



**Matrox<sup>®</sup> Maevex<sup>™</sup> Series**  
**Maevex Encoder • Maevex Decoder**

**User Guide**

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# About this user guide

Your Matrox user guide provides information on installing and using your Matrox hardware.



**Note:** THE INFORMATION IN THIS GUIDE IS SUBJECT TO CHANGE AT ANY TIME AND WITHOUT NOTICE.

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## Using this guide

This guide assumes you're familiar with basic functions like click, right-click and double-click, and that you're familiar with the basics of the operating system you're using. Also, we use the following conventions:

- **Bold** for headings and for references to text that appears on-screen.
- *Italics* for file names, paths, publication titles, and new terms.
- ***Bold Italics*** for emphasis.
- Keyboard keys in square brackets, with a plus sign separating keys that you press simultaneously. For example: press [Ctrl]+[Alt]+[Del] to start Windows Task Manager.
- Arrows ("→") to separate ordered directions. For example, "click **OK** → **Close** → **OK**" is the same as "click **OK**, then click **Close**, then click **OK**".
- Green for cross-references. If you're viewing online, click green text to jump to what's being referenced.

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## More information

Be sure to check for any last-minute release notes included with your product. Also, check the Matrox Web site ([www.matrox.com/graphics](http://www.matrox.com/graphics)) for the latest Matrox software, technical support, and product information.

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# Overview

Thank you for purchasing a Matrox MaeveX Series product. Matrox MaeveX is a video distribution over IP solution that consists of an encoder unit and one or more decoder units capable of extending video, audio, and RS232 control signals over a standard TCP/IP network. A MaeveX Decoder can also be used as a standalone video player to view video files stored in its internal memory or on a memory card.

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## Features

Your Matrox MaeveX products include the following features:

- Start/Stop functionality
- Advanced networking support and network discovery (UPnP, manual or automatic IP allocation)
- Output resolution management with fixed resolution lists
- Mute and Volume controls
- Image control
- Ability to play back streaming output on a system running VLC
- Audio input and output selection
- Support to scale output
- Select and control target bitrate
- Video cropping support on decoder
- Continuous mode video playback from SD card
- Image appearance controls (brightness, contrast, hue, and saturation).

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## Hardware supplied\*

- **MaeveX Encoder** – Encoder unit, 1 power supply, 1 DVI to HDMI adapter, 1 6' CAT 5E network cable, 1 analog audio cable.
- **MaeveX Decoder** – Decoder unit, 1 power supply

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\* The hardware supplied with your Matrox product may vary depending on the SKU or part number of your product. For more information, contact your Matrox representative.

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## Hardware required (sold separately)

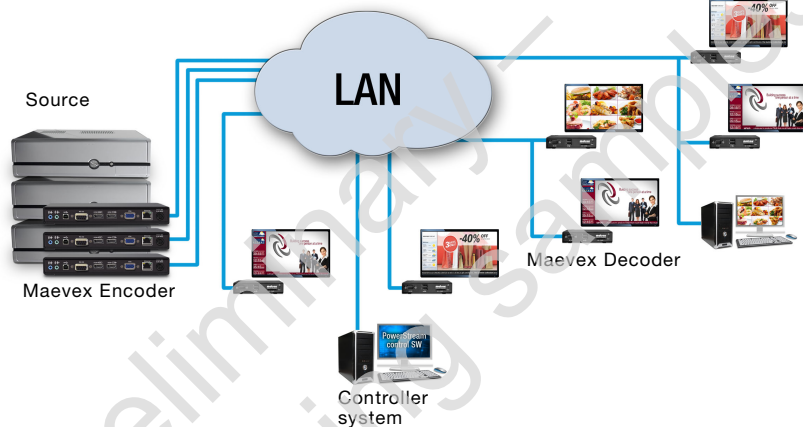
- Network cable
- HDMI cable

Preliminary –  
Engineering samples

# Using Maevox Encoder and Decoder units in extension mode

Matrox Maevox Encoder and Decoder units work in conjunction to provide unicast (one-to-one) or multicast (one-to-many) streaming over an IP network. This is referred to as *extension mode*. Through Matrox PowerStream, you can manage your entire Maevox network from a single system.

In extension mode, a Matrox Maevox environment is made up of four (4) elements connected to a network:



- **Source** – A video source connected to an encoder. A system used as a source is also called a host system.
- **Maevox Encoder** – An encoder is needed for each source in your Maevox environment. An encoder can broadcast to a single decoder or to multiple decoders.
- **Maevox Decoder** – A decoder is needed for each output in your environment. A decoder may play video received from an encoder or stored locally on the decoder. A computer system using VLC as a video player can also be used as a decoder.
- **Controller system** – A system connected to the network and running Matrox PowerStream. A controller system can also be a source.

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## Before you begin

- Before you power on your units, connect your encoder unit to your source and to the network, your decoder unit to the network, and your monitors and other devices to your decoder and encoder units.

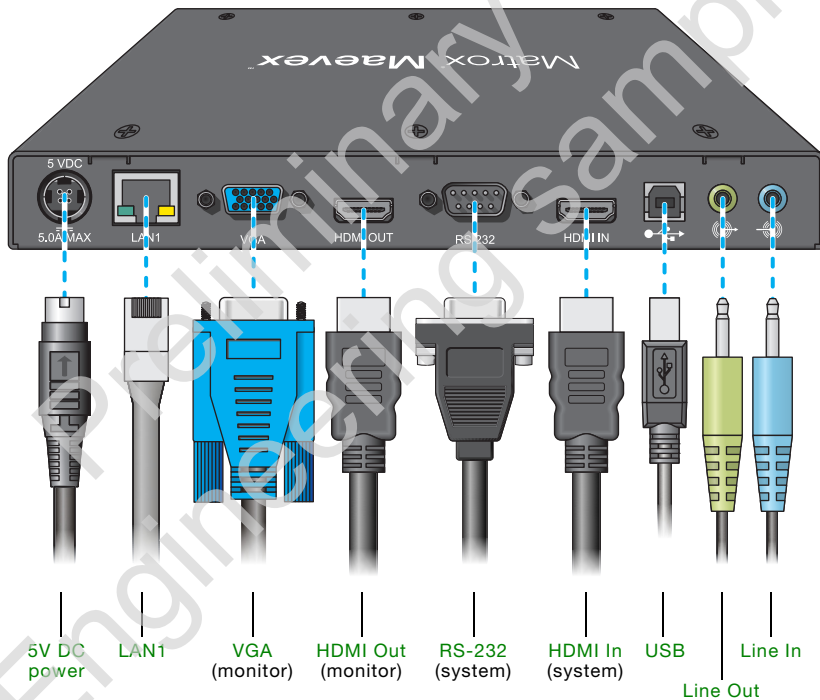
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## Connection overview

This section describes the connectors that may be used on your Maevex Encoder and Decoder unit in extension mode.

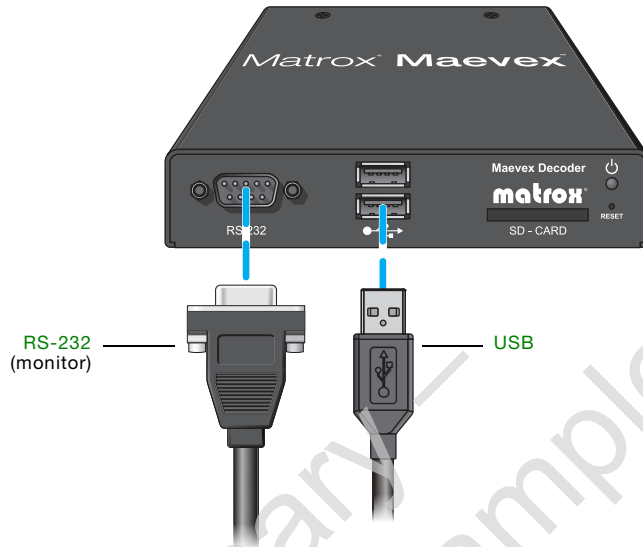
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### Maevex Encoder – Back

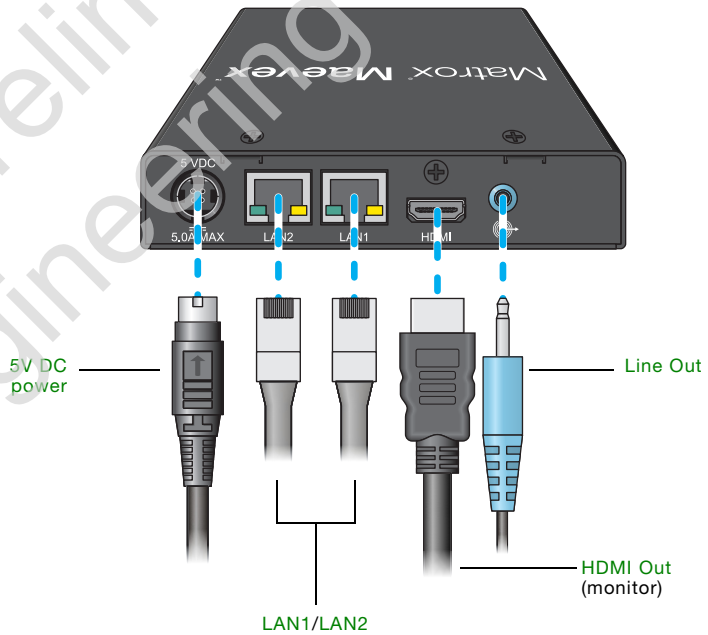




## Maevox Decoder - Front



## Maevox Decoder - Back



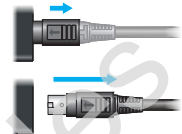
## Connector descriptions

Connector	Encoder	Decoder	Description	Required encoder connection
<b>5V DC power</b>	✓	✓	Connect the 5V DC power supply included with your product to this connector. While the 5V DC power supply is connected to the unit and electrical socket, the power LED ( $\phi$ ) is active (green).	
<b>HDMI</b>		✓	Connect a digital monitor to this connector. If your digital monitor has a DVI connector, you need an HDMI to DVI adapter to connect your monitor to this connector.	
<b>HDMI In</b>	✓		Connect your video source to this connector. If your video source doesn't support HDMI output, you need to use an HDMI adapter to connect it to your encoder unit. If your source has a DVI connector, use the DVI to HDMI adapter included with your Maevex product to connect it to your encoder unit. <b>Note:</b> To connect to this connector, you need a shielded HDMI cable.	
<b>HDMI Out</b>	✓		<b>Optional</b> – Connect a digital monitor to this connector. If your digital monitor has a DVI connector, you need an HDMI to DVI adapter to connect your monitor to this connector.	
<b>LAN1</b>	✓	✓	Connect a network cable to this connector. <b>Note:</b> The second network connector on a decoder allows you to daisy chain decoder units.	
<b>LAN2</b>		✓		
<b>Line In</b>	✓		<b>Optional</b> – Connect the analog audio output of your video source to this connector. If you're using HDMI audio input, this connector is disabled.	
<b>Line Out</b>	✓	✓	<b>Optional</b> – Connect your analog audio output device (such as speakers) to this connector.	Line In or HDMI In
<b>RS-232</b>	✓	✓	<b>Optional</b> – To control the monitors on your decoder units with a serial connection from your source. <ul style="list-style-type: none"> <li>▪ <b>Encoder unit</b> – You need to connect an RS-232 serial cable from your controller system to this connector.</li> <li>▪ <b>Decoder unit</b> – You need to connect an RS-232 serial cable from your decoder to your monitor.</li> </ul>	RS-232

Connector	Encoder	Decoder	Description	Required encoder connection
USB	✓	✓	<i>Currently unsupported.</i>	USB
VGA	✓		<b>Optional</b> – Connect an analog monitor to this connector. For local viewing of uncompressed video from your video source.	



**WARNING:** To avoid damaging the power connector on your unit or on your power cable, firmly hold the power connector, pull back the connector on the cable, then carefully remove the power cable.



Your Maevox units are now connected. Install your Matrox software (see [“Installing Matrox PowerStream”](#), page 16).

Preliminary –  
Engineering samples

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# Using a Maevox Decoder unit in player mode

A Matrox Maevox decoder unit can play back video files stored on a SD card inserted in the slot of the unit. This is referred to as *player mode*. A decoder may work in player mode in a network with encoders and decoders in extension mode.

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## Before you begin

- Before you power on your Maevox Decoder unit, make sure your decoder unit is properly connected to all your audio and video devices and to your network.

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## Connection overview

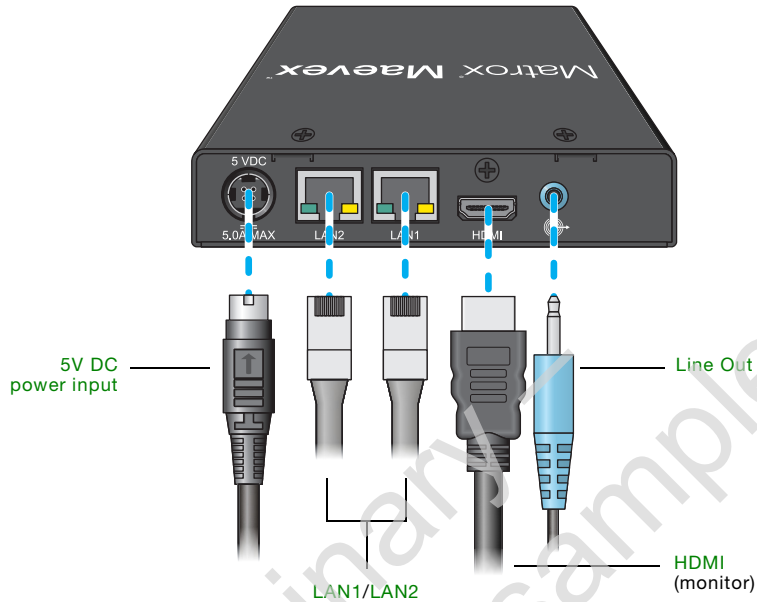
This section describes the connectors that may be used on your Maevox Decoder unit in player mode.

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### Maevox Decoder – Front



## Maevex Decoder – Back

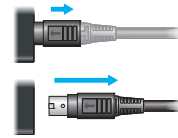


## Connector descriptions

Connector	Description
<b>5V DC power input</b>	Connect the 5V DC power supply included with your product to this connector. While the 5V DC power supply is connected to the unit and electrical socket, the power LED ( $\phi$ ) is active (green).
<b>HDMI</b>	Connect a digital monitor to this connector. If your digital monitor has a DVI connector, you need an HDMI to DVI adapter to connect your monitor to this connector.
<b>LAN1 LAN2</b>	Connect a network cable to this connector. <b>Note:</b> The second network connector allows you to daisy chain decoder units.
<b>Line Out</b>	<b>Optional</b> – Connect your audio output device (such as speakers) to this connector.
<b>RS-232</b>	This connector is unsupported in player mode.
<b>SD card</b>	Insert an SD card with your video content in this slot. The card must be inserted before your unit is powered on. For more information on SD cards, see “Setting up your local playlist”, page 14.
<b>USB</b>	Currently unsupported.



**WARNING:** To avoid damaging the power connector on your unit or on your power cable, firmly hold the power connector, pull back the connector on the cable, then carefully remove the power cable.



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## Setting up your local playlist

In player mode, your decoder can continuously decode and play video and audio files stored on an SD card. Here are the requirements to use your decoder in player mode using an SD card:

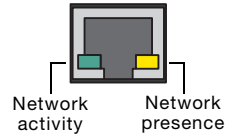
- Your SD card must be formatted on a Windows system with a FAT32 or NTFS file system.
- Your SD card must be inserted before starting the decoder.
- Files are played in alphanumeric order.
- A decoder can play H.264 video (.mp4) and audio (.mp3) files. Support for additional file formats planned for a future release.
- When playing audio only, the HDMI display is black.

After your playlist is set up, insert your SD card and power on your decoder unit. The decoder unit starts decoding your media files automatically.

# Description of LEDs

## Network connector


The network connectors on your Matrox Encoder and Decoder unit use indicator lights (LEDs) to provide information on the network activity and presence. The following describes the different network connector LEDs:



	<b>Flashing Green</b>	<b>No LED (black)</b>
<b>Network activity</b>	Data transfer in progress.	No data transfer in progress or no network detected.
	<b>Orange</b>	<b>No LED (black)</b>
<b>Network presence</b>	Network communication established.	No communication established.

## Encoder/Decoder

A Maevox Encoder and Decoder unit uses its power indicator light (LED) to provide information on the status of your unit. The following describes the LED on a Maevox unit.

	<b>Green</b>	<b>Orange</b>	<b>No LED (black)</b>
 <b>Power and status</b>	Unit is operational.	Firmware update in progress.	No power.

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# Installing Matrox PowerStream

This section describes how to install Matrox PowerStream software for *Windows*® 7.



**Note:** Support for additional operating systems planned for release.

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## Before you begin

You may need administrator rights to install or uninstall certain software. For more information, see Windows documentation or contact your system administrator.

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## Obtaining Matrox PowerStream

Matrox makes the latest PowerStream software available on the Matrox Technical Support Web site ([www.matrox.com/graphics/en/support](http://www.matrox.com/graphics/en/support)).

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## Selecting the proper software

Matrox makes available two versions of the software (32- and 64-bit). The program you install depends on the operating system you're using in your system.

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## Installing your software

To install the software for your MaeveX product, run the MSI (Microsoft Installer) file for your software package. Follow the on-screen instructions.



# Matrox PowerStream



Matrox PowerStream software enables you to remotely control, manage, and update your MaeveX units from a controller system in your MaeveX environment.



**Note:** A DHCP server is required to assign an initial IP address to your units.

## Key features



Matrox PowerStream currently includes the following features:

- Automatic device identification using Universal Plug-and-Play (UPnP)
- Encoding parameter management
- Switching of encoder-to-decoder combinations
- Output configuration support with EDID and forced resolution support
- Video size control through scaling and cropping of video source.
- Image appearance controls (brightness, contrast, hue, and saturation).
- Audio signal selection between HDMI and analog at input and output.

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## Accessing Matrox PowerStream

To access the main interface of PowerStream, click **Start** → **All Programs** (or **Programs**) → **Matrox Graphics\*** → **Matrox PowerStream**. (\* Depending on your version and configuration of Windows, this part of the step may not be necessary.)

For more information on Matrox PowerStream software, see the rest of this guide.

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## The main interface







PowerStream main interface is divided into four (4) panels:

- Events – Supported in a future release.
- Health – Supported in a future release.
- Overview – Displays the decoders and encoders previously and currently detected by PowerStream. It also displays their current status.
- Settings – Displays PowerStream version.

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## Overview

The main interface overview provides a list of Maevox encoders and decoders units previously and currently known by the PowerStream software on your system. The status of a unit is shown by a color:

- Gray  – Unit is present on the network but isn't initialized.
- Yellow  – Unit is initializing.
- Dark Green  – Unit is ready to encode or decode.
- Green  – Unit is awaiting connection.
- Bright green  – Unit is encoding or decoding a stream.
- Dark gray  – Unit is no longer detected on the network. You can remove the tile for such a unit by selecting the tile and pressing [Delete].

To select a unit, click its tile. The selected unit tile border is white.

A unit tile has the serial number in the upper left corner, its status in the center, and its data transfer rate in the lower right corner.

To view the settings for an encoder or decoder unit, you can right-click or double-click the unit tile. You can then view and change the settings for your unit.

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## Encoder Settings

The settings specific to an encoder are:

**Encoder information** – The information for the currently selected encoder.

The information provided is the serial number of the unit, its firmware version, its IP address, and its status. Click **Start encoding** when you want the encoder to start transmitting.

While the encoder is transmitting, the URL for the stream is also listed. To assign a stream to a decoder, copy this URL and paste it in the **Stream address** box of the decoder window.

Click **Stop encoding** when you want the encoder to stop transmitting. You can also click on the **Reboot** button to restart the unit.

While the encoder is transmitting, the average and current bit rate plus the average and current frame rate are provided for the current stream.

**Capture** – The capture settings provide the information on the video and audio signal received by your encoder.

Select the frame rate for video capture. Possible choices are to grab every frame, every other frame, or down to one frame every 30 frames.

Select the audio source to use for audio capture. Select the bit rate used to transmit audio and the sampling rate used to receive audio.

**Encoding** – The encoding settings define how the video and audio signal are compressed and sent by your encoder.

By enabling **Use a specific video size**, you can scale the video before it's encoded. Specify the width and height in pixels of the video. If your video source uses a different size, your encoder scales the video to the specified size and distortion may occur.

The **Bit rate limit** is the maximum bandwidth in Mb/s (MegaBits per second) used by your encoder to transmit the streaming signal. The actual bandwidth used by your encoder varies according to your source and your encoding method.

To determine how the bandwidth allocated to your encoder is used, select which aspect you want to favor between speed and quality under **Strategy**.

Enter the number of frames making up your *Group of pictures* (GOP) and the number of frames at which a P frame is inserted. A smaller group of picture and a higher number of P frames have a higher image quality but require more bandwidth.

If you enable **Use Rate Control**, select the range of *QP* (Quantisation Parameter) used to compress the various frames in your GOP. The range of QP is from 0 to 51. We recommend using increasing values from I to B frames.

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## Decoder Settings

The settings specific to a decoder are:

**Decoder information** – The information for the currently selected decoder.

The information provided are the serial number of the unit, its firmware version, and its IP address.

Decoder controls allow you to view and change the URL for the streaming signal and to start/stop the unit from decoding the streaming signal.

The **Stream address** box is used to paste the URL of the encoder signal received by your decoder unit.

Click **Start Decoding** to decode the streaming signal and output to your monitor. Once the decoder starts, it may take a few minutes before the video is visible on your monitor. While a decoder is in player mode, PowerStream lists the decoder status as **Local decoding** instead of **Decoding**.

Click **Reboot** to restart your decoder unit.

**Details** – Currently not used.

**Decoding** – Decoding defines how the streaming signal is processed by your decoder unit.

Under **Routing Scheme**, select the type of signal received by your decoder. Possible choices are UDP unicast or UDP multicast.

Under **Latency**, select the maximum number of incomplete frames which can be received by your decoder. If the number of incomplete frame is exceeded, the oldest incomplete frames are discarded.

Under **Max Lateness**, select the maximum number of frames (complete or incomplete) which can be stored by your decoder. If the number of frames stored on the decoder is exceeded, the oldest frames are dropped. The **Max Lateness** is always higher than the **Latency**.

**Extra delay** is the number of milliseconds (ms) between the moment a frame is ready to be shown and the moment it's actually shown on screen.

Enable **Crop video** to remove pixels from one or more borders of the video. Enter the number of pixels removed from the left and top side, and then the width and height in pixels of the area of the video shown.

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## Common Encoder and Decoder Settings

The settings common to both an encoder and a decoder are:

**Local output** –

For an encoder, select the **Signal type** for your video output. Possible choices are **HDMI**, **VGA**, or **HDMI + VGA**.

**Size and transformations** defines how the local output displays video.

If you want to use a specific display mode, enable **Force display mode** and specify which mode to use with your monitor.

Select how the image is shown on the output. Possible values are:

- **Center image in display** – the video is shown in the center of the display. No scaling is done to the image. Black border may appear around your video.
- **Fill display** – The video is scaled to fit the entire display area. If the display area has a different aspect ratio than the display area, the image may be distorted.
- **Fit image in display** – The video is scaled to fit the display area without distorting the image. If the display area has a different aspect ratio than the display area, black borders appear either above and below or on each side of your video.

**Image appearance** allows you to adjust the video output of your unit.

- **Brightness** – how light or dark all the colors appear. Value ranges from 0 to 10000.
- **Contrast** – the difference in brightness between the lightest and darkest colors. Value ranges from 0 to 10000.
- **Hue** – the tint or tone of colors. Value is in degrees and varies from -180 to 180.
- **Saturation** – the color depth. A higher saturation gives more vivid colors. Value ranges from 0 to 10000.

**Audio** – the volume for the HDMI and analog channels of your unit. If audio is used on the HDMI channel, the analog channel is disabled.

**Network** –

Select how to assign an IP address to your unit. By default, the IP address is assigned through DHCP. You can also assign the IP address of your unit manually.

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# Product information

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## Specifications

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### Maevox Encoder

	<b>Maevox Encoder</b>
<b>Video input connector</b>	1× HDMI
<b>Video output connectors</b>	1× HD-15 (VGA) + 1× HDMI
<b>Audio input connector</b>	1× mini-stereo jack
<b>Audio output connector</b>	1× mini-stereo jack
<b>Network connector</b>	1
<b>Dimensions</b>	21.59 cm × 2.59 cm × 10.16 cm / 8.50" × 1.02" × 4.00"

### Maevox Decoder

	<b>Maevox Decoder</b>
<b>Supported resolutions</b>	Up to 1920×1200
<b>Video output connectors</b>	1× HDMI
<b>Audio output connector</b>	1× mini-stereo jack
<b>Network connectors</b>	2
<b>Video streaming supported</b>	Mpeg4 Part 10 / AVC (H.264)
<b>Internal storage capacity</b>	4 GB
<b>SD cards supported</b>	SDHC cards (min: 8 GB, max: 32 GB)
<b>Local video codecs supported</b>	Mpeg4 Part10 / AVC (H.264)
<b>Local audio codecs supported</b>	MP3, AAC LC
<b>Local A/V file format supported</b>	MP4 (.mp4, .m4v), MP3 (.mp3)
<b>Dimensions</b>	12.83 cm × 2.59 cm × 10.90 cm / 5.05" × 1.02" × 4.29"

## Environmental

<b>Temperature, operational</b>	0 to 40 °C (32 to 104 °F)
<b>Temperature, non-operational storage and transportation</b>	-40 to 70 °C ( -40 to 158 °F)
<b>Humidity, operational (indoor)</b>	20 to 80% (non-condensing)
<b>Humidity, non-operational storage and transportation</b>	5% to 95% (non-condensing)
<b>Atmospheric pressure, operational</b>	650hPa (3,580 meters / 11,745 feet) to 1013hPa (0 meters / 0 feet)
<b>Atmospheric pressure, non-operational and transportation</b>	192hPa (12,000 meters / 39,370 feet) to 1020hPa (-50 meters / -164 feet)
<b>Estimated MTBF (Mean Time Between Failure)</b>	Encoder unit: 135.05 years @ 40 °C (excluding power supply) Decoder unit: 164.81 years @ 40 °C (excluding power supply) Power supply: 11.45 years @ 25 °C (with full load)

## Power consumption and supply voltage

<b>Maevex Encoder</b>	
<b>Power requirements</b>	5V DC, maximum 5 A (5 A fuse for overcurrent protection)
<b>Power connector</b>	DIN 4 female (4-pin)
<b>Typical power consumption</b>	9.65 W
<b>Maevex Decoder</b>	
<b>Power requirements</b>	5V DC, maximum 5 A (5 A fuse for overcurrent protection)
<b>Power connector</b>	DIN 4 female (4-pin)
<b>Typical power consumption</b>	7.1 W
<b>External power supply</b>	
<b>Input AC voltage range</b>	100 to 240 V AC
<b>Input frequency</b>	50-60 Hz
<b>Input connector</b>	IEC 60320-C8
<b>Output voltage</b>	+5 V DC
<b>Output connector</b>	DIN 4 male (4-pin) with lock
<b>Maximum power consumption</b>	15 W

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## Audio

HDMI	
Stereo audio	2 channel L-PCM
Bits per sample	16 or 24 bits per channel, 2 channel (Left and Right)
Sampling rates supported	32, 44.1, or 48 kHz
Analog	
Audio connector type	3.5 mm stereo audio jacks

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## Display mode support

Resolution	Aspect ratio	Refresh rate
1920 × 1200	16:10	60 Hz
1920 × 1080	16:9	60 Hz
1680 × 1050	16:10	60 Hz
1600 × 1200	4:3	60 Hz
1400 × 1050	4:3	60 Hz
1600 × 900	16:9	60 Hz
1440 × 900	16:10	60 Hz
1366 × 768	16:9	60 Hz
1360 × 768	16:9	60 Hz
1280 × 1024	4:3	60 Hz
1280 × 768	16:9	60 Hz
1024 × 768	4:3	60 Hz
852 × 480	16:9	60 Hz
848 × 480	16:9	60 Hz

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## LAN support

- 10/100/1000Base-T Ethernet support.
- Streaming protocol support: RTSP (RTP, RTCP, and UDP) unicast and multicast.
- Required command and control network protocols: TCP/IP, UPnP, and HTTPS.
- Firmware update through LAN.



- Support of cat 5, 5e, 6, and 7 cables.

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## Notes

- Your Matrox product supports EDID v1.3 (monitor settings) and DDC-2B (Plug-and-Play monitor).
- The display resolutions and refresh rates available depend on your monitor and PowerStream settings. For information on the capabilities of your monitor, see your monitor documentation.
- To prevent overheating and potential damage to your Matrox product, please make sure the units aren't stacked one on top of another directly. A sufficient airspace should be left unobstructed around each unit to allow heat from the unit casing to escape through natural convection.

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## Digital flat panel and source compatibility

- HDMI compatible
- DVI 1.0 compatible (using HDMI-to-DVI adapter)

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# Customer support

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## Matrox Web

Our Web site has product literature, press releases, technical material, a sales office list, trade show information, and other relevant material. Visit the Matrox Graphics Web site at [www.matrox.com/graphics](http://www.matrox.com/graphics).

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## Technical support

Matrox values your business and offers professional support for your Matrox product.

*If your product was purchased through a Matrox dealer*, contact your dealer for product support. This is the quickest and most effective method of technical assistance. Your dealer is familiar with your complete system.

*If your product was purchased through Matrox*, contact your Matrox representative or visit our technical support Web site at [www.matrox.com/graphics/support](http://www.matrox.com/graphics/support).

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## Information we need

Please give a complete description of the problem, and include:

- Matrox product serial number, model number, revision number, and firmware number.
- Computer brand and model name.
- Graphics card manufacturer, model number, revision number, BIOS number, driver type and version.
- Monitors brand and model name.
- Operating system, version, and service pack.
- Brand and model of any other cards and devices installed on your system.

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## Firmware package

A more recent firmware package may support more features and may offer increased capabilities (such as support for higher display resolutions). To obtain the latest firmware package, contact your Matrox sales representative or Matrox Technical Support.

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## **View your warranty information**

Matrox makes warranty information available on the Matrox site ([www.matrox.com/graphics/en/about/warranty](http://www.matrox.com/graphics/en/about/warranty)).

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## **Register your Matrox product**

Please register online ([www.matrox.com/graphics/en/registration](http://www.matrox.com/graphics/en/registration)) to be eligible for customer support, new product announcements, and information on special offers and upcoming events.

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