



# Wrap

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## Wrap's simple guide to trouble-free streaming

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### Preparation (the most important key to success)

Thorough preparation should involve setting up the entire streaming project in advance, to make sure that your computer hardware and software are interacting as expected with the rest of the equipment, and to be completely sure that you have all the necessary cables, adapters and other equipment.

Ideally you should set up the project and make a rehearsal stream/video call a day or more before the actual event. This will give you enough time to buy/borrow any extra adapters, cables and hardware that you might have overlooked in planing.

### General preparation

- Make sure you have a good, stable internet connection - preferably with a cable. Test the bandwidth, and talk to the venue about how many other people use the network, to get an idea of how stable you can expect the bandwidth to be.
- Use the exact same computer and hardware for the rehearsal/test that you will be using for the event. Otherwise there are many small factors that can affect the result in unpredictable ways.
- Use the exact same software and settings that you intend to use for the real event, and make sure that no-one is going to change any settings, or borrow any of the equipment in the time between your rehearsal and the final event. Don't update software after the rehearsal/tests - if it works for the tests then no need to change anything.
- Expect the rehearsal/tests to take more time than you would like. It could be a good idea not to invite a whole ensemble of musicians to be ready at a given time on the day of streaming rehearsals, as it is not the performance but the technical setup that needs to be tested. Rather than having musicians/performers present, consider using a colleague to step in where needed (for instance to check microphones etc.).
- Take the rehearsal/test very seriously - make sure you are using the same cables, cable lengths, adapters, extenders, patch panels etc. If you don't use the same stuff as for the real event then it isn't very meaningful, and unexpected things can still happen.

### Camera settings

- Make sure all cameras have the same frame rate and output resolution (usually 1080p).
- Make sure all cameras are set to a similar white balance/image profile and exposure.
- Check that you have a reliable power supply to all cameras. Charge batteries in advance (if necessary) permanent power supplies are much safer than batteries.
- If there is a chance you might want to have uncompressed video footage directly from the camera, then make sure you have adequate SD storage in all relevant cameras.
- If you are using any cameras for audio, check the audio levels.
- Make sure all cameras are sending a clean HDMI output (with no menu/settings icons).

## **ATEM preparation**

- Make sure the ATEM encoder setting is appropriate for the bandwidth at the venue and for the streaming platform you are using. For Zoom and other applications where you are using the ATEM as a USB video capture/input device, use the “Hyperdeck High” (maximum quality) setting.
- If you are using the audio mini-jack inputs on the ATEM, check that they are set to the correct setting (mic/line) in the audio settings of the Software Control.
- Make sure that the ATEM is set up with the appropriate switching and keying modes (using ATEM Setup application via USB).
- Make sure you have a USB-C storage device with enough space to record the stream (if you are using this highly recommended function).
- Make sure you have loaded all lower thirds and other graphics into the media player.
- Name inputs appropriately.
- Set up your desired Multi-view arrangement (the default is usually good).
- When you have done the steps above, save the settings in the ATEM Software Control as a settings file.

## **Audio preparation**

- Make sure your audio is in synch! the easiest/quickest way is often by sending the audio to your video camera, and then using the audio that is transmitted via HDMI from the camera. Otherwise you may have to add some milliseconds of delay to the audio - which can be done in the ATEM Software Control or on a professional digital mixer.
- Make sure you have (a) good, clear audio input(s). Use Wrap’s XLR to jack/mini-jack if you are using the ATEM inputs. Audio has to be checked by receiving the stream on a computer/phone and listening to the stream. Use decent headphones or speakers to quickly identify problems.
- Make sure your audio is loud enough without it clipping. Talk to the sound operator about applying compression and/or a limiter if necessary.

## **Planing the program**

- Set up a written schedule for the program that you (and the technical crew) can follow. This should include:  
When the stream will go on air - usually with a count-down that starts before the actual event.  
When different graphics and credits/scrolling text will be used.  
Start and finish times of individual parts of the program (if it includes various content).
- Prepare all graphics, credits etc. in advance. Make sure they are correct, and can be played back without glitches during the stream.
- Check that the entire crew are clear about the schedule, ask them in advance if they have any questions or concerns about it, and make sure they have a copy of it that they can refer to during the event if necessary.

## **Show time**

- Remember that the stream needs to go “on-air” from your computer/encoder/ATEM but ALSO it has to “go live” (or something similar) on the actual streaming platform.
- Be sure to monitor the actual live stream in the same way the audience will see it (on Vimeo/Youtube/Twitch/Facebook).
- Make sure there aren’t lots of people watching the show on multiple devices. If you have multiple contributors to the event who are waiting around and want to watch the show - consider setting up a comfortable place where they can watch it on a shared screen. It is a good idea to limit the number of people who are connected to and using the network!

- If you are a nervous producer, try to stay calm and supportive. If you have followed all these preparatory steps, then there shouldn't be much to worry about on the technical side.

#### About encoder settings

Allow a bandwidth buffer of at least 20% - so if your venue has an upload bandwidth of 10Mb/s then make sure you are streaming at no more than 8Mb/s.

Most places in Norway have at least 10Mb/s upload speed/bandwidth from their service provider, but CHECK the actual available bandwidth. You can check using [www.netfart.no](http://www.netfart.no) or any other free online bandwidth testing service. The more people/machines who are using the network, the less of this speed/bandwidth is available.

Frame rate (24fps, 60fps etc.) and resolution (720p, 1080p, 4k etc.) affect the amount of bandwidth that you require in order to get a good, uncompressed image. Lower frame rates and resolutions will allow for much better quality encryption, so there's usually no point in streaming at a resolution above 1080p, and 24fps is often a very good idea!

These are the maximum recommended bit rates from leading platforms as of April 2021:

**Facebook** - 4Mb/s (max 720p at 30fps)

**Youtube** - 6Mb/s

**Twitch** - 6Mb/s

**Vimeo** - 5Mb/s

These maximum bandwidth recommendations are designed to give predictable good results at appropriate frame rates and resolutions. If you have a lot of available bandwidth, and want to push it, you will probably find that these platforms can handle it, but it may drop out if you are unlucky!

There are four standard encoder settings that come pre-configured with the ATEM Mini pro. These settings should be chosen carefully, based on available bandwidth, and the platform you are streaming to. Note: ATEM Mini (standard/not pro) does NOT have built-in encoding and needs to be used in connection with a software encoder such as OBS.

**HyperDeck High** 45 to 70 Mb/s (for recording very high quality video for professional post-production).

**HyperDeck Medium** 25 to 45 Mb/s (for recording high quality video for professional post-production where storage space is a consideration).

**HyperDeck Low** 12 to 20 Mb/s (For streaming very high quality images, or for recording video for post-production purposes when storage capacity is limited).

**Streaming High** 6 to 9 Mb/s (Recommended for streaming to Youtube and other platforms IF you have an upload bandwidth of about 20Mb/s).

**Streaming Medium** 4.5 to 7 Mb/s (Decent encoding for live streams where the available upload bandwidth is around 10Mb/s).

**Streaming Low** 3 to 4.5 Mb/s (Encoding for venues and situations where upload bandwidth is limited, but not less than 6Mb/s).