



Videon Product Manual

Shavano Encoder

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Product Ordering Information for Videon products:

To order encoders and decoders, as well as other Videon products, call our Customer Care team at (814) 235-1111 x303.

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Overview

Thank you for purchasing a Videon product.

This manual will describe device setup, configuration, technical specifications and troubleshooting. All Videon devices are interoperable and controlled via a web user interface. This manual is specific to Shavano H.265 Encoder, unless stated otherwise.

Questions? Let Customer Care Help.

Search the Videon Product Knowledge Base at <https://kb.videon-central.com> for troubleshooting help and tips!

If at any point you have questions or comments about your Videon product, or just need a hand getting started, our Customer Care team would be happy to assist you. Submit a support ticket through our Customer Help Desk.

Help Desk:

https://helpdesk.videon-central.com/customer_techsupport@videon-central.com

1. Setting up your Videon device(s)

1.1 Network Requirements

Your installation space must be equipped with a DHCP-enabled and multicast-enabled Ethernet router. Dynamic Host Configuration Protocol (DHCP) refers to a method of assigning unique IP addresses to devices on a network. Most routers have these capabilities and default to these settings.

Upload bandwidth needs to be sufficient for the video bitrate that you're encoding. See the *Suggested Bitrate Table* in *Section 2.5*. (Use a network speed diagnostic tool such as speedtest.net to determine your maximum upload bandwidth.)

1.2 Equipment

In order to set up a Videon encoder, you need:

- HDMI or SDI video source
- Computer with Google Chrome web browser (Chrome version 39 or newer is recommended)
- DHCP- and multicast-enabled router connected to network
- HDMI or SDI cable to connect video source to encoder
- Ethernet cable to connect encoder to router
- Ethernet cable to connect control computer to router

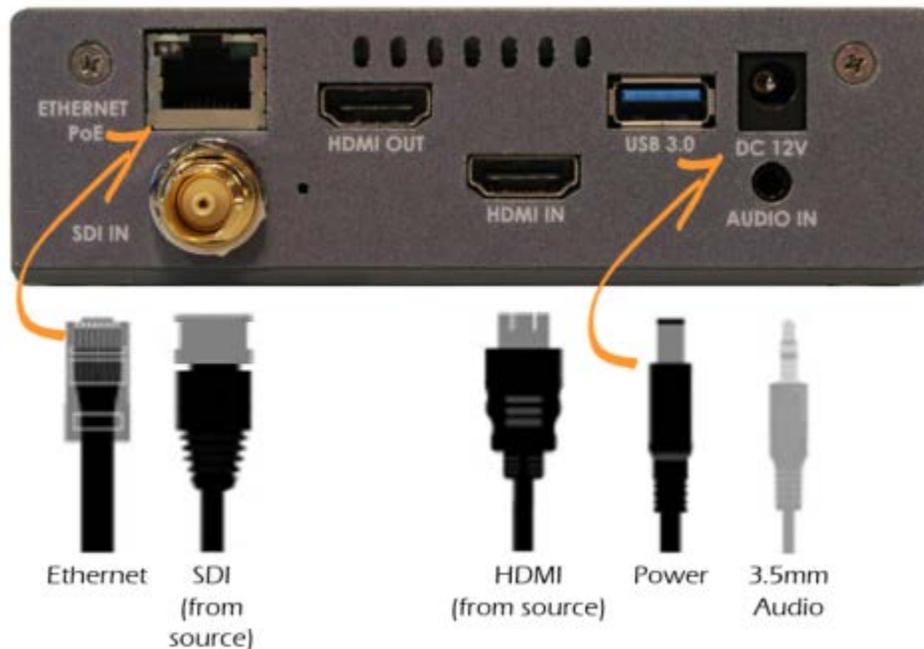
With your device, you received a Videon power supply and a USB stick. On the USB stick, you'll find the Videon Discovery Application.

1.3 Connecting Your Videon device(s)

We recommend completing all hardware connections before powering on your device.

1. Connect the video source to the device's HDMI IN port with an HDMI cable, or the SDI IN port with an SDI cable. Connect an audio jack to the device's AUDIO IN port to use analog audio, rather than embedded audio.
2. Connect the device's Ethernet port to the router with an Ethernet cable.
3. Connect the control computer to the router with an Ethernet cable.
4. Plug one end of provided power supply into the device's 12V connector and plug the other into the wall. This will power on the device. Alternatively, use Power over Ethernet to power the device. Be sure to use a PoE switch.

1.4 Connection Diagram



1.5 Final Setup

Verify that the following components of your installation are turned on:

- Video source
- Control computer
- Router

2. Controlling your Videon Device(s)

2.1 Overview

To control Videon devices, you will use a device's IP address to log into the web user interface through your browser. Once you are connected to a Videon device, you can control any other device on that network through the same interface window. (You do not need to enter the IP address of each unit individually.)

2.2 Initial Setup: IP Address Discovery

Videon Discovery Application (Recommended):

The first time you use your control computer to connect to a Videon device, you will need to run the Videon Discovery Application to detect the IP addresses of devices on your network.

Download the Videon Discovery Application from the Videon Knowledge Base at <https://kb.videon-central.com/display/GKB/Product+Resources>, or install the app from the USB stick that came with your device.

Windows: Run the executable file called "*Videon_Discovery_App_Windows.exe*" and install.

Mac: Once the folder called "Mac" is extracted, run the executable file called "*videon-discovery-os-x.dmg*" and install.

Linux: Once files are extracted, go to the folder named "*VideonDiscovery*" and double-click the executable called "*VideonDiscovery*". Optionally, follow the install instructions in "*README-linux*".

The app will automatically begin scanning the network for Videon devices and will display the IP addresses of the devices as they are found. **Click the *Open* button** next to the IP address of any device. This device will act as the controller to enter the web-based user interface.

Note: If you are using more than one Videon device on your network, we recommend connecting each device independently the first time you operate it. Log onto the user interface and rename that device before moving on to the next. This will help you identify the devices.

Alternate Method: If you are unable to find the Videon device using the Videon Discovery Application, use the alternative method below that uses the USB Storage Device included in the package contents.

IP Address Stored to an SD or USB Storage Device:

Once the device is booted up, obtain the network information of your device, such as the IP address. Insert a USB storage device or an SD card. Wait at least 30 seconds, and then remove the storage device. There should now be a file on the storage device named "streaming_network_configurations.txt".

The file should contain the following:

- IP address
- The subnet mask
- The gateway address
- The domain name servers (DNS)

Enter the IP address shown in the .txt file into your web browser to reach the web UI.

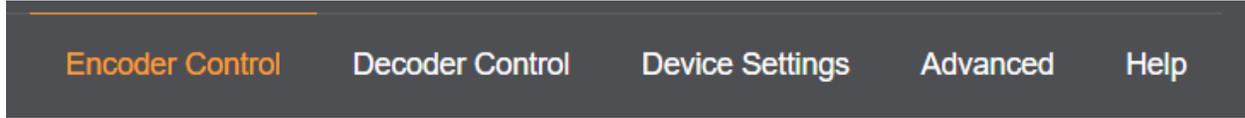
2.3 LED Indicators

The LED indicators on the front of the Shavano device signifies the following states:

State	Source LED	Record LED	Stream LED
Off	No source	Record is off	All stream outputs turned off
Blue	Valid source	Recording	Streaming
Blue blinking			Connecting to RTMP
Red	Invalid source	Error recording	Streaming error
Red blinking			Error connecting to RTMP



2.4 Basic Control Functions



Once inside the web-based user interface, these tabs (above) appear. Descriptions of each tab can be seen in the table below. See subsequent sections for more detailed description of options in each tab.

Tab	Function
Encoder Control	Set up and manage encoder functions
Decoder Control	Set up and manage Videon decoders
Device Settings	Manage basic settings such as network settings and device name
Advanced	Manage advanced settings such as software updates and resets
Help	Links to the Videon Knowledge Base and Help Desk

2.5 Encoder Control

This tab allows you to control all Videon encoders currently on your network. If the device that is currently serving the user interface has an “Encoder” role enabled, it will be the first row in the table. (You can tell which device is serving the interface by looking at the top right corner of the interface window.) Each row shows a summary of an individual encoder’s status and provides a *Configure* button for the *Encoder Settings* and a *Configure* button for the *Output Settings*.

Information about the encoder:

Device Name: The name assigned to the encoder. It can be changed in the *Device Settings* tab.

AV Input Type: Select the appropriate video input type.

Input Resolution: Indicates whether a valid video signal is detected from the encoder’s selected video source.

- If a valid video signal is detected from the selected video source, this column lists the resolution and framerate.
- If , no valid video signal is currently detected.

Streaming: Indicates if the encoder is actively streaming.

Icon	Hover Text	Result
	Streaming	Stream is active (RTMP, unicast, multicast, or RTSP).
	Not streaming	All streaming is off.
	RTMP connecting	RTMP is connecting to server.
	Error connecting to RTMP server	An error occurred while connecting. Please confirm the correct values have been entered for the RTMP settings.
	Waiting for input	The encoder does not detect any video input. Please confirm the video source is powered on and outputting video.
	Unable to encode	The encoder detects the video input, but it is in a format which it does not support. Please refer to the Knowledge Base at kb.videon-central.com for your encoder’s Datasheet.

Recording: Indicates if video is being recorded to the inserted USB drive.

Icon	Hover Text	Result
	Recording	Device is actively recording to USB drive.
	Not recording	Recording is off.
	Finishing FTP Uploads. 1 file(s) remaining...	Recorded file(s) are being uploaded.
	USB drive unmounting	USB drive is being unmounted. Wait until unmounting is complete before removing the drive.
	Waiting for input	Input a valid HDMI or SDI video source to begin recording.
	Waiting for USB drive	Insert a USB drive to begin recording.
	USB drive unmounted, please re-insert	USB drive is unmounted. Re-insert it to record.
	USB drive full	USB drive is full. Remove files from the drive to continue recording.
	FTP login failure	The provided username/password for the FTP server are not valid.
	FTP server storage full	The FTP server is full. Delete files on the server to continue uploading.

Encoder Settings: Click the *Configure* button in this column to open the *Encoder Settings* dialog. Refer below to the *Encoder Settings* section for descriptions on the options within this dialog.

Output Settings: Click the *Configure* button in this column to open the *Output Settings* dialog. Refer below to the *Output Settings* section for descriptions on the options within this dialog.

Output Settings

Use this dialog set the *Output Settings* for the device. *Output Settings* control how the encoded video is routed to the destinations (e.g. via unicast, multicast or RTMP).

RTMP Output: Allows you to configure the encoder to send a single stream to an RTMP server. If you are using one of our integrated partners as a Content Delivery Network (CDN) or streaming platform, please refer to the instructions provided by that CDN partner. (Also refer to videon-central.com/resources)

For a generic RTMP output, follow these steps:

- Select `rtmp://` or `rtmps://` (RTMP over a TLS/SSL connection) as protocol.
- Enter the URL of the RTMP server. Refer to the RTMP server's encoding settings recommendations. Servers use different RTMP protocols. If you have difficulty connecting to your RTMP server, please contact their customer service or visit the Videon Knowledge Base (<https://kb.videon-central.com>), Videon Help Desk, or email techsupport@videon-central.com for help.
- In the *Encoder Stream Settings*, ensure that H.264 video and AAC audio are selected.
- The status icon to the right of the URL will update when the connection is successful or failing.
- In addition to controlling the RTMP output from the user interface, the RTMP stream can be turned ON/OFF using the *Stream* button on the front of the module.

Multicast Output: Allows you to configure the encoder to send a single stream that can be received by multiple decoders. To configure *Multicast Output*, follow these steps:

- Select a protocol from the dropdown. `rtp://` is recommended for more reliability and `udp://` is recommended for less latency.
 - Each encoder must be configured with a unique, valid combination of multicast address and port value (instructions below).
 - For full description of valid multicast range, refer to [iana.org](http://www.iana.org/assignments/multicast-addresses/multicast-addresses.xml#multicast-addresses-12) (<http://www.iana.org/assignments/multicast-addresses/multicast-addresses.xml#multicast-addresses-12>).
- Enter a multicast address. **Recommended** address values are in the range 239.0.0.0 to 239.255.255.249.
- Enter a multicast port value to indicate the network port that the multicast stream is to be sent over.
 - **Recommended** port values are even numbers between 1024-49150.
 - For additional details about port values, see Section 11 of IETF RFC3550 (<https://tools.ietf.org/html/rfc3550>).
- Enter a TTL. **Recommended** TTL value is 5.

Unicast Output (A/B): Allows you to configure the encoder to send unicast output(s). Videon encoders are capable of two simultaneous unicast outputs, in addition to the multicast output. Each unicast output can be controlled independently.

Note: If you are streaming between two Videon devices, we recommend configuring the stream via *Decoder Stream Settings*. The instructions in this section apply to the use of third party decoders.

To configure unicast output via the encoder, follow these steps:

- Select a protocol, rtp:// or udp://. rtp:// is recommended for more reliability and udp:// is recommended for less latency.
- Manually enter the IP address of the third party decoder device (See Section 2.2). The third party decoder must accept RTP over UDP (rtp://) or Raw UDP (udp://) delivery of an MPEG-2 Transport Stream containing H.264 or H.265 video and the selected audio codec or compression type.
- Manually enter the listening port value for the third party decoder device. Configure the decoder device to receive on the same port value as well.

File Recording: Allows you to record video to a USB storage device. Supports fat32 file systems.

- The default saved filename is VID. Filename will be appended with a timestamp when recording is saved to the storage device.
- Storage status is shown based on used vs. total available storage and in terms of the estimated recording time remaining at the current bitrate.
- A list of files can be seen and downloaded from the “*Files on USB root*” dropdown.
- Clicking “*Safely Remove*” ensures the recording processes have completed before the storage device is removed. This prevents file corruption.
- Files saved to the storage device are saved in .ts format.

FTP Upload: Allows you to upload recorded files to an FTP site

- Credentials needed: FTP server address, authentication username/password and FTP filepath (optional).
- **Tech Tip:** Credentials can (and should!) be tested by clicking *Test Connection*.
- “*Delete file from USB after upload*” will remove the recorded file from the USB storage device once FTP upload has completed.
- FTP upload history gives a record of what files have been uploaded to the authenticated server.
- **Note:** FTP upload only occurs for a file being actively recorded. Previously recorded files cannot be selected for upload to the FTP server.

Encoder Settings

Through this dialog, you can set the *Encoder Settings* for the device. *Encoder Settings* control how the audio and video are compressed/encoded (e.g. bitrate, scaling, etc.)

Video Input Resolution: Displays the resolution and framerate of the video source connected to the *HDMI IN* or *SDI IN* port, depending on which is selected. Possible input resolutions are 2160p30, p25, p24; 1080p60, p59.94, p50, p30, p29.97, p25; 720p60, p59.94, p50; 576p50; 480p60

Video Scaling: Select the scaling option you prefer.

- Passthrough outputs the same resolution as the input.

- Possible Video Scaling Resolutions include: 320x180p, 480x270p, 640x360p, 720x480p, 720x576p, 960x540p, 1280x720p, 1920x1080p, and 3840x2160p

Limit to 30 FPS: If the input is greater than 30fps, selecting this option will cut the fps in half. This is also useful for low bitrate streams.

Encoding Mode: Allows you to select the encoding bitrate mode for the MPEG-2 Transport Stream container.

- For a constant H.264/H.265 video bitrate, select Constant Bitrate.
- For a variable H.264/H.265 video bitrate, select Variable Bitrate.

Video Encoding: Allows you to set the target bitrate for your H.264 video encoding. The table below shows the suggested bitrates' different priorities (best compression vs. best quality).

Encoded Resolution	Bitrate (kbps) for Best Compression	Bitrate (kbps) for Best Quality
1920x1080	2500	7000
1280x720	2000	5000

H.264 Profile: Allows you to set the H.264 Profile to High, Main, or Baseline. Depending on which profile is selected, the H.264 Level will be auto-configured to one of the following levels: 3, 3.1, 3.2, 4, 4.1, 5.1. This is based upon the specified Video Encoding bitrate and Video Scaling selections.

H.265 Profile: Allows you to set the Main H.265 Profile level. Depending on which profile is selected, the H.265 Level will be auto-configured Up to level 5.1. This is based upon the specified Video Encoding bitrate and Video Scaling selections.

Audio Encoding: Allows you to set the audio encoding codec and bitrate value to use for the encoded audio. Shavano supports MPEG-4 AAC-LC at 48 kHz at the following bitrates:

- 64 kbps
- 96 kbps
- 128 kbps
- 192 kbps
- 256 kbps
- 384 kbps
- 512 kbps

When you have finished *Output Settings* and *Encoder Settings*, you may select from three options at the bottom of the dialog.

- The OK button will save the settings and close the dialog.
- The Cancel button will close the dialog without saving any settings.
- The Apply button will save the settings.

2.6 Device Settings

This tab is used to modify the device name, role, password management and network settings for any Videon device on the network. Clicking the “Save” button will change the configuration of the device.

Select a device: This dropdown lists all Videon devices on the network. Select the device for which you want to adjust settings.

General Settings

Name: Enter the name that you want to use to identify the device on the network. We recommend choosing a name that indicates the physical location of the device or the video source or display that is connected to the device. By default, Videon devices are assigned the unit’s serial number as a name.

Security

Password Management

- **Setting Password:** Turn *Authentication* on. Enter the password in the *Password* field and the *Confirm Password* field. Press *Save*.
- **Username:** The default username is “admin”.
- **Changing Password:** Enter your old password in the *Admin Password* field and enter your new password in the *New Password* and *Confirm New Password* field.
- **Turning Authentication Off:** Turn the *Authentication* switch off. Enter your password in the *Admin Password* field.

Note: If you forget your password, authentication can be turned off by doing a factory reset on the board. Refer to *Section 3: Hardware Reset Instructions* for instructions on how to do a factory reset.

Network Settings

Address Assignment: Use this setting to change the device between *DHCP* and *Static IP* address modes.

IP Address: This displays the current IP address configured for the device. If *Static IP* was selected in the *Address Assignment* option above, you can edit the IP address.

Subnet Mask: This displays the current subnet mask configured for the device. If *Static IP* was selected in the *Address Assignment* option above, this can be edited.

Gateway: This displays the current gateway configured for the device. If *Static IP* was selected in the *Address Assignment* option above, this can be edited.

DNS Address: This displays the current DNS server address configured for the device. If *Static IP* was selected in the *Address Assignment* option above, this can be edited.

2.7 Advanced

This tab offers more advanced control over Videon devices, including reset and firmware updates. The functions on this tab will likely be used only by system administrators.

Reboot Device

Reboots the device that is currently serving the web user interface.

Reset Settings

Use this function to reset all stream settings (encode and decode) to a default, unconfigured state. Network settings, device name, and other settings controlled from the *Device Settings* tab will remain unchanged. If you would like to reset these settings, refer to *Section 3: Hardware Reset Instructions*.

1. Select the device that will be reset.
2. With the device selected, press the *Confirm Reset* button to clear all stream settings.
3. The selected device will reboot and the stream settings will be cleared.

Debug Information

Click on *Download* in this section to download a file providing information about your unit's settings. This file can be attached to a support ticket or sent through email (techsupport@videon-central.com) so that we can help solve your problem.

2.8 Help

Videon Knowledge Base: Select this button to visit the Videon Knowledge Base. The Knowledge Base has helpful tools like how-to guides, tech tips, and walkthroughs to make using your Videon device easier.

Videon Help Desk: Select this button to report a problem, give feedback, or request service.

3. Hardware Reset Instructions

To reset all settings, including the network settings and device name of a Videon device, there exists a full hardware reset function. Use the physical reset button on the front of the device opposite the connectors to complete this process.

1. Power off the device by disconnecting it from external power.
2. Hold in the stream button.
3. While holding in the stream button, power on the device.
4. Hold the stream button for at least 30 seconds while the device is powering on. The LED will flash blue 5 times once reset is complete.
5. Upon successful hardware reset, the following values will be set as default.

Default Configuration Values

Configuration Page	Element	Default Value
Encoder	Video Input Resolution	Auto-Detected
Encoder	AV Input Type	HDMI with Embedded Audio
Encoder	Video Scaling	Passthrough
Encoder	Limit to 30 FPS	OFF
Encoder	Encoding Mode	Variable Bitrate
Encoder	Video Encoding Type	H.264 (AVC)
Encoder	Video Encoding Value	10000 kbps
Encoder	Audio Encoding Type	MPEG-4 AAC-LC
Encoder	Audio Encoding Value	128 kbps
Encoder	RTMP Output	OFF
Encoder	Multicast Output	OFF
Encoder	Unicast Output A	OFF
Encoder	Unicast Output B	OFF
Encoder	Record to USB	OFF
Encoder	Filename	VID
Encoder	Upload Recorded USB Files	OFF
Encoder	Delete file from USB after upload	OFF
Device Settings	Name	vunit-xx
Device Settings	Encoder	ON
Device Settings	Network Settings	DHCP

Still need help?

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If at any point you have questions or comments about your Videon product, or just need a hand getting started, our Customer Care team would be happy to assist you. Submit a support ticket through our Customer Help Desk.

Help Desk:

https://helpdesk.videon-central.com/customer_techsupport@videon-central.com