August 14, 2024

# Extron Media Processors and Encoders
# Streaming to third parties using RTMP and RTMPS

The following notes provide guidance on setting up Extron Streaming Media Processors and Encoders for publishing live streams to third party services such as YouTube via RTMP or RTMPS. For more information, please consult your Extron Applications Engineer.

## Extron Products Affected:

| | |
|---|---|
| SMP 111 | 60-1594-01 |
| SME 211 | 60-1763-01 |
| SMP 351 | 60-1324-01 / 60-1324-11 |
| SMP 351 3G-SDI | 60-1324-02 / 60-1324-12 |
| SMP 352 | 60-1634-01 / 60-1634-11 |
| SMP 352 3G-SDI | 60-1634-12 |
| SMP 401 | 60-1825-01 |
| SMP 401 12G-SDI | 60-1825-02 |

## SPECIAL NOTES

Streaming to third party services requires a user to have an account with those services. Accounts with third party providers are the responsibility of those maintaining the stream and its content.



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# TECH NOTE

Extron encoders support RTMP push streaming for publishing live video to third party services like YouTube, Wowza Video, Twitch, MS Stream, and others, as well as support for RTMPS for secure live video streaming.

> **Note:** The examples in this document show the interface of the **SMP 401, SMP 352, SMP 111** and **SME 211,** which may look different, but the same settings apply.
>
> Specific instructions apply only to the **SMP 401**.

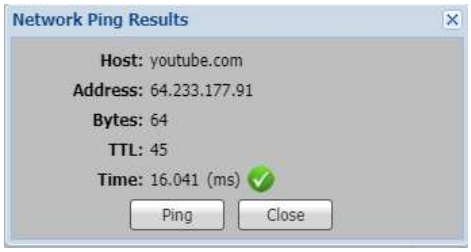
To configure the Encoder for RTMP Push streaming to a live streaming provider:

**1.** Ensure your SMP or SME is connected to the network and has access to the internet.

a. Open the web browser of the Encoder, **Troubleshooting, Diagnostic Tools.**

b. Ping your live service, such as [YouTube.com].

i. If successful, a green checkmark is shown.




ii. If results fail, verify network and DNS settings.

For **SMP 401**

a. Open the web browser of the SMP 401, **Monitor**, **Diagnostics**

b. Ping Network, Hostname or IP Address such as [YouTube.com]

i. If successful, results shown



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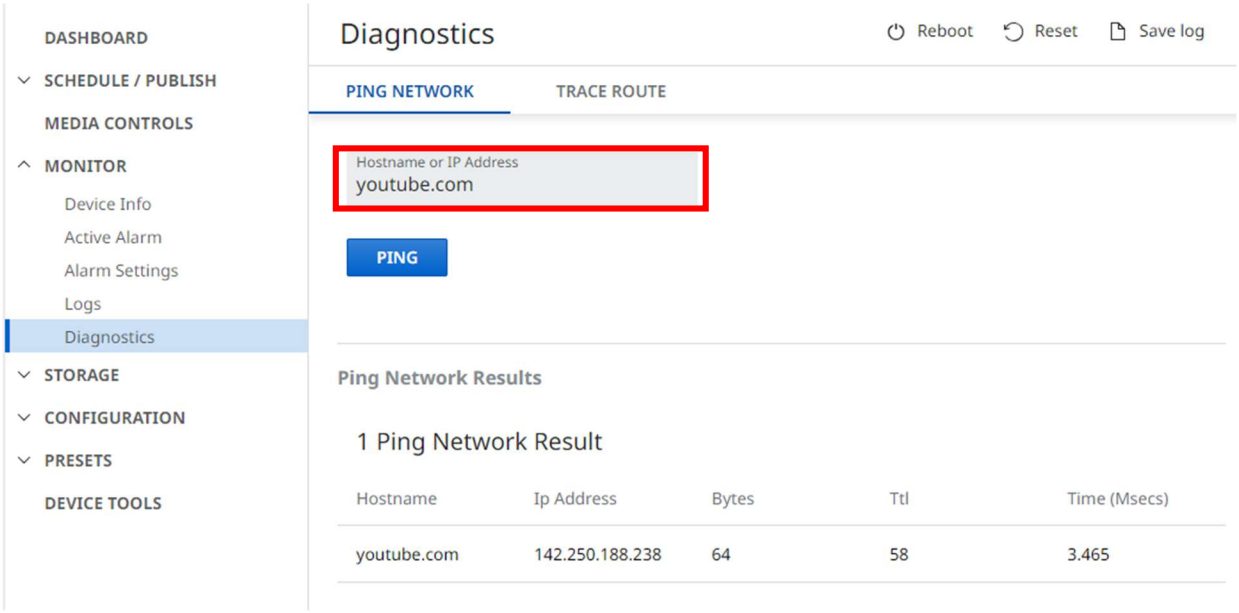


2. Open a web browser of the Encoder, **Configuration, Encoding, Encoding Presets:**


3. Confirm the Encoder is in Stop Mode. If needed, press stop on the front panel.
4. Select **PUSH** and **RTMP** from the streaming method and protocol options.



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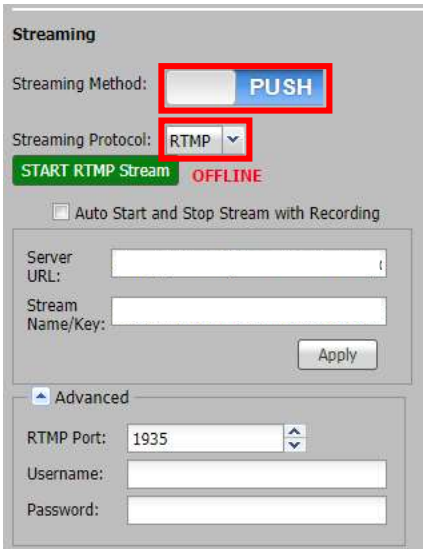
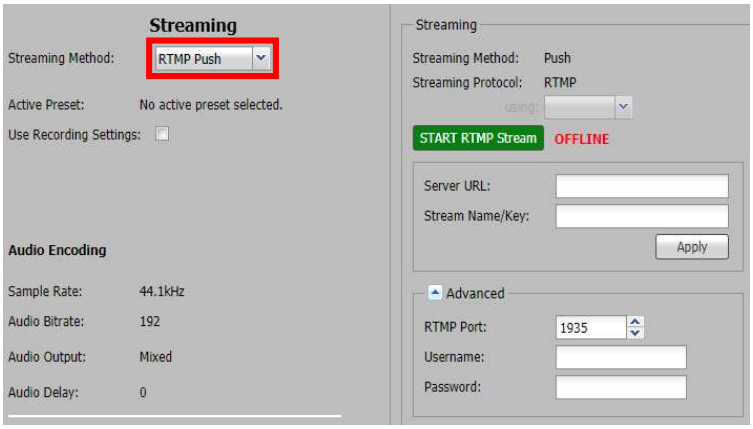
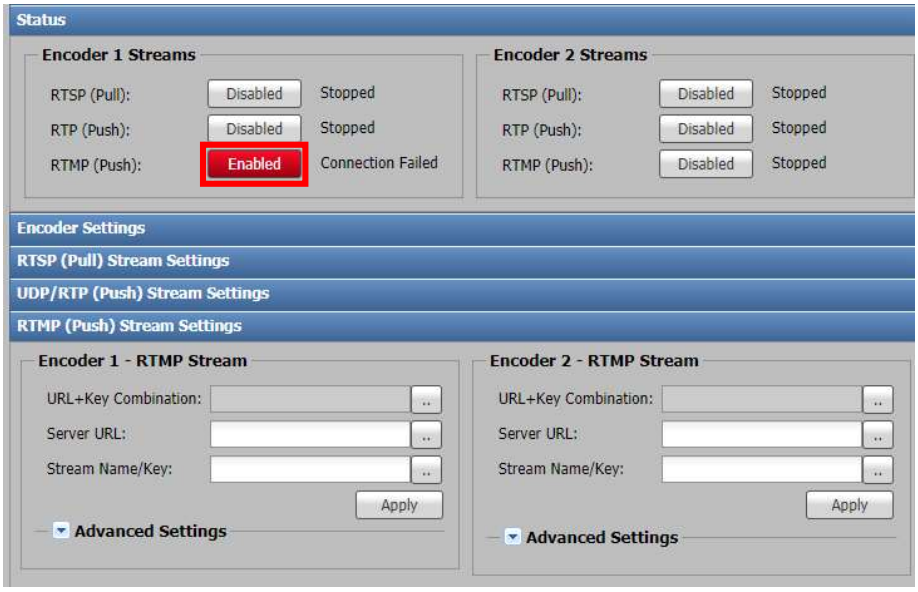



*SMP 352 example*




*SMP 111 example*




*SME211 example*



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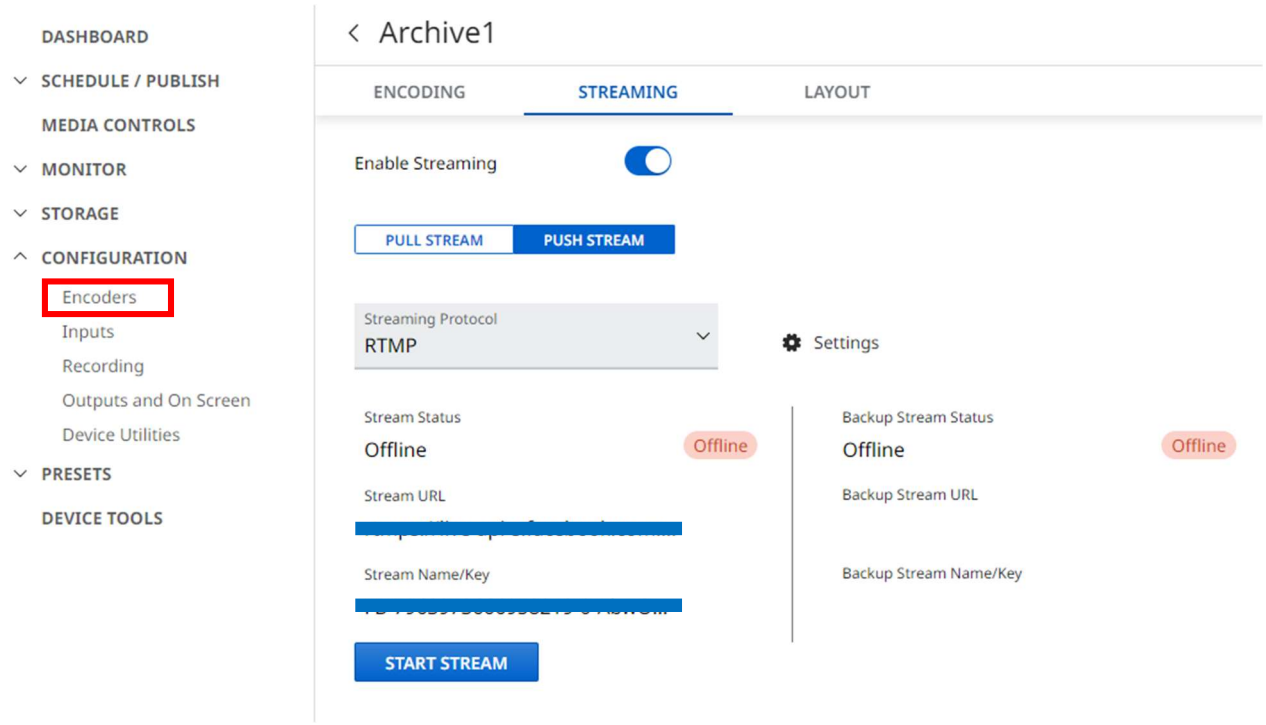
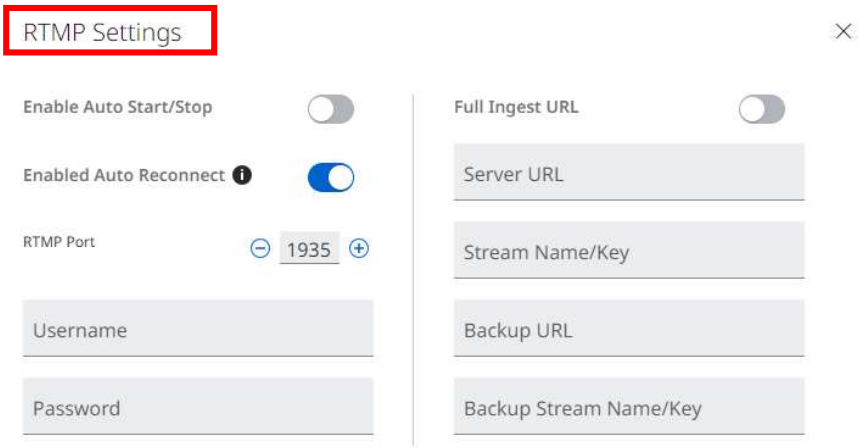
For **SMP 401**

Open the web browser of the SMP, **Configuration**, **Encoders**

- Select any of the 4 available encoders or 2 virtual inputs and open **Streaming tab**
- Select **PUSH STREAM** and select **RTMP** for the Streaming Protocol
- Open **settings** to input streaming information obtained in the next steps



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5. The **Server URL**, **Stream Name/Key** and optionally the **Username**, and **Password** information is needed:

    a. Follow the links in the next section to obtain the fields from these services. Services other than those listed in this document will also require similar information.

6. For configuring SMP or SME **encoder settings**, reference the **Recommended Settings** section at the end of this guide.

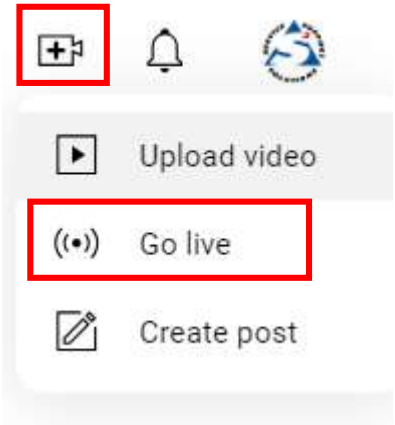
## Streaming to YouTube Live

Create a YouTube live stream with an encoder:

https://support.google.com/youtube/answer/2907883?hl=en&ref_topic=9257892&sjid=9348289071179525633-NC#zippy=%2Cstart-live-streaming-now

For **Live** **Events** with immediate stream workflow on the YouTube page:

1. Go to www.youtube.com and if not logged in to your account, proceed with the log in.
2. In the top right, click the camera + icon, and select Go Live:



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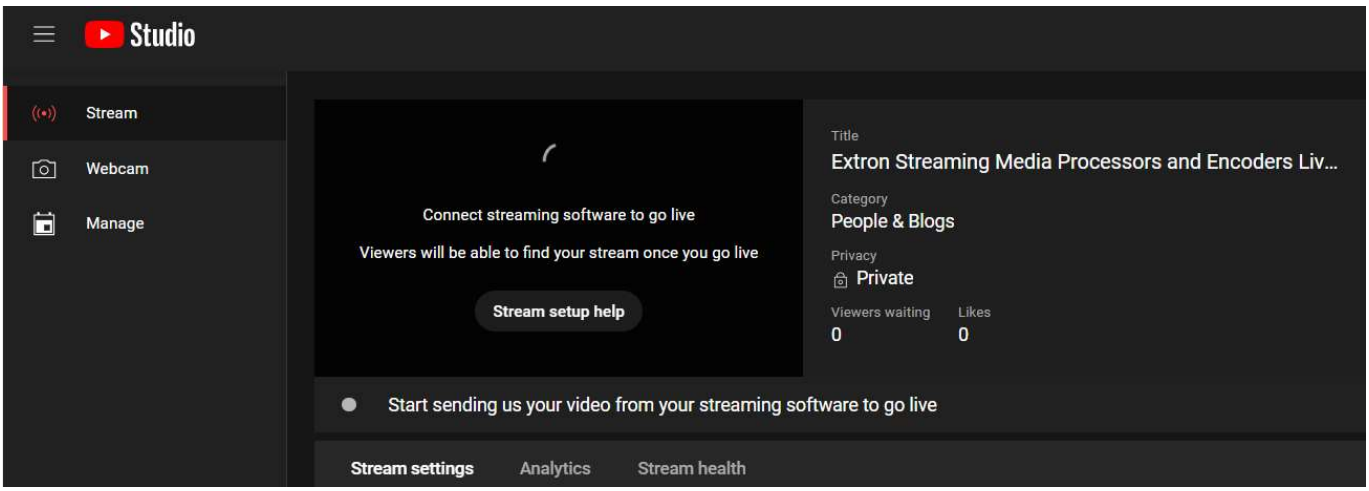
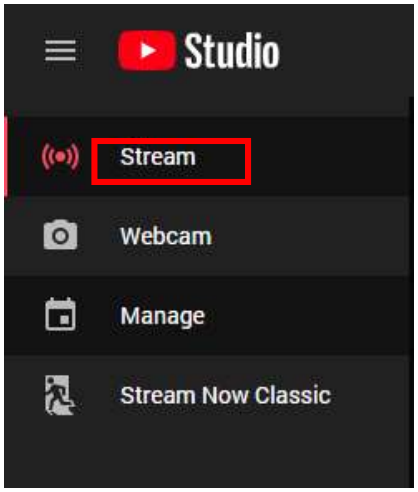
This opens the **YouTube Studio web portal**.




3. Select **Stream**




## Notes:

- Enabling a live stream for the first time may take up to 24 hours. Once enabled, your stream can go live instantly.
- **If it's your first live stream:** Edit your stream and click **Create stream**.
  **If you've live streamed before**: Your previous stream settings will load, including your stream key, which means you won't need to update your encoder.



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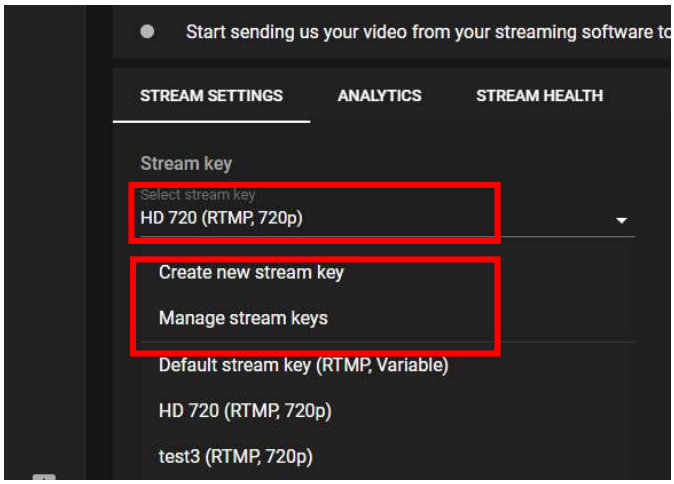
Once the stream is setup, you will have the following screen and options:

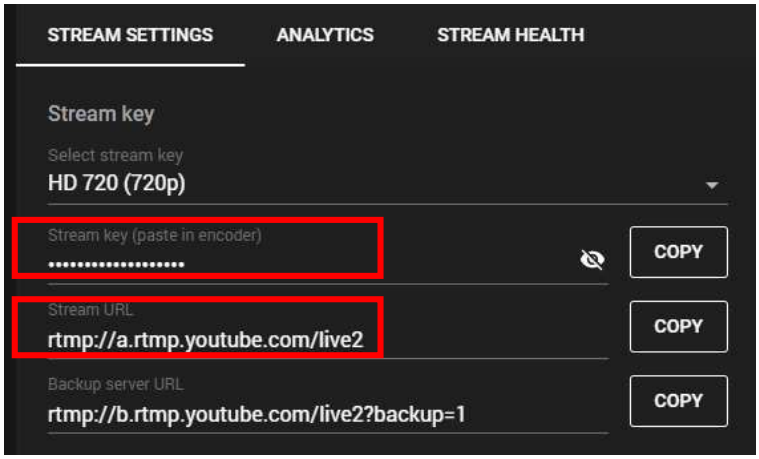
From the Stream Key pull down:




- Create New Stream Key: This allows you to set up a streaming profile for the bit rates expected.
- Manage Stream Keys: Lets you edit or delete stream key presets. Presets store both stream rate and the key.

For most applications, setup only one stream key for your application. i.e. 720p streaming @ 1500 – 4000 kbps.

4. Copy the **Stream Key** and **Stream URL** one at a time and paste them into the SMP or SME encoder data fields. Click **Apply** or **Save** to save the stream URL and Key.



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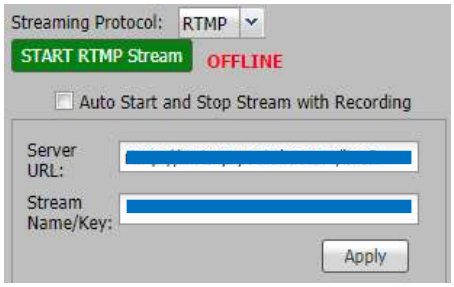
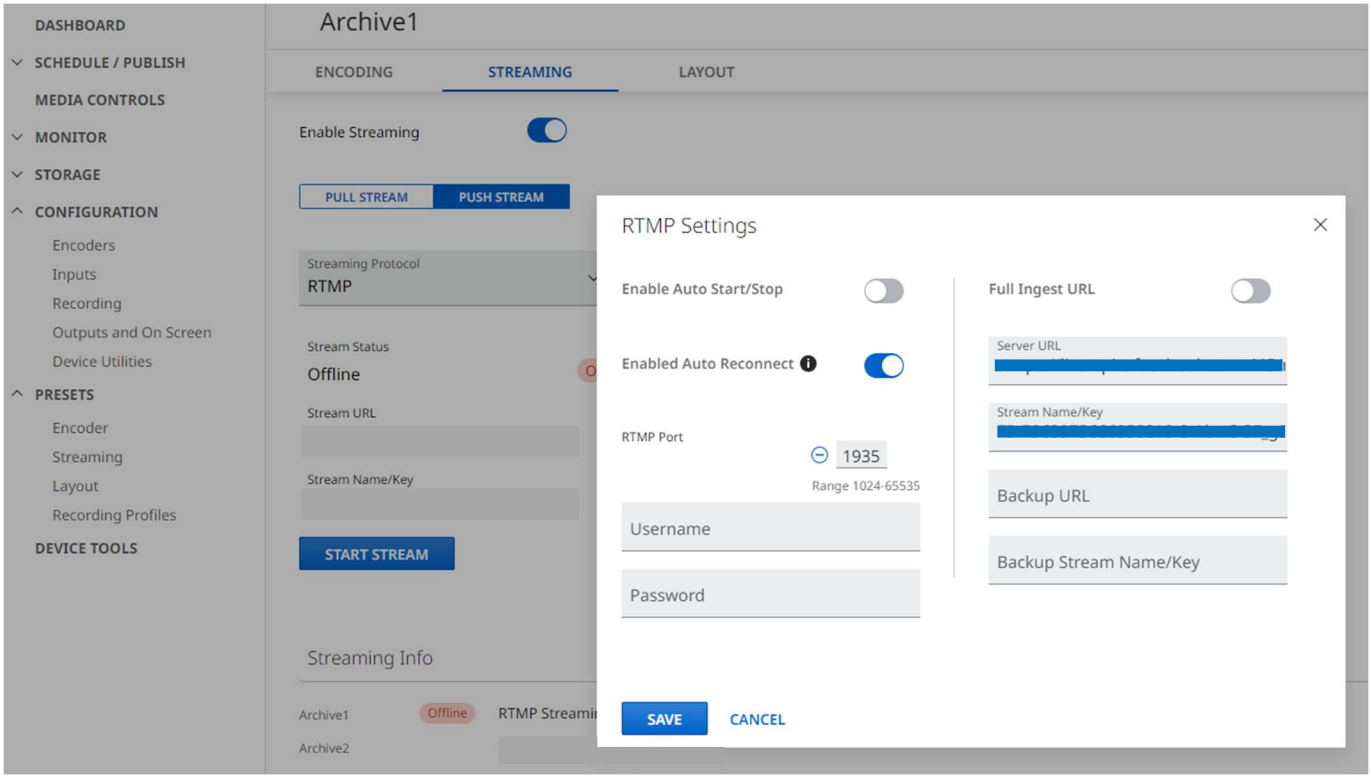
For the **SMP 111** and **SMP 300 Series**




For the **SMP 401**




5. On the SMP or SME Encoder, click “Start RTMP stream” button to activate the stream.

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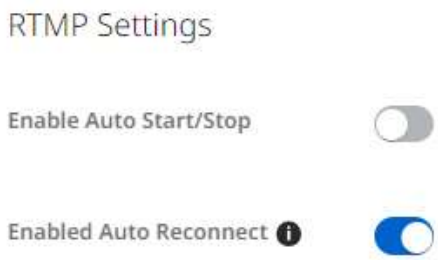
## Notes:

- You can also select Auto Start which will start the stream automatically when recording starts. YouTube also has the option to “Enable Auto-start” for scheduled streaming operation.

For the **SMP 401**

Use slider “Enable Auto Start/Stop”.




6. After a few seconds, the button will change to red or white and indicate the stream is now live.


7. Back on the YouTube Studio dashboard page, you should now see the encoder’s streaming content live.



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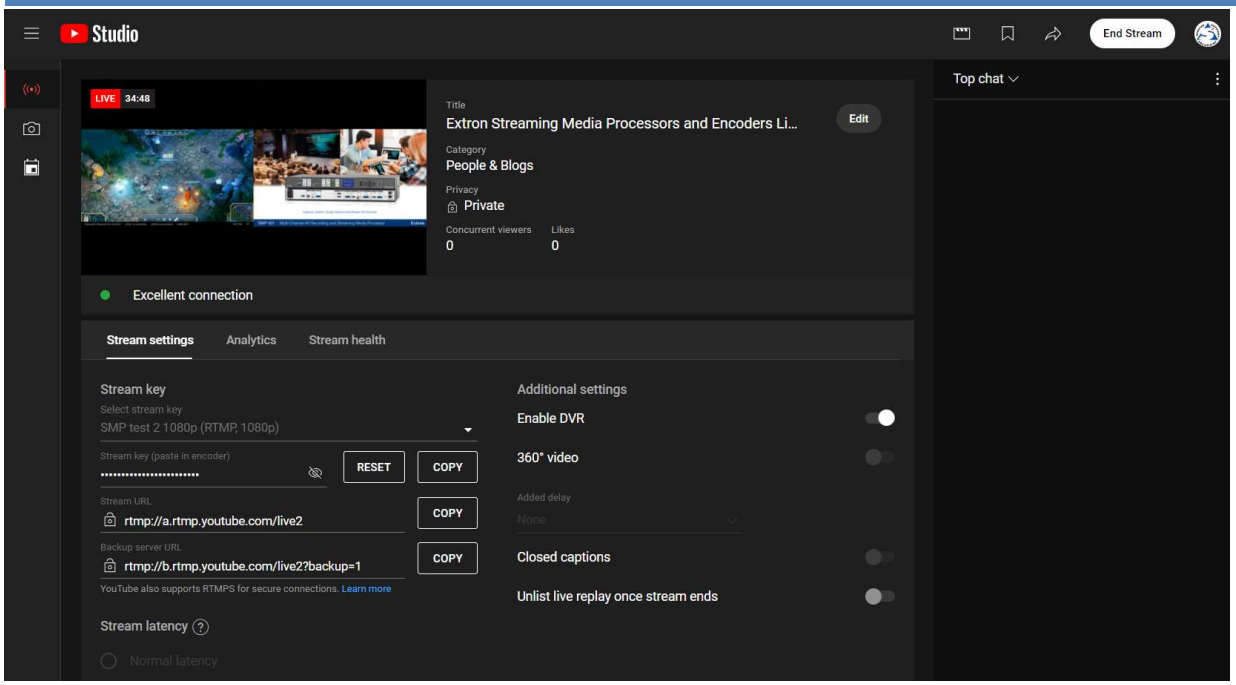
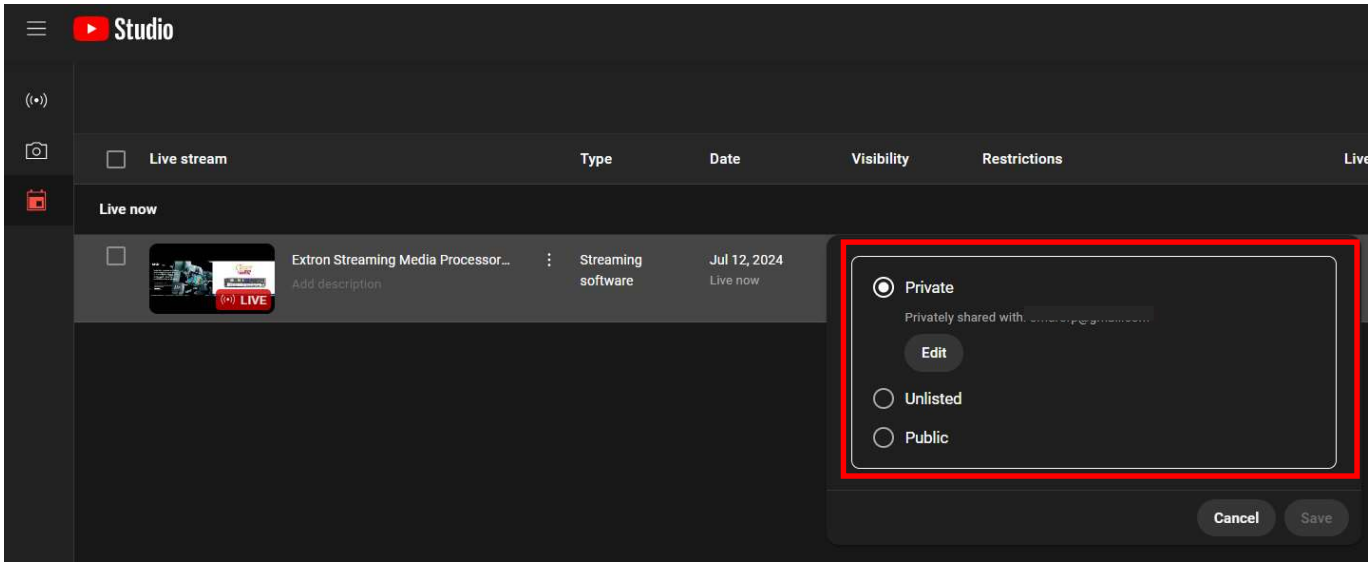



## Notes:

- YouTube does not require Username and Password for the Live Stream encoder. Also, YouTube does not authenticate viewers, however, an unlisted event can be created so only users with the direct link can view the stream or select as Private to send directly the stream via email. YouTube uses TCP port 1935 for streaming. This port must be open for network access.



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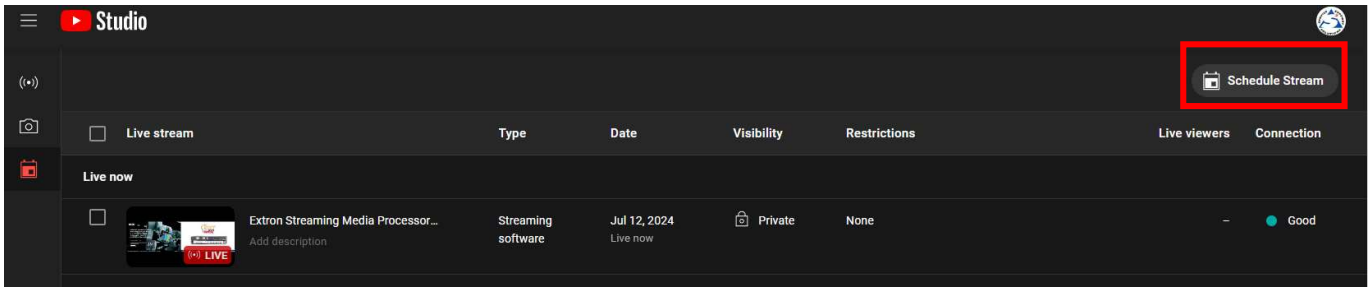
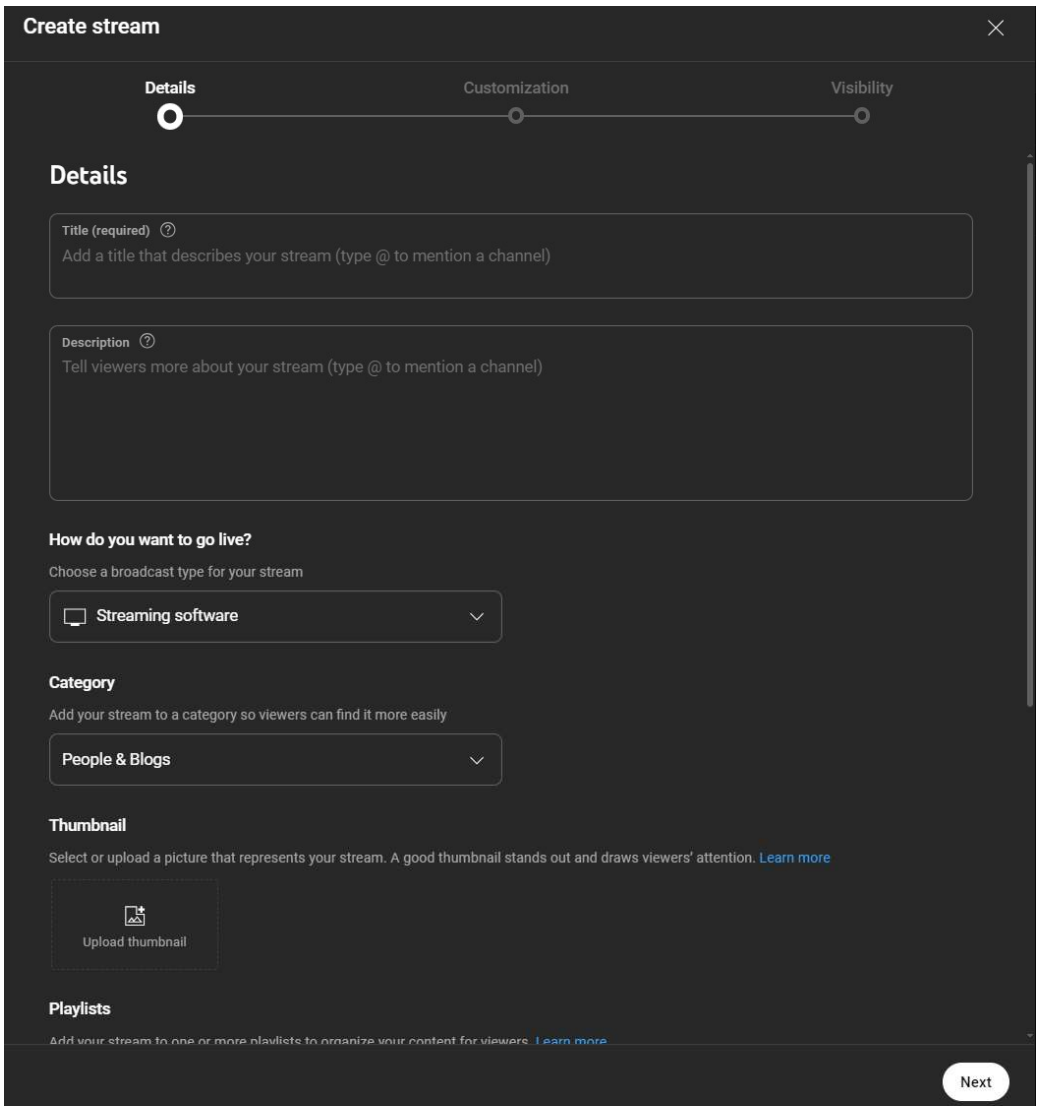
8. For **Scheduled Events** select **Schedule Stream** from the YouTube Studio top right corner:




9. Fill out information regarding title, description, category and select **Streaming Software.**



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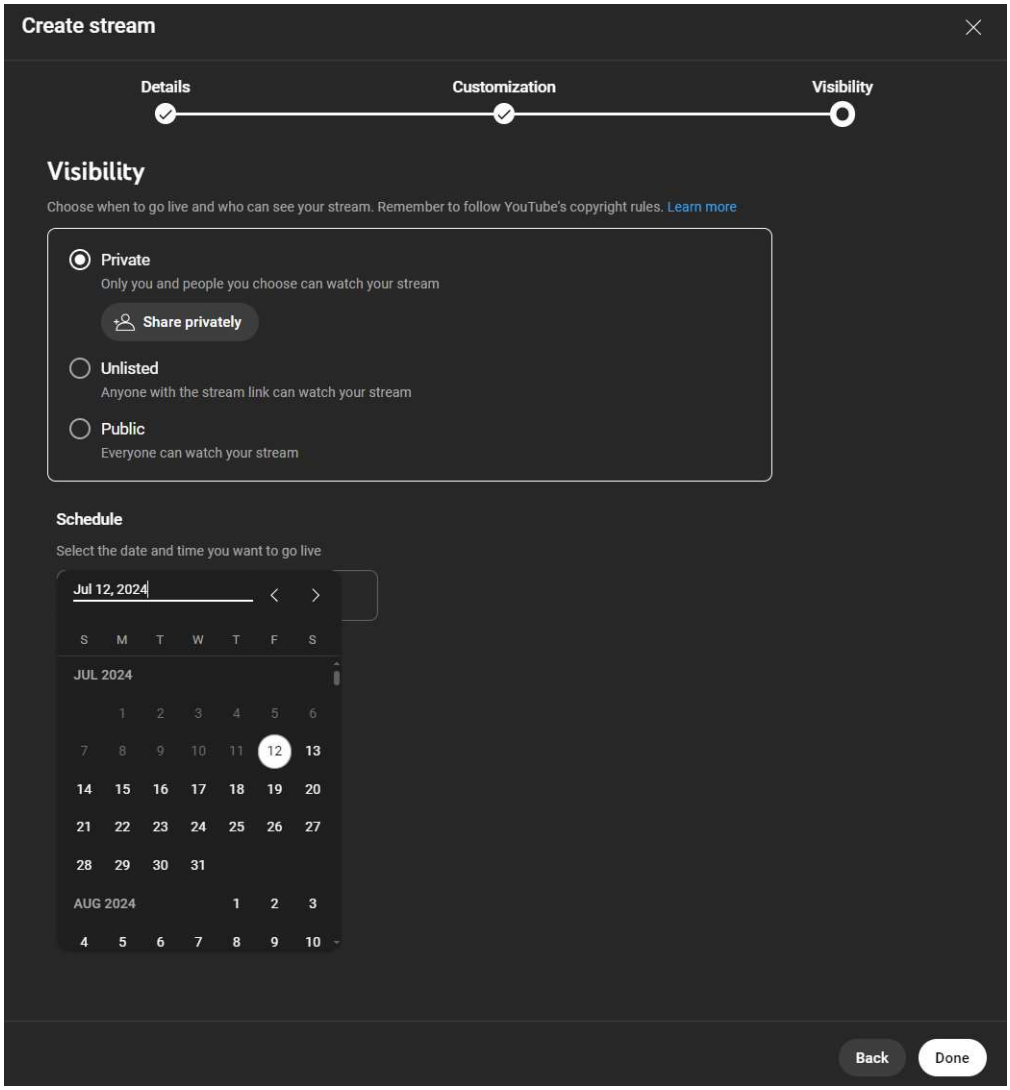
10. Select visibility, date and time, then select **Done** to create the scheduled stream.




11. Back on the YouTube Studio dashboard page, you should now see the preview display of the encoder's streaming content, and the content is ready to go live once scheduled date is met or you can choose to go live with from the top right corner.
12. See the previous section for options about Stream Keys and enabling Auto Start.



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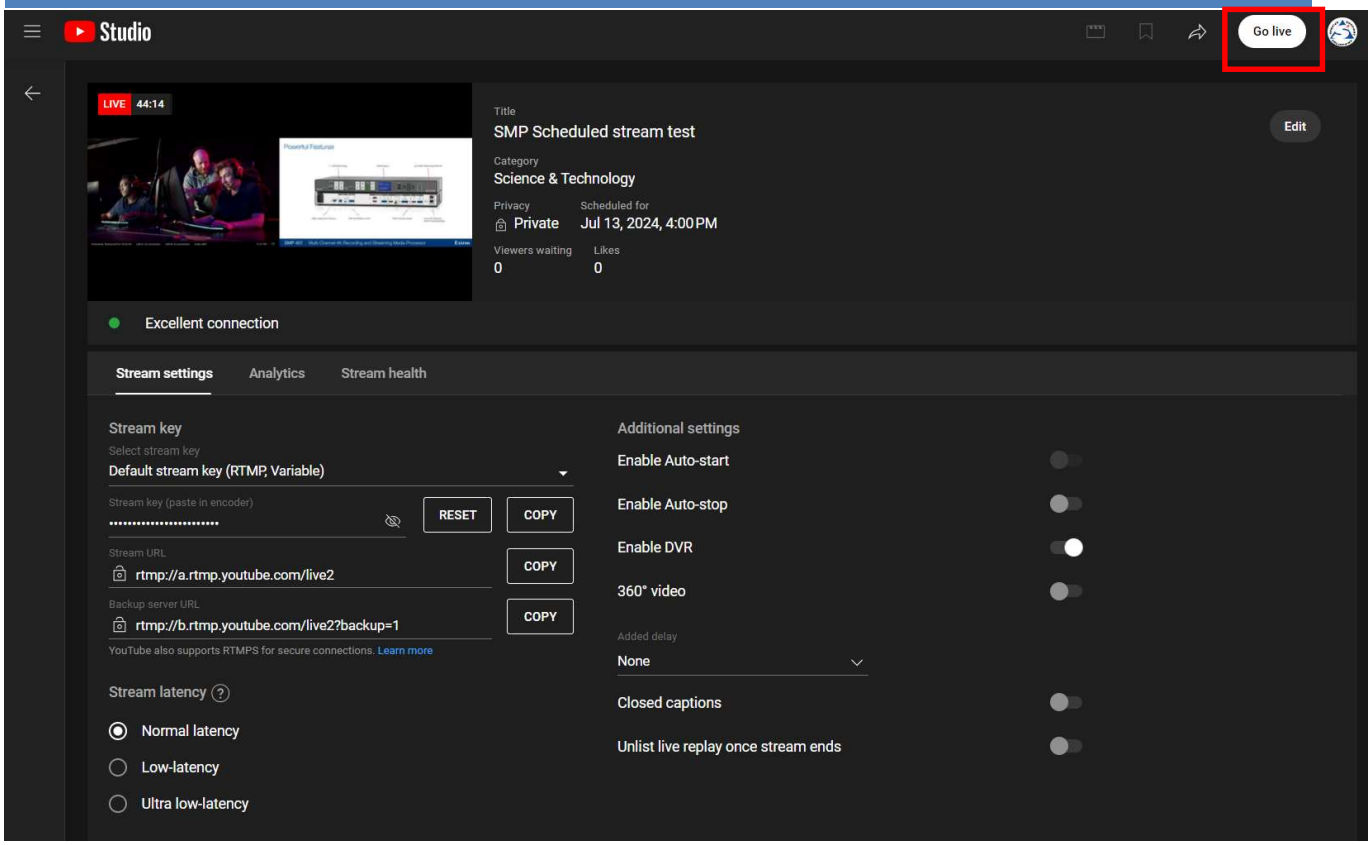


## Notes:

- Scheduled streams with a duration entered will automatically stop at the appropriate time.
- If scheduled without an end time on the YouTube page, press 

- Once a streaming Event is stopped in YouTube, it cannot be restarted. A new Event must be created.

After YouTube is stopped, then stop the Encoder. 





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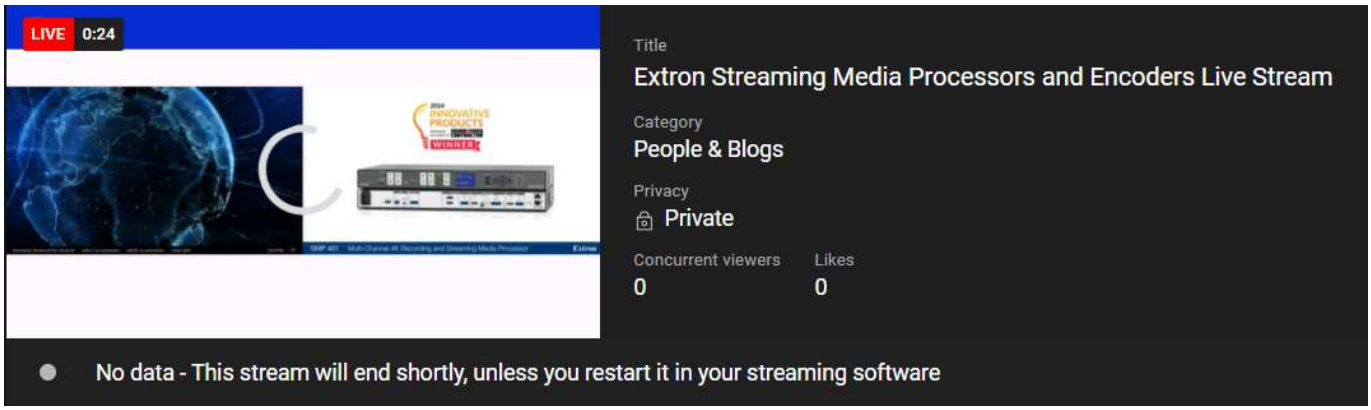
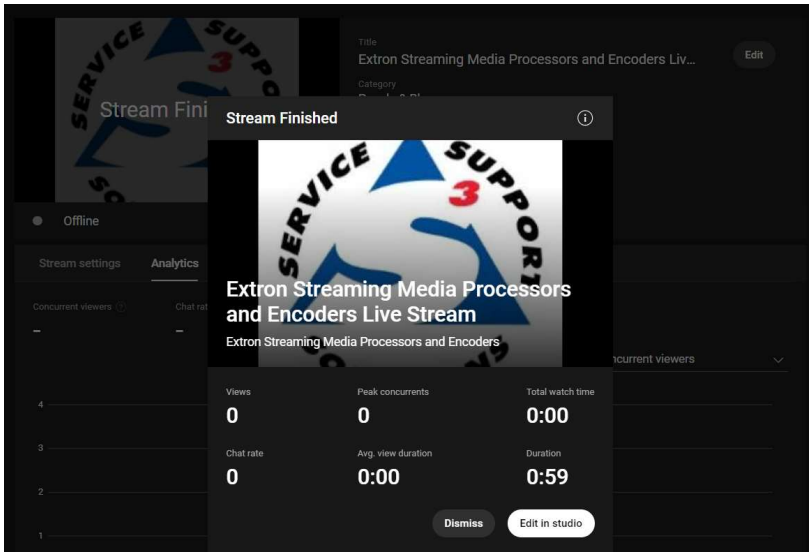
Note: If you stop the Encoder before the YouTube Stream, the public will see an error:




**Secure Streaming (RTMPs):**

You can stream to YouTube Live with **RTMPS**, a secure extension to the popular RTMP streaming video protocol. It is RTMP over a Transport Layer Security (TLS/SSL) connection and provides encryption.



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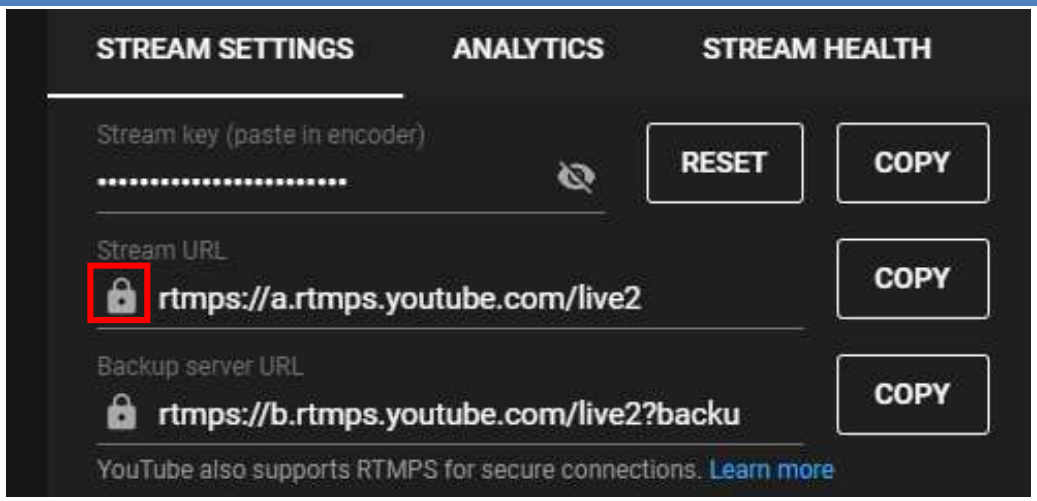


## Notes:

For SMP 300 Series and SMP 111

When you press apply – the URL will be:

rtmps://a.rtmps.youtube.com:**1935**/live2

You Must change the 1935 to 443 and press apply for proper operation of secure streaming:

rtmps://a.rtmps.youtube.com:**443**/live2



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## Troubleshooting:

1. Ensure the Encoder is configured for RTMP Streaming format.
2. Verify the Server URL and Stream Name are entered correctly.
    - Note: The Stream Name / Key will change if using “Basic Ingestion” profiles.
3. Verify that the SMP can Ping youtube.com – see page 2
4. Ensure that the Encoder’s Stream is started, and that the firewall is open to port 1935. See page 2 for NMAP instructions.

## Recommended Settings:

https://support.google.com/youtube/answer/2853702?hl=en&ref_topic=9257892&sjid=9348289071179525633-NC

Recommended **bitrate** setting ranges are based on video ingestion codec, video ingestion resolution and frame rate.

Audio Bitrate: 128 kbps
Audio Sample Rate: 44.1 kHz or 48 kHz
Resolution: Maximum 4K / 2160p @60fps
FPS: Max 60
GOP: Max 60 (ensure IDR interval ≤ 2 seconds) max 4
Video Bitrate: Set for 80% of available bandwidth using speed test depending upon resolution.

4K/60: 10000 -35000 kbps
1080p/60: 6400 – 12000 bps
1080p/30: 3200 – 6000 Kbps
720p/30: 1600 – 4000 Kbps
480p: 500 – 2000 Kbps

Rate Control: CBR
H.264 Profile: Main/High



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**GOP Information (Group of Pictures)**

Use a GOP setting to set how often a full I frame is sent.

**Formula: GOP/FrameRate = Interval**

Frame rate = 30, and GOP = 30 then 30/30 = 1 seconds: an I frame every 1 second.
Frame rate = 30, and GOP = 60 then 60/30 = 2 seconds: an I frame every 2 seconds.
Frame rate = 15, and GOP = 60 then 60/15 = 4 seconds: an I frame every 4 seconds.

An additional setting is available for IDR frames (Instantaneous Decoder Refresh). This setting along with GOP determines how often an Interstitial frame is sent. IDR Frames are helpful for editing and seek playback.

**Formula: (GOP/FrameRate) * IDR = Interval**

**Frame Rate =30, GOP =30, and IDR ratio =2:**

I frames alternate with IDR frames, with an IDR frame being sent every 2 seconds, in the order IDR, I, IDR, I.

**Frame Rate =30, GOP = 60, and IDR ratio = 1:**

Every I frame is also an IDR frame and they are sent every 2 seconds, in the order IDR, IDR, IDR, IDR.

**Frame Rate =30, GOP = 60, and IDR ratio =2:**

I frames alternate with IDR frames, with an IDR frame being sent every 4 seconds, in the order IDR, I, IDR, I.

**Frame Rate = 30, GOP = 20, and IDR ratio = 3:**

Every third I frame is an IDR frame with an IDR frame being sent every 2 seconds, in the order IDR, I, I, IDR, I, I.



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