



Matrox Monarch EDGE

Installation and User Guide

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CHAPTER

1

Introduction

This chapter provides an overview of the Matrox Monarch EDGE product, including the system requirements and an installation and configuration roadmap to help get you started.

Introducing the Matrox Monarch EDGE

Matrox Monarch EDGE is a 4K/multi-HD webcasting and REMote Integration (REMI) encoder that helps keep data rates low while minimizing latency. Using a variety of streaming protocols, Monarch EDGE can deliver a single or multiple independent live feeds to local media servers or OVPs with multi-camera support.

For more information on the Monarch EDGE, see our website for a complete description:

https://www.matrox.com/video/en/products/monarch_edge/

You can configure and control the Matrox Monarch EDGE in two ways:

- Using Matrox Monarch EDGE Control Hub. This is the primary configuration application for the majority of users.
- Using the RESTful HTTP API for OEMs that choose to build their own applications.

About Matrox Monarch EDGE Control Hub

The Matrox Monarch EDGE Control Hub software enables you to remotely control, manage, and configure your Monarch EDGE from a Windows computer connected to your network. You can download Monarch EDGE Control Hub from the [support section](#) of our website.

About the RESTful API

The Matrox RESTful API provides a set of JSON-based commands that allow you to control, manage, and configure your Monarch EDGE the same way you would with the Matrox Monarch EDGE Control Hub application.

The API is typically used by OEMs to create their own application for the Monarch EDGE. Documentation for the API is provided as comments in the JSON code which is then extracted to an HTML file for easy reading. This offers developers an efficient method of understanding the basic commands of the Monarch EDGE.

The API should be considered a supplement to this user guide, as the API does not explain the overall functionality of the Monarch EDGE.

For more information on the RESTful API, contact your Matrox representative.

System requirements

The system requirements for the Monarch Edge are as follows:

- To install Matrox Monarch EDGE Control Hub, you need a computer running Microsoft Windows 10.

Other operating systems may work but have not been fully validated through internal testing. Before trying another operating system, please contact [Matrox support](#).

- It is recommended to use a DHCP-enabled (Dynamic Host Configuration Protocol) network with SSDP Discovery service, network discovery, and file sharing options enabled. If a DHCP network is not available, the Monarch EDGE will boot with a self-assigned link-local IP address between 169.254.0.0 and 169.254.255.255. For more information on link-local addressing, contact your network administrator.

For full hardware and other technical specifications, such as the supported video formats, see "[Technical specifications](#)" on page 53.

Step 1. Read the Release Notes Before getting started, it is always recommended to read the *Matrox Monarch EDGE Release Notes* available on the [Matrox website](#) where you download the installation package. The Release Notes contain the latest information about the release, including new features and known issues.

Step 2. Monarch EDGE device(s). A DHCP network is recommended for device discovery.

More info: The setup sheet included with your product describes the basic connections. For more information, see "[Matrox Monarch EDGE connections](#)" on page 6.

Step 3. Update Monarch EDGE firmware When you first connect and power up your Monarch EDGE, you should check to see which firmware you have, and update it if it is not the most current version.

More info: The setup sheet included with your product describes the firmware update process. For more information, see:

- "[Update and installation prerequisites](#)" on page 12.
- "[Updating the Monarch EDGE firmware](#)" on page 13.

Step 4. Install Monarch EDGE Control Hub This is the application you use to configure and control the Monarch EDGE. The version of Monarch EDGE Control Hub you install must match the firmware version of the Monarch EDGE device(s).

More info: The setup sheet included with your product describes the installation process. For more information, see "[Installing Monarch EDGE Control Hub](#)" on page 14.

Step 5. Discover your Monarch EDGE devices With Monarch EDGE Control Hub installed, you'll need to discover the Monarch EDGE devices available on the network. You can search for specific devices or for a range of devices.

More info: See "[Network management](#)" on page 17.

Step 6. Create an environment administrator To configure your Monarch EDGE devices, you must first create an environment administrator account. Monarch EDGE devices are grouped into different environments.

More info:

- See "[Starting up Matrox Monarch EDGE Control Hub](#)" on page 22.
- See "[Environment administrator accounts](#)" on page 23.

Step 7. Create user accounts After you have created your environment administrator account, you'll need to create users with specific permissions to use the Monarch EDGE devices.

More info:

- See "[About user accounts](#)" on page 24.
- See "[Creating a user account](#)" on page 25.
- See "[User accounts](#)" on page 24.

Step 8. Configure Monarch EDGE devices You can now learn how the Monarch EDGE Control Hub user interface works and begin configuring your devices.

More info:

- See "[About the Monarch EDGE Control Hub user interface](#)" on page 34.
- See "[Configuring Processing settings](#)" on page 36.
- See "[Configuring Network settings](#)" on page 47.
- See "[Configuring Date and Time settings](#)" on page 48.
- See "[Configuring Genlock settings](#)" on page 49.
- See "[Configuring Local preview settings](#)" on page 50.

CHAPTER

2

Hardware connections

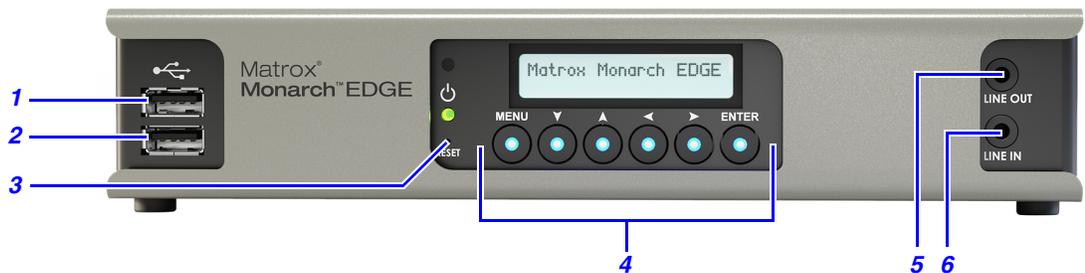
This chapter describes how to power up and connect the various cables to the Matrox Monarch EDGE, and also describes the functionality of the device's front panel buttons.

Matrox Monarch EDGE connections

This section describes the Matrox Monarch EDGE connections and front panel button functionality.

Matrox Monarch EDGE (front)

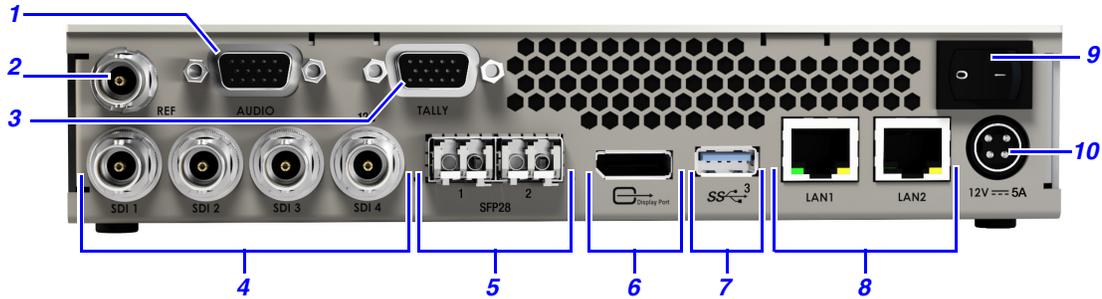
Refer to the table below the illustration for more information on each connector.



	Connector	Description
1	USB port 1	For internal use only.
2	USB port 2	For internal use only.
3	RESET	Reboots the Monarch EDGE with a short press, or resets to factory default settings with a long press of about five seconds (until green light flashes). NOTE A factory reset will also remove any user accounts or environment administrator accounts associated to this Monarch EDGE. For more information, see " Environment administrator accounts " on page 23.
4	Front Panel Buttons	Monarch EDGE front panel buttons are used to cycle through the information on the LCD display. For more information on how the front panel works, see " Matrox Monarch EDGE front panel " on page 8.
5	LINE OUT	Connect your headphones to this connector.
6	LINE IN	Not currently supported.

Matrox Monarch EDGE (back)

Refer to the table below the illustration for more information on each connector.



	Connector	Description
1	AUDIO	Analog XLR audio
2	REF	Connect to an external sync generator for bi-level genlock output.
3	TALLY	To be supported in a future release.
4	SDI 1 to 4	SDI connectors 1 to 3 are 3G SDI inputs per SMPTE ST 425 (Level A mapping only). SDI connector 4 is a 12G SDI input per SMPTE ST 2082.
5	SFP28 1 and 2	To be supported in a future release. NOTE SFP28 connectors are shown for illustrations purposes only. They are not included with your Monarch EDGE product.
6	DisplayPort	Connect a DisplayPort monitor to this connector to use as a pre-view monitor for your video sources. If your monitor does not have a DisplayPort connector, you can use an HDMI or DVI-D adapter. NOTE Use only HD monitors (1920 × 1200 maximum) for DisplayPort preview. Higher resolution monitors will negatively impact processing performance.
7	USB 3.0 port	For internal use only.
8	LAN1	Connect a network cable to this connector. This connector is used for controlling and streaming. This connector is also the one you must use for the initial boot up of Monarch EDGE.
	LAN2	If you're using multiple subnets, connect a network cable to this connector. This connector is used for secondary streaming.
9	Power	Turn your Monarch EDGE on or off.
10	12V DC power	Connect the included 12V DC power supply to this connector. While the 12V DC power supply is connected to the device and electrical socket, the power LED is active (not black).

Matrox Monarch EDGE front panel

This section describes how to use the Matrox Monarch EDGE front panel buttons.



When not being used (idle mode), the Monarch EDGE LCD screen will scroll through the device's status (e.g. IP address, MAC address, etc)

Button	Function
MENU	Access the Monarch EDGE menu from idle mode. Once in the menu, this button acts as a “back” button to return to a previous option or to cancel an option.
Arrow buttons	Navigate through submenus and options.
ENTER	Enter a submenu or make a selection.

The front panel menu gives you access to the following settings:

Menu option	Submenu option	Settings
Device info	N/A	Manually scroll through the same status information that is displayed in idle mode.
Device config	Network settings	Set the Lan1 or Lan2 to DHCP or Static IP modes (using the arrow buttons).
	Audio settings	Select the audio source for the Line Out connector (see " <i>Matrox Monarch EDGE (front)</i> " on page 6).
	Maintenance	Used to reboot or factory reset the Monarch EDGE, and clear or save the logs to a USB key. NOTE The save to USB option is only available when a USB key is connected to the Monarch EDGE.

Description of LEDs

The LED on your Monarch EDGE device provides information to help you troubleshoot your product. The following describes the LEDs on your device.

Color	What it means
No LED (black)	Device isn't powered.
Green (solid)	Device is active.
Green (slow blink)	Device is rebooting.
Green (fast blink)	Configuration reset in process.
Amber (solid)	Device is in maintenance mode. ¹
Amber (slow blink)	Device is restarting and is in maintenance mode.
Amber (fast blink)	Device is updating the firmware.
Red (solid)	Device has detected a fatal error. Try rebooting your device. If, after restarting your device, the LED is still red, contact Matrox support.

1. To enter maintenance mode, press the **RESET** pin button on the Monarch EDGE device front panel for more than 10 seconds.

CHAPTER

3

Firmware update and Monarch EDGE Control Hub installation

This chapter describes how to update your Monarch EDGE firmware, and how to install the Monarch EDGE Control Hub software application that you use to configure, manage, and control your Monarch EDGE.

Update and installation prerequisites

Before you update your Monarch EDGE firmware and install Monarch EDGE Control Hub, read and comply with the following:

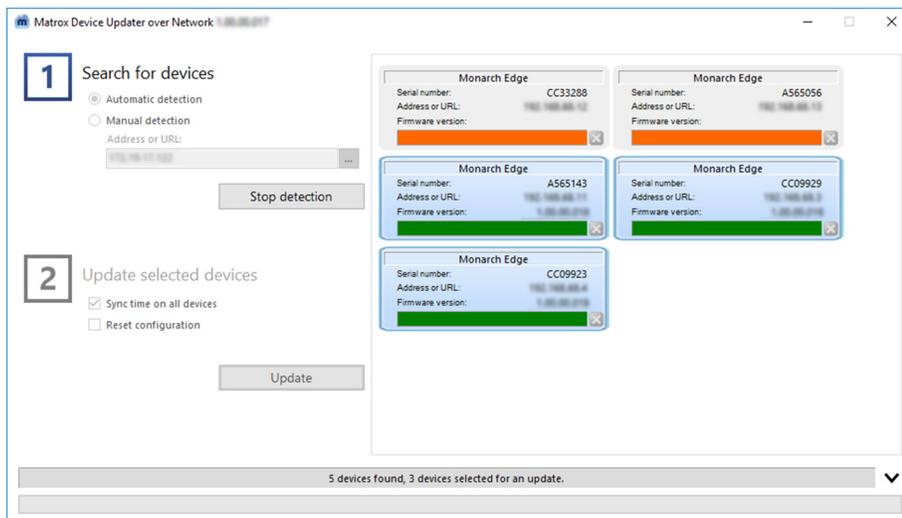
- The versions of Monarch EDGE firmware and Monarch EDGE Control Hub must match to ensure proper functionality and compatibility between devices and software.
- You may need administrator rights to install or uninstall Monarch EDGE Control Hub. For more information, see your Windows documentation or contact your system administrator.
- When you power on the Monarch EDGE, the LAN1 connector on the device must be connected to a network (“LAN”, 100/1000 Base-T) for the Monarch EDGE to be seen by the firmware updater. Monarch EDGE will not boot unless the LAN1 is connected to a network or LAN.
- It is recommended that you connect to a DHCP-enabled network, and that your server maintains the IP address of a device when it reappears on the network after a reboot. However, if a DHCP network is not available, the Monarch EDGE will boot with a randomly-assigned link-local address between 169.254.0.0 and 169.254.255.255. For more information on link-local IP addressing, contact your network administrator.
- The latest version of Microsoft .NET Framework is required to run the Monarch EDGE firmware updater and Monarch EDGE Control Hub, as well as, to identify Monarch EDGE devices on a network.
- Stop all processing sessions on your Monarch EDGE devices.
- Close Monarch EDGE Control Hub if it is running.
- Make sure you have at least 1 GB of free disk space available.
- Use only one instance of the firmware updater on your network at a time.
- If your system doesn't have access to a DNS server, use a fixed IP address (such as local host - 127.0.0.1) as its DNS server. Otherwise, the firmware update process may take a long time to complete.

Updating the Monarch EDGE firmware

The Matrox Monarch EDGE firmware updater allows you to remotely update the firmware on multiple devices on your network at once.

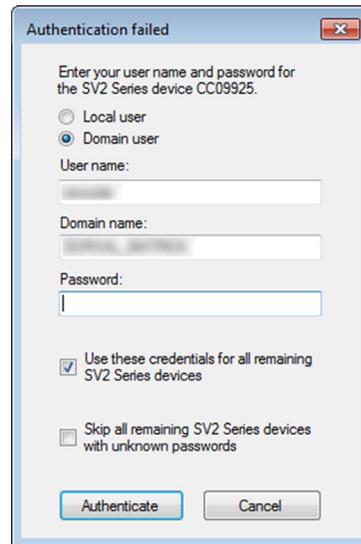
To update the Monarch EDGE devices, follow the steps below:

- Step 1.** Read "*Update and installation prerequisites*" on page 12.
- Step 2.** Download the Matrox Monarch EDGE firmware updater from the Matrox website at <https://www.matrox.com/video/en/support/downloads/>.
- Step 3.** Run the firmware updater.
- Step 4.** Select **Automatic detection**, or **Manual detection** to search for devices on different subnets, then click **Search**.
- Step 5.** Click on the Monarch EDGE devices to update, then click **Update**.



More info: Select **Sync time on all devices** to synchronize the internal device clocks across all updated devices. Select **Reset configuration** to reset the encoder settings of the device(s).

- Step 6.** If the Monarch EDGE you are trying to update is already part of an EDGE environment (see "*User and device management*" on page 21), the following message will be displayed.



- a. Click **Local user**.
- b. Enter the credentials for the Monarch EDGE you want to update. You may need to contact your environment administrator for the information.
- c. If the other Monarch EDGE devices you want to update share the same credentials, you can have the updater use them for those as well.
- d. Click **Authenticate**.

Result of this task: The firmware on your Monarch EDGE device(s) has been updated.

Installing Monarch EDGE Control Hub

To install Matrox Monarch EDGE Control Hub, follow the steps below:

- Step 1.** Read "*Update and installation prerequisites*" on page 12.
- Step 2.** Download the Matrox Monarch EDGE Control Hub installation program from <https://www.matrox.com/video/en/support/downloads/>.
- Step 3.** Run the Matrox Monarch EDGE Control Hub installation program, click **Next**, then follow the on-screen instructions.

Step 4. When the installation is complete, click **Finish**.

Result of this task: Matrox Monarch EDGE Control Hub is installed on your system.

When done, remember: When you start Matrox Monarch EDGE Control Hub for the first time you will be asked to create your environment administrator account. For more information, see "[Starting up Matrox Monarch EDGE Control Hub](#)" on page 22.

Uninstalling or repairing Monarch EDGE Control Hub

To uninstall Matrox Monarch EDGE Control Hub, do one of the following:

- **Go to Windows Control Panel** Click **Start > Control Panel > Programs and Features > Uninstall a program**, click on **Matrox Monarch EDGE Control Hub**, then click **Uninstall**.
- **Run the Monarch EDGE Control Hub installer** You can uninstall Monarch EDGE Control Hub, or repair the installation if it is already installed.

CHAPTER

4

Network management

This chapter describes how to manually add Matrox Monarch EDGE devices to your network, and how to set a device to a static IP address.

About Matrox Monarch EDGE device discovery

Matrox Monarch EDGE Control Hub automatically detects and adds new devices to your Monarch EDGE environment. If devices aren't detected, Control Hub can scan one or more specific IP addresses or a range of IP addresses for Monarch EDGE devices.

Discovering devices automatically

After you install and run Monarch EDGE Control Hub for the first time, it automatically detects all the Monarch EDGE devices on the same subnet as your controller system through the UPnP (Universal Plug and Play) protocol.

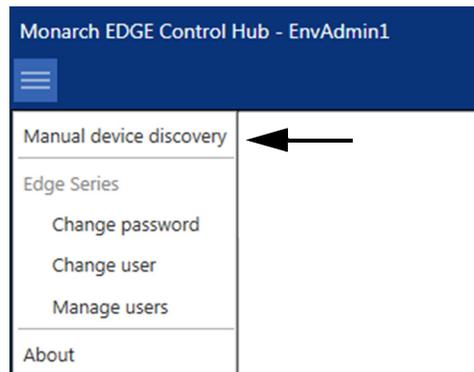
Monarch EDGE Control Hub continually scans for devices whenever it is open. If a new device appears on the network, it will be displayed in Monarch EDGE Control Hub, but it may not yet be assigned to an environment by an environment administrator.

Discovering devices manually

If Monarch EDGE Control Hub doesn't automatically detect the Monarch EDGE devices on the same subnet as your controller system, you can add them to your environment manually.

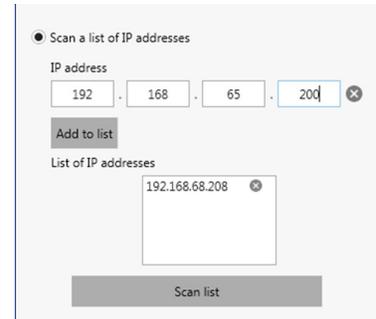
To manually add a Monarch EDGE to your environment, follow the steps below:

- Step 1.** Go to **Start > Programs > Matrox Monarch EDGE Control Hub**.
- Step 2.** Open the Control Hub menu at the top left, then click on **Manual device discovery**.



Step outcome: The **Unit Discovery** window opens.

- Step 3.** Scan for specific Monarch EDGE devices:
- a.** Select **Scan a list of IP addresses.**
 - b.** Enter the IP address of the Monarch EDGE to add.
 - c.** Click **Add to list.**
 - d.** If needed, repeat steps **a** to **c** to add more Monarch EDGE devices.
 - e.** Click **Scan list.**



● Scan a list of IP addresses

IP address

192 . 168 . 65 . 200

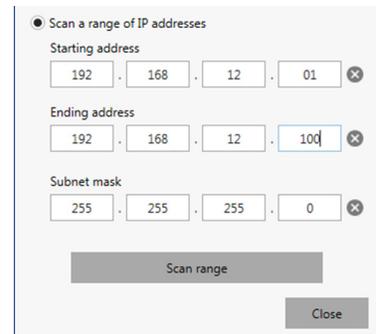
Add to list

List of IP addresses

192.168.68.208

Scan list

- Step 4.** Scan for devices across an IP range:
- a.** Select **Scan a range of IP addresses.**
 - b.** Enter your **Starting address.**
 - c.** Enter your **Ending address.**
 - d.** Enter your **Subnet mask.**
 - e.** Click **Scan range.**



● Scan a range of IP addresses

Starting address

192 . 168 . 12 . 01

Ending address

192 . 168 . 12 . 100

Subnet mask

255 . 255 . 255 . 0

Scan range

Close

Result of this task: The Monarch EDGE devices have been discovered and can be added to your environment.

Assigning a static IP address to a Monarch EDGE

After your Monarch EDGE has been connected, powered up, and has an DHCP-assigned IP address, you can assign it a static IP address using the LCD screen on the front of the device.

- Step 1.** As Monarch EDGE is scrolling through the status, press **Menu.**
- Step 2.** Go to **Device config** then press **Enter.**
- Step 3.** Go to **Network Settings** then press **Enter.**
- Step 4.** Go to **Lan 1** or **Lan 2** then press **Enter.**
- Step 5.** Go to **Static** then press **Enter.**
- Step 6.** Use the directional buttons to enter your desired IP address.
- Step 7.** Press **Enter.**

Result of this task: Your Monarch EDGE now has a static IP address.

When done, remember: You can also change the current static IP address using this method.

CHAPTER

5

User and device management

This chapter describes how to create Matrox Monarch EDGE administrators, users, and modify permission settings to customize access to the devices on your network.

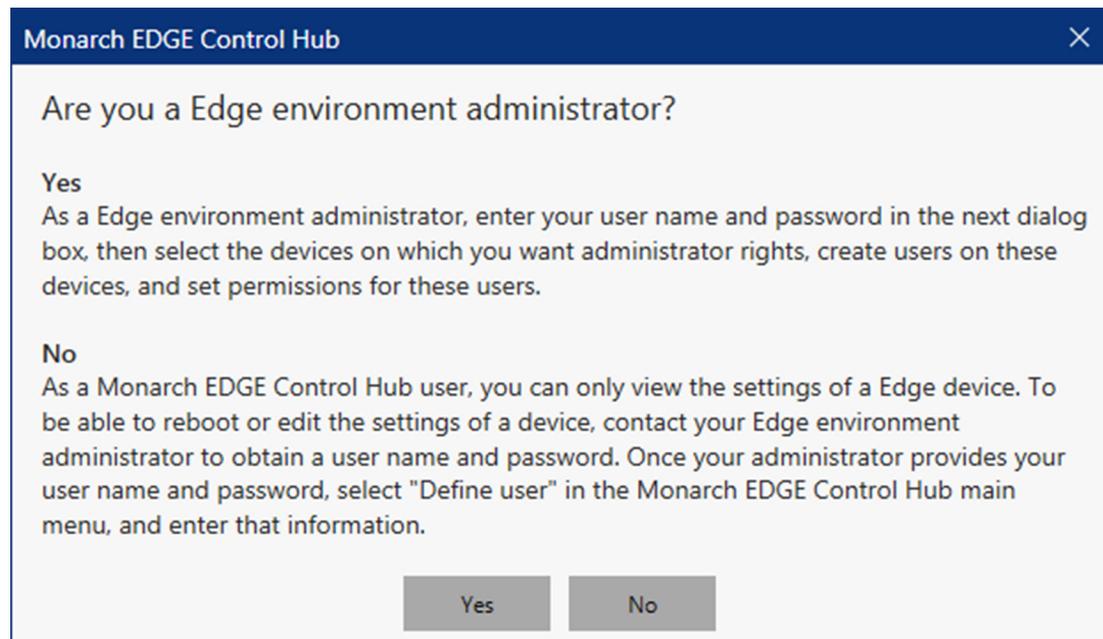
About User and Device Management

Matrox Monarch EDGE Control Hub software enables you to remotely control, manage, and configure your Monarch EDGE devices from a controller system in your Monarch EDGE environment. With Control Hub, you can access any device on your DHCP-enabled network, including devices on different subnets.

Anyone can open Matrox Monarch EDGE Control Hub to view the discovered Monarch EDGE devices, but you must be an environment administrator or an authorized user with the proper credentials to modify device settings.

Starting up Matrox Monarch EDGE Control Hub

When you install and start Matrox Monarch EDGE Control Hub for the first time, you will be asked if you are an environment administrator.



- If you **are** a Monarch EDGE environment administrator, click **Yes**. You will then be asked to create your environment administrator username and password. For more information, see "[Environment administrator accounts](#)" on page 23.
- If you are **not** a Monarch EDGE environment administrator, click **No**. You will then be asked to enter the username and password provided by your environment administrator for use with the devices they have specified. For more information, see "[User accounts](#)" on page 24.

Environment administrator accounts

This section explains what Matrox Monarch EDGE environment administrators are and describes how to create an environment administrator account in Monarch EDGE Control Hub.

About environment administrators

As an environment administrator, you will have full administrator rights on the Matrox Monarch EDGE devices you choose to control. You take control of the devices after creating your environment administrator username and password by selecting the devices from a displayed list of available devices.

Therefore, you can think of “environments” as groups of Monarch EDGE devices all controlled by the same environment administrator account. By becoming the environment administrator for your devices, you can then create user accounts for others with the proper permissions to modify the device settings.

Please note the following about environment administrator accounts:

- **There can be more than one.**

You can have multiple environment administrators controlling different groups of devices. For example, if there are 10 Monarch EDGE devices available on your network, you could have two environment administrators each controlling five devices.

- **A factory reset on a device purges the account.**

Performing a factory reset on a Monarch EDGE device will also reset the environment administrator account on it. The device will then be available on the network again as if it were a new device. All user accounts associated to the device are purged as well. A device reboot does **not** affect the environment administrator or user accounts.

- **You don't need one to find Monarch EDGE devices.**

You do not need to be an environment administrator to find specific Monarch EDGE devices, or a range of devices, on the network. For more information on device discovery, see "[Network management](#)" on page 17.

- **You need one to see other users.**

Only environment administrators can see the other users on the environment and add new users. The “Edit users” permission only allows a user to edit their own accounts.

Creating an environment administrator account

You must create an environment administrator account when you install and start Monarch EDGE Control Hub for the first time. Once you have your administrator account, you can create as many other administrator or user accounts as needed.

To create an administrator account, follow the steps below:

- Step 1.** Read "[About environment administrators](#)" on page 23.
- Step 2.** Go to **Start > Programs > Matrox Monarch EDGE Control Hub**.
- Step 3.** If this is the first time you start Control Hub, you will be asked if you are an environment administrator. Click **Yes**.
- Step 4.** Enter the username and password you want to use for this environment administrator account, then click **Apply**.
- Step 5.** From the available Monarch EDGE devices displayed, click on the ones you want to control, then click **Add devices**.

More info: **Shift-click** or **Ctrl-click** selects multiple devices.



Result of this task: You are now the environment administrator for the Monarch EDGE devices you selected.

When done, remember: You will need to add users and give them permission to modify settings on the devices you control. For more information, see "[User accounts](#)" on page 24.

User accounts

This section explains what Matrox Monarch EDGE user accounts are and describes how to create a user account in Control Hub.

About user accounts

User accounts are created by the environment administrator(s). User accounts are created on specific Monarch EDGE devices that are part of an environment. For example, an environment

administrator cannot create a user without also immediately assigning that user to at least one Monarch EDGE device.

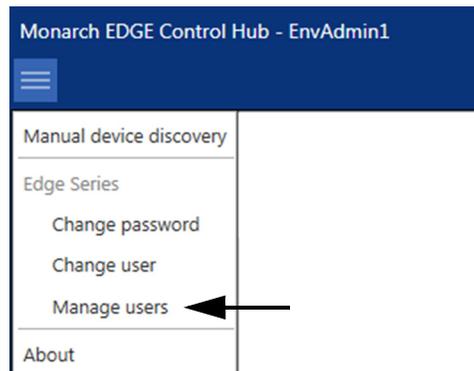
Users can be granted the following permissions:

- **Administrator** An environment administrator can create other administrators by granting a user administrator rights. Administrators can create, delete, and edit other users, as well as do all the other actions listed below. They can also take control of other available Monarch EDGE devices on the network, thereby becoming environment administrators themselves. For more information on this process, see "*Environment administrator accounts*" on page 23.
- **Apply changes** This allows users to apply settings changes to Monarch EDGE devices (e.g. change encoder settings, start/stop encoding, etc).
- **Edit users** This allows users to edit their own credentials and permissions.
- **Reboot devices** This allows users to reboot Monarch EDGE devices from the Control Hub application (any device can be physically rebooted if needed).

Creating a user account

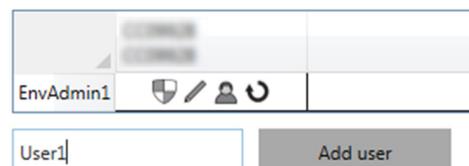
To create a user account, follow the steps below (you must be an environment administrator):

- Step 1.** Go to **Start > Programs > Matrox Monarch EDGE Control Hub**.
- Step 2.** Open the Control Hub menu at the top left, then click on **Manage users**.
Example: In this example, the environment administrator is *EnvAdmin1*.



- Step 3.** Type the username you want in the field provided, then click **Add user**.

Add or remove users and edit their permissions.



Step outcome: The new user will appear under the *EnvAdmin1* account.

Step 4. Click (+) to access the **Permissions** menu on the far-right of the Monarch EDGE Control Hub interface, then give your user the desired permissions.

Example: Let's say you only want this user to modify settings, not to edit users or reboot Monarch EDGE devices.

Add or remove users and edit their permissions.



Step 5. Click **Apply**.

Result of this task: Your new Monarch EDGE user is created and (in this case) can only modify settings on the devices in their environment.

When done, remember: If you have multiple Monarch EDGE devices in your environment, you can specify which devices your users have access to, and what they can do on each device. For more information, see "[Managing users and device permissions](#)" on page 26.

Managing users and device permissions

This section includes topics on the various user and device management tasks you can perform in the Matrox Monarch EDGE Control Hub.

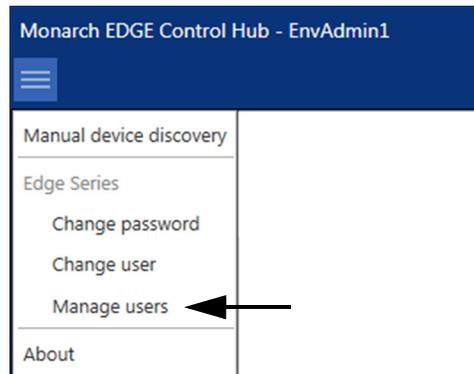
Transferring control to a different environment administrator

If you have an environment administrator account controlling one or more Monarch EDGE devices, and you want to transfer control of those devices to a different administrator account, you can do so as follows:

Step 1. Go to **Start > Programs > Matrox Monarch EDGE Control Hub**.

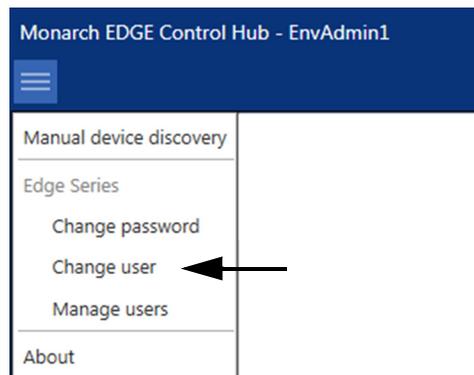
Step outcome: Monarch EDGE Control Hub opens and the Monarch EDGE devices on the network are displayed.

Step 2. Open the Control Hub menu at the top left, then click on **Manage users**.



Step 3. Create a new user (see [Creating a user account](#)) and give the new user administrator rights.

Step 4. Open the Control Hub menu at the top left again, but this time click on **Change user**.



Step 5. Enter the username and password of the user you just created in [Step 3](#).

Step 6. Click **Apply**.

Step outcome: You are now logged on to the environment as the new user you created, with the same administrator rights as the original environment administrator.

Step 7. From the list of users displayed, click on the original environment administrator account, then click **Delete user**.

Step 8. Click **Yes** to confirm, then **Apply** to apply the change to the environment.

Result of this task: You have created a new environment administrator to replace the original environment administrator. You can do this as many times as needed.

When done, remember: You can always factory reset any Monarch EDGE device to completely remove all environment administrator control from it.

Changing the environment password

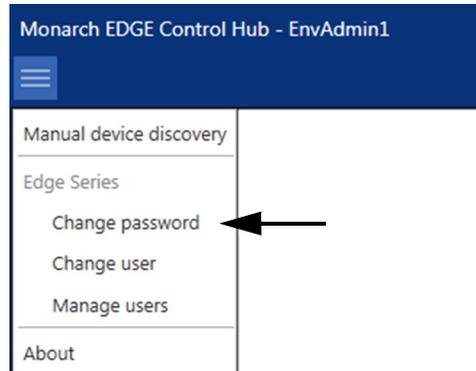
Environment administrators can change the password across all devices in the environment.

To change the environment password, follow the steps below:

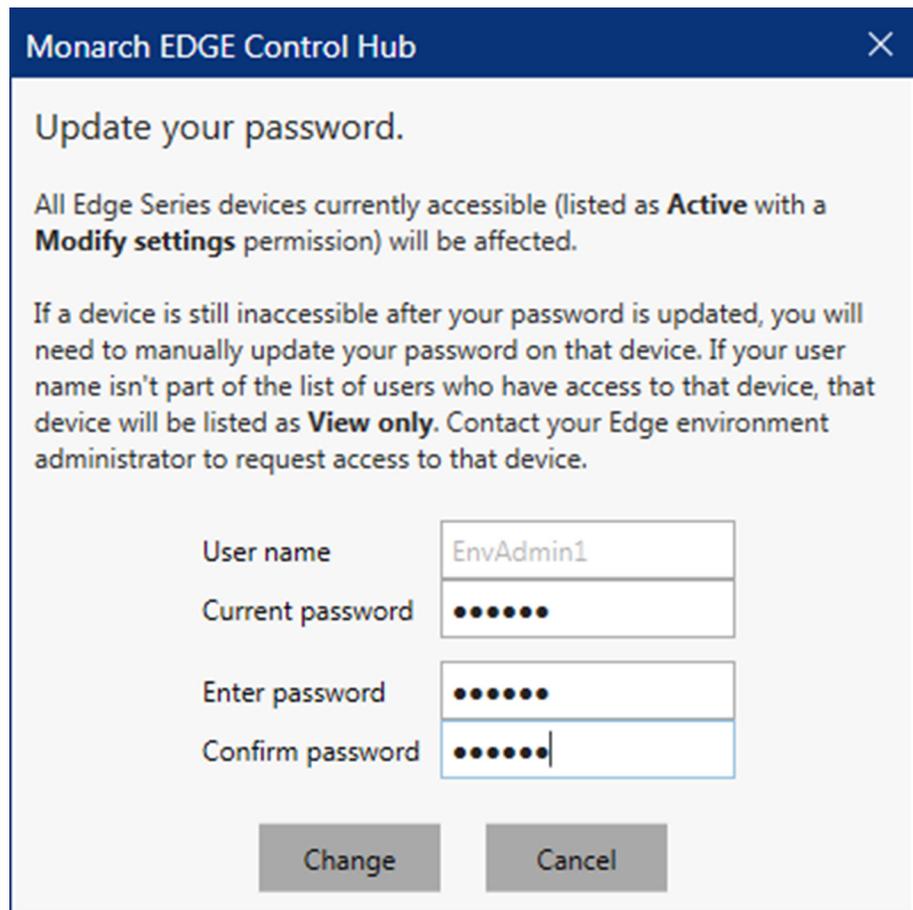
Step 1. Go to **Start > Programs > Matrox Monarch EDGE Control Hub**.

Step outcome: Control Hub displays the Monarch EDGE devices.

Step 2. Open the Control Hub menu at the top left, then click on **Change password**.



Step 3. Enter the password to use for the devices in your environment.



Step 4. Click **Change**.

Result of this task: The environment password has been changed.

Changing user accounts

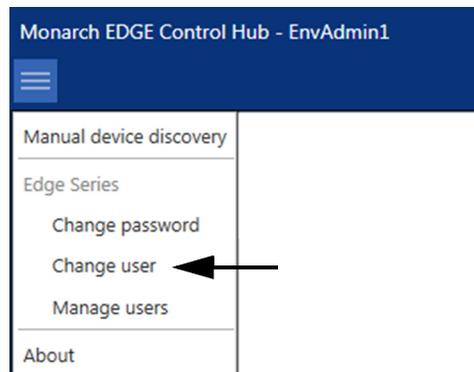
To change the user logged on to the Monarch EDGE Control Hub, follow the steps below:

Step 1. Go to **Start > Programs > Matrox Monarch EDGE Control Hub**.

Step outcome: Control Hub displays the Monarch EDGE devices.

Step 2. Open the Control Hub menu at the top left, then click on **Change user**.

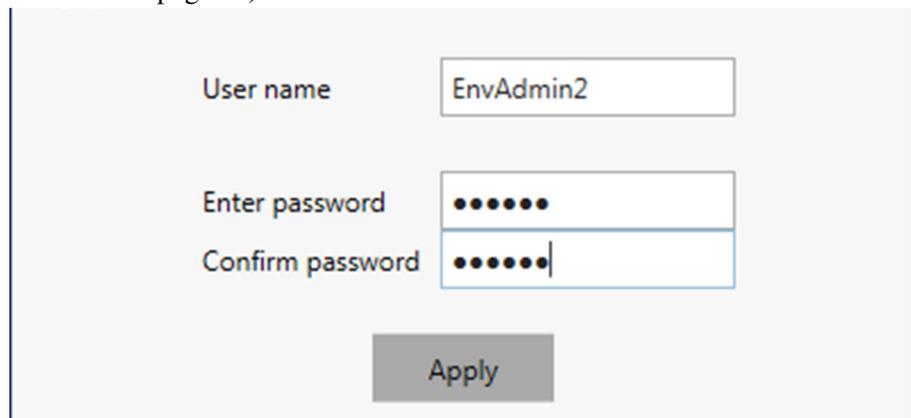
Example: The environment administrator *EnvAdmin1* is currently logged on.



Step 3. Enter the user name and password of the user that wants to log on.

Example: In this case, a different administrator *EnvAdmin2* will log on.

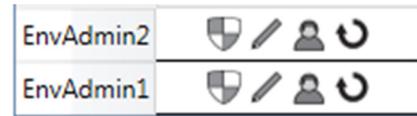
More info: The user must have already been created (see "[Creating a user account](#)" on page 25).

A screenshot of the user login form. It contains three input fields: "User name" with the text "EnvAdmin2", "Enter password" with seven dots, and "Confirm password" with seven dots and a cursor. Below the fields is a grey "Apply" button.

Step 4. Click **Apply**.

Result of this task: The account *EnvAdmin2* is now logged on to Monarch EDGE Control Hub.

When done, remember: The account currently logged on to Monarch EDGE Control Hub is displayed at the top left of the application in the title bar, and is also displayed on top in the **Manage users** section.



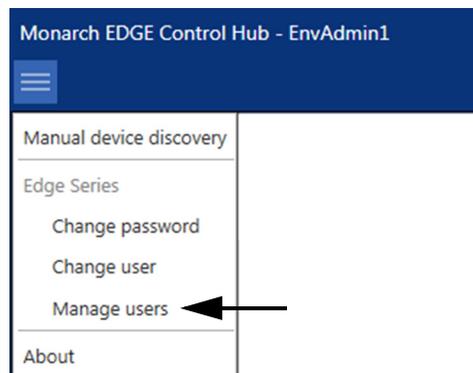
Managing user accounts and permissions

Environment administrators create and/or delete users, and specify users' permissions. To create, delete, or manage user permissions, follow the steps below:

Step 1. Go to **Start > Programs > Matrox Monarch EDGE Control Hub**.

Step outcome: Control Hub displays the Monarch EDGE devices.

Step 2. Open the Control Hub menu at the top left, then click on **Manage users**.



Step outcome: The user accounts are displayed along with their permissions.

CHAPTER

6

Monarch EDGE Control Hub configuration

This chapter describes how to configure the Monarch EDGE for processing and encoding using the Monarch EDGE Control Hub application.

About the Monarch EDGE Control Hub user interface

The Monarch EDGE Control Hub's main menu consists of six configuration pages:

- **Processing** The main settings related to video and audio streaming. Most of the Monarch EDGE essential settings are here. For more information, see "[About the Processing page contextual menu](#)" on page 34 and "[Configuring Processing settings](#)" on page 36.
- **Network** These are the network settings that allow you to set DHCP or static IP addressing for LAN 1 and/or LAN 2 (if applicable). For more information, see "[Configuring Network settings](#)" on page 47.
- **Date and time** These are the settings that allow you to configure time-related options such as specifying an NTP server, or setting the time zone of your Monarch EDGE. For more information, see "[Configuring Date and Time settings](#)" on page 48.
- **Genlock** This is where you enable the genlock functionality and set the genlock to sync to NTSC or PAL frame rates. For more information, see "[Configuring Genlock settings](#)" on page 49.
- **Local preview** This is where you can enable the video preview option that uses the Monarch EDGE's DisplayPort connection. Please note that this feature can affect the EDGE's processing performance. It is not recommended to use a 4K monitor for preview. For more information, see "[Configuring Local preview settings](#)" on page 50.
- **Logs** This where you can download the logs to be used for troubleshooting your Monarch EDGE, if needed. For more information, see "[Managing Logs](#)" on page 50.

About the Processing page contextual menu

The Processing section of the Monarch EDGE Control Hub user interface allows you to configure your settings in a single window by using a contextual menu that changes depending on where you click.

In the following image, if you click on any of the areas indicated, the menu on the right of the Monarch EDGE Control Hub screen will change to display the relevant settings. The active area of Control Hub will be a darker shade of its color (e.g. in the image, **SDI 1** is selected).

NOTE This image does not necessarily represent a realistic user scenario, it is intended simply to show you where in the application you can click.

Click a green box to configure your **Inputs/Outputs**

Inputs/Outputs

SDI 1 Digital A/V Input 1 1920 x 1080i @ 29.97 Hz Audio @ 48.0 kHz, 16 bits Stereo Enabled YUV 4:2:2 10 bits	SDI 2 Digital A/V Input 2 (no video) (no audio) Enabled (needs signal) YUV 4:2:2 10 bits	SDI 3 Digital A/V Input 3 (no video) (no audio) Enabled (needs signal) YUV 4:2:2 10 bits	SDI 4 Digital A/V Input 4 (no video) (no audio) Enabled (needs signal) YUV 4:2:2 10 bits	Analog Audio Input (connection detected) Enabled	Headphone Volume: 0 dB
---	--	--	--	--	---------------------------

Processings **+** — **Add Processings** **Add Encodings** **Add Streams**

Processing

Sources
 Audio source: Digital A/V Input 3
 Layout: A

Encoding
 1920 x 1080p @ 60.00 Hz, YUV 4:2:2 10 bits
 Target bit rate of 15.00 Mb/s, High YUV 4:2:2 video profile, GOP length of 30 frames
 Audio bit rate of 128 kb/s, AAC LC profile, High

Streams

Base port: 15012, RTSP port: 3049, Multicast (address: 224.30.20.10, TTL: 16) Stream name/key: ES2 Name: <i>New encoder added</i> rtsp://192.168.68.228:3049/ES2	RTSP
Stream name/key: S1 Name: <i>RTMP, to YourRTMPLocation</i>	RTMP
Base port: 1027, Multicast (address: 239.0.68.228, TTL: 16) Name: <i>MPEG-2 TS, on port 1027</i>	MPEG-2 TS
Base port: 1028, Unicast (address: 123.45.67.89, TTL: 16) Name: <i>SRT, on port 1028</i>	SRT

Click here to configure your Sources (see **Processings**)

Click here to configure your **Streams**

Click here to configure your **Processings**

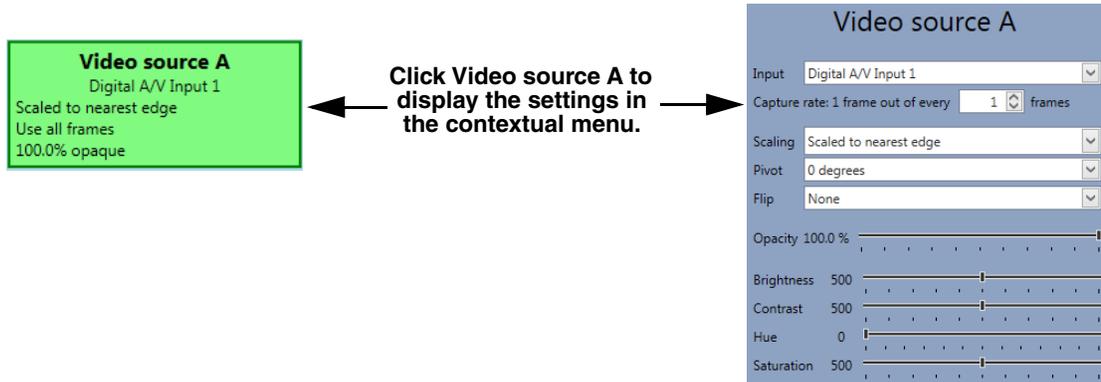
Click here to configure your **Encodings**

Don't forget to **Apply** your changes

Apply

Cancel

Clicking any of the above areas in the user interface displays settings in the contextual menu.



After changing settings, you need to click **Apply** or **Cancel** at the lower right of Control Hub to apply your changes.

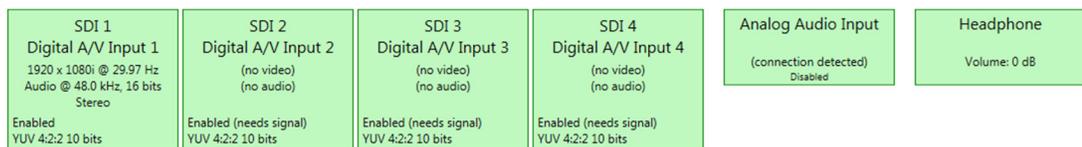
Configuring Processing settings

This section describes the Processing settings in Monarch EDGE Control Hub.

For more information on how the user interface’s contextual menu works, see "[About the Monarch EDGE Control Hub user interface](#)" on page 34.

Inputs/Outputs

This section describes the **Inputs/Outputs** settings in Monarch EDGE Control Hub

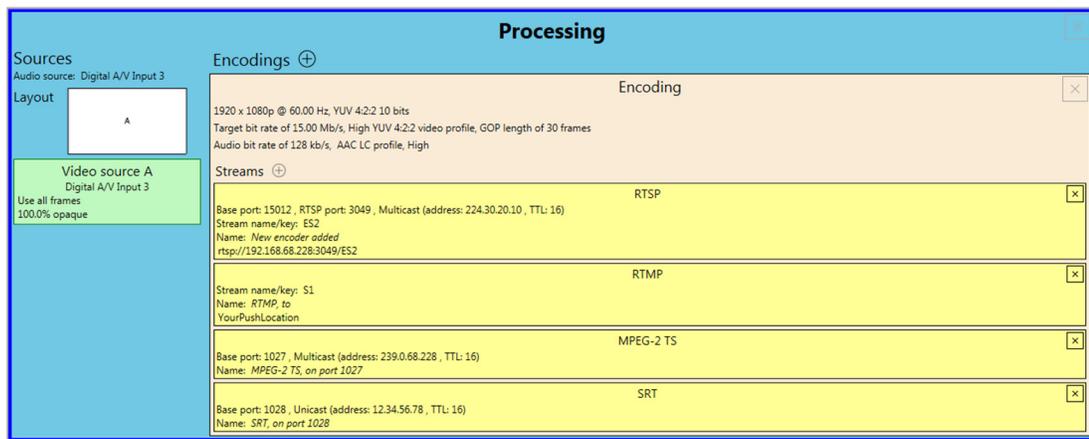


Connector	Setting	Description
SDI Inputs 1 to 4	Enable input	Enable the input. Monarch EDGE detects the input resolution but you still need to enable the input.
	Input name	Give the input a specific name.

Connector	Setting	Description
Analog Audio Input	Enable input	Enable your XLR analog audio input.
	Gain	Increase or decrease the amplitude of your analog audio input.
Headphone	Audio source	Select which audio source to output through the Monarch EDGE headphone jack.
	Volume	Increase, decrease, or mute the headphone volume.

Processings

This section describes the **Processing** settings in Monarch EDGE Control Hub.



Setting	Description
Audio	
Audio source	The source of the audio signal to use.
Video	
Layout	Select the video layout and the number of sources to use.
Follow source input	By default, Monarch EDGE will follow the frame size, frame rate, background color, and pixel format of the source video. If you want to customize these settings, clear this option and the settings become available for modification.

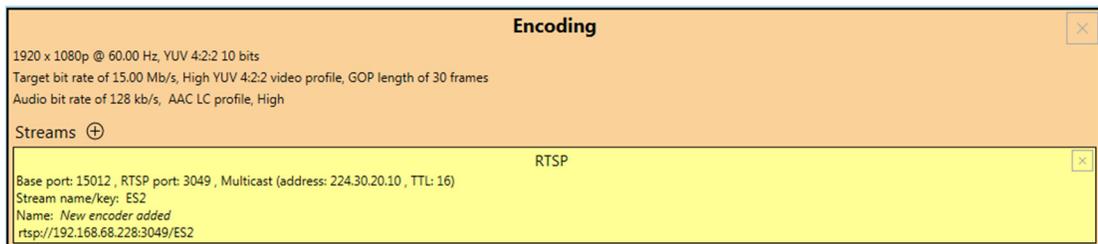
Setting	Description
Frame size	The width and height, in pixels, of the source. If the layout of your sources uses a height or width that's smaller than your frame size, black borders may appear on both sides, or on the top and bottom, of the frame. The width ranges from 64 to 4096 and must be a multiple of 16. The height ranges from 64 to 4096 and must be an even number.
Frame rate	The frame rate, in FPS (frames per second), for the source.
Background color	The background color for your source. If the layout of your sources uses less height or width than your frame size, the borders will use the background color. If no video is captured for your source, the background color is shown instead.
Pixel format	The pixel format to define the quality of your image, and the pixel depth for each color in the image format. A higher YUV format and pixel depth provides a higher quality image and requires more resources to process. Only certain pixel formats may be available.
Video sources	
Input	Select the input to use for your source.
Capture rate	Select the frame rate for video ingest. Reducing the frame rate also reduces the frame rate of the stream.

Setting	Description
<p>Scaling</p>	<p>Select how to scale your video:</p> <ul style="list-style-type: none"> • Unscaled from top left The video is unscaled and positioned in the top left corner of the display area. If the display resolution of the video is bigger than the display area, the video will be cropped. • Unscaled centered The video is unscaled and centered in the display area. If the display resolution of the video is bigger than the display area, the video will be cropped. • Stretched to all edges The video is stretched to fit the entire display area without respecting the aspect ratio of the original video. If the aspect ratio of the video and the display area don't match, the video may be distorted. • Scaled to all edges The video is scaled to fit the entire display area while respecting the aspect ratio of the original video. The video is centered in the display area. If the aspect ratio of the video and the display area don't match, the video will be cropped. • Scaled to nearest edge The video is scaled to fit to the display area while respecting the aspect ratio of the original video. The video is centered in the display area. If the aspect ratio of the video is not scaled to the display area, black borders will appear on both sides of the video or above and below. The video isn't cropped.
<p>Pivot</p>	<p>Change the orientation of your source:</p> <ul style="list-style-type: none"> • 0 degrees No pivot is applied. • 90 degrees clockwise The source is rotated 90 degrees clockwise. • 180 degrees The source is rotated 180 degrees. • 90 degrees counterclockwise The source is rotated 90 degrees counterclockwise.

Setting	Description
Flip	Select the plane along which the source is flipped: <ul style="list-style-type: none"> • None No flip is applied. • Vertically The source is flipped along the vertical plane. The top becomes the bottom. • Horizontally The source is flipped along the horizontal plane. The right side becomes the left. • On both axes The source is flipped along the vertical plane and the horizontal plane. This is visually similar to rotating 180 degrees.
Opacity	Increase or decrease how opaque the source video appears. The default is 100%.
Brightness	Increase or decrease how light or dark the colors appear. The default is 500.
Contrast	Change the difference in brightness between the lightest and darkest colors. The default is 500.
Hue	Increase or decrease the tint or tone of colors. The default is 0.
Saturation	Increase or decrease the depth of the colors. The default is 500.

Encodings

This section describes the **Encoding** settings in Monarch EDGE Control Hub



NOTE A single RTSP stream is active by default when you create a new Encoding. One stream window is always open in the Encoding window. For more information, see "[Streams](#)" on page 44).

Setting	Description
Include	Select the signals to include (Audio only , Video only , or Audio and video) in your encoding.

Setting	Description
Video	
Force encoding size	Select to increase or reduce the captured video size before encoding.
Frame size	Specify the width and height, in pixels, of the video up to the width and height of the original video layout. If your video source uses a different size, your encoder scales the video to the specified size (image may be distorted). The width ranges from 64 to 4096 and must be a multiple of 16. The height ranges from 64 to 4096 and must be an even number.
Scaling	<p>Select how to scale your video:</p> <ul style="list-style-type: none"> • Unscaled from top left The video is unscaled and positioned in the top left corner of the display area. If the display resolution of the video is bigger than the display area, the video will be cropped. • Unscaled centered The video is unscaled and centered in the display area. If the display resolution of the video is bigger than the display area, the video will be cropped. • Stretched to all edges The video is stretched to fit the entire display area without respecting the aspect ratio of the original video. If the aspect ratio of the video and the display area don't match, the video may be distorted. • Scaled to all edges The video is scaled to fit the entire display area while respecting the aspect ratio of the original video. The video is centered in the display area. If the aspect ratio of the video and the display area don't match, the video will be cropped. • Scaled to nearest edge The video is scaled to fit to the display area while respecting the aspect ratio of the original video. The video is centered in the display area. If the aspect ratio of the video is not scaled to the display area, black borders will appear on both sides of the video or above and below. The video isn't cropped.
Pivot	<p>Change the orientation of your source:</p> <ul style="list-style-type: none"> • 0 degrees No pivot is applied. • 90 degrees clockwise The source is rotated 90 degrees clockwise. • 180 degrees The source is rotated 180 degrees. • 90 degrees counterclockwise The source is rotated 90 degrees counterclockwise.

Setting	Description
Flip	<p>Select the plane along which the source is flipped:</p> <ul style="list-style-type: none"> • None No flip is applied. • Vertically The source is flipped along the vertical plane. The top becomes the bottom. • Horizontally The source is flipped along the horizontal plane. The right side becomes the left. • On both axes The source is flipped along the vertical plane and the horizontal plane. This is visually similar to rotating 180 degrees.
Force pixel format	<p>The pixel format defines the quality of the image encoded. YUV refers to the color format used to receive each block of bits in the video signal. The format is followed by the pixel depth used for each color in the image format. A higher YUV format and pixel depth provides a higher quality image and requires more resources to process.</p>
Encoding profile	<p>Select an encoding profile for your signal. Changing the encoding profile may prevent your decoder from streaming.</p> <ul style="list-style-type: none"> • Baseline • Main • High • High 10-bit (if available) • High YUV 4:2:2 (if available)
Target bit rate	<p>The target bit rate, in Mb/s (Megabits per second), for encoding. The actual bandwidth used by your encoder varies according to your source and encoding method. The default is 15 Mb/s. A lower target bit rate may result in lower image quality. A higher target bit rate limit may result in lower performance or a higher bandwidth when streamed.</p>
Bit rate control	<p>Select one of the following:</p> <ul style="list-style-type: none"> • Use variable bit rate • Use constant bit rate
Maximum bit rate	<p>The maximum bit rate for encoding. When encoding, the processor attempts to use the target bit rate but may use up to the maximum bit rate specified. The default is 22.5 Mb/s. The maximum bit rate is 120 Mb/s.</p>

Setting	Description
Quantization parameters	The range used to compress the various frames in your GOP. A high maximum increases the level of compression of the frame and should decrease the bit rate but may decrease the image quality.
Force CAVLC entropy encoding	Enable this to force the use of context adaptive variable length coding (CAVLC) entropy encoding. Enabling this option overrides the default entropy encoding selection (CABAC).
GOP length	The number of frames from one complete frame (I-frame) to another. A higher GOP length increases the compression level but may result in a lower quality image. The default is 30.
Insert P-frame every	Enter the number of frames before a P-frame is inserted. All other frames are B-frames. A higher number of frames before inserting a P-frame increases the quality of the image but may result in a loss of performance. The minimum and default value is 1 (indicating no B frames). The maximum value is 4.
Audio	
Bit rate	Select the audio bit rate, in kbps, for your audio transmission. A higher bit rate produces a sound quality closer to the source quality, but requires more bandwidth. The value ranges from 32 to 576. The default is 128.
AAC encoder	Select one of the following: <ul style="list-style-type: none"> • AAC LC Allowed bit rate range is 32 to 576 kbps. • AAC HEv1 Allowed bit rate range is 32 to 288 kbps. • AAC HEv2 Allowed bit rate range is 32 to 144 kbps.
AAC quality	Force the use of encoding complexity (low to high) to improve the quality of compressed audio. Adjusting these settings doesn't affect the audio sample rate, target bit rate, or latency. <ul style="list-style-type: none"> • Low • Medium • High
Use temporal noise shaping	This reshapes the quantization noise over time to improve the quality of the audio signal. This option is enabled by default.
AAC format	Select one of the following: <ul style="list-style-type: none"> • ADTS • No container format

Streams

This section describes the **Streams** settings in Monarch EDGE Control Hub

RTSP Base port: 15012 , RTSP port: 3049 , Multicast (address: 224.30.20.10 , TTL: 16) Stream name/key: ES2 Name: <i>New encoder added</i> rtsp://192.168.68.228:3049/ES2
RTMP Stream name/key: S1 Name: <i>RTMP, to</i> YourPushLocation
MPEG-2 TS Base port: 1027 , Multicast (address: 239.0.68.228 , TTL: 16) Name: <i>MPEG-2 TS, on port 1027</i>
SRT Base port: 1028 , Unicast (address: 12.34.56.78 , TTL: 16) Name: <i>SRT, on port 1028</i>

Setting	Description
RTSP	
Enable stream	Enable or disable your stream.
Base port	The port number used to transmit your stream.
Name	Enter a name for your stream.
Network interface	Select LAN1 or LAN2
RTSP port	The RTSP port number used to transmit your stream.
Stream name/key	Enter a suffix as part of your stream address. If you're using a media player to decode your stream, the media player may require this as part of the stream address to connect to a stream.
Time to live	The number of hops or network nodes (such as network switches or routers) through which a multicast signal can travel. Once the TTL number is reached, the receiving network node prevents the signal broadcast further down the network. The value ranges from 1 to 255. The default is 16.
Routing scheme	Select one of the following: <ul style="list-style-type: none"> • Unicast When selecting unicast, you need to specify the destination IP address of the stream. You can enter a valid IP address or host name. • Multicast Enter a Multicast address. Using multicast may require additional network configuration to support the transmission protocol (some network switches and routers can block multicast signals). For more information, contact your network administrator. To also allow unicast connections, enable the Allow unicast connections option.

Setting	Description
RTMP	
Enable stream	Enable or disable your stream.
Push location	The path of your RTMP stream.
Name	Enter a name for your stream.
Network interface	Select LAN1 or LAN2
Stream name/key	Enter a suffix as part of your stream address. If you're using a media player to decode your stream, the media player may require this as part of the stream address to connect to a stream.
Use authentication	Enable this if you're using an authentication server, then enter your credentials (User name and Password).
MPEG-2 TS	
Enable stream	Enable or disable your stream.
Base port	The port number used to transmit your stream.
Name	Enter a name for your stream.
Network interface	Select LAN1 or LAN2
Time to live	The number of hops or network nodes (such as network switches or routers) through which a multicast signal can travel. Once the TTL number is reached, the receiving network node prevents the signal broadcast further down the network. The value ranges from 1 to 255. The default is 16.
Routing scheme	Select one of the following: <ul style="list-style-type: none"> • Multicast Enter a Multicast address. Using multicast may require additional network configuration to support the transmission protocol (some network switches and routers can block multicast signals). For more information, contact your network administrator. To also allow unicast connections, enable the Allow unicast connections option. • Unicast When selecting unicast, you need to specify the destination IP address of the stream. You can enter a valid IP address or host name.
SRT	
Enable stream	Enables the SRT stream to the specified location.
Base port	The port number used to transmit your stream.

Setting	Description
Name	Enter a name for your stream.
Network interface	Select LAN1 or LAN2
Encryption	Select one of the following: <ul style="list-style-type: none"> • Unencrypted • AES-128 • AES-192 • AES-256
Passphrase	When using encryption, this is the passphrase used to generate the encryption key. We recommend a passphrase length of 16 characters (AES-128), 24 characters (AES-192), and 32 characters (AES-256).
Latency	The target latency, in milliseconds (ms), for transmission. The default is 40 ms.
Time to live	The number of hops or network nodes (such as network switches or routers) through which a multicast signal can travel. Once the TTL number is reached, the receiving network node prevents the signal broadcast further down the network. The value ranges from 1 to 255. The default is 16.
Routing scheme	Only unicast is available. You must specify a unicast address. You can enter a valid IP address or host name. The SRT protocol prefix (srt://) and the base port suffix (:9000) aren't required when entering a host name as the unicast address.

Configuring Network settings

This section describes the **Network** settings in Monarch EDGE Control Hub.

	LAN1	LAN2
Processing		
Network	IP address <input type="radio"/> Dynamic IP address (DHCP) <input checked="" type="radio"/> Static IP address	No connection detected.
Date and time	IPv4 address <input type="text"/>	
Genlock	IPv4 netmask <input type="text"/>	
Local Preview	IPv4 gateway <input type="text"/>	
Logs	DNS servers <input type="text"/>	

NOTE For illustration purposes, LAN2 is not connected in this example. If there were a secondary LAN connection, the same settings as LAN1 would apply.

Setting	Description
IPv4 address	An IP address between 192.168.0.0 and 192.168.255.255 (recommended). Also, we recommend you assign an IP address within the subnet of your network.
IPv4 netmask	The subnet mask defining group of IP addresses in your subnet. By default, the subnet mask is 255.255.255.0.
IPv4 gateway	The gateway is often the same as your IP address, but the last byte may be 0 or 1.
DNS servers	The address of your DNS (Domain Name System) server or servers. If multiple addresses are entered, separate each address with a space.

Configuring Date and Time settings

This section describes the **Date and Time** settings in Monarch EDGE Control Hub.

The screenshot shows the configuration interface for Date and Time settings. On the left is a navigation menu with options: Processing, Network, Date and time (highlighted), Genlock, Local Preview, and Logs. The main content area shows the following settings:

- NTP server:** Enabled
- NTP server URL:** time.nrc.ca
- Time zone:** (UTC-5:00) Toronto

Under the heading "Date and time", there are three radio button options:

- Use current date and time settings of the device
- Use date and time of the current system
- Use the following date and time

The "Use the following date and time" option is selected, and a text input field shows "Wednesday, May 15, 2019 10:10:30 AM".

Below these options, there are two radio button options for NTP synchronization:

- Enable synchronization with an NTP (Network Time Protocol) server
- Disable synchronization with an NTP server

The "Enable synchronization..." option is selected, and an "NTP server URL" text input field contains "time.nrc.ca".

Under the heading "Time zone", there are two radio button options:

- Use current time zone of the device
- Use the following time zone

The "Use the following time zone" option is selected, and a dropdown menu shows "(UTC-5:00) Toronto".

Setting	Description
Date and time	
Use current date and time settings of the device	Keep the current date, time, and NTP (Network Time Protocol) synchronization settings for your devices. This is the default.
Use date and time of the current system	Use the date and time of your controller system to update your devices. This setting uses the time zone of the controller system. If your controller system and your device are using different time zones, the date and time will differ. This setting disables synchronization with an NTP server.
Use the following date and time	Use the date and time specified to update your devices. This setting doesn't use the time zone of your controller system. You can use the arrow keys to change the date and time specified. This setting disables synchronization with an NTP server.

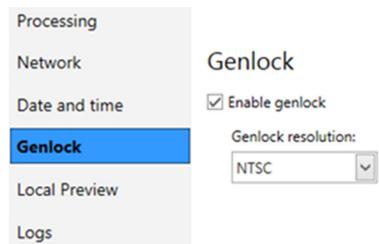
Setting	Description
Enable synchronization with an NTP server	Use an NTP server to update the date and time for your device at regular intervals. You must provide the NTP server URL , even if one is already stored on your device. For more information on using NTP, contact your network administrator.
Disable synchronization with an NTP server	Stop using an NTP server to update the date and time for your device. Disabling NTP keeps the current date and time of the device, but it won't update the devices at regular intervals.
Time zone	
Use current time zone of the device	Use the time zone currently set for your devices. This is the default.
Use the following time zone	Change the time zone for your devices to the one selected. Changing the time zone may adjust the date and time for a device.

Configuring Genlock settings

This section describes the **Genlock** settings in Monarch EDGE Control Hub.

Click **Enable** to turn on the Monarch EDGE genlock which allows you synchronize SDI outputs to the device's internal clock.

You can genlock your SDI devices/cameras to either an **NTSC** or **PAL** resolution.

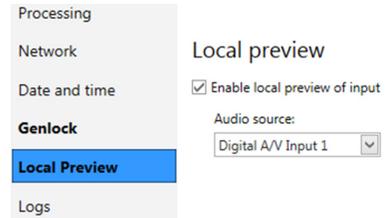


Configuring Local preview settings

This section describes the **Local preview** settings in Monarch EDGE Control Hub.

Click **Enable** to turn on the Monarch EDGE preview feature which allows you view the video output on a preview monitor connected to the Monarch EDGE DisplayPort connector.

You can select the **Audio source** for your preview from the drop-down list.

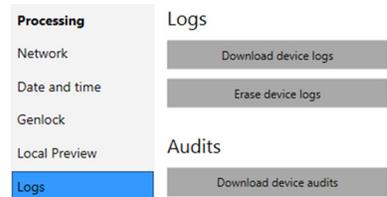


NOTE The video preview feature impacts the Monarch EDGE’s encoding performance. If you use this feature, do **not** connect a monitor with a resolution greater than HD.

Managing Logs

This section describes the **Logs** settings in Monarch EDGE Control Hub.

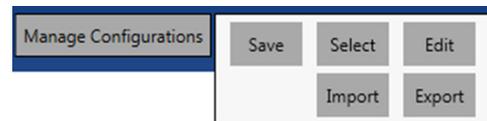
- **Download device logs** Download the log files that contain information on your Monarch EDGE to use for troubleshooting purposes.
- **Erase device logs** Erase the log files.
- **Download device audits** This file contains information on the user interactions with your Monarch EDGE devices for troubleshooting purposes.



Managing configurations

This section describes the **Manage Configurations** settings in Monarch EDGE Control Hub.

- **Save** Save your Monarch EDGE’s configuration settings.
- **Select** Select and load a previously-saved configuration, or load the Monarch EDGE’s default configuration.
- **Edit** Rename or delete a previously-saved configuration. You can also directly edit the settings by editing the XML in the *.fav* file that is exported.



- **Export** Export your configuration settings to your computer or to a USB drive.
- **Import** Import configuration settings from your computer or a USB drive.

Monitoring Monarch EDGE devices

From the main Monarch EDGE Control Hub page, you can quickly view the status of all your Monarch devices by opening the status menu. The status menu provides a variety of information at a glance, such as which inputs are connected, what their resolutions are, and displays the currently active streams.

The screenshot shows the Monarch EDGE Control Hub interface. At the top, there is a navigation bar with a hamburger menu icon. Below it, the 'Main' section shows '1 item' with a device card for 'CC09929'. A callout points to this card with the text 'Your selected Monarch EDGE'. Below the main section, there is a 'New devices' section with '7 items', showing a row of device cards for 'CB99516', 'CC3288', 'A565141', 'MIG15-aaNNN', 'CB99523', 'CC3283', and 'A550001'. A callout points to the status menu icon on the selected device card with the text 'Open and close status menu'. At the bottom, the status menu for device 'CC09929' is displayed, showing various system metrics and stream information.

CC09929		Inputs		Local output (preferred mode)		Streams			
Identity & Version	Telemetry	Digital A/V Input 1:	1920 x 1080p @ 59.94 Hz	RTMP, to 223.168.1.137/live	RTMP, to	RTMP, to 223.168.1.137/live	RTMP, to 223.168.1.137/live	RTMP, to 223.168.1.125/live	RTMP, to 223.168.1.125/live
Monarch Edge	5/16/2019 11:23:31 AM	Digital A/V Input 2:	1920 x 1080p @ 59.94 Hz	1920 x 1080 @ 59.94 Hz	1920 x 1080 @ 59.94 Hz	1920 x 1080 @ 59.94 Hz	1920 x 1080 @ 59.94 Hz	1920 x 1080 @ 59.94 Hz	1920 x 1080 @ 59.94 Hz
Firmware version: 1.00.03.004	Device temperature: 66.4°C	Digital A/V Input 3:	1920 x 1080p @ 59.94 Hz	59.93 frames/s	59.93 frames/s	59.93 frames/s	59.93 frames/s	59.93 frames/s	59.93 frames/s
	Max. temperature supported: 100.0°C	Digital A/V Input 4:	1920 x 1080p @ 59.94 Hz	10.22 Mbit/s	10.26 Mbit/s	10.26 Mbit/s	10.26 Mbit/s	10.22 Mbit/s	10.22 Mbit/s
		Analog Audio Input 1:	No audio						

General

Regulatory compliance:

- EMC: FCC Class A, CE Mark Class A, ACMA RCM Mark, KC Mark
- RoHS Directive 2011/65/EU

Weight:

- 1,66 kg

Power:

- Input: 12 VDC
- Connector: DIN4
- Total power consumption: 48 Watts (60 max)

Power Supply:

- Line voltage: 100-240 VAC
- Frequency: 50-60 Hz
- Input connector: IEC320-C8
- Output connector: DIN4 Locking power
- Nominal output voltage: 12 VDC
- Maximum power output: 60 W
- Maximum current output: 5 amp

International Adapter

- US/UK, European

Connections

SDI inputs:

- 1× 12G SDI input per SMPTE ST 2082
- 3× 3G SDI inputs per SMPTE ST 425 (Level A mapping only)
- Supported video formats (auto-detected):
 - 3840 × 2160p at 50, 59.94, and 60 fps¹
 - 1920 × 1080p at 50, 59.94, and 60 fps

1. Currently, UHD supports square-division only.

-
- 1920 × 1080i at 25 and 29.97
 - 1280 × 720p at 50, 59.94, and 60 fps
 - 2-channel, 24-bit SDI embedded audio, 48 kHz sample rate, synchronous
 - SDI compliant with SMPTE ST 292M/424M(Level A)/425M
 - BNC connectors (75 Ohms), terminated

Data ports:

- Two GbE (Gigabit Ethernet) ports
- Two MSA-compatible SFP28 cages supporting 10 and 25 GbE modules (third-party modules required)¹

Balanced analog audio input:

- 2 XLR input channels (left and right)
- Max Input Level = 22 dBu (headroom)
- Frequency Response @ line level (4 dBu): 20 Hz to 20 kHz
- THD+N @ 1 kHz, 4dBu < 0.05%
- Analog gain available for microphone: +86 dB

Balanced analog audio output:

- 2 XLR output channels (left and right)
- Max Output Level = 22 dBu (headroom)
- Frequency Response @ line level (4 dBu): 20 Hz to 20 kHz
- THD+N @ 1 kHz, 4dBu < 0.05%

Configurable genlock:

- Bi-level genlock output

USB ports:

DisplayPort:

Tally I/O²:

- 8x tally signals (sent to cameras)
- Tally ports available via a 15-pin D-SUB connector

1. To be supported in a future release.
2. To be supported in a future release.

Compression

Codecs:

- Video: H.264/MPEG-4 Part 10 (AVC)
- Audio: AAC-HE and AAC-LC

Bitrate per stream:

- Video: Up to 120 Mbps (IBP)
- Audio: From 32 to 256 Kbps

Chroma sub-sampling:

- 4:2:2 (8-bit and 10-bit)
- 4:2:0 (8-bit and 10-bit)

Encoding level:

- Up to 5.2

Profile:

- Up to High 4:2:2 Profile (Hi422P)

Latency:

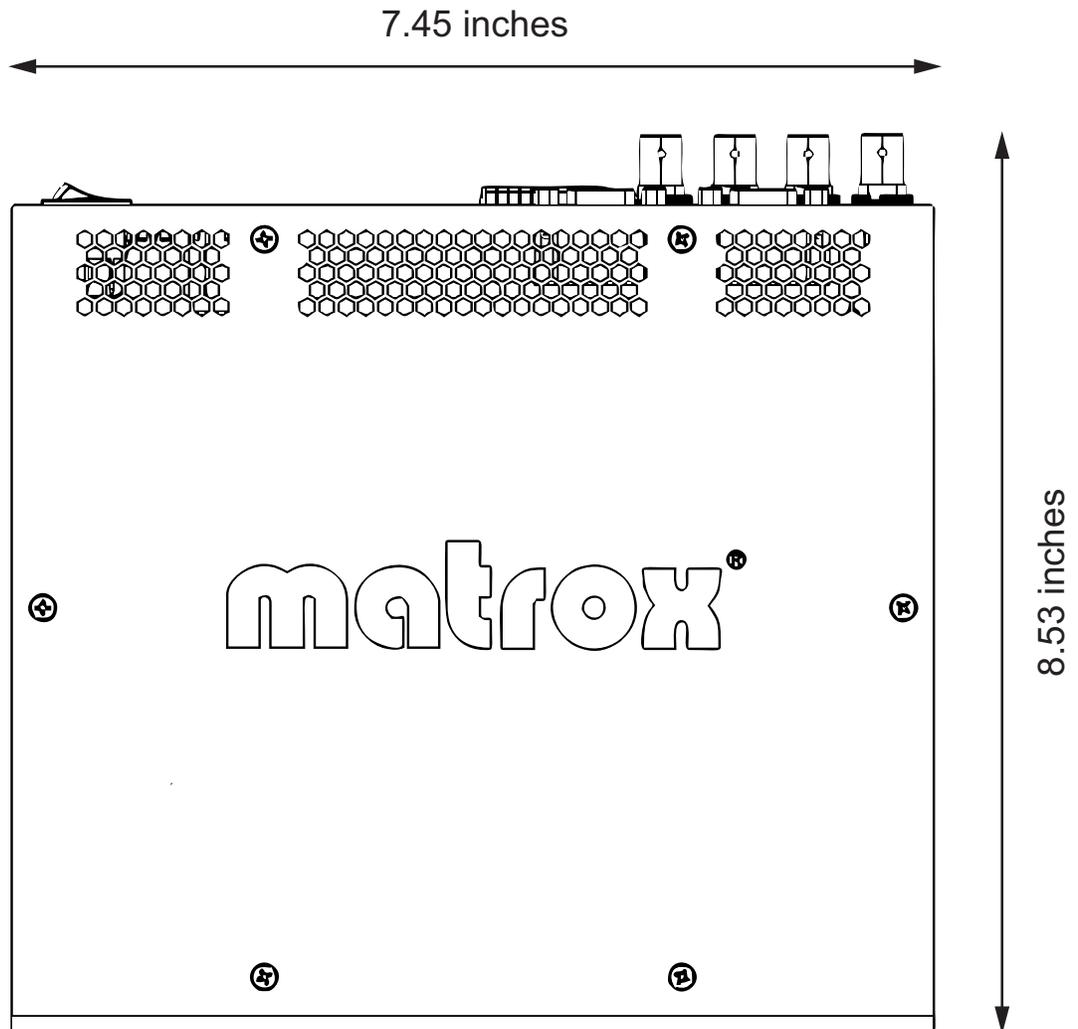
- Encode latency as low as 50 ms (network transfers and decode operation additional)

Environmental specifications

- Minimum/maximum room operating temperature: 0 to 40° C
- Typical operating temperature: 25° C
- Minimum/maximum storage temperature: -20 to 60° C
- Maximum altitude for operation: 3,000 meters
- Maximum altitude for transport: 12,000 meters
- Operating humidity: 20 to 80% relative humidity (non-condensing)
- Storage humidity: 5 to 95% relative humidity (non-condensing)

Dimensions

Top view



Front view

