datavideo

4K MULTI-CHANNEL
STREAMING SWITCHER

KMU-300

Instruction manual

www.datavideo.com

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Disclaimer of Product & Services

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FCC Compliance Statement

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Warnings and Precautions

1. Read all of these warnings and save them for later reference.
2. Follow all warnings and instructions marked on this unit.
3. Unplug this unit from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning.
4. Do not use this unit in or near water.
5. Do not place this unit on an unstable cart, stand, or table. The unit may fall, causing serious damage.
6. Slots and openings on the cabinet top, back, and bottom are provided for ventilation. To ensure safe and reliable operation of this unit, and to protect it from overheating, do not block or cover these openings. Do not place this unit on a bed, sofa, rug, or similar surface, as the ventilation openings on the bottom of the cabinet will be blocked. This unit should never be placed near or over a heat register or radiator. This unit should not be placed in a built-in installation unless proper ventilation is provided.
7. This product should only be operated from the type of power source indicated on the marking label of the AC adapter. If you are not sure of the type of power available, consult your Datavideo dealer or your local power company.
8. Do not allow anything to rest on the power cord. Do not locate this unit where the power cord will be walked on, rolled over, or otherwise stressed.
9. If an extension cord must be used with this unit, make sure that the total of the ampere ratings on the products plugged into the extension cord do not exceed the extension cord rating.
10. Make sure that the total amperes of all the units that are plugged into a single wall outlet do not exceed 15 amperes.
11. Never push objects of any kind into this unit through the cabinet ventilation slots, as they may touch dangerous voltage points or short out parts that could result in risk of fire or electric shock. Never spill liquid of any kind onto or into this unit.
12. Except as specifically explained elsewhere in this manual, do not attempt to service this product yourself. Opening or removing covers that are marked "Do Not Remove" may expose you to dangerous voltage points or other risks, and will void your warranty. Refer all service issues to qualified service personnel.
13. Unplug this product from the wall outlet and refer to qualified service personnel under the following conditions:

a. When the power cord is damaged or frayed;
b. When liquid has spilled into the unit;
c. When the product has been exposed to rain or water;
d. When the product does not operate normally under normal operating conditions. Adjust only those controls that are covered by the operating instructions in this manual; improper adjustment of other controls may result in damage to the unit and may often require extensive work by a qualified technician to restore the unit to normal operation;
e. When the product has been dropped or the cabinet has been damaged;
f. When the product exhibits a distinct change in performance, indicating a need for service.

Warranty

Standard Warranty

- Datavideo equipment are guaranteed against any manufacturing defects for one year from the date of purchase.
- The original purchase invoice or other documentary evidence should be supplied at the time of any request for repair under warranty.
- The product warranty period begins on the purchase date. If the purchase date is unknown, the product warranty period begins on the thirtieth day after shipment from a Datavideo office.
- All non-Datavideo manufactured products (product without Datavideo logo) have only one year warranty from the date of purchase.
- Damage caused by accident, misuse, unauthorized repairs, sand, grit or water is not covered under warranty.
- Viruses and malware infections on the computer systems are not covered under warranty.
- Any errors that are caused by unauthorized third-party software installations, which are not required by our computer systems, are not covered under warranty.
- All mail or transportation costs including insurance are at the expense of the owner.
- All other claims of any nature are not covered.
- All accessories including headphones, cables, and batteries are not covered under warranty.
- Warranty only valid in the country or region of purchase.
- Your statutory rights are not affected.

Three Year Warranty

- All Datavideo products purchased after July 1st, 2017 are qualified for a free two years extension to the standard

warranty, providing the product is registered with Datavideo within 30 days of purchase.

- Certain parts with limited lifetime expectancy such as LCD panels, DVD drives, Hard Drive, Solid State Drive, SD Card, USB Thumb Drive, Lighting, Camera module, PCIe Card are covered for 1 year.

- The three-year warranty must be registered on Datavideo's official website or with your local Datavideo office or one of its authorized distributors within 30 days of purchase.

Disposal
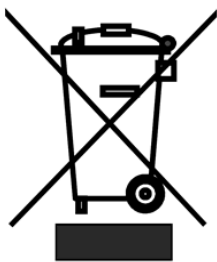
For EU Customers only - WEEE Marking

This symbol on the product or on its packaging indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

CE Marking is the symbol as shown on the left of this page. The letters "**CE**" are the abbreviation of French phrase "Conformité Européene" which literally means "European Conformity". The term initially used was "EC Mark" and it was officially replaced by "CE Marking" in the Directive 93/68/EEC in 1993. "CE Marking" is now used in all EU official documents.

Chapter 1   Introduction

The KMU-300 is a single unit which allows users to convert 4K input signal to the 1080 high definition output signal. Moreover, it allows users to use joystick and knob to control the Zoom IN, Zoom OUT, Tilt and Pan of the virtual PTZ camera. The buttons allow users to control KMU-300's picture selection. Furthermore, its 14" capacitive touch screen allows users to assign their desired pictures for switching by gesture control.

The KMU-300 allows users to output multiple landscape or portrait pictures simultaneously. The high-definition output signal can be streamed to many mainstream live-streaming platforms and can be stored in SD card. The KMU-300 achieves camera control, audio mixing, backup recording within one single tiny unit which is suitable for we media studio especially. The multitasking production can be done by one single person.

1.1   Features

- One 4K input for splitting into four Full HD channels.
- Joystick and Zoom knob for moving the cropped video.
- Intuitive multi-touch gestures for controlling Zoom IN, Zoom OUT, Pan and Tilt.
- Streams to major live streaming platforms.
- Real time video backup recording with a bitrate up to 16Mbps.
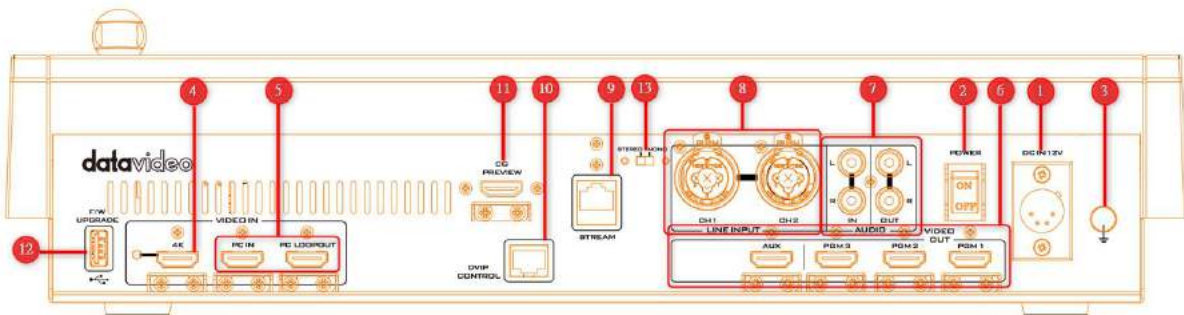- Portrait video streaming designed specifically for social media applications.

1.2   System Diagram
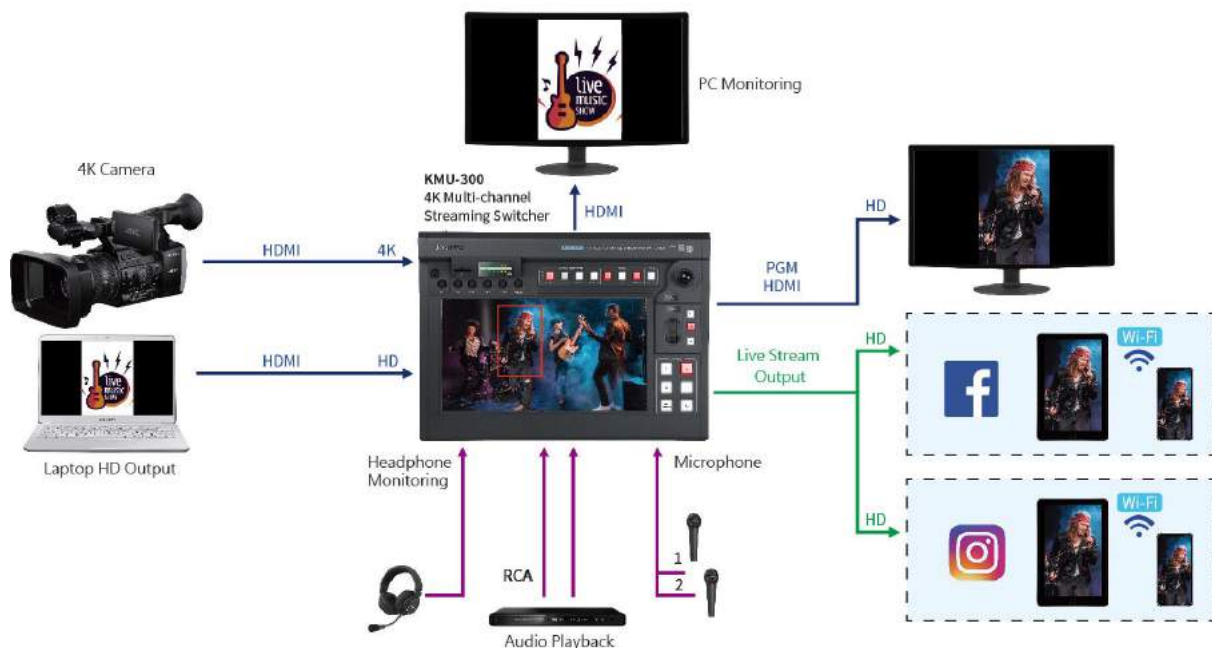
Chapter 2   Connections to the KMU-300

In this section, you will be provided with general overviews of the rear panel as well as the control panel.
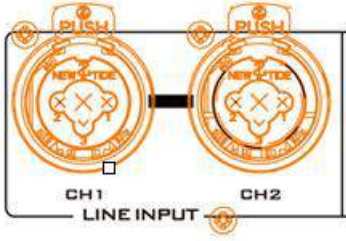
2.1   Rear Panel

This section provides brief descriptions of various connection ports on the rear panel.

Power		
1	DC IN 12V	**DC IN** DC in socket connects the supplied 12V PSU. Pin 1 = GND (-) Pin 2 = NC Pin 3 = NC Pin 4 = VCC (+)
2	POWER ON OFF	**Power Switch** Turns ON/OFF the device
3		**Grounding Terminal** When connecting this unit to any other component, make sure that it is properly grounded by connecting this terminal to an appropriate point. When connecting, use the socket and be sure to use wire with a cross-sectional area of at least 1.0 mm^2.
Video		

4	**4K**	**4K HDMI IN** Video IN supporting up to 2160p50/59.94/60. The green LED on the left indicates presence of the 4K input.
5	PC IN PC LOOPOUT	**PC IN** Connect a PC or laptop. **PC LOOPOUT** Connect a monitor for displaying PC IN video.
6	AUX PGM 3 PGM 2 PGM 1	**AUX Output** The AUX port outputs one of Channel 1/2/3/4 videos, which can be set in **OSD menu**. **PGM 1/2/3 Output** The PGM 1, PGM 2 or PGM 3 port outputs one of Channel 1/2/3/4 videos, full screen of the image captured by the camera and PC IN view. You can also select your PGM Output Channel using the channel buttons on the control panel. See **Channel Buttons** for details of operation.
	Audio	
7	L L R R IN OUT AUDIO	**Audio IN/OUT – Stereo RCA** Connect unbalanced analog audio source to AUDIO IN for streaming and recording. The RCA AUDIO OUT allows monitoring of the selected audio source using external audio equipment.

8		MIC Input – 6.3 mm XLR Connect balanced audio to the MIC inputs. Details of operation are summarized below:

CH 1 (L)	CH 2 (R)	States
MIC1	MIC2	MIC 1(L) and MIC 2(R) are respectively connected to left (CH 1) and right (CH 2) channels.
MIC1	NC*	When MIC 1 is connected to the left channel (CH 1) and MIC 2 is not connected to the right channel (CH 2), the right channel (CH 2) switch will replicate MIC 1 signal onto the right channel (CH 2) thus both channels are MIC 1 input signals.
NC*	MIC2	When no MIC signal is connected to the left channel (CH 1) and only MIC 2 is connected to the right channel (CH 2), MIC 2 signal will not be replicated onto the left channel (CH 1) which will thus be grounded.
NC*	NC*	When no MIC is connected to the two channels, the left channel (CH 1) switch will ground the left channel (CH 1) to prevent noise from being generated.

NC – Not Connected

Streaming		
9		**Stream OUT** The stream port allows you to broadcast your video online via various streaming protocols such as the RTMP. See **Chapter 5 Video Streaming and Recording** for detailed descriptions.

Control		
10		**DVIP/Control** This port allows you to connect to a Datavideo PTZ camera with a DVIP port by an RJ-45 Ethernet cable in order to control the connected camera by your KMU-300.

CG PREVIEW		
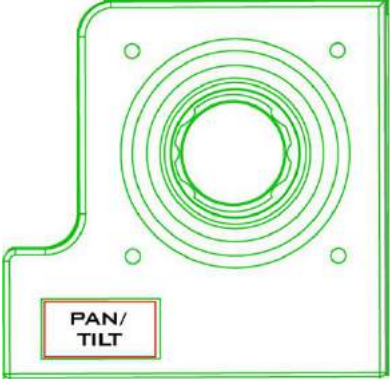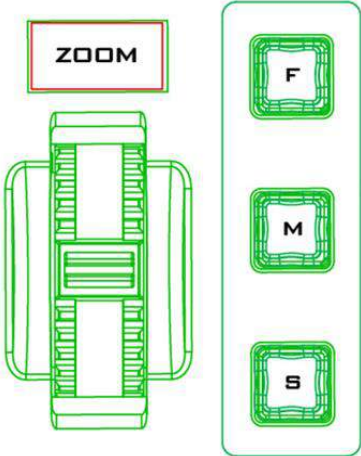
11	CG PREVIEW	CG PREVIEW When you set the related parameters in the "CG" option within the Web UI of KMU-300 built-in NVS-31 MARK IV streaming server, you can use this "CG PREVIEW" interface to connect to another external monitor to preview the related CG settings before the live-streaming begins.
Firmware Upgrade		
12	F/W UPGRADE	FW Upgrade Please place the latest firmware into the root directory of your USB flash drive. After that, please insert the USB Flash drive into the "FW Upgrade" interface and then turn on the power of your KMU-300, the firmware update procedure will be started automatically. See **Appendix 1 Firmware Upgrade** for more details.
Stereo/Mono Toggle Switch		
13	STEREO MONO	Stereo/Mono Toggle Switch This switch allows you to switch the headset and PGM output audio to Stereo or Mono. If there is only one channel connected to XLR Channel 1, and the toggle switch is switched to "Mono", the output audio will be Mono. If there is only one channel connected to XLR Channel 1, and the toggle switch is switched to Stereo, the output audio will be Stereo.

2.2 Controls

This section provides an overview of various functions of the control panel.
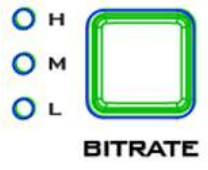
Output Selections		
1		**Channel Button Group** This button group allows you to select what you would like to display on the PGM Output. Buttons **1 – 4** correspond to Channels 1 – 4. Press the **Full Screen** button to downscale the full screen image which is shot by the 4K PTZ camera connected to the 4K HDMI Input port and to display this full screen image to an external monitor as the PGM screen. Press the **PC** button to display the PC IN video. For more about these button operations, see **Chapter 4**.
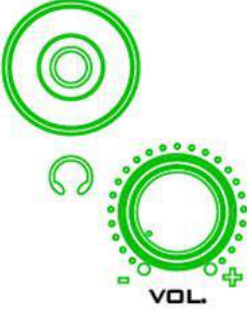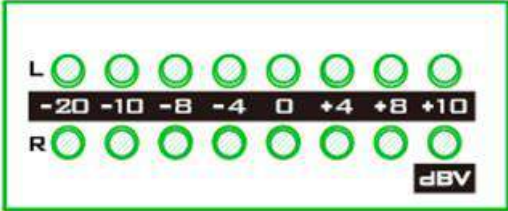
Pan / Tilt Control		
2		**P/T Joystick** **PAN** – Move the joystick left or right to pan the selected frame from left to right or vice versa. **TILT** – Move the joystick up or down to tilt the selected frame up or down. **Note:** Before moving the selected frame to the left, right, up or down side by the joystick, please make sure that **the PTZ INT/EXT button is set in INT**, which means that the **PTZ INT/EXT button** is lit in white. If the **PTZ INT/EXT** button switches to EXT, which means that the **INT/EXT** button is lit in red, the joystick can control the connected PTZ camera only. You need to switch to "INT", which means that the **INT/EXT button** is lit in white, to control the four selected frames of the KMU-300.
3		**Scroll Wheel – ZOOM** **ZOOM** – Scroll up to zoom in and down to zoom out. When the **PTZ INT/EXT button** is set in **INT**(shown in white), you can use this scroll wheel to control the scaling of the selected frame. If the **PTZ/INT button** is set in **EXT**(Shown in red), you can use this scroll wheel to control the Zoom IN/Zoom OUT of the external connected camera. **Speed Selection Buttons (F/M/S)** The pan, tilt and zoom speed can be chosen by pressing one of the three speed buttons on the right of the scroll wheel.

4		**PTZ INT/EXT Button** When the PTZ INT/EXT button is shown in white and you press it once, it will become red. If the PTZ INT/EXT button is shown in red, it means that the current setting is "PTZ/EXT". At this time, KMU-300's joystick can control the Pan and Tilt of the external connected camera only and the four selected frames can not be controlled. When the PTZ INT/EXT button is shown in red and you press it once, it will become white. If the PTZ INT/EXT button is shown in white, it means that the current setting is "PTZ/INT". At this time, you can use KMU-300's joystick to move the four selected frames to the up, down, left and right sides.
Output Settings	
5		**L/S Buttons** The L button allows you to select the large selected frame and the S button allows you to select the small selected frame. This L/S button can be applied to "Channel 1", "Full Screen" and "PC" buttons only in the "Channel" area. When you slide up on the KMU-300 touch screen with 3 fingers on the 4-channel selected frames screen, or tap its 14" touch screen with 3 fingers, you can enter the PGM screen which will show one selected frame only. At this time, the "Channel 1" button will be lit in red, if you press the "L" key at this time, the "L" key will blink in red, you can change the PGM (Channel 1) selected frame to a large frame by tapping any point of the touch screen slightly by your finger at this time.

		If you press the "S" key at this time, the "S" key will blink in red, you can change the PGM (Channel 1) selected frame to a small frame by tapping any point of the touch screen slightly by your finger at this time. **Vertical Button** When the KMU-300 touch screen displays the 4-channel selected frame mode, press the Vertical key to switch the four output channel images to vertical display. If the KMU-300 is set in the single PGM selected frame mode, press the Vertical key to switch the single PGM screen to vertical display. When switching to Vertical display mode, the "Vertical" button will be lit in red, you can resume it to the Horizontal display mode by pressing the "Vertical" button again.
H.264 Encoder		
6		**RECORD** Press the **RECORD** button to enable video record mode. **STREAM** Press the **STREAM** button to enable video stream mode. **VERTICAL** Press the **VERTICAL** button to change the stream video orientation.
7		**BITRATE** Use the **BITRATE** button to switch between **high (H)**, **moderate (M)** and **low (L)** bitrates for **RECORD** and **STREAM** modes.
External Storage		

8		**SD Card Slot** Insert an SD card into the SD card slot for video recording. See **Chapter 5 Video Streaming and Recording** for detailed descriptions. **Note that you should only use Class 10 SD card or above. See the Appendix 2, Recommended SD Cards, for a list of SD cards recommended by Datavideo.** **Note: Do not remove SD card while recording is in progress as doing so may result in corrupted video files.**
	Volume Control	
9		**Headphone Jack** Headphone jack accepts mini jack plug of any stereo headphone type for audio monitoring. The headphone volume is controlled by the Headphone volume adjustment knob.
10		
	• **CH1**: Balanced MIC 1 IN • **CH 2**: Balanced MIC 2 IN • **AUX**: RCA audio input (analog) • **Digital**: HDMI audio input (digital) • **Master**: PGM audio output	
11		**MASTER OUT Volume Meter** The LED indicator shows the audio signal strength at the Main Program Audio Output. Green to Yellow LED indicators show the normal volume range. When the volume LED indicator is increased gradually to +10 dBV and the red LED indicator lights up, it means that the

<table>
<tr><td></td><td colspan="15">output audio signal is distorted seriously. You can adjust the output volume to its suitable level by using the Master audio volume control knob.</td></tr>
</table>

Audio Volume (dBV)	-20		-10		-8		-4		0		+4		+8		+10
LED Color	G		G		G		G		G		Y		Y		R
Range (dBV)	-20	-12	-11	-9.5	-8.5	-6.5	-5.5	-3	-2	1	2	5.5	6.5	8	9+

Chapter 3   OSD Menu

The KMU-300 can be configured via an on screen menu. To open the OSD menu, slide two fingers down on the touch screen. Slide two fingers up on the touch screen to close the OSD menu. To select a particular option, simply tap on the corresponding item on the touch screen. After entering into the option of the OSD menu, you can go back to the previous layer of the option by clicking on the touch screen other than the menu. This OSD menu allows you to set each parameter of the KMU-300, camera parameters and KMU-300 Network parameters.

3.1   Overview

This section covers the menu options in the order that they appear on the touch screen. These settings may also appear in more detail elsewhere in this instruction manual. Options may vary depending on the firmware version in use.

Main Menu	Options	Suboptions
Output Setup	1080p60	
	1080p59.94	
	1080p50	
	720p60	
	720p59.94	
	720p50	
Input Info	4K	
	1080p	
AUX Setup	CH1	
	CH2	
	CH3	
	CH4	
Video Processing	Brightness	0 – 100
	Contrast	0 – 100
	Saturation	0 – 100
Audio Setup	AUX	4K Bypass
		Follow PGM
	PGM	HDMI 4K
		HDMI PC
		Follow
	Audio Level	Auto
		SMPTE
		EBU
	Audio Delay	0-16
FW	FW Version	MB: Version No.
		DB: Version No.
		KB: Version No.
		FPGA: Version No.
		Panel: Version No.

Main Menu	Options	Suboptions
	FW Update	MB
		DB
		KB
		PL
		MB SP
		DB SP1
		DB SP2
		DB SP3
		Update
Language	English	
	Traditional Chinese	
	Simplified Chinese	
Restore Default	Yes	
	No	

3.2   Camera

Main Menu	Options	Suboptions		
Camera	Search	PTC-xxx		
	Camera Model	PTC-xxx		
		Camera Mode		
		KMU-300 Mode		
	Camera Control	White Balance	Auto	
			One Push	
			Manual	
		Focus	Auto	
			Manual	Far
				Near
		Aperture	Auto	
			Manual	Bright
				Dark
		Shutter	Auto	
			Manual	Fast
				Slow
	Network Info	Using Fixed IP	Off/On	
		IP address	x.x.x.x	
		Mask	x.x.x.x	
		Gateway	x.x.x.x	
		Primary DNS	x.x.x.x	
		Secondary DNS	x.x.x.x	
	Video Format	1080p59.94		
		1080p60		
		1080p50		
		2160p25		

Main Menu	Options	Suboptions
		2160p29.97
		2160p30
		2160p50
		2160p59.94
		2160p60
	Mirror Mode	Off
		Horizontal
		Vertical
		H+V
	Camera OSD	Enter
		Back
		Up
		Down

3.3   KMU-300 Network

Main Menu	Options	Suboptions
Using Fixed IP	On/Off	
IP address	192.168.100.5	
Mask	255.255.255.0	
Gateway	192.168.100.1	
Primary DNS	0.0.0.0	
Secondary DNS	0.0.0.0	

Chapter 4   KMU-300 Operations
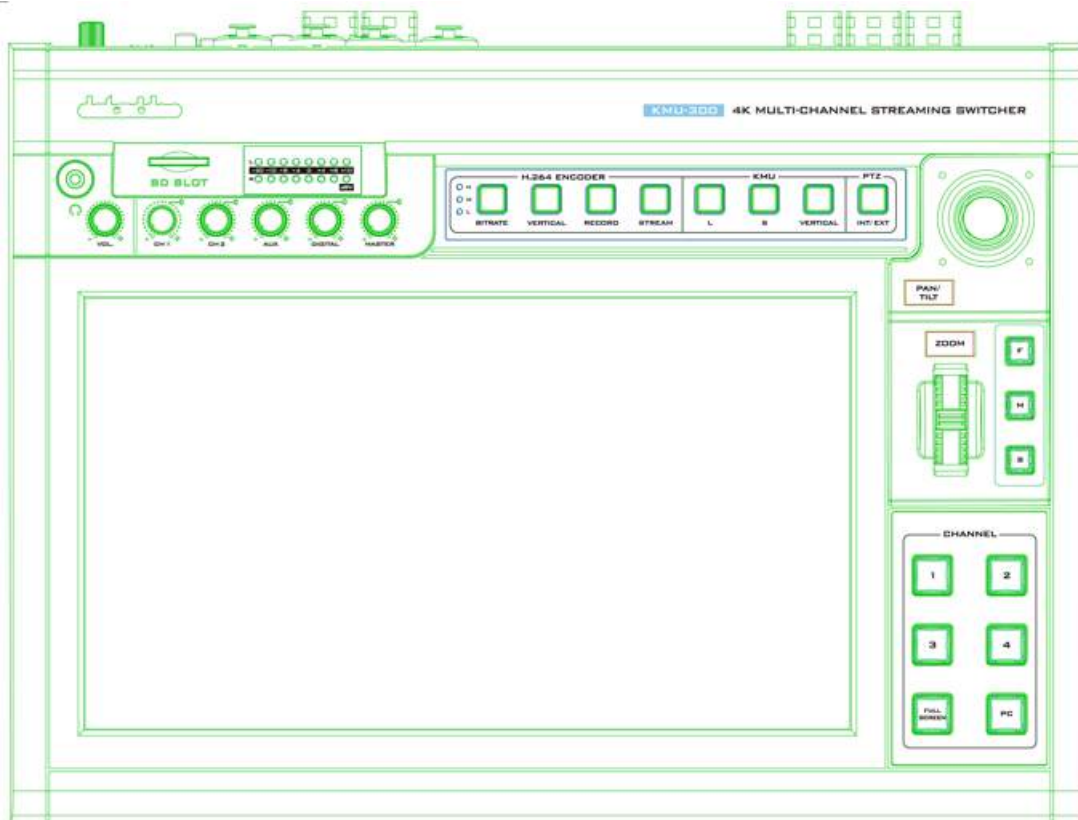
4.1   Channel Buttons

After the KMU-300 is powered ON, you will only see one channel button illuminated red, indicating that particular channel is the program channel (on air) and the button corresponding to the preview channel should illuminate green. If you only see one channel button illuminated red and the rest of the channel button LEDs are off, program and preview channels share the same channel.

To switch the program channel to other channels, simply press the corresponding channel button.

Note: only one channel can be activated as the program channel.

To select the preview channel using the channel button group, follow the steps below:

1. Press and hold the Program Channel (PGM) button, which is one of the four channel buttons illuminated red.
2. Press other channel button to activate the Preview mode, and the channel button should be illuminated green once pressed.
3. Release the Program Channel button after you have successfully selected the Preview Channel.

4. To enable the Program and Preview mode on the same channel, press the current Preview Channel button.

Note: The Program and Preview modes can only be activated on one channel at a time.

4.2 Touch Screen

You can do a lot on the touch screen using simple gestures like zoom in on images, open OSD menu and more.

Here are some common gestures:

Gesture	Action
●	**Tap:** Tap the channel number to select PVW channel.
↑↑↓↓	**Two-finger scroll:** Slide two fingers up to close the OSD menu or down to open the OSD menu.
↗	**Two-finger Pinch to zoom:** Pinch your thumb and finger open or close to zoom in or out of the image.
● ● ●	**Three-finger tap:** Tap anywhere with three fingers to enable/disable PGM channel only mode on the touch screen. Note: When switching to "PGM Only Mode", there are three channel buttons can be selected including "Channel 1", "Full Screen" and "PC". When operating in "PGM Only Mode", there are three buttons can not be selected including "Channel 2", "Channel 3" and "Channel 4". When KMU-300 is operated in 4 Channel selected frame mode, you can slide up by three fingers on the touch screen to switch to the "PGM Only Mode". When KMU-300 is operated in "PGM Only Mode", you can slide down by three fingers on the touch screen to switch to 4 Channel selected frame mode.

Preview

You are allowed to move the Preview Channel frame or non-Program Channel frames on the touch screen. Simply tap and slide with one finger.

Program

In order to move the Program Channel frame, double tap to set program and preview to the same channel.

To show only the Program Channel on the touch screen, tap the touch screen with three fingers. To move the channel frame to the desired image crop, slide the frame with one finger or tap the desired image point with one finger. Tap the touch panel again with three fingers to exit the full screen mode.

You can also move the channel frame to the desired image point and at the same time to allow the KMU-300 to change the channel frame size to a small or large frame. The steps are outlined as follows:

1. Press the channel button to select the Program Channel.
2. Tap the touch screen with three fingers such that only the Program Channel is shown on the touch screen.
   Note: You can also slide down with three fingers to show the Program Channel only; slide down with three fingers to show all four channels.
3. In the KMU button group, press L or S button and the button should blink in red.
4. Tap the desired image point with one finger.
5. The channel image is now the image in the frame of the size (L or S) selected at Step 3.

Chapter 5   Video Streaming and Recording

The KMU-300 4K Multi-Channel Touch Screen Region of Interest includes a built-in Video Streaming Server (NVS-31 MARK IV) allowing the user to stream and record your program at the same time. From any SDI/HDMI input sources, the Datavideo's video streaming server generates an H.264 encoded stream that is compliant with RTSP or RTMP protocols. While encoding the video at bit rates appropriate for live streaming, the Datavideo NVS-31 MARK IV concurrently records a high-quality MP4 file to an SD card.

Note: The built-in video streaming server and recording device are referred to as NVS-31 MARK IV.
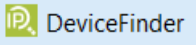
5.1   Streaming Network Connection and Device Search

This section details how to connect the NVS-31 MARK IV to a network with or without a DHCP server, and describes how to acquire the NVS-31 MARK IV's IP address.

Connecting to a DHCP Network (DHCP Mode)

Follow the following procedure to scan your DHCP network for connected NVS-31 MARK IV devices.

Note: The NVS-31 MARK IV will be automatically assigned an IP address upon connection to the DHCP network.

1. Connect the NVS-31 MARK IV's stream port to the network via an Ethernet cable.
2. Turn on the KMU-300's power and the NVS-31 MARK IV will also be turned ON in the DHCP mode by default.
3. Connect the laptop to the same network that the NVS-31 MARK IV is connected to and download the free IP Finder utility program.
4. Please unzip the "Devicefinfer vx.xx.x" zip file. After that, please unzip the "Device_Finder_DataVideo_x_xx_x.zip" zip file.
5. Please double-click the DeviceFinder icon to open the software.
6. Please select the IP address of your laptop or PC which the IP address is set within the same LAN as the NVS-31 MARK IV.
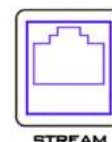
7. Please click the "Scan" button and then you can find the IP address of the connected NVS-31 MARK IV.

Connecting to a NON-DHCP Network (Static IP)

Upon connection to a non-DHCP network, the NVS-31 MARK IV will not be assigned of any IP addresses. As such it is recommended that you manually assign a fixed IP address to the device or use the default IP address (192.168.1.200).

Default Fixed IP

Default Fixed IP is primarily used in point-to-point connection, such as connecting the PC to the NVS-31 MARK IV directly. In a non-DHCP environment, the NVS-31 MARK IV works in fixed IP mode only. To configure the NVS-31 MARK IV to the **default IP**, please follow the steps outlined below:

1. Connect the NVS-31 MARK IV's stream port to the network via an Ethernet cable.
2. Turn on the KMU-300's power and the NVS-31 MARK IV will also be turned ON in the DHCP mode by default.
3. Search for the NVS-31 MARK IV device according to the method as detailed in the previous DHCP section. Once found, log into the user interface on the web browser.
4. Enter the system page by clicking the "System" tab on the home of the user interface.
5. In the "Network Setting", disable the DHCP mode.

6. You will then be allowed to manually enter the static IP address once the DHCP mode is disabled. The static IP is 192.168.1.200 by default. The subnet mask and default gateway are 255.255.255.0 and 192.168.1.254 respectively.

Tip: If you forget or lose the IP address, do the following to reset the network settings.

- Turn off the device.
- Press the **RECORD** and **STREAM** buttons at the same time then turn ON the power of the device
- Wait for about five seconds and release the button push as soon as you see the **RECORD** and **STREAM** button LEDs light up.
- The IP address should be the default IP which is **192.168.1.200**.

Troubleshooting the Network Connection

Connect the NVS-31 MARK IV to the network and open the IP Finder utility program. Scan for the device. If not found, it is possible that your network is not assigning IP addresses. Reasons of this are outlined as follows:

- Router or DHCP server is not connected to the network.
- New devices are blocked by the network administrator.
- Anti-virus software or the firewall blocks the communication.

Solve the problem by trying the following:

- Turn off the router, wait for 10 seconds then turn on the router again.
- Reset the NVS-31 MARK IV to the factory default:
  - Turn off the device.
  - Push the **Record and Stream** buttons simultaneously while turning on the device's power.
  - Wait for about five seconds and release the button push as soon as you see the **RECORD** and **STREAM** button LEDs light up.
- Reboot the PC.

If the problem persists, try the following:

- Temporarily shut down the anti-virus software or firewall.
- Make sure no other devices are connected to the LAN (wired or wireless) because this may result in IP conflicts.

After trying all methods and if the problem is still not solved, the NVS-31 MARK IV video streaming server offers the fixed IP feature that allows you to establish direct connection to the NVS-31 MARK IV. The default IP address is 192.168.1.200.

This method allows you to configure the NVS device to the IP range of your network so that you do not need a DHCP server to gain access to the NVS device.

- Connect your PC to the NVS device directly using an Ethernet cable (not necessarily a crossover cable).

Next, change the network settings of your PC or laptop.

- Click **START** located at the bottom left corner of your screen.

- On the text bar, enter **Network Connections** then click the icon that appears.

- Double click the network adapter that connects your PC or laptop to the network.

- Click the "**Properties**" button.

- Select "**Internet Protocol Version 4 (TCP/IPv4)**" option and click the "**Properties**" button.

- Check the "**Obtain an IP address automatically**" option.

- Enter IPv4 settings:
    - IP Address: 192.168.1.2
    - Subnet Mask: 255.255.255.0 (System default is 255.255.255.0)
    - Default Gateway: Not required for one-to-one connection.
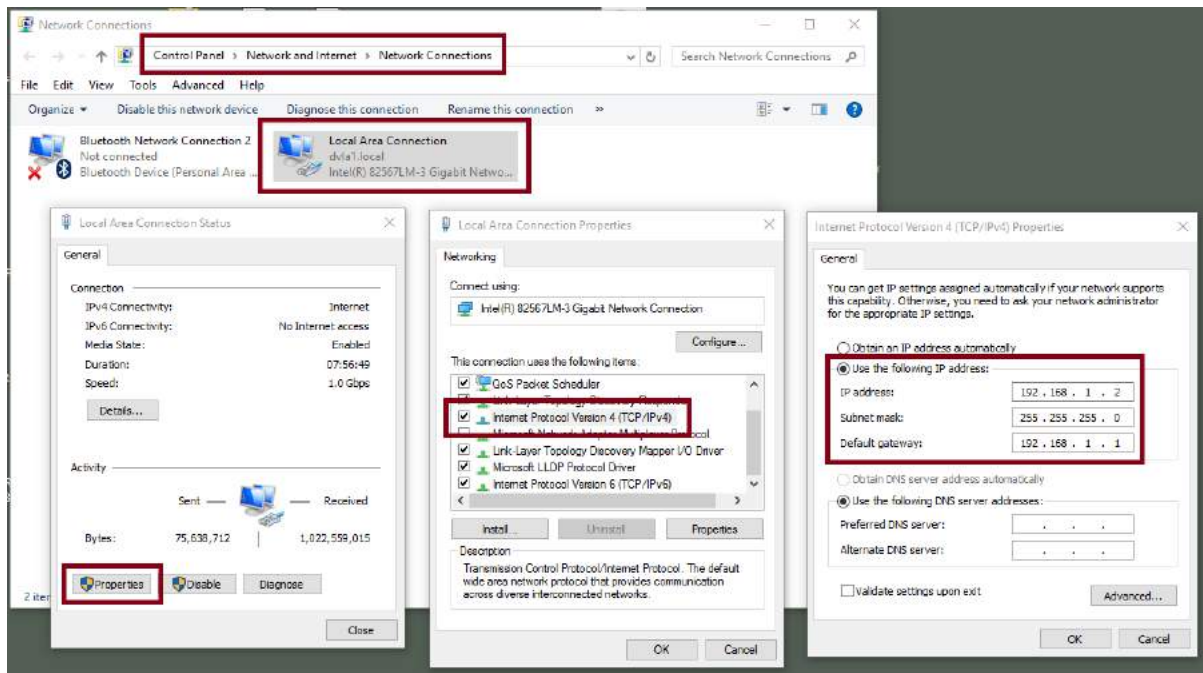
Note: Please write down the IPv4 address previously entered as it may be needed after you are done with streaming or recording.

- The NVS-31 MARK IV should now be connected with an IP address of 192.168.1.200. If the NVS-31 MARK IV still cannot connect, simply restore the NVS-31 MARK IV to the factory defaults.
  - Turn off the device.
  - Push the **Record and Stream** buttons simultaneously while turning on the device's power.
  - Wait for about five seconds and release the button push as soon as you see the **RECORD** and **STREAM** button LEDs light up.
  - Make sure no other devices are connected to the LAN (wired or wireless) because this may result in IP conflicts.

- Login the NVS-31 MARK IV via a web browser.
 - Default user name is **admin**
  - Default password is **000000**

- Click the "**System**" tab then on the system page, enter network settings such as static IP and default gateway. Make sure that the default gateway matches your connected network and no device shares the same IP as the NVS-31 MARK IV.

  For example, if your router's default gateway IP is 10.10.1.1, then in the default gateway field, you should also enter 10.10.1.1. Then set the IP address of the NVS-31 MARK IV to 10.10.1.X, which can range from 10.10.1.2 to 10.10.1.255. Pick an unused IP address.

Network Setting

DHCP	**Static IP**
Enable	192.168.1.200
Subnet Mask	**Default Gateway**
255.255.255.1	192.168.1.1
Primary DNS	**Secondary DNS**
192.168.1.100	0.0.0.0

- DHCP：Disable
- Static IP：X.X.X.Y；the first three decimal numbers must be the same as your router or switch. The number Y must be a number not used by any devices connected to the network.
- Subnet Mask：255.255.255.0
- Default Gateway：Z.Z.Z.Z；same as the gateway IP of your router or switch.

Note: Some router may require special gateway IP setting; instead of the standard 192.168.1.1. Therefore, you should check the network properties on the PC before switching to the fixed IP mode.

For example, some routers have a gateway IP of 192.168.1.254 and as a result, the default gateway and primary DNS fields on the NVS-31 MARK IV must also be configured to 192.168.1.254.

- Primary DNS: Same as the default gateway IP, which, if causing issues, can be changed to 8.8.8.8 or 8.8.8.4 (Public DNS provided by Google).
- Click the "**Apply**" button to save the network settings.
- Reconnect the PC and the NVS-31 MARK IV to the network.
- Restore the PC's original network settings.
- Shut down the KMU-300; wait for approximately five seconds before turning the KMU-300 back ON.
- You should be able to access the NVS-31 MARK IV through the fixed IP address.

Advanced Troubleshooting

If you still are unable to connect, please try the following:

- Use the ARP table to search for the encoder's MAC address; the device's MAC address is on the print label at the bottom of your HS device.
- MAC address starts with **00:07:36:03:xx:xx**.
  - Device's MAC address starts with 00:07:36:07:xx:xx (KMU-300 and KMU-300 only)
- On the command prompt (terminal on MAC OS), enter "**arp -a**" then press enter key to display an ARP list. See if the NVS-31 MARK IV is successfully connected to the network.
- Execute **services.msc**，and on the right column of the "**Services**" window, locate "**DHCP Client**" then click "**Restart**".

- On the command prompt, enter **ipconfig/flushdns** followed by **ipconfig/release and ipconfig/renew.**

5.2 Web User Interface

By now, we have obtained the IP addresses of the PC and the NVS-31 MARK IV. Enter the NVS-31 MARK IV's IP address into the address bar of a browser then hit the **ENTER** button. Login by entering the user name as well as the password into a pop-up dialogue box as shown below.
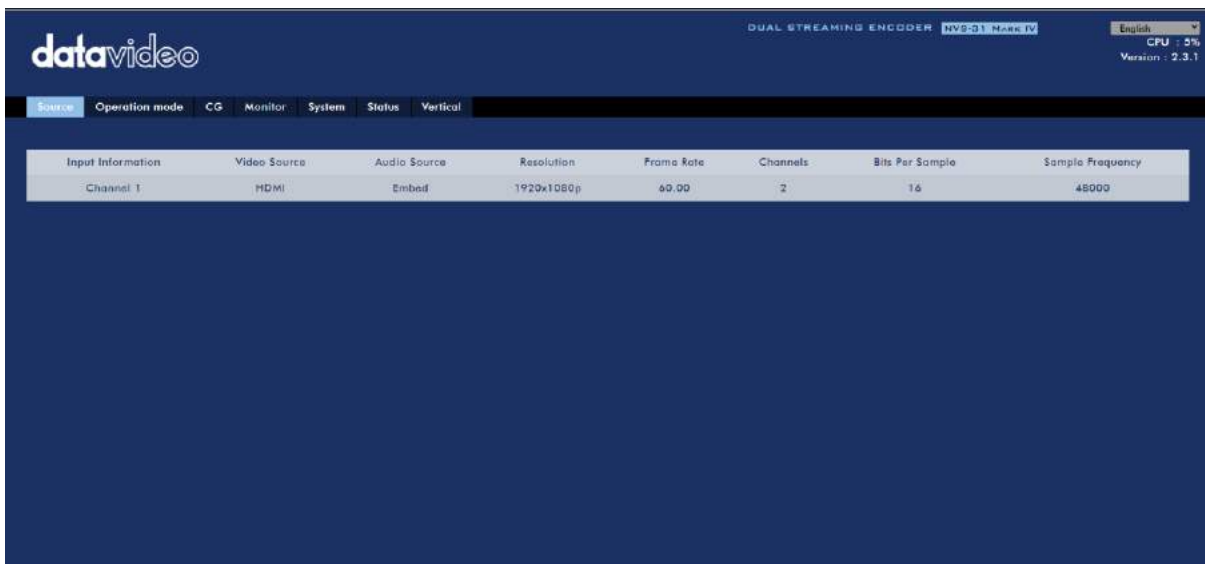
Username: admin

Password: 000000

Click **OK** to login. Once logged in, the first page that appears will be the **Source** page.

Source

You will see the **Source** page immediately after logging into the NVS-31 MARK IV web UI. On the Source page, you will see **Input Information**, **Video Source**, **Audio Source**, **Resolution**, **Frame Rate**, **Channels, Bits Per Sample** and **Sample Frequency**.

Note: The NVS-31 MARK IV web UI does not update automatically so to learn the latest device status, please refresh the page manually.

While monitoring streaming and recording, please update the page periodically regardless of how you operate the device (using the device's physical buttons only or using the device's

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physical buttons along with the web UI). This ensures the page is always displaying the most up-to-date information.

Operation Mode

Click the **Operation Mode** tab on the tool bar to open the operation mode configuration page on which the user will be allowed to customize various stream and record settings.
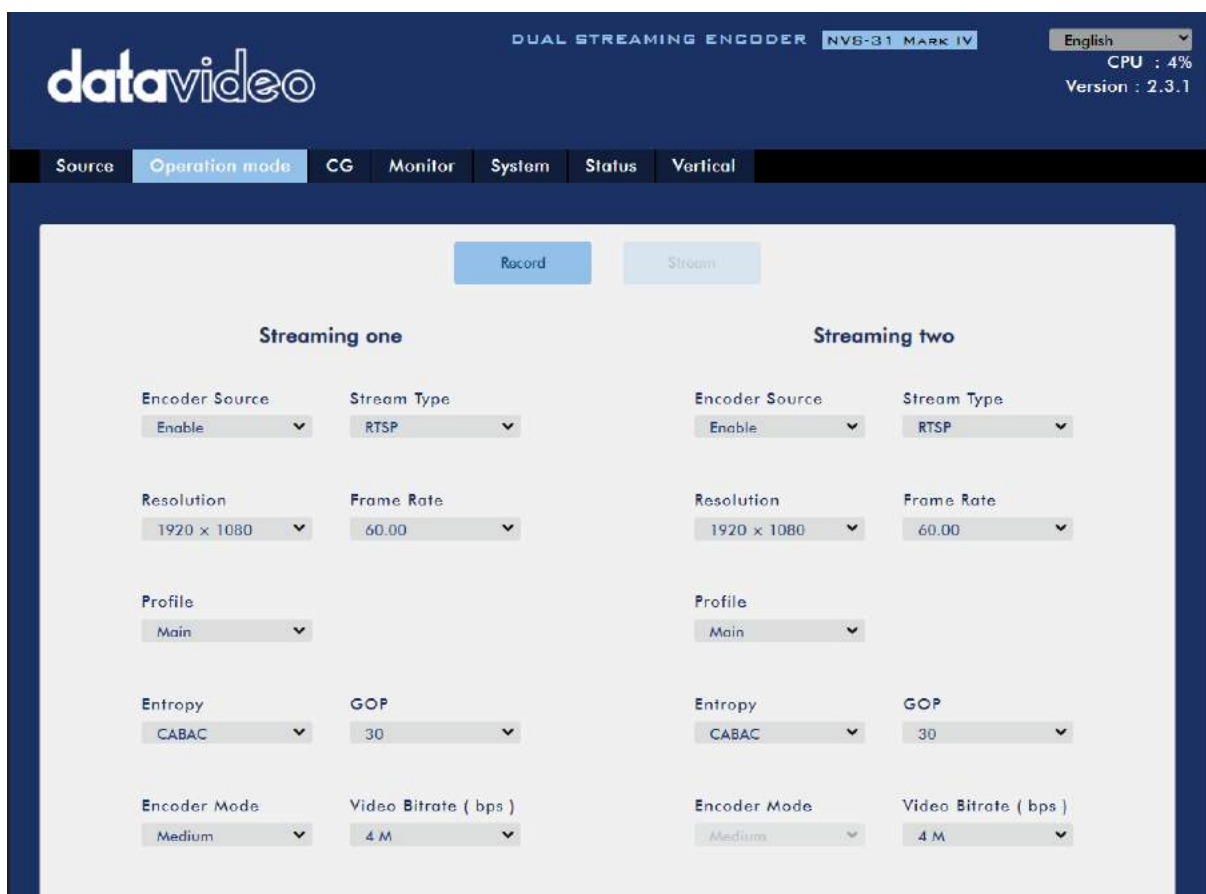
The NVS-31 MARK IV offers the following operation modes:

- **Stream**
- **Record**

which will be discussed in detail in this section.

Stream Mode

The NVS-31 MARK IV has two stream engines allowing you to stream to two different destinations over multiple protocols. The configurable stream settings are **Encoder Source**, **Stream Type**, **Resolution**, **Frame Rate**, **Profile**, **Entropy**, **GOP**, **Encoder Mode**, **Video Bitrate(bps), Audio Bitrate(bps), RTSP Port** and **RTSP HTTP Port** which will be described later in this section.

Seven streaming protocols available on the NVS-31 MARK IV are **RTSP**, **RTMP**, **HLS**, **TS, SRT, KUAISHOU and DVCloud**. See *Section 5.3* for instructions on each individual stream setup.

Note that once your video streams are set up, click **"Apply"** button to apply the new stream settings. Click **"Start Stream"** to open the stream and **"Stop Stream"** to end the stream. To reset, simply click the default button.

Next, we will discuss the stream setting options in greater detail.

Encoder Source
This option allows you to enable the stream encoder for configurations of various parameters. If the stream encoder is not needed, disable this option.

Stream Type
The NVS-31 MARK IV offers the user four stream types which are **RTSP**, **RTMP**, **TS**, **HLS, SRT, KUAISHOU** and **DVCloud**. Parameters of each individual protocol will be briefly described below.

RTSP (Real Time Streaming Protocol)

- RTSP Port: The RTSP port number ranges from 554 to 564 and is 555 by default.

- RTSP HTTP Port: The RTSP HTTP port number ranges from 8553 to 8563 and is 8555 by default.

- Account / Password: The RTSP streaming account credentials which are root/root by default.

- Session Name: The default RTSP session name is session0.mpg.

RTMP (Real-Time Messaging Protocol)

- RTMP URL: Enter an RTMP URL obtained from any live streaming platform such as Ustream.

Note: The NVS-31 MARK IV supports RTMP Publish only and not RTMP Local.

- Stream Name: Enter a stream name or key from any live streaming platform such as Ustream.

- Account / Password: Enter the account name and the password of your RTMP platform account.

TS (Transport Stream)

- TS URL: Enter a URL for your transport stream.

SRT (Secure Reliable Transport)

SRT is the abbreviation of "Secure Reliable Transport", which is the streaming protocol developed by Haivision.   The most important feature of the SRT live-streaming is that it can provide a live-streaming with lower latency compared to the RTMP live-streaming. According to the Technology White Paper   (http://www.haivision.com/resources/white-paper/srt-versus-rtmp/) which is released by the SRT protocol developer, Haivision, the latency of the SRT is 2.5 to 3.2 times less than the RTMP under the same test environment. Moreover, SRT can keep its data transmission even in bad network environment. The architecture of the SRT provides a built-in protection mechanism which can cope with issues such as network bandwidth fluctuation, package loss and other quantitative changes. So, the SRT live-streaming can keep the integrity and quality of the live-streaming video within unpredictable network environment. The major difference of the RTMP and SRT is that the RTMP video stream does not have timestamp in its header, which means that this message is not existed in single data package. So, the RTMP receiver must send data package to the encoder at every fixed time interval. So, the RTMP protocol needs larger buffer in order to reduce the difference of the transmission time for every single data package, which will cause higher latency. However, the SRT provides timestamp for every single data package. For a receiver, the SRT makes it easy to reproduce the signal which is sent, which can reduce the need for a buffer greatly. The bitstream of the SRT sender and the bitstream of the receiver are highly similar. The SRT can recognize each lost data package and the resend is done only when the data package is lost, which can reduce the latency. The SRT Stream Type provides several options for you to set which are shown as below.

- Stream Type: The "Stream Type" option allows you to select the "SRT Caller" or "SRT Listener".
- SRT Port: Enter the port number which is provided by the SRT stream server. The default port number is 10001.
- Caller IP Address: Enter the IP address which is provided by the stream server.
- Passphrase: Enter your desired SRT stream password. The length of the password must be within 10-79 digits.
- Latency: Enter the amount of latency in ms to apply to the SRT stream. The default latency is 1000 ms.

- Stream ID: Enter a name for your video stream which is provided by the stream server.

KUAISHOU

This is the KUAISHOU live-streaming platform, which can be used only in China.

DV Cloud

DV Cloud is the cloud streaming platform which is provided by Datavideo. There are two options including "Username(email) and "Password". You can enter your DvCloud "Username" and "Password" for streaming by the DvCloud streaming platform.

- Username(email): You can enter your "Username" which is used to apply your DvCloud account in this column.

- Password: You can enter your "Password" which is used to apply your DvCloud account in this column.

Please note that when streaming, the NVS-31 MARK IV converts video into data, which are sent across an IP network. High bitrates consume more bandwidth across the IP network. In a gigabit office LAN, high bitrate may not be a concern and Speed/Bandwidth is therefore not a limitation in an NVS-31 MARK IV application environment.

If your available bandwidth is limited, you should reduce both your resolution and your bitrate accordingly. A good rule of thumb is for the bitrate of your stream to use no more than 50% of your available upload bandwidth capacity on a dedicated line. For example, if the result you get from a speed test shows that you have 2Mbps of upload speed available, your video bitrate should not exceed 1Mbps.

Resolution
The first step of encoder setup is to adjust the image size. It is best to either match your original video source or scale it down. For example, capture at HD 720 and stream at HD 720. Or capture at HD 720 and stream at 540 (high).

You should never be scaling up and streaming at a higher resolution than your original video source. For example, it does not make sense to capture at 720 and stream at 1080. Note that you will also have no gain in quality and you are using more bandwidth than is necessary for your viewers.

You should also be aware that higher resolutions require greater processing power to encode the stream. Attempting too high of a resolution on too little processing power can result in degraded image quality and corrupted or interrupted streams or recordings.

Resolutions available for your stream encoder are listed as follows:

- 1920x1080
- 1280x720

- 720x576
- 720x480
- 640x480
- 320x240

Frame Rate

Select a frame rate from the drop-down menu for video streaming. Note that frame rates should always match the frame rate of the video source. Note: The NVS-31 MARK IV will detect the frame rate automatically, if the detected frame rate is 60 or 30, only 60, 30, 20 and 15 can be selected. If the detected frame rate is 59.94 or 29.97, only 59.94, 29.97,20 and 15 can be selected. If the detected frame rate is 50 or 25, only 50, 25, 20 and 15 can be selected.

- 60.00
- 59.94
- 50.00
- 30.00
- 29.97
- 25.00
- 20.00
- 15.00

Video Bitrate (bps)

The bitrate of the video specifies the amount of information stored in the video. The higher the bitrate is, the clearer the video is. However, when choosing your encoder settings for streaming, you should first check your available upload bandwidth. A good rule of thumb is for the bitrate of your stream to use no more than 50% of your available upload bandwidth capacity on a **DEDICATED** line. For example, if the result you get from a speed test shows that you have 2Mbps of upload speed available, your combined audio and video bitrate should not exceed 1Mbps.

Usually high bitrate means good image quality; however, there are also exceptions. For example, SD video may appear acceptable at 1000 Kbps (1M) but HD video is unacceptable at 1000 Kbps.

Available video bitrates are listed as follows:

- 10M
- 8M
- 6M
- 4M
- 2M
- 1M
- 512K

- 256K

Encoder Mode

The Encoder Mode sets the video bitrate mode for your video stream. The available modes are listed as follows:

- High (8M)
- Medium (4M)
- Low (2M)

Tip: You can also switch between different bitrate modes by pressing the Bitrate button in the H.264 Encoder button group. See Section 5.4 for details.

Profile

Profile sets the H.264 encoding profile for your stream. The available options are **Baseline**, **Main**, and **High**. Typically, **High** profile provides the best image quality and is suitable in most instances. However, depending on the decoder used when viewing the stream, such as with mobiles devices, a Main or Baseline profile may be required.

- High
- Main
- Baseline

Entropy

There are two coding options available for generating H.264 content:
- CAVLC (Context-Adaptive Variable Length Coding)
- CABAC (Context-based Adaptive Binary Arithmetic Coding)

CABAC encoding provides a 7-10% quality improvement over CAVLC but requires an extra 10-15% CPU. CABAC encoding is only available in H.264 Profiles Main & High. When targeting at low-powered devices, such as older cell phones and tablets, we recommend the Baseline Profile that uses CAVLC which requires less computing power.

GOP

GOP pattern with longer GOP length encodes video very efficiently. Shorter GOP lengths usually work better with video that has quick movements, but they do not compress the data rate as much. Depending on your applications, the NVS-31 MARK IV offers the user 16 GOP sizes ranging from 1 to 255.

- 255
- 240
- 200
- 120
- 100
- 60
- 50

- 30
- 25
- 20
- 15
- 10
- 5
- 3
- 2
- 1

Audio Bitrate (bps)

Audio Bitrate is the compression ratio for encoding the input audio source. The higher the bit rate, the better the sound quality and file size. The NVS-31 MARK IV provides five audio bitrate options for you to select, and the range is from 32Kbps to 384Kbps.

- 384K
- 256K
- 128K
- 64K
- 32K

Record Mode

The NVS-31 MARK IV's record engine allows you to record your program on the SD card. See *Appendix 2* for a list of recommended SD cards. The record parameters shown in the diagram below will be discussed in detail in this section.
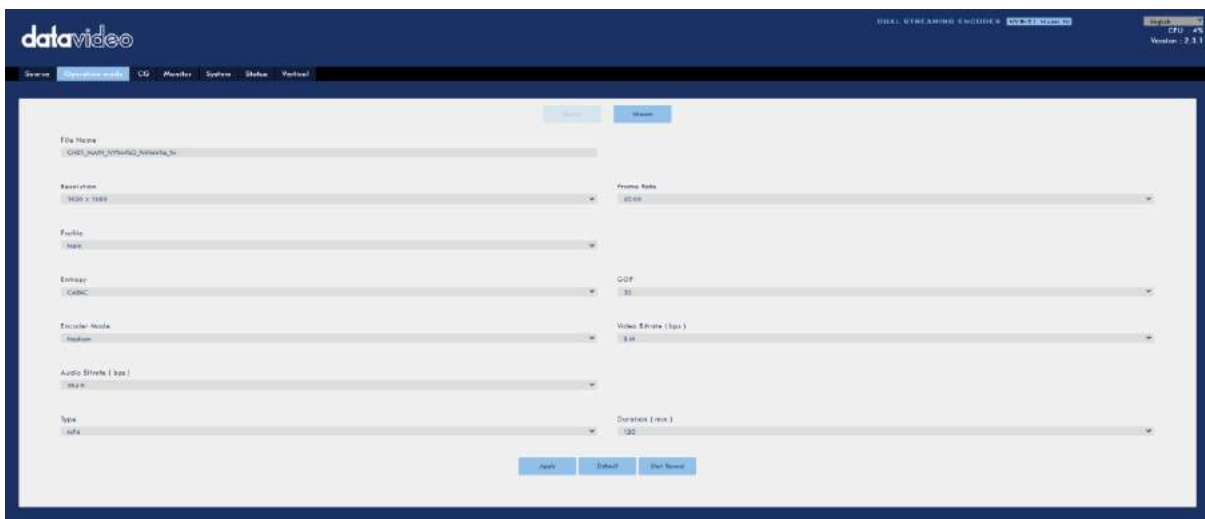
Note that after you've configured the record settings, click **"Apply"** to apply the new record settings. Click **"Start Record"** to start recording and **"Stop Record"** to end recording. To reset, simply click the default button.

Encoder Source

This option allows you to enable the record engine for configurations of various parameters. If the recorder is not needed, disable this option.

File Name

Enter the name of your record file.

Resolution

Recording resolution is the number of pixels (dots) used to create an image. Higher resolutions use more pixels to create an image. This means that greater amounts of detail can be expressed in the image, but larger files sizes and a greater amount of storage (i.e. hard drive space) are required to save the images or video.

Resolutions available for your recorder are listed as follows:

- 1920x1080
- 1280x720
- 720x576
- 720x480
- 640x480
- 320x240

Frame Rate

Select a frame rate from the drop-down menu for video recording. Note: The NVS-31 MARK IV will detect the frame rate automatically, if the detected frame rate is 60 or 30, only 60, 30, 20 and 15 can be selected. If the detected frame rate is 59.94 or 29.97, only 59.94, 29.97,20 and 15 can be selected. If the detected frame rate is 50 or 25, only 50, 25, 20 and 15 can be selected.

- 60.00
- 59.94
- 50.00
- 30.00
- 29.97
- 25.00
- 20.00
- 15.00

Frame rate greatly impacts the style and viewing experience of a video. Different frame rates yield different viewing experiences, and choosing a frame rate often means choosing between things such as how realistic you want your video to look, or whether or not you plan to use techniques such as slow motion or motion blur effects.

Below is a list of common options for different applications:

- **24fps** – This is the standard for movies and TV shows, and it was determined to be the minimum speed needed to capture video while still maintaining realistic motion.
- **30fps** – Videos with a lot of motion, such as sports, will often benefit from the extra frames per second.
- **60+fps** – Anything higher than 30fps is mainly used to create slow motion video or to record video game footage.

Video Bitrate (bps)

The bitrate of the video specifies the amount of information stored in the video. The higher the bitrate is, the clearer the video is.

Available video bitrates are listed as follows:

- 16M
- 12M
- 8M
- 6M
- 4M
- 2M
- 1M
- 512K
- 256K

Recommended video bitrates

- **720P or lower** – 8 – 10 mbps
- **1080P or higher** – 15 mbps or higher

Encoder Mode

The Encoder Mode sets the video bitrate mode for your recording. The available modes are listed as follows:

- High (8M)
- Medium (4M)
- Low (2M)

Tip: You can also switch between different bitrate modes by pressing the Bitrate button in the H.264 Encoder button group. See Section 5.4 for details.

Profile

Profile sets the H.264 encoding profile for your recorder. The available options are **Baseline**, **Main**, and **High**. Typically, **High** profile provides the best image quality and is suitable in most instances. However, depending on the decoder used when viewing the recording, a Main or Baseline profile may be required.

- High

- Main
- Baseline

Entropy

There are two coding options available for generating H.264 content:

- CAVLC (Context-Adaptive Variable Length Coding)
- CABAC (Context-based Adaptive Binary Arithmetic Coding)

CABAC encoding provides a 7-10% quality improvement over CAVLC but requires an extra 10-15% CPU. CABAC encoding is only available in H.264 Profiles Main & High. When targeting at low-powered devices, such as older cell phones and tablets, we recommend the Baseline Profile that uses CAVLC which requires less computing power.

GOP

GOP pattern with longer GOP length encodes video very efficiently. Shorter GOP lengths usually work better with video that has quick movements, but they do not compress the data rate as much. Depending on your applications, the NVS-31 MARK IV offers the user 16 GOP sizes ranging from 1 to 255.

- 255
- 240
- 200
- 120
- 100
- 60
- 50
- 30
- 25
- 20
- 15
- 10
- 5
- 3
- 2
- 1

Audio Bitrate (bps)

Audio Bitrate is the compression ratio for encoding the input audio source. The higher the bit rate, the better the sound quality and file size. The NVS-31 MARK IV provides five audio bitrate options for you to select, and the range is from 32Kbps to 384Kbps.

- 384K
- 256K

- 128K
- 64K
- 32K

Type

This drop-down menu allows you to select the file format of the recorded file.

- MP4

- TS

Duration (min)

This drop-down menu allows you to select your desired time length for recording the video.

- Unlimitation

- 120

- 60

- 30

- 5

- 1

CG

The CG function allows the user to place scrolling texts (News), a still picture (Graphic), a logo and an animated image above the video layer. Various CG layers will be discussed in this section.

News

News allows you to place the scrolling text over the video.

First pre-enter the scrolling text content into a text file then upload the text file to NVS-31 MARK IV. Lastly, customize the following text properties.

Note: You can only enter up to 15 lines of text into the text file only and for Chinese text, please set the font type to UTF-8.

Size: Set the font size to large, medium or small.

See the table below for the corresponding English and Chinese font sizes:

Size	English	Chinese
Large	Lowercase → 23 Uppercase → 29	16
Medium	Lowercase → 37 Uppercase → 48	26
Small	Lowercase → 56 Uppercase → 72	40

Font: NotoSerifCJKtc and Open are the two available font types.

Text Color: You can set the text color to Black, Blue, Green, Orange, Red, White or Yellow.

Border Line: Select ON to enable the border line of the text entered.

Border Color: The border line color can be set to Black, White or Yellow.
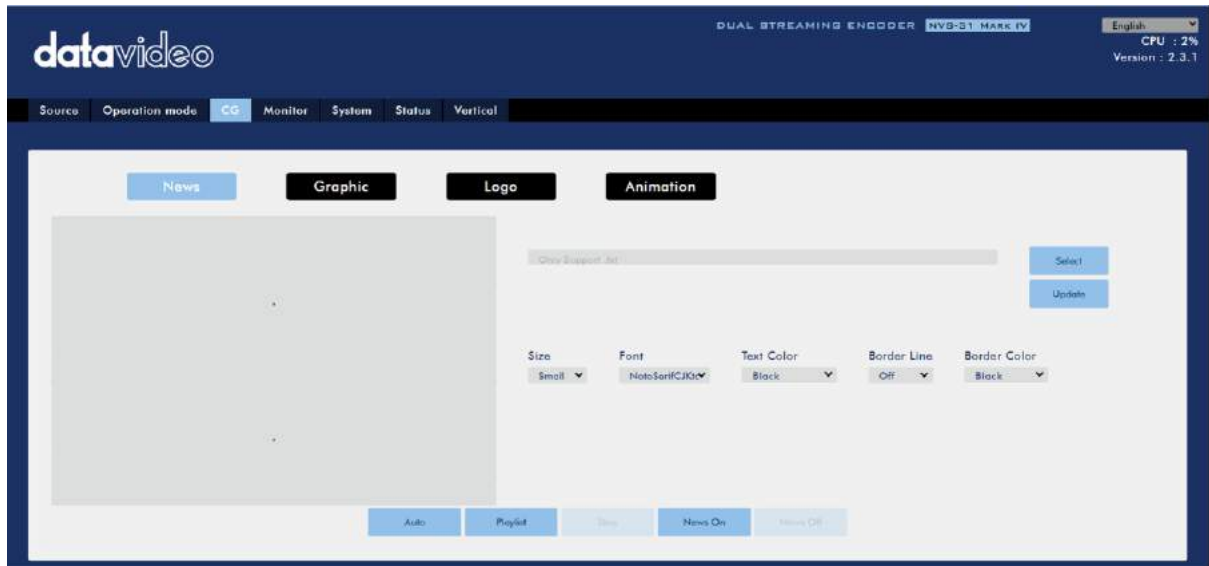
After you've entered and configured the scrolling text, you may enable them on the video using one of the three ways described below:

Click "**AUTO**" to play the scrolling text and change lines for every 6 seconds.

Click "**Playlist**" to play the scrolling text and change lines only when the space key is pressed. At the 15th line (last line), press the space key to return to the first line.

Click "**News On**" to select any text preview box with the mouse. When the text line turns red as the mouse cursor is hovered over, that particular line of text is too long and certain parts have been cropped on the screen.
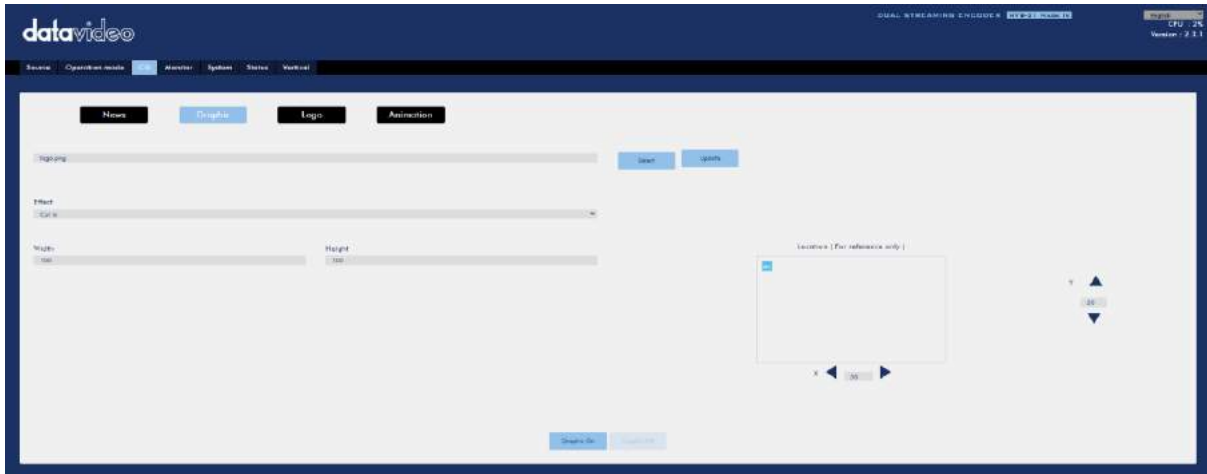
Graphic

You can also add a picture to the video. You will be required to select a png file from your local hard disk. Click **Select** to browse the hard drive for your graphic file then click **Update** to start the upload.

After the graphic file has been successfully uploaded, you can adjust the size by entering appropriate values in the **Width** and **Height** fields.

The **Effect** drop-down list sets how the image enters the video. If you want the image to enter from either side of the screen, select "**Left to Right**" or "**Right to Left**". Select "**Cut in**" if you want the image to appear with no effect. Lastly, set the coordinates of the image. The position of the image on the screen will be shown in the location box.

To turn on the graphic image, simply click the **Graphic ON** button which can be found at the bottom of the page.
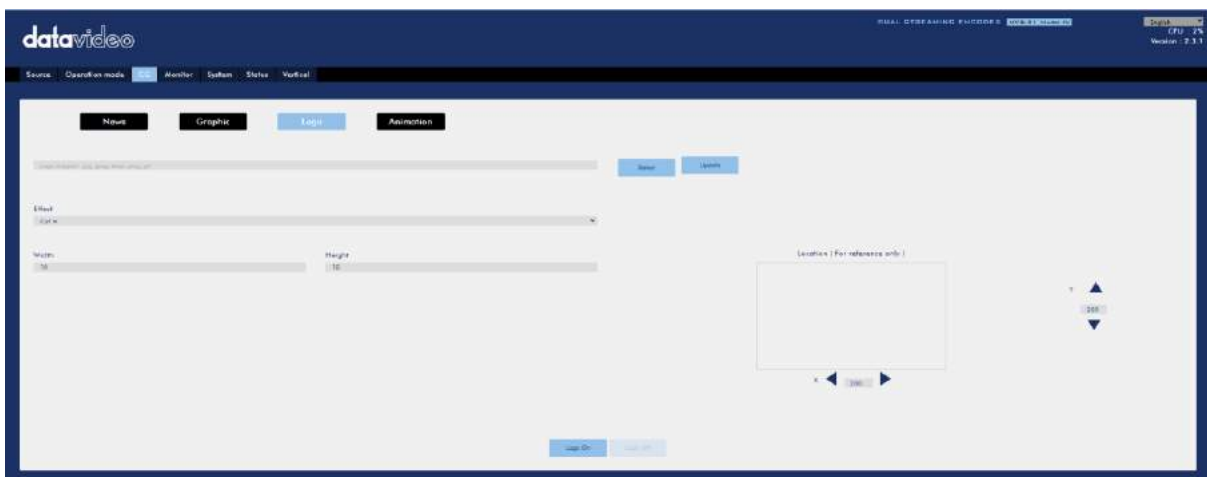
Logo

You can also add a logo to the video. You will be required to select a jpg, jpeg, bmp, png or gif file from your local hard disk. Click **Select** to browse the hard drive for your logo file then click **Update** to start the upload.

After the logo file has been successfully uploaded, you can adjust the size by entering appropriate values in the **Width** and **Height** fields.

The **Effect** drop-down list sets how the logo enters the video. If you want the logo to enter from either side of the screen, select "**Left to Right**" or "**Right to Left**". Select "**Cut in**" if you want the logo to appear with no effect. Lastly, set the coordinates of the logo. The position of the logo on the screen will be shown in the location box.

To enable the logo, simply click the **Logo ON** button which can be found at the bottom of the page.


Animation

You can also add an animation to the video. You will be required to select a jpg, jpeg, bmp, png or gif file from your local hard disk. Click **Select** to browse the hard drive for your animation file then click **Update** to start the upload.

After the animation file has been successfully uploaded, you can adjust the size by entering appropriate values in the **Width** and **Height** fields.

The **Effect** drop-down list sets how the animation enters the video. If you want the animation to enter from either side of the screen, select "**Left to Right**" or "**Right to Left**". Select "**Cut in**" if you want the animation to appear with no effect.

Lastly, set the coordinates of the animation. The position of the animation on the screen will be shown in the location box.

To enable the animation, simply click the **Animation ON** button which can be found at the bottom of the page.
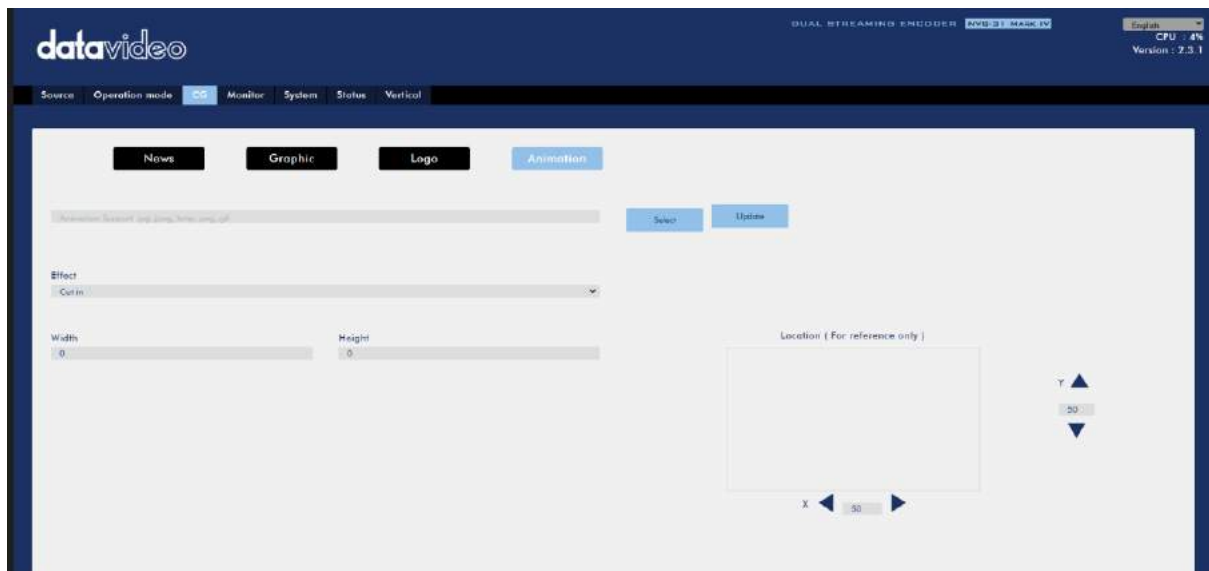
Monitor

The **Monitor** option allows you to set the frame rate of the streaming video from the **Frame Rate** drop-down menu. You can also use the **Audio Delay** slider to adjust the audio delay of the streaming.
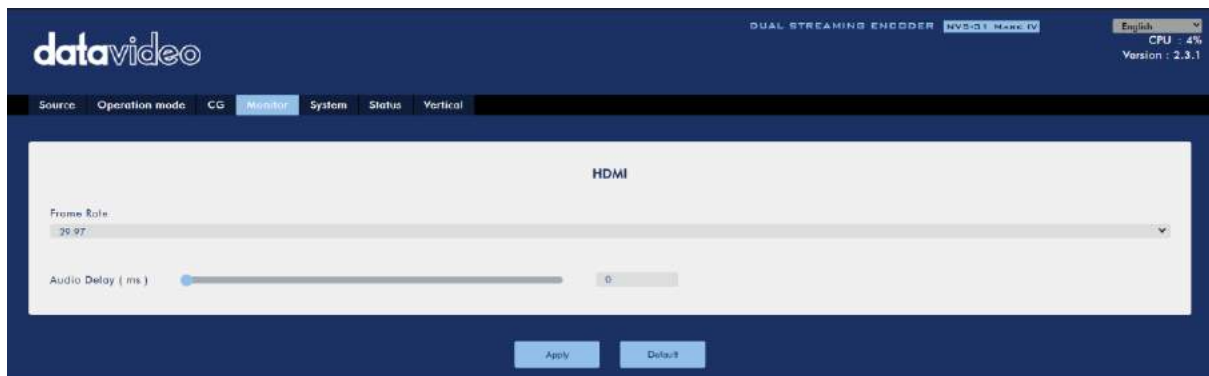
Frame Rate
This drop-down menu allows you to select your desired video frame rate of the streaming.

- 60.00

- 59.94

- 50.00

- 30.00

- 29.97

- 25.00

Audio Delay (ms)

The **Audio Delay** slider allows you to adjust the audio delay of the streaming, and the adjusted range is 0-3000 ms.

The **Monitor** interface is shown as below.

System

The system page allows the user to configure several network and system related settings.

The network settings are **DHCP enable/disable**, **static IP address**, **subnet mask**, **default gateway**, **primary and secondary DNS**, and etc.

The system settings are **account credentials**, **time settings**, **firmware update**, **disk format** and **device name**.

The system page is shown in the diagram below.
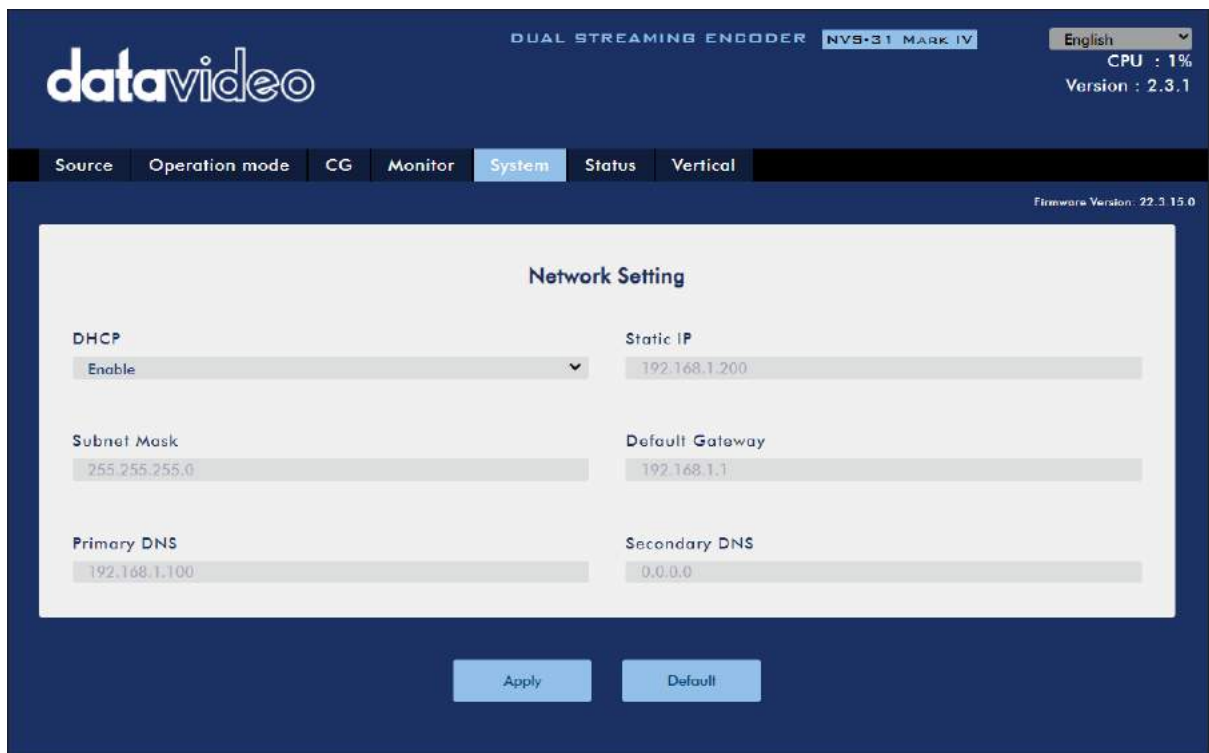
Account and Password

New Account

New Password

[   ]   [   ]   Apply

Time Setting

Type

Timezone

Manually ▾   UTC+8 ▾   Apply

Date

Time

2023-10-03   14:55:18

Firmware Update

File Path

[   ]   Browse

Update

Disk Information

Device

Device0: ▾   Apply

Format Type

FAT-32 ▾   Format

Device Name Setting

Device Name

[   ]   Apply

Other Option

Timeout Period

20 Min ▾   Apply

System Control

Restore to Default   Reboot

Network Setting

In network settings, you can either manually enter the IP address or set the device to DHCP mode which allows the router to automatically assign the IP address to the NVS-31 MARK IV.

DHCP

In DHCP mode, the router automatically assigns the IP address to the device. If you want to manually configure the network settings, disable this option.

Static IP Address

If the DHCP is disabled, the static IP field will be activated for the user to manually enter the IP address. The static IP address is 192.168.1.200 by default.

Tip: If you do not know the device's IP address, you can always use the following method to reset the network settings.

- Shut down the machine
- Turn on the machine while holding down **RECORD** and **STREAM** buttons simultaneously.
- Approximately after 5 seconds, release the **RECORD** and **STREAM** buttons as soon as the button LEDs are turned **ON**.
- The default IP address should be 192.168.1.200.

Subnet Mask

Static IP address mode requires the **subnet mask**, which is 255.255.255.0 by default.

Default Gateway

Static IP address mode requires the **default gateway**, which is 192.168.1.254 by default.

Primary DNS (Optional)

Primary DNS is required in static IP mode only but is optional.

Secondary DNS (Optional)

Secondary DNS is required in static IP mode only but is optional.

Account and Password

New Account: It can be used to set the Account of the NVS-31 MARK IV, please press the Apply button after the Account is set.

New Password: It can be used to set the Password of the NVS-31 MARK IV, please press the Apply button after the Password is set.

Time Setting

In time setting, you are allowed to select the reference time source for the NVS-31 MARK IV.
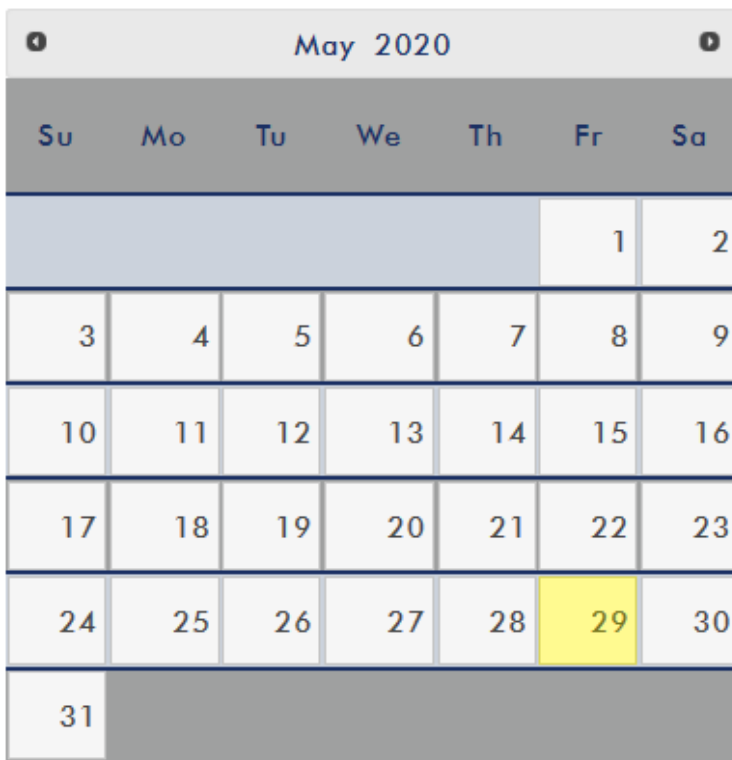
Type

In this drop-down menu, you can either select to allow the device to retrieve the time automatically from the Network Time Protocol (NTP) server by selecting "**Automatically from the Internet**" or locally by selecting **"Manual"**.

NTP Server

If you've selected "**Automatically from the Internet**," you will need to enter the NTP server address here.

Manual

If you've selected "**Manual**", the **Date** and **Time** fields will appear showing the device's system date and time values. A calendar will appear after the **Date** field is clicked. Simply click a day to set the date. Set the time in the **Time** field.

◀			May 2020			▶
Su	Mo	Tu	We	Th	Fr	Sa
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

Time Zone

Click the drop-down menu to select a time zone for your device.

After you've configured the time settings, click **Apply** to save the new settings.

NTP Server

This option allows you to enter your desired NTP server.

Firmware Update

File Path

Click **Browse** to search for the latest firmware file saved on the PC's hard disk. After the latest firmware file is uploaded, click **Update** to start the firmware update.

Device

When an SD Card is inserted into the SD SLOT of the KMU-300, this option will show the remaining capacity and total capacity of the inserted SD Card. When the inserted SD Card is selected, please press the "Apply" button for confirmation.

Format Type

In this pane, you will be allowed to view the SD card information and format the SD card to one of the format types listed as follows:

- FAT-32
- NTFS
- EXFAT

Click **Format** to start formatting.

Device Name Setting

Enter a name for this device and click **Apply** to save the name.

Other Option

Timeout Period

This sets the timeout period for the current login. See below for available options.

- 20 Min
- 120 Min
- 1 Day
- 7 Day
- Never

System Control

Restore to Default

Click to restore the system's default settings.
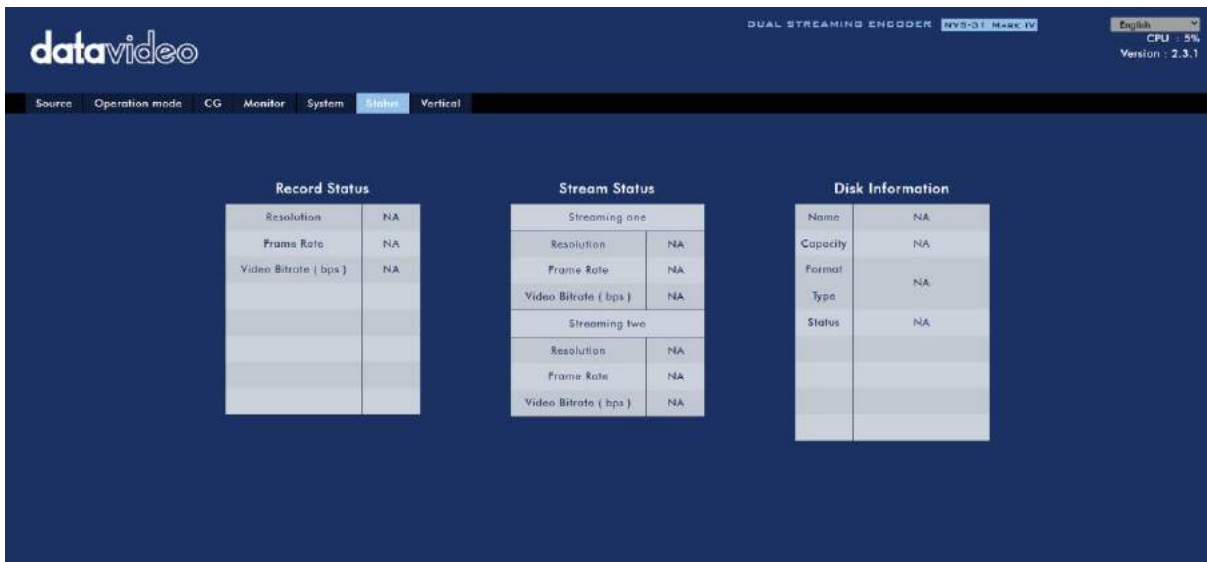
System Reboot

Click to reboot the NVS-31 MARK IV.

Status

The status page shows **Record**, **Stream** and **Disk** information as depicted in the diagram below.

Note: The NVS-31 MARK IV web UI does not update automatically so to learn the latest device status, please refresh the page manually.

While monitoring streaming and recording, please update the page periodically regardless of how you operate the device (using the device's physical buttons only or using the device's physical buttons along with the web UI). This ensures the page is always displaying the most up-to-date information.

Vertical

On this page, you will be able to change your stream video orientation.

- Crop: Designed for KMU-300 product series allowing 16:9 video output and image crop on left and right.
- Rotate: Designed for video production; if the camera is placed upside down, this mode will reverse it.
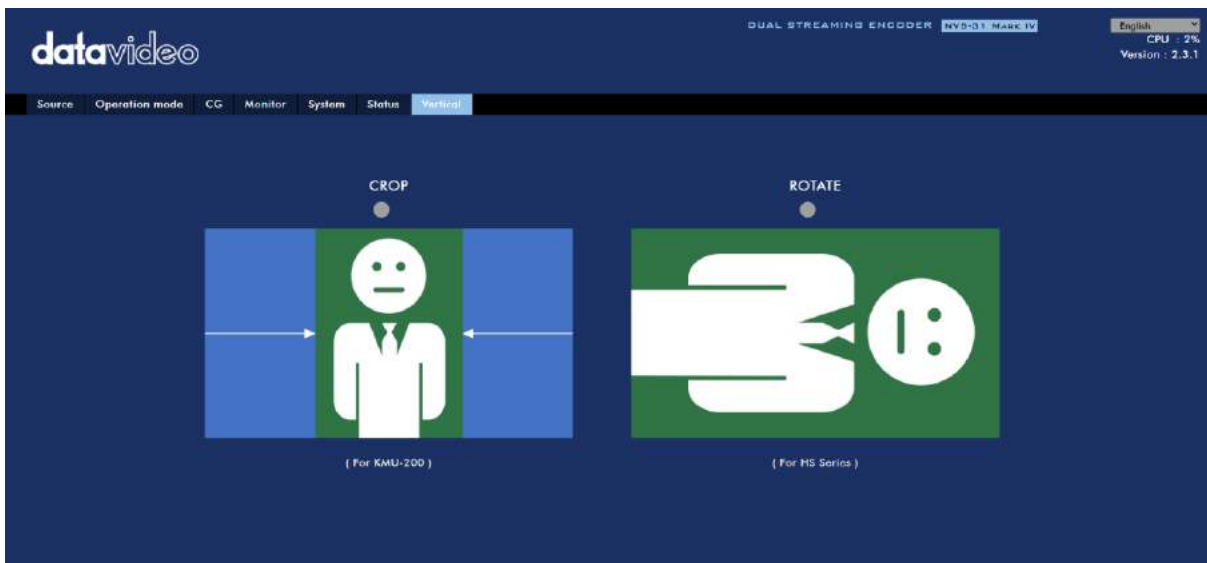
5.3   Operations

In this section, we will discuss how you can play the video using different streaming protocols and how to place texts on your video.

Video Streaming

The NVS-31 MARK IV provides the user with different video streaming options such as **RTSP**, **RTMP**, **TS**, **HLS**, **SRT**, **KUAISHOU** and **DV Cloud**. Note: The KUAISHOU platform can be used in China only.

This section discusses settings of these options and how to stream your video using these methods.

RTSP/TS/HLS

In the **RTSP/TS/HLS** modes, the **NVS-31 MARK IV** is a stream server which allows any client device to connect and playback your video stream.

The following operation procedure uses VLC media player to playback video stream. If your PC or laptop does not have VLC media player installed, please visit VideoLAN's official homepage (https://www.videolan.org/) and download the installation file then install the program.

Follow the steps below to obtain the RTSP URL:

1. On the web UI, click "**Operation Mode**" → "**Stream**" to open the stream settings page.

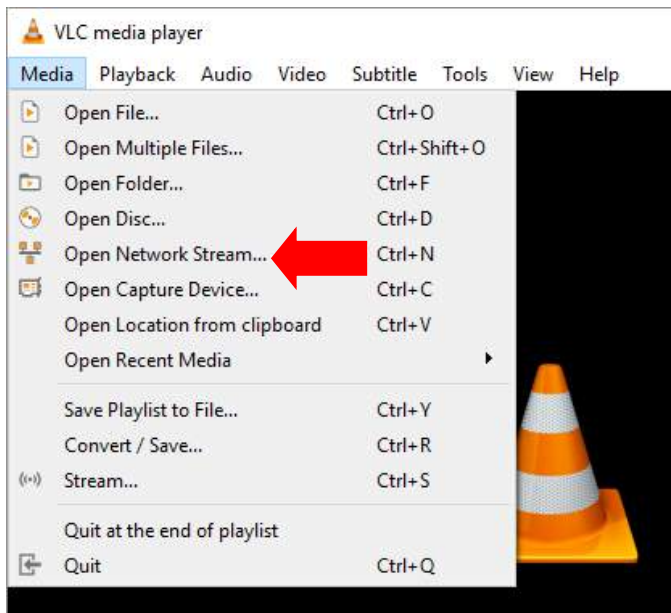2. Select **RTSP** from **Stream Type** drop-down menu.
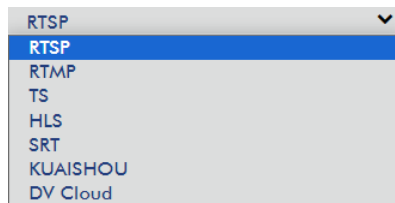
3. Click the **Start Stream** button to generate the RTSP URL.

4. Based on your settings, the device will automatically generate the RTSP URL **rtsp://root:root@192.168.1.200:555/session0.mpg**.

5. To view the RTSP video stream, enter the RTSP URL into the client device.

6. Open VLC then click **Open Network Stream** (shown in the diagram below).
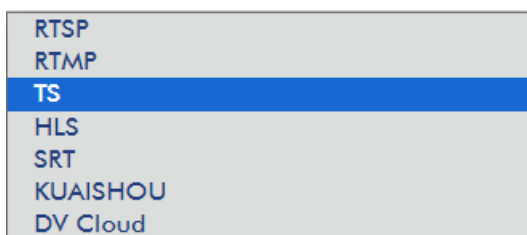
7. As shown in the diagram below, enter the stream URL then click **Play** to start streaming.
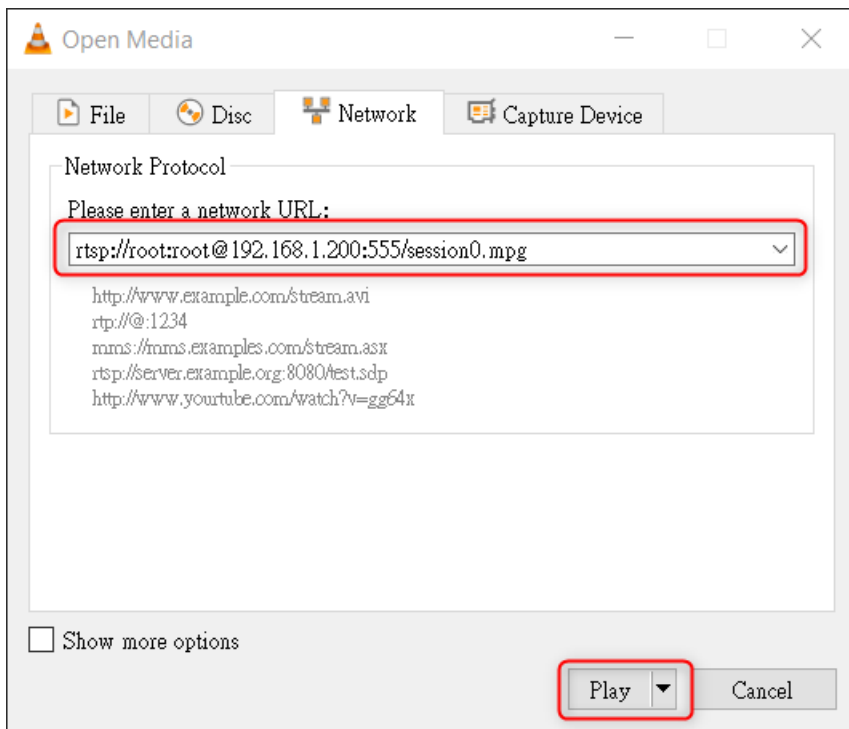
Follow the steps below to obtain the TS URL:

1. On the web UI, click "**Operation Mode**" → "**Stream**" to open the stream settings page.

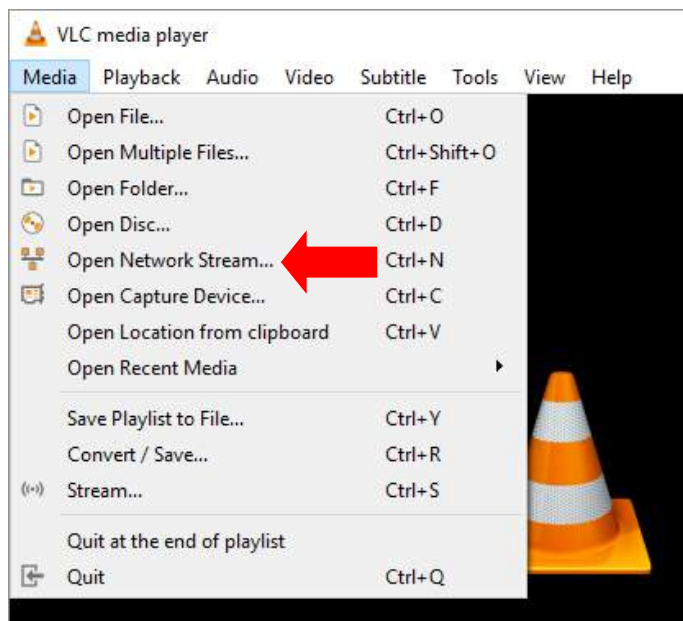2. Select **TS** from **Stream Type** drop-down menu.

3. Enter the TS URL. Note that the TS URL shown below is only for illustration purpose.

TS URL

udp://192.168.1.66:12345

4. Click the **Start Stream** button to start the stream.

Play URL

udp://192.168.1.66:12345

5. Enter the TS play URL into the client device to which the video stream is delivered over TS protocol.

6. On the computer, open VLC then click **Open Network Stream** (shown in the diagram below).
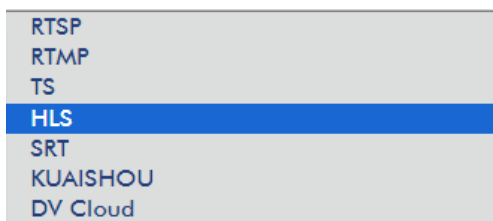

7. As shown in the diagram below, enter the stream URL then click **Play** to start streaming.
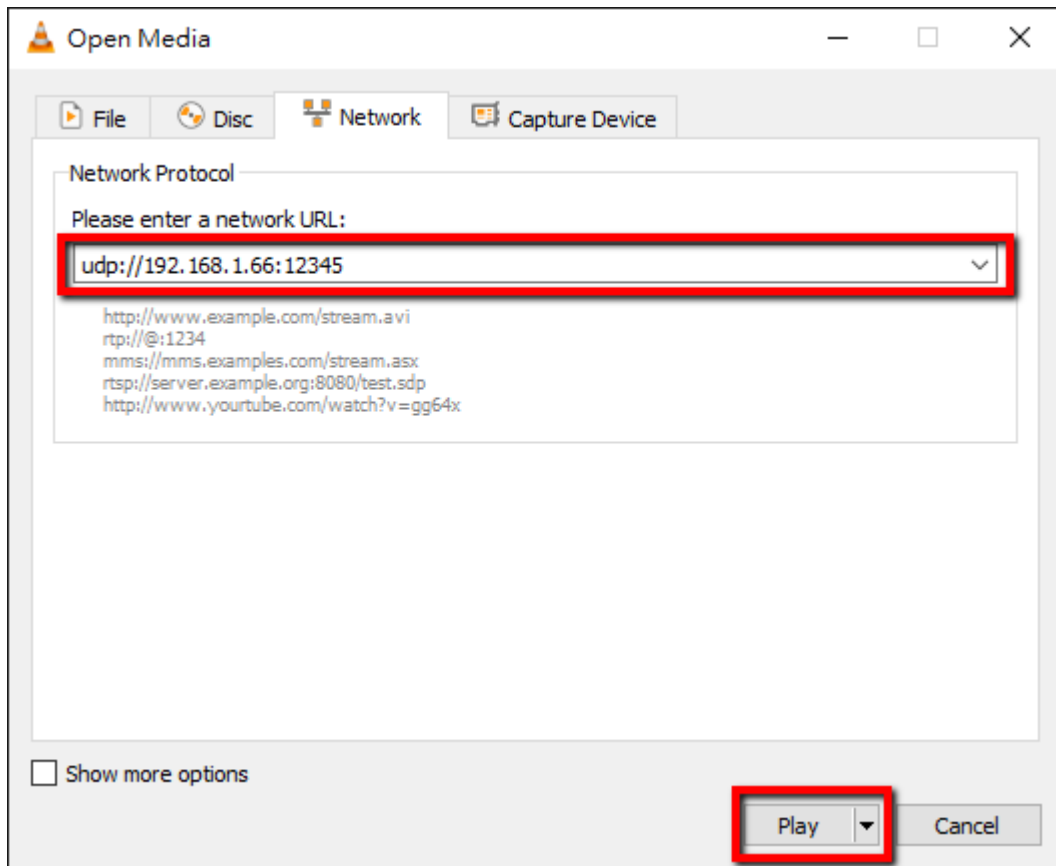
Follow the steps below to obtain the HLS URL:

1. On the web UI, click "**Operation Mode**" → "**Stream**" to open the stream settings page.

2. Select **HLS** from **Stream Type** drop-down menu.

3. Click the **Start Stream** button to start the stream.

4. Based on your settings, the device will automatically generate a .m3u8 stream URL: http://192.168.1.82/hls/2/session0.m3u8

5. Enter the **HLS** URL into the client device.

6. Open VLC then click **Open Network Stream** (shown in the diagram below).

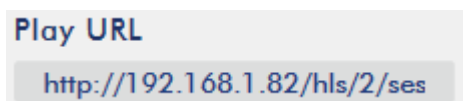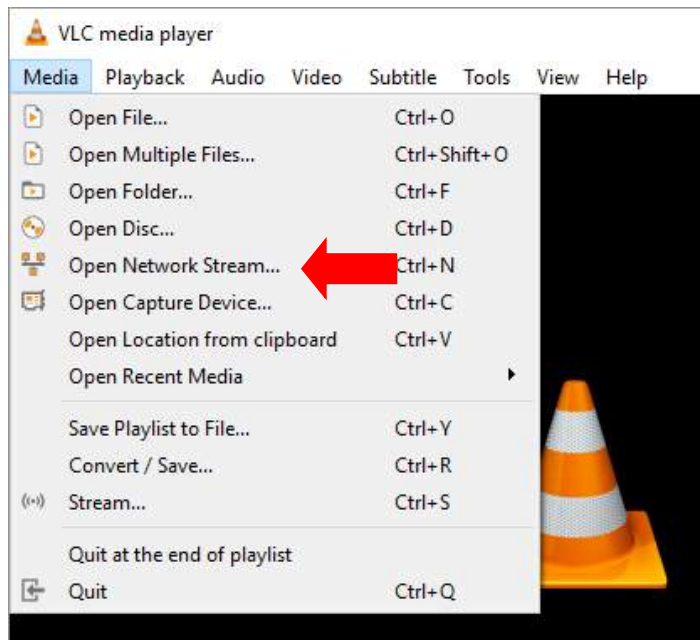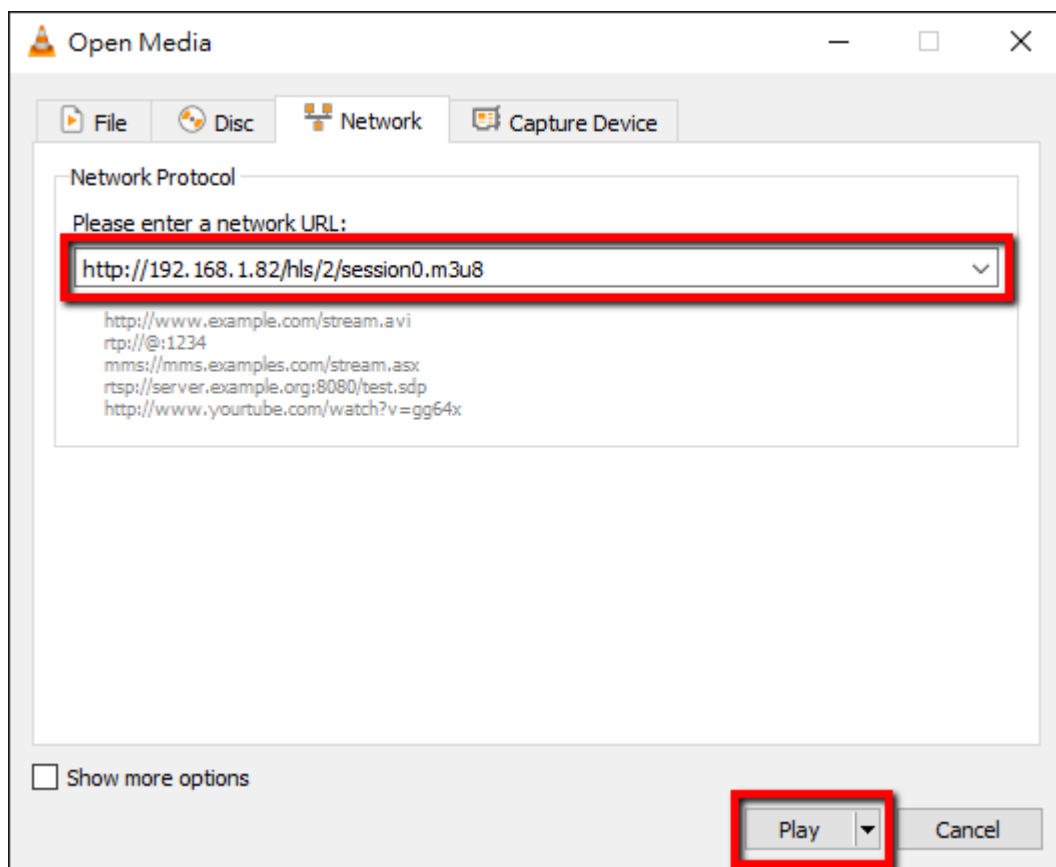7. As shown in the diagram below, enter the stream URL then click **Play** to start streaming.

8. You can also play .m3u8 stream URL using the devices listed as follows:

- iPhone, iPad and MacBook: Use Safari to open the .m3u8 stream URL.
- Windows 10: Use Microsoft Edge to open the .m3u8 stream URL.

RTMP

In the **RTMP** mode, the NVS-31 MARK IV can send up to two data streams to multiple CDNs or media servers that support the **Real-Time Messaging Protocol**. Examples of the **RTMP** media server are **USTREAM** and **Youtube**.

Note: The NVS-31 MARK IV does not support RTMP local.

In the following section, we will show you how to set up an **RTMP** stream to **Youtube**. The step-by-step account setup is outlined as follows:

1. First, obtain the Server URL and Stream name/key from Youtube.

2. Open the Youtube Live Dashboard https://www.youtube.com/live_dashboard

3. Please click the "Create>Go Live" option which is located at the top-right corner.

4. On the right, scroll down to the bottom where you will be able to find **Stream URL** and **Stream key**.
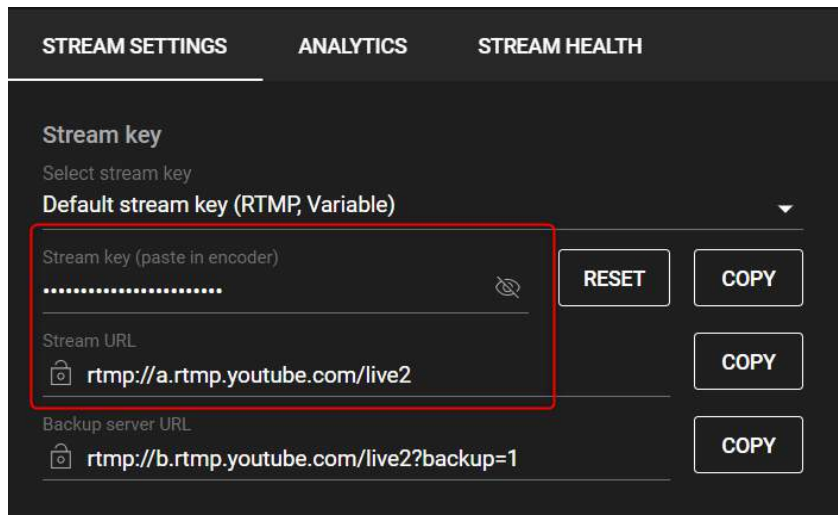
5. On the NVS-31 MARK IV, open the **Stream** operation mode page.

6. Select **RTMP** from the Stream Type drop-down menu.
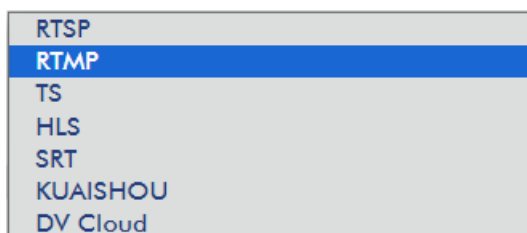
7. Enter the **Stream URL (rtmp://a.rtmp.youtube.com/live2)** obtained from the **Youtube Live Streaming** page into the **RTMP URL** field.

RTMP URL

rtmp://a.rtmp.youtube.com/live2

8. Enter the **Stream key** obtained from the **Youtube Live Streaming** page into the **Stream Name** field.

Stream Name

gfay-3jva-70aw-trjd-6grr

9. As required by the live streaming channel, enter your Youtube account name and password into the **Account** and **Password** fields.

Account   Password

10. Click the **Start Stream** button to start streaming the live video to the **Youtube Live**. You should also see an **RTMP URL** generated.

RTMP URL

rtmp://a.rtmp.youtube.com/live2

11. At this point, you should be able to view your stream video on Youtube.

12. To stop live streaming, simply click the **Stop Stream** button.

SRT

When setting up an SRT stream on NVS-31 MARK IV of the KMU-300, you can configure it as an SRT source encoder (caller mode) or an SRT destination decoder (listener mode).

To establish an SRT link between the source and destination devices, ensure that one device is a Listener and the other is a Caller. The device you set as the caller or listener is entirely arbitrary.

To access the device's SRT settings, log in to the web UI, select the **"Operation Mode"** tab, then click the **"Stream"** button to open the stream settings page.

Now, follow the steps below to set up the SRT traffic:

1. Select **SRT** from **Stream Type** drop-down menu. Please select "Streaming One" or "Streaming Two". After that, please select "Enable" from the Encoder Source drop-down menu. Please refer to for setting the main and sub encoders.

2. Please select **SRT** from the **Stream Type** drop-down menu.

Stream Type

SRT
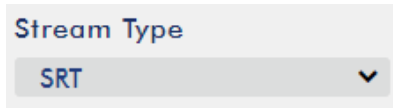
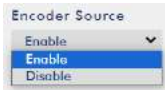3. Scroll down to the bottom and locate a second **Stream Type** drop-down menu in which you will be able to set the device to the Caller (source) or Listener (destination) mode.

Stream Type
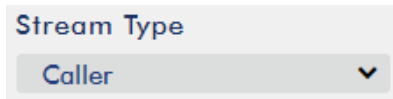
Caller

a. If Caller is selected, do the following:
   - In the **IP Address and SRT Port** fields, enter the IP address and the port number of the destination device (decoder) respectively. If your SRT stream destination is a CDN or media server, the IP address and the port number should be provided by the service provider.
   - In the **Latency** field, enter the amount of latency to apply to the stream. The default value is 1000 ms.
b. If Listener is selected, simply enter a port number that you intend to use on this device for the SRT stream.

4. Click the **Start Stream** button to start the SRT stream.

DV Cloud

If you would like to stream or record an input video channel to DV Cloud via SRT protocol, please select "Enable" for "Streaming One" or "Streaming Two" from the "Operation Mode>Stream". Please select "DV Cloud" from the "Stream Type" drop-down menu and then enter the DV Cloud admin login credentials. The admin login account is the account credentials entered when you sign up for a DV Cloud account.

Username (email)

Password

Login   Logout

Once logged in, you will see the fields as shown in the diagram below.

Enter the following information.

Encoder Source: Select "Enable" from the drop-down menu. See **Page 35-38** for details of the encoder settings.

Public Server: DV Cloud server name

SRTPassword: Enter a password to encrypt the SRT stream.

Channel Name: Enter an arbitrary name of the video channel streamed to DV Cloud.

Model Name: Please enter your desired source name for showing on the DV Cloud.

Reference Latency: This column will show the reference latency for your reference.

After entering all information, click the **Start Stream** button

 and then click "Go to DV Cloud" icon to view your video channel on DV Cloud as illustrated in the diagram below.

5.4 Stream and Record Buttons

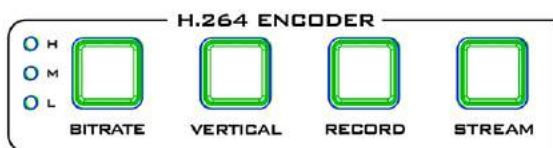The **RECORD**, **STREAM**, **VERTICAL** and **BITRATE** buttons on the front panel of the KMU-300 give the user certain controls of the record and stream functions. In this section, we will cover operations of these four buttons in detail.

RECORD and STREAM Button LED behaviors are listed in the table below:

	RECORD Button	**STREAM Button**
Solid White	Record function in idle state	Stream function in idle state
Blinking Red	Record function is activating or resetting	Stream function is activating or resetting
Solid Red	Record function activated	Stream function activated

Record Button

Press the **RECORD** button to start/stop recording.

Start recording

- When idle, the **RECORD** button is solid white.
- Press and hold the **RECORD** button for approximately 2 seconds.
- When the record function is activating, the **RECORD** button turns from solid white, then blinking red and finally to solid red.
- When the **RECORD** button is solid red, this indicates that the record function has been successfully activated.

Stop recording

- While recording, the **RECORD** button is solid red.
- Press and hold the **RECORD** button for approximately 2 seconds.
- When the record function is terminating, the **RECORD** button turns from solid red, then blinking red and finally to solid white.
- When the **RECORD** button is solid white, this indicates that the record function has been successfully terminated.

Stream Button

Press the **STREAM** button to start/stop streaming.

Start streaming

- When idle, the **STREAM** button is solid white.
- Press and hold the **STREAM** button for approximately 2 seconds.

- When the stream function is activating, the **STREAM** button turns from solid white, then blinking red and finally to solid red.
- When the **STREAM** button is solid red, this indicates that the record function has been successfully activated.

Stop streaming

- While streaming, the **STREAM** button is solid red.
- Press and hold the **STREAM** button for approximately 2 seconds.
- When the stream function is terminating, the **STREAM** button turns from solid red, then blinking red and finally to solid white.
- When the **STREAM** button is solid white, this indicates that the stream function has been successfully terminated.

Bitrate Button

Follow the steps below to switch the stream bitrate mode using the **BITRATE** button:

- Press and hold one of the **RECORD** button and **STREAM** button until the pressed button starts blinking red.
- Continue holding down one of the **RECORD** button and the **STREAM** button while pressing the **BITRATE** button to switch stream bitrate mode (H, M or L).

Note: The system will return to original settings if the BITRATE button push is not sensed. The default bitrate is M.

Vertical Button

Press the **Vertical** button to switch the video orientation between **Portrait** and **Landscape**.

5.5   Restoring Factory Defaults

On the system page, scroll down to **System Control** in which you should be able to find the **Restore to Default** button. Click to restore the system's factory defaults. Alternately, you can follow the steps below to restore the NVS-31 MARK IV's factory defaults.

- The **RECORD** and **STREAM** buttons are either solid white and solid red, which means the factory defaults can be restored regardless of the state of the device.
- Press and hold the **RECORD** and **STREAM** buttons simultaneously for more than 10 seconds.
- While the NVS-31 MARK IV's factory defaults are being restored, the **RECORD, STREAM, VERTICAL** and **BITRATE** buttons turn from solid red, then blinking red and finally to solid white.

- When the **RECORD, STREAM, VERTICAL** and **BITRATE** buttons turn solid white, it indicates that the NVS-31 MARK IV's factory defaults have been successfully restored.

5.6   Firmware Update

Datavideo usually releases new firmware containing new features or reported bug fixes from time to time. See **Appendix 1** for instructions.

Chapter 6   Appendices

1.   Firmware Update

Datavideo usually releases new firmware containing new features or reported bug fixes from time to time. Customers can either download the firmware as they wish or contact their local dealer or reseller for assistance.

This section outlines the firmware upgrade process which should take **approximately few minutes to complete**.

The existing settings should persist through the *firmware upgrade process, which should not be interrupted once started* as this could result in a non-responsive unit.

Firmware Upgrade Requirements

- The latest KMU-300 firmware update zip file x 1
  The latest firmware zip file can be downloaded from Datavideo official website's KMU-300 product page https://www.datavideo.com/product/KMU-300 After the downloaded firmware file is unzipped, you can see the firmware files which are shown as below.
  - ➢ DBSPCSC.bin
  - ➢ KMU300MB.bin
  - ➢ KMU300CF.bin
  - ➢ KMU300DB.bin
  - ➢ KMU300KB.bin
  - ➢ KMU300PL.bin
- KMU-300x 1
- USB Flash Drive x 1
- DC 12V power adapter x 1

System Diagram

Check the Current Firmware Version

1. Please use two fingers to slide up on the KMU-300 touch screen display to show KMU-300's OSD Menu.

2. Please tap "FW>FW Version" and then you can see several firmware version numbers including MB, DB, KB, FPGA and Panel.

Firmware Update

For the way to update the KMU-300 firmware, please refer to the descriptions below.

Updating the firmware by combining a USB Flash Drive and KMU-300's OSD Menu

➢ At first, please confirm that the latest firmware file is downloaded from Datavideo official website's product page.

➢ Please unzip the downloaded firmware and then please save the six firmware files including DBSPCSC.bin、KMU300MB.bin、KMU300CF.bin、KMU300DB.bin、KMU300KB.bin and KMU300PL.bin into the root directory of your USB flash drive.

➢ Please turn on the power of the KMU-300 and then please insert your USB Flash Drive into the F/W UPGRADE interface which is located on the rear panel of the KMU-300.

➢ Please slide up by two fingers on KMU-300' touch panel display to show the OSD menu.

➢ Please tap "FW>FW Update>Update", and then the firmware update will be started automatically.

2.   Recommended SD Cards

You should only use Class 10 SD card or above. In this appendix, you will find a list of SD cards recommended by Datavideo.

Recommended SD Cards			
No.	**Brand**	**Model**	**Pictures**
1	**Kingston**	SDHC I C10 16GB	
2	**SANDISK Extreme**	SDXC I C10 U3 V30 64GB	
3	**SONY**	SDXC I C10 U1 64GB	
4	**SANDISK Extreme PRO**	SDXC I C10 U3 128GB/64GB	
5	**SONY**	SDXC I C10 U3 64GB	
6	**TOSHIBA**	SDHC C10 16GB	

7	**SANDISK Extreme**	SDHC C10 16GB	
8	**ADATA Premier Pro**	microSDXC I UHS-I U3 Class 10 with SD adapter 64GB/16GB	
9	**SANDISK ULTRA®**	SDHC™/SDXC™ UHS-I 128GB	
10	**Transcend**	300S UHS-I SDHC 64GB/32GB	

3. Frequently-Asked Questions

This section describes problems that you may encounter while using the KMU-300. If you have any questions, please refer to related sections and follow all suggested solutions. If problem still exists, please contact your distributor or the service center.

No.	Problems	Solutions
1.		

4.   Dimensions

330.50

405.50
437.60

17
96.60
36.40
10.40
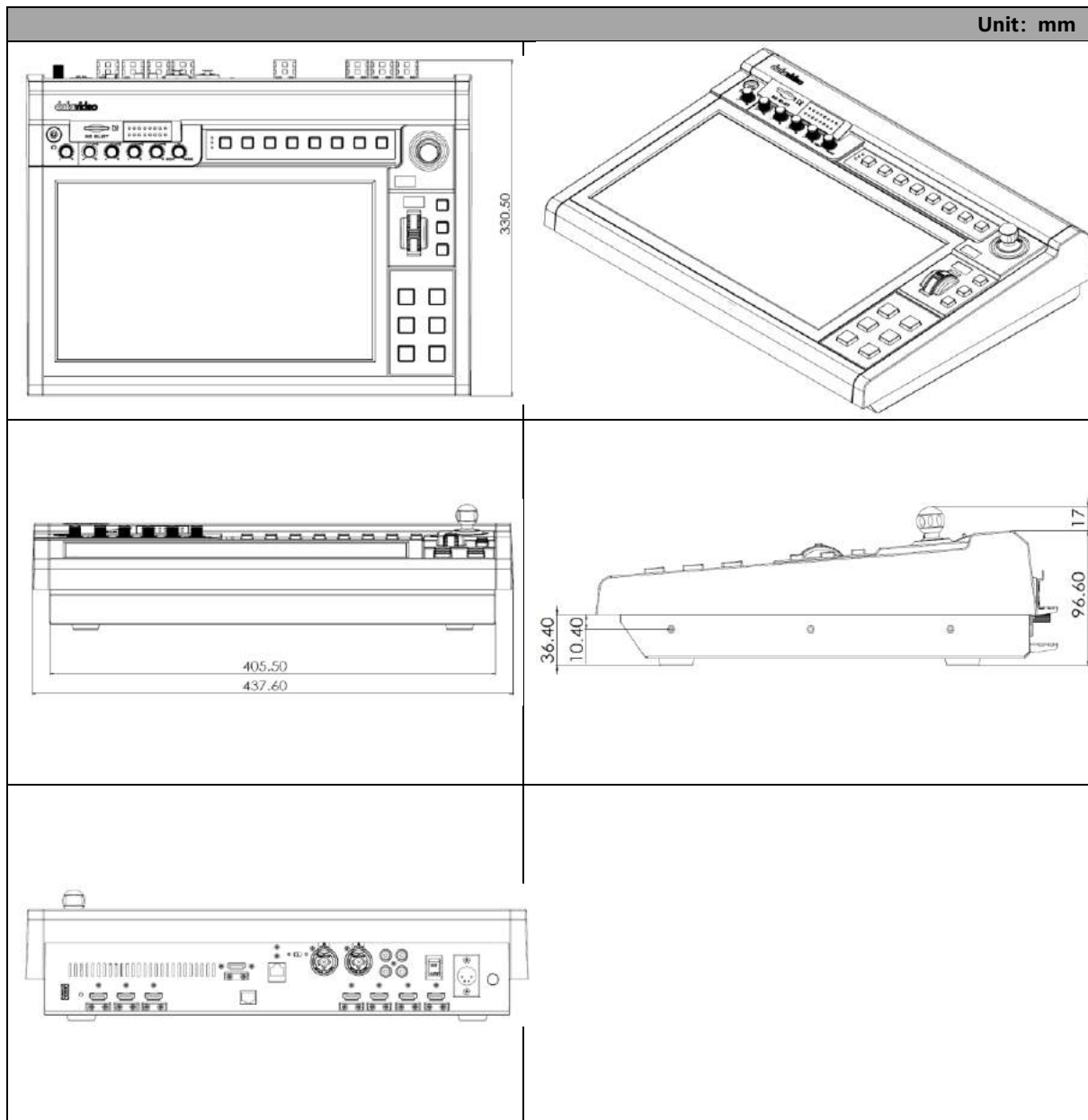
5. Specifications

Model Name	KMU-300
Product Name	**4K Multi-channel Streaming Switcher**
Video Standard	UHD & HD
Video Format	Input: 3840x2160p 23.98/24/25/29.97/30/50/59.94/60 1080p 50/59.94/60 Output: 1080p 50/59.94/60 720p 50/59.94/60
Video Processing	4:4:4 / 4:2:2 / 4:2:0
Video Input	1x HDMI 2.0 1x HDMI 1.4 with Loop through
Video Output	3x HDMI 1.4 (Program) 1x HDMI 1.4 (Aux: Ch1-Ch4)
Support Video Output Resolution	1920 x 1080p 50/59.94/60 1280 x 720p 50/59.94/60
Streaming	
Streaming Encode	H.264/AVC, Main/High Profile
Streaming Video Bitrate	Record Only: Up to 16Mbps (1080p50/60) Stream Only: Up to 10Mbps (1080p50/60), dual stream Record+Stream: 36Mbps (1080p50/60)
Streaming Video Rate Mode	CBR
Streaming Audio Mode	Stereo/Mono
Streaming Audio Bitrate	Stereo: 64~384Kbps Mono: 32~192Kbps
Streaming Protocols	TS over TCP/UDP (unicast & multicast) RTSP over HTTP/TCP/UDP (RTSP Elementary Streaming) RTMP/RTMPS (Publish) HLS SRT
Network Interface	1x RJ45 (10/100Mbps Ethernet)
Recording	
Recording Storage Medium	SD Card (Class 10 above)
Recording Storage File System	NTFS, FAT, exFAT
Recorded File Format	MP4
Built-in Audio Mixer	Yes, 4 Channels
Audio	
Audio Input	2x XLR(Mic) 2x RCA
Audio Output	2x Unbalanced RCA
Others	
Preview Display	14" Capacitive Touch LCD
Dimension (LxWxH)	438 x 331 x 114 mm

Weight	4.3 kg
Power Supply	DC 12V, 52W
Storage Temp. Range	- 10°C ~ 60°C (14°F~140°F)
Operating Temp. Range	0~40 °C

Service & Support

It is our goal to make owning and using Datavideo products a satisfying experience. Our support staff is available to assist you to set up and operate your system. Contact your local office for specific support requests. Plus, please visit www.datavideo.com to access our FAQ section.

Please visit our website for latest manual update.

www.datavideo.com/product/KMU-300