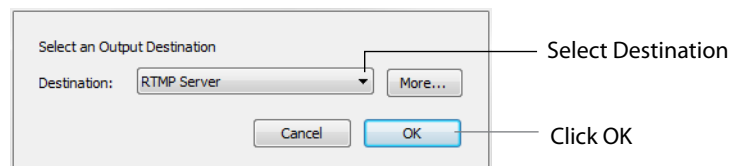
If you are streaming to Facebook, additional status is displayed on the right side of the status bar.



Wirecast attempts to reconnect. Each time reconnection is attempted, the stream icon will blink. The number of reconnection tries is set in the General Preferences (Select *File>Preferences*, then click the *General* tab).



If you have not already selected a destination and logged into it, a dialog box displays. Select a destination, log in when asked to do so, then click OK.



## Record To Disk

If you want to archive your stream, you can use the Record To Disk destination.

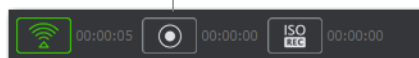
**Note:** Wirecast auto-saves your Stream/recording every 20 seconds.

To record to disk, follow these steps:

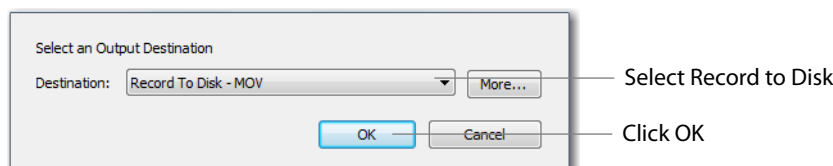


1. Click the Record button at the top of the Wirecast Main window.

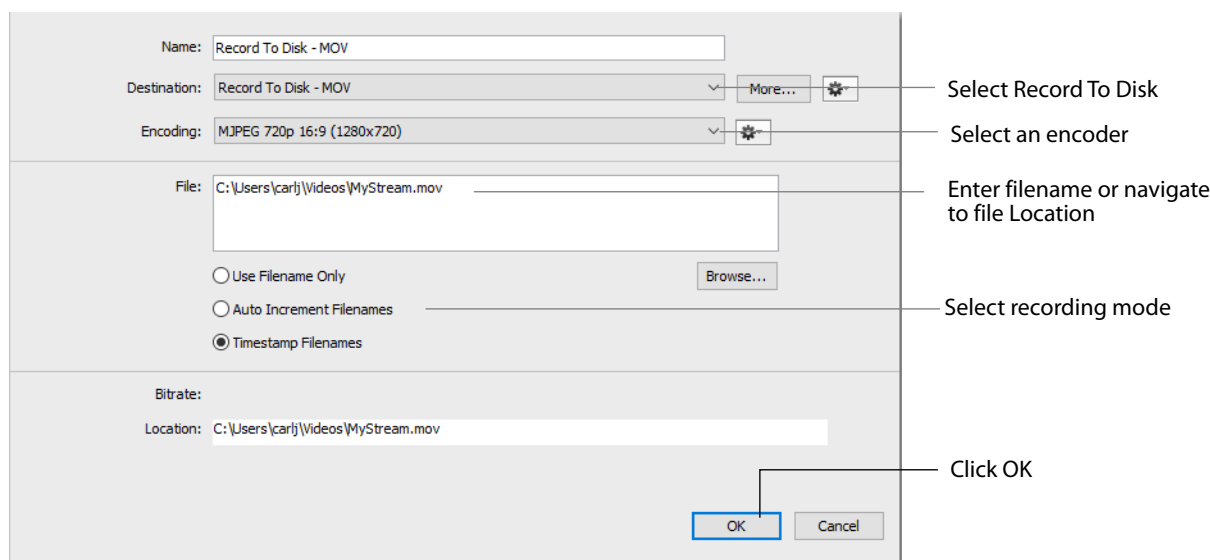
Click Record



2. When the dialog box displays, select *Record to Disk* and click *OK*.



3. When the Output Settings window displays, Select *Record To Disk* (for MP4 or Windows Media, MOV)
4. Select an encoder.
5. Click Browse or enter the path to where you want your recording located.
6. Select the recording mode: Use Filename Only, Auto Increment Filenames, or Timestamp Filenames. If you select Auto Increment Filenames, your filename will have an incremental number appended to the end of it. This causes a new file to be created every time you start recording to disk, otherwise your previous file is overwritten (if you have selected Use Filename Only).
7. Click OK.



**Note:** When recording to disk on FAT32 formatted drives, single files cannot be larger than 4GB in size. So, recording to disk on a FAT32 formatted drive may result in files

that do not close properly if they exceed 4GB in size. It is recommended that you record to disk on a Mac OS X Extended formatted partition whenever possible.

---

# Encoder Presets

## Introduction

Wirecast supports a wide variety of encoders (also known as codecs).

An encoder is a program that compresses the audio and/or video output of Wirecast for broadcast. Without an encoder, the uncompressed data is too large to successfully broadcast across a network. This is why encoders are so important.

The settings for encoders range from simple to very complex. Because of this, Wirecast offers presets of the most common settings for encoders. This provides a starting point, reduces complexity, and enables you to experiment and adjust settings as you test your broadcast.

---

**Note:** Encoder Presets can also be edited from the Output Settings window. To do this select *Output > Output Settings*, click the gear icon, then choose *View Details* from the drop-down menu.

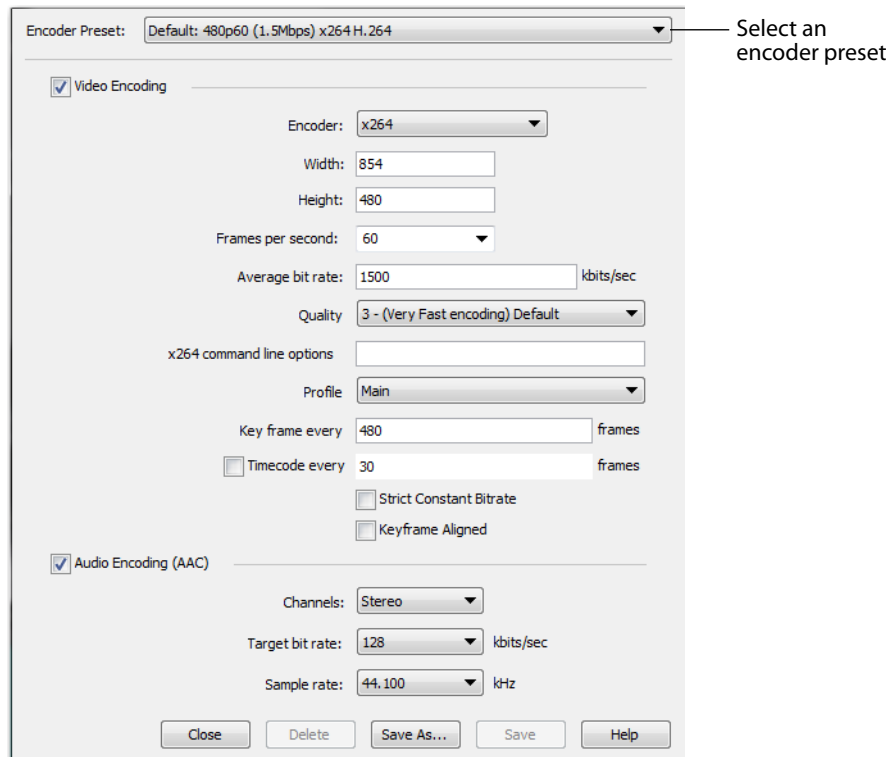
---

## Topics

- [The Encoder Presets Window](#)
- [MainConcept H.264](#)
- [x264](#)

## The Encoder Presets Window

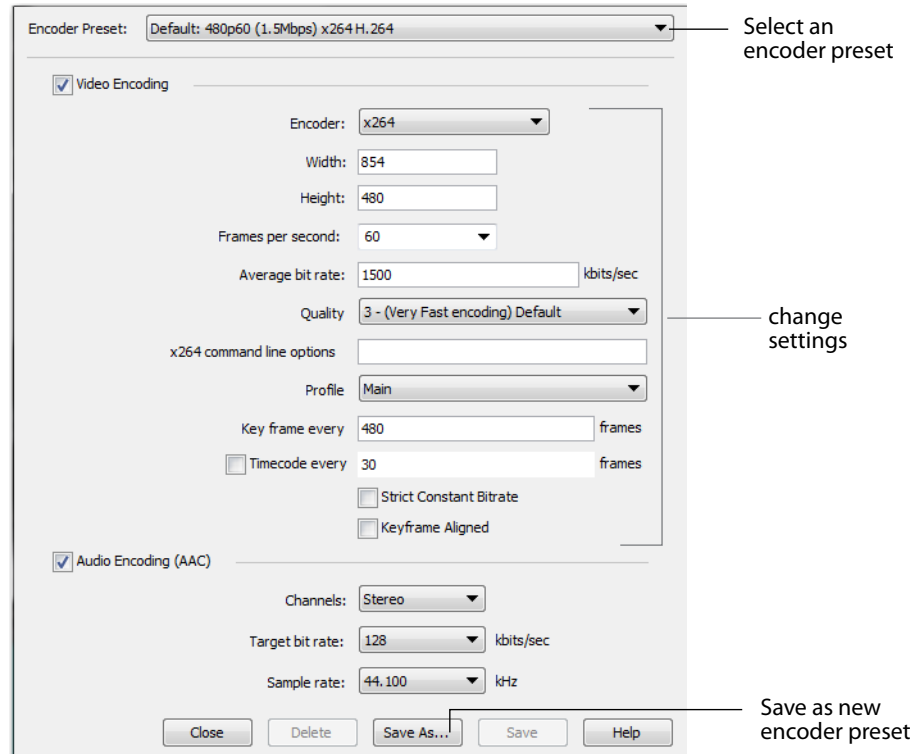
To open the Encoder Presets window, select **Window > Encoder Presets**. The Encoder Preset menu at the top of the window provides a list of encoder presets. Select a preset to edit.



## Creating New Presets

The default encoder presets cannot be changed. However, you can make a copy of any preset, modify it as needed, and save it under a new name. You can refer back to the default presets at any time since they are never modified.

To create a new preset, you must make a copy of an existing preset. To do this, select an existing preset from the Encoder Presets menu that is close to what you need, change settings as needed, then click *Save As* to save the preset with a new name.



## Profile Options

Many encoder presets enable you to select one of three profiles: Baseline, Main, or High.

**Baseline Profile (BP)** Baseline profile is primarily for low-cost applications that require additional data loss robustness. This profile is used in some video conferencing and mobile applications. It includes all features supported in the Constrained Baseline Profile, plus three additional features used for loss robustness (or for other purposes such as low-delay multi-point video stream compositing). The importance of this profile has faded somewhat since the definition of the Constrained Baseline Profile in 2009. All Constrained Baseline Profile bitstreams are also considered to be Baseline Profile bitstreams, since these two profiles share the same profile identifier code value.

**Main Profile (MP)** The Main profile is used for standard-definition digital TV broadcasts that use the MPEG-4 format as defined in the DVB standard. It is not, however, used for

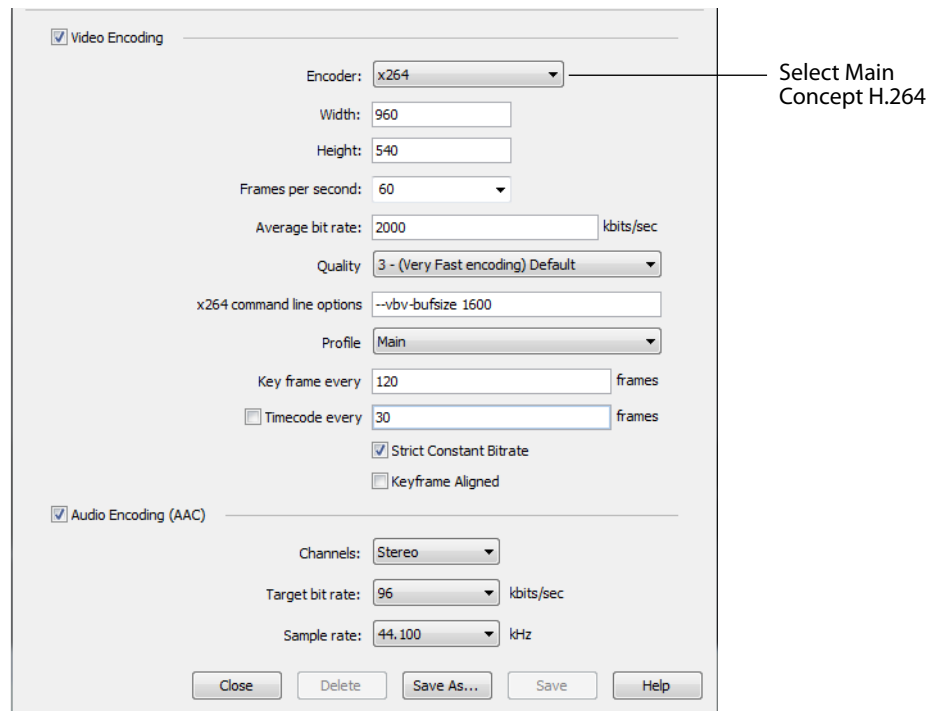
high-definition television broadcasts, since the importance of this profile faded when the High Profile was developed in 2004 for that application.

**High Profile (HiP)** The High profile is the primary profile used for broadcast and disc storage applications, particularly for high-definition television applications. For example, this profile is used by the Blu-ray Disc storage format and the DVB HDTV broadcast service.

## MainConcept H.264

To modify a MainConcept H.264 preset, follow these steps:

1. Open the Encoder Presets window.
2. Select the MainConcept H.264 encoder preset from the Encoder menu.




---

**Note:** To use a newly created preset (See [Creating New Presets](#)).

---

3. Check the Video Encoding checkbox. When checked, the video for your broadcast is encoded. When unchecked, a blank video screen is provided. This is the preferred method of producing audio-only broadcasts.
4. Enter the Width of your broadcast video.
5. Enter the Height of your broadcast video.
6. Select the desired frames per second (fps) of your broadcast. This value is a target value for the encoder and the exact value is not guaranteed.

7. Enter the average bit rate in Kbits (1000 bits) per second. This is the target bit rate of your video. Higher numbers provide better quality. The connection speed of your audience is a significant factor in determining your target bit rate. The encoder compresses the video to approximate this target. However, at different times during your broadcast the bit rate may be higher or lower than the target rate.
8. Select an encoder profile from the Profile menu. Three profiles are provided: Baseline, Main, and High. The Baseline profile is commonly used in mobile applications. It is also used in other applications which operate with limited processing power, storage capacity, and/or bandwidth. The Main profile is appropriate for general-purpose applications of broadcast media, such as high-bandwidth Internet broadcasting. The High profile provides the highest broadcast quality encoding.
9. Key Frame (optionally) allows you to enter the number of frames. A movie is a sequence of images and each image is called a frame. To compress video data, most encoders take a frame and make it a reference (also known as a key). This keyframe is sent as part of the broadcast, and all of the data after that keyframe is relative to it. The benefit of this is that the compressor only needs to send what has changed since the last keyframe. The main drawback of this is that over time it becomes harder for the encoder to distinguish the frame-difference information, especially if there is a lot of motion in the video. Another drawback is if your viewer's computer misses a keyframe, the video is distorted until the next keyframe is sent. However, you can control how often the encoder makes a new keyframe by setting the number of frames. The more keyframes you broadcast, the more bandwidth required and less compression, but results in better quality video.
10. Check (optionally) the Timecode Every checkbox and enter the number of frames between timecodes. Wirecast can generate timecodes embedded in the flash stream. If a frames value of zero is entered, the timecode is never sent. Wirecast sends metadata along with the frames. This data looks like an ONFI call. Various timecodes and timestamps are also sent with the stream.
11. Check (optionally) Strict Constant Bitrate. When checked, it forces the Average bit rate (see item 8 above) to maintain the exact bit rate entered. CBR pads the data (when necessary) to meet exact bitrate specified. Disabling CBR can result in slightly improved quality and decrease file size, but at the cost of greater bitrate fluctuations which could prove troublesome for certain streaming destinations. Selecting this option for recording is not recommended because it can result in decreased quality and larger files, with no real benefit.
12. Check (optionally) Keyframe aligned. When checked, it facilitates adaptive bitrate streaming by ensuring that keyframes from multiple streams are in sync, along with the keyframes timestamp, DTS and PTS values. But this is true only if those other streams also have the option turned on and have the same keyframe interval. To accomplish this, Wirecast disables scene detection and manually inserts the keyframe at the exact keyframe interval specified. Therefore, to ensure quality and smooth switching in the player, the keyframe interval should be in the 1 to 4 second range. When Keyframe Aligned is enabled, absolute timestamp is also enabled.

13. Check (optionally) the Audio Encoding (AAC) checkbox. When checked, the audio for your broadcast is included. When unchecked, audio is absent. This is the preferred method of producing video-only broadcasts because the presence of silent audio uses bandwidth.
14. Select the number of channels: Mono or Stereo. Mono uses less bandwidth than stereo, but stereo is more pleasing to the listener.
15. Select the audio bit rate, in Kbits (1000 bits) per second, from the Target Bit Rate menu. This is the target bit rate of your audio. Higher numbers provide better quality. The connection speed of your audience is a significant factor in determining your target bit rate. The encoder compresses the audio to approximate this target. However, at different times during your broadcast the bit rate may be higher lower than the target rate. The total broadcast bit rate is a function of video bit rate plus audio bit rate.
16. Select the audio sample rate, in kHz (1000 Hz) per second, from the Sample Rate menu. This value specifies how many thousands of times per second to sample the audio in the broadcast. Higher values provide better quality sound, but at greater bandwidth.
17. Click Save to save your settings.

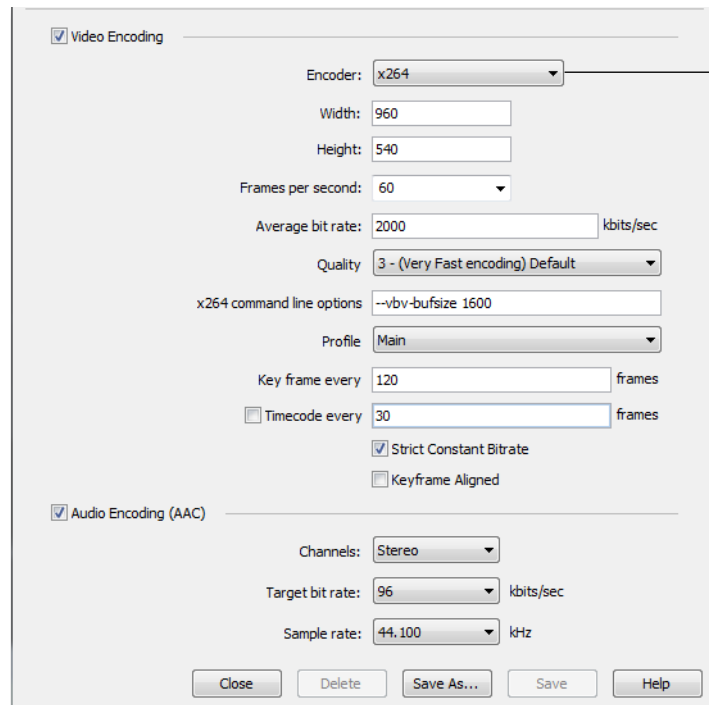


# x264

**Note:** The x264 implementation of the H.264 standard results in better quality and lower CPU usage for any given bitrate, but at the cost of higher memory usage. The default implementation is based on the MainConcept codec and uses less memory.

To modify an x264 preset, follow these steps:

1. Open the Encoder Presets window.
2. Select an x264 from the Encoder menu.



The screenshot shows the 'Encoder Presets' window with the 'Video Encoding' section active. The 'Encoder' dropdown is set to 'x264', which is highlighted by a line and the text 'Select x264'. Other settings include Width: 960, Height: 540, Frames per second: 60, Average bit rate: 2000 kbits/sec, Quality: 3 - (Very Fast encoding) Default, x264 command line options: --vbv-bufsize 1600, Profile: Main, Key frame every: 120 frames, Timecode every: 30 frames (unchecked), Strict Constant Bitrate (checked), and Keyframe Aligned (unchecked). The 'Audio Encoding (AAC)' section is also visible with Channels: Stereo, Target bit rate: 96 kbits/sec, and Sample rate: 44,100 kHz. At the bottom are buttons for Close, Delete, Save As..., Save, and Help.

**Note:** To use a newly created preset (See [Creating New Presets](#)).

3. Check the Video Encoding checkbox. When checked, the video for your broadcast is encoded. When unchecked, a blank video screen is provided. This is the preferred method of producing audio-only broadcasts.
4. Enter the Width of your broadcast video.
5. Enter the Height of your broadcast video.
6. Select the desired frames per second (fps) of your broadcast. This value is a target value for the encoder and the exact value is not guaranteed.
7. Enter the average bit rate in Kbits (1000 bits) per second. This is the target bit rate of your video. Higher numbers provide better quality. The connection speed of your audience is a significant factor in determining your target bit rate. The encoder

compresses the video to approximate this target. However, at different times during your broadcast the bit rate may be higher or lower than the target rate.

8. Select encoding quality (*Ultra fast* to *Very slow* encoding). Slower encoding results in better quality.
9. In the *x264 command line options* edit box, enter any command line options you want included.
10. Select an encoder profile from the Profile menu. Three profiles are provided: Baseline, Main, and High. The Baseline profile is commonly used in mobile applications. It is also used in other applications which operate with limited processing power, storage capacity, and/or bandwidth. The Main profile is appropriate for general-purpose applications of broadcast media, such as high-bandwidth Internet broadcasting. The High profile provides the highest broadcast quality encoding.
11. Key Frame (optionally) allows you to enter the number of frames. A movie is a sequence of images and each image is called a frame. To compress video data, most encoders take a frame and make it a reference (also known as a key). This keyframe is sent as part of the broadcast, and all of the data after that keyframe is relative to it. The benefit of this is that the compressor only needs to send what has changed since the last keyframe. The main drawback of this is that over time it becomes harder for the encoder to distinguish the frame-difference information, especially if there is a lot of motion in the video. Another drawback is if your viewer's computer misses a keyframe, the video is distorted until the next keyframe is sent. However, you can control how often the encoder makes a new keyframe by setting the number of frames. The more keyframes you broadcast, the more bandwidth required. The result is less compression but better quality video.
12. Check (optionally) Strict Constant Bitrate. When checked, it forces the Average bit rate (see above) to maintain the exact bit rate entered. CBR pads the data (when necessary) to meet exact bitrate specified. Disabling CBR can result in slightly improved quality and decrease file size, but at the cost of greater bitrate fluctuations which could prove troublesome for certain streaming destinations. Selecting this option for recording is not recommended because it can result in decreased quality and larger files, with no real benefit.
13. Check (optionally) Keyframe aligned. When checked, it facilitates adaptive bitrate streaming by ensuring that keyframes from multiple streams are in sync, along with the keyframes timestamp, DTS and PTS values. But this is true only if those other streams also have the option turned on and have the same keyframe interval. To accomplish this, Wirecast disables scene detection and manually inserts the keyframe at the exact keyframe interval specified. Therefore, to ensure quality and smooth switching in the player, the keyframe interval should be in the 1 to 4 second range. When Keyframe Aligned is enabled, absolute timestamp is also enabled.
14. Check (optionally) the Timecode Every checkbox and enter the number of frames between timecodes. Wirecast can generate timecodes embedded in the flash stream. If a frames value of zero is entered, the timecode is never sent. Wirecast sends metadata along with the frames. This data looks like an ONFI call. Various timecodes and timestamps are also sent with the stream.

15. Check (optionally) the Audio Encoding (AAC) checkbox. When checked, the audio for your broadcast is included. When unchecked, audio is absent. This is the preferred method of producing video-only broadcasts because the presence of silent audio uses bandwidth.
16. Select the number of channels: Mono or Stereo. Mono uses less bandwidth than stereo, but stereo is more pleasing to the listener.
17. Select the audio bit rate, in Kbits (1000 bits) per second, from the Target Bit Rate menu. This is the target bit rate of your audio. Higher numbers provide better quality. The connection speed of your audience is a significant factor in determining your target bit rate. The encoder compresses the audio to approximate this target. However, at different times during your broadcast the bit rate may be higher or lower than the target rate. The total broadcast bit rate is a function of video bit rate plus audio bit rate.
18. Select the audio sample rate, in kHz (1000 Hz) per second, from the Sample Rate menu. This value specifies how many thousands of times per second to sample the audio in the broadcast. Higher values provide better quality sound, but at greater bandwidth.
19. Click Save to save your settings.
- 20.



# Making Great Broadcasts

## Introduction

These topics provide helpful information about how to prepare for creating great presentations.

## Topics

- *Overview*
- *High Quality Audio*
- *Good Lighting*
- *Broadcast Settings*

## Overview

There are many ways to make a good live event even better. But this appendix focuses on two main things to remember about video streaming:

- **High Quality Audio Input** Great looking video with poor audio input appears unprofessional.
- **Good Lighting** Poor lighting can ruin an otherwise excellent live event. If you are doing chroma keying, this may become the most important part of your setup.

When video is saved to disk or sent over the network, it needs to be compressed. The compression process is done by encoders (codecs) which are optimized to work with clean input data. This means that if the audio or video is muddy to start with, it remains muddy after compression. Some codecs may even highlight poor input because the algorithm is built to look for differences.

Your goal should be to give the best possible quality audio and video to the compression process as possible. This means making sure what you see in the Live area is the best possible quality because Wirecast takes exactly what you see and sends it to the codecs.

## High Quality Audio

Audio has an artistic aspect to it. You can make a great live event even better by remembering to focus on a few details. Here are some suggestions on producing clean audio.

- **Use a Good Microphone** Though this may sound obvious, a good microphone can make a huge difference. Most DV cameras have an audio input for an external microphone. Use this, whenever possible, instead of the built-in microphone that comes with the camera. Built-in microphones are usually not good quality and tend to pick up hum from the electronics inside the camera. Even when it is not a great microphone, an external microphone almost always sound better.
- **Use a Microphone Splitter** If you are doing an interview with one camera, you can use two microphones with a splitter (less than \$5). This often gives better results than one omni-directional microphone at a distance. You can also use a dual lapel microphone with a splitter.
- **Position the Microphone Properly** Place any microphone as close to the sound source as possible, even when using omni-directional microphones, because sound volume decreases greatly the farther away the microphone is placed. Stronger signals coming into the microphone results in better quality.
- **Use Lapel Microphones** Even inexpensive (less than \$20) lapel microphones can make a huge difference because it places the microphone much closer to the person speaking.
- **Control Environmental Noise** If a chair squeaks, use a different one. If you have a wood floor and you can hear people shuffling their feet as they talk, put down a rug. Do whatever it takes to keep noise at a minimum. Microphones pick up everything.

## Good Lighting

Do not underestimate the power of lighting. When an event is shot outdoors, a great deal of attention goes into lighting. For professionals, lighting is viewed as an artistic task. Many people make their living controlling lighting, so there is a lot to it. Here are a few suggestions to help you obtain reasonably good lighting:

- If you are using only one lighting source, do not shine it directly on your subject. You should diffuse the light by bouncing it off of a wall or by shining it through opaque material.
- Avoid deep shadows. Make sure you fill all areas of your subject with light. Sometimes this requires adjusting the light to bounce off a different wall or use two lights. Placing a light low and another one high is often a good way to light evenly.
- Do not light too evenly. If you evenly light a set, you may actually be worse off than not lighting the set at all. Take a sample shot and see if it looks natural. Good lighting usually has a little more light coming from above than any other direction. You should very rarely light just from below a subject.

- Beware of having too much light on your subject. If your subjects are people and you must use a lot of light, use make-up to compensate for the overly bright lighting. This is not necessarily a bad thing, but you must choose how much effort you want to go through to make a good live event. If your lighting balance is excellent, you can avoid using make-up on your subjects. The key in adjusting the lighting is to look at your subject and make sure they do not look washed out.
- Watch professional events and learn from them. As you watch, notice the lighting instead of watching the program. Notice how they employ the suggestions listed above.

These guidelines might seem to suggest subtle improvements, but good lighting can make an amateur video look professional and a professional video look fabulous. The important thing to remember is that one or two properly placed lights makes a huge difference in the quality of your live event.

## Triangular Lighting

One advanced and very effective approach to good lighting is known as *triangular lighting* (or *three light setup*). Although this may sound complicated, it is actually quite simple. It involves setting up three lights (sometimes using natural light as one of the light sources), in a configuration that achieves a good balance. Here are the main elements of Triangular Lighting:

- **Main Light (Key Light)** This is the strongest of your lights and does most of the work. This light normally comes from one side of the camera (the left, for example) and is slightly raised. However, using just the main light results in shadowing.
- **Fill Light** This is a soft light placed directly in front of the subject. It removes shadows and fills in the image. It is usually direct and usually comes from the same direction as the camera (or just to the side and behind it). It could be, for example, placed on the same level as the head of a person you are lighting. If you use only a fill light, your subject might appear too dark. The only purpose of a fill light is to add to the main light by filling in shadows. If your key light comes from the left of your camera, your fill light should come from the right, and vice versa.
- **Back Light (Rim Light)** This light is directed from behind the subject and above it. This is the hardest light to explain, but the best way is to describe it as an accent of your subject. If you look at a typical high school yearbook picture, you will notice that the top-left (or top-right) part of each head shot has a highlight of light in it. This light is the *back light*. It is also called a *rim light* because it makes a slight rim around the edge of the head of your subject. This light normally comes from behind and above the subject, and it is focused. Make sure it is not directed at the camera.

Most serious lighting starts with these three basic lights. There are also some great Websites that describe these techniques in great detail.

## Broadcast Settings

Once you have good video and audio coming into Wirecast, the final item of importance is make sure the Broadcast Settings are configured correctly for your presentation. Though there are many broadcast parameters to modify, there are three that are the most important: bandwidth, motion, and encoder settings.

### Bandwidth

The first item of importance is knowing how much bandwidth is available. Bandwidth is how much data you can broadcast from your computer. This depends on the speed of your network connection and the type of connection your viewers are using. More specifically, it is the minimum speed between you and all of your viewers. For example, if you have one viewer who is using a dial-up modem, for that viewer to see good quality you must broadcast at Modem speed.

Thus, you must know who your viewers are and what kind of connection they have. This may be difficult to know because you must determine if their connection is cable modem or DSL and whether or not they reside on your local network.

In some situations, you are broadcasting for just your local network (in an office building, for example). In this case you should discuss your plans with your network administrator and verify that you will not disrupt the network with your broadcasts. Ask them what your upper limit bandwidth should be. Your available bandwidth is the minimum of what you can upload, combined with what your viewers can download.

### Motion

Once you know your bandwidth, you need to decide whether or not your video contains a lot of motion. Motion is how much things move around in your video presentations. An interview is considered low motion. A sports event, however, would probably be high motion. Wirecast comes configured with defaults to help ease your configuration task. Choose a default configuration that meets your motion (and bandwidth) constraints.

### Encoder Settings

The parameters of the encoders are quite technical and can be overwhelming. It is beyond the scope of this document to describe the delicate balance required in setting them. There are professionals who fine-tune encoders to do exactly what is required. The Wirecast default settings are generally optimal for the various network environments. (See [Encoder Presets](#) for information on changing the encoder settings.)



# Acknowledgments

## Acknowledgments

### Overview

Portions of this software may utilize the following copyrighted material, the use of which is hereby acknowledged:

### Steinberg VST Plug-In SDK Licensing Agreement (Version "3.6.6- 17.06.2016")

#### OBJECT OF THE AGREEMENT

- 1.The object of this agreement consists of the Steinberg VST PlugIn Software Development Kit version 3.6.6 respectively any preview version of this Kit, comprising of documentation, example code, and several PlugIn examples. These are described hereinafter as the "Licensed Software Developer Kit".
- 2.In case a preview or beta version of the Licensed Software Developer Kit is provided, the Licensee is allowed to use the Licensed Software Developer Kit solely for internal evaluations. Any publishing, distribution or transfer to a third party is not permitted.
- 3.Steinberg is the holder of all copyrights, rights of ownership, and other rights concerning the Licensed Software Developer Kit.
- 4.The Licensed Software Developer Kit contains information about how to develop a Product, and how to extend an application so that it can host VST PlugIns, that are developed under the VST PlugIn Specification, either by Steinberg or any Third-Parties.

Currently the Licensed Software Developer Kit is running on the following computer platforms: Apple Macintosh Computers under the Mac OS 10.8, 10.9, 10.10, 10.11 (32 and 64bit) Windows 7, Windows 8 and Windows 10 (32 and 64bit)

#### GRANTING OF RIGHTS

- 1.Steinberg hereby grants to the Licensee a non-exclusive, worldwide, nontransferable license during the term of this agreement to use the Licensed Software Developer Kit solely:
  - For the development of PlugIns/Application and/or for the development of an application that can host VST PlugIns (herein VST Product),

- Publish, sell or otherwise distribute a Product under his own brand name that is using parts or all of the Licensed Software Developer Kit.

2. In case the Licensee receives a preliminary version of the Licensed Software Developer Kit, the Licensee is not allowed to publish any Product to the public using a preliminary Software Developer Kit. The Licensee is only allowed to publish Products to the public based on a Licensed Software Developer Kit which is not declared as a preliminary version by Steinberg.

3. The Licensee has no permission to sell, licence, give-away and/or distribute the Licensed Software Developer Kit or parts of it for the use as software developer kit in any way, for example, integrated in any framework application, on any medium, including the Internet, to any other person, including sub-licensors of the Licensee or companies where the Licensee has any involvement. This includes re-working this specification, or reverse-engineering any products based upon this specification.

4. In case the Licensed Software Developer Kit is modified, it shall not be published, sold or distributed without agreement of Steinberg. Furthermore, the naming of the Licensed Software Developer Kit shall not include "VST3.6.6 SDK" or any combination containing the VST brand without permission of Steinberg.

5. In case the Licensed Software Developer Kit is extended by additional code, it shall not be used in any other description than "(Licensees company name) extension to the Steinberg VST3.6.6 SDK".

6. The Licensee recognises the value of the goodwill associated with the mark VST Plug-In Technology and acknowledges that such goodwill exclusively belongs to the benefit of Steinberg and belongs to Steinberg. The Licensee warrants that it will not use the mark VST PlugIn Technology on promotional merchandise, with the exception of demo versions of any of his product making use of this Licensed Software Developer Kit. The Licensee warrants that it will not use the mark VST PlugIn Technology on, or in connection with products obscene, pornographic, excessively violent or otherwise in poor taste.

7. If the Licensee is developing a Product, that is using parts or all of the Licensed Software Developer Kit, and this product is not published under his own name but will be published under the name of a third party, this third party has to agree to be bound by Sections 2.1 to 2.3 and 3 of this VST PlugIns SDK Licensing Agreement. The third party has to completely comply with these provisions. If the third party is not in accordance with these conditions, the third party is not allowed to distribute this product which is using parts or all of the Licensed Software Developer Kit.

8. If the Licensee is planning to publish a Product under his own name or under the name of a third party, that is using parts or all of the Licensed Software Developer Kit, the Licensee is under the obligation to inform Steinberg about it by sending the signed 'Steinberg VST Plug-In SDK Licensing Agreement' to Steinberg, either by mail, or by fax.

#### COPYRIGHTS NOTICE, USE OF TRADEMARKS

If the Licensee is publishing a Product under his own name that is using parts or all of the Licensed Software Developer Kit, the Licensee shall be under an obligation to refer to Steinberg's copyrights and trademarks in the following way:

a) In case that the Licensee is publishing a 'boxed product', the Licensee shall display in a visible manner the VST Logo and Steinberg's copyright notice on the packages. Steinberg's copyrights notice: "VST is a trademark and software of Steinberg Media Technologies GmbH"

b) In case that the Product is published without a physical packages (e.g. download), The Licensee shall display the VST Logo and Steinberg's copyrights notice on the Licensee's website in the context of the Product.

c) The Licensee shall include the VST Logo and Steinberg's copyrights notice in all electronic documentation, regardless of the media used, such as PDF manuals, website etc. and all printed and all electronic advertising materials. The VST Logo artwork and usage guidelines are part of the "Licensed Software Developer Kit" and are supplied by Steinberg in digital format.

d) In the 'about box' or an alternative place (e.g. help menu, startup screen) of the Product in one of the following formats: VST PlugIn Technology by Steinberg Media Technologies, VST PlugIn Interface Technology by Steinberg Media Technologies GmbH.

#### FEES AND ROYALTIES

1.This license is non-royalty bearing and the Licensee shall not obligated to pay to Steinberg any fees or royalties with respect to the VST PlugIn Interface technology.

#### LIMITATION OF LIABILITY

1.Subject to the provisions in the following sub-sections, Steinberg shall only be liable, irrespective of the legal grounds, for damages caused by the intentional or grossly negligent conduct of Steinberg, its legal representatives, managerial employees or any other vicarious agents. In the case of damage caused by the grossly negligent conduct of any other vicarious agents, the liability shall be limited to those damages which must typically be expected within the scope of an agreement such as the present one. Any further liability other than as permitted under this agreement shall be excluded.

2.Any liability of Steinberg for damages arising from violation of life, body and health, from the assumption of a guarantee or from a procurement risk as well as Steinberg's liability for damages pursuant to the Product Liability Act (Produkthaftungsgesetz) shall remain unaffected.

3.To the extent the liability of Steinberg is excluded pursuant to the subsections of these provisions, this shall also apply to the benefit of Steinberg's employees in the event the Licensee files any claims directly against them.

## FFmpeg Project

GNU LESSER GENERAL PUBLIC LICENSE Version 2.1, February 1999 Copyright (C) 1991, 1999 Free Software Foundation, Inc.

51 Franklin Street, Fifth Floor, Boston, MA 02110-1301 USA Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

[This is the first released version of the Lesser GPL. It also counts as the successor of the GNU Library Public License, version 2, hence the version number 2.1.]

Preamble The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public Licenses are intended to guarantee your freedom to share and change free software--to make sure the software is free for all its users.

This license, the Lesser General Public License, applies to some specially designated software packages--typically libraries--of the Free Software Foundation and other authors who decide to use it. You can use it too, but we suggest you first think carefully about whether this license or the ordinary General Public License is the better strategy to use in any particular case, based on the explanations below.

When we speak of free software, we are referring to freedom of use, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you want); that you receive source code or can get it if you want it; that you can change the software and use pieces of it in new free programs; and that you are informed that you can do these things.

To protect your rights, we need to make restrictions that forbid distributors to deny you these rights or to ask you to surrender these rights. These restrictions translate to certain responsibilities for you if you distribute copies of the library or if you modify it.

For example, if you distribute copies of the library, whether gratis or for a fee, you must give the recipients all the rights that we gave you. You must make sure that they, too, receive or can get the source code. If you link other code with the library, you must provide complete object files to the recipients, so that they can relink them with the library after making changes to the library and recompiling it. And you must show them these terms so they know their rights.

We protect your rights with a two-step method: (1) we copyright the library, and (2) we offer you this license, which gives you legal permission to copy, distribute and/or modify the library.

To protect each distributor, we want to make it very clear that there is no warranty for the free library. Also, if the library is modified by someone else and passed on, the recipients should know that what they have is not the original version, so that the original author's reputation will not be affected by problems that might be introduced by others.

Finally, software patents pose a constant threat to the existence of any free program. We want to make sure that a company cannot effectively restrict the users of a free program by obtaining a restrictive license from a patent holder. Therefore, we insist that any patent license obtained for a version of the library must be consistent with the full freedom of use specified in this license.

Most GNU software, including some libraries, is covered by the ordinary GNU General Public License. This license, the GNU Lesser General Public License, applies to certain designated libraries, and is quite different from the ordinary General Public License. We

use this license for certain libraries in order to permit linking those libraries into non-free programs.

When a program is linked with a library, whether statically or using a shared library, the combination of the two is legally speaking a combined work, a derivative of the original library. The ordinary General Public License therefore permits such linking only if the entire combination fits its criteria of freedom. The Lesser General Public License permits more lax criteria for linking other code with the library.

We call this license the "Lesser" General Public License because it does Less to protect the user's freedom than the ordinary General Public License. It also provides other free software developers Less of an advantage over competing non-free programs. These disadvantages are the reason we use the ordinary General Public License for many libraries. However, the Lesser license provides advantages in certain special circumstances.

For example, on rare occasions, there may be a special need to encourage the widest possible use of a certain library, so that it becomes a de-facto standard. To achieve this, non-free programs must be allowed to use the library. A more frequent case is that a free library does the same job as widely used non-free libraries. In this case, there is little to gain by limiting the free library to free software only, so we use the Lesser General Public License.

In other cases, permission to use a particular library in non-free programs enables a greater number of people to use a large body of free software. For example, permission to use the GNU C Library in non-free programs enables many more people to use the whole GNU operating system, as well as its variant, the GNU/Linux operating system.

Although the Lesser General Public License is Less protective of the users' freedom, it does ensure that the user of a program that is linked with the Library has the freedom and the wherewithal to run that program using a modified version of the Library.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, whereas the latter must be combined with the library in order to run.

**GNU LESSER GENERAL PUBLIC LICENSE TERMS AND CONDITIONS FOR COPYING, DISTRIBUTION AND MODIFICATION** This License Agreement applies to any software library or other program which contains a notice placed by the copyright holder or other authorized party saying it may be distributed under the terms of this Lesser General Public License (also called "this License").

Each licensee is addressed as "you".

A "library" means a collection of software functions and/or data prepared so as to be conveniently linked with application programs (which use some of those functions and data) to form executables.

The "Library", below, refers to any such software library or work which has been distributed under these terms. A "work based on the Library" means either the Library or any derivative work under copyright law: that is to say, a work containing the Library

or a portion of it, either verbatim or with modifications and/or translated straightforwardly into another language. (Hereinafter, translation is included without limitation in the term "modification".) "Source code" for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running a program using the Library is not restricted, and output from such a program is covered only if its contents constitute a work based on the Library (independent of the use of the Library in a tool for writing it). Whether that is true depends on what the Library does and what the program that uses the Library does.

1. You may copy and distribute verbatim copies of the Library's complete source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and distribute a copy of this License along with the Library.

You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Library or any portion of it, thus forming a work based on the Library, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions: a) The modified work must itself be a software library.

b) You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change.

c) You must cause the whole of the work to be licensed at no charge to all third parties under the terms of this License.

d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.) These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose

permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library.

In addition, mere aggregation of another work not based on the Library with the Library (or with a work based on the Library) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may opt to apply the terms of the ordinary GNU General Public License instead of this License to a given copy of the Library. To do this, you must alter all the notices that refer to this License, so that they refer to the ordinary GNU General Public License, version 2, instead of to this License. (If a newer version than version 2 of the ordinary GNU General Public License has appeared, then you can specify that version instead if you want.) Do not make any other change in these notices.

Once this change is made in a given copy, it is irreversible for that copy, so the ordinary GNU General Public License applies to all subsequent copies and derivative works made from that copy.

This option is useful when you want to copy part of the code of the Library into a program that is not a library.

4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License.

Section 6 states terms for distribution of such executables.

When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not.

Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.) Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6.

Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also combine or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.

You must give prominent notice with each copy of the work that the Library is used in it and that the Library and its use are covered by this License. You must supply a copy of this License. If the work during execution displays copyright notices, you must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this License. Also, you must do one of these things: a) Accompany the work with the complete corresponding machine-readable source code for the Library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine-readable "work that uses the Library", as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library. (It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions.) b) Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user's computer system, rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.

c) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.

d) If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.

e) Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing the executable from it. However,



as a special exception, the materials to be distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

It may happen that this requirement contradicts the license restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the Library together in an executable that you distribute.

7. You may place library facilities that are a work based on the Library side-by-side in a single library together with other library facilities not covered by this License, and distribute such a combined library, provided that the separate distribution of the work based on the Library and of the other library facilities is otherwise permitted, and provided that you do these two things: a) Accompany the combined library with a copy of the same work based on the Library, uncombined with any other library facilities. This must be distributed under the terms of the Sections above.

b) Give prominent notice with the combined library of the fact that part of it is a work based on the Library, and explaining where to find the accompanying uncombined form of the same work.

8. You may not copy, modify, sublicense, link with, or distribute the Library except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense, link with, or distribute the Library is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

9. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Library or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Library (or any work based on the Library), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Library or works based on it.

10. Each time you redistribute the Library (or any work based on the Library), the recipient automatically receives a license from the original licensor to copy, distribute, link with or modify the Library subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein.

You are not responsible for enforcing compliance by third parties with this License.

11. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Library at all. For example, if a patent license would not permit royalty-free redistribution of the Library by all those who receive copies directly or indirectly through you, then the only

way you could satisfy both it and this License would be to refrain entirely from distribution of the Library.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply, and the section as a whole is intended to apply in other circumstances.

It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

12. If the distribution and/or use of the Library is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Library under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

13. The Free Software Foundation may publish revised and/or new versions of the Lesser General Public License from time to time.

Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

Each version is given a distinguishing version number. If the Library specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Library does not specify a license version number, you may choose any version ever published by the Free Software Foundation.

14. If you want to incorporate parts of the Library into other free programs whose distribution conditions are incompatible with these, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

NO WARRANTY 15. BECAUSE THE LIBRARY IS LICENSED FREE OF CHARGE, THERE IS NO WARRANTY FOR THE LIBRARY, TO THE EXTENT PERMITTED BY APPLICABLE LAW.

EXCEPT WHEN OTHERWISE STATED IN WRITING THE COPYRIGHT HOLDERS AND/OR OTHER PARTIES PROVIDE THE LIBRARY "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED

WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE ENTIRE RISK AS TO THE QUALITY AND PERFORMANCE OF THE LIBRARY IS WITH YOU. SHOULD THE LIBRARY PROVE DEFECTIVE, YOU ASSUME THE COST OF ALL NECESSARY SERVICING, REPAIR OR CORRECTION.

16. IN NO EVENT UNLESS REQUIRED BY APPLICABLE LAW OR AGREED TO IN WRITING WILL ANY COPYRIGHT HOLDER, OR ANY OTHER PARTY WHO MAY MODIFY AND/OR REDISTRIBUTE THE LIBRARY AS PERMITTED ABOVE, BE LIABLE TO YOU FOR DAMAGES, INCLUDING ANY GENERAL, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE LIBRARY (INCLUDING BUT NOT LIMITED TO LOSS OF DATA OR DATA BEING RENDERED INACCURATE OR LOSSES SUSTAINED BY YOU OR THIRD PARTIES OR A FAILURE OF THE LIBRARY TO OPERATE WITH ANY OTHER SOFTWARE), EVEN IF SUCH HOLDER OR OTHER PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

