GoStream Mini 200

Full 3G HEVC/H.264 Encoder

Manual

1. Product Introduction

1.1 General Introduction

The GoStream Mini 200 (GSM 200) is a small form-factor encoder designed for encoding live video using either advanced HEVC (High Efficiency Video Coding) Main Profile or H.264 BP/MP/HP video compression up to 1080p resolution at 60 frames per second, with CBR (Constant Bit Rate) & VBR (Variable Bit Rate) support from 64kbps ~ 32Mbps. The single SDI-3G or HDMI video inputs provide video capture capability in convenient formats for professional video feeds while the onboard USB 2.0 and gigabit Ethernet ports offer great flexibility in transporting the compressed video stream through wireless (such as WiFi, LTE, etc.) and wireline interconnections to remote and cloud side for archiving or further processing. The SD memory card interface can also be used for local storage. The module also features audio encoding from either embedded SDI/HDMI audio channels or a separate 3.5mm audio jack socket.

The encoder is supplied with software that allows for a streamlined workflow from video acquisition, encoding, streaming to archiving in a hassle-free approach for simplifying system adoption and integration effort. The well-defined web-based software APIs opens the possibilities for customization.

With a small physical dimension and low power dissipation characteristics, the GSM 200 can be easily applied to portable and mobile broadcasting, medical imaging, UAV (Unmanned Aerial Vehicle) applications, etc. where real-time and high-quality video content needs to be captured and transported in an efficient way using the latest HEVC compression standard.

1.2 Packing List

Before you begin installing your card, please make sure that the following items have been shipped:

- 1 GSM 200 Encoder
- 1 Power Adapter (VCC12 Load 0.4A)
- 1 Flash Drive
- 1 USB WiFi device

If any of these items are missing or damaged, please contact your distributor or sales representative immediately.

1.3 Safety Notice and Warnings

FCC Notice

This device complies with Subpart B of Part 15 of the FCC Rules. Operation is subject to the following two conditions:

This device may not cause harmful interference.

This device must accept any interference received, including interference that may cause undesired operation.

No Telecommunications Network Voltage (TNV)-connected PCBs shall be installed.
Other Certifications
This class A digital apparatus complies with Canadian ICES-003, Issue 4.
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.
This device complies with EN 55022 standards.
This device complies with EN 61000-3-2 standards.
This device complies with EN 61000-4-2 standards.
This device complies with CISPR 22 Edition 6.
This device complies with AS/NZS CISPR 22.

Notice
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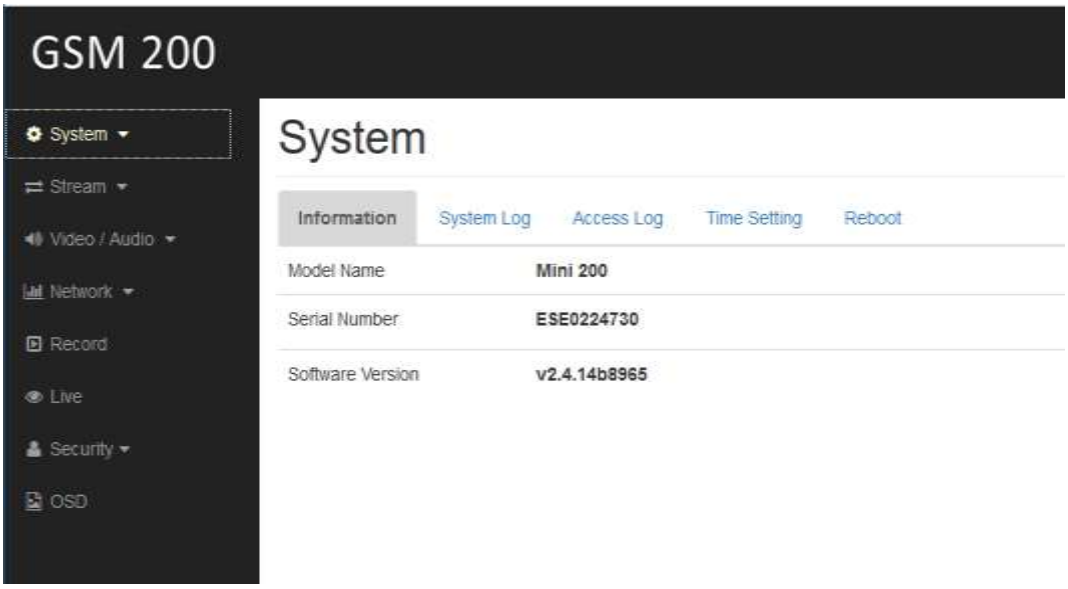
1.4 Product Specifications

Hardware	**Features**	1-ch HEVC/H.264 1080p60 encode 1-ch SDI-3G & HDMI video inputs One HDMI monitor output One audio phone jack input One USB 2.0 Type-A connector One gigabit Ethernet RJ-45 connector One SD Card connector One mini-USB console port Onboard 1GB DDR3 memory
	Form-factor	Small form-factor (90x100 mm)
	Power Consumption	< 5W (VCC12 Load 0.4A)
	Operating Temperature	0C to +40C ambient air temperature around board
Video Input	**Channels**	1 (up to 1080p60, 8bit, YUV)
	Video Formats	HD, SD
	Frame Rates	HDMI 1.4 Interface 1920x1080: 60p / 59.94p / 50p / 30p / 29.97p / 25p / 24p 1280x720: 60p / 59.94p / 50p / 30p / 29.97p / 25p / 24p 720x576: 50p 720x480: 60p / 59.94p BNC (3G-SDI) Interface 1920x1080: 60p / 59.94p / 50p / 30p / 29.97p / 25p / 24p 1280x720: 60p / 59.94p / 50p / 30p / 29.97p / 25p / 24p 720x576: 50p 720x480: 60p / 59.94p
	Chroma Sampling Format	4:2:2 / 4:2:0
	Interfaces (only one active)	HDMI 1.4 3G-SDI BNC (SMPTE424M Level A)
Video Output	**Compression**	H.265 (HEVC)/H.264
	HEVC Profile	Main
	HEVC Tier	Main
	HEVC Level	1.0 / 2.0 / 2.1 /3.0 / 3.1 / 4.0 / 4.1
	Bitrate 1080P format	64 Kbps ~ 32 Mbps
	Bit Depth / Chroma Subsampling	8 bit / 4:2:0
	Bit Rate Control	CBR/VBR
	Output Format	RTSP/MP4
Audio	**Channels**	Up to 2
	Format	AAC encoding
	Sampling Rates	48Khz/16bit
	Connectors	HDMI 1.4 / SDI-3G / Line-In
Web	**PC/Mobile phone**	IE/Chrome/FireFox

2. Accessing the Encoder

2.1 Accessing the Encoder via the Web Browser

1. **The default IP address for the Ethernet port is 192.168.1.10**
2. **The Wi-Fi default IP address is 192.168.0.1**
3. **The Wi-Fi password is ”aclncgvsd” .**
4. **Please setup your PC to the same domain to connect to the GSM 200 (192.168.1.x)**
5. **Start the Web browser on the computer and type 192.168.1.10 in the URL address bar**
6. **The System Info page should be displayed as follows.**



2.2 Upgrading Firmware

The GSM 200 factory default firmware can be automatically updated by means of a USB storage thumb drive.

1. **Prepare an empty USB disk**
2. **Download the firmware file from the Niagara web site or from a support person.**
3. **Put firmware file, "GSM200_XXXX.upd", onto the USB disk.**
4. **Insert USB to GSM 200 module and remove other devices (LAN & video source) except for power adaptor .Then power on it.**
5. **Power LED will keep blink red light, this indicate upgrade is on-going.**
6. **After firmware update finish, module will be powered off automatically. And Power LED will be Red light.**
7. **Please remember to remove USB disk.**
8. **Checking software version from Web, System → Information → Software version**

[NOTE]

- **After the GSM 200 powers on, if you insert the USB with the firmware file within 40 seconds, GSM 200 encoder will load the new firmware. After the firmware updates, the GSM 200 will be powered off.**
- **But if there is no firmware file (GSM200_XXXX.upd) on the USB, the GSM 200 will neither execute the update nor power off.**

Beware that if the GSM 200 has powered on for over 40 seconds, then no matter which USB (with firmware file or not) you insert afterwards, the GSM 200 will neither execute the update nor power off.

[NOTE] Please restore GSM 200 to factory default after upgrading Firmware. (see 2.3)

2.3 Restoring the GSM 200 to factory defaults

A hard reset will restore the GSM 200 to factory default settings. Push the button for at least 5 seconds and the GSM 200 will reset to factory default settings. After restoring to default, the GSM 200 will reboot automatically.

3. Web Interface

3.1 System Page

This System page shows the product Information.

Information

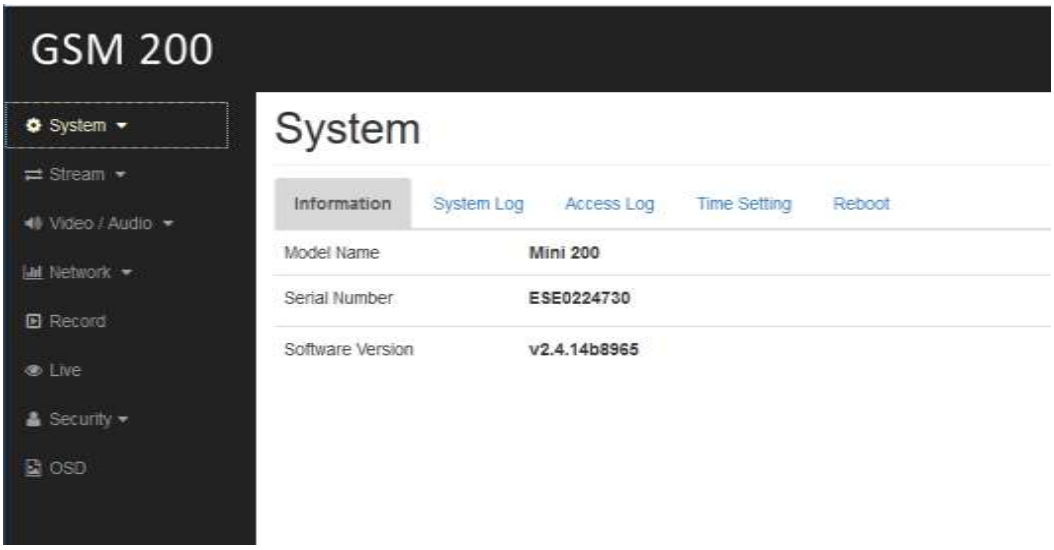
Information includes Model Name, Serial Number and Software Version

Time Setting

This is where you can set the time with an NTP server

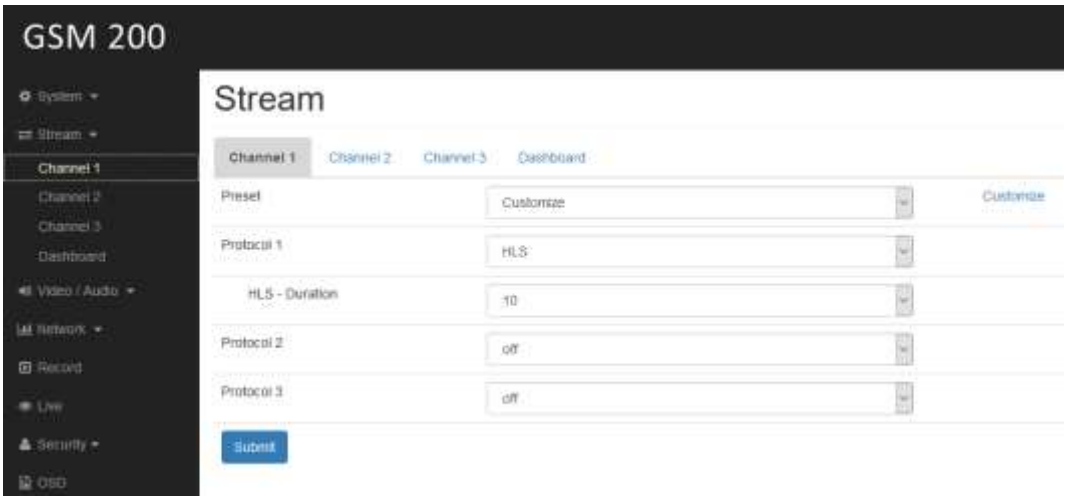
Reboot

You can re-boot the device from this tab



3.2 Stream Settings Page

Use this Stream page to configure each “Channel”. Each Channel can have up to 3 outputs.

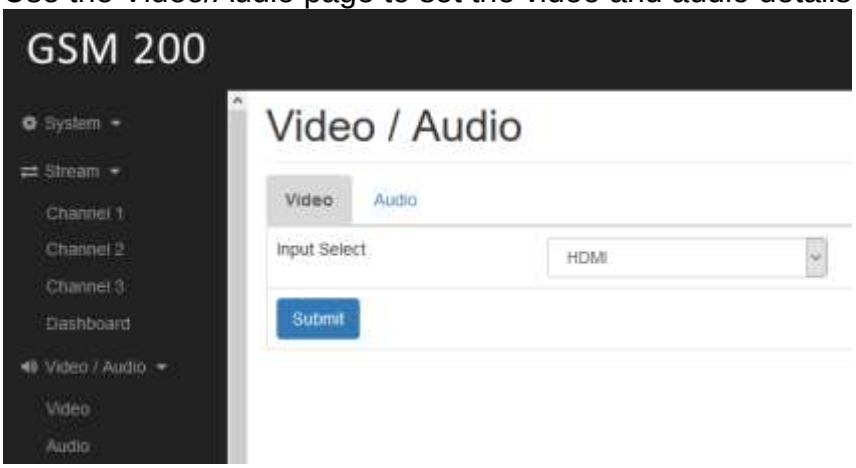


- **Protocol 1**
- **Select HLS, RTMP, TS over IP or off.**
- **Protocol 2**
- **Select RTMP, TS over IP or off.**
- **Protocol 3**
- **Select RTMP, TS over IP or off.**
- **HLS - Duration**
- **If set Protocol 1 to “HLS”, the duration of HLS can be set.**
- **TS – Protocol**
- **If Protocol 1/2/3 is set to “TS over IP”, the TS-protocol can be tcp or udp.**

1. **TS – IP**
   The IP address is entered here. This can be a unicast address or a multicast address.
2. **TS – Port**
   The port is entered here.
3. **RTMP – URL**
   The URL for the server and application is entered here. For example; rtmp://192.168.10.10:1935/live
4. **RTMP - Key**
   The key, also called stream name is entered here.
5. **Video Settings (You can use the presets to save time or click on Customize)**
   - **Encoding**
     Select H.265 (HEVC), H.264. For Profiles 2 and 3 they can be set to off as well.
   - **Resolution**
     Select the resolution of encoded output stream.
   - **Frame rate**
     Set the frame rate of the output stream.
   - **I-picture interval**
     Set the I-picture insertion interval in seconds.
   - **H264 Profile**
     Set the profile setting for H.264 to high, main or baseline if H.264 is selected.
   - **Bit rate compression mode**
     Select Constant Bit Rate (CBR), or Variable Bit Rate (VBR).
   - **Bit rate**
     When you set the codec to H.265/H.264 and set Bit rate compression mode to CBR, the target bit rate of the output stream can be set.
   - **Image quality**
     When you set Image codec to H.265/H.264 and set Bit rate compression mode to VBR, the quality of the output stream can be set. (1 being the lowest and 10 being the highest)

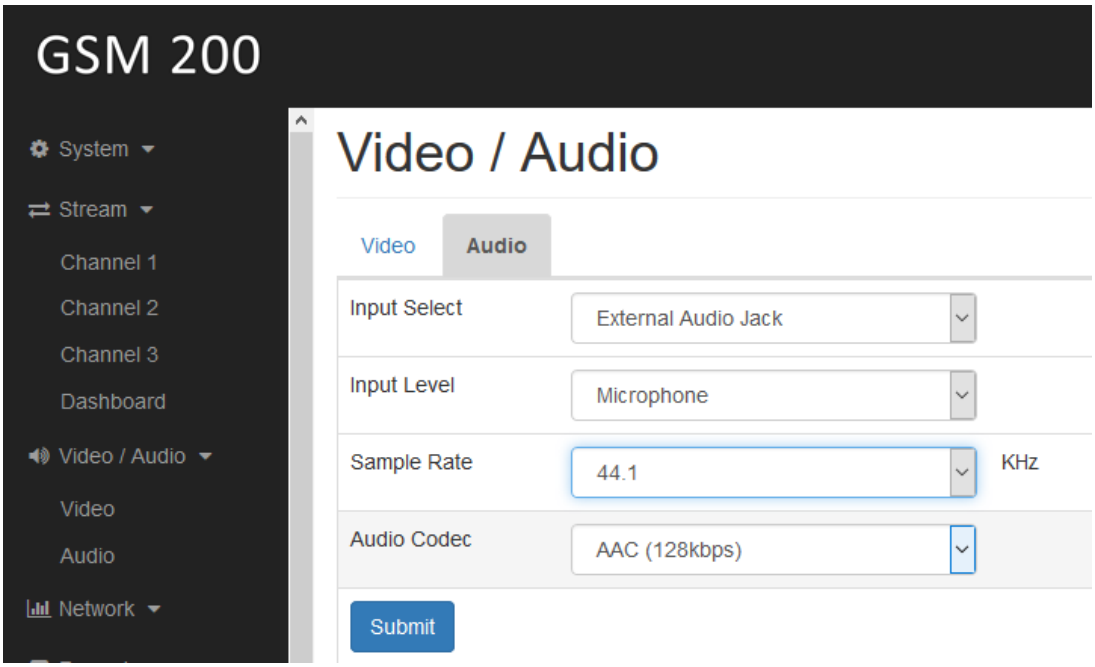
3.3 Video/Audio Stream

Use the Video/Audio page to set the video and audio details for the active stream.



1. **Video Stream**
   - **Input Select**
     Select either SDI or HDMI for the input.

2. **Audio Stream**
   - **Input Select**
     Select either “SDI/HDMI” or “External Audio Jack”.
   - **Input Level**
     You can select Microphone or Line in for “External Audio Jack”. The encoder will provide voltage bias for Microphone if Input Level is “Microphone”.
   - **Sample Rate**
     Select the sample rate when “External Audio Jack” is selected.
   - **Audio Codec**
     Select the bit rate desired.

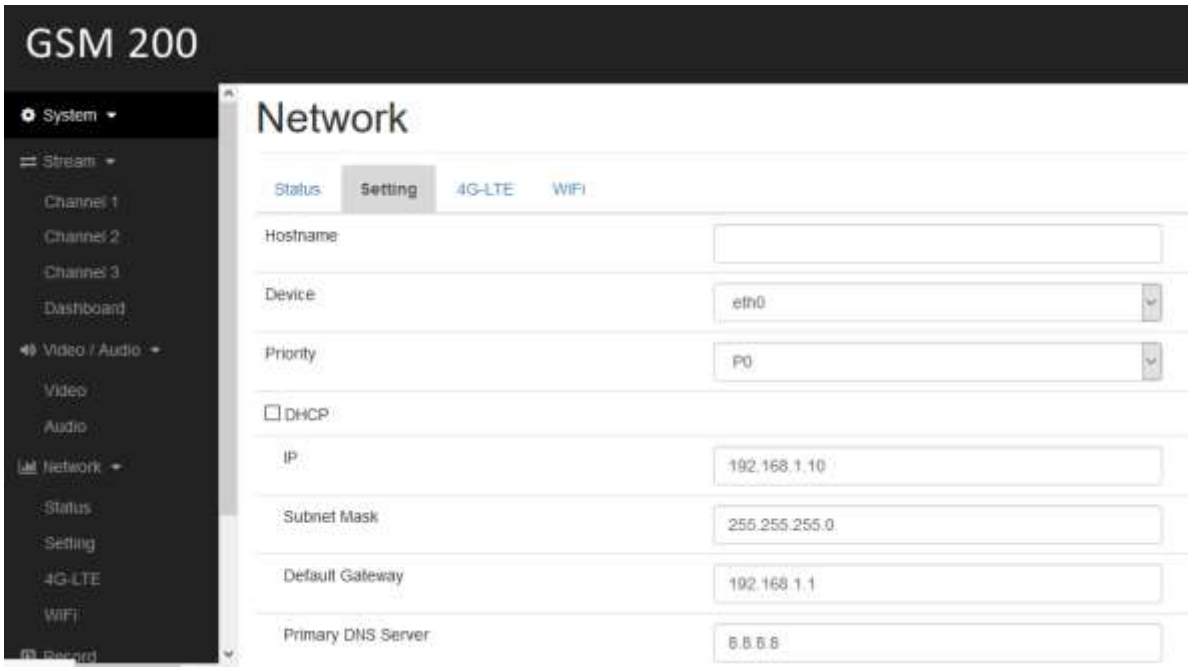


3.4 Network settings

Use this Network page to show or set the items for the Network.

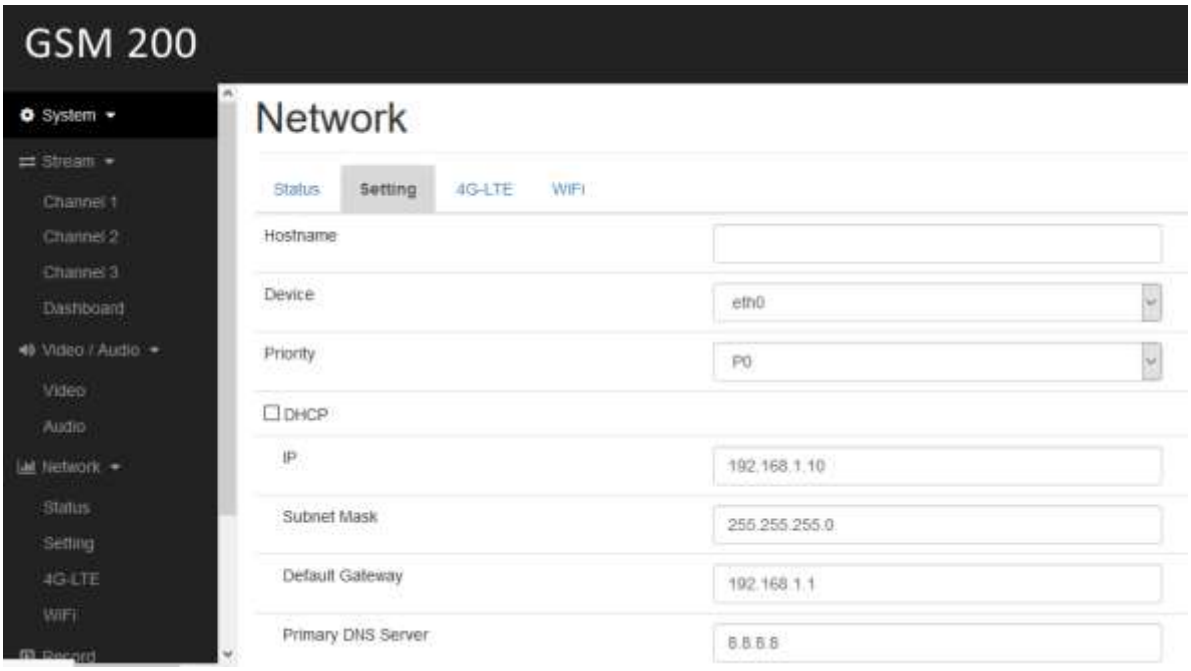
1. Status

Shows the Network status include MAC Address, Ethernet Status, Auto-MDI/MDIX, IP Address, Subnet Mask, Default Gateway, Primary DNS Server, Secondary DNS Server.



2. **IPv4 Setting**
   a. **To get IP settings automatically check the DHCP to obtain an IP address automatically.**

   b. **To specify static settings IP address, un-click the DHCP box.**



3.5 Record settings

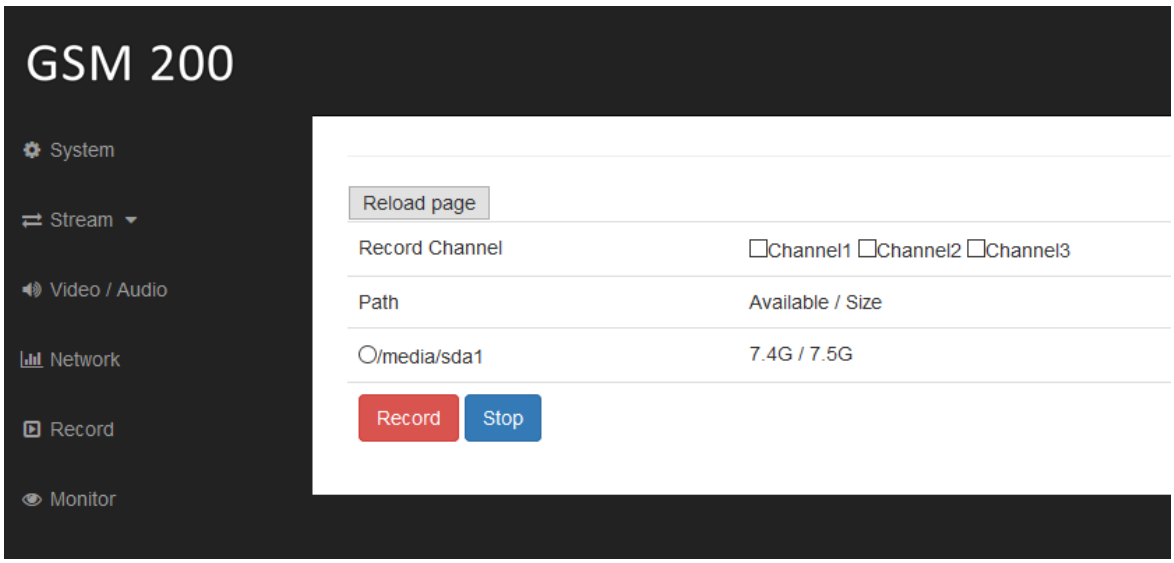
Use this page to record for Profile1/ Profile 2/ Profile 3.

Record Channel

The default **video setting** is Channel 1(H265) / Channel 2(Off) / Channel 3(Off). So you can only check the Profile 1 recording.

Storage Path

You can insert USB or SD card storage and press the “Reload page” button. It will show the storage information.



Record

Check which stream channel you want to record and check the recording path. Press the “Record” button to start recording.

Stop

Press the “Stop” button to stop recording.

[NOTE]

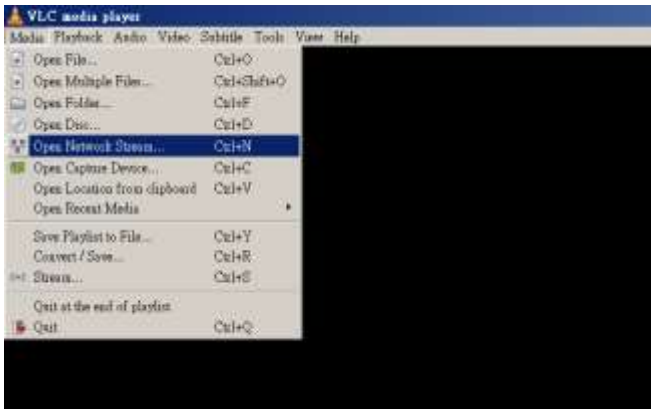
- **While recording, the “Power LED” will flash a yellow light. The “Power LED” will be a solid yellow light after stopping the recording.**
- **Channel 1 has video and audio recording, Channel 2 & Channel 3 only have video recording.**

4. How to stream

4.1 RTSP/RTP

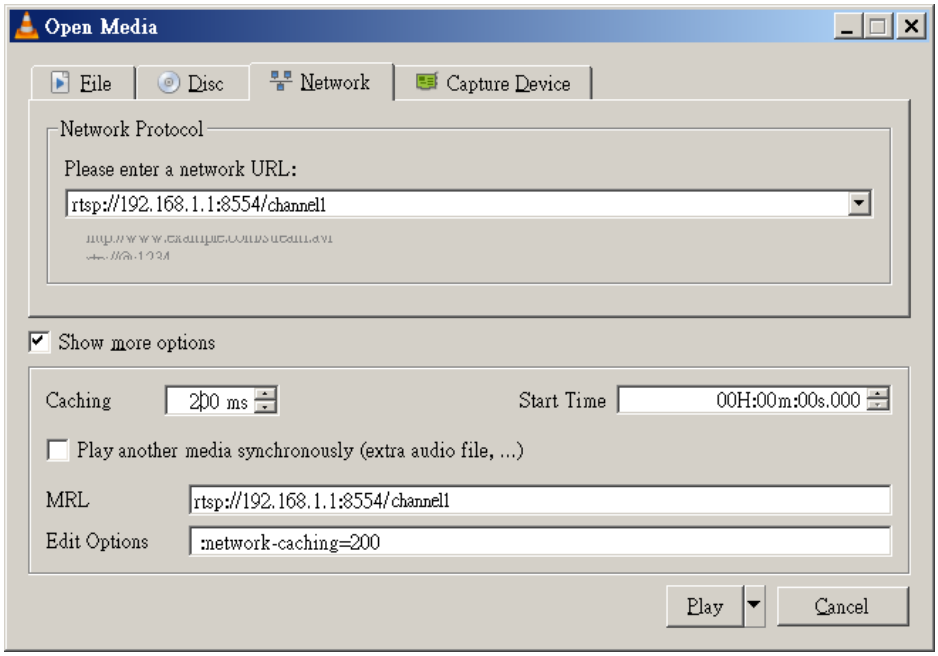
This section shows how to open RTSP streaming from VLC on a suitable player. Please make sure that SDI / HDMI source is connected to GSM 200 correctly before starting.

1. Open Network Stream from VideoLAN VLC media player



2. Use this URL to play RTSP streams, it is recommended to set caching to small value.

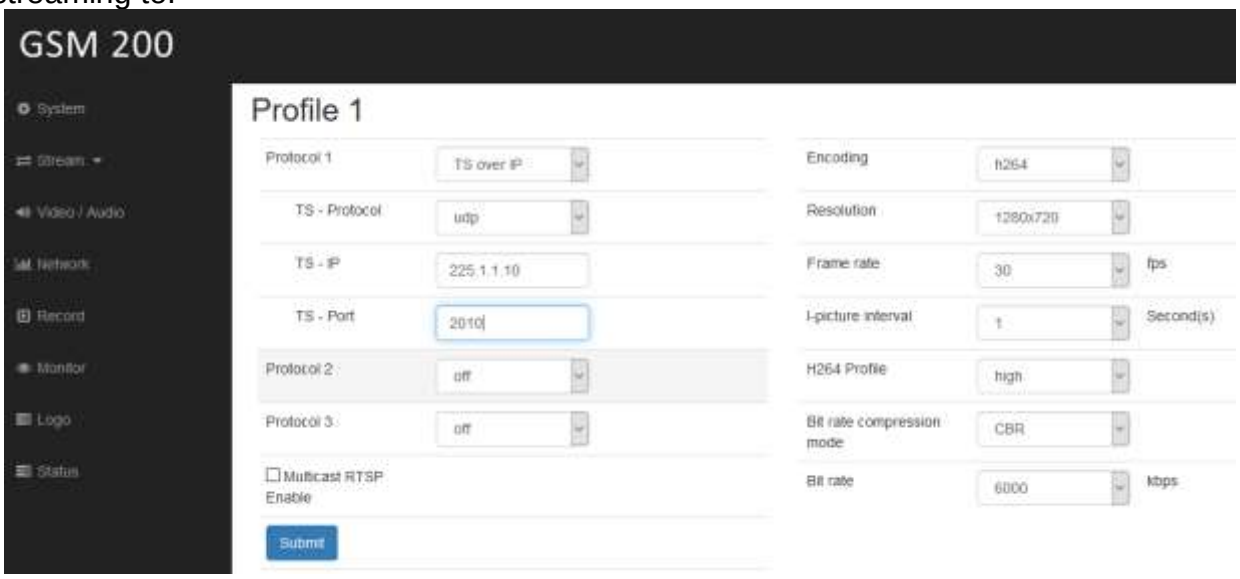
```
rtsp://{GSM200-ip-address}:8554/channel1
```



4.2 MPEG-TS

This section shows how to play MPEG-TS from VLC. Please make sure that SDI / HDMI source is connected to GSM 200 correctly before starting.

1. Start the VLC player and select Open Network Stream as before.
2. Enter the TS IP address from the encoder. Note that the syntax is udp://@225.1.1.10:2010 for a multicast address. For unicast to a PC you can use a short version udp://@1234 where 1234 is the port number. The encoder must have the IP address of the computer you are streaming to.



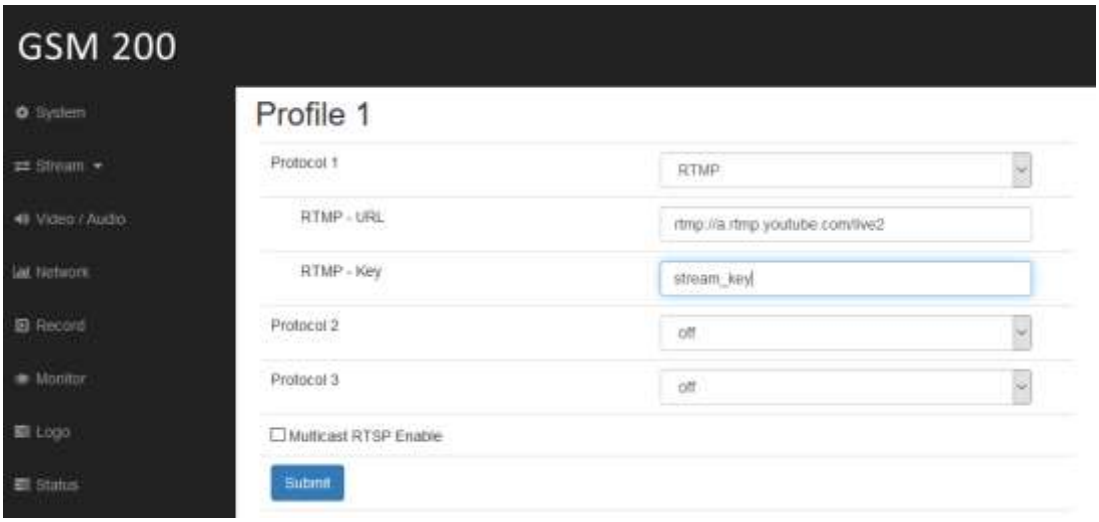
[NOTE]

- **Multicast UDP streaming address range: 224.0.0.0 to 239.255.255.255.**

4.3 RTMP

This section shows how to stream to Youtube & Facebook. You can use the same procedure for other CDNs and media servers such as Wowza and Adobe Media Server. Please make sure that the SDI / HDMI source is connected to GSM 200 correctly before starting.
[NOTE] There is no support for RTMP/HEVC, only H.264.

1. **Youtube**
   (1) YouTube Dashboard **https://www.youtube.com/live_dashboard**
   (2) You can get Server URL : "*rtmp://a.rtmp.youtube.com/live2*" and Stream name/key : "*xxxx-xxxx-xxxx-xxxx*"
   (3) Fill in the corresponding RTMP Key and RTMP URL on the Profile page.
   •



   (4) Submit
   (5) You can start streaming to YouTube Live.

2. **Facebook**

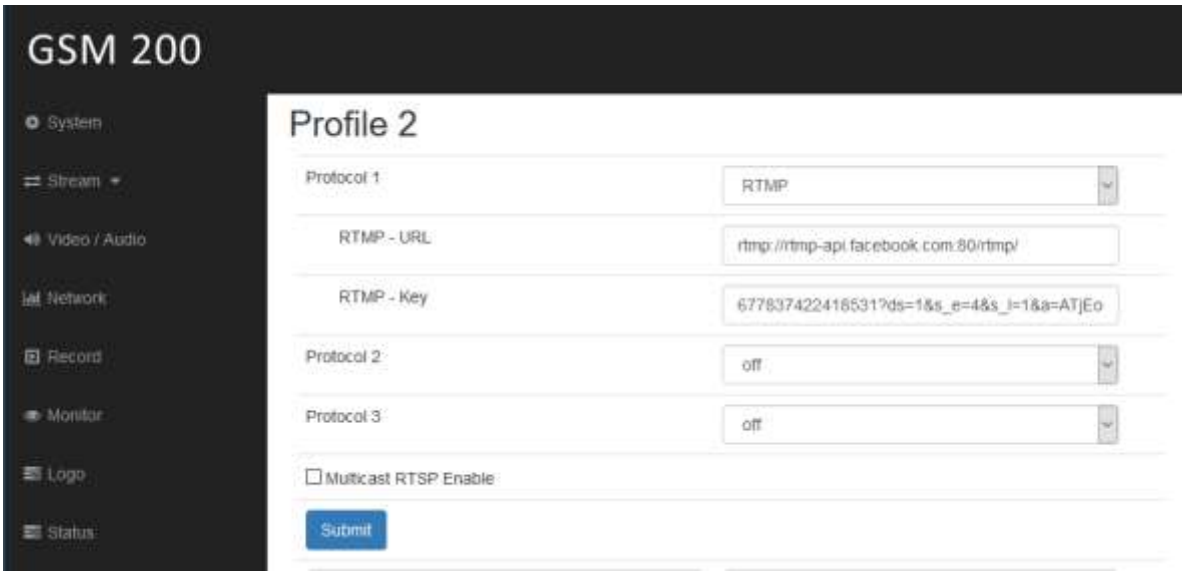
(1) How to Broadcast from your Computer with Facebook Live
http://iag.me/socialmedia/broadcast-computer-facebook-live/

(2) Press Facebook Live Button and broadcast on Facebook Live

(3) Continue

(4) You can get the Server URL : "rtmp://rtmp-api.facebook.com:80/rtmp/"
and Stream name/key : "*xxxxxxxxxxxxxxxxx?ds=1&a=xxxxxxxxxxxxxxx*"

(5) Fill in the corresponding RTMP Key and RTMP URL on the Profile page .



(6) Submit

(7) You can start streaming to Facebook Live.

4.4 HTTP Live Streaming

HTTP Live Streaming (HLS) is an HTTP-based media streaming communications protocol implemented by Apple Inc. as part of its QuickTime, Safari, OS X, and iOS software. It works by breaking the overall stream into a sequence of small HTTP-based file downloads, each download loading one short chunk of an overall potentially unbounded transport stream.

- **Use this URL to play the HLS stream:**
  http://<IP ADDRESS OF ENCODER>/hls/channel1.m3u8

4.5 Status Page

The Status Page shows the current status of the encoder.

Appendix A: Hardware/Software Support List

A1. Hardware support list

Input selection	mode	Status	Notes
3G SDI	1ch	Supported	
HDMI	1ch	Supported	Input and Outputs
Audio phone jack	1ch	Supported	

A2. GSM 200 video encoding performance

◎ Input source：1080p 60

	Channel1 (H265) : 6M	Channel2 (H265) :3M	Channel3 (H265) : 1.5M
1 stream	1920x1080 (60fps)	X	X
2 streams	1920x1080 (60fps)	1024x576 (60fps)	X
2 streams	1920x1080 (60fps)	1280x720 (30fps)	X
3 streams	1920x1080 (30fps)	1280x720 (30fps)	720x480 (30fps)

◎ Input source：1080p 50

	Channel1 (H265) : 6M	Channel2 (H265) :3M	Channel3 (H265) : 1.5M
1 stream	1920x1080 (50fps)	X	X
2 streams	1920x1080 (50fps)	1280x720 (50fps)	X
3 streams	1920x1080 (50fps)	1280x720 (30fps)	720x480 (30fps)

◎ Input source：720p 60

	Channel1 (H265) : 6M	Channel2 (H265) :3M	Channel3 (H265) : 1.5M
1 stream	1280x720 (60fps)	X	X
2 streams	1280x720 (60fps)	1280x720 (30fps)	X
3 streams	1280x720 (60fps)	1280x720 (30fps)	720x480 (30fps)

◎ Input source：720p 50

	Channel1 (H265) : 6M	Chan	Channel3 (H265) : 1.5M
1 stream	1280x720 (50fps)	X	X
2 streams	1280x720 (50fps)	1280x720 (50fps)	X
3 streams	1280x720 (30fps)	1280x720 (30fps)	720x480 (30fps)

◎ Input source：1080p 60

	Channel1 (H264) : 6M	Channel2 (H264) :3M	Channel3 (H264) : 1.5M
1 stream	1920x1080 (60fps)	X	X
2 streams	1920x1080 (60fps)	1024x576 (60fps)	X
2 streams	1920x1080 (60fps)	1280x720 (30fps)	X
3 streams	1920x1080 (30fps)	1280x720 (30fps)	720x480 (30fps)

◎ Input source：1080p 50

	Channel1 (H264) : 6M	Channel2 (H264) :3M	Channel3 (H264) : 1.5M
1 stream	1920x1080 (50fps)	X	X
2 streams	1920x1080 (50fps)	1280x720 (50fps)	X
3 streams	1920x1080 (50fps)	1280x720 (50fps)	720x480 (30fps)

◎ Input source：720p 60

	Channel1 (H264) : 6M	Channel2 (H264) :3M	Channel3 (H264) : 1.5M
1 stream	1280x720 (60fps)	X	X
2 streams	1280x720 (60fps)	1280x720 (60fps)	X
3 streams	1280x720 (60fps)	1280x720 (60fps)	640x480 (30fps)

◎ Input source：720p 50

	Channel1 (H264) : 6M	Channel2 (H264) :3M	Channel3 (H264) : 1.5M
1 stream	1280x720 (50fps)	X	X
2 streams	1280x720 (50fps)	1280x720 (50fps)	X
3 streams	1280x720 (50fps)	1280x720 (50fps)	640x480 (50fps)

A3. Supported Wireless dongle list

Ve	Model Name
Re alt ek	RTL8188CUS RTL8188RU RTL8188CUS-Slim Solo RTL8188CUS-Slim Combo RTL8188CE-VAU RTL8188CUS-VL RTL8188CTV RTL8192CUS RTL8192CE-VAU RTL8812AU

[NOTE]
Only these are officially supported.