










# StreamingChurch.tv Equipment Recommendations

	Minimum	Better	Best
Camera	 <p>Almost Any Consumer Camcorder Analog, SD output \$300 - \$500</p>	 <p>Canon VIXIA HF G20 \$800</p>	 <p>Vaddio Wallview 100 PTZ Camera System 3 Cameras \$4100</p>
Adapter	 <p>Elgato Systems USB 2.0, RCA &amp; S Video \$100</p>	 <p>Magewell USB 3.0 Capture Dongle \$299</p>	 <p>Magewell Pro Capture Quad Card \$899</p>
Encoder	 <p>Open Broadcaster Software (free)</p>	 <p>Vmix Live Encoder Free to \$60 HD upgrade</p>	 <p>Wirecast or vMiX HD \$500 to \$700</p>
Internet	DSL or better	Cable or better	Dedicated High Speed Cable

**Computer**

We recommend a minimum dual core 2.8 processor with at least 2Gb of Ram. With a larger number of camera inputs, a high quality video input card is recommended. Large resolutions, multiple streams and high bit rate encoding will require more CPU power and RAM.

**Audio**

We recommend providing your audio input into the encoder from your audio mixer board. For a higher quality streaming experience a separate mix for the web is also recommended.

## Equipment Recommendations for StreamingChurch.tv



### A typical setup for live streaming involves up to five components:

1. Computer
2. Cameras
3. Video Capture
4. Encoding
5. High Speed Internet

### Computers

#### PC

Windows 7 32-bit & 64-bit

- Windows 8 64-bit
- Windows 10 64-bit
- Windows computer with Intel 'Sandy Bridge' chips or higher
- i3 recommended for 540p or lower streaming
- i5 or higher recommended for 720p streaming
- i7 recommended for 1080p streaming
- 2GB RAM minimum
- 4GB RAM and 64-bit OS recommended for 720p or higher streaming
- 200MB free hard drive space for installation
- Hard Drive space for recording to disk
- 512 MB PCI-Express graphics card with 3D acceleration
- GeForce or Radeon class card recommended
- NVIDIA cards may cause some visual distortion if YUV color space rendering is enabled in Preferences.

#### Mac

- OS X 10.9 Mavericks and later
- Mac computer with Intel 'Sandy Bridge' chips or higher
- i3 recommended for 540p or lower streaming
- i5 or higher recommended for 720p streaming

- i7 recommended for 1080p streaming
- 2GB RAM minimum
- 4GB recommended for 1080p streaming
- 200MB free hard drive space for installation
- Hard drive space for recording to disk
- 512 MB PCI-Express graphics card with 3D acceleration
- GeForce or Radeon class card recommended

## Cameras

There are hundreds of different cameras that will work with StreamingChurch.tv. In terms of compatibility with streaming, what's important is not usually the specific brand and model, but rather the type of *output* your camera has and how that connects to your encoding software or hardware. Most cameras do not connect directly to an encoder. Most cameras you will need to connect to a switcher and capture card. From there to the encoder. The encoder is what sends the video stream to Streamingchurch.tv

There are several types of cameras that are the most commonly used and the easiest to use for streaming.

1. Built in webcams or USB connected cameras
2. HDMI cameras
3. SDI cameras
4. Component or composite (analog) output cameras

### Built in webcams and USB connected cameras



#### Pros and Cons of Built-in / USB webcams

##### Pros

Low cost

Easy or no setup involved

Can connect directly to most computers, no capture cards or boxes required

Usually no batteries or AC power required, can be powered directly from computer

## Cons

Typically lack zoom, manual focus, iris, white balance and gain controls required for more precise shots

No ability to upgrade lenses

No ability to record locally

No ability to input professional audio and pass through to encoder

## Component or composite (analog) output cameras

Most cameras have some option for analog output. Typically it is a proprietary connector type on the camera end and a standard "RCA" type connection on the other end of the cable. The analog cameras tend to have a lower quality output and picture quality.



## Pros and Cons of analog cameras

### Pros

Very common connection type, available on almost any camera, new or old

Lowest cost, particularly with all the older used cameras available

Easy to source and replace cables and cameras

Relatively easy to find capture cards, switchers and encoders that support this connection type

### Cons

Many analog connections only support SD resolution. Only newer cameras support HD over analog component connections

Not recommended for long cable runs. Analog cables can be prone to interference and signal degradation.

Most camera brands have proprietary connectors on the camera, these cables are not as easy to replace and typically you need to connect an additional cable to reach your switcher or encoder

## HDMI cameras

Cameras with HDMI output are a great choice because there are many inexpensive models available that shoot and record in HD and output over HDMI. [Click here](#) to shop for cameras currently available at B&H Photo/Video with HDMI output.

These types of cameras can be used with an HDMI capture card or box, like the Magewell Capture Device.



### Pros and Cons of HDMI Cameras

#### Pros

Wide range of options, from affordable entry-level camcorders to professional, full-featured cameras

Widely available and easy to buy

Easy to convert to SDI for more capture / encoder options

#### Cons

Might require conversion to SDI for compatibility with some switchers and encoders

Cannot do cable runs as long as SDI

Cables do not lock, can get disconnected if you are not careful

Some consumer-level HDMI connections have built in copy protection which will prevent signal transfer

### **SDI output cameras**

SDI output cameras are the most professional, and typically the most expensive option. SDI cameras are common in professional video productions because SDI cables lock into place, offering a secure connection. In addition SDI cables are the best for long cable runs. With USB, Analog and HDMI cables you can only go about 20 feet (maybe up to 50 feet in ideal conditions) before you start to run the risk of video image quality loss or interference. With SDI cables, you can do much longer cable runs without fear of interference. Because cameras with direct SDI output can be expensive, many people choose to use HDMI output cameras and then use an HDMI to SDI converter. An HDMI cable can run out of the camera into a converter which is located on the tripod of the camera, or right near it. This way you only have a short HDMI cable run out of the camera and then from the converter to your switcher or encoder you can run SDI cable.



## Pros and Cons of SDI Cameras

### Pros

- Most professional and robust connection type
- Can do the longest cable runs
- Locking connectors
- Most common connection type for capture cards and encoders

### Cons

- Cost

## Video Capture Devices

### ION Audio VIDEO 2 PC MKII Digital Video Converter

There are several kinds of capture devices that go from your camera into your computer. We don't normally recommend USB devices for streaming but if budget is a factor some of these can work. These will only work for composite or s-video outputs on your camera.



- Converts Analog Video to Digital Files
- Works with VCRs, Camcorders & More
- Easy to Set Up and Use
- Creates MPEG2 Files to Edit or View
- Image and Audio Enhancement
- RCA, S-Video, USB Connectivity
- No External Power Needed
- PC and Mac Compatible

### **Magewell XI100DUSB-HDMI HDMI to USB 3.0 Video Capture Dongle**

The Magewell XI100DUSB-HDMI dongle delivers huge results from a tiny device with a footprint smaller than a credit card. HDMI live capture - for any application from videoconferencing to streaming to video wall display - has never been easier. This driver-free device is truly plug-n-play, and compatible with Windows, Linux and OS X systems, and across multiple USB 3.0 and 2.0 chipsets. The Magewell HDMI dongles support up to 1920x1200p60 with error-free, reliable, stable, high quality video processing. Firmware can be updated remotely. From hardware scaling to automatic deinterlacing, flexible features are packed into its compact design including support of numerous APIs. SDK available.

- Convert HDMI signals to USB 3.0
- Converts SD signals to USB 2.0
- Works with Vidyo, Zoom.us & Microsoft Lync Plus many more.
- 1080p Resolution
- Plug and Play
- Compatible with Windows, Mac and Linux Machines



## Magewell Pro Capture Quad Card 4 Channel (HDMI or SDI)

The Pro Capture Quad HDMI Card from Magewell is a normal-profile PCIe x4 card that allows for capturing 4 channels of HDMI input. The card supports multiple color sampling modes, 10- and 12-bit color depths, up to 8 audio channels at 48 kHz, and output resolutions up to 2048x2048 with frame rates up to 120 fps. The card is also capable of numerous video processing features, including cropping, scaling, de-interleaving, aspect ratio conversion, color format conversion, video frame rate conversion, and video OSD composition.

Pro Capture HDMI Card supports multiple cards per system and unlimited output streams with independently adjustable parameters per stream. Additional features include ultra-low latency, timestamp and A/V synchronization, and LED status indicators. The card supports both Windows, Linux, and Mac operating systems, multiple APIs for Windows and Linux, and provides Windows SDKs for easier integration.



- 225 MHz HDMI receiver
  - Adaptive HDMI equalizer support for cables lengths up to 98'
  - Supports customized EDID
  - Supports extraction of AVI/Audio/SPD/MS/VS/ACP/IRSC1/ISRC2/Gamut InfoFrames
  - Full colorimetry support
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- Supports 8/10/12-bit color depths
  - Supports RGB 4:4:4, YCbCr 4:4:4, YCbCr 4:2:2 color sampling
  - Supports up to 8-channel IEC60958/IEC61937 audio streams
  - Supports extraction of audio formation information & channel status data, video timing information, 3D format information, and Sony/Canon DSLR time code

## Live Encoders

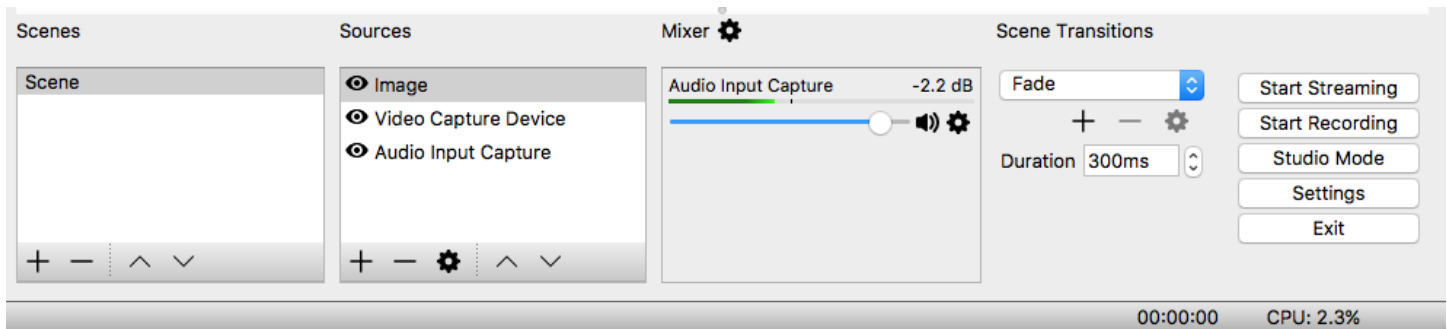
Encoders are devices that convert data from one format to another. They can be either hardware or software and are essential to converting the feed from your camera to streamable data.

### Software encoders

Software encoders are programs that run on a computing device like your laptop or desktop computer. There are several available.

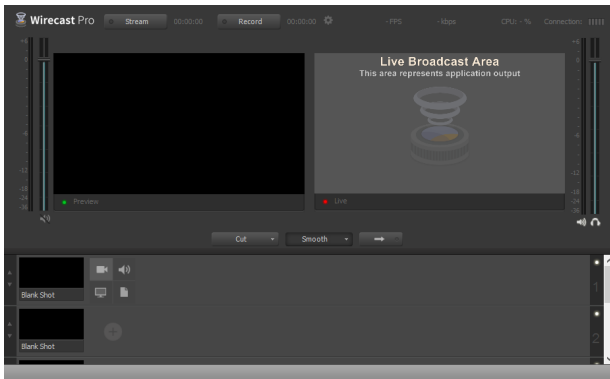
### Open Broadcaster Software (OBS) Project





Open Broadcaster Software (OBS) is a powerful free encoder that allows you to broadcast directly to StreamingChurch.tv. It is a free encoder that is available on several platforms including PC, Mac and Linux. You should install the "Studio" version of the OBS software. The primary limitation with OBS right now is that it's limited to stream to a single source. It won't work if you're employing Adaptive Bit Rate (ABR) or wanting to stream to multiple sources simultaneously (Facebook and StreamingChurch.tv).

## Wirecast



One of the most popular software encoders is Wirecast by Telestream.

The quality on software encoders is great. You have the ability to tweak or change most aspects of the codecs (compressors/decompressors) to get the bit-rate and video quality you want. Unlike hardware encoders, these can be easily updated when a new version or upgrade is available.

Something that makes software encoders appealing is their low cost and customization. In fact, one of the most popular software encoders (Adobe Flash Media Live Encoder) is free!

However, they lack the overall latency speed that hardware encoders have because your computer is running multiple programs at the same time and can't devote all of its resources like hardware encoders.

## vMix



vMix offers a free/basic Live Stream Encoder that you can use to send your audio and video signals to our servers (in real-time) for live streaming your events. Or, you can purchase an upgraded version for additional features. vMix is only available for PCs not Macs. This live encoding software fully support H.264 video, and AAC audio, making your live stream accessible on just about all iOS and Android devices.

## Hardware Encoders

Hardware encoders are dedicated processors that use a designed algorithm to encode video and data into streamable content. These encoders can come in smaller, portable boxes or larger permanent fixtures.

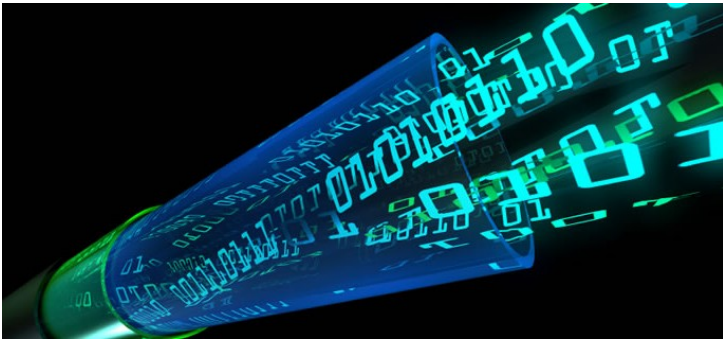
Hardware encoders tend to be for professional broadcasters because of their high price. They are specialized for just encoding, which gives them an advantage over software encoders.



The video quality of hardware encoders is usually pretty fixed and there's not a lot of room to adjust them. Because the hardware encoders take time to design, build, and manufacture they are sometimes equipped with older codecs (compressors/decompressors) if you shop for an older model. This makes them very inflexible, meaning that their restrictions are built in and not meant to be customized or changed.

The price point and latency between hardware and software encoders are one of the key differences between the two. You won't find any free hardware encoders, but you can find some for as low as \$100. They also can be very expensive for the professional grade ones. Since hardware encoders are built just for encoding, they are a lot faster than their software counterparts. For more info on hardware encoders email [support@StreamingChurch.tv](mailto:support@StreamingChurch.tv)

## Internet



The upload speed and quality of service are the most important for streaming video. You should always test your speed on a regular basis. You can do so at [speedof.me](http://speedof.me).

You should set your encoder to broadcast at least 500 kbps below your worst upload score. If you experience buffering or skipping in your broadcast, it's almost always due to the fact that you're encoding/broadcasting at a bit rate that exceeds the capability of your ISP's network. Reducing your bit rate will almost always solve your skipping issues.

Below are some recommend settings when it comes to resolutions. Your video format should always be set at H.264 and audio always stereo, audio should be set to AAC.

#### Normal

- Resolution: 512x288
- Bitrate: 350Kbps
- Sample rate: 44100
- Stereo audio bitrate: 96Kbps

#### Medium

- Resolution: 768x432
- Bitrate: 550Kbps
- Sample rate: 44100
- Stereo audio bitrate: 96Kbps

#### High

- Resolution: 858x480
- Bitrate: 1500Kbps
- Sample rate: 48000
- Stereo audio bitrate: 256Kbps

#### HD

- Resolution: 1280x720
- Bitrate: 2000Kbps
- Sample rate: 48000
- Stereo audio bitrate: 96Kbps