YAMAHA

Live Streaming System Setup Guide

for Small Music Venues and Houses of Worship
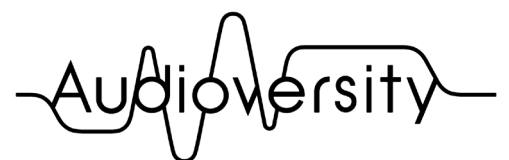
Audioversity
by Yamaha Pro Audio

Table of Contents

1.0 Introduction

The global outbreak of COVID-19 has forced music venues to restrain themselves from keeping their businesses open to host concerts and large events with tightly packed crowds. While social distancing and stay-at-home restrictions have made more people seek entertainment online, streaming music events online may open up new opportunities for their businesses.

Also, House of worship is one of the fastest-growing groups online, with many establishments reaching their worshipers by live streaming. While congregations meet in all sorts of unique places, it requires the setup of multiple audio configurations.

In this guide, we'll provide a simple step-by-step introduction to how you can move your music events or congregations online and feature high-quality professional content with a multi-camera setup, a video switcher, and Yamaha mixing consoles.

2.0 Main Equipment

2.1 Video switcher

Streaming a music event online can be done easily with a camera, but using a video switcher can help to improve the quality of your productions. With a video switcher, you can create multi-angle shots to make your video look and feel more professional. There are many video switchers available in the market, but a compact switcher like the ATEM Mini Pro can get the job done even on a tight budget.

2.1.1 ATEM Mini Pro

ATEM Mini Pro is a video mixer/AV switcher that accepts up to four camera inputs (HDMI) in full resolution 1080HD quality and operates up to 60 frames per second. It is a compact all-in-one switcher for professional use. It features a USB webcam output which allows to send all video input sources into your PC. It also offers Picture-in-Picture, MultiView monitoring, video recording to a hard drive, etc.

ATEM Mini Pro

> **Note:**
> Please note that the "standard" ATEM Mini does not support MultiView function, which may not be suitable for a serious production.

2.2 Mixing Console/Audio Interface

A mixing console can be a great help when it comes to building an outstanding live performance. Yamaha has a wide range of mixing consoles, both analog and digital. Generally, analog mixers are more straightforward and less expensive, while digital mixers provide more flexibility with onboard features like effects, scene recall, etc. Both Yamaha analog and digital mixing consoles can work as audio interfaces, allowing you to easily transfer your audio signal to a production PC. So you'll always be able to find a console that fits your budgetary, venue, and production needs. Here, we will use a Yamaha MG-XU mixer (Analog) and a TF Series mixer (Digital) for our system examples.

For some older mixing consoles that do not include a PC audio interface, it is possible to connect the output of the console to an audio interface which converts the audio signal to digital and transmits to the PC for live streaming. For example, a Steinberg UR Series audio interface would be a good choice.

2.2.1 Yamaha MG XU Series Analog Mixing Consoles

The Yamaha MG XU Series has earned a reputation as an intuitive, easy-to-use interface that's suitable for a diverse range of users and applications. The MG XU models feature a USB port that allows you to transfer audio signals between your console and PC for live streaming. The MG XU Series contains mixing consoles with models ranging from 10 to 20 channels, giving music venue owners a lot of options.

Available Models – MG20XU, MG16XU, MG12XU, MG12XUF, MG10XU, MG10XUK

2.2.2 Yamaha TF Series Digital Mixing Consoles

The TF Series combines Yamaha know-how with new insight from the field and the latest touch-screen technology to deliver an evolved experience in console operation. It also features powerful processors and effects, advanced channel presets, efficient panel layouts and high-performance system expansion. All TF Series models can support Dante™ audio networking with the NY64-D I/O expansion card which allows transmission and reception of 64 channels of uncompressed 48kHz 24-bit digital audio data via a Dante™ audio network. The audio signal can be transmitted to the PC over the Dante network for live streaming, as well as multi-track recording. There are 3 models in the TF Series providing up to 48 input channels that can be mixed simultaneously – suitable for a wide variety of music venues.


Available Models – TF5, TF3, TF1

NY64-D I/O expansion card

> **Note:**
>
> All Yamaha Digital Mixing consoles that support Dante networks can transmit digital audio signals from the mixing console to a live streaming PC, e.g. Yamaha CL/QL Series. Also, some consoles do not have the Dante port by default, can use Dante network with the Dante-MY16-AUD2 I/O card. So take time to find the most suitable mixing console for your music venue.

CL Series/QL Series
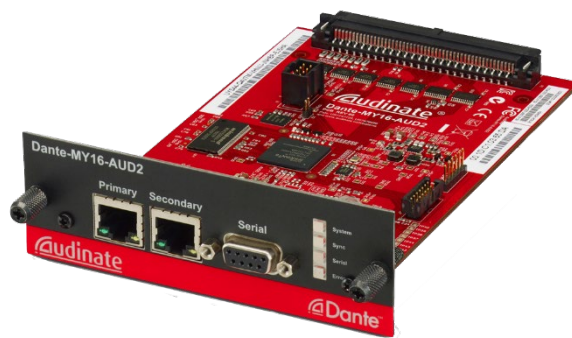
Dante-MY16-AUD2 expansion card

2.2.3 Steinberg UR Series

Yamaha and Steinberg have together produced the UR, UR-C and UR-RT series audio interfaces which all have exceptionally high audio quality, flexibility and reliability at heart. Whatever and wherever your recording or production needs, we have an audio interface that will surpass your expectations.

2.3 Other equipment

To make your live streaming production look as professional as possible, other equipment such as cameras, tripods, lights, PCs, power supplies, and the Internet connections are also very important. Here are some tips:

2.3.1 Cameras

As you probably already know, higher quality cameras produce higher quality video. To produce a high quality picture, a video camera that can support at least 1080p Full HD is required. Of course, using a 4K camera will give you a much better picture for your production, but please note that the ATEM Mini Pro only supports video output up to 1080p with HDMI. Also, some of the streaming platforms do not support 4K output anyway. So, a camera that supports Full HD video will be enough for livestreaming in most case.

2.3.2 Lights

Ensuring that the subjects of your video can be seen is also crucial. Lighting helps in obtaining good picture quality as well as establishing the desired mood you want for your live stream.

2.3.3 Tripod

Using a tripod can improve the quality of your picture. Select a tripod based on the weight of your camera.

2.3.4 Microphones

Using the proper microphone will improve the quality of the audio. Basically, there are two types of microphone: dynamic microphones and condenser microphones. They differ in structure, price and sound quality. Make sure to select a suitable microphone for the environment and usage.

2.3.5 PC (or Mac)

A PC is a must for your system. At least one PC is necessary for streaming. ATEM Mini Pro has a USB-C output to your PC, which will allow you to use the ATEM Mini Pro as a webcam. ATEM Mini Pro is only supported on Windows 10 (64-bit) or Mac OS X or higher.

2.3.6 Power supply

In advance, make sure that you have enough power outlets and that the circuit they are on can supply enough power. To avoid trouble, do not use low-price mass-market outlet strips. Always use power conditioners or power distributors with noise filtering that are intended specifically for use in both video and audio applications.

2.3.7 Internet connection

For live streaming, we need to have a stable connection to the Internet. Use a wired connection to create the best possible connection from your Mac/PC to the Internet. To obtain a stable live stream in 1080p Full HD Quality, it is recommended to have at 4-6Mbps Internet speed.

2.3.8 Display Monitor

This display monitor is for the operator to control the switcher and to monitor the output of the streaming program. Basically, ATEM Mini Pro supports any display monitors with HDMI connection, but we recommend using at least a 1920x1080 Full HD display.

3.0 System Examples

3.1 Basic System

3.1.1 Overview

This system is a basic system for streaming live music events with minimal and existing equipment. It is built with an ATEM Mini Pro, an existing mixing console without any audio interface feature (Yamaha MGP32X as an example) and a Steinberg UR Series (UR22mkII as an example) audio interface.

For video, two cameras are used as video inputs. Connect the cameras to ATEM Mini Pro with HDMI cables. Also, connect the ATEM Mini Pro to the display monitor with HDMI for Multi-View monitoring, then to the PC with a USB cable for delivering the image to the PC for streaming.

> **Note:**
>
> ATEM Mini Pro has an USB-C port to connect to the PC as a video interface. It allows the ATEM Mini Pro to be recognized as the webcam video source. The "Program" video source will be sent to your PC, which allows you to stream your source live with Teams, Zoom, FB Live, etc.

For audio, the master audio mix from the MGP32X will be transmitted to the UR22mkII. Connect the output for your master audio to the Mic Input 1 and 2 on UR22mkII with XLR or jack cables respectively. Also, connect the UR22mkII to a PC with a USB cable for streaming.

> **Note:**
>
> It is possible to input the audio signal to ATEM Mini Pro by connecting the output from the mixing console to audio input on the ATEM MIini Pro. However, ATEM Mini pro only supports 3.5mm mini jack for audio input, so it may not be suitable for live sound that requires more secured connections.

Mic Input

MultiView Monitor

HDMI Input

ST/AUX Output

Mic Input CH 1   Mic Input CH 2

HDMI Out

Streaming PC

USB to PC

USB Out
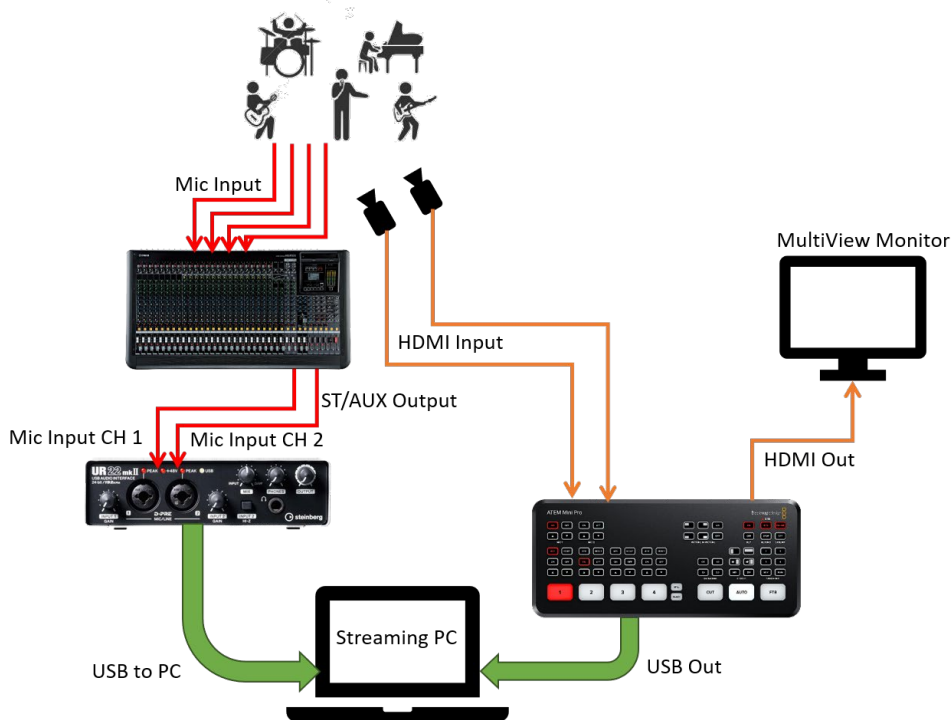
3.1.2 System Benefits

In this system, the displayed camera image can be easily switched using the ATEM Mini Pro. Likewise, the audio managed on MGP32X can be sent to the UR22mkII and transmitted to the PC for live stream. Both video and audio can be delivered from a high-quality environment and make your production more attractive and entertaining.

3.2 Improved System

3.2.1 Overview

This is an Improved system for streaming live music events from a small venue. It was designed using an ATEM Mini Pro and Yamaha MG20XU
For video, four cameras are used as video inputs. Connect the cameras to ATEM Mini Pro with HDMI cables. Also, connect the ATEM Mini Pro to a display monitor via HDMI for MultiView monitoring. Then, connect the PC and ATEM Mini Pro via USB to deliver images to the PC for streaming.
For audio, 20 inputs (microphones or instruments) can be physically connected to the MG20XU. Use XLR or jack cables to connect each input accordingly. Then, connect the

MG20XU to a PC with a USB cable for streaming.
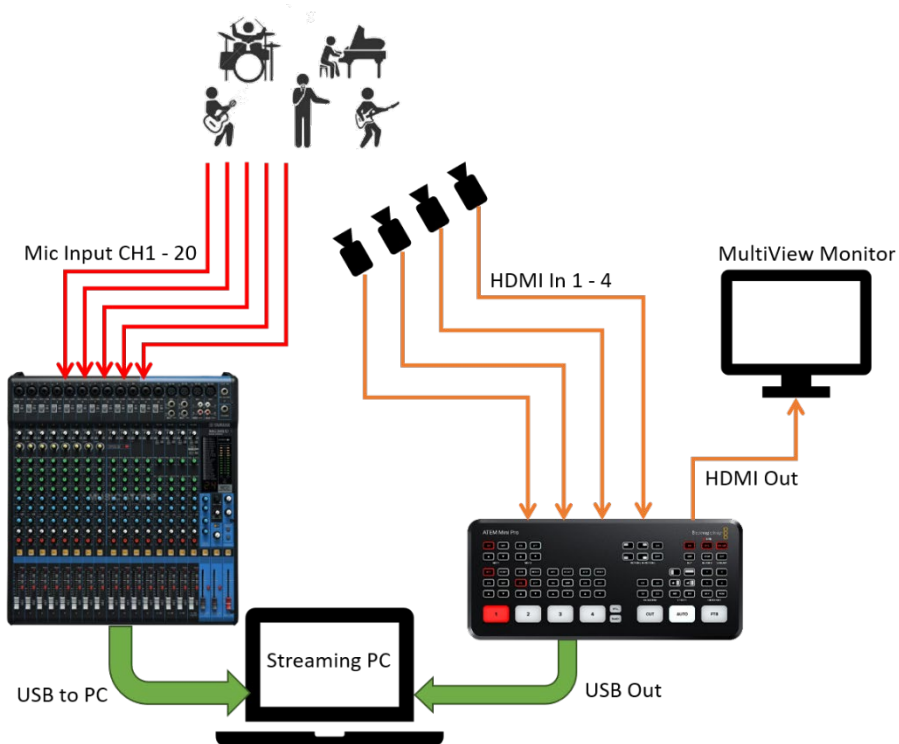
3.2.2 System Benefits

In this system, multiple cameras are used for the production. All camera images can be displayed with the ATEM Mini Pro Switcher which will help bring your production to the next level. For audio, the MG20XU can help you to set up and manage all your input and output sources. Easily set up your sound for live stream to further increase the quality of your production.

3.3 Advanced System with Dante network

3.3.1 Overview

An advanced system with a completely digital network is well suited for mid-size or larger venues. Using a TF5 with a Tio I/O rack system, all of your audio signals will be transmitted over a Dante network, providing up to 48 channels of digital audio being transmitted through

your venue. These audio signals can then be transmitted to your PC via Dante for both streaming and multi-track recording.
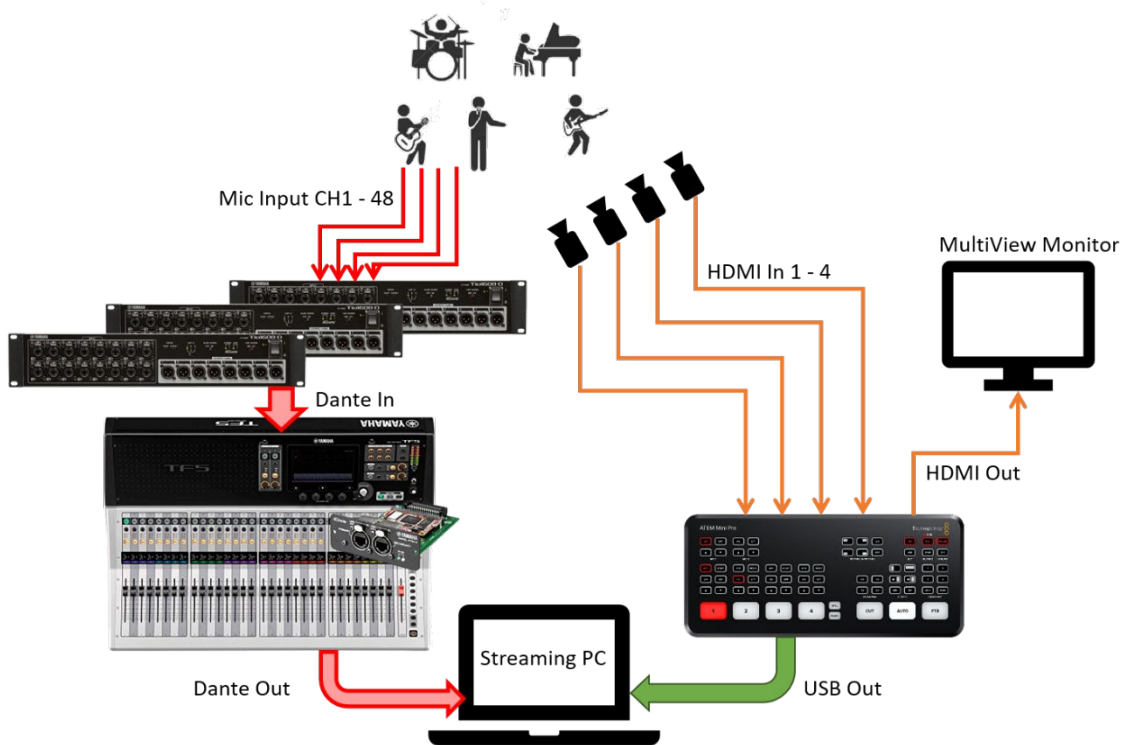
3.3.2 System Benefits

In this system, the TF can help you to set up and manage all your input and output sources. Easily set up presets and fine tune your sound to further increase the quality of your production. Even if you have multiple bands performing in one night, the TF can help you store channel assignments, name performance scenes, and instantly recall them, saving you from lost time and frustration for your team. Also, multi-track recording can be done simultaneously with the bundled Nuendo Live software application. Recording your show in the best quality sound for your on-demand production.

> **Note:**
>
> It is recommended to use a separated PC from for recording from your streaming PC if possible. Simply add an additional PC to the Dante network and use the Dante controller to make patches for live streaming and recording.

Note:

A license for Steinberg Nuendo Live software is bundled with Yamaha mixing console (CL, QL and TF Series). This is compatible with Mac and Windows computers, and can be used for multi-track live recording. It is designed to be simple and quick to setup and operate, while providing a stable and reliable recording environment.
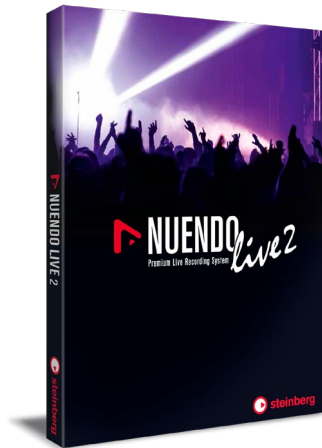
For more details on how to set up and record your production with Nuendo Live, please refer to the "Live Recording Guide with Nuendo Live" available on our website: yamaha.com

4.0 System Setup

4.1 Basic System

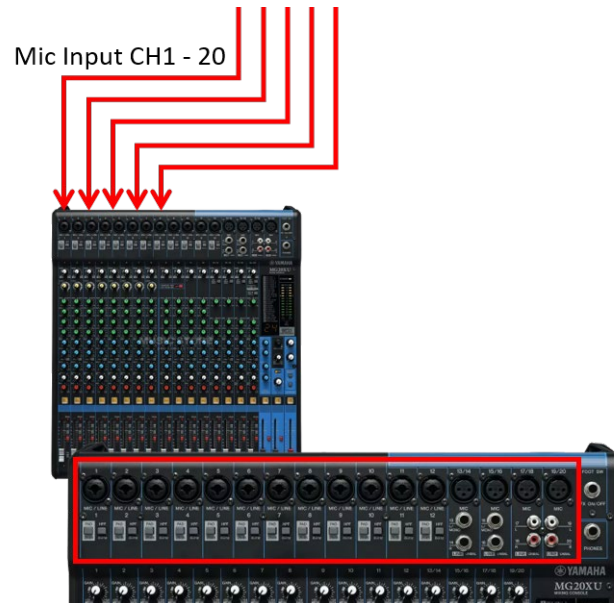### 4.1.1 Video Inputs and Output

- Use HDMI cables to connect camera 1 and 2 to ATEM Mini Pro's HDMI In 1 and 2
- Use an HDMI cable to connect HDMI Out on ATEM Mini Pro to a display monitor
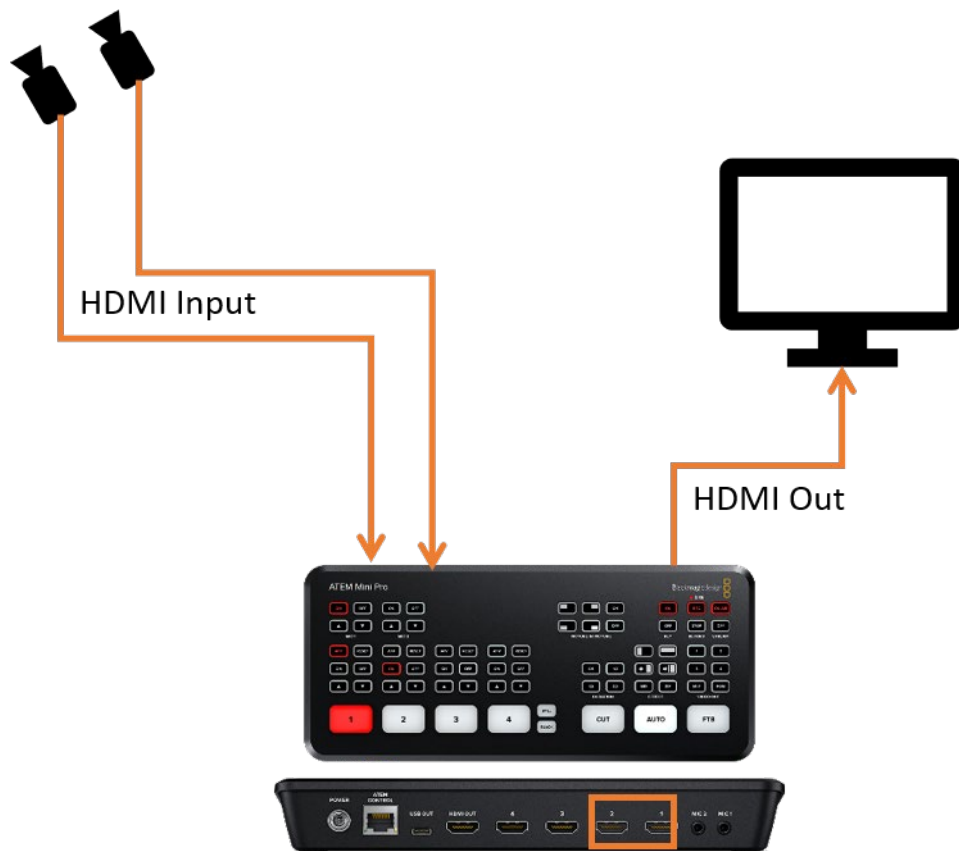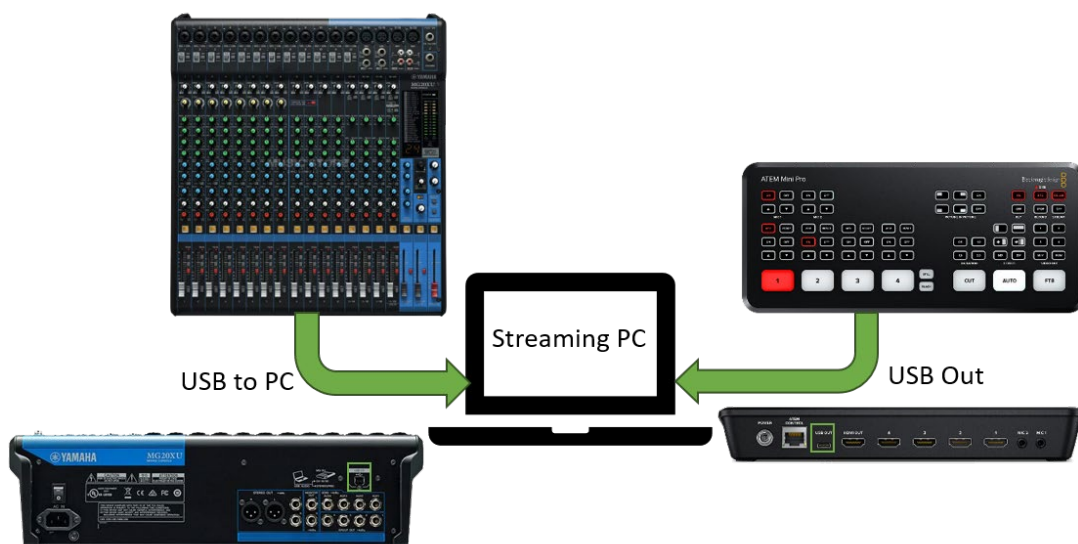

4.1.2 Audio

- Connect microphone and musical instrument to the mic inputs on the mixing console
- Connect other equipment (loudspeakers, processors, amplifiers, etc.) to the mixing console's outputs as necessary
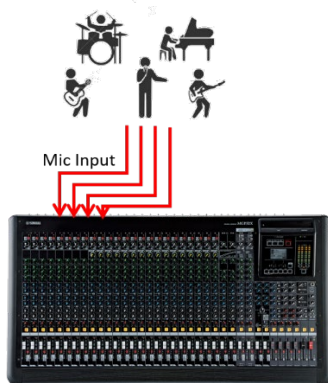
- Connect the ST or AUX Out on the main console to the mic input CH 1 & 2 on UR22mkII with XLR or phone cables

ST/AUX Out

Mic Input CH 1

Mic Input CH 2
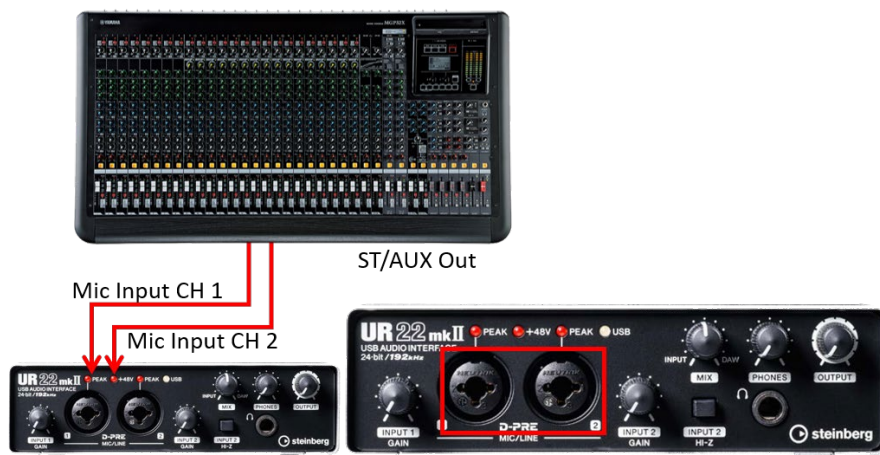
4.1.3 USB out

- Connect USB Out from ATEM Mini Pro to PC with a USB-C cable
- Connect USB Out from UR22mkII to PC with USB 2.0 cable or better
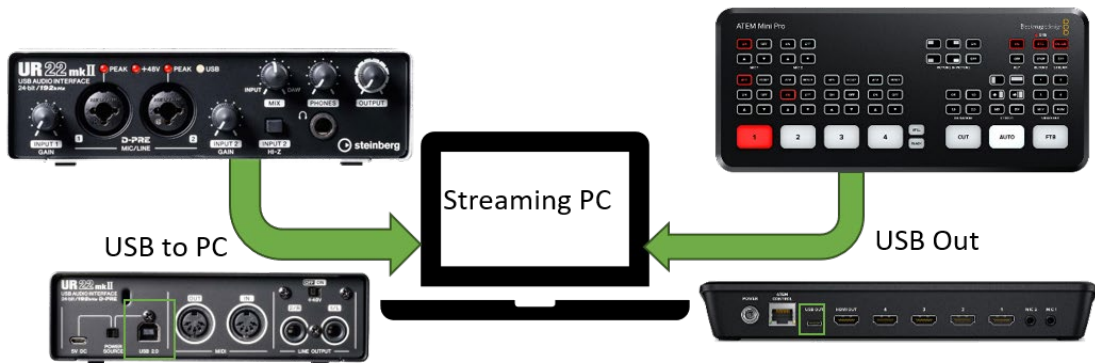
4.2 Improved system

4.2.1 Video Inputs and Output

- Use HDMI cables to connect cameras 1 - 4 to ATEM Mini Pro's HDMI In 1 - 4
- Use an HDMI cable to connect HDMI Out on ATEM Mini Pro to a display monitor
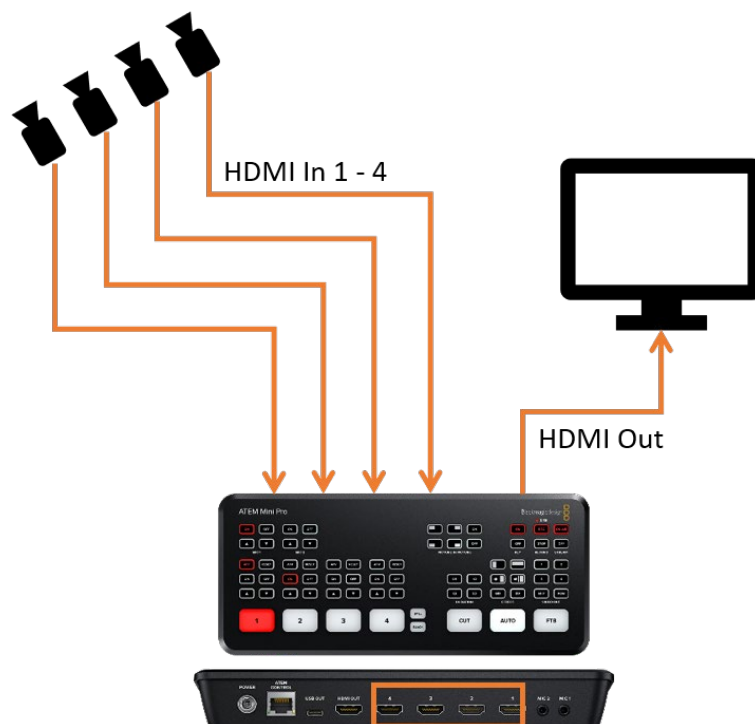
### 4.2.2 Audio

- Connect microphone and musical instrument to the mic inputs on the mixing console

- Connect other equipment (loudspeakers, processors, amplifiers, etc.) to the mixing console's outputs as necessary

4.2.3 USB out

- Connect USB Out from ATEM Mini Pro to PC with a USB-C cable
- Connect USB Out from MG20XU to PC with a USB 2.0 cable or better

4.3 Advanced system with Dante network

4.3.1 Video Inputs and Output

- Same as advanced system above

4.3.2 Audio

- Connect microphones and musical instruments to the mic inputs on the Tio1608-D I/O racks
- Connect other equipment (loudspeakers, processors, amplifiers, etc.) to the outputs on the Tio1608-D I/O racks as necessary
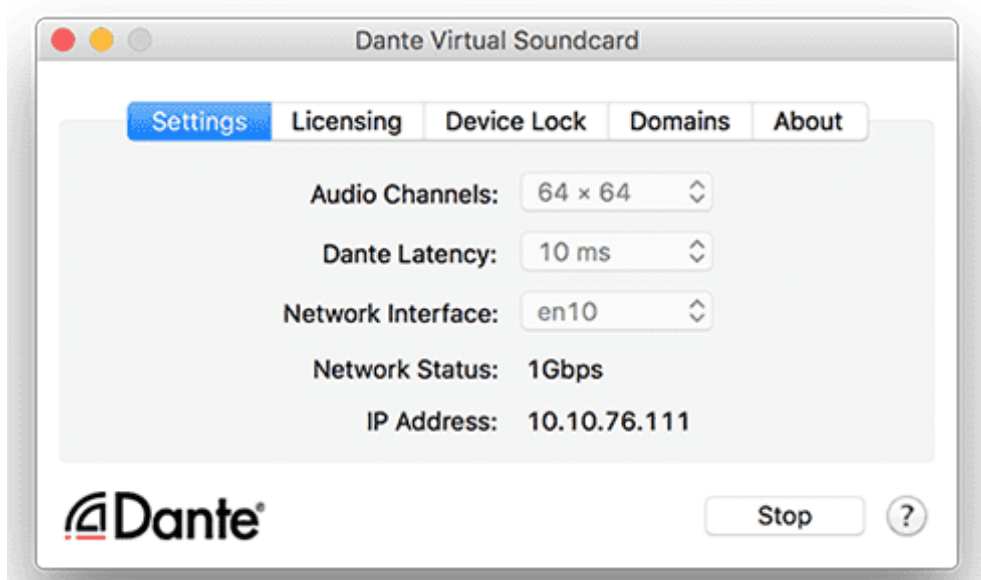- Connect the Dante Primary port on the Tio1608-D I/O rack to the Dante port on NY64-D inserted to the mixing console with Ethernet cable*
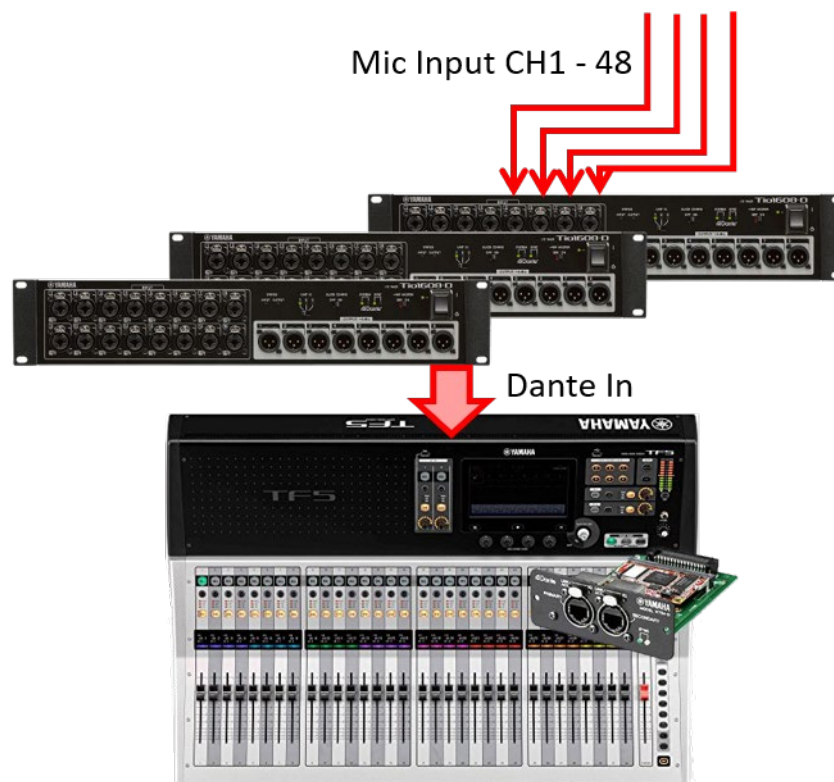
*   There are several methods to connect TF and Tio, for details, please refer to the Tio1608-D owner's manual available on our website (https://www.yamaha.com/)

- Connect the Dante port on NY64-D inserted to the mixing console to the Ethernet port on your PC with Ethernet cable (*2)

Dante Out
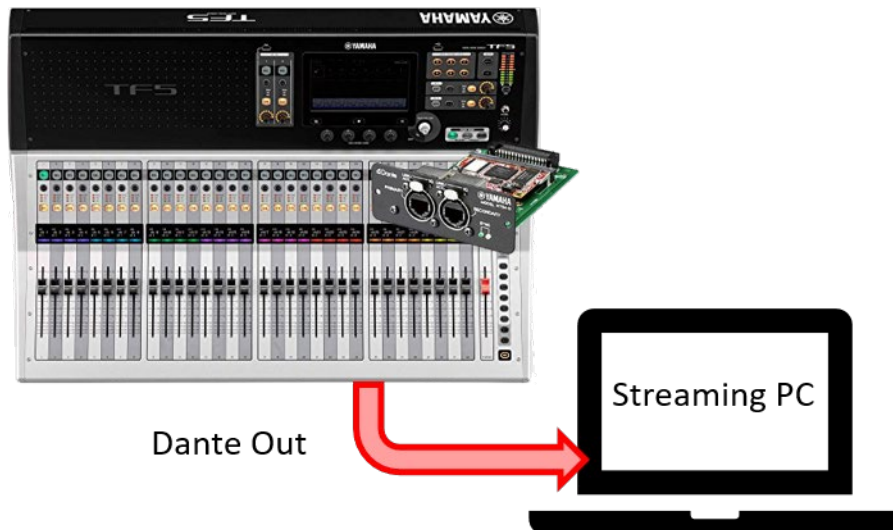
Streaming PC

(*2) To connect the PC to the Dante network, it is necessary to install Dante Virtual Sound card and Dante Controller (https://www.audinate.com) on your PC

Dante Controller™

Copyright © 2007-2019 Audinate Pty Ltd

US Pats.9178927, 8171152
and see audinate.com/patents

4.3.3 USB out

- Connect USB Out from ATEM Mini Pro to PC with a USB-C cable

5.0 Optimize ATEM Mini Pro for Live-streaming

To configure ATEM Mini Pro, use the ATEM Mini Pro setup app available on
(https://www.blackmagicdesign.com/). This application contains the driver and the UI
software for ATEM Mini Pro.
Panel Settings allow to make settings for the switching mode, Picture in picture keyer, etc.
The control surface has a similar function to the hardware, but it is possible to make some
more detailed settings.

USB-C

Control Surface/Audio
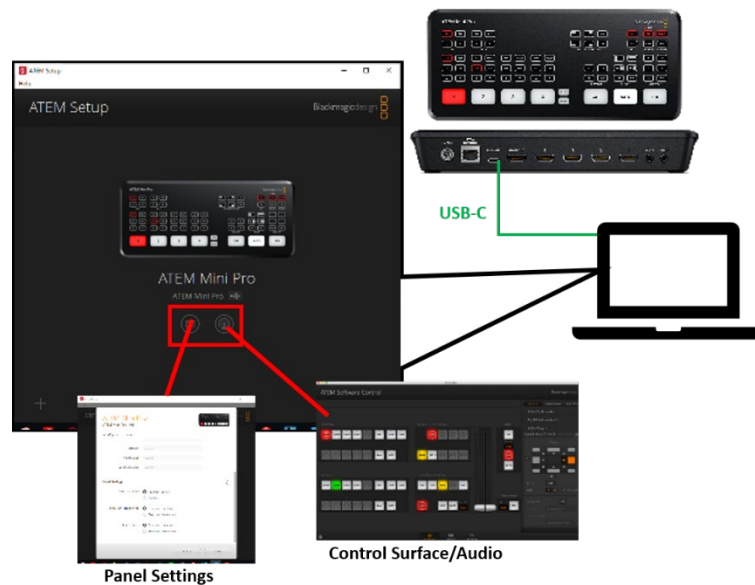
Panel Settings

On the Panel settings page, make sure the switching mode of ATEM Mini pro is set to
Program/Preview. It allows you to operate the switcher with Preview mode so you can
prepare the preview source to avoid any mistake during operation.
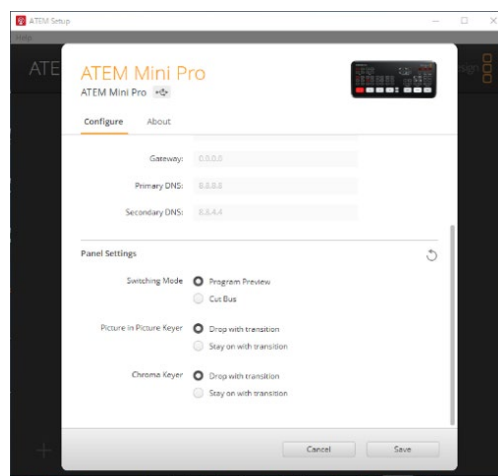
5.1 Prepare the video program for live streaming

On "ATEM Software Control", prepare the program with various sources. All sources can be monitored with the Multiview function.
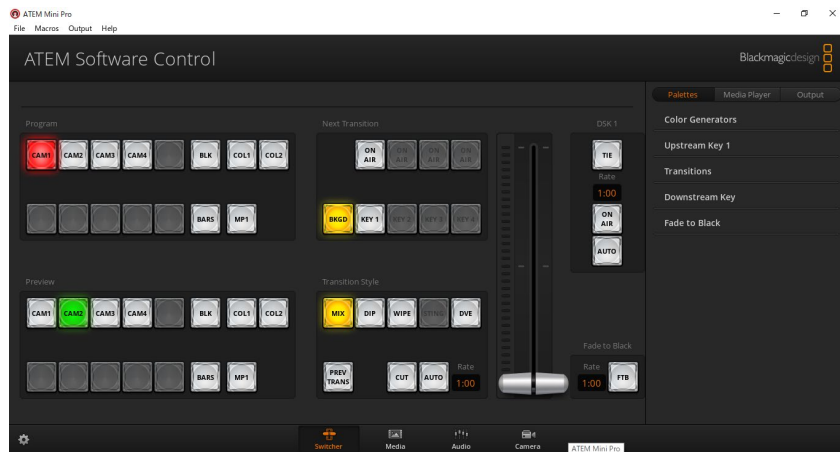
ATEM Software Control Panel

MultiView monitoring

Switching Input sources can be done on both the hardware and the software.

Cam1 to Cam4: Video input source 1 to 4

Still: Still graphic stored in the media player

Black: To black screen

Red indicator is "Program"

Green indicator is "Preview"

For more details about the functions and operations of "ATEM Software Control", please refer to the "ATEM Mini Manual" which comes together with the software.

6.0 Optimize your mixing console for live-streaming

For MG-XU series, the audio output from the stereo output bus will be sent to the PC via USB cable (Please note that the USB cable is not included in the product). If you are using the MG on Microsoft Windows OS, it is necessary to install the "Yamaha Steinberg USB Driver".

For TF series with NY64-D card, the stereo output bus will be sent from Slot out 57 – 58. Please use Dante Controller (https://www.audinate.com) to set the patch on your PC.

Note:

To learn how to optimize your audio mix for live-streaming, please find more details on our Yamaha website (https://www.yamaha.com) or our Youtube channel: yamaha_global.

How To Mix Live Music

PA Beginners Guide

7.0 Set up and configure the streaming platform

After preparing all your video and audio sources for your live-stream, you can configure your streaming platform. There are two methods to stream using the system introduced in this document.

- Use the devices as webcam/audio sources directly
- Use the devices together with a software encoder (e.g. OBS studio)

In this document, we will use the steaming platform "YouTube" as an example. Make sure to evaluate and decide which platform makes the most sense for you or your business

7.1 Use the devices as webcam/audio sources directly

The ATEM Mini Pro can be used as a webcam to transmit camera images to the PC directly. After connecting the ATEM Mini pro and the mixing console to the PC, select the devices as video and audio sources on the streaming platform respectively.
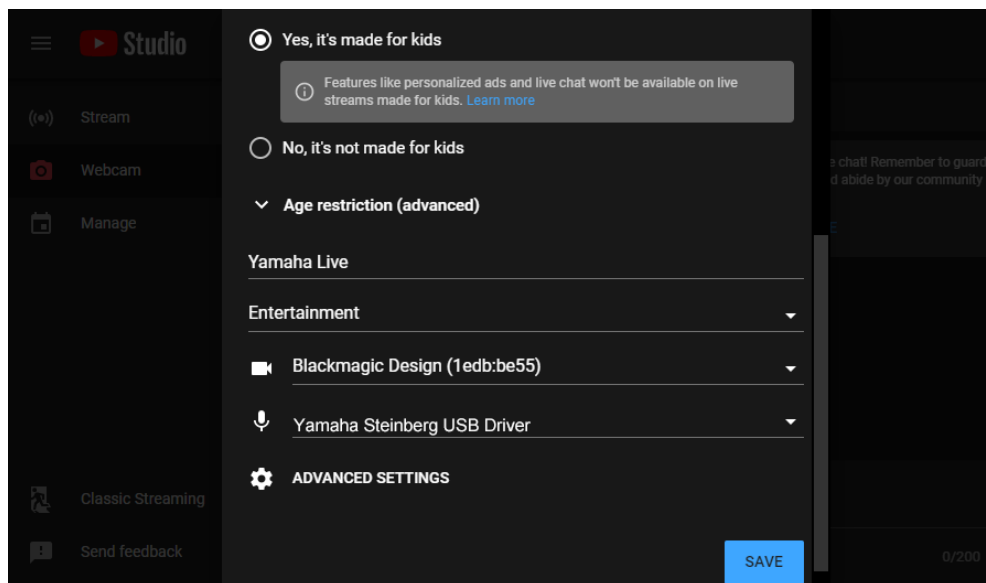

Example: Choosing the devices on YouTube

7.2 Use the devices together with a software encoder (e.g. OBS Studio)

Open Broadcaster Software (OBS) is a free open source software suite that is used for live streaming and recording. Some live-stream platforms require the use of an encoder like OBS to convert the content into a compatible digital format. To live-stream using a software encoder like OBS Studio together with the system, it is necessary to select the devices as video and audio sources first.
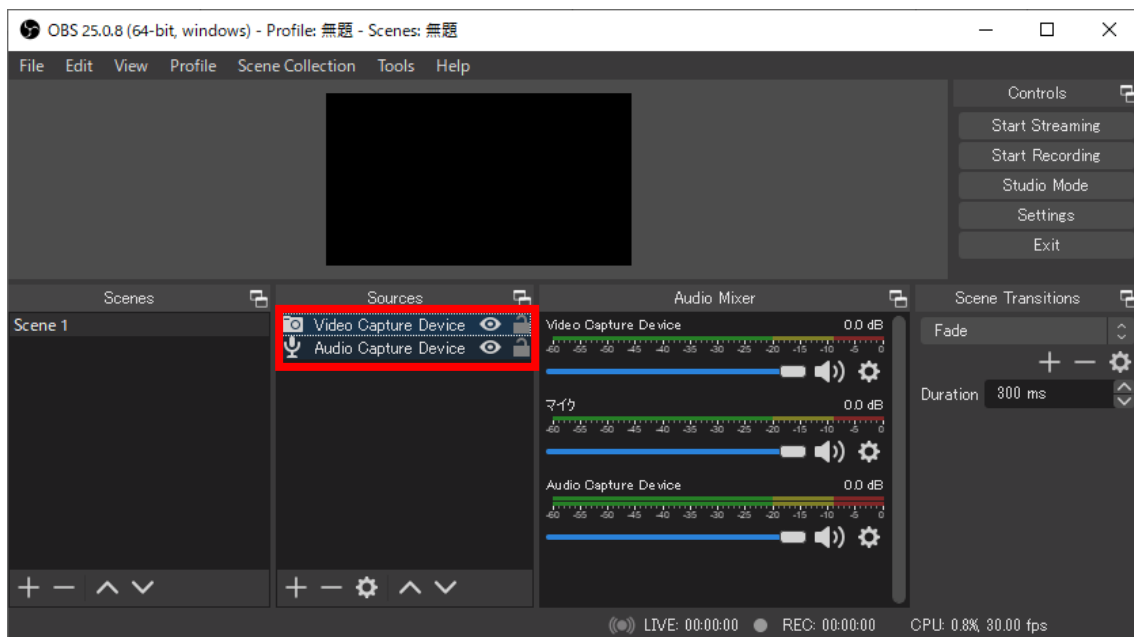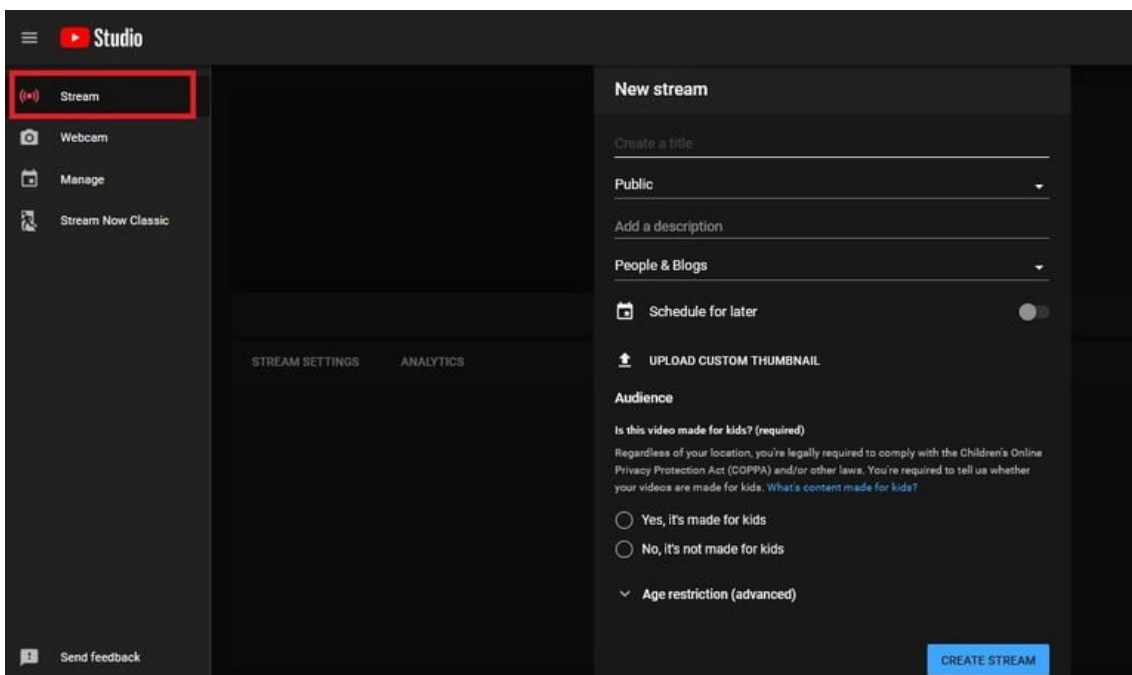

Set the device in "Properties"
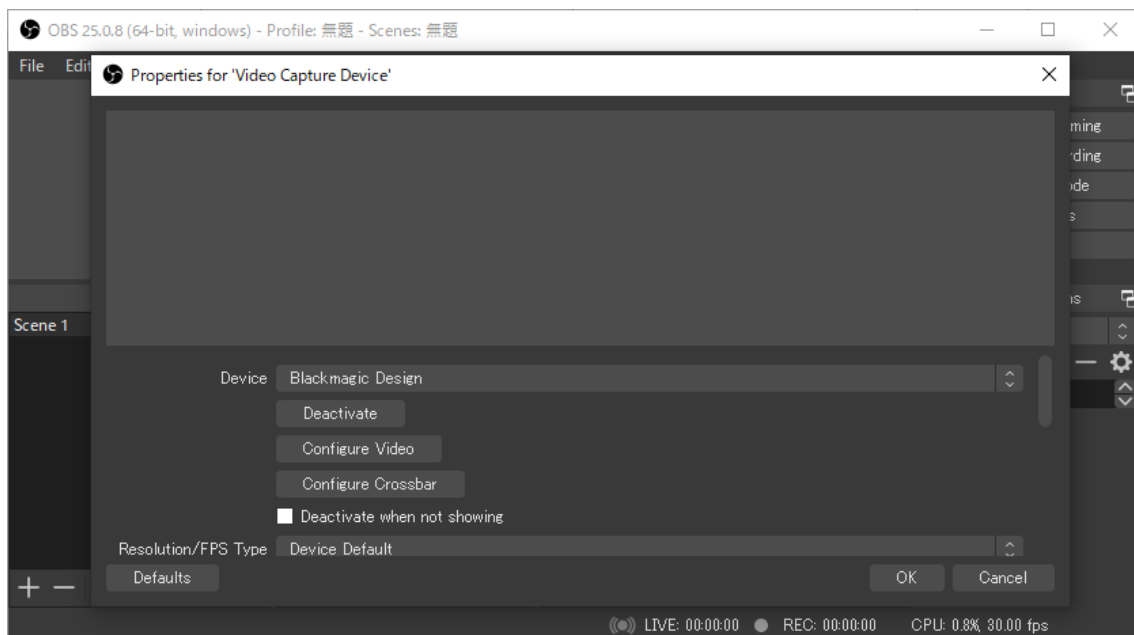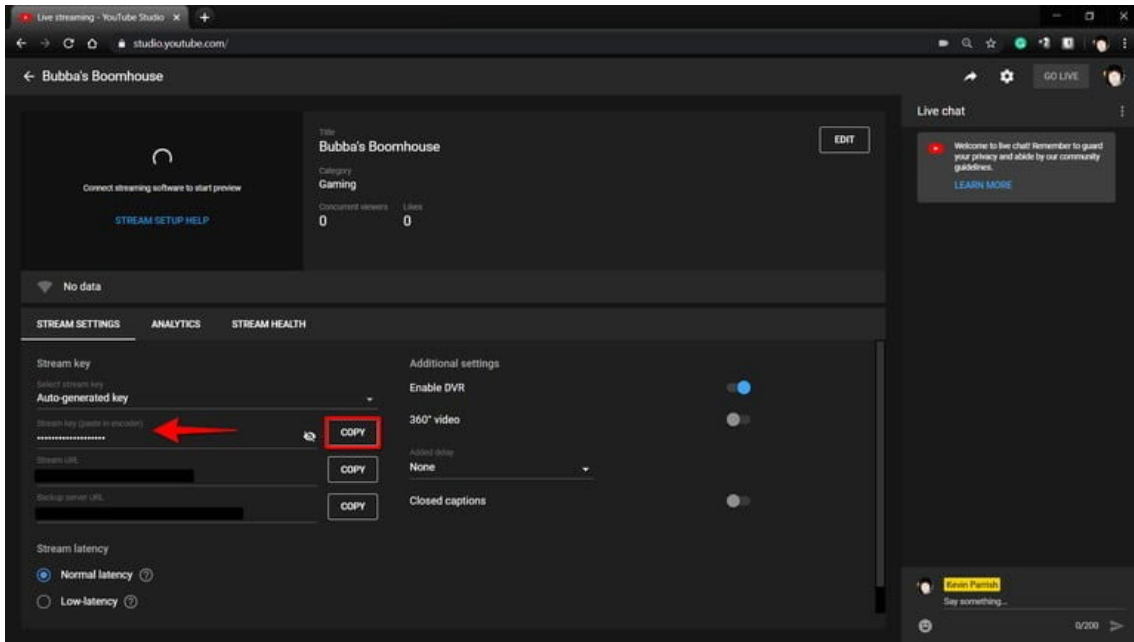

Choosing the device for video
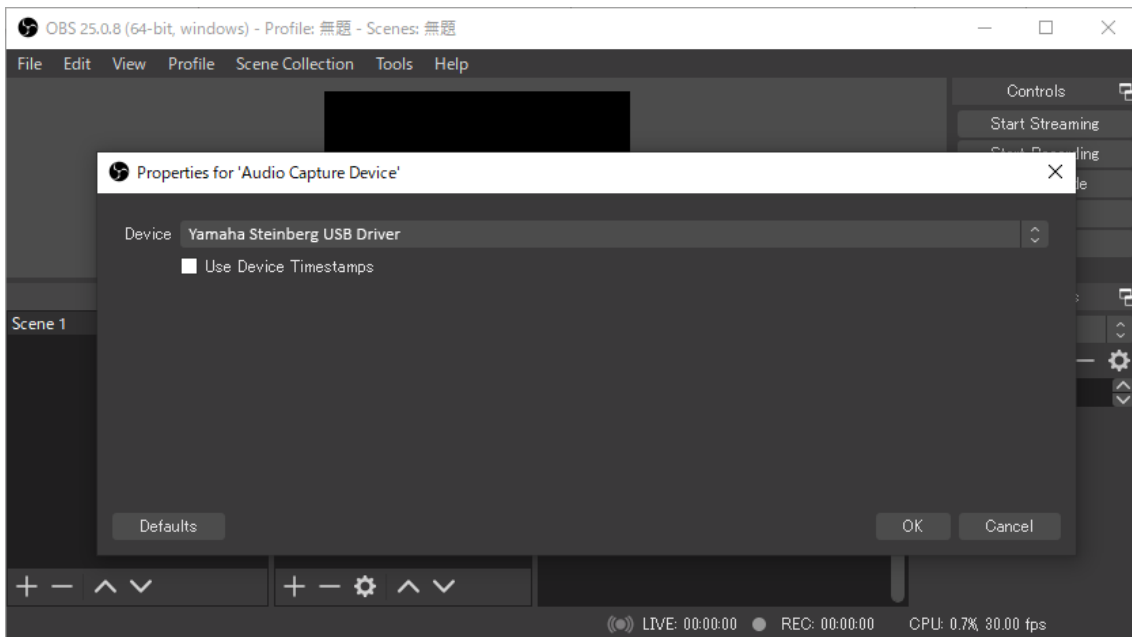
Choosing the device for audio

After making the configuration on OBS Studio, you can create a stream and generate the stream key on your platform and link it to OBS Studio.
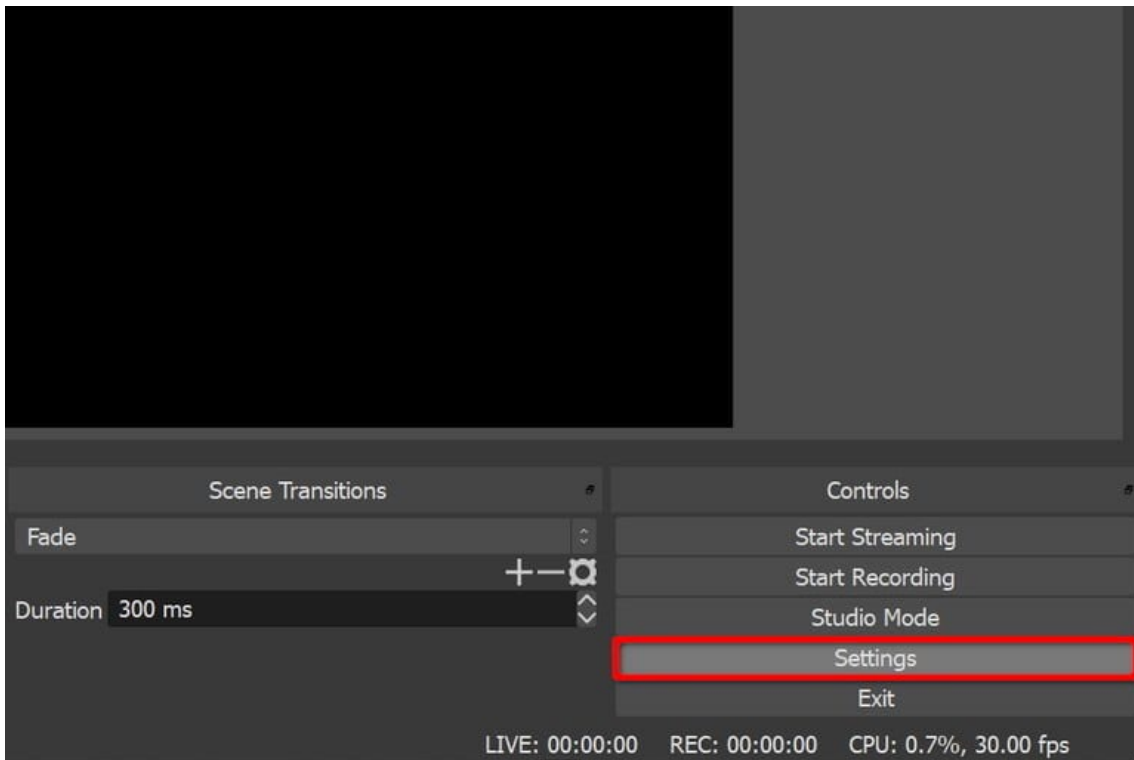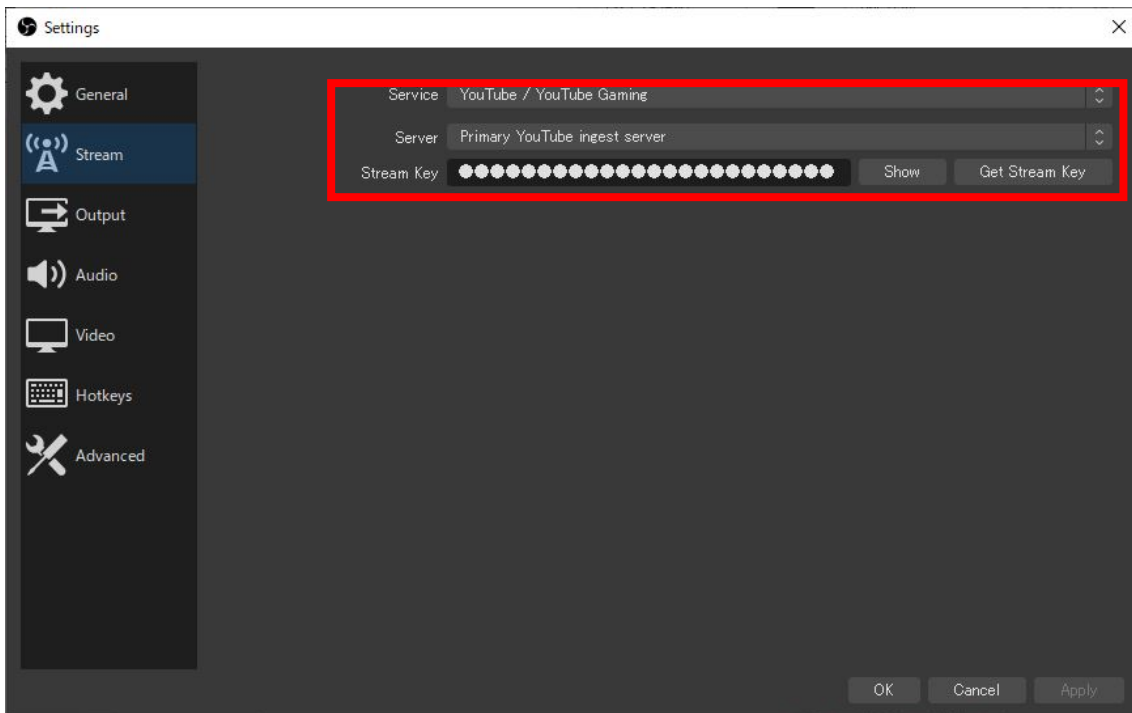

Create a live-stream on your platform

You can find the Stream key in the Setup page

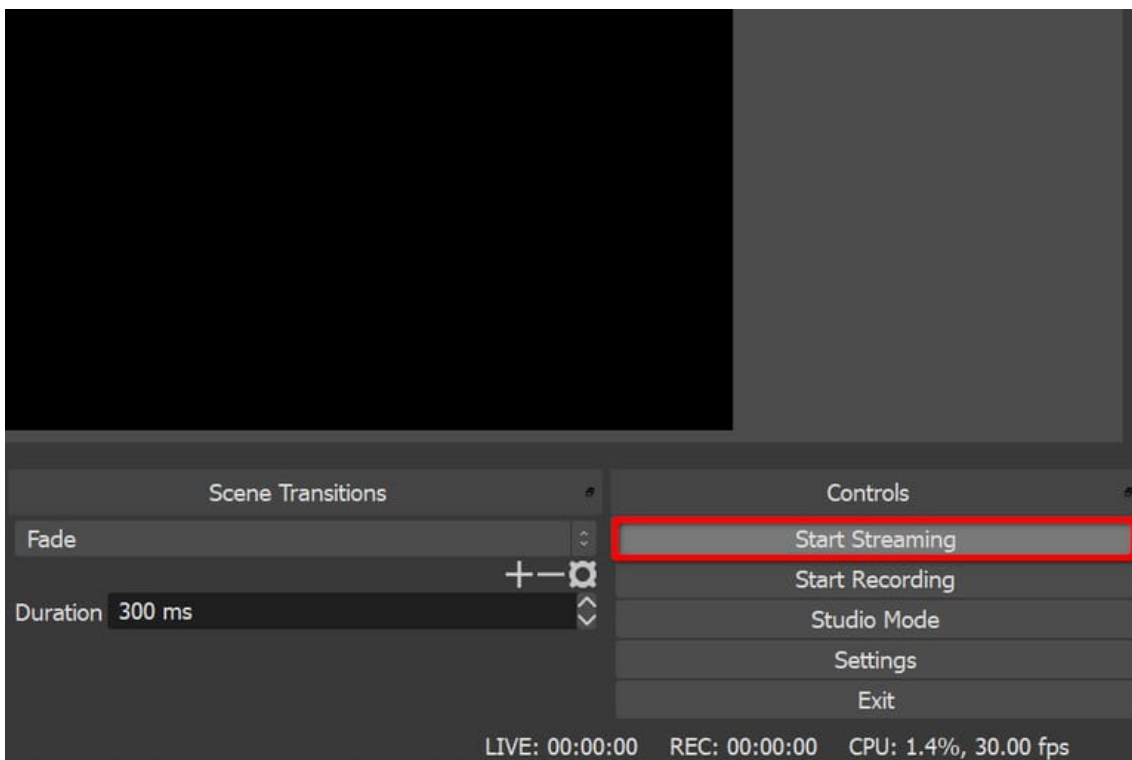On OBS studio, select "Settings" in the "Controls" menu to set the stream key

"Settings" on OBS Studio

Select Stream in Settings and copy the stream key > OK

Now, your event is ready to go live!

Click "Start Streaming" to start your live-stream

Audioversity

by Yamaha Pro Audio