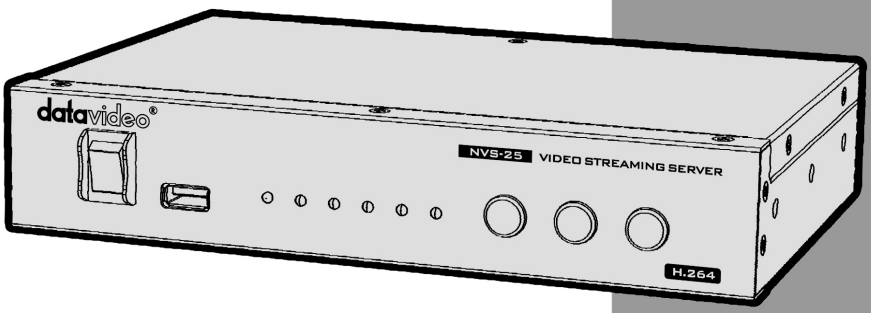
datavideo



H.264 VIDEO STREAMING SERVER

NVS-25

Quick Start Guide

www.datavideo.com

Contents

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's 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 is 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.
- Damage caused by accident, misuse, unauthorized repairs, sand, grit or water is not covered by this warranty.
- All mail or transportation costs including insurance are at the expense of the owner.
- All other claims of any nature are not covered.
- Cables & batteries are not covered under warranty.
- Warranty only valid within the country or region of purchase.
- Your statutory rights are not affected.

Two Year Warranty

- All Datavideo products purchased after 01-Oct.-2008 qualify for a free one year extension to the standard Warranty, providing the product is registered with Datavideo within 30 days of purchase. For information on how to register please visit www.datavideo.com or contact your local Datavideo office or authorized Distributors

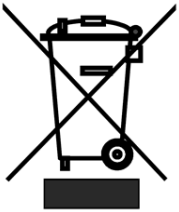
- Certain parts with limited lifetime expectancy such as LCD Panels, DVD Drives, Hard Drives are only covered for the first 10,000 hours, or 1 year (whichever comes first).

Any second year warranty claims must be made to your local Datavideo office or one of its authorized Distributors before the extended warranty expires.

Disclaimer of Product & Services

The information offered in this instruction manual is intended as a guide only. At all times, Datavideo Technologies will try to give correct, complete and suitable information. However, Datavideo Technologies cannot exclude that some information in this manual, from time to time, may not be correct or may be incomplete. This manual may contain typing errors, omissions or incorrect information. Datavideo Technologies always recommend that you double check the information in this document for accuracy before making any purchase decision or using the product. Datavideo Technologies is not responsible for any omissions or errors, or for any subsequent loss or damage caused by using the information contained within this manual. Further advice on the content of this manual or on the product can be obtained by contacting your local Datavideo Office or dealer.

Disposal



For EU Customers only - WEEE Marking

This symbol on the product indicates that it will not be treated as household waste. It must be handed over to the applicable take back scheme for the recycling of Waste Electrical and Electronic Equipment. For more detailed information about the recycling of this product, please contact your local Datavideo office.

Packing List

The following items should be in the box. If any items are missing please contact your supplier.

Item No.	Description	Quantity
1	NVS-25 Unit	1
2	Accessory List	1
3	Instruction Manual	1

Product Overview

NVS-25 is a broadcast quality H.264 network streaming server. This unit serves the purpose of sharing HD or SD video over local or global IP networks. Equipped with HDMI, SDI and Composite Video interfaces, NVS-25 is designed for live event streaming at up to 6Mbps. NVS-25 supports the following streaming protocols:

- HLS [HTTP Live Streaming]
- RTP / RSTP
- RTMP [Flash]

NVS-25 can be set up and controlled using almost any devices with a web browser. Users are allowed to configure real time audio and video streaming on the web-based graphical user interface. The encoded video stream can be delivered to a single browser, a group of clients on a Local Area Network (LAN) or even a Content Delivery Network (CDN).

The Core Value of Datavideo, sharing the value!

Features

- Broadcast quality HD / SD H.264 network streaming
- Quick and easy setup
- H.264 Encoding

Video Inputs - Choose from:

- HD / SD-SDI [BNC]
- HDMI
- CVBS [BNC]

Audio Inputs:

- Unbalanced RCA Phono sockets
- or
- Balanced 3pin XLR

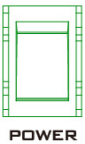
Encoded Video Stream:

- H.264 / AVC up to High Profile Level 4.0
- Up to 1920x1080 @ 30 fps
- Configurable bitrate up to 6Mbps

Control

- Web user interface for configuration and control

Front Panel



Power On/Off Switch

Switches the power On / Off

USB

USB 2.0 interface for connecting external storage

Mode Select

Mode Button - Select Input source between CVBS / SDI / HDMI.

REC – Displays the recording status

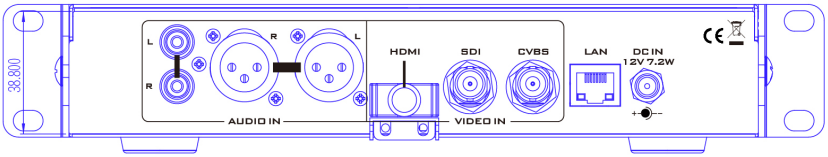
STM – Displays the stream server status

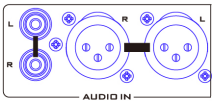
PWR – Displays the power status

See the section on LED Status & Button Behaviour

Restore factory defaults from the front panel.
From power off**.** Press and hold in the mode button and turn on the NVS-25 power; keep holding the mode button for 40 seconds. When released the NVS-25 will take a further 30 seconds to finish the boot up process. Remember to login with the default username and password (Default Login Details).

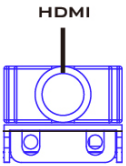
Rear Panel



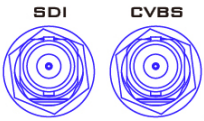


AUDIO IN (XLR)
Supports two channels XLR Balanced Audio Input.

AUDIO IN (RCA)
RCA stereo for a line level auxiliary analogue audio source, such as a CD player or tape deck. If you are using more than two sources via an external audio mixer, connect the audio mixer's line level output to this unbalanced audio input.

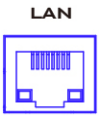


HDMI IN
HDMI digital signal input connector.



CVBS IN
Composite video input: takes a BNC connector from the composite output of a VCR, camera, DVD player, etc.

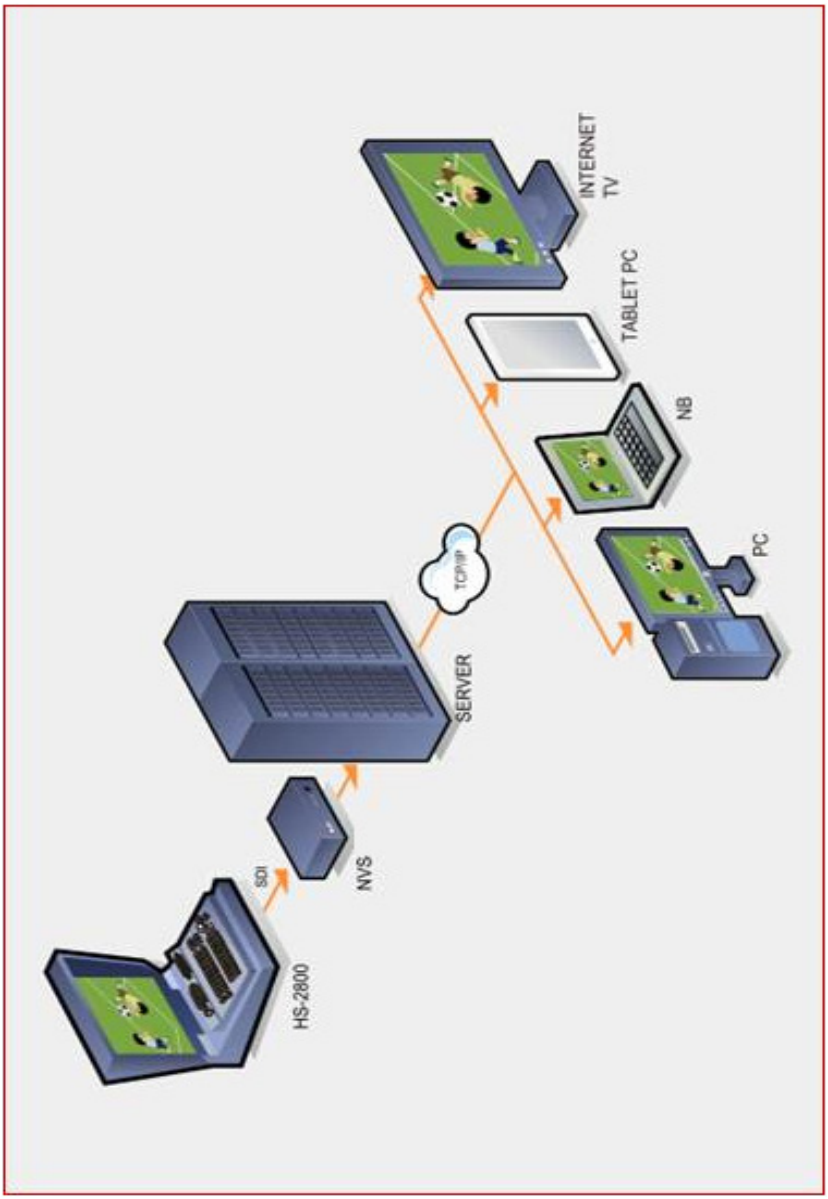
SDI IN
BNC connector for SDI input.



Ethernet Port (RJ-45)
10/100M base Ethernet Network interface

DC In Socket
Connect the supplied 12V PSU to this socket. The connection can be secured by screwing the outer fastening ring of the DC In plug to the socket.

System Diagram



NVS-25 Network Video Streaming Server Setup

The NVS-25 is designed to act as an interface between video source equipment and the IP network as depicted in the System Diagram.

Connect live video and audio to NVS-25

Refer to Real Panel section for connection of your live video and audio source cabling to the rear panel of the NVS-25.

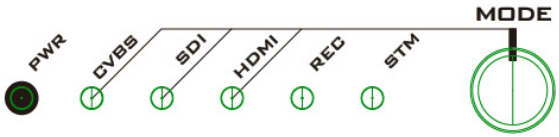
Connect NVS-25 to the local IP network

Refer to Real Panel for connection of the NVS-25 to the local IP network via RJ-45 Ethernet cable. The local IP network could be from an office LAN face plate on the wall or an existing LAN network router / switch.

Connect power to NVS-25

The NVS-25 comes with its own power supply unit which is plugged into a normal wall/power outlet. The device can also receive power from Datavideo's PD-2 power distribution unit. PWR LED indicator on the front panel of the NVS-25 should be flashing red after being switched on. It takes approximately one minute for the unit to start and the boot-up process is complete when PWR LED indicator turns to constant green.

Select the input connection to be streamed



The **MODE** button on the front panel of the NVS-25 is used to select the live video input connected to the rear of the unit. Press this button to cycle through HDMI, SDI and Composite [CVBS].

Each time the button is pressed, an LED will be lit for the selected source. The default at power on is HDMI. If no source video is detected, the LED will be flashing red. If a live video source is detected, the LED will be changed to solid green.

The STM or stream LED will become solid green once the unit is correctly configured by IP connected computer.

How to find the NVS-25 on an IP network

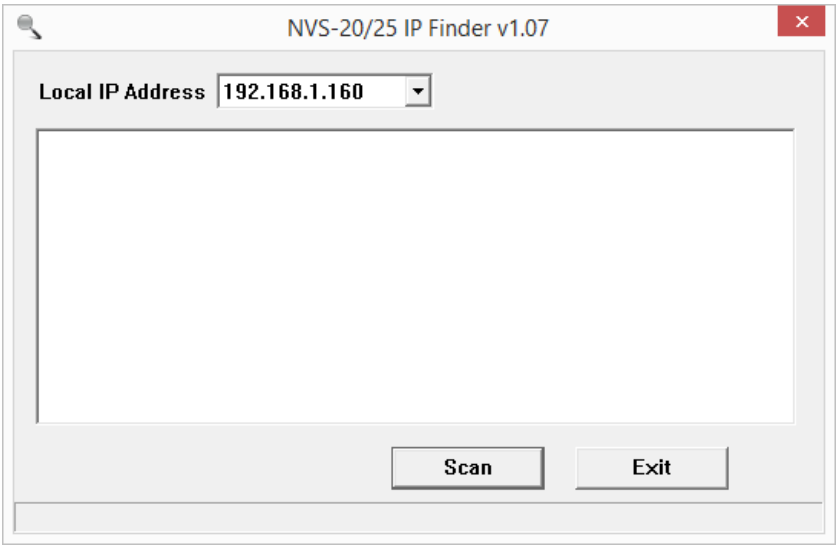
As illustrated in the System Diagram, the NVS-25 is designed to act as an interface between video source equipment and the IP network.

By default, the **NVS-25 will try to obtain an IP Address from the DHCP network server** once physical network connection has been established. This can be later changed to True Static IP mode if required.

How to use the NVS25 IP Finder utility software

Datavideo provides a free, *Windows based* utility, called **NVS-2X IP Finder**.

You need to make sure that IP Finder Utility will not be blocked by computer firewall or anti-virus software the first time the utility is run on the computer. The utility must be able to scan or search the local network.



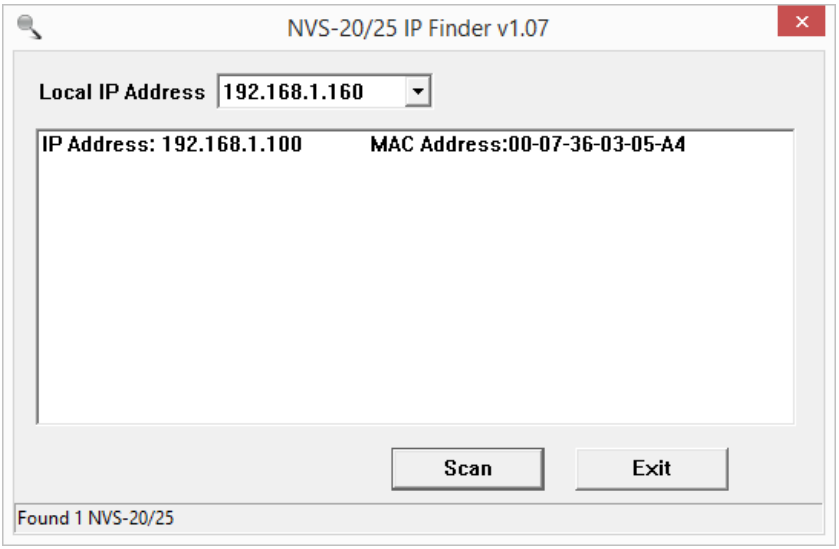
After opening the NVS-25 IP Finder Utility, the computer IP address is displayed in the "Local IP Address" pull-down menu of the utility window.

Make a note of the IP Address for the computer.

When the utility scans the LAN that the computer is connected to, it will display the IP and MAC addresses of all the NVS-25 units found on this local area network.

Make a note of the NVS-25 IP Address.

The IP address may differ from the example shown below.



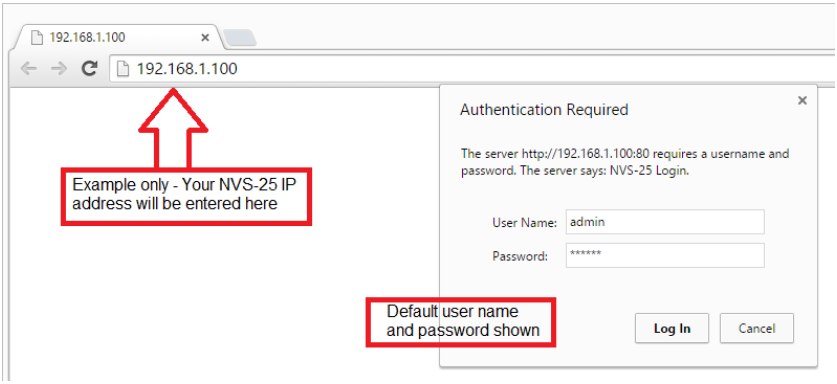
If you are using an Apple computer then you can use an alternative utility app such as Fing or Network Analyzer Lite.

NVS-25 login using a web browser

By now, we have obtained the IP addresses of the computer and NVS-25. If both devices are assigned the IP addresses with the same network prefix, we should be able to use any web browser to login and configure NVS-25.

Compatible browsers such as Google Chrome, Firefox, Opera or even Safari can be used. Please note that ***Internet Explorer*** can also be used, but you may need to ***enable compatibility view*** and ***pop-up windows*** on the browser first.

Type the NVS-25 IP address into the browser address bar. Remember to include the dots between the four octets. After hitting the “enter” key, you will then be prompted to enter the login information of NVS-25 on a pop-up window.



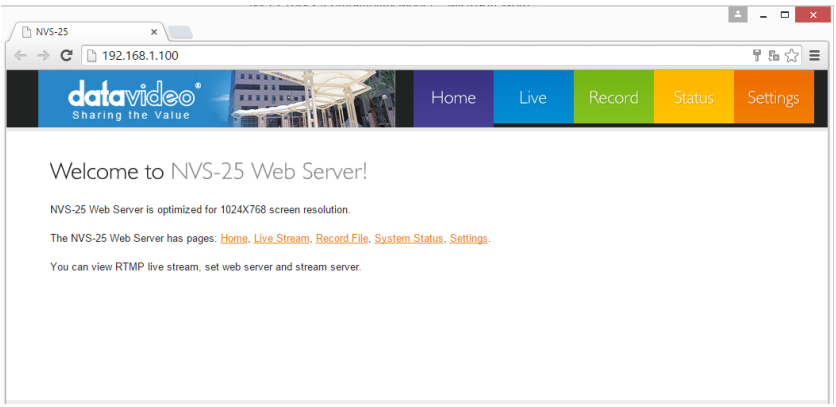
Default Login Details

All NVS-25 units are delivered from the factory with the same default username and password. This can be changed at a later stage to suit your needs.

Username = admin **Password = 000000** [Six Zeros]

Please refer to Account Setup section for instructions on how to change the default login information.

Once we are logged into NVS-25, we will be automatically directed to the **Home Page** shown below. Four options are available on this page: Live, Record, Status and Settings.



Live Option

On the Live option page, the user can retrieve live video stream link and enter the link into a video streaming application such VLC player or view the live video stream on a local area network. Please refer to Live Stream Setup section for more information.

Record Option

On the Record option page, NVS-25 can be configured to connect to an external USB 2.0 hard drive or pen drive. When the USB storage device is connected, NVS-25 can then record video to the device. The recording time is dependent on the recording bit rate and the free space available on the USB device. Please refer to Record Option for more information.

Status Option

The Status Option displays the current stream settings in use.

Setting Option

Six setting sections can be inspected on this page and they are **Live Stream Setup**, **Encoder Setup**, **Network Setup**, **Firmware Update**, **Account Setup** and **Restore Default.**

Setting > Live Stream Setup - Protocols

It is always preferable to decide what stream setting best matches your purpose of use as well as the network and protocol before streaming video via NVS-25.

HLS Protocol

Use NVS-25 to feed IP video stream to several **Apple computer clients** or tablet computers such as iPad, iPhone or MacBook running Safari browser. HLS feeds video and audio streams to the iOS devices. **Note that, depending on the settings chosen, HLS latency may be up to 10 seconds in case of live events.**

RTSP Protocol

Use NVS-25 to feed IP video stream [TCP , HTTP] to a small group of clients on a Local Area Network (LAN) or Wide Area Network (WAN). The user can then view the video via free client software such as VLC Player. **However RTSP does not work well with some tablet computers.** RTSP is open for viewing by anyone on the same network with the streaming details or link. **It can be sent across the internet, but each client added will add data loading to NVS-25, as each video stream is set up individually for each client.** RTSP has a limitation of three viewing clients before NVS-25 becomes congested and video stream fails.

RTMP Protocol

Use NVS-25 to deliver a single IP video stream [TCP] to a server on a Wide Area Network [WAN] like the *internet* (RTMP Publish) or to a small group of clients on a private Local Area Network [LAN] (RTMP Local).

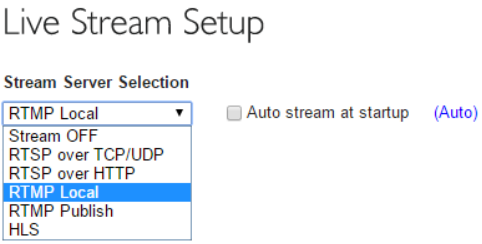
The server on the WAN could be the server of a **Content Delivery Network** [CDN],

such as ***Ustream***. To use a CDN, you may need to register for a free / trial account with additional costs first. The user just need to deliver one video stream to the CDN and that IP video feed will be shared among multiple viewers. This means less work for you and the NVS-25 as well. CDNs differ in tariffs and the way they operate so **it is best to do your homework beforehand.**

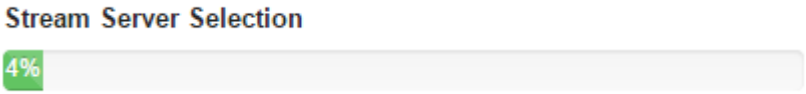
The server on a WAN could also be your own ***Wowza server***. Wowza server is another form of CDN solution, typically for large organizations, where you brand the look and feel of the delivery network plus the video stream itself. **Again it is best to do your homework beforehand.**

Stream Server Selection

This pull-down menu allows you to either select one of three transmission protocols [HLS, RTSP (TCP, HTTP), RTMP (Local, Publish)] or switch off the current video stream. The default is stream off.



NOTE: All settings applied will not be in effect unless the **Apply** button has been clicked and the NVS-25 configuration progress bar indicates 100% completion.



The user can also enable "**Auto stream at startup**" so that the original settings persist through the power cycle process.

RTMP Publish URL

Four text bars will appear when **RTMP Publish** is selected under the ***Stream Server Selection*** Option. Enter the corresponding information to stream your video to your Content Delivery Network.

- **RTMP URL:** Enter the RTMP Publish URL for your WAN-based server or CDN account
- **RTMP Stream:** Name of the streaming video
- **RTMP Username:** Username of CDN account
- **RTMP Password:** Password of CDN account

If you wish to view the RTMP stream directly from NVS-25 on the local area network (LAN) using the Live option, select **RTMP Local** option.

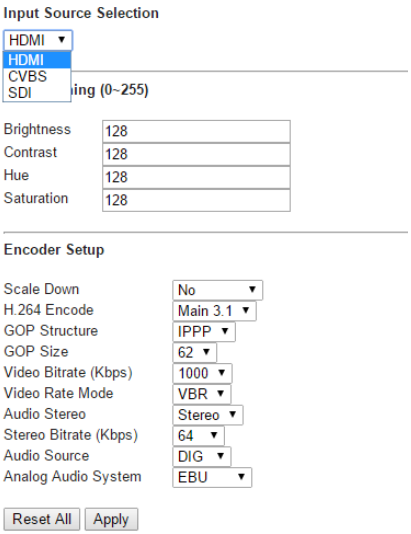
Setting > Encoder Setup

On any video streaming device, the encoder plays a crucial role in the entire system. The NVS-25 provides the user with several configurable parameters as listed in the table below. The following sub-sections will provide details of each parameter.

Input Source Selection	**HDMI / CVBS / SDI**
Video Tuning	**Brightness / Contrast / Hue / Saturation / Sharpness 0 ~ 255**
Scale Down	**1280x720 / 720x576 / 720x480**
H.264 Encode	**Main 3.0 / Main 3.1 / High 4.0**
GOP Structure	**IBBP / IPPP / IBP**
GOP Size	**6 / 9 / 12 / 15 / 18 / 21 / 24 / 27 / 30 / 33 / 36 / 39 / 42 / 45 / 48 / 51 / 54 / 57 / 60**
Video Bitrate (Kbps)	**800 / 900 / 1000 / 1500 / 2000 / 2500 / 3000 / 3500 / 4000 / 4500 / 5000 / 5500 / 6000**
Video Rate Mode	**CBR / VBR**
Audio Stereo	**Stereo / Mono**
Stereo Bitrate (Kbps)	**64 / 96 / 112 / 128 / 160 / 192 / 224 / 256 / 320 / 384**
Audio Source	**DIG / RCA / XLR**
Analog Audio System	**EBU / SMPTE**

Input Source Selection

This pull-down menu allows you to switch between physical video inputs, HDMI, CVBS and SDI, located on the rear panel of NVS-25. The default is HDMI. Please note that you will not be able to use Video Tuning if SDI is selected.



Video Tuning

For HDMI and CVBS inputs, set video brightness, contrast, hue and saturation on the NVS-25. SDI video is usually adjusted on the source equipment before it is delivered to the NVS-25. The values of brightness, contrast, hue and saturation range from 0 to 255 with the default programmed to 128.

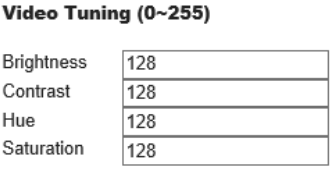
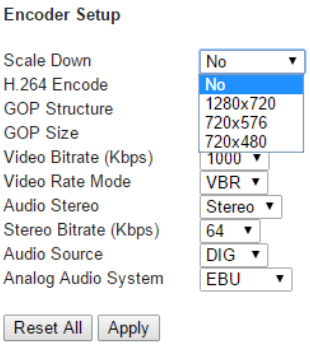


Image Size

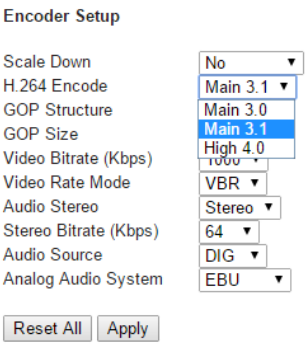
The first step of encoder setup is to adjust the image size. The NVS-25 allows you to downscale the output image and set the SD aspect ratio at the input. The Scale Down function, as the name suggests, allows the user to shrink the image size. The table below shows all possible downscaled resolutions on NVS-25.

Original Resolution	Downscaled Resolution
1920x1080	1280x720, 720x567, 720x480
1280x720	720x576, 720x480
720x576	720x480



H.264 Encode

The H.264 standard can be viewed as a "family of standards" composed of different profiles. A specific encoder encodes at least one, but not necessarily all profiles. The NVS-25 offers the user three profiles: Main Profile 3.0, Main Profile 3.1 and High Profile 4.0.



Main Profile
The 'Main' or Mainline Profile includes support for interlaced video, inter-coding using B-slices, inter coding using weighted prediction and entropy encoding using context-based adaptive binary arithmetic coding (CABAC). Ideal application of the Main Profile includes long term video archival storage and standard-definition digital TV broadcasts that use the MPEG-4 format as defined in the DVB standard.

High Profile
The High Profile is used as the preferred choice for HD broadcast and disc storage applications, adopted by the Blu-ray Disc storage format and DVB HDTV broadcast service.

Group of Pictures

H.264/MPEG-4 AVC (Advanced Video Coding) is a common video stream compression method. It eliminates redundant video information within a frame known as intraframe compression as well as over a period of time known as interframe compression. The two compression techniques are described as follows:

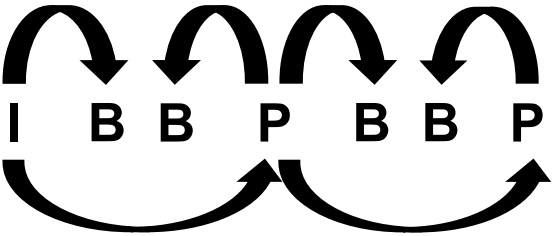
- Intraframe compression (Spatial Compression): a compression technique applied to information contained only within the current frame, creating video frames called I-frames
- Interframe compression (Temporal Compression): a compression technique applied to a sequence of video frames, rather than a single image; instead of storing complete frames, only changes from one frame to the next are stored in order to reduce the amount of data needed to be stored while still achieving high-quality images.

H.264/MPEG-4 AVC uses the two above-mentioned compression techniques, whereby three types of compressed frames described as follows are generated and organized in a group of pictures, or GOP.

- I-frame: Intra (I) frames, also known as reference or key frames, contain all the necessary data to re-create a complete image.

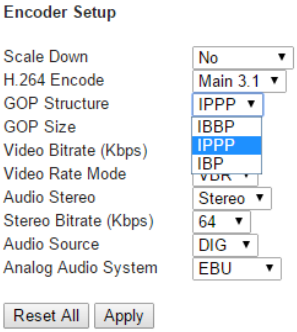
- P-frames: Predicted (P) frames are encoded from a “predicted” picture based on the closest preceding I- or P-frame.
- B-frames: Bi-directionally (B) predicted frames are encoded based on an interpolation from I- and P-frames that come before and after them.

The Group of Pictures (GOP) structure specifies the order in which intra- and inter-frames are arranged. All three frame types do not have to be used in a pattern. The typical GOP structure is IBBPBBP. The I-frame is used to predict the first P-frame and these two frames are also used to predict the first and the second B-frame. The second P-frame is predicted using the first P-frame and they join to predict the third and fourth B-frames.The relationship between I-frame, P-frame, and B-frame is illustrated diagrammatically below.

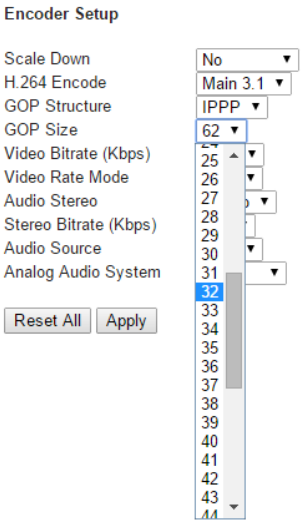


The GOP structure is often referred by the GOP size, which is defined as a distance between two full images. For example, in a sequence with pattern IBBPBBPBBPBBIBBPB…, the GOP size is equal to 12 (length between two I frames).

The NVS-25 offers the user three types of GOP structure: IBBP, IPPP and IBP. Note: Since B-frame is predicted based on I and P frames, a GOP cannot end with a B-frame because if B-frame is used as a reference for making further prediction, a growing propagation error will result.



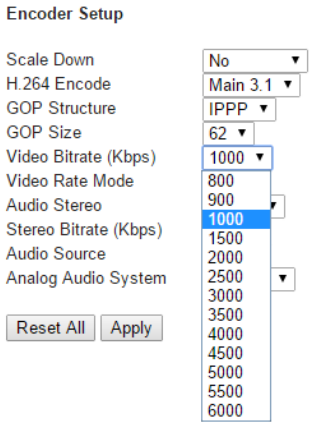
GOP pattern with longer GOP length encodes video very efficiently. Shorter GOP lengths usually work better with video that has quick movements, but they do not compress the data rate as much. On the NVS-25, there are 19 GOP sizes available for the user, ranging from 6 to 60 with an increment of 3 between each level.



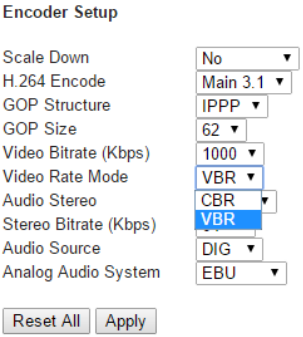
Video Bitrate/Mode

The bitrate of the video specifies the amount of information stored in the video. The higher the bitrate is, the clearer the video is. For example, SD video may appear acceptable at 1000 Kbps but HD video is unacceptable at 1000 Kbps. The NVS-25 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, bitrate may not be a concern. Speed/Bandwidth is the limitation in a NVS-25 application environment.

The bitrate ranges from 800 to 6000 Kbps as shown in the diagram below.

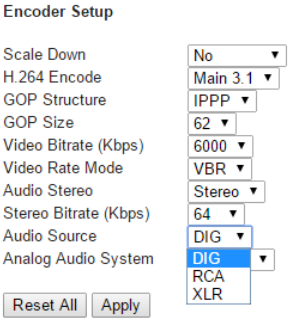


The NVS-25 also offers two bitrate modes, Variable Bitrate (VBR) and Constant Bitrate (CBR). Set the NVS-25 to VBR to efficiently send video data across an IP network but there is also a trade-off against video quality. CBR provides better video quality but is less data and bandwidth efficient when sent across an IP network.

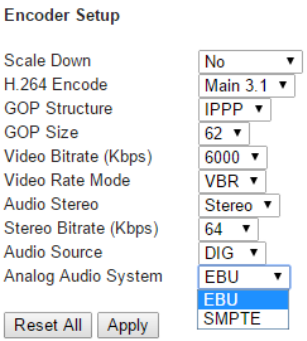


Audio Setup

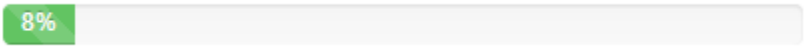
Audio Source can be fed into the NVS-25 in two ways. One way is to embed audio into digital video stream such as HDMI and SDI [DIGITAL] and another way is to feed audio into a separate analog XLR/RCA phono inputs [Analog]. Select your audio source first as shown in the diagram below.



Since analog audio levels of the standards in EBU and SMPTE regions are different, thus audio standard option also needs to be taken into consideration. The audio standard settings can be found under the ***Analog Audio System*** Menu.

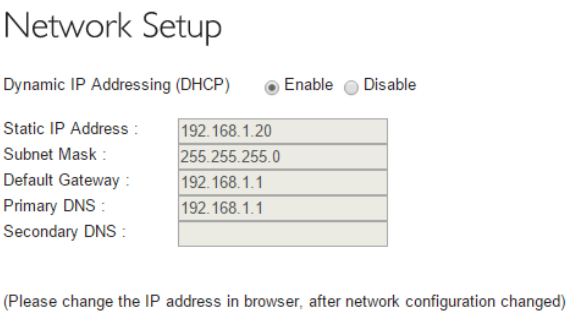


NOTE: All settings applied will not be in effect unless the **Apply** button has been clicked and the NVS-25 configuration progress bar displays 100% completion.



Setting > Network Setup

On the Network Setup page, the user is able to configure the basic network settings on NVS-25. DHCP and True Static modes are available. In DHCP mode, NVS-25 is randomly assigned an IP address. In True Static mode, the user is allowed to assign a fixed IP address to NVS-25.



DHCP Enable

If DHCP mode is enabled, NVS-25 will attempt to obtain an IP address automatically from the DHCP server upon connection to an office LAN or the router. **IP address obtained in DHCP mode changes every time when NVS-25 is power cycled.** The IP address assigned to NVS-25 has the same network prefix as the office network or the router. **Please refer to the IP finder section for more information on how to locate NVS-25 on a DHCP network.**

DHCP Disable

If DHCP mode is disabled, NVS-25 will be set to True Static mode. **A true static IP address does not change even after the unit is power cycled.** This allows NVS-25 to be easily located on the network.

If you wish to work in true static mode on your office network, please consult your local network administrator or IT support for advice. They are also able to confirm the IP address of the **Default Gateway**.

The network setting should persist through the firmware upgrade process. Please refer to the Firmware Upgrade section for the process.

Setting > Firmware Update

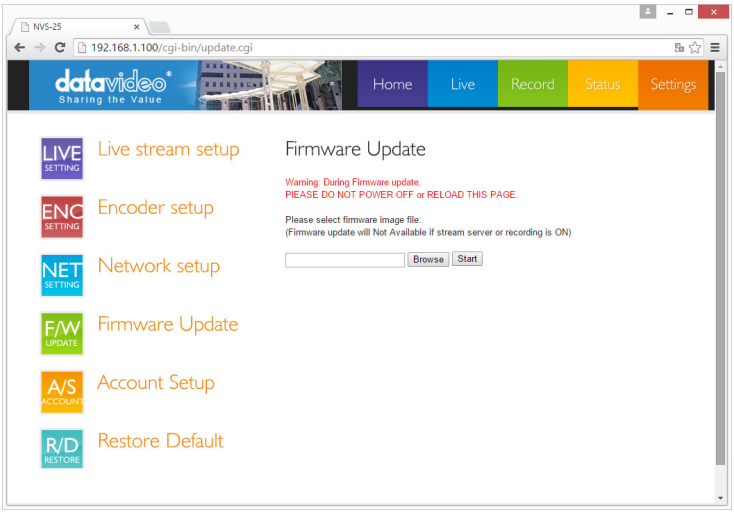
Datavideo usually releases new firmware containing new features or reported bug fixes from time to time. Customers can either download the NVS-25 firmware as they wish or contact their local dealer or reseller for assistance.

This section outlines the firmware upgrade process which should take ***approximately 10 minutes to complete***.

The existing NVS-25 settings should persist through the *firmware upgrade process, which should not be interrupted once started* as this could result in a non-responsive unit.

Successful firmware upgrade on NVS-25 requires:

- The latest firmware file, which can be obtained from your local Datavideo dealer or office.
- A computer with web browser on the same IP network as the NVS-25.
- The current NVS-25 IP address and settings.



1. Log into the NVS-25 server on the computer web browser.
2. Click on **Settings Tab** and turn **Stream OFF** under **Stream Server Option;** click on **apply**.
3. Select **Firmware Update** and **Browse** to the latest firmware file.
4. Click on the **Start button** to upgrade the NVS-25 to the latest firmware.

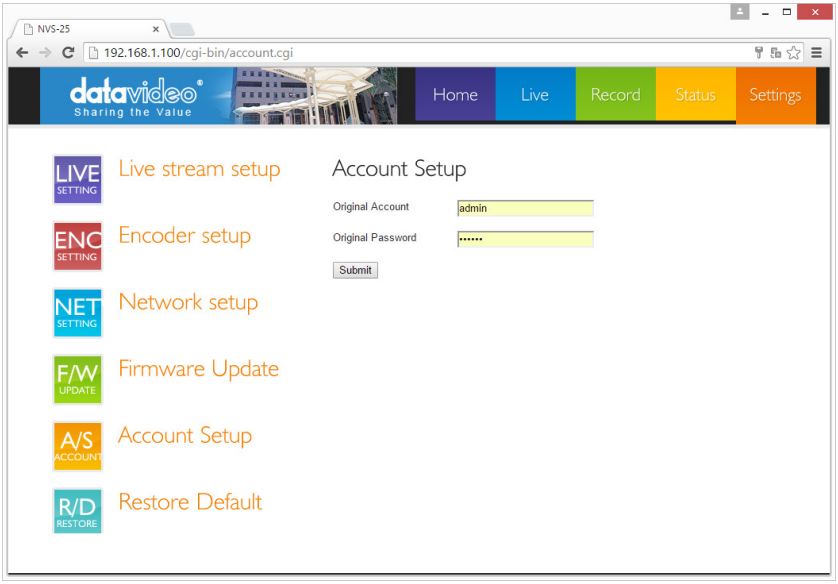
Note: After firmware upgrade, you may need to re-locate the NVS-25 on the network; please refer to the section on How to find NVS-25 on an IP network for further instructions. Settings of the unit need to be restored to settings prior to firmware upgrade.

Setting > Account Setup

The NVS-25 has a default admin account and password. This account has access to the NVS-25 login credential and stream settings.

Default username = **admin** Default password = **000000** [Six Zeros]

This section outlines steps to changing the above default username and password to a more secured login credential.

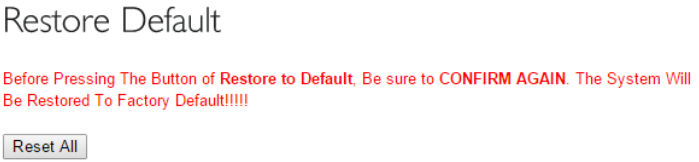


1. Log into the NVS-25 server on the computer web browser.
2. Click on **Settings Tab** and turn **Stream OFF** under **Stream Server Option;** click on **apply**.
3. Click on **Account Setup** and enter the **current username and password**.
4. The user will then be prompted to enter the new login credential again. Enter the new password twice to confirm.
5. After clicking on "**apply change"**, the user will be prompted to re-login with new login credential.

NOTE: Please keep the new login credential in a safe place as the old/default login credential is usually deleted during this process.

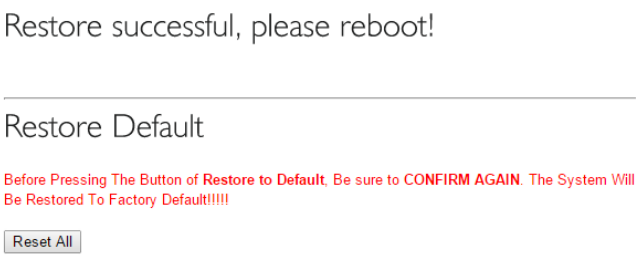
Setting > Restore Default

Settings on NVS-25 are usually changed many times, and this function is used when you wish to restore your factory default settings.



NOTE: This feature will also reset the NVS-25 login credential to the default username and password (admin/000000).

1. Log into the NVS-25 server on the computer web browser.
2. Click on **Settings Tab** and select **Restore Default**.
3. Click on the **Reset All** button to proceed.
4. Reboot the unit after all settings have been restored to the default; re-login with default username and password (admin/000000).



The factory default stream settings are listed as follows:

Stream Server	: OFF
Input Source	: HDMI
Brightness	: 128
Contrast	: 128
Hue	: 128
Saturation	: 128
Sharpness	: 128
H.264 Level	: 3.1
GOP Structure	: IPPP
GOP Size	: 30

Audio Stereo	: Stereo
Audio Bitrate	: 384 Kbps
Video Bitrate	: 3000 Kbps
Video Rate Mode	: VBR
Audio Source	: DIG
Analog Audio System	: EBU

Restore Factory default via mode button

NVS-25 can also be restored to the factory defaults using the MODE button located on the front panel. **Power off the unit** and then press and hold the MODE button while turning on the NVS-25 power; keep pressing the MODE button for **40** seconds. After releasing the MODE button, NVS-25 will take another 30 seconds to complete the boot-up process. Remember to login with default username and password (admin/000000).

Recording the stream to USB 2.0 media

The NVS-25 is capable of recording the **streamed video** and audio into an **MPEG2 TS/MPEG-4 file** on a connected USB 2.0 pen drive.

If the video being streamed into NVS-25 is of a High Definition 1080i video format then the recorded file will use this resolution. If the video being streamed into NVS-25 is of a Standard Definition NTSC format then the recorded file will adopt this resolution instead.

The USB 2.0 pen drive should be a formatted FAT32 drive in order to be readable by NVS-25 to which it is connected. If the USB connected media is incompatible (not FAT32) or unformatted, the error message will show "***USB storage partition incorrect."*** The user may choose to format the connected USB drive by clicking on the "Format USB Storage" button.

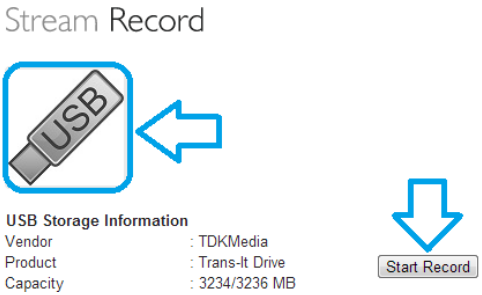
Pen Drive Video Capacity

A 4GB USB 2.0 pen drive can store just over two hours of video and audio **when the default NVS-25 settings are used.** If the bitrate is changed to a higher data rate, the available recording time will be shorter on the pen drive with the same capacity.

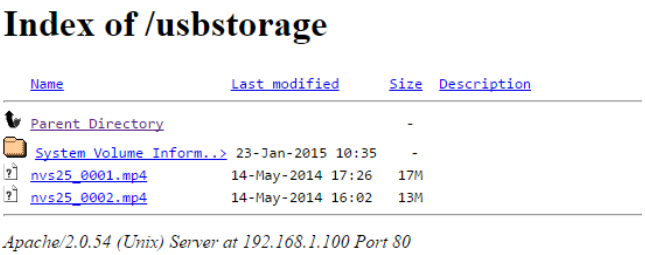
Note: Make sure your USB pen drive is empty before starting the stream recording process. NVS-25 may overwrite previously recorded sectors on the USB pen drive when the available space is low.

Note: FAT32 limits the file size to 2 GB. Additional files will be created by NVS-25 as soon as the 2-GB file limit is reached. Files will be numbered sequentially.

Stream Record Process



1. Log into the NVS-25 server on the computer web browser.
2. Click on the **Settings Tab** and change the **Live Stream Setup** accordingly.
3. Connect the USB 2.0 storage medium to the USB port located on the front panel of NVS-25.
4. Click on the **Record Tab** and then the **Start Record** button.
5. If MP4 file format is desired, please put a check on the box located on the right of "MP4 Recording" before clicking on the "**Start Record**" button.
6. After the recording is started, the recorded file name will be displayed above the "**Stop Record**" button.
7. Click on the **USB Storage icon** to view the root directory of the connected USB 2.0 storage medium. This opens a new web page [as shown in the example below], which can be refreshed to show the incrementing **NVS25_xxxx.ts** stream file size.



8. Click on the **Record Tab** and then the **Stop Record** button once when the medium is nearly full or the event being recorded is complete.

Status > Device Information

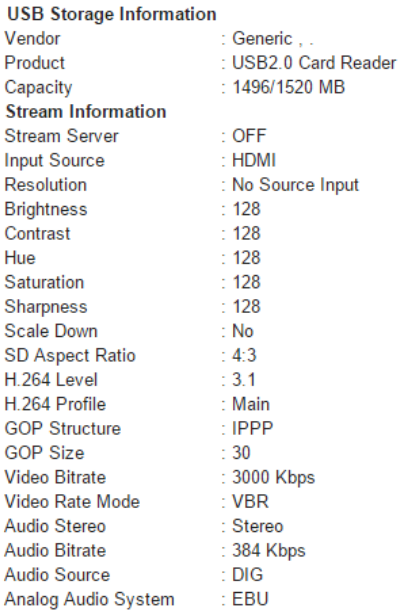
The Status tab displays the device information such as USB storage information and stream information.

USB Storage Information

If no USB drive is connected, the message “NO USB Storage plugged” will be displayed as shown below.

Stream Information

Stream information displays the current encoder settings. A sample stream information display is shown below.



Streaming Examples

Various examples of streaming using NVS-25 will be described as follows. There are three streaming protocols available on the NVS-25: **HTTP Live Streaming (HLS) Protocol, Real Time Streaming Protocol (RTSP), and Real Time Messaging Protocol (RTMP)**.

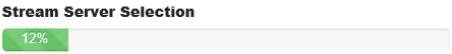
HTTP Live Streaming (HLS) Protocol

Use NVS-25 to feed IP video stream to several **Apple computer clients** or tablet computers such as iPad, iPhone or MacBook running Safari browser. HLS feeds video and audio streams to the iOS devices. **Note that, depending on the settings chosen, HLS latency may be up to 10 seconds in case of live events.**

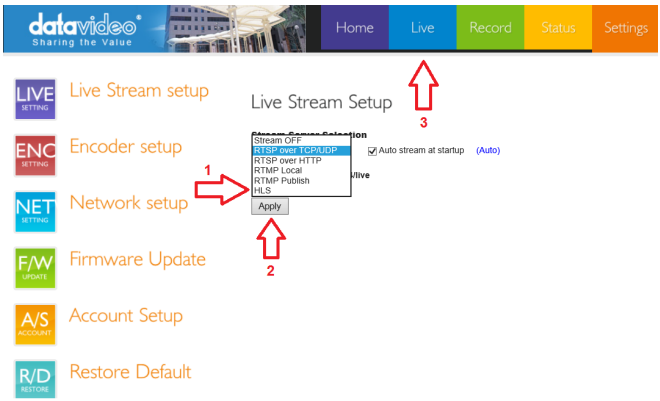
In order to configure HLS protocol, the user should first find the NVS-25 IP address on the network using the IP finder that Datavideo provides. Once the NVS-25 IP address is known, enter the IP address into the Safari web browser address bar on iPad or other iOS devices. Please refer to the section on How to find NVS-25 on an IP network for more information.

Enter the username and password to log into NVS-25 to gain access to the **Home** Page of the web-based graphical user interface. Please refer to the section on NVS-25 Login using a Web-Based Graphical User Interface for more information.

Click on the **Settings Tab** and change the protocol to HLS. Click on **Apply to select the desired protocol.**



Once the NVS-25 configuration progress bar displays 100% completion, click on the Live tab and the video stream will be displayed on iPad or other iOS devices.



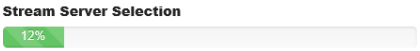
Real Time Streaming Protocol (RTSP)

Use NVS-25 to feed IP video stream [TCP , HTTP] to a small group of clients on a Local Area Network (LAN) or Wide Area Network (WAN). The user can then view the video via free client software such as VLC Player. **However RTSP does not work well with some tablet computers.** RTSP is open for viewing by anyone on the same network with the streaming details or link. **It can be sent across the internet, but each client added will add data loading to NVS-25, as each video stream is set up individually for each client.** RTSP has a limitation of three viewing clients before NVS-25 becomes congested and video stream fails.

In order to configure RTSP protocol, the user should first find the NVS-25 IP address on the network using the IP finder that Datavideo provides. Once the NVS-25 IP address is known, enter the IP address into the web browser address bar on the computer or other devices. Please refer to the section on How to find NVS-25 on an IP network for more information.

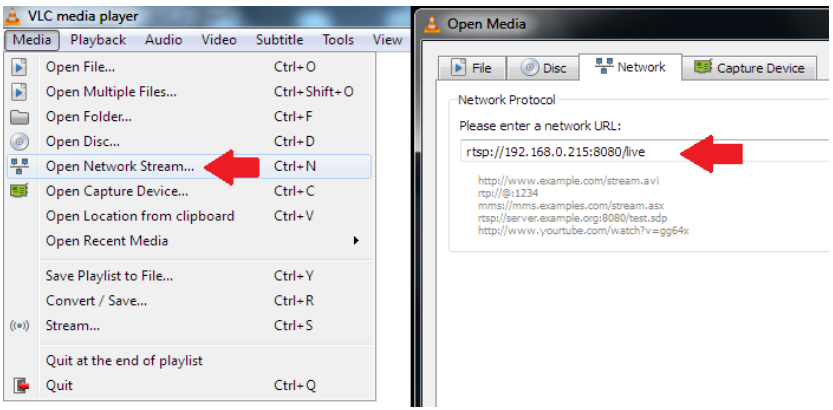
Enter the username and password to log into NVS-25 to gain access to the **Home** Page of the web-based graphical user interface. Please refer to the section on NVS-25 Login using a Web-Based Graphical User Interface for more information.

Click on the **Settings Tab** and change the protocol to RTSP over TCP or RTSP over HTTP. Click on **Apply to select the desired protocol.**



Once the NVS-25 configuration progress bar displays 100% completion, click on the Live tab and an RTSP link to the video stream will be displayed. You can also find the link displayed below the Stream Server Selection menu.

Enter the RTSP link into **VLC Media Player** as depicted in the diagram (**Media** > **Open Network Stream**) below.



Real Time Messaging Protocol (RTMP)

Use NVS-25 to deliver a single IP video stream [TCP] to a server on a Wide Area Network [WAN] like the *internet* (RTMP Publish) or to a small group of clients on a private Local Area Network [LAN] (RTMP Local).

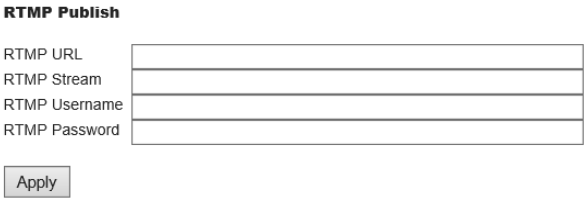
The server on the WAN could be the server of a **Content Delivery Network** [CDN], such as ***Ustream***. To use a CDN, you may need to register for a free / trial account with additional costs first. The user just need to deliver one video stream to the CDN and that IP video feed will be shared among multiple viewers. This means less work for you and the NVS-25 as well. CDNs differ in tariffs and the way they operate so **it is best to do your homework beforehand.**

The server on a WAN could also be your own ***Wowza server***. Wowza server is another form of CDN solution, typically for large organizations, where you brand the look and feel of the delivery network plus the video stream itself. **Again it is best to do your homework beforehand.**

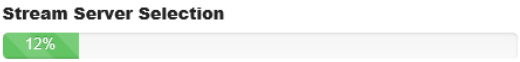
Connect your NVS-25 to a server and use the IP finder to search for the device on the network. Once the NVS-25 IP address is known, enter the IP address into the web browser address bar on the computer or other devices. Please refer to the section on How to find NVS-25 on an IP network for more information.

Enter the username and password to log into NVS-25 to gain access to the **Home** Page of the web-based graphical user interface. Please refer to the section on NVS-25 Login using a Web-Based Graphical User Interface for more information.

Click on **Setting** and change the protocol to RTMP Publish or RTMP Local. If you are sending the NVS-25 stream to a Content Delivery Network (CDN), please select RTMP Publish and enter your CDN Publish URL and Stream Name in the text box as shown below.



Click on **Apply to select the desired protocol.**



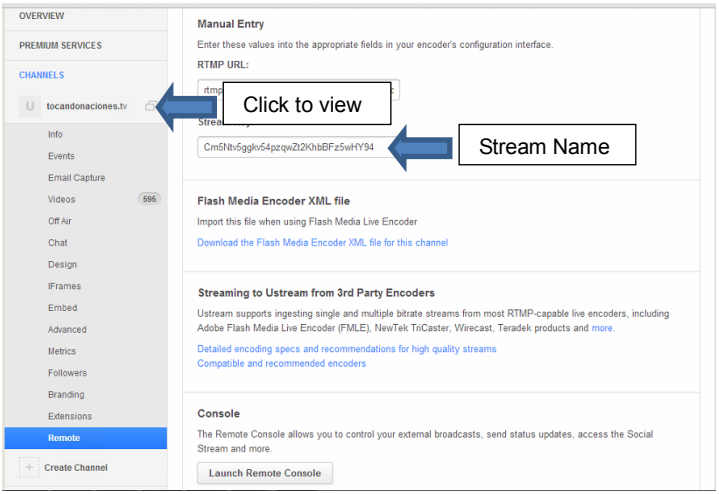
Once the NVS-25 configuration progress bar displays 100% completion, you can now view the streaming video from NVS-25 on the Content Delivery Network (CDN).

If you are using NVS-25 as the local RTMP server then a video stream player window will be available under the **Live Tab**. Click on the Play button at the lower left corner of the payer window to start playback of the RTMP stream.

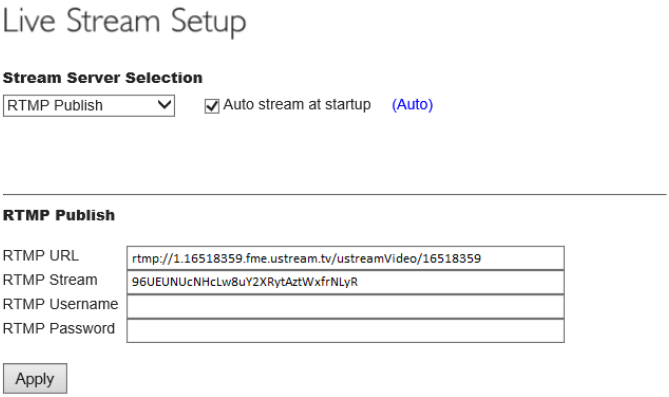
The following three sub-sections provide examples of streaming video to a Content Delivery Network such as USTREAM, a WOWZA Server and Youtube.

NVS25-USTREAM Connection Configuration

1. Login USTREAM (http://www.ustream.tv/) and create a channel under function list
2. Click on the remote option, the page will generate two parameters, RTMP URL and a stream name, as shown in the diagram below.
3. Login NVS-25 and go to “Live Stream Setup.”
4. Copy and paste “RTMP URL” and the “stream name” into RTMP URL and RTMP Stream text bars respectively. If your CDN service provider requires you to enter the RTMP stream credentials, please enter in the “**RTMP Username**” and “**RTMP Password**” text bars.
5. Step 4 allows the user to stream video from NVS-25 to USTREAM.
6. Select the configured channel on USTREAM to view the video streamed from NVS-25.



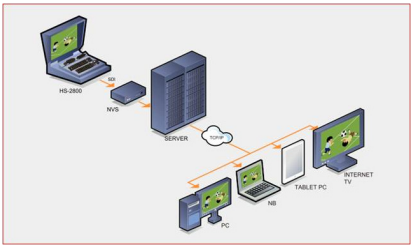
RTMP URL and Stream Name



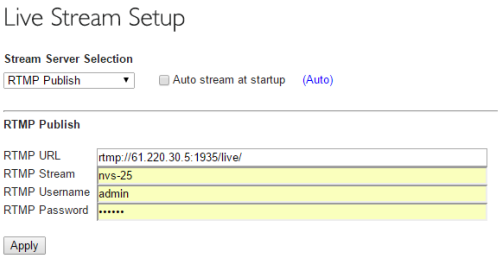
NVS-25 Live Stream Setup (USTREAM)

NVS25-WOWZA Server Connection Configuration

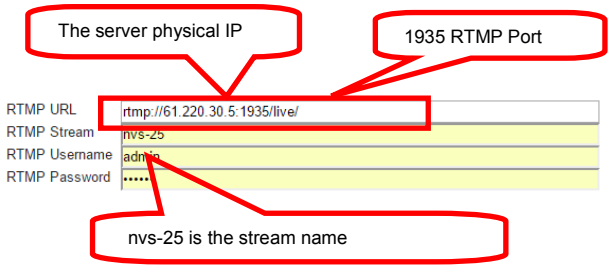
1. Install WOWZA on a server assigned of an external IP (This server is solely for WOWZA and contains no other unnecessary configurations).



2. Login NVS-25 and go to “Live Stream Setup.”
3. Enter “rtmp://61.220.30.5/live/nvs-25” into the respective RTMP Publish text bars as depicted in the diagram below, where 61.220.30.5 is the WOWZA server computer IP (RTMP URL) and NVS-25 (RTMP Stream) is the custom streaming location on the WOWZA server.

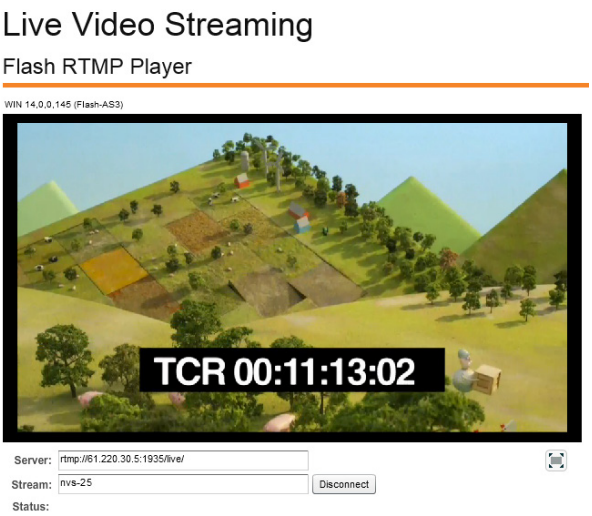


4. Go to the website, http://www.wowza.com/resources/3.5.0/examples/LiveVideoStreaming/FlashRTMPPlayer/player.html.
5. Enter the WOWZA server computer IP and the custom streaming location as illustrated in the diagram shown below.



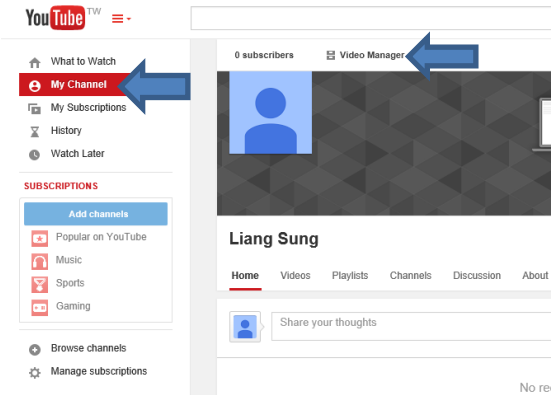
NVS-25 Live Stream Setup (WOWZA Server)

6. Live video streaming is displayed in the diagram below.

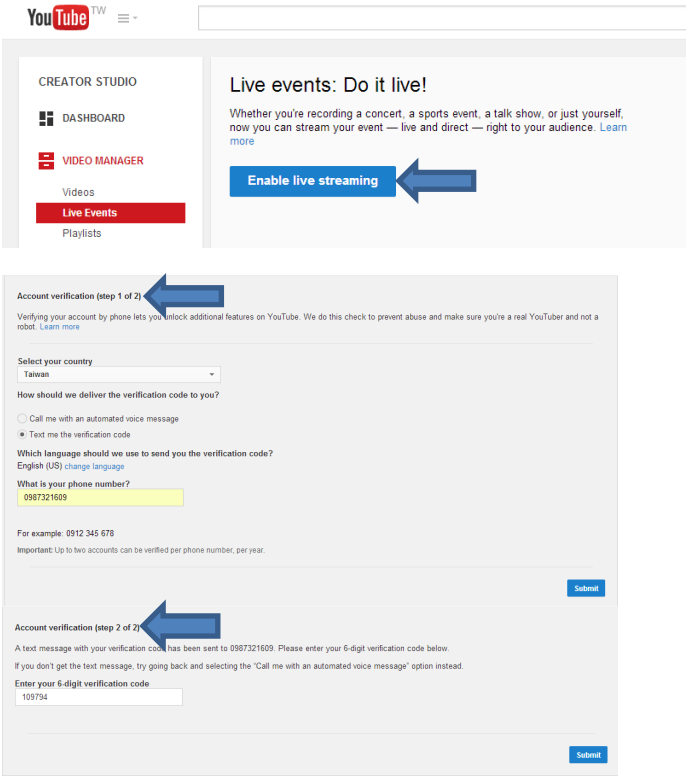


NVS25-Youtube Connection Configuration

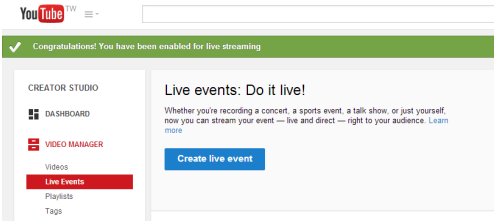
1. Login Youtube (https://www.youtube.com/) and click on “My Channel” to enter a page on which you will find a Video Manager tab.



2. For first-time user, the Youtube account must be verified before creating a live event. Click on “Enable live streaming” button and the subsequent wizard will take you through the account verification process.

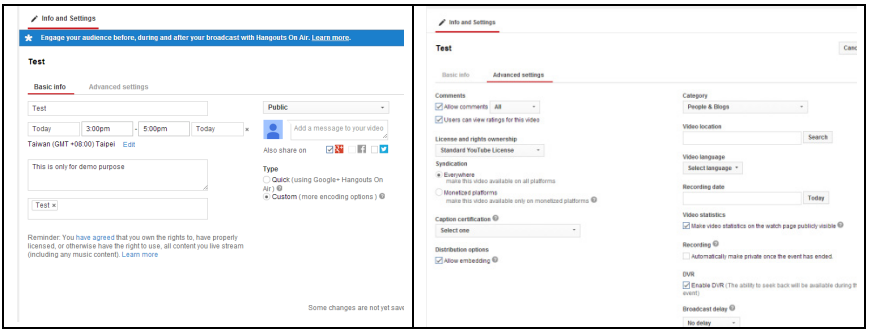


3. Once your youtube account is verified, you are then ready to start creating a live stream. Click on the blue “Create live event” button to enter the event settings page.

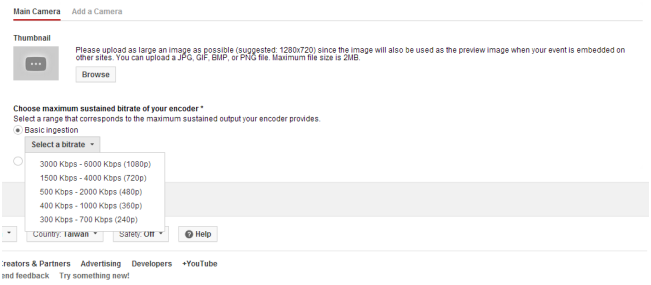


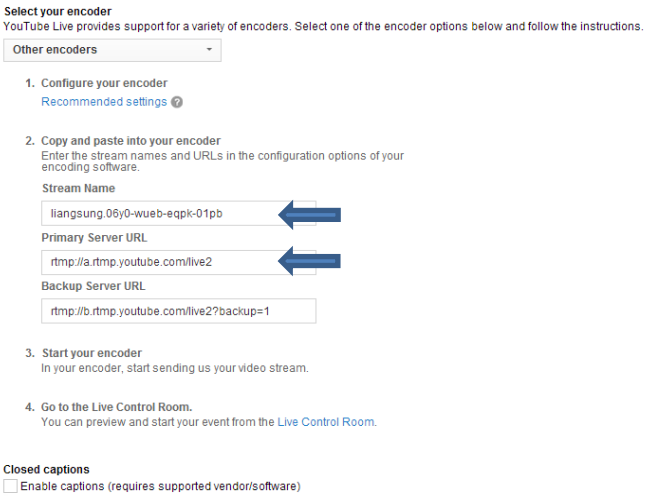
4. There are two tabs on the event settings page, basic info and advanced settings, as shown in the diagram below.
   a. To best promote your video, enter the event’s title and description and make sure they are clear, specific and relevant to the live event.

b. Also add relevant tags to expedite search for the event.
c. Configure start and end times so users are able to know when to watch the event.
d. In the private setting dropdown menu, set the event to public if you are ready to have the event appear on the channel and the search result. If you are not ready to have the event viewable, or setting up the task event, make sure to select the unlisted archive setting in the dropdown menu.
e. Categorize correctly, people are more likely to read your video highly and watch it more frequently if it is placed in the relevant category.
f. Next to the basic info tab is the “Advanced settings” task, where you can allow and disallow comments.
g. You can also enable embedding which makes the event embeddable in other locations.
h. In the second column, this is where you can enable and disable recording in DVR functionality.
i. Click on the blue “Create Event” button to save the setting. Once your event settings are saved, you can now move on to configure your ingestion setting.

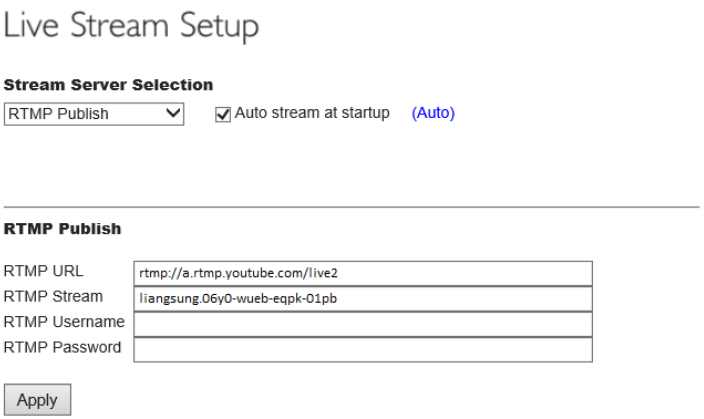


5. On the Ingestion setting page, the encoder setting will appear after a bitrate is selected. “Primary Server URL” and “Stream Name” are two important parameters to be entered into Live Stream Setup on NVS-25.

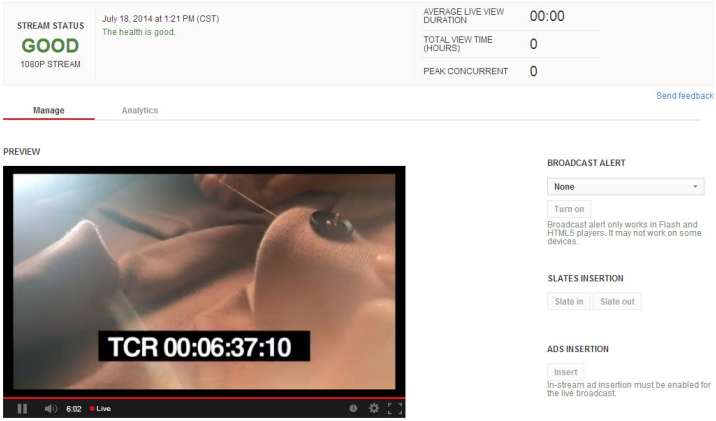




6. Copy and paste “Primary Server URL” and “Stream Name” into RTMP URL and RTMP Stream text bars on the Live Stream Setup page of NVS-25 respectively. If your CDN service provider requires you to enter the RTMP stream credentials, please enter in the “**RTMP Username**” and “**RTMP Password**” text bars.



7. After completing Step 6, click on the Live Control Room to enter the page shown below. Once the stream is loaded, the “Preview” button will turn to “Start Streaming”. Click on “Start Streaming” button to start streaming video to Youtube.


STREAM STATUS
GOOD
1080P STREAM
July 18, 2014 at 1:21 PM (CST)
The health is good.
AVERAGE LIVE VIEW DURATION
00:00
TOTAL VIEW TIME (HOURS)
0
PEAK CONCURRENT
0
Send feedback
Manage
Analytics
PREVIEW
TCR 00:06:37:10
6:02
Live
BROADCAST ALERT
None
Turn on
Broadcast alert only works in Flash and HTML5 players. It may not work on some devices.
SLATES INSERTION
Slate in
Slate out
ADS INSERTION
Insert
In-stream ad insertion must be enabled for the live broadcast.

Port Forwarding on your Firewall / Router

In order to view the NVS-25 video stream on remote computers (hosts on the Internet), port forwarding function must be enabled, i.e. set aside one port number on the gateway for the exclusive use of communicating with a service in the private network. Contact your local network administrator or IT support for port forwarding configuration.

Different port numbers of the “port forwarding” function

Web Server/HLS	RTSP	RTMP
80	8554 (over TCP)	1935 (RTMP)
	8000 (over HTTP)	8080 (RTMPT)
	8080 (over HTTP)	8081 (RTMPS)

LED Status & Button Behaviour

LED Status

Function	State	Description
Power LED	a. Off	Power Off
	b. Red	System Boot-up & Program Initialization
	c. Green	System Ready with Interface LED
	d. Blinking	System Error
Record	a. Red	System Error
	b. Green	Recording
Stream	a. Off	Stream Off
	b. On	Stream On
Interface	a. Off	Program not initialized
	b. On	Source input OK
	c. Blinking Red	Blinking while no source input
		Blinking while invalid source input

Mode Button Behaviour

Function	Behavior	Description	LED
Stream On/Off	Hold for 3 seconds until Stream LED	Start/Stop Stream	Stream LED on/off for starting or stopping
Interface change while Stream Off	Press Once	Change to next (HDMI->SDI->CVBS->)	Interface LED changed
Interface change while Stream On	Press Once	Stop Stream -> change to next (HDMI->SDI->CVBS->) Start Stream	1. Streaming LED off 2. Interface LED changed 3. Stream LED ON (If there is a valid source input)
Record On/Off	Press Once	Start/Stop Recording	Record LED on/off

Frequently-Asked Questions

This section describes problems that you may encounter while using NVS-25. If you have questions, please refer to related sections and follow all the suggested solutions. If problem still exists, please contact your distributor or the service center.

No.	Problems	Solutions
1.	**Mode buttons on the front panel is not sensitive.**	It takes quite a while for the system to switch modes after the mode button is pressed. Please wait for at least 10 seconds.
2.	**Record button on the front panel is not sensitive.**	Please wait for at least 10 seconds and if the system does not respond, press the button again.

Specifications

Video Input	1 x BNC for HD/SD-SDI(75 ohm)
	1 x BNC for CVBS (75 ohm)
	1 x HDMI (Ver 1.3)
Audio Input	SDI embedded audio (2 channels)
	2 x XLR/RCA for Analog audio (2 channels)
	HDMI embedded audio (2 channels)
Output	1x RJ-45 Female (10/100M Ethernet) 1x USB 2.0 Type A for file output to USB storage
Video Encode	H.264 / AVC video CODEC, up to High Profile Level 4.0 Configurable Bit-rate up to 6Mbps
Supported Video Resolution	1080 @ 50P / 59.94P / 60P (50P/59.94P/60P input, 25P/30P record/output) 1080 @ 50i / 59.94i / 60i 720 @ 50P / 59.94P / 60P 576@ 50i, 480 @ 59.94i
Audio Encoding	AAC-LC audio CODEC Sample rate:48KHz,16bit Configurable Bit-rate up to 384Kbps
Network Feature	DHCP Client Streaming feature: - HLS/RTSP/RTMP Server (One protocol at a time) - Supports up to 3 clients
Monitoring	6 x LED (PWR/ CVBS/ SDI/ HDMI/ REC / Streaming)
Storage	USB 2.0 Mass Storage File system: FAT32/MP4
Control	Web UI for system configuration and control
Update	Firmware upgradable by web UI
Power	Input AC 100 ~ 240V Switching Adaptor
Environmental Conditions	Operating temperature: 0～50℃ Storage temperature: -10～60℃

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.

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Please refer to our website for update the latest version manual.
www.datavideo.com/Encoders/NVS-25

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