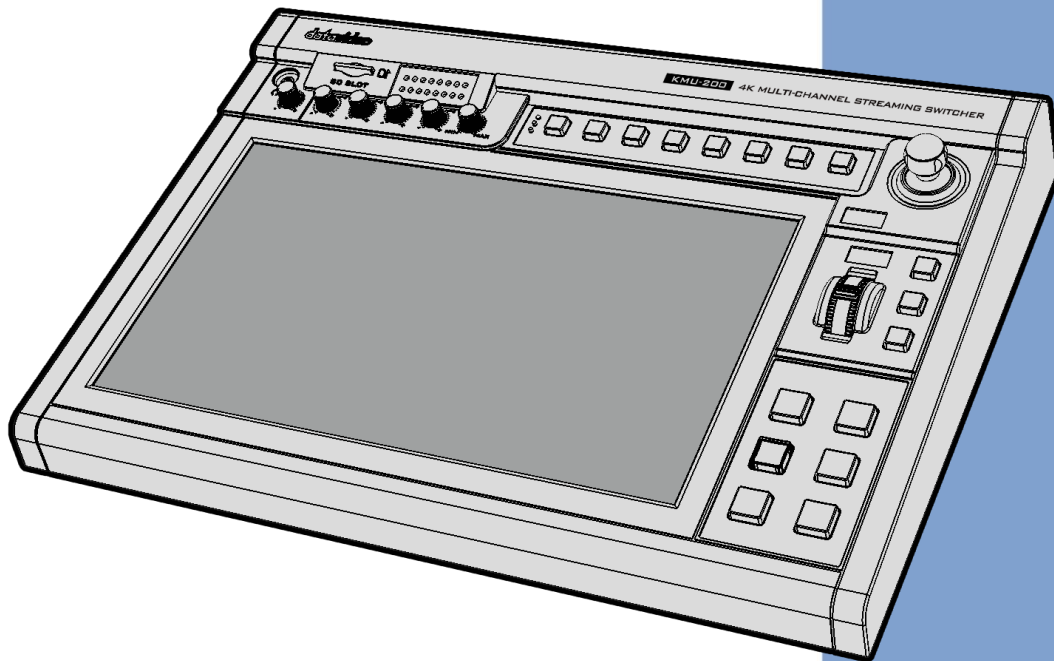


datavideo



**4K MULTI-CHANNEL
TOUCH SCREEN
REGION OF INTEREST SWITCHER**

KMU-200

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

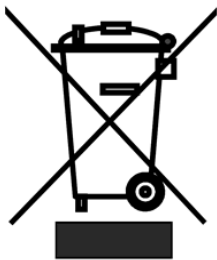
- All Datavideo products purchased after July 1st, 2017 are qualified for a free two years extension to the standard warranty, providing the product is registered with Datavideo



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-200 4K Multi-Channel Touch Screen Region of Interest is a single unit that allows you to convert the 4K input from the connected camera to the 1080 HD output. The channel buttons select the Program Channel output as well as the Preview. The joystick and knob adds greater flexibility to Pan, Tilt and Zoom controls of the selected frame. With a 14" Multi-Touch Screen, you can tap, swipe, or pinch to perform useful actions.

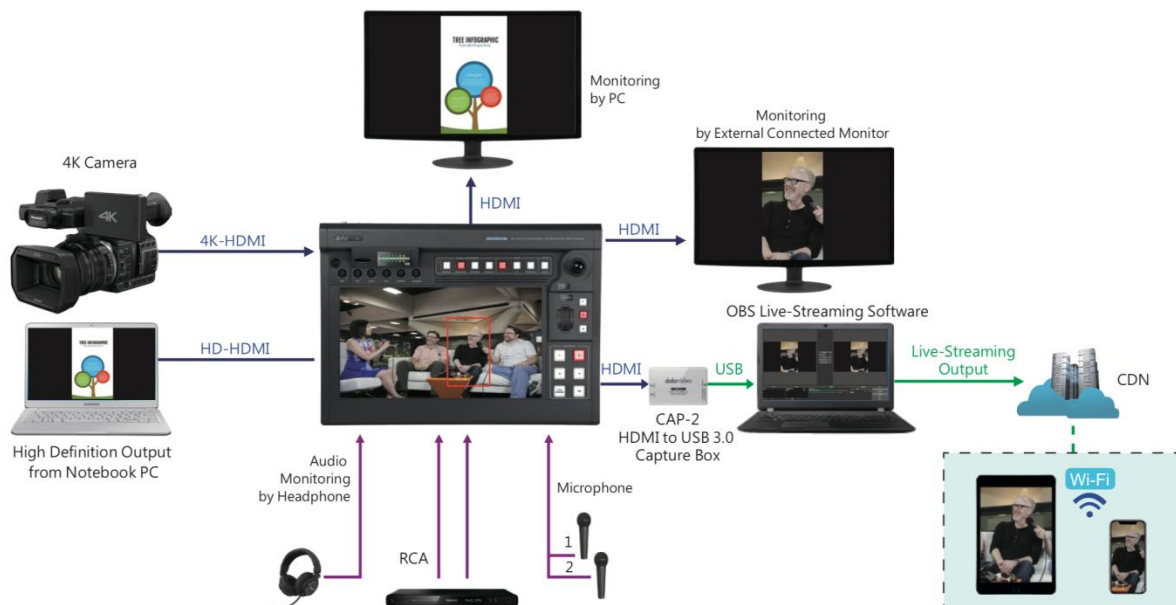
The KMU-200 allows you to output multiple landscape views or portrait video. The HD output can be streamed to multiple live streaming platforms and stored on an SD card.

By integrating frame control, audio mixing, and backup recording into a small single box, the KMU-200 is a perfect device for We Media Studio particularly and makes one-man multi-task production possible.

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 pan, tilt and zoom.
- 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

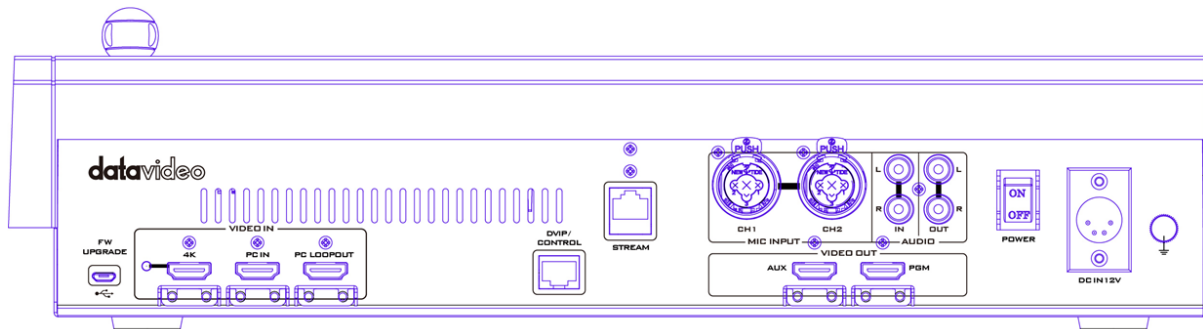


Chapter 2 Connections to the KMU-200

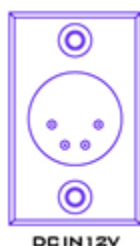
In this section, you will be provided with general overviews of the rear panel as well as the control panel.

2.1 Rear Panel

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



Power



DC IN

DC in socket connects the supplied 12V PSU.

Pin 1 = GND (-)

Pin 2 = NC

Pin 3 = NC

Pin 4 = VCC (+)



Power Switch

Turns ON/OFF the device



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 mm².

Video



4K HDMI IN

Video IN supporting up to 2160p50/59.94/60.

The green LED on the left indicates presence of the 4K input.



PC IN

Connect a PC or laptop.

PC LOOPOUT

Connect a monitor for displaying PC IN video.



AUX Output

The AUX port outputs one of Channel 1/2/3/4 videos, which can be set in [OSD menu](#).

PGM Output

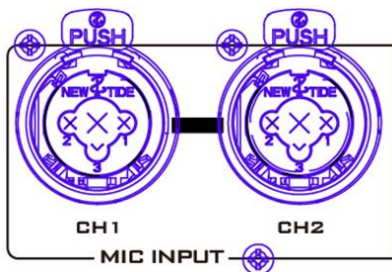
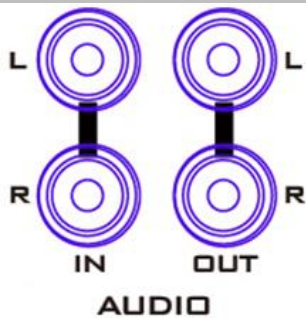
The PGM port outputs one of Channel 1/2/3/4 videos, full screen of the image captured by the camera and PC IN view. You can also select your PGM Output Channel using the channel buttons on the control panel. See [Channel Buttons](#) for details of operation.

Note: AUX and PGM are HDMI embedded audio ports.

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.



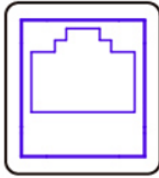
MIC Input – 6.3 mm XLR

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



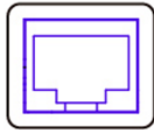
STREAM

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

DVIP/
CONTROL



DVIP/Control

TBD

Firmware Upgrade

FW
UPGRADE

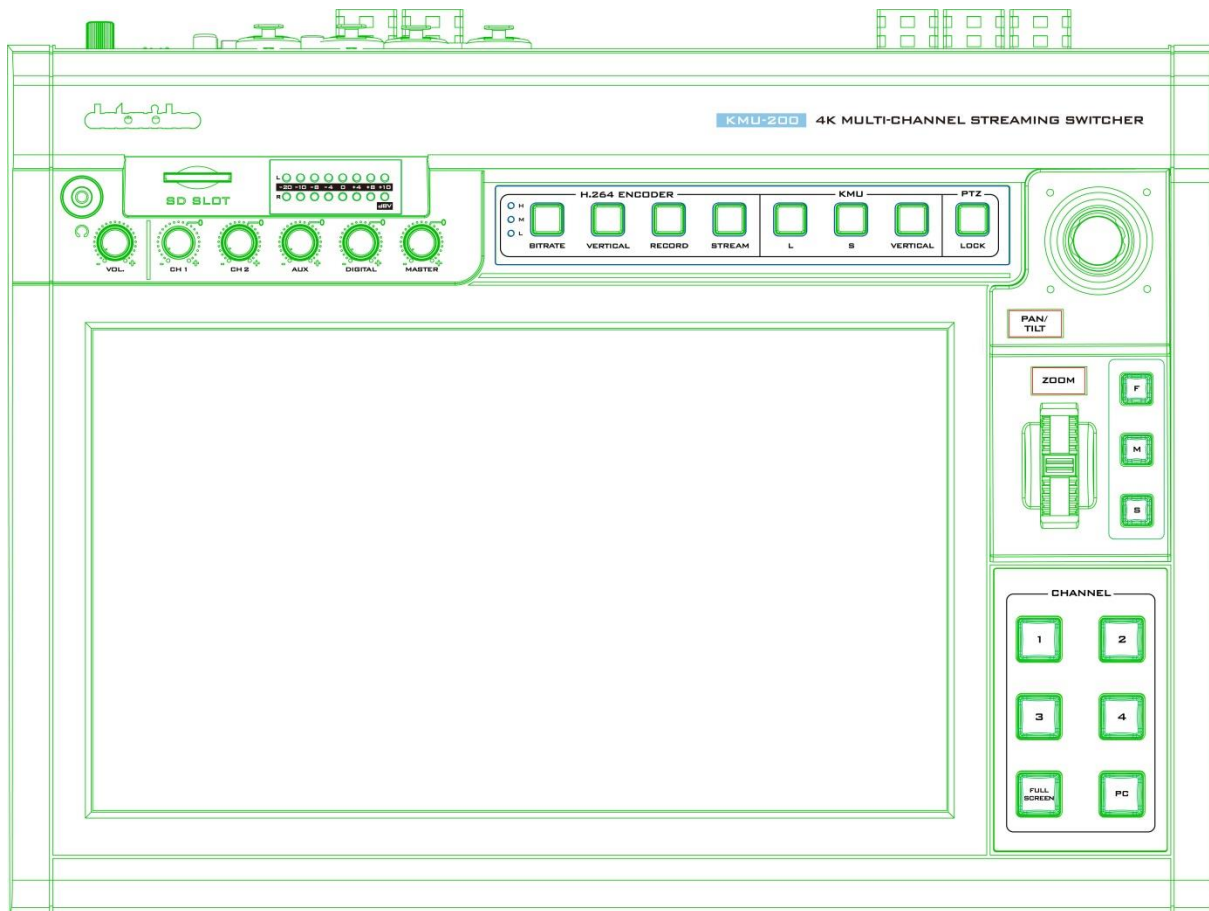


FW Upgrade

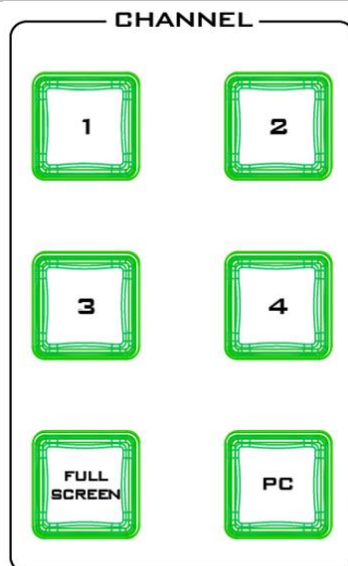
Connect the KMU-200 to a laptop/PC via a mini-USB-to-USB cable to perform a firmware upgrade. See [Appendix 1 Firmware Upgrade](#) for more details.

2.2 Controls

This section provides an overview of various functions of the control panel.



Output Selections



Channel Button Group

This button group allows you to select what you would like to display on the PGM Output.

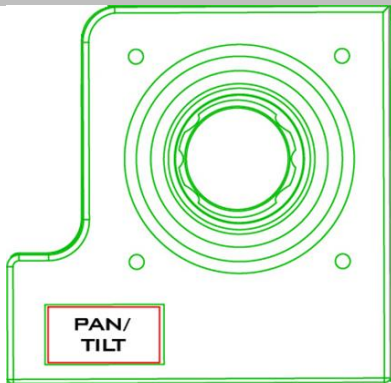
Buttons **1 – 4** correspond to Channels 1 – 4.

Press the **Full Screen** button to display the entire image captured by the camera connected to 4K HDMI IN port.

Press the **PC** button to display the PC IN video.

For more about these button operations, see [Chapter 4](#).

Pan / Tilt Control

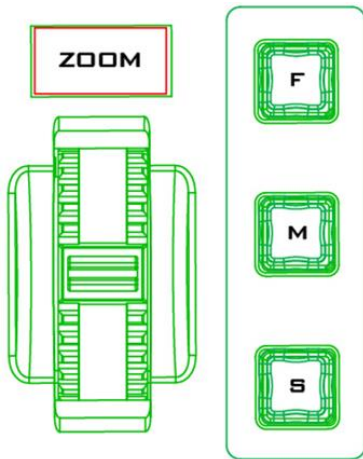


P/T Joystick

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 attempting to use the joystick to PAN or TILT the frame, first make sure the **PTZ LOCK** button is not enabled. If the **LOCK** button LED is ON, the joystick is locked; press the **LOCK** button to unlock the joystick.



Scroll Wheel – ZOOM

ZOOM – Scroll up to zoom in and down to zoom out.

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.

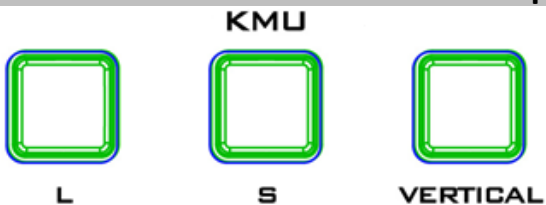
Note: Make sure the **LOCK** button is not enabled. If the **LOCK** button LED is ON, the scroll wheel is locked; press the **LOCK** button to unlock the scroll wheel.



LOCK Button

When enabled, the joystick and scroll wheel will be in the lock state. To resume their functional status, simply press the button once to unlock.

Output Settings



L/S Buttons

The **L** button sets the channel frame size to large and the **S** button sets the channel frame size to small. The setting applies to all four channels.

Vertical Button

Press the **Vertical** button to change the output orientation (to vertical display) of all four channels.

H.264 Encoder



RECORD

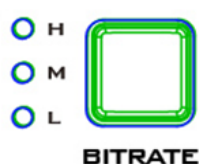
Press the **RECORD** button to enable video record mode.

STREAM

Press the **STREAM** button to enable video stream mode.

VERTICAL

Press the **VERTICAL** button to change the stream video orientation.



BITRATE

Use the **BITRATE** button to switch between **high (H)**, **moderate (M)** and **low (L)** bitrates for **RECORD** and **STREAM** modes.

External Storage



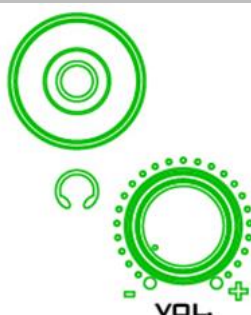
SD Card Slot

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, [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

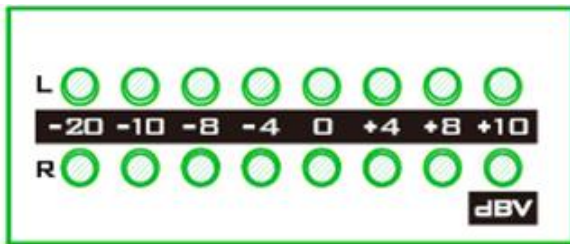


Headphone Jack

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.



- **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



MASTER OUT Meter

The LED style meters show the audio signal strength at the Main Program Audio Output. The signal strength is determined by the level set with the Master OUT knob. The LEDs turn red at +10 dB to indicate audio clipping.

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

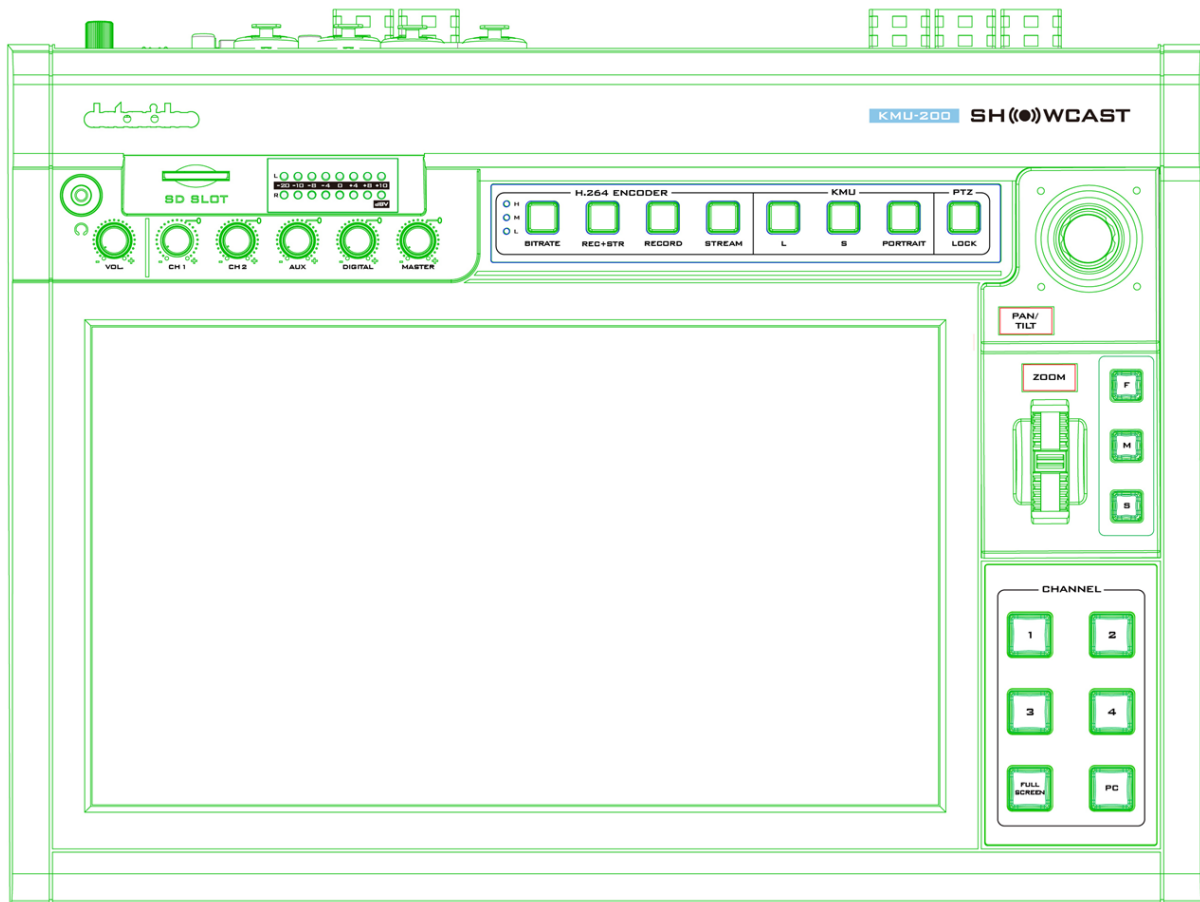
The KMU-200 can be configured via an on screen menu. To open the OSD menu, slide two fingers down on the touch screen. Slide two fingers up on the touch screen to close the OSD menu. To select a particular option, simply tap on the corresponding item on the touch screen.

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		
FW Version	MB	Version No.
	DB	Version No.
	KB	Version No.
	FPGA	Version No.
	Panel	Version No.
Language	English	
	Traditional Chinese	
	Simplified Chinese	
Restore Default		

Chapter 4 KMU-200 Operations



4.1 Channel Buttons

After the KMU-200 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.





- 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.

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-200 to change the channel frame size to a small or large frame. The steps are outlined as follows:

- 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-200 4K Multi-Channel Touch Screen Region of Interest includes a built-in Video Streaming Server (NVS-31 MARK II) 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 II 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 II.

5.1 Streaming Network Connection and Device Search

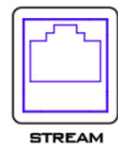
This section details how to connect the NVS-31 MARK II to a network with or without a DHCP server, and describes how to acquire the NVS-31 MARK II's IP address.

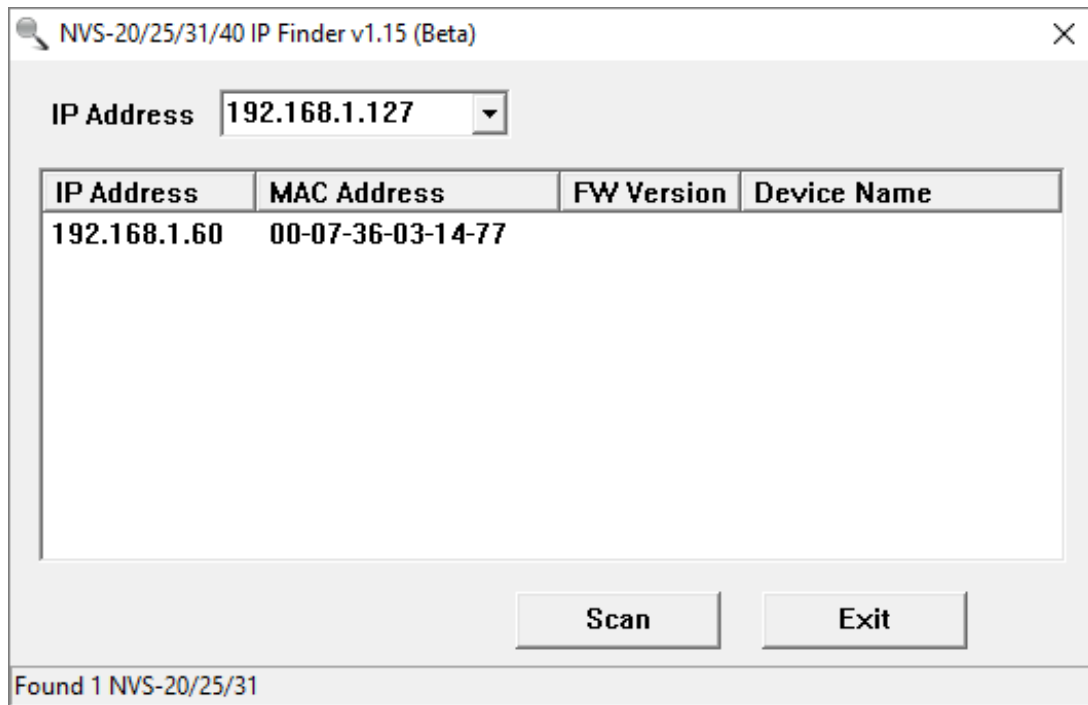
Connecting to a DHCP Network (DHCP Mode)

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

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

1. Connect the NVS-31 MARK II's stream port to the network via an Ethernet cable.
2. Turn on the KMU-200's power and the NVS-31 MARK II will also be turned ON in the DHCP mode by default.
3. Connect the laptop to the same network that the NVS-31 MARK II is connected to and download the free IP Finder utility program.
4. Double click the IP Finder utility program icon to open the IP Finder interface.
5. Click the **SCAN** button to start searching for connected devices.





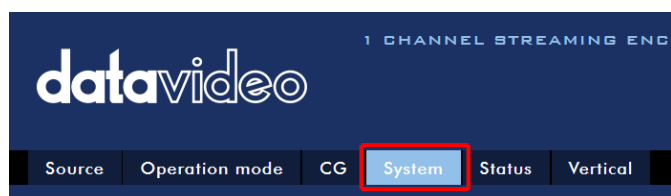
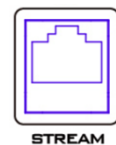
Connecting to a NON-DHCP Network (Static IP)

Upon connection to a non-DHCP network, the NVS-31 MARK II 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 (**192.168.1.60**).

Default Fixed IP

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

1. Connect the NVS-31 MARK II's stream port to the network via an Ethernet cable.
2. Turn on the KMU-200's power and the NVS-31 MARK II will also be turned ON in the DHCP mode by default.
3. Search for the NVS-31 MARK II 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 192.168.1.60 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 **192.168.1.60**.

Troubleshooting the Network Connection

Connect the NVS-31 MARK II 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 II 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.

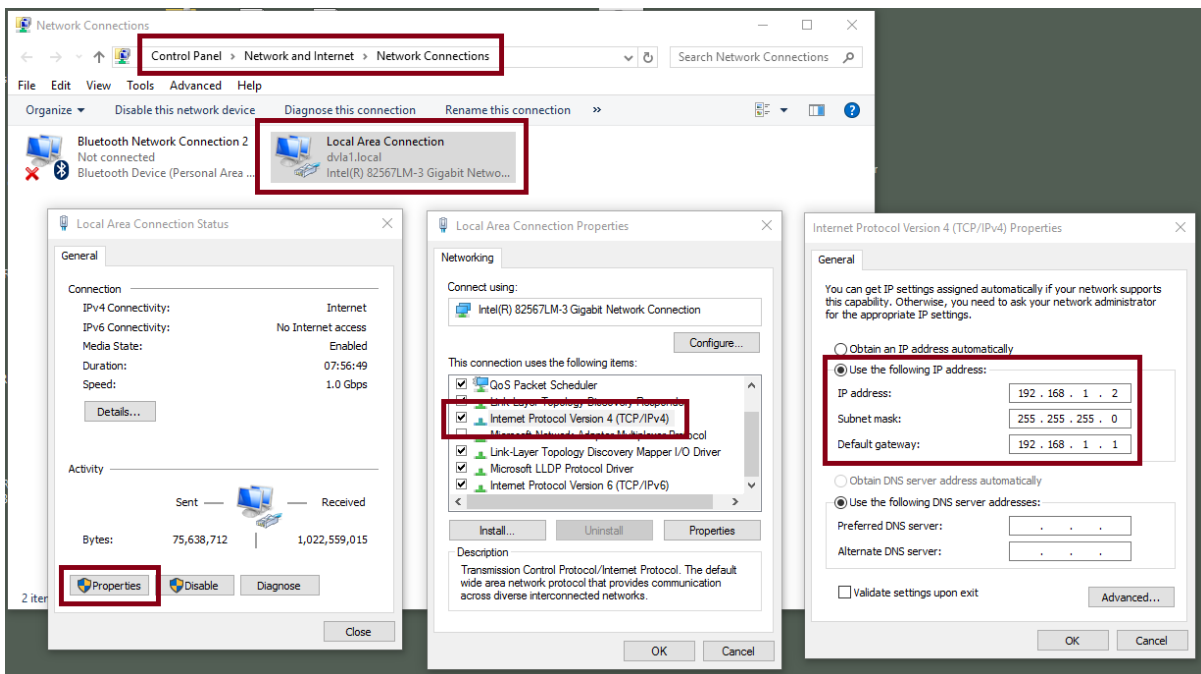
After trying all methods and if the problem is still not solved, the NVS-31 MARK II video streaming server offers the fixed IP feature that allows you to establish direct connection to the NVS-31 MARK II. The default IP address is 192.168.1.60.

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 II should now be connected with an IP address of 192.168.1.60. If the NVS-31 MARK II still cannot connect, simply restore the NVS-31 MARK II 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 II 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 II.

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 II 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 <input type="checkbox"/>	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 II 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 “**Submit**” button to save the network settings.
- Reconnect the PC and the NVS-31 MARK II to the network.
- Restore the PC’s original network settings.
- Shut down the KMU-200; wait for approximately five seconds before turning the KMU-200 back ON.
- You should be able to access the NVS-31 MARK II 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-200 and KMU-200 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 II 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 II. Enter the NVS-31 MARK II'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.



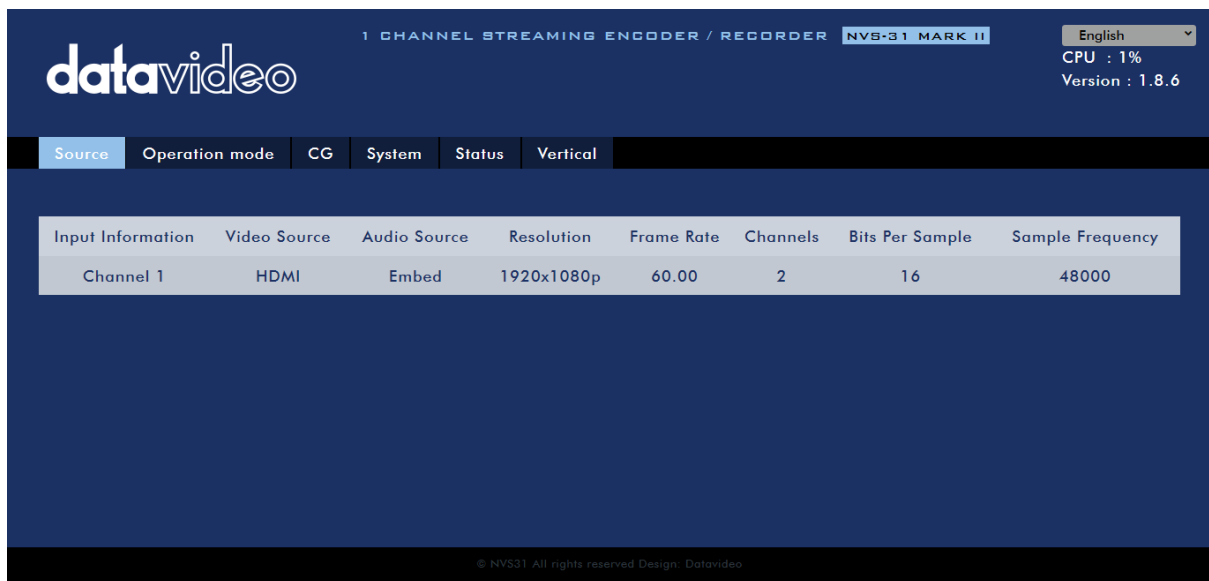
Username: admin

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 II 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 II 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.

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.

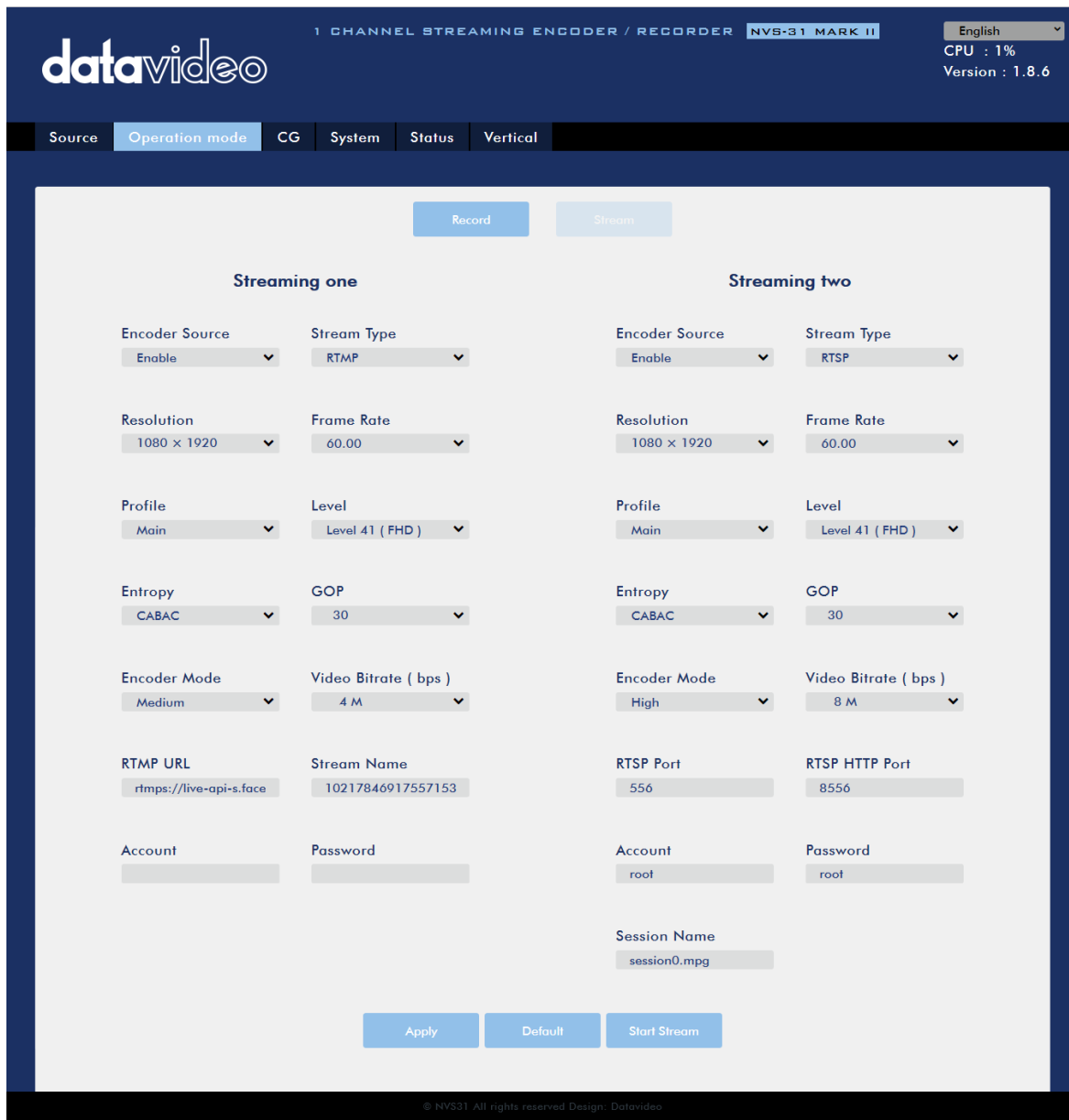
The NVS-31 MARK II offers the following operation modes:

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

which will be discussed in detail in this section.

Stream Mode

The NVS-31 MARK II 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, Level, Entropy, and Video Bitrate (bps)** which will be described later in this section.



Four streaming protocols available on the NVS-31 MARK II are **RTSP**, **RTMP**, **HLS**, and **TS**. 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 II offers the user four stream types which are **RTSP**, **RTMP**, **TS**, and **HLS**. 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 562 and is 554 by default.
- RTSP HTTP Port: The RTSP HTTP port number ranges from 8553 to 8563 and is 8554 by default.
- Account / Password: The RTSP streaming account credentials which are root/root by default.
- Session Name: The default RTSP session name is session0.mgp.

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 II 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.

Please note that when streaming, the NVS-31 MARK II 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 II 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:

- 1080x1920
- 720x1280
- 576x720
- 480x720
- 480x640

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.

- 60.00
- 50.00
- 30.00
- 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 mobile devices, a Main or Baseline profile may be required.

- High
- Main
- Baseline

Level

Levels specify the size of the video a decoder must be able to handle. They specify a maximum bit-rate for the video and a maximum number of macroblocks per second. Level numbers range from 1 to 5 with intermediate steps (e.g., 1.1, 1.2, 1.3 and etc). The table below provides a summary of maximum parameters supported by each H.264/AVC level.

Level ID	Max. Video Bitrate in kbits/s	Max Frame Size in macroblocks	Max decoding speed in macroblocks per second	Resolution, Frame Rate (Max Stored Frames)
1.0	64	99	1485	128×96@30.9 (8) 176×144@15.0 (4)
1b	128	99	1485	128×96@30.9 (8) 176×144@15.0 (4)
1.1	192	396	3000	176×144@30.3 (9) 320×240@10.0 (3) 352×288@7.5 (2)
1.2	384	396	6000	320×240@20.0 (7) 352×288@15.2 (6)
1.3	768	396	11880	320×240@36.0 (7) 352×288@30.0 (6)
2.0	2000	396	11880	320×240@36.0 (7) 352×288@30.0 (6)
2.1	4000	792	19800	352×480@30.0 (7) 352×576@25.0 (6)
2.2 (SD)	4000	1620	20250	352×480@30.7 (12) 352×576@25.6 (10) 720×480@15.0 (6) 720×576@12.5 (5)

Level ID	Max. Video Bitrate in kbits/s	Max Frame Size in macroblocks	Max decoding speed in macroblocks per second	Resolution, Frame Rate (Max Stored Frames)
3.0	10000	1620	40500	352×480@61.4 (12) 352×576@51.1 (10) 720×480@30.0 (6) 720×576@25.0 (5)
3.1	14000	3600	108000	720×480@80.0 (13) 720×576@66.7 (11) 1,280×720@30.0 (5)
3.2 (HD)	20000	5120	216000	1,280×720@60.0 (5) 1,280×1,024@42.2 (4)
4.0	20000	8192	245760	1,280×720@68.3 (9) 1,920×1,080@30.1 (4) 2,048×1,024@30.0 (4)
4.1 (FHD)	50000	8192	245760	1,280×720@68.3 (9) 1,920×1,080@30.1 (4) 2,048×1,024@30.0 (4)

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 II 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

Record Mode

The NVS-31 MARK II'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:

- 1080x1920
- 720x1280
- 576x720
- 480x720
- 480x640

Frame Rate

Select a frame rate from the drop-down menu for video recording.

- 60.00
- 50.00
- 30.00
- 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

Level

Levels specify the size of the video a decoder must be able to handle. They specify a maximum bit-rate for the video and a maximum number of macroblocks per second. Level numbers range from 1 to 5 with intermediate steps (e.g., 1.1, 1.2, 1.3 and etc). The table below provides a summary of maximum parameters supported by each H.264/AVC level.

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				320×240@10.0 (3) 352×288@7.5 (2)
1.2	384	396	6000	320×240@20.0 (7) 352×288@15.2 (6)
1.3	768	396	11880	320×240@36.0 (7) 352×288@30.0 (6)
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2.1	4000	792	19800	352×480@30.0 (7) 352×576@25.0 (6)
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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 II 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

CG

The CG function allows the user to place a textual or picture layer on top of the video. The CG settings on the CG page are shown in the diagram below.

The screenshot shows the web interface for the NVS-31 MARK II. At the top, the 'datavideo' logo is on the left, and '1 CHANNEL STREAMING ENCODER / RECORDER NVS-31 MARK II' is in the center. On the right, there is a language dropdown set to 'English', 'CPU : 9%', and 'Version : 1.8.6'. Below the header is a navigation bar with tabs: 'Source', 'Operation mode', 'CG' (selected), 'System', 'Status', and 'Vertical'. The main content area is titled 'CG' and contains several settings:

- CG Layer:** A dropdown menu showing 'Layer 0'.
- CG Type:** A dropdown menu showing 'Text'.
- Text:** A text input field containing 'CH01 %Y.%M.%D %h:%m:%s'.
- Text Size:** A numeric input field set to '36'.
- Location-X:** A numeric input field set to '50'.
- Location-Y:** A numeric input field set to '50'.
- Foreground Color:** A color selection field showing 'R: 255. G: 255. B: 255'.

At the bottom of the settings area, there are four buttons: 'Apply', 'Default', 'Start CG', and 'Stop CG'. The footer of the page contains the text '© NVS31 All rights reserved Design: Datavideo'.

CG Layer

You are allowed to toggle the CG text or picture between four layers, from layer 0 to layer 3.

CG Type

You may select to place a text (Text) or graphic (Picture) CG object on your video from the drop-down menu.

Text

After setting the CG type to **Text**, you will be allowed to enter the text that you want to place on the video.

Text

Enter the CG text here.

Text Size

Enter the font size for the CG text.

Picture

If you set the CG Type to **Picture**, you will be required to select a picture file from your local hard disk.

File Path

Click **Browse** to browse the hard drive for your graphic CG file.

Location-X

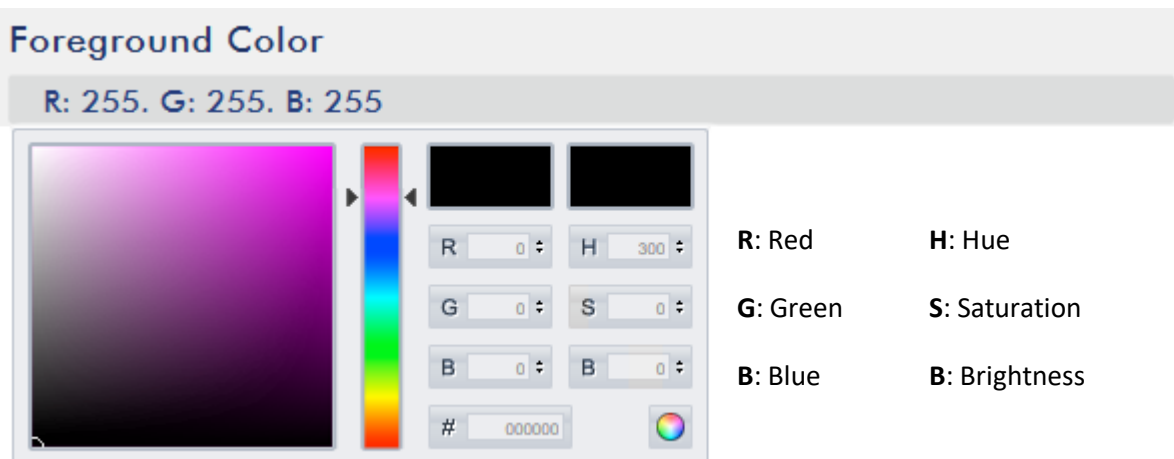
Enter the x-coordinate that determines the horizontal location of the CG object overlaid.

Location-Y

Enter the y-coordinate that determines the vertical location of the CG object overlaid.

Foreground Color

You may either enter the RGB values or select a color from the color spectrum to set the foreground color. Then fine tune the selected color by dragging the circle cursor on the palette. Click the color wheel button at the bottom right corner to confirm the selection.



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.

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

Apply

Default

Account and Password

New Account	New Password	Apply
-------------	--------------	-------

Time Setting

Type	Timezone	Apply
Automatically from the internet	UTC+8	
NTP Server		
time.google.com		

Firmware Update

File Path	Browse
	Update

Disk Format

Device	Format Type	Format
Device0:	FAT-32	

Device Name Setting

Device Name	Apply
-------------	-------

Other Option

Timeout Period	Apply
20 Min	

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 II.

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 192.168.1.60 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 192.168.1.60.

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

Set the NVS-31 MARK II's account name and password here. Click **Apply** to save the new login credentials.

Time Setting

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

Type

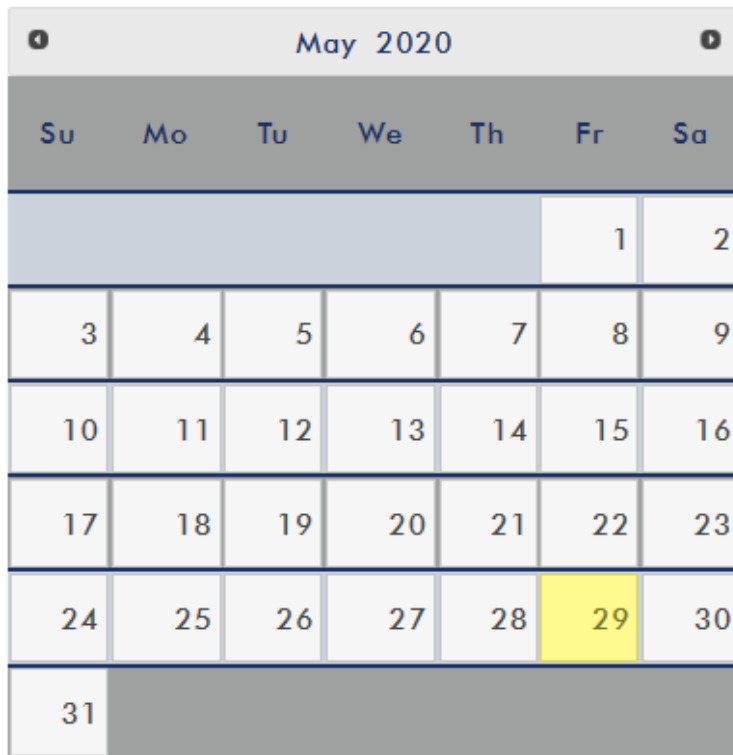
In this drop-down menu, you can either select to allow the device to retrieve the time automatically from the Network Time Protocol (NTP) server by selecting "**Automatically from the Internet**" or locally by selecting "**Manual**".

NTP Server

If you've selected "**Automatically from the Internet**," you will need to enter the NTP server address here. An example of the NTP server address is time.google.com.

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.



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.

Firmware Update

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.

Disk Format

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 II.

Status

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

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

The screenshot displays the web interface for the NVS-31 MARK II device. The top navigation bar includes 'Source', 'Operation mode', 'CG', 'System', 'Status' (highlighted), and 'Vertical'. The main content area is divided into three sections:

- Record Status:** A table with three rows: Resolution (NA), Frame Rate (NA), and Video Bitrate (bps) (NA).
- Stream Status:** A table with two sections: 'Streaming one' (Resolution: 1080x1920, Frame Rate: 60, Video Bitrate: 4M) and 'Streaming two' (Resolution: 1080x1920, Frame Rate: 60, Video Bitrate: 8M).
- Disk Information:** A table with four rows: Name (NA), Capacity (NA), Format Type (NA), and Status (NA).

The footer of the page contains the copyright notice: © NVS31 All rights reserved Design: DataVideo.

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-200 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 II provides the user with different video streaming options such as RTSP, TS, RTMP, and HLS.

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 II** is a stream server which allows any client device to connect and playback your video stream.

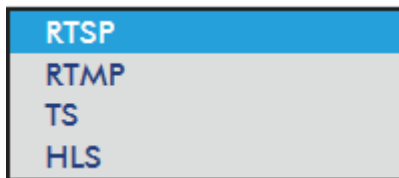


The following operation procedure uses VLC media player to playback video stream. If your PC or laptop does not have VLC media player installed, please visit

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:

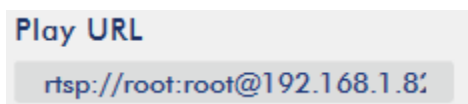
1. On the web UI, click "**Operation Mode**" → "**Stream**" to open the stream settings page.
2. Select **RTSP** from **Stream Type** drop-down menu.



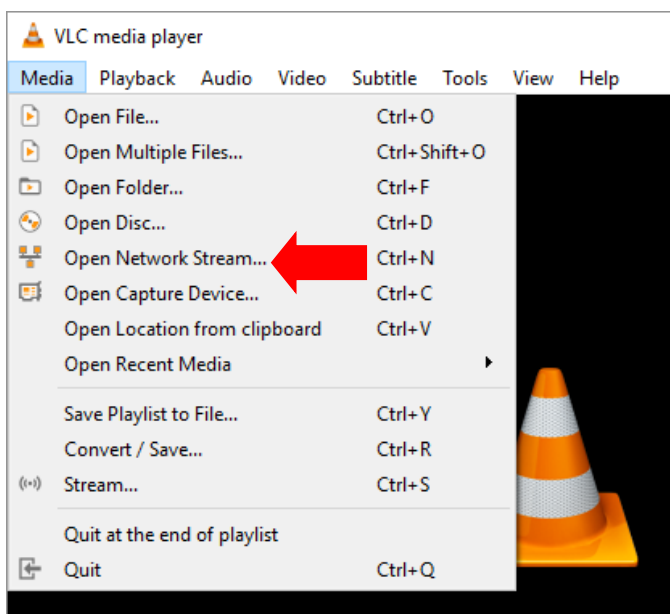
3. Click the **Start Stream** button to generate the RTSP URL.



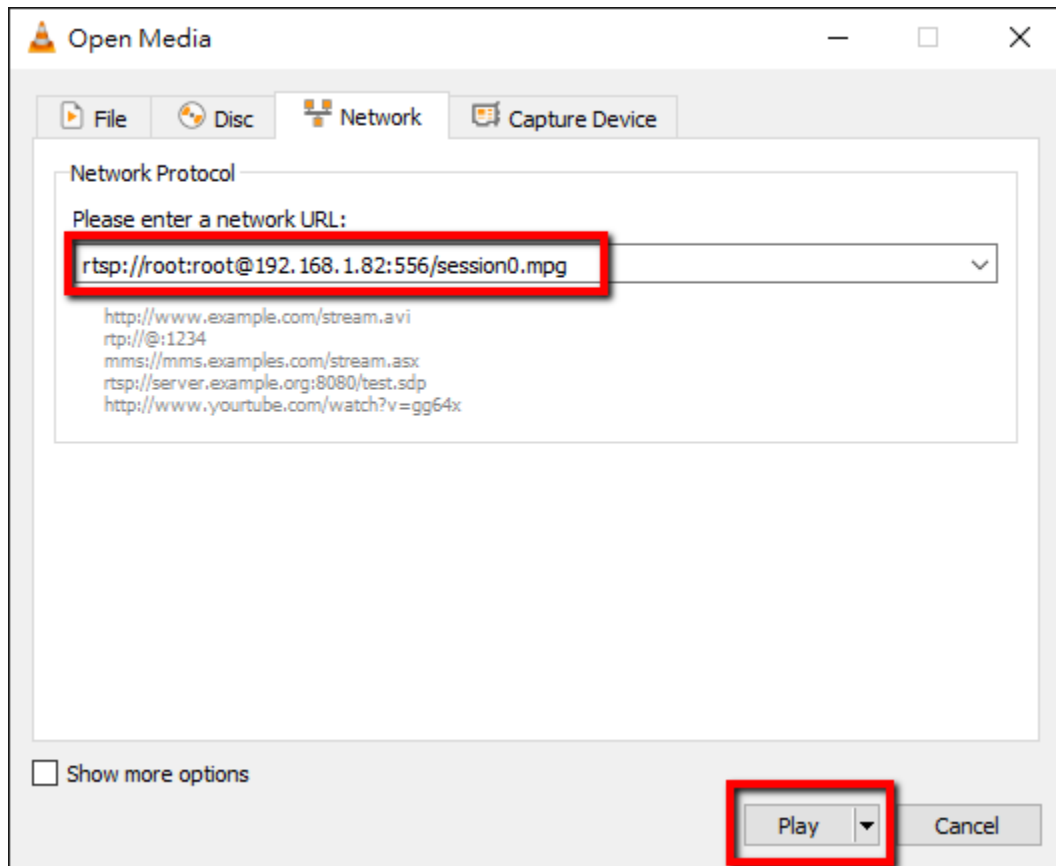
4. Based on your settings, the device will automatically generate the RTSP URL **rtsp://root:root@192.168.1.82:556/session0.mpg**.



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).

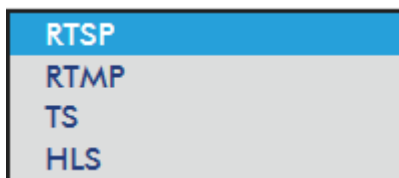


7. As shown in the diagram below, enter the stream URL then click **Play** to start streaming.



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.



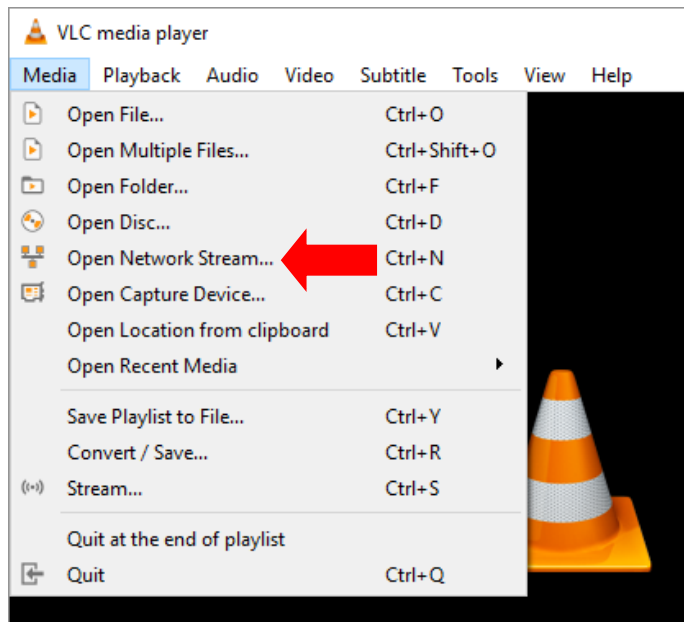
3. Enter the TS URL. Note that the TS URL shown below is only for illustration purpose.



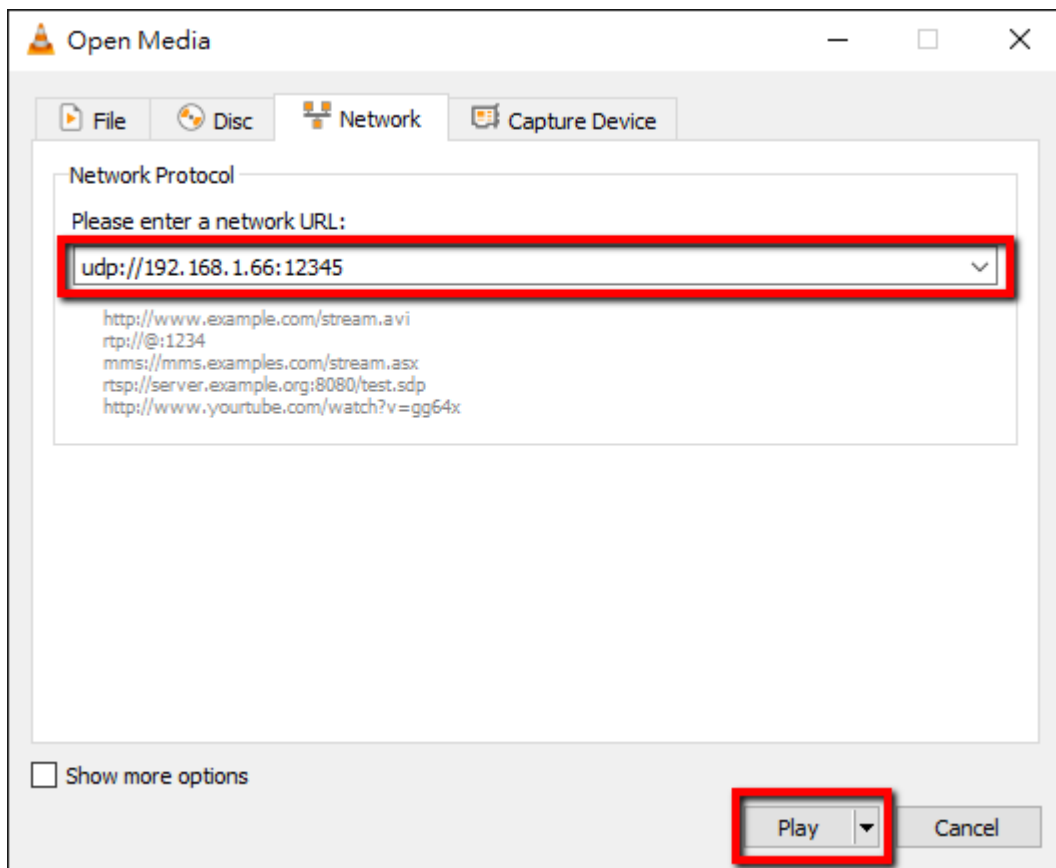
4. Click the **Start Stream** button to start the stream.



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).

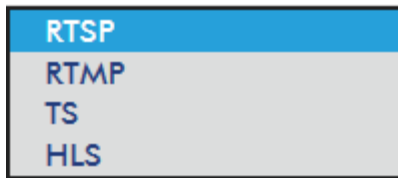


7. As shown in the diagram below, enter the stream URL then click **Play** to start streaming.

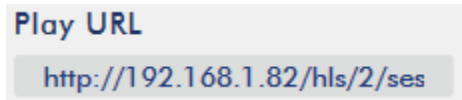


Follow the steps below to obtain the HLS URL:

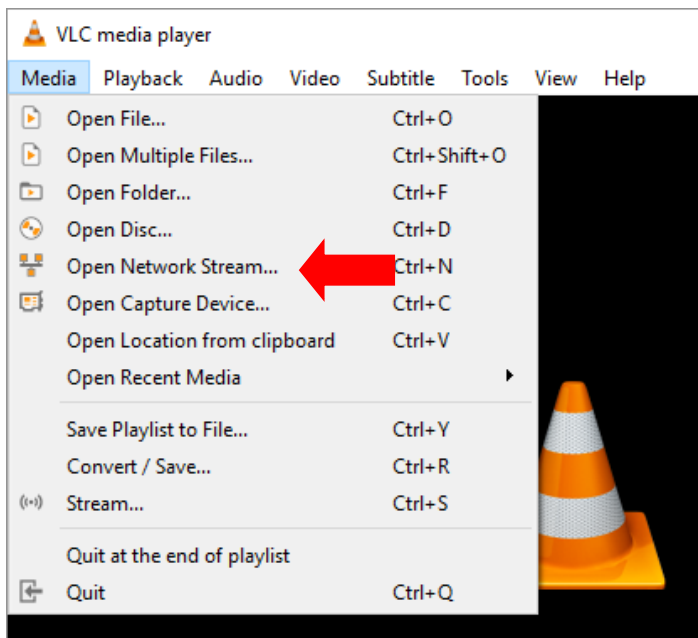
1. On the web UI, click **“Operation Mode”** → **“Stream”** to open the stream settings page.
2. Select **HLS** from **Stream Type** drop-down menu.



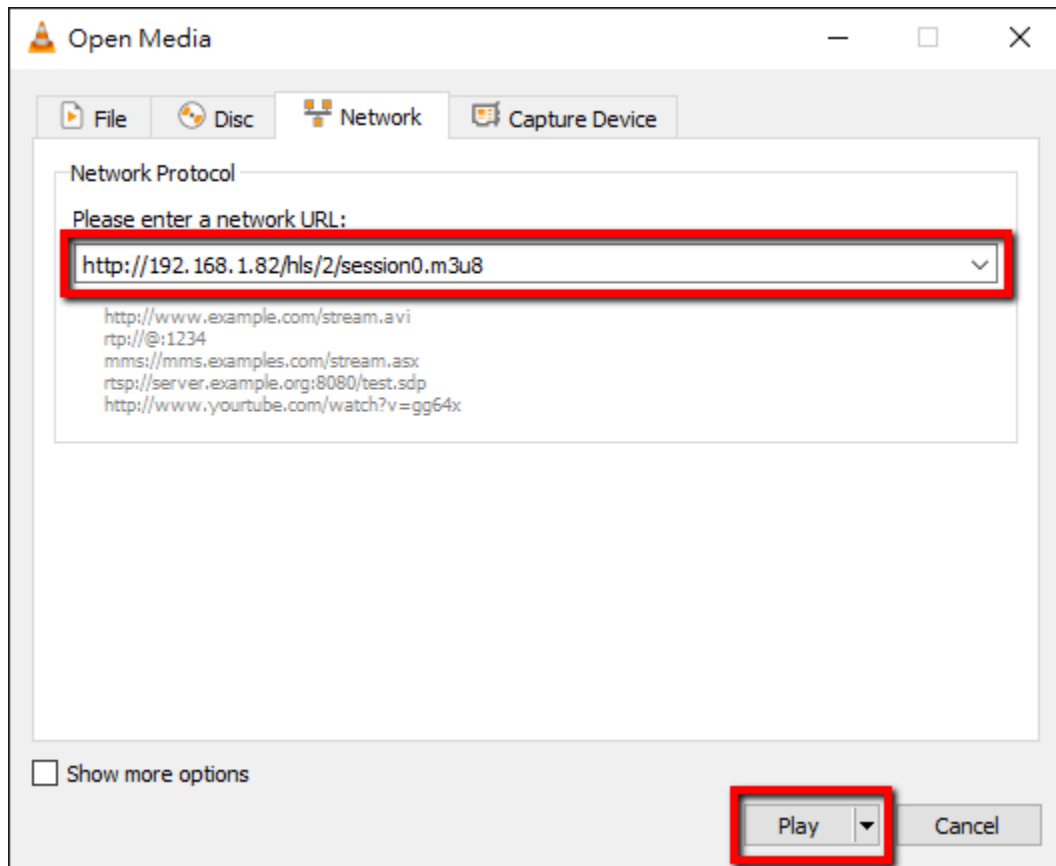
3. Click the **Start Stream** button to start the stream.



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.

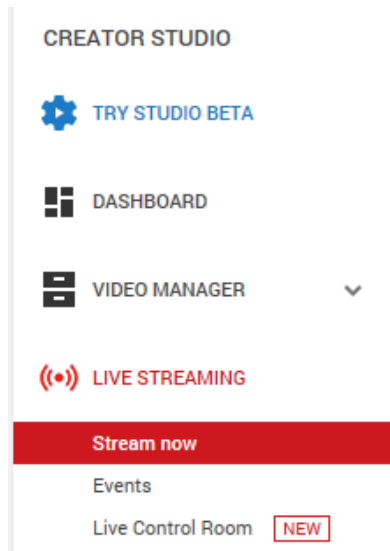
RTMP

In the **RTMP** mode, the NVS-31 MARK II 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**.

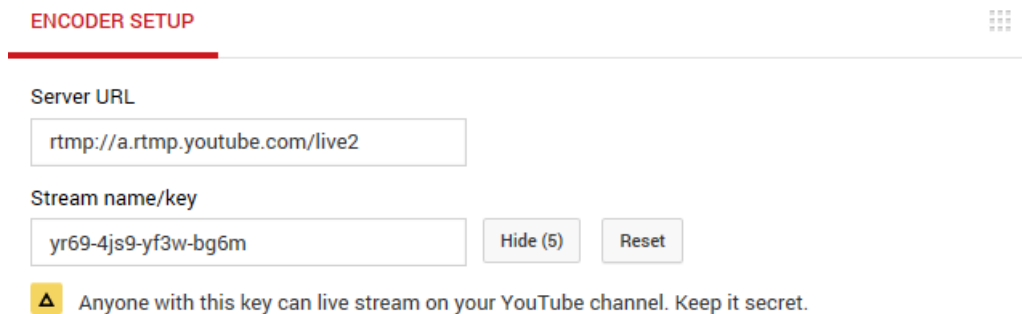
Note: The NVS-31 MARK II does not support RTMP local.

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:

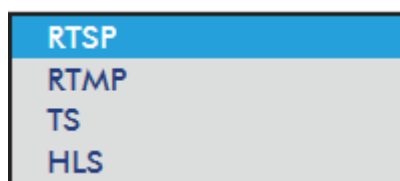
1. First, obtain the Server URL and Stream name/key from Youtube.
2. Open the Youtube Live Dashboard https://www.youtube.com/live_dashboard
3. On the left column, locate and click "**Stream now.**"



4. On the right, scroll down to the bottom where you will be able to find **Server URL** and **Stream name/key**.



5. On the NVS-31 MARK II, open the **Stream** operation mode page.
6. Select **RTMP** from the Stream Type drop-down menu.



7. Enter the **Server URL (rtmp://a.rtmp.youtube.com/live2)** obtained from the **Youtube Live Streaming** page into the **RTMP URL** field.



8. Enter the **Stream name/key (yr69-4js9-yf3w-bg6m)** obtained from the **Youtube Live Streaming** page into the **StreamName** field.



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

Account	Password
<input type="text"/>	<input type="password"/>

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

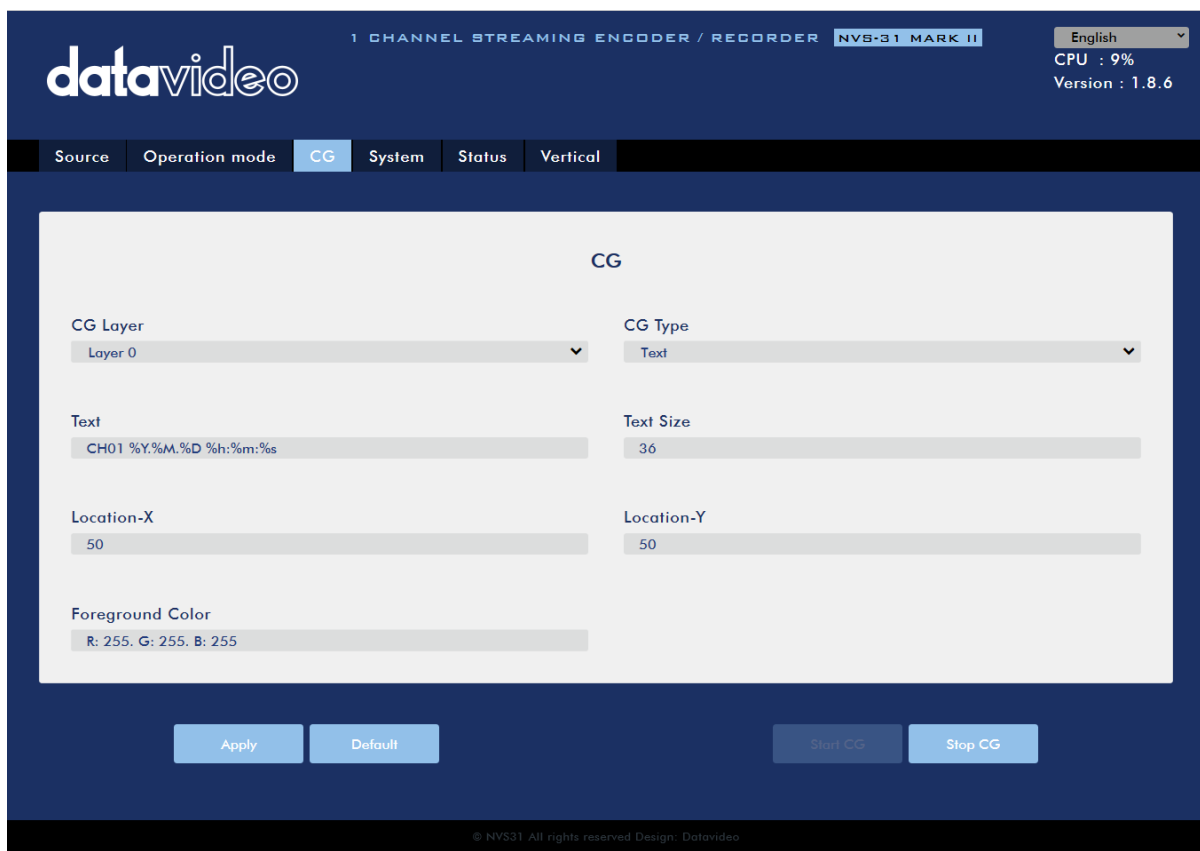
Play URL
<input type="text" value="rtmp://a.rtmp.youtube"/>

- At this point, you should be able to view your stream video on Youtube.
- To stop live streaming, simply click the **Stop Stream** button.

Text Overlay Video

The KMU-200's built-in video streaming server not only allows you to stream and record your program, it also features a CG tool that is capable of overlaying text on the video currently being broadcast.

The CG settings page is shown below:

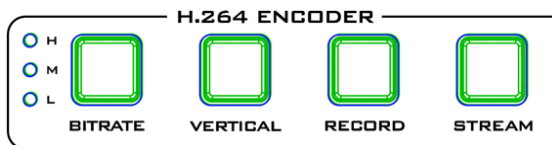


Follow the steps below to overlay text on the video:

1. Open the **CG** settings page.
2. Set the CG layer.
3. Select the CG Type.
4. If Text is selected, enter the overlay text in the **Text** field, otherwise browse for the picture file on the disk.
5. Enter the **X and Y coordinates** to set the CG object position.
6. If you have selected the picture CG, you will need to adjust the object's width and height as well.
7. Set the foreground color.
8. Click **Apply** button to save CG settings.

Note: Increasing the X coordinate moves the overlay object to the right and decreasing the X coordinate moves the overlay object to the left; increasing the Y coordinate moves the overlay object down and decreasing the Y coordinate moves the overlay object up.

5.4 Stream and Record Buttons



The **RECORD**, **STREAM**, **VERTICAL** and **BITRATE** buttons on the front panel of the KMU-200 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 II'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 II'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 II'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

- PC/Laptop
- Latest firmware files
 - DB: KMU-200_DB-vx.xx.bin
 - MB: KMU-200_MB-vx.x.bin
 - Touch Panel: KMU-200-PL_x.x.bin
 - Keyboard: RMC-500-CTRL_vx.xx.bin
- Firmware Update Tools
 - KMU-200 FirmwareTool
 - LMFlash

Note: Download the latest firmware files and update tools from the product page (<https://www.datavideo.com/us/product/KMU-200#downloads>).

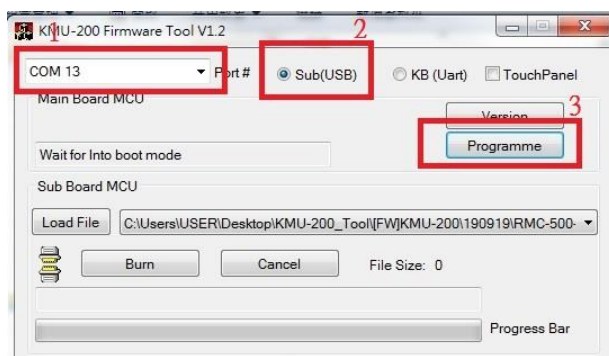
Upgrade Procedure

First, connect your laptop to the KMU-200's firmware upgrade port (mini USB) via a USB cable. Then follow the procedures below to update the respective firmware.



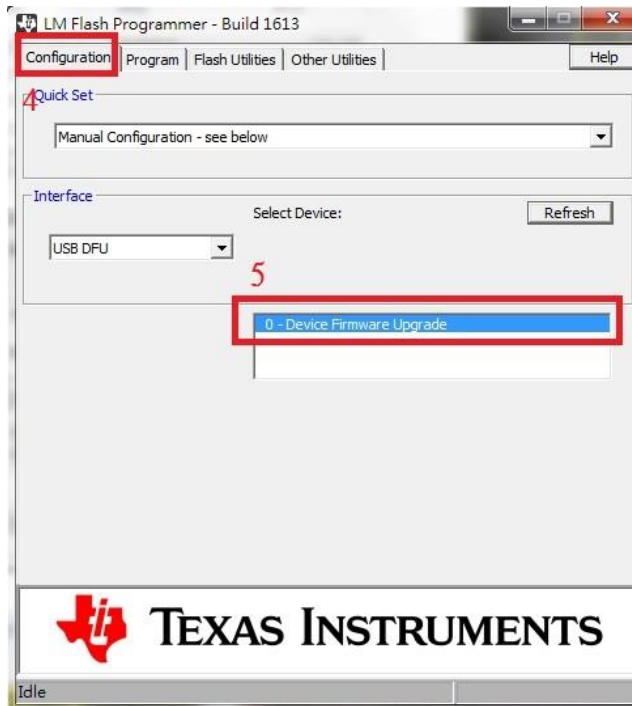
MB: KMU-200_MB-vx.x.bin

1. On your laptop, double click the KMU-200 Firmware Tool.

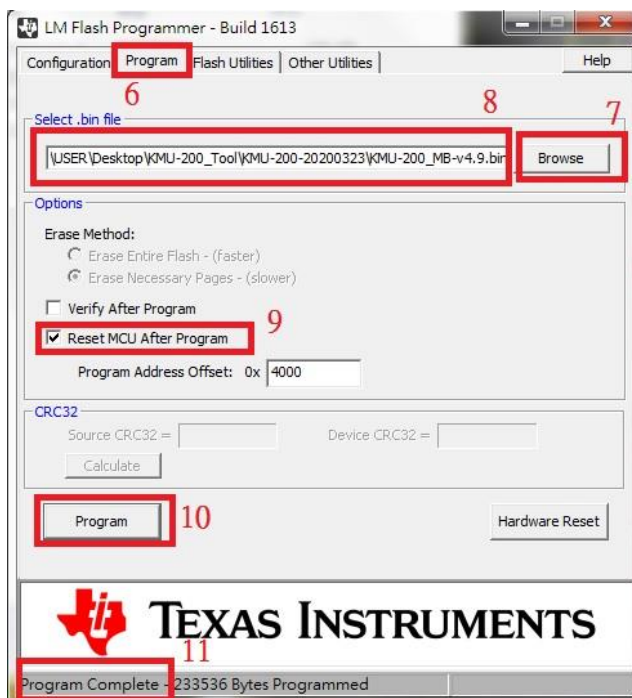


- I. Make sure the KMU-200 Firmware Tool has detected the **COM** port to which the KMU-200 is connected.
- II. Select **Sub (USB)**
- III. Click the **Programme** button.

2. Open the LM Flash Programmer.
3. In the Configuration tab, make sure “**0 – Device Firmware Upgrade**” is there.



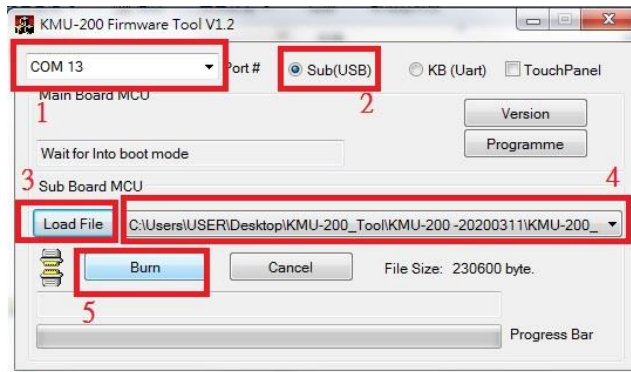
4. In the **Program** tab, click **Browse** to locate the MB file “KMU-200_MB-vx.x.bin” on the local hard disk. Make sure “**Reset MCU After Program**” is checked before clicking the **Program** button.



5. When you see “**Program Complete**” in the status area at the bottom of the tool interface, the MB firmware is updated successfully.

DB: KMU-200_DB-vx.xx.bin

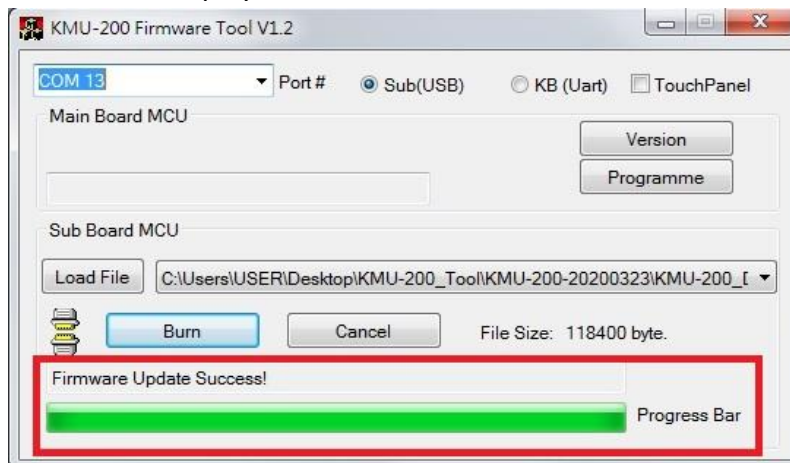
1. On your laptop, open the KMU-200 Firmware Tool.



- I. Make sure the KMU-200 Firmware Tool has detected the **COM** port to which the KMU-200 is connected.

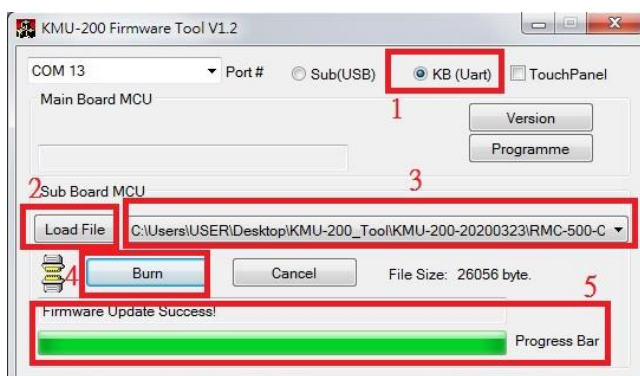
- II. Select **Sub (USB)**

2. Click the **Load File** button to locate the DB file “KMU-200_DB-vx.xx.bin” on the local hard disk.
3. Click the **Burn** button.
4. Power cycle the KMU-200.
5. The firmware upgrade process will begin as soon as the KMU-200 is turned ON again.
6. The process is complete when the Progress Bar reaches 100% and the “Firmware Update Success!” is displayed.



Keyboard: RMC-500-CTRL_vx.xx.bin

1. On your laptop, open the KMU-200 Firmware Tool.



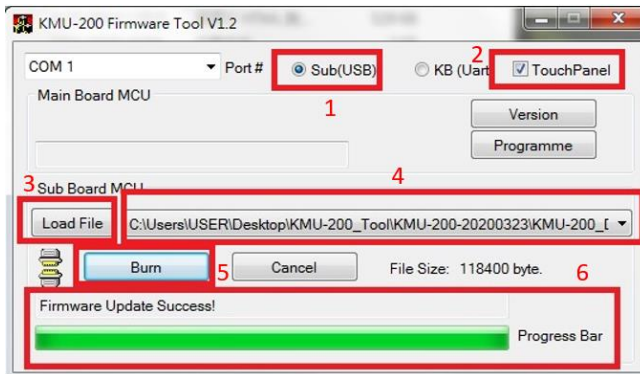
- I. Make sure the KMU-200 Firmware Tool has detected the **COM** port to which the KMU-200 is connected.

- II. Select **KB (UART)**

2. Click the **Load File** button to locate the KB file “**RMC-500-CTRL_vx.xx.bin**” on the local hard disk.
3. Click the Burn button and the firmware upgrade process will begin.
4. The process is complete when the Progress Bar reaches 100% and the “Firmware Update Success!” is displayed.

Touch Panel: **KMU-200-PL_x.x.bin**

1. On your laptop, open the KMU-200 Firmware Tool.



I. Make sure the KMU-200 Firmware Tool has detected the **COM** port to which the KMU-200 is connected.




II. Select **Touch Panel**

2. Click the **Load File** button to locate the firmware file “**KMU-200-PL_x.x.bin**” on the local hard disk.
3. Click the Burn button and the firmware upgrade process will begin.
4. The process is complete when the Progress Bar reaches 100% and the “Firmware Update Success!” is displayed.











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 16G	
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	 
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	
9	SANDISK ULTRA®	SDHC™/SDXC™ UHS-I 128 GB	

Compatible SD Card for Mobile Cast and NVS-33

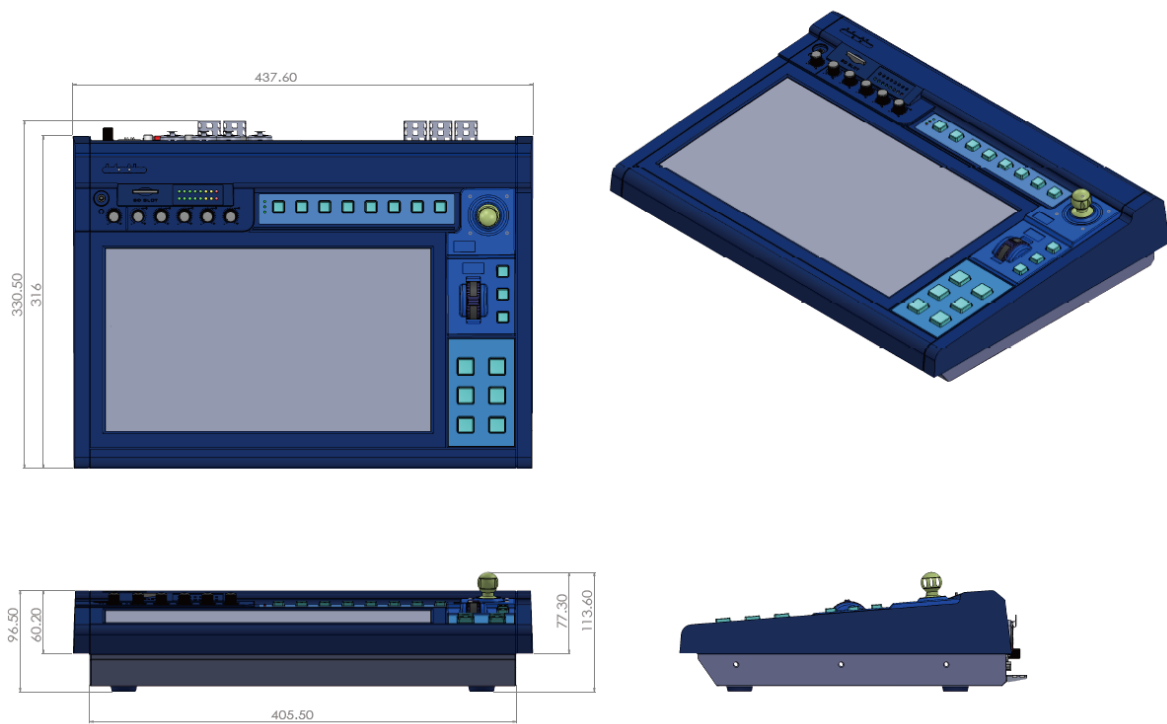
- Kingston**
SDHC C10
16GB

- SANDISK Extreme**
SDXC C10 U3 V30
64GB

- SONY**
SDXC C10 U1
64GB

- SANDISK Extreme PRO**
SDXC C10 U3
128GB
 
- SONY**
SDXC C10 U3
64GB

- TOSHIBA**
SDHC C10
16GB

- SANDISK Extreme**
SDHC C10
16GB

- ADATA Premier Pro**
microSDXC UHS-I U3 Class 10
64GB

- SANDISK ULTRA SDHC SDXC UHS-I**
128GB


3. Frequently-Asked Questions

This section describes problems that you may encounter while using the KMU-200. 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.		
2.		

4. Dimensions



All measurements in millimeters (mm)

5. Specifications

Interfaces	
Video Inputs	2 x HDMI (HDMI 2.0 for 4K, HDMI 1.4 for PC input)
Loopout	PC loopout
Video Outputs	2 x HDMI (PGM, AUX)
Audio Input	XLR/6.3mm x2 (Mic In) , RCA x 1 pair
Audio Output	RCA x1 pair, HDMI embedded out
Power	DC 12V 5A
Firmware Update	Micro USB, Ethernet
Video Standards	
4K Input Resolution	<ul style="list-style-type: none"> • 3840 x 2160p 25/29.97/30/50/59.94/60 (Color space : 4:4:4 / 4:2:2 /4:2:0) • 1920 x 1080p 50/59.94/60
PC Input Resolution	<ul style="list-style-type: none"> • 1920 x 1200p 60 • 1920 x 1080p 60/50/30/25/24 • 1920 x 1080i 60/50/ • 1680 x 1050p 60 • 1600 x 1200p 60 • 1440 x 900p 60 • 1366 x 768p 60 • 1360 x 768p 60 • 1280 x 1024p 75/60 • 1280 x 960p 60 • 1280 x 768p 75/60 • 1280 x 720p 60/50/30/25 • 1024 x 768p 75/60 • 800 x 600p 75/60 • 720 x 576p 50 • 720 x 576i 50 • 720 x 480p 60 • 720 x 480i 60 • 640 x 480p 75/60
Output Resolution	<ul style="list-style-type: none"> • 1920 x 1080p 50/59.94/60 • 1280 x 720p 50/59.94/60
Encoder	
Input Resolution	<ul style="list-style-type: none"> • 1080p60/59.94/50/30/29.97/25/24/23.98 • 1080i60/59.94/50 • 720p60/59.94/50
Output Resolution	Down scaling up to 128x128
Mode of Operation	<ul style="list-style-type: none"> • Record Only: Up to 16Mbps (1080p50/60) • Stream Only: Up to 10Mbps (1080p50/60) • Rec and Stream: Up to 36Mbps (1080p50/60)
Audio Format	<ul style="list-style-type: none"> • AAC-LC • Configurable bitrate from 32Kbps to 384Kbps

	<ul style="list-style-type: none"> • Sample rate : 48KHz, 16bit
Storage	SD Card (Class 10 above)
File System	FAT, NTFS, exFAT
Network	10/100Mbps Ethernet
Streaming Protocols	<ul style="list-style-type: none"> • TS over TCP/UDP (unicast & multicast) • RTSP over HTTP/TCP/UDP (RTSP Elementary Stream) • RTMP(Publish)
Other	
Dimension (mm)	438(W) x 331(D) x 114 (H)
Weight	4.258 KG

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-200

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Jun-30.2020
Version E1