# StreamingChurch.tv Equipment Recommendations

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Better</th>
<th>Best</th>
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</thead>
<tbody>
<tr>
<td><strong>Camera</strong></td>
<td>Almost Any Consumer Camcorder</td>
<td>Canon VIXIA HF G20</td>
<td>Vaddio Wallview 100 PTZ Camera System 3 Cameras</td>
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<tr>
<td></td>
<td>Analog, SD output $300 - $500</td>
<td>$800</td>
<td>$4100</td>
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<tr>
<td><strong>Adapter</strong></td>
<td>Elgato Systems USB 2.0, RCA &amp; S Video $100</td>
<td>BlackMagic Intensity Shuttle HD $189</td>
<td>Blackmagic Decklink Studio 4K $595</td>
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<tr>
<td><strong>Encoder</strong></td>
<td>Flash Media Live Encoder (free)</td>
<td>Vmix Live Encoder Free to $60 HD upgrade</td>
<td>Wirecast or vMiX HD $500 to $700</td>
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<tr>
<td><strong>Internet</strong></td>
<td>DSL or better</td>
<td>Cable or better</td>
<td>Dedicated High Speed Cable</td>
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<tr>
<td><strong>Computer</strong></td>
<td>We recommend a 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 and high bit rate encoding will require more CPU power and RAM.</td>
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<tr>
<td><strong>Audio</strong></td>
<td>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.</td>
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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. Many switchers and capture cards accept analog connections, so these can be a good choice for maximum compatibility. The downside on analog cables is that you run a higher risk of interference or video quality loss, the longer you run the cables. Using high quality shielded cables and keeping your cable runs short can help avoid this.

**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 Blackmagic Design Intensity Shuttle

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

Blackmagic Design Intensity Shuttle

The Blackmagic Design Intensity Shuttle is a 10-bit HD/SD video capture/playback device, and allows you to capture 10-bit HDMI or analog video directly from a camera onto your computer for professional editing or mere playback. With a neat, compact design, the Intensity Shuttle is very portable and easy to set up. As the input and output connections are on different sides, you can simply plug the unit in line with your existing cable setup.

• 10-bit HD/SD Capture/Playback

• USB 3.0 Support (note - we recommend Thunderbolt)

• 10-bit HDMI Video Direct Capture

• Separate Sides for Inputs & Outputs

• Support for Multiple Video Standards

• No Compression Required

• No Separate Power Source Required
Compatibi\l with Multiple Applications

Supporting HDTV 1080i/59.94, 1080i/50, 720p/59.94, 720p/50, the Intensity Shuttle allows easy and instant switching between HD and SD video standards. Additionally, using the Thunder interface eliminates the need to compress visual data and thus saves on CPU processing power; this allows your CPU to solely focus on HD real-time effects.

Fully compatible with multiple software image-editing solutions such as Premiere Pro, Photoshop, After Effects, Fusion, and Nuke, the Intensity Shuttle also supports all Windows computers with a Thunderbolt port.

Note: **Not compatible with Dell computers.**

The transfer from the camera to the Shuttle is done through an HDMI cable, and from the Shuttle to the computer can also be by HDMI, but available on the Shuttle is a Thunderbolt port (only available on the Intensity Shuttle Thunderbolt model), which is an advanced data-transfer technology that with a 10Gbps capacity is extremely fast. Thunderbolt is also bidirectional and can thus serve as an input and an output. The receiving computer -- or storage device -- must also be equipped with Thunderbolt. Macs were the first of any devices to be equipped, and all Macs are equipped.

**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.

**Adobe Flash Media Live Encoder**

Adobe Flash Media Live Encoder (FMLE) is a powerful free encoder that allows you to broadcast directly to StreamingChurch.tv. It has its limitations because it has not been upgraded for several years and support from Adobe is poor. It also has issues with HD high resolution streaming and does not pair up well with some video capture devices. Still, it is a good encoder for SD streaming.

**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 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

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 here.

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.

If you have problems with this speed test tool on your computer, contact us at Support@StreamingChurch.tv. We’re sorry but this speed test is no longer supported on Chrome (use Firefox, Safari, Opera or Edge instead). You can update your java on your computer at java.com. Or you can run the speed test at SpeedTest.net.

Below are some recommend settings when it comes to resolutions. Your video format should always be set at H.264 and audio always stereo, mp3 unless you have AAC.

Normal

- Resolution: 512x288
- Bitrate: 350Kbps
- Sample rate: 44100
• Stereo audio bitrate: 128Kbps
• Medium
• Resolution: 768x432
• Bitrate: 550Kbps
• Sample rate: 44100
• Stereo audio bitrate: 128Kbps

**High**

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

**HD**

• Resolution: 1280x720
• Bitrate: 2000Kbps
• Sample rate: 48000
• Mono audio bitrate: 160Kbps
• Stereo audio bitrate: 320Kbps