Matrox Monarch EDGE Series

Installation and User Guide

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CHAPTER 1

Introduction

This chapter includes the following topics:

About the Matrox Monarch EDGE Series

The Matrox Monarch EDGE series of H.264-based encoding and decoding appliances are designed for 4K/Multi-HD webcasting and remote production, and contribution workflows. This user guide includes information for the Monarch EDGE E4, Monarch EDGE D4, and Monarch EDGE S1 devices.

For more information on the Monarch EDGE Series of products, go to our website at: *https://video.matrox.com/en/products/encoders-decoders/monarch-edge-series*

Matrox Monarch EDGE E4 and Monarch EDGE D4

Coupled with the powerful Monarch EDGE D4 decoder, the Monarch EDGE E4 encoding device offers exceptional quality at the lowest latency while securely transporting your video feeds from the event to the centralized production facility. This compact, robust, and low-power remote production (REMI) encoder and decoder pair has made producing live, multi-camera events more affordable than ever by keeping talent in-house.

Programs destined for web or over-the-top (OTT) delivery to the cloud can select the Monarch EDGE E4 4:2:0 8-bit encoder, while the 4:2:2 10-bit capable Monarch EDGE E4 is ideal for demanding, broadcast-quality productions.

Matrox Monarch EDGE S1

Affordably enhance remote production (REMI) workflows with Monarch EDGE S1. A simultaneous encode/decode appliance, Monarch EDGE S1 allows users to provide low latency return feeds to multi-camera production crews in the field. Monarch EDGE S1 offers one 3G-SDI input, allowing return feeds coming from studio to be encoded for secure transport over private or public internet connections. At remote sites, Monarch EDGE S1 can decode one HD feed and output via a genlockable 3G-SDI connection for distribution of the program feed. As both encode and decode operations can occur simultaneously, a single camera contributor in the field can use this device to both send a high-quality feed to studio and receive the program feed being produced by the studio.

Matrox Monarch EDGE Control Hub

The Matrox Monarch EDGE Control Hub software allows you to discover Monarch EDGE devices on your network from a Windows computer connected to the same network. With Control Hub, you can check the status of your Monarch EDGE device and access the Matrox Monarch EDGE Command Center Web UI for device control and configuration.

You can download the Matrox Monarch EDGE Control Hub application and the latest Monarch EDGE firmware from the *support section* of our website.

Matrox Monarch EDGE Command Center

The Matrox Monarch EDGE Command Center is the primary configuration tool for the Monarch EDGE device. It allows you to remotely control, manage, and configure the device through a secure, web-based interface. Instead of installing software on your computer, simply access the Monarch EDGE Command Center via a web browser using the device's IP address.

Matrox Monarch EDGE RESTful API

The Matrox RESTful API provides a set of JSON-based commands that allow you to control, manage, and configure your Monarch EDGE E4 the same way you would with the Matrox Monarch EDGE Command Center application.

The API is typically used by OEMs to create their own application for the Monarch EDGE E4. 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 E4.

The API should be considered a supplement to this user guide, as the API does not explain the overall functionality of the Monarch EDGE E4.

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

System requirements

The system requirements for all Monarch EDGE devices are as follows:

- To install Matrox Monarch EDGE Control Hub, you need a computer running Microsoft Windows 10 or Windows 11. Other Windows operating systems may work but have not been fully validated through internal testing. Before trying another operating system, contact *Matrox Video support*.
- To access Matrox Monarch EDGE Command Center, we recommend using Google Chrome for an optimal user experience. Other web browsers (e.g. Mozilla Firefox) may work but have not been fully validated through internal testing.
- 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 device will boot with a self-assigned link-local IP address between 169.254.0.0 and 169.254.255.255 which will be displayed on the front LCD screen upon boot up. 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 *86*.

Installation and configuration overview

This section provides a general roadmap for getting started with Monarch EDGE devices. For more detailed information, links are provided to refer you to the relevant topics described in other parts of this manual.

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 Video 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. **Connect your Hardware** Start by connecting and powering up your Monarch EDGE device(s). A DHCP network is recommended for device discovery. The setup sheet included with your product describes the basic connections.

More info: see "*Hardware connections*" on page *5*.

Step 3. **Update Monarch EDGE firmware** When you first connect and power up your Monarch EDGE device, you should check to see which firmware you have, and update it if it is not the most current version. The setup sheet included with your product describes the firmware update process.

More info: see "*Monarch EDGE firmware update and Control Hub installation*" on page *13*.

Step 4. **Start configuring Monarch EDGE** You can configure Monarch EDGE by using the Monarch EDGE Command Center. Open your web browser (Google Chrome is recommended) and go to your Monarch EDGE's IP address. For a secure connection, use the “https” prefix (e.g. https://192.168.123.45). After you log in to Command Center, continue to *Step 8.*

Step 5. **Install Monarch EDGE Control Hub** This is the installable application you use to discover your Monarch EDGE devices. The version of Monarch EDGE Control Hub you install must match the firmware version of the Monarch EDGE device(s).

More info: see "*Monarch EDGE firmware update and Control Hub installation*" on page *13*.

Step 6. **Discover your Monarch EDGE devices** With Monarch EDGE Control Hub installed, you 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 7. **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 "*User and device management*" on page *21*.

Step 8. **Create user accounts** You will need to create user accounts with specific permissions to use devices.

More info: see "*User and device management*" on page *21*.

Step 9. **Configure Monarch EDGE devices** You can now use Monarch EDGE Command Center to configure your devices as needed.

More info: see "*Monarch EDGE Command Center configuration*" on page *34*.

Result of this task: You are ready to use your Matrox Monarch EDGE device(s).

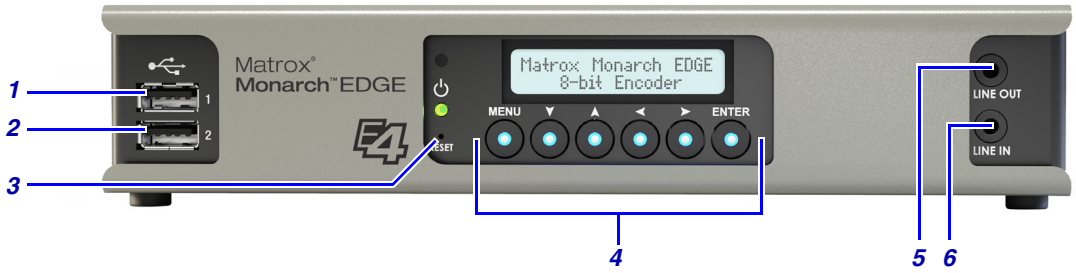
CHAPTER 2

Hardware connections

This chapter includes the following topics:

Matrox Monarch EDGE front connections

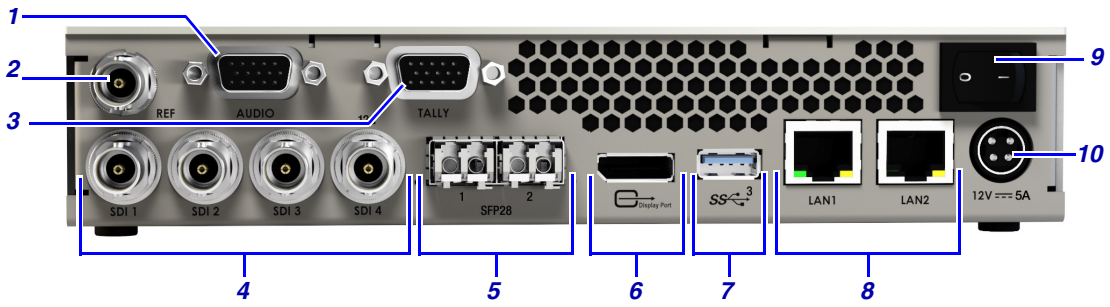
The Matrox Monarch EDGE E4 8-bit encoder is shown for illustration purposes only. The information below applies to all Monarch EDGE devices.



	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). 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 *22*. **NOTE** Pressing the Reset button too long will cause the Monarch EDGE to enter maintenance mode (amber light). This mode is used for internal purposes only. If this occurs, reboot the EDGE and try the factory reset again.
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 *11*.
5	LINE OUT	Connect your headphones to this connector.
6	LINE IN	Not currently supported.

Matrox Monarch EDGE E4 and D4 rear connections

The information below applies to Monarch EDGE E4 and D4 devices.



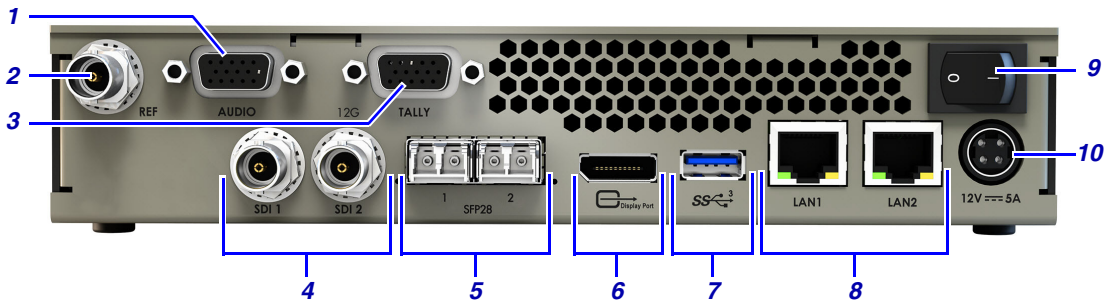
	Connector	Description
1	AUDIO	Analog XLR audio with two balanced analog audio inputs and outputs. On the Monarch EDGE E4, these can be used for program audio or for Talkback functionality (when used for Talkback, analog audio is not available). On the Monarch EDGE D4, the analog audio is only used for Talkback. **NOTE** A separate audio cable is available for purchase.
2	REF	For Monarch EDGE E4, this is a bi-level genlock output. For Monarch EDGE D4, this is a bi- or tri-level genlock input.
3	TALLY	Connect to a production switcher for the transfer of tally signals between in-studio switchers and on-site cameras. Although the physical connector is the same on Monarch EDGE E4 and D4 devices, the Monarch EDGE E4 uses the connector's pins as four GPI inputs and eight Tally outputs, while the Monarch EDGE D4 uses them as eight Tally inputs and four GPI outputs.
4	SDI 1 to 4[1]	SDI connectors function as inputs on the Monarch EDGE E4 and outputs on the Monarch EDGE D4. Connectors 1 to 3 are 3G SDI per SMPTE ST 425 (Level A and Level B mapping). SDI connector 4 is a 12G SDI per SMPTE ST 2082 and supports 4K when connectors 1 to 3 are not being used.
5	SFP28 1 and 2	SFP 1 and 2 are MSA-compatible SFP28 cages supporting 10 and 25 GbE modules. To be supported in a future release for SMPTE ST 2110 signals. **NOTE** The SFP28 connectors are shown for illustration purposes only. They are not included with your Monarch EDGE, and must be purchased separately from a third-party.

	Connector	Description
6	DisplayPort[2]	Connect a DisplayPort monitor to this connector to use as a preview monitor for your video sources. If your monitor does not have a DisplayPort connector, you can use an HDMI or DVI-D adapter. Use only HD monitors (1920 × 1200 maximum) for DisplayPort preview. Higher resolution monitors will negatively impact processing performance.
7	USB 3.0 port	For Monarch EDGE E4, this port can be used for saving recorded content to a compatible USB device. NTFS and FAT32 file systems are supported, however, please note that FAT32 has a maximum file limitation size of 4 GB.
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, or if you want to separate your control network from your media network, 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).

1. If your SDI input source changes from interlaced to progressive while streaming, the input will become disabled, and you will need to re-enable the input to continue streaming.
2. The preview feature will affect the Monarch EDGE encoding and decoding performance. If you use preview while the Monarch EDGE is streaming, you may experience performance-related issues.

Matrox Monarch EDGE S1 rear connections

The information below applies to Monarch EDGE S1.



	Connector	Description
1	AUDIO	Analog XLR audio with two balanced analog audio inputs and outputs. When encoding, these can be used for program audio or for Talkback functionality (when used for Talkback, analog audio is not available). When decoding, the analog audio is only used for Talkback. **NOTE** A separate audio cable is available for purchase.
2	REF	Bi- or tri-level genlock input.
3	TALLY	Connect to a production switcher for the transfer of tally signals between in-studio switchers and on-site cameras. The Monarch EDGE S1 can be paired with another Monarch EDGE S1, a Monarch EDGE E4, or a Monarch EDGE D4. When paired with another S1 or E4 device, four GPI inputs and outputs are usable on each device (tally connections 5, 6, 7, and 8 are not available). When paired with a D4 device, the Tally behavior works similar to the typical Monarch E4 to D4 behavior.
4	SDI 1 and SDI 2[1]	SDI 1 functions as the input. SDI 2 functions as the output. Both connections are 3G SDI per SMPTE ST 425 (Level A mapping only) and support 8- and 10-bit simultaneous encoding and decoding capability.
5	SFP28 1 and 2	SFP 1 and 2 are MSA-compatible SFP28 cages supporting 10 and 25 GbE modules. To be supported in a future release for SMPTE ST 2110 signals. **NOTE** The SFP28 connectors are shown for illustration purposes only. They are not included with your Monarch EDGE, and must be purchased separately from a third-party.

	Connector	Description
6	DisplayPort[2]	Connect a DisplayPort monitor to this connector to use as a preview monitor for your video sources. If your monitor does not have a DisplayPort connector, you can use an HDMI or DVI-D adapter. Use only HD monitors (1920 × 1200 maximum) for DisplayPort preview. Higher resolution monitors will negatively impact processing performance.
7	USB 3.0 port	For encoding, this port can be used for saving recorded content to a compatible USB device. NTFS and FAT32 file systems are supported, however, please note that FAT32 has a maximum file limitation size of 4 GB.
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, or if you want to separate your control network from your media network, 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).

1. If your SDI input source changes from interlaced to progressive while streaming, the input will become disabled, and you will need to re-enable the input to continue streaming.
2. The preview feature will affect the Monarch EDGE encoding and decoding performance. If you use preview while the Monarch EDGE is streaming, you may experience performance-related issues.

Matrox Monarch EDGE front panel

This section describes how to use the Matrox Monarch EDGE front panel buttons. Although the Monarch EDGE E4 8-bit appliance is shown, this information applies to all versions of Monarch EDGE.

When not being used (idle mode), the Monarch EDGE LCD screen will not display information. Otherwise, it 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). When in Static IP mode, you can also specify the desired IP address.
	Audio settings	Select the audio source for the Line Out connector.
	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 is 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 Video support.

1. To enter maintenance mode, press the **RESET** pin on the Monarch EDGE front panel for more than 10 seconds. Do not use this mode unless asked by Matrox Video technical support and under their supervision.

CHAPTER 3

Monarch EDGE firmware update and Control Hub installation

This chapter includes the following topics:

Update and installation prerequisites

Before you update your Monarch EDGE firmware and install Monarch EDGE Control Hub, please 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 connector 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.

NOTE It is possible to remotely update the firmware on one device at a time using Monarch EDGE Command Center's Updater. For more information see "*Using Updater* on page 81.

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

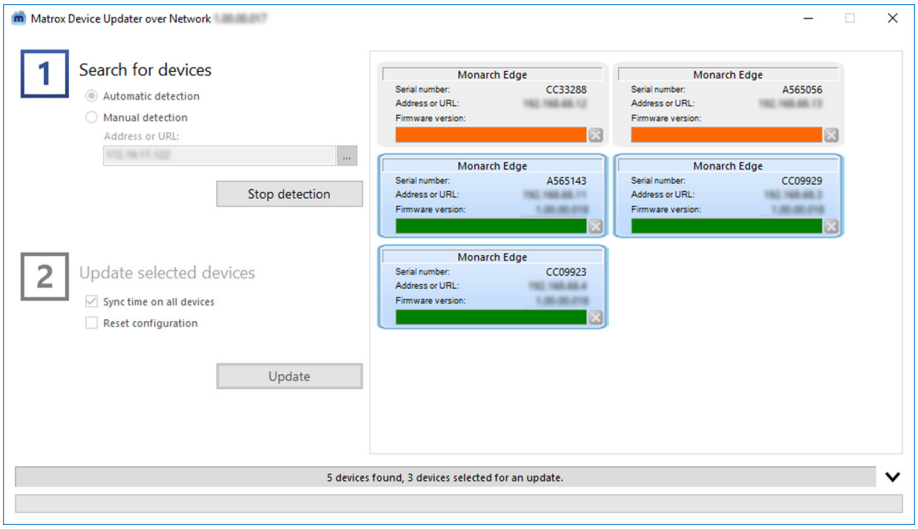
Step 1. Read "*Update and installation prerequisites* on page *13*.

Step 2. Download the Matrox Monarch EDGE firmware updater from the Matrox Video website at *https://video.matrox.com/en/apps/drivers/home*.

Step 3. Run the firmware updater.

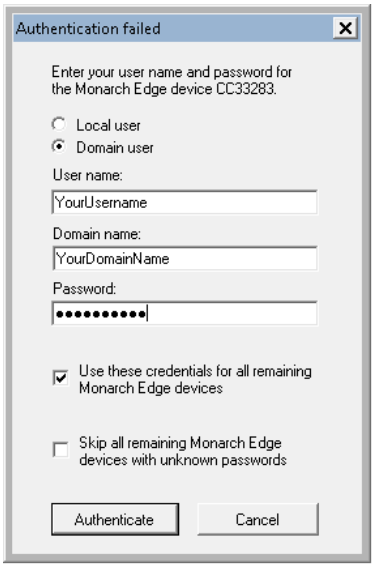
Step 4. Select **Automatic detection**, or **Manual detection** to search for devices on different subnets, then click **Search**.

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 device 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 *13*.

Step 2. Download the Matrox Monarch EDGE Control Hub installation program from *https://video.matrox.com/en/apps/drivers/home*.

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:

- 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 (see "*Installing Monarch EDGE Control Hub*" on page *15*), then uninstall Monarch EDGE Control Hub, or repair the installation if it is already installed.

CHAPTER 4

Network management

This chapter includes the following topics:

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 Series 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.

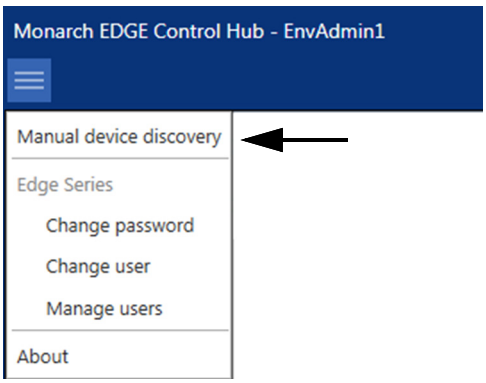
Discovering devices manually

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

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

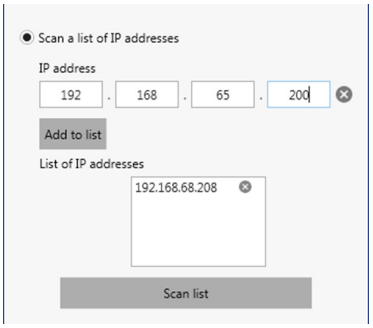
Step 1. Go to **Start > Programs > Matrox Monarch EDGE Control Hub**.

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**.

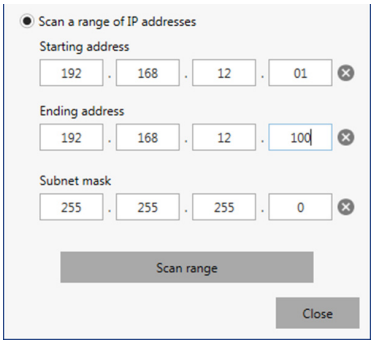
b. Enter the IP address of the Monarch EDGE to add.

c. Click **Add to list**.

d. If needed, repeat steps **a** to **c** to add more Monarch EDGE devices.

e. Click **Scan list**.

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.

Result of this task: Monarch EDGE Control Hub discovers the devices and you can add them to your environment.

Assigning a static IP address to a Monarch EDGE

After your Monarch EDGE has been connected, powered up, and has a DHCP-assigned IP address, you can assign it a static IP address from Monarch EDGE Command Center (see "*Configuring Network settings*" on page *69*) or from the LCD screen on the device as described below:

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 the static IP address you entered.

When done, remember: If your Monarch EDGE already has a static IP address, you can change it to a new static IP address using this same method.

Monarch EDGE firewall requirements

This section describes the firewall requirements for the Monarch EDGE device, firmware updater application, Monarch EDGE Control Hub, and Monarch EDGE Command Center.

Network port	Type	Inbound	Outbound	Functionality
20, 21	TCP	Yes	N/A	**FTP:** File download (failsafe or firmware)
69	UDP	N/A	Yes	**DHCP:** DHCP client
123	UDP	N/A	Yes	**NTP:** Network Time Protocol
443[1]	TCP	Yes	N/A	**HTTPS:** Monarch EDGE Control Hub commands, authentication, firmware update, and tally
80	TCP	Yes	N/A	**HTTP:** Monarch EDGE Command Center
1500 (default)	UDP	N/A	Yes	**MPEG-2 TS:** Streaming (configurable)
1500 (default)	UDP	Yes	Yes	**SRT:** Streaming (configurable)

Network port	Type	Inbound	Outbound	Functionality
1900, 11900	UDP	Yes	Yes	**UPnP:** Microsoft SSDP for discovery of UPnP devices
Ephemeral[1]	UDP	Yes	Yes	**RTP/RTCP:** Audio and video streams and control
1935	TCP	N/A	Yes	**RTMP:** Streaming (configurable)
3049	TCP	Yes	Yes	**RTSP:** Streaming (configurable)
1022 - 1025	UDP	Yes	Yes	**RTSP:** Base ports for talkback

1. Minimum requirements.

CHAPTER 5

User and device management

This chapter includes the following topics:

About User and Device Management

You can use either Monarch EDGE Control Hub or Monarch EDGE Command Center to manage users and their access to devices. The user management capability of Command Center is a simplified version of what you can do in Control Hub.

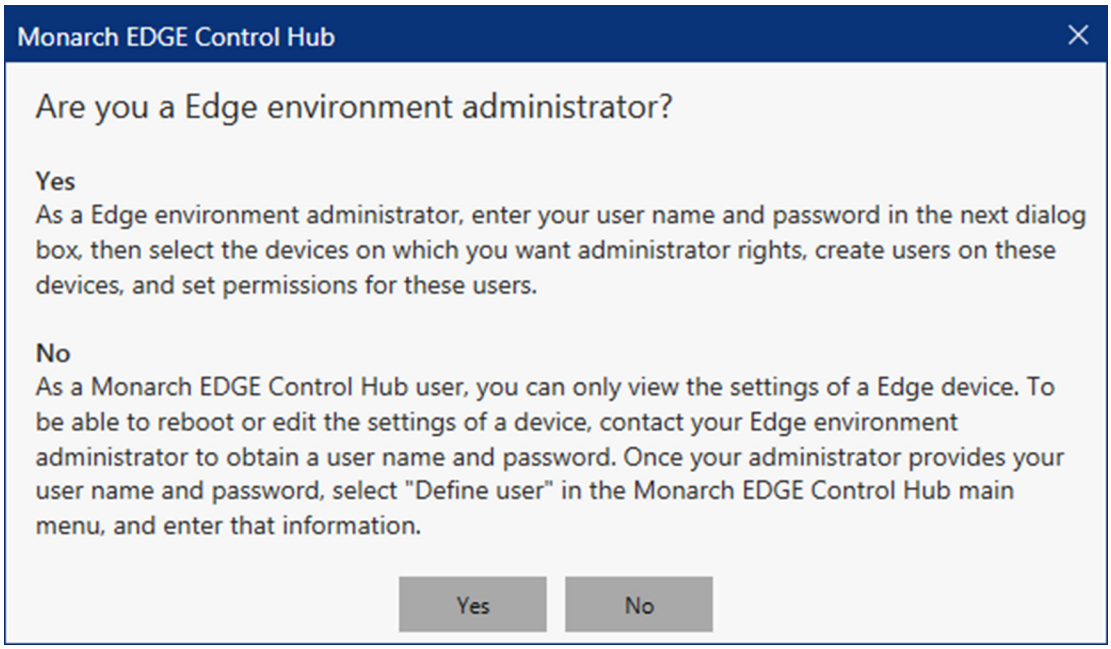
Monarch EDGE Control Hub: The Control Hub software enables you to discover and access any device on your DHCP-enabled network, including devices on different subnets. Anyone can open Matrox Monarch EDGE Control Hub to view the discovered Monarch EDGE devices, but you must be an environment administrator or an authorized user with the proper credentials to modify device settings.

Monarch EDGE Command Center: As a web-based configuration tool, Command Center offers simplified user management capability for a single Monarch EDGE device. You cannot use Command Center to view all EDGE devices on your network or to configure users on multiple EDGE devices. If a particular EDGE device has already been configured in Control Hub, the user management settings are inherited when you access the same device in Command Center.

This chapter only describes user management with Monarch EDGE Control Hub. For more information on how to manage users and devices on Monarch EDGE Command Center, see the chapter "*Monarch EDGE Command Center configuration*" on page *34*.

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 *22*.
- 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*.

- **They can create other environment administrators.**

  Only environment administrators can create and edit other environment administrator accounts. The “Edit users” permission has similar rights (e.g. see other users, edit permissions, etc) but the key difference is that a regular user cannot create or edit an administrator account, even if they have the “edit users” permission.

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**.

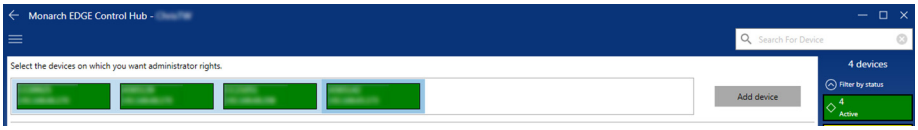
Step 3. If this is the first time you start Control Hub, you will be asked if you are an environment administrator. Click **Yes**.

Step 4. Enter the username and password you want to use for this environment administrator account, then click **Apply**.

Step outcome: Your environment administrator account is created. Now you need to select which Monarch EDGE devices this account controls.

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 *22*.

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).

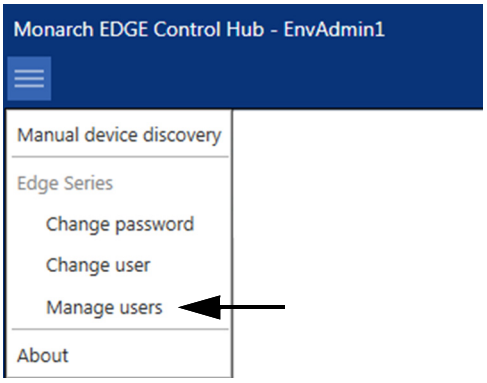
Creating a user account

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

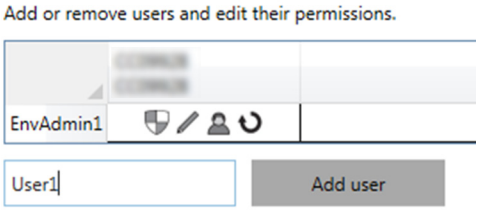
Step 1. Go to **Start > Programs > Matrox Monarch EDGE Control Hub**.

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**.



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.

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.

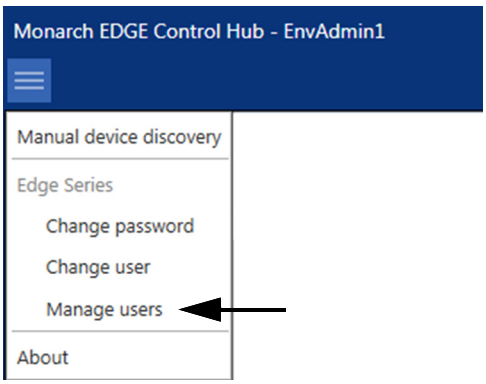
Transferring control to a different environment administrator

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**.

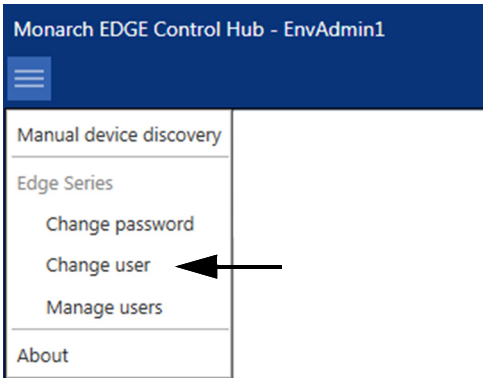
Step outcome: Monarch EDGE Control Hub opens and the Monarch EDGE devices on the network are displayed.

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*" on page *25*) 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 controls from it.

Changing the environment password

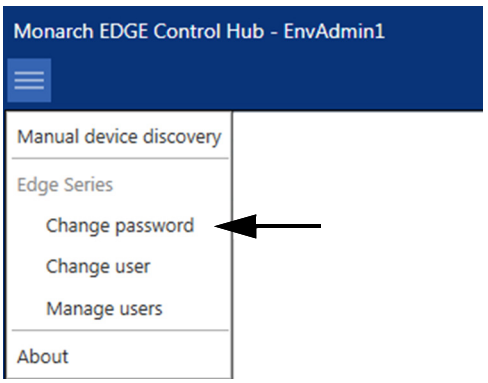
Environment administrators can change the password across all devices in the environment.

To change the environment password, follow the steps below:

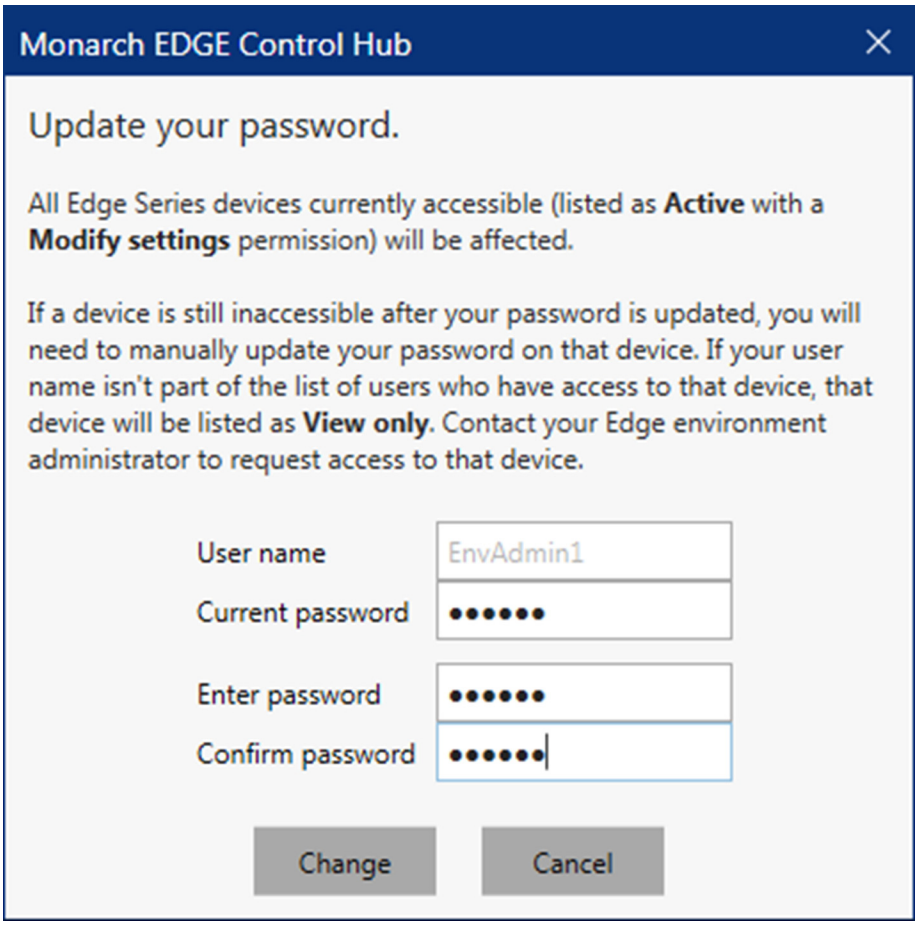
Step 1. Go to **Start > Programs > Matrox Monarch EDGE Control Hub**.

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

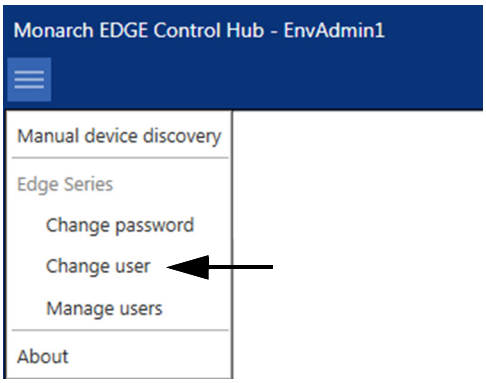
To change the user logged on to the Monarch EDGE Control Hub, follow the steps below:

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**.

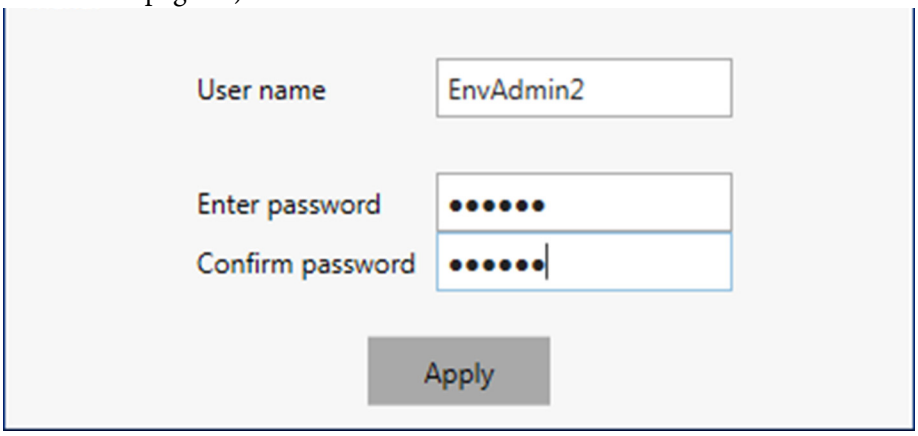
Example: The environment administrator *EnvAdmin1* is currently logged on.



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*).



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.

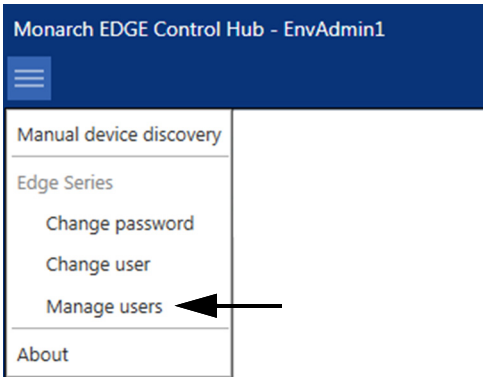
Managing user accounts and permissions

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**.

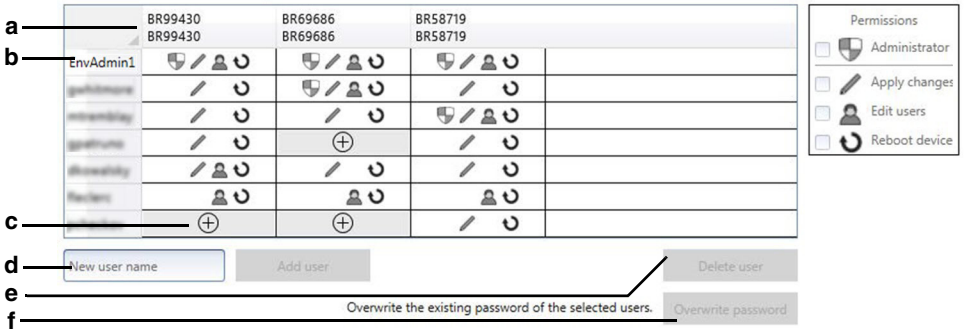
Step outcome: Control Hub displays the Monarch EDGE devices.

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.

Step 3. Modify your users as needed.



a. The devices controlled by the current environment administrator. Each column displays the device, its users, and their permissions.

b. The list of users on this environment. Click on a user to select it. **Shift-click** or **Ctrl-click** selects multiple users. The username at the top of the list is the one currently logged on to Control Hub.

c. Adds the user to the device and allows access to the permissions menu.

d. Adds a new user (see "*Creating a user account*" on page *25*).

e. Deletes the selected user. **Shift-click** or **Ctrl-click** selects multiple users.

f. Overwrites the selected users' passwords. **Shift-click** or **Ctrl-click** selects multiple users.

Step 4. Click **Apply**.

Result of this task: Your user modifications have been applied.

CHAPTER 6

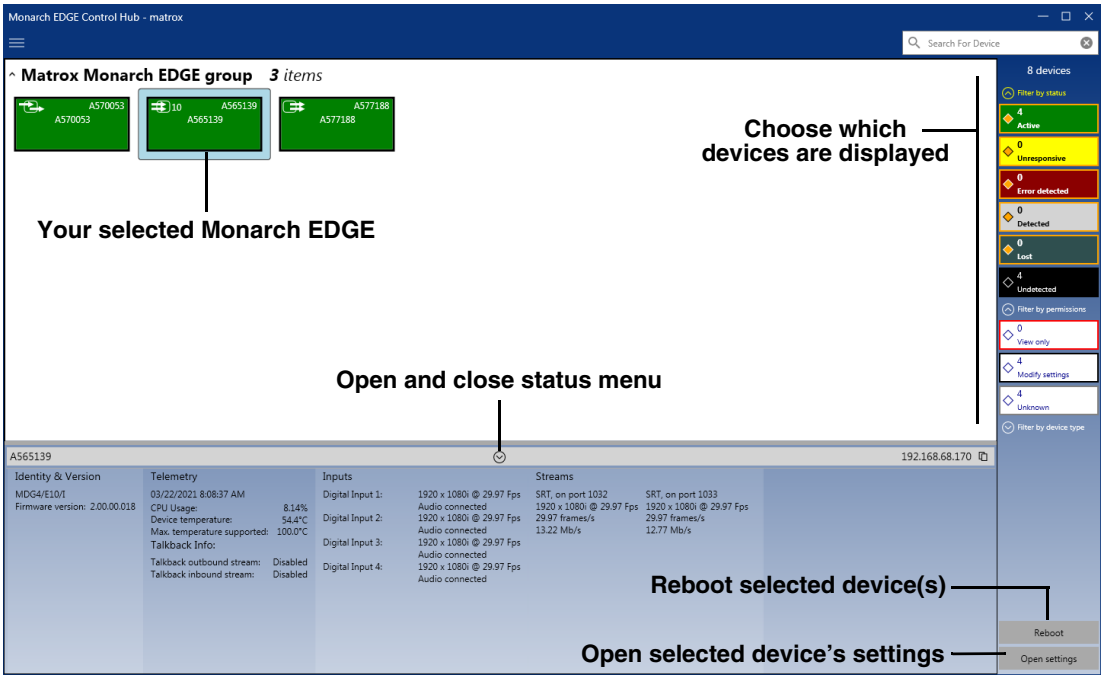
Monarch EDGE Control Hub configuration

This chapter includes the following topics:

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.

In the image below, for illustration purposes, three active Monarch EDGE devices are shown: a **Monarch EDGE E4** ( ), a **Monarch EDGE D4** ( ), and a **Monarch EDGE S1** ( ). Your Monarch EDGE environment will likely be different, and may show both active and inactive devices, as well as unresponsive devices or devices with other statuses.



About the Monarch EDGE Control Hub user interface

From the Control Hub's main page (see "*Monitoring Monarch EDGE devices*" on page *32*), you can double-click a device to launch the Matrox Monarch EDGE Command Center Web UI for control and configuration (see "*Monarch EDGE Command Center configuration*" on page *34*).

Grouping Monarch EDGE devices

From the main Monarch EDGE Control Hub page, you can group devices together into Logical groups or Sync groups.

Logical groups: These are standard groups of any number of Monarch EDGE devices. This type of grouping makes it easier to monitor your devices in the Control Hub user interface, especially when you have many devices in many different locations. You can also group devices that are paired. Other than visually, this grouping has no other effect on the devices themselves.

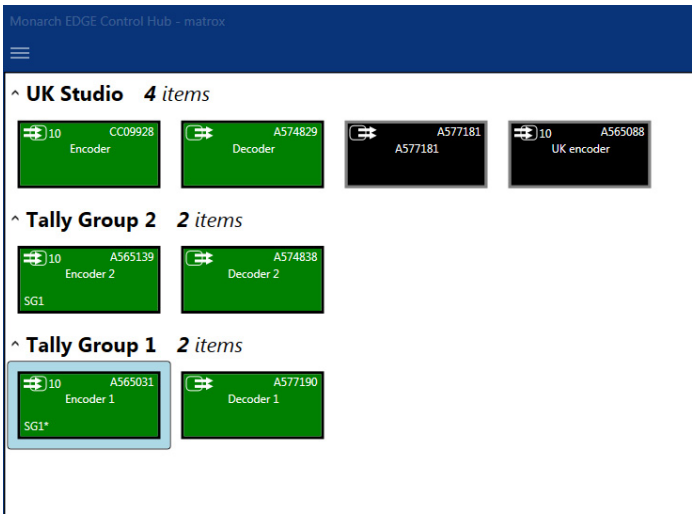
Sync groups: These are groups of Monarch EDGE E4 and S1 devices only, as you can only synchronize encoder-capable devices. Sync groups are not related to logical groups in any way; that is, devices that belong to one sync group can be found in different logical groups. Sync groups share a common timestamp value to allow for synchronization of streams by decoders (SRT and MPEG-2 TS only). Devices in a Sync group will have an SG# displayed depending on how many groups you have (e.g. SG1, SG2, SG3, etc).

To group devices together, right-click any of the devices on the main page and then select **Move to group** for a Logical group, or select **Move to sync group** to group encoders together for stream synchronization. You are able to create your groups from the right-click menu.

In the example on the right, you have both Logical groups and Sync groups.

There are two sets of devices paired for a Tally/GPI workflow. Notice that the encoders in each Logical group are also part of a Sync group.

In **UK Group**, devices are not part of a Sync group, but they are logically grouped by location, and two of them are offline.



CHAPTER 7

Monarch EDGE Command Center configuration

This chapter includes the following topics:

About Monarch EDGE Command Center

Monarch EDGE Command Center is a web-based configuration tool that allows you to configure a single Monarch EDGE device using a web browser (Google Chrome is recommended). It also includes almost all the same options as Monarch EDGE Control Hub except for the following:

- You cannot view all the EDGE devices on your network.
- You cannot manage users and their access to multiple devices, only the individual device you are logged on to.

Logging in to Monarch EDGE Command Center

To log in to your Monarch EDGE device's Command Center user interface, you must know the EDGE device's IP address.

If you don't know your device's IP address, and you have access to the physical EDGE device, you can see the IP address displayed on the LCD screen.

If you don't have access to the physical EDGE device, you can discover its IP address by using the Monarch EDGE Firmware Updater as described in "*Updating the Monarch EDGE firmware* on page *14*, or by using Monarch EDGE Control Hub (if you have it installed) as described in "*About Matrox Monarch EDGE device discovery* on page *17*.

When you know your device's IP address, log in to Monarch EDGE Command Center:

Step 1. Open your web browser (Google Chrome is recommended) and type your Monarch EDGE device's IP address in the address bar, then press **Enter**.

More info:

- If you enter only the IP address, Command Center will default to a non-secured HTTP connection. If you want HTTPS, you must enter the proper prefix as well (e.g. https://192.168.123.456).
- If your browser gives you a message saying that the website is not secure, you can ignore the message and continue to the login page. It only means

that the SSL certificate is not updated. This has no effect on the performance or security of the EDGE device.

Step outcome: The login page appears.

Step 2. Enter the username and password of the device, select whether or not to stay logged in, then click **Log in**.

More info: If this is the first time anyone has logged in to this particular EDGE device (e.g. it is a brand new device), the username and password you enter here *becomes* the administrator account. You will then be able to create users and assign permissions. If this EDGE has already been configured with a user account, such as from Monarch EDGE Control Hub, you must log in with the username and password that was previously assigned to it.

Result of this task: You are logged in to Monarch EDGE Command Center and can begin configuring your device as needed.

About the Monarch EDGE Command Center user interface

After you log in to your Monarch EDGE device, you will see the configuration page which consists of the following sub-sections:

Encode / Decode: These are the main settings related to video and audio streaming. Depending on which Monarch EDGE you have, you will see either **Encode** (Monarch EDGE E4), **Decode** (Monarch EDGE D4), or both (Monarch EDGE S1). For more information, see "*Configuring Encode settings*" on page *40*, and "*Configuring Decode settings*" on page *64*.

Transmuxing: These settings allow you to use an MPEG-2 TS stream as an input into the Monarch EDGE E4 and have it output as an SRT stream (for example, to a destination such as the Monarch EDGE D4). Similarly, on the encoder you can use an SRT stream as an input and output it as an MPEG-2 TS stream. On the decoder, you can take an SRT stream and output it as an MPEG-2 TS stream on LAN1 or LAN2, or take an MPEG-2 TS stream and output it as an SRT stream on LAN1 or LAN2. For more information, see "*Configuring Transmuxing settings*" on page *58*.

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 *69*.

Tally and Talkback: This is where you enable and use the Tally and Talkback functionality of the Monarch EDGE For more information, see "*Configuring Tally settings*" on page *70* and "*Configuring Talkback settings*" on page *72*.

Genlock: This is where you enable the genlock functionality for the Monarch EDGE E4 and set the genlock output to sync to NTSC or PAL frame rates. For more information, see "*Configuring Genlock settings*" on page *73*. The Monarch EDGE D4 and Monarch EDGE S1 genlock settings are described in "*Configuring Decode settings*" on page *64*.

DP Output: 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 DP Output settings*" on page *73*.

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 *74*.

Configuration: This is where you manage different configuration settings for your EDGE device. You can create preset configuration profiles that you can load to quickly configure other EDGE devices. For more information, see "*Managing configurations*" on page *75*.

Logs: This is where you can download the logs to be used for troubleshooting your Monarch EDGE, if needed. For more information, see "*Managing Logs*" on page *76*.

SyncGroup: This is where you create a group of EDGE devices that synchronize streaming across the entire group. For more information, see "*Managing SyncGroups*" on page *76*.

User management: This is where you add new users and grant them different permissions. This is a simplified version of the user management functionality on Monarch EDGE Control Hub. For more information, see "*Configuring User management settings*" on page *77*.

SRT statistics: This is where you can monitor your SRT statistics such as your latency and bandwidth, as well as export the information to a CSV file. The information on this page can help you optimize your SRT workflow. For more information, see "*Viewing SRT statistics*" on page *79*.

Docker: Connect to our Docker provider. For more information, see "*Connecting to Docker*" on page *80*.

Updater: Update your device firmware, or join an update group to both update your firmware and install the Docker platform. For more information, see "*Using Updater*" on page *81*.

Log out: Log out of Monarch EDGE Command Center.

Status: Verify the status of your Monarch EDGE at a glance. For more information, see "*Checking Status*" on page *82*.

Theme: Switch between a light and a dark theme for the user interface.

Reboot: Reboots the Monarch EDGE. You will be asked to confirm reboot.

Using the contextual menu for encoder and decoder settings

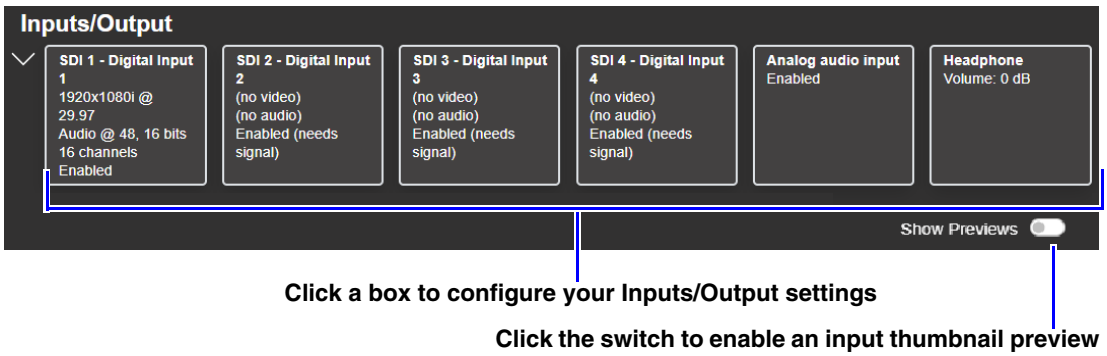
The **Encode** and **Decode** sections of the Monarch EDGE Command Center user interface allow you to configure your settings in a single window by using a contextual menu that changes depending on where you click.

In the following image, if you click on any of the areas indicated, the menu on the right of the Monarch EDGE Command Center window will change to display the relevant settings. The active area of Command Center will have a blue border (e.g. in the image, **SDI 1** is selected).

The image below shows the encoder settings for a Monarch EDGE E4, but the user interface works the same way for Monarch EDGE D4 and Monarch EDGE S1; that is, as a menu that dynamically displays the relevant configuration settings depending on where you click.

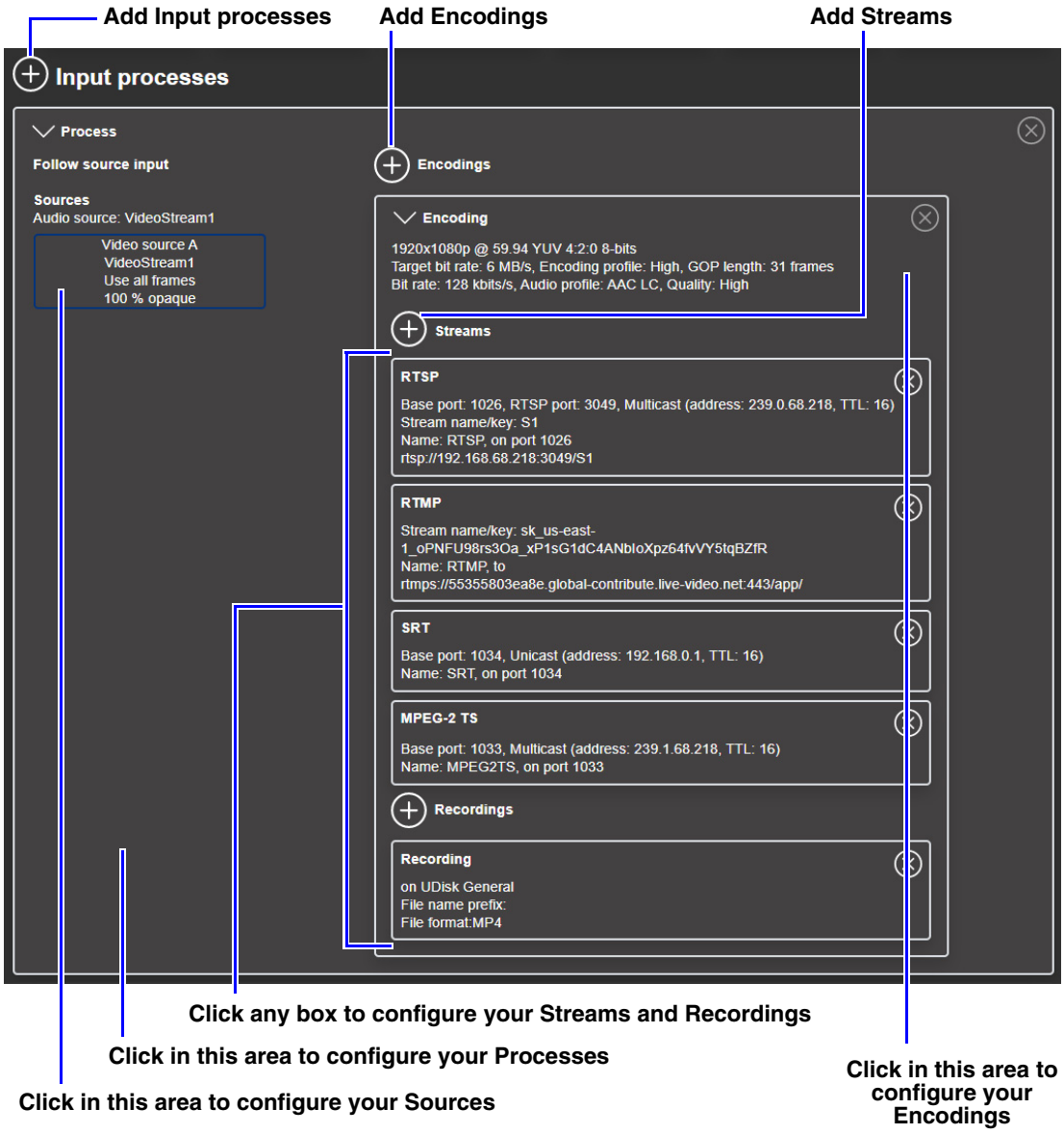
This image does not necessarily represent a realistic user scenario, it is intended simply to show you where in the user interface you can click to access the desired settings.

Monarch EDGE E4

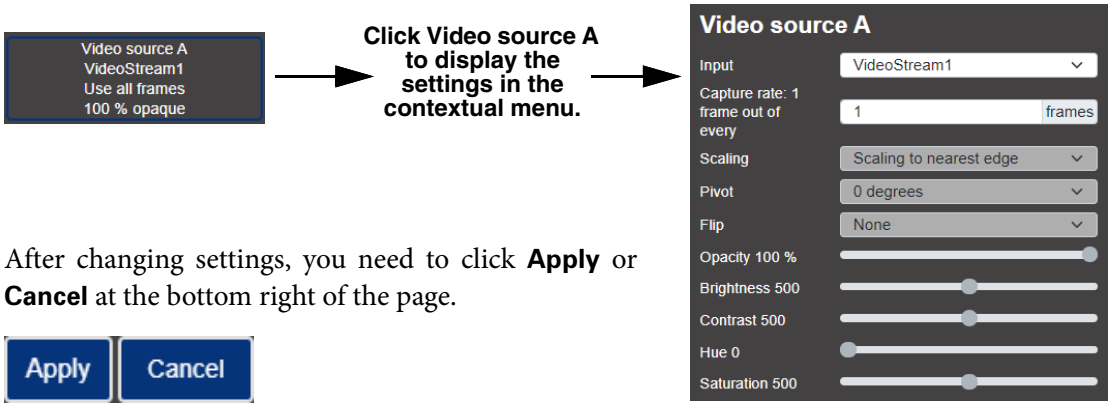


Click a box to configure your Inputs/Output settings

Click the switch to enable an input thumbnail preview



Clicking any of the above areas shows the settings in the contextual menu, as follows.



After changing settings, you need to click **Apply** or **Cancel** at the bottom right of the page.

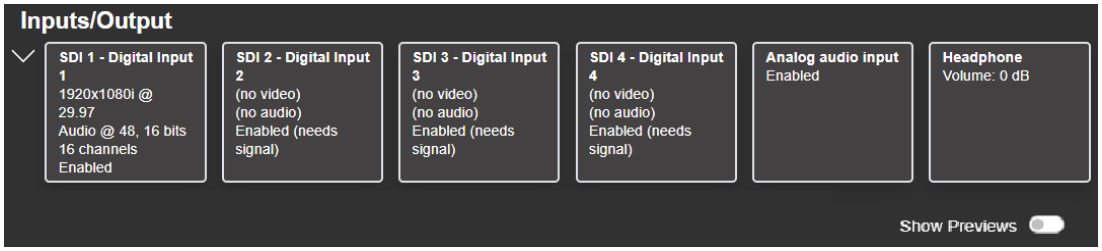
Configuring Encode settings

This section describes the Monarch EDGE Command Center **Encode** settings for your Monarch EDGE E4 and Monarch EDGE S1.

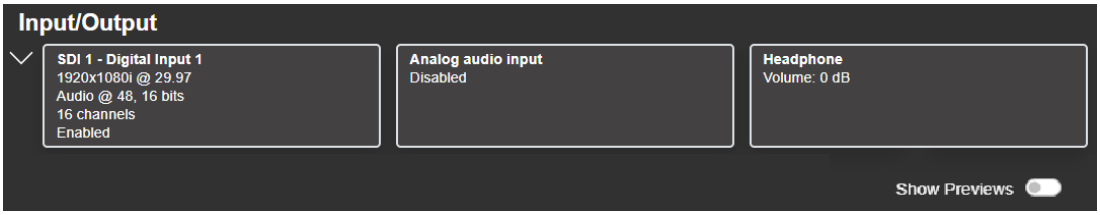
Inputs/Output

This section describes the **Inputs/Output** settings in Monarch EDGE Command Center.

Monarch EDGE E4 settings



Monarch EDGE S1 settings



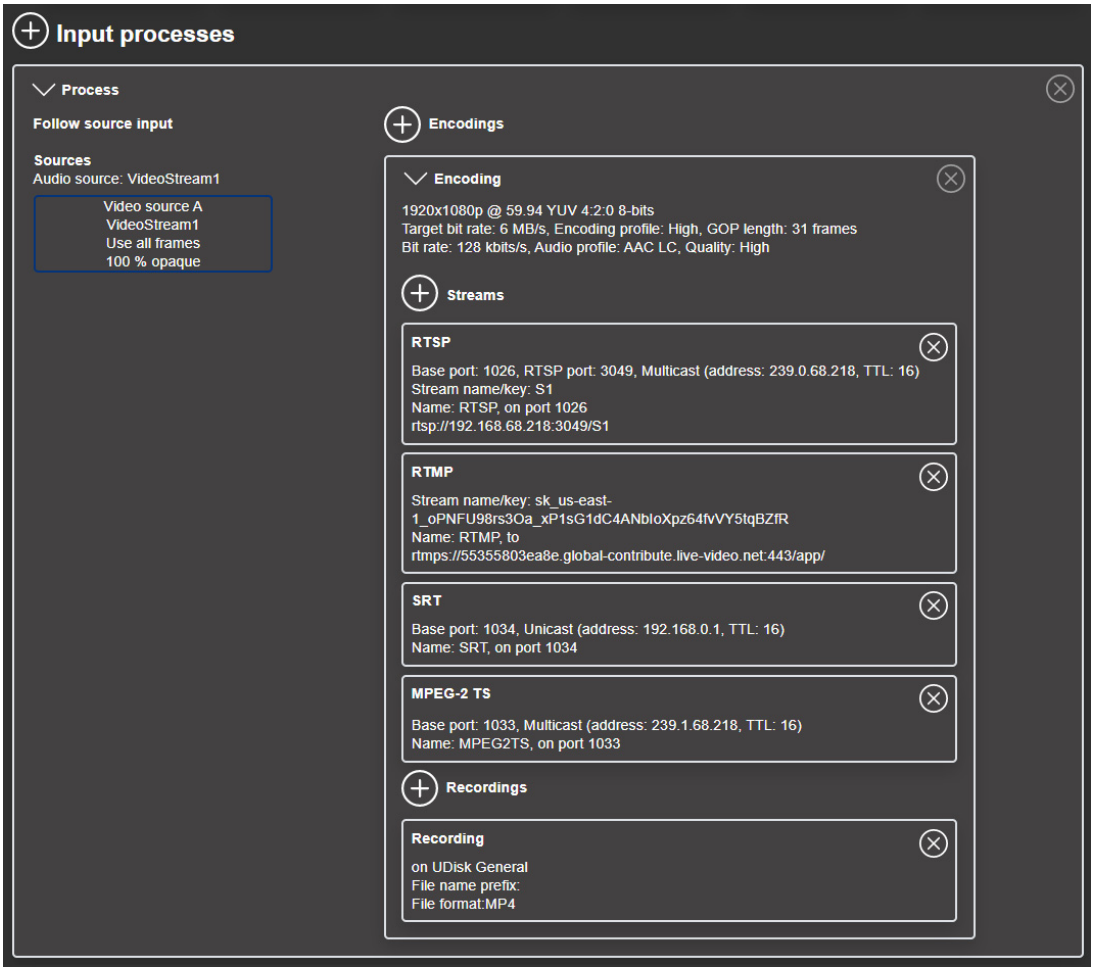
Connector	Setting	Description
SDI Inputs 1 to 4 (Monarch EDGE E4)[1] **SDI Input 1 (Monarch EDGE S1)**	**Enable input**	Enable the input. Monarch EDGE detects the input resolution but you still need to enable the input. Monarch EDGE will not stream unless there is an input connected to it.
	Input name	Give the input a specific name.
	Enable PCM mode[2]	Enable PCM mode to detect and transport the audio as is from the SDI input to a decoder.
	Enable Preview	Enable the input preview.
Analog Audio Input[3]	**Enable input**	Enable your XLR analog audio input.
	Gain	Increase or decrease the amplitude of your analog audio input.

Connector	Setting	Description
Headphone	**Audio source**	Select which audio source to output through the Monarch EDGE headphone jack.
	Volume	Increase, decrease, or mute the headphone volume.
-	**Show Previews**	Show input thumbnail previews that refresh every 5 seconds. The input's preview must be enabled for it to show.

1. The audio value shown here is what the SDI input is feeding to the Monarch EDGE's codec. For example, even if your video contains 24-bit audio, the AAC codec can only handle 16-bit so that is what is displayed.
2. Available for MPEG2-TS and SRT streams only. When Enable PCM mode is enabled, streams that do not support PCM audio will be marked as invalid. The invalid streams must be deleted before clicking Apply.
3. Available only when the Talkback feature is disabled.

Input processes

This section describes the **Input processes** settings in Monarch EDGE Command Center.



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. For interlaced signals, you **must** select this option for the interlaced nature of the signal to be pre-served in the encoding process.

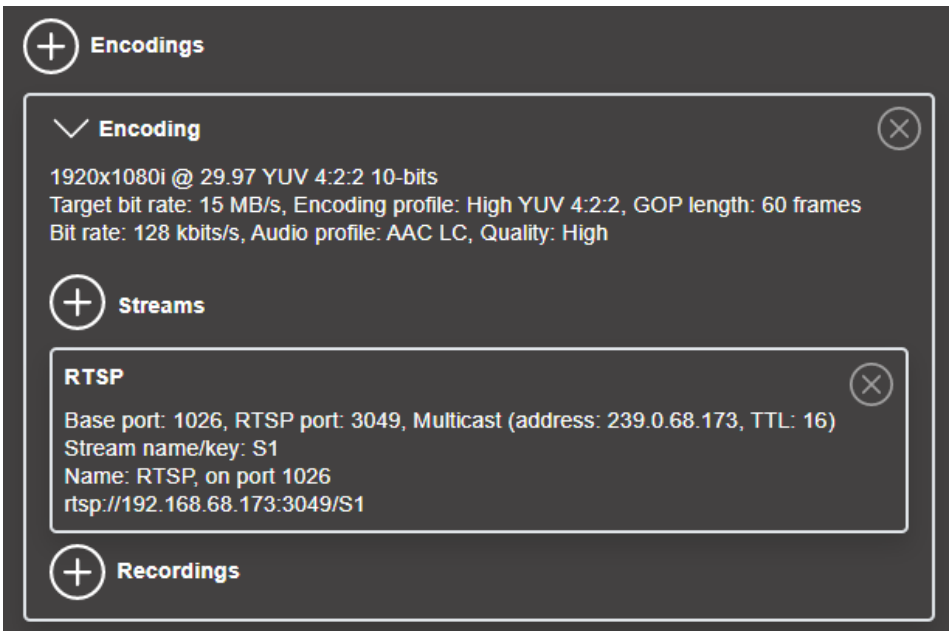
Setting	Description
Continue streaming on signal loss	In the event of a signal loss, enabling this option will ensure Monarch EDGE continues streaming at the previous resolution and frame rate when the signal is restored. The behavior of this option depends on whether or not **Follow source input** is enabled: • If it is enabled, the signal will resume at the same resolution as the source input. If you change the resolution and frame rate of the source, you will need to restart your stream. • If it is disabled, the signal will resume at the resolution specified by the **Frame size** and **Frame rate** settings. **NOTE** When enabled, this feature applies to all inputs.
Test mode	In the absence of a valid video source, enabling this option allows you to proactively validate the connection between your encoders and decoders. You can test each input process individually. The process will appear with an orange border when test mode is enabled.
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.
Enable logo	When this option is selected the chosen image file will appear in the live stream, or in the test stream if test mode is enabled.
Selected logo	From the list of saved image files, select the one that will appear in the stream.
Add logo	Choose an image, give the image a name, and click **Add** to save it on your Monarch EDGE device. **NOTES** Create the graphic based on the dimensions you want it to appear in your stream. Logo images must be in PNG format and no more than 500 KB. Up to 10 logo images can be stored on your Monarch EDGE device.

Setting	Description
Manage logos	Delete image files that are no longer needed.
Logo position	Select the position of the logo on the screen.
Video sources	
Input	Select the input to use for your source.
Capture rate	Select the rate of capture per input.
Scaling	Select how to scale your video: • **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	Change the orientation of your source: • **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: • **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 Command Center.



NOTE One RTSP stream is active by default when you create a new Encoding. For more information, see "*Streams*" on page *50*.

Setting	Description
Include	Select the signals to include (**Audio only**, **Video only**, or **Audio and video**) in your encoding.
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 canvas uses a different size, your encoder scales the video to the specified size (image may be distorted). The width ranges from 64 to 3840 and must be a multiple of 16. The height ranges from 64 to 2160 and must be an even number.
Scaling	Select how to scale your video: • **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.

Setting	Description
Pivot	Change the orientation of your source: • **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.
Flip	Select the plane along which the source is flipped: • **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	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.
Encoding profile[1]	Select an encoding profile for your signal. Changing the encoding profile may prevent your decoder from streaming. • **Baseline** • **Main** • **High** • **High 10-bit** (if available) • **High YUV 4:2:2** (if available)
Target bit rate	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 may require higher network bandwidth.
Bit rate control	Select one of the following: • **Use variable bit rate** • **Use constant bit rate**

Setting	Description
Maximum bit rate	The maximum bit rate for variable bit rate encoding. When encoding, the processor attempts to use the target bit rate but may use up to the maximum bit rate specified here. The default is 22.5 Mb/s. The maximum bit rate you can set is 120 Mb/s.
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.
Encoding mode	Select one of the following: • **Optimized for low latency**[2] Potentially reduces the delay between the time the video is captured on the encoder and the time it's shown on a monitor connected to a decoder (not supported on third-party decoders). • **Favor image quality**[3] Favors image quality over latency, but may introduce extra frames of delay in certain circumstances. Matrox Video highly recommends this setting when using default encoding parameters.
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 GOP length 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[4]). 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.

Setting	Description
AAC encoder	Select one of the following: • **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. • **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: • **ADTS** • **No container format**
No. of Audio Channels[5]	Select the number of channels.

1. The encoding profile you want may not be available depending on the pixel format of your video.
2. Low latency cannot be maintained if you change the Monarch EDGE Encoder settings while streaming to the Monarch EDGE Decoder. To re-establish low latency, go to your Monarch EDGE Decoder's SDI Output settings, disable the output, set **Output stream selector** to **None**, then click **Apply**. After you have disabled the output and the stream, re-enable both of them to ensure low latency is restored to your stream.
3. The **Optimized for low latency** mode does not necessarily result in improved latency, as you may have the same latency performance as the **Favor image quality** mode. However, the **Favor image quality** mode will always result in a better quality image and is recommended unless specific encoder uses cases are validated.
4. There are no B frames in low latency mode.
5. Only applicable when PCM mode is enabled. You must have a source that contains the selected channels.

Streams

This section describes the **Streams** settings in Monarch EDGE Command Center.

Setting	Description
RTSP	
Enable stream	Enable or disable your stream.
Audio pair selection	Select the audio pair you want to encode. You can select one pair per stream, but you can create additional streams and select a different audio pair for each of them (e.g. use the same stream but with a different language for each other audio pair).
Base port	The port number used to transmit your stream.
Name	Enter a name for your stream.
Network interface	Select LAN1 or LOCAL.[1]
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.

Setting	Description
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: • **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.
RTMP	
Enable stream	Enable or disable your stream.
Audio pair selection	Select the audio pair you want to encode. You can select one pair per stream, but you can create additional streams and select a different audio pair for each of them (e.g. use the same stream but with a different language for each other audio pair).
Push location	The path of your RTMP stream.
Name	Enter a name for your stream.
Network interface	Select LAN1 or LOCAL.[1]
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**).
RTP	
Enable stream	Enable or disable your stream.
Audio pair selection	Select the audio pair you want to encode. You can select one pair per stream, but you can create additional streams and select a different audio pair for each of them (e.g. use the same stream but with a different language for each other audio pair).
Base port	The port number used to transmit your stream.

Setting	Description
Name	Enter a name for your stream.
Network interface	Select LAN1 or LOCAL.[1]
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: • **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.
MPEG-2 TS	
Enable stream	Enable or disable your stream.
Audio pair selection	Select the audio pairs you want to encode. You can select up to eight pairs (16 audio channels) per stream, but you can create additional streams and select different audio pairs for each of them. **NOTE** The embedded audio channel mapping from Monarch EDGE Encoder to Decoder will match, regardless of which audio channels you select. For example, if you select audio pairs 1-2 and 13-14 on the encoder side, they will be mapped to the same locations on the decoder side. The other audio channels will be blank.
Base port	The port you are transmitting to on the receiving device.
Name	Enter a name for your stream.
Network interface	Select LAN1, LAN2, or LOCAL.
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.

Setting	Description
Routing scheme	Select one of the following: • **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.
Enable ancillary data	If 608/708 closed captioning or SCTE 104 signals are present, selecting this option will enable passthrough of the ancillary data as per the ST-2038 specification.
Convert SCTE-104 to SCTE-35	If you enable this option, SCTE-104 messaging signals (used for commercial breaks and ad insertions) are converted to SCTE-35 signals. These messages are embedded in the transport stream.
Enable RTP	Enables RTP. **NOTE** If this option is disabled, UDP will be used.
Enable Custom PIDs[2]	If you enable this option, you must attribute a unique packet identifier to audio channels.[3] • With *Enable PCM Mode* selected, assign a packet identifier to each track of 8 channels. • With *Enable PCM mode* not selected, assign a packet identifier to each pair of audio channels. **NOTE** The order of the packet identifiers determines the order of the audio channels. Therefore, you must assign PIDs in ascending order to avoid changing how audio channels are mapped.
Video and PCR PID	When *Enable custom PIDs* is selected, you must enter a unique packet identifier for video and PCR.[3]
ANC PID	When *Enable ancillary data* and *Enable custom PIDs* are both selected, you must enter a unique packet identifier.[3]
SCTE-35 PID	When *Convert SCTE-104 to SCTE-35* and *Enable custom PIDs* are both selected, you must enter a unique packet identifier.[3]

Setting	Description
SRT	
Enable stream	Enables the SRT stream to the specified location.
Audio pair selection	Select the audio pairs you want to encode. You can select up to eight pairs (16 audio channels) per stream, but you can create additional streams and select different audio pairs for each of them. **NOTE** The embedded audio channel mapping from Monarch EDGE Encoder to Decoder will match, regardless of which audio channels you select. For example, if you select audio pairs 1-2 and 13-14 on the encoder side, they will be mapped to the same locations on the decoder side. The other audio channels will be blank.
SRT Protocol	Set your SRT protocol to **Caller**, **Listener**, or **Rendezvous**. • **Caller:** The device must know the public IP address and port number of the **Listener**. • **Listener:** The device only needs to know that it should listen for an SRT stream on a certain port. • **Rendezvous:** Allows two devices to negotiate an SRT session over a mutually agreed upon port. Both source and destination must be in **Rendezvous** mode.
Base port	The port you are transmitting to on the receiving device.
Name	Enter a name for your stream.
Network interface	Select LAN1, LAN2, or LOCAL.
Encryption	Select one of the following: • **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.

Setting	Description
Unicast address	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.
Stream ID	Enter a Stream ID up to 512 characters. Use it to identify the user from the caller side and specify the connection's purpose, such as streaming a file. Include the resource name if the listener has multiple resources, and the desired connection mode (receiving, sending, or both). Although any format is acceptable, following SRT conventions is recommended for consistency.
Enable ancillary data	If 608/708 closed captioning or SCTE 104 signals are present, selecting this option will enable passthrough of the ancillary data as per the ST-2038 specification.
Convert SCTE-104 to SCTE-35	If you enable this option, SCTE-104 messaging signals (used for commercial breaks and ad insertions) are converted to SCTE-35 signals. These messages are embedded in the transport stream.
Enable Custom PIDs[2]	If you enable this option, you must attribute a unique packet identifier to audio channels.[3] • If *Enable PCM Mode* is selected, assign a packet identifier to each track of 8 channels. • If *Enable PCM mode* is not selected, assign a packet identifier to each pair of audio channels. The order of the packet identifiers determines the order of the audio channels. Therefore, you must assign PIDs in ascending order to avoid changing how audio channels are mapped.
Video and PCR PID	When *Enable custom PIDs* is selected, you must enter a unique packet identifier for video and PCR.[3]
ANC PID	When *Enable ancillary data* and *Enable custom PIDs* are both selected, you must enter a unique packet identifier.[3]
SCTE-35 PID	When *Convert SCTE-104 to SCTE-35* and *Enable custom PIDs* are both selected, you must enter a unique packet identifier.[3]

1. RTSP, RTMP, and RTP streaming protocols are officially supported only on LAN1 and LOCAL (problems may occur if you use LAN2).
2. With this feature enabled, changes can only be applied once a unique packet identifier is entered in each of the required fields.
3. Supported packet identifiers are 32 through 8190 inclusive.

Recordings

This section describes the **Recordings** settings in Monarch EDGE Command Center.

Setting	Description
Enable recording	Enable or disable your recording. If **Scheduled recording** is enabled, this option isn't available.
File name prefix	The video file name is made up of two parts: • **First part** - The name, which you enter. • **Second part** - The timestamp of when the video file started, which your encoder defines. The resulting file name is *Prefix[YYYY-MM-DD_HH-MM-SS].mp4*, where YYYY is the year, MM the month, DD the day, HH the hour (in a 24-hour format), MM the minutes, and SS the seconds. A file name prefix can be up to 19 characters long.
File format	Select the format for your recording (MP4 or MOV). To use fragmented MP4, enable the **Use MP4 file fragmentation** option. This option ensures your recorded file won't be corrupted in the event your network connection is disrupted.
Maximum file block duration	Enter the recording time for each video file recorded. Once the recording time for a file is reached, Monarch EDGE creates a new file. A file can hold up to 8 hours of recording. If the sampling rate (audio or video) changes, a new file is created, regardless of the file duration.

Setting	Description
Record to	Under **Record to**, provide the path to the existing network shared folder or select the external storage device where your video files will be stored. **NOTE** To make sure the network path is properly recognized by your device, we recommend you provide the full computer name or the IP address of the system where the shared folder is located. The full computer name is part of the Windows properties of the system. For example, the full computer name of network-server may be *networkserver.domain.com*. For more information, contact your network administrator. To safely remove an external storage device from your system, select the device you want to remove, then click the **Eject** (⏏) button.
Add network shared folder	Enter the path to the existing network shared folder, then select how to connect to the shared folder: • **Connect as guest** - If your network drive doesn't require user identification, use this. When you're done, click **OK**. • **Connect with credentials** - If your network drive requires user identification, enter a User name and Password. When you're done, click **OK**.
Manage network shared folders	Use this to review your list of credentials, and to remove user names and passwords that are no longer required.
Scheduled recording	Enable this to schedule a date, time, and duration for your encoder to record a video file. • **Start recording at** - Enter the date and time to start recording. • **Stop recording at** - Enter the date and time to stop recording.

Configuring Transmuxing settings

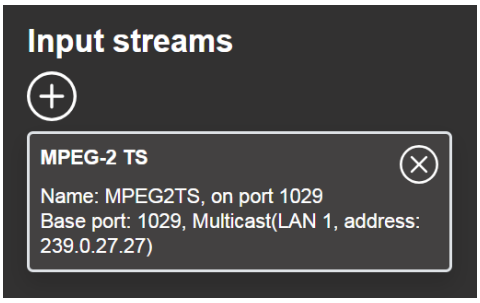
This section describes the Monarch EDGE Command Center **Transmuxing** settings for Monarch EDGE encoders and decoders.

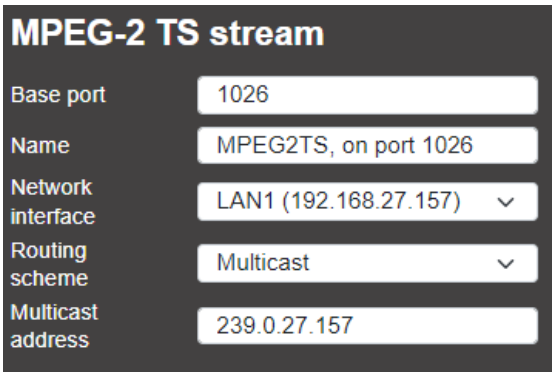
MPEG-2 TS to SRT

This section describes the Monarch EDGE Command Center **Transmuxing** settings, from MPEG-2 TS to SRT, for your Monarch EDGE E4 encoder, Monarch EDGE D4 decoder, and Monarch EDGE S1.

Input streams

This section describes the **Input streams** (MPEG-2 TS) settings in Monarch EDGE Command Center.



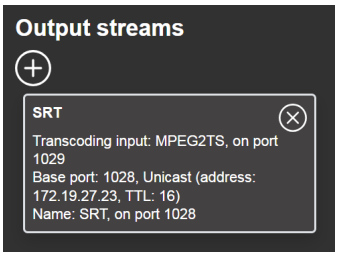


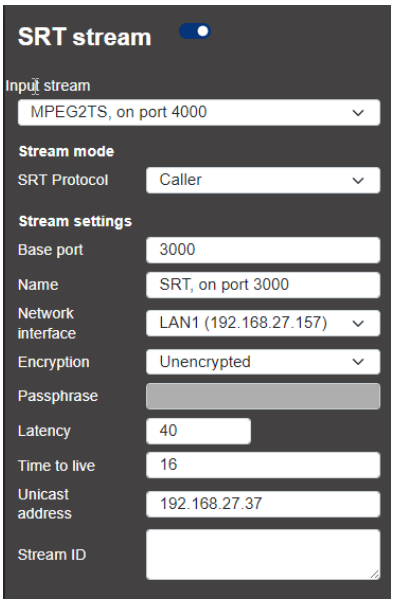
Setting	Description
Base port	The port number used to transmit your stream.
Name	Enter a name for your stream.

Setting	Description
Network interface	Select LAN1, LAN2 or LOCAL.
Routing scheme	Select one of the following: • **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.

Output streams

This section describes the **Output streams** (SRT) settings in Monarch EDGE Command Center.





Setting	Description
SRT stream	Enable or disable your stream using the radio button.
Input stream	Select the input stream you want to assign to the selected SRT output.
Stream mode	
SRT Protocol	Set your SRT protocol to **Caller**, **Listener**, or **Rendezvous**. • **Caller:** The device must know the public IP address and port number of the **Listener**. • **Listener:** The device only needs to know that it should listen for an SRT stream on a certain port. • **Rendezvous:** Allows two devices to negotiate an SRT session over a mutually agreed upon port. Both source and destination must be in **Rendezvous** mode.
Stream settings	
Base port	The port you are transmitting to on the receiving device.
Name	Enter a name for your stream.
Network interface	Select LAN1, LAN2 or LOCAL.
Encryption	Select one of the following: • **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.
Unicast address	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.

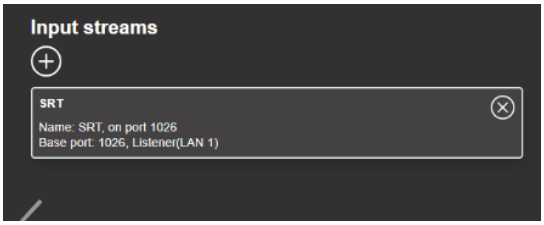
Setting	Description
Stream ID	Enter a Stream ID up to 512 characters. Use it to identify the user from the caller side and specify the connection's purpose, such as streaming a file. Include the resource name if the listener has multiple resources, and the desired connection mode (receiving, sending, or both). Although any format is acceptable, following SRT conventions is recommended for consistency.

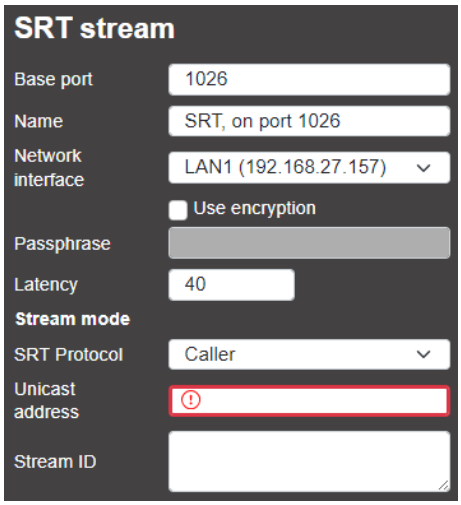
SRT to MPEG-2 TS

The following Input streams and Output streams sections describe the Monarch EDGE Command Center **Transmuxing** settings, from SRT to MPEG-2 TS, for your Monarch EDGE E4 encoder, Monarch EDGE D4 decoder, and Monarch EDGE S1.

Input streams

This section describes the **Input streams** (SRT) settings in Monarch EDGE Command Center.

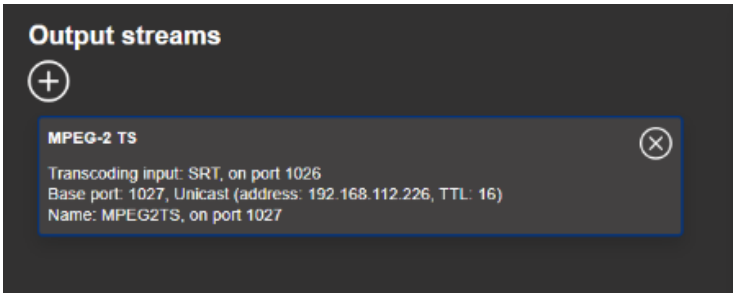


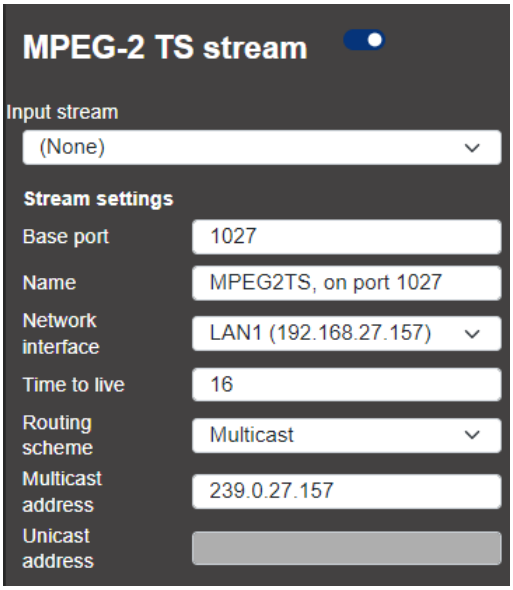


Setting	Description
Base port	The port number used to transmit your stream.
Name	Enter a name for your stream.
Network interface	Select LAN1, LAN2 or LOCAL.
Use encryption	Select one of the following: • **Unencrypted** • **AES-128** • **AES-192** • **AES-256**
Passphrase	When using encryption, this is 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.
Stream mode	
SRT Protocol	Set your SRT protocol to **Caller**, **Listener**, or **Rendezvous**. • **Caller:** The device must know the public IP address and port number of the **Listener**. • **Listener:** The device only needs to know that it should listen for an SRT stream on a certain port. • **Rendezvous:** Allows two devices to negotiate an SRT session over a mutually agreed upon port. Both source and destination must be in **Rendezvous** mode.
Unicast address	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.
Stream ID	Stream ID is available only when **SRT protocol** is selected as **Caller**. Enter a Stream ID up to 512 characters. Use it to identify the user from the caller side and specify the connection's purpose, such as streaming a file. Include the resource name if the listener has multiple resources, and the desired connection mode (receiving, sending, or both). Although any format is acceptable, following SRT conventions is recommended for consistency.

Output streams

This section describes the **Output streams** (MPEG-2 TS) settings in Monarch EDGE Command Center.





Setting	Description
MPEG-2 TS stream	Enable or disable your stream using the radio button.
Input stream	Select the SRT input stream you want to assign to the selected MPEG-2 TS output.
Stream settings	
Base port	The port you are transmitting to on the receiving device.
Name	Enter a name for your stream.
Network interface	Select LAN1, LAN2, or LOCAL.

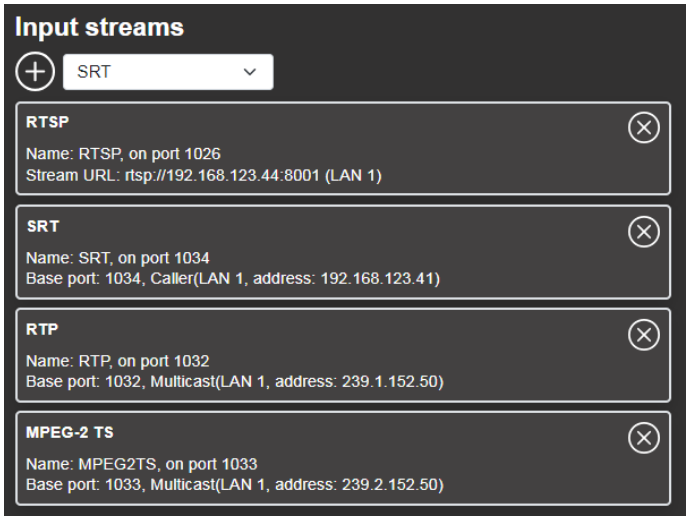
Setting	Description
Time to live	The number of hops or network nodes (such as network switches or routers) through which a multicast signal can travel. Once the TTL number is reached, the receiving network node prevents the signal broadcast further down the network. The value ranges from 1 to 255. The default is 16.
Routing scheme	Select one of the following: • **Unicast** When selecting unicast, you need to specify the destination IP address of the stream in the **Unicast address** field. 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.

Configuring Decode settings

This section describes the Monarch EDGE Command Center **Decode** settings for your Monarch EDGE D4 and Monarch EDGE S1.

Input streams

This section describes the **Input Streams** settings for your Monarch EDGE D4 and Monarch EDGE S1 **Decode** section in Monarch EDGE Command Center.



Setting	Description
RTSP	
Name	Enter a name for your stream.
Network interface	Select LAN1.[1]
RTSP URL	Enter the URL of your RTSP stream.
RTP	
Base port	The port number that receives the stream.
Name	Enter a name for your stream.
Network interface	Select LAN1[1]
Routing scheme	Select one of the following: • **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.

Setting	Description
MPEG-2 TS	
Base port	The port number that receives the stream.
Name	Enter a name for your stream.
Network interface	Select LAN1 or LAN2.
Routing scheme	Select one of the following: • **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.
SRT	
Base port	The port number that receives the stream.
Name	Enter a name for your stream.
Network interface	Select LAN1 or LAN2.
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.

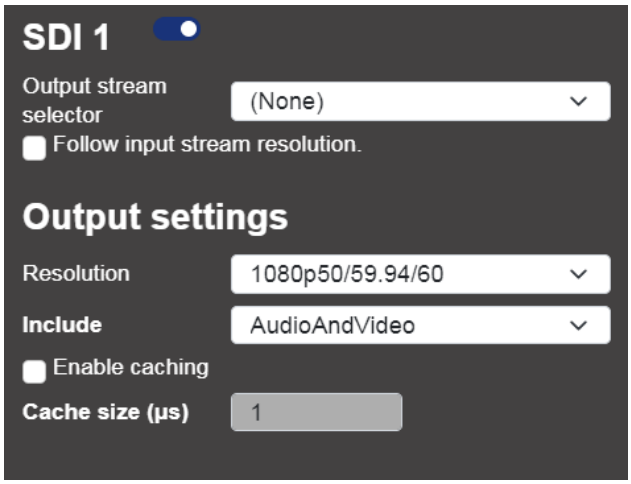
1. RTSP and RTP streaming protocols are officially supported only on LAN1 (problems may occur if you use LAN2).

SDI output

This section describes the **SDI output** settings for your Monarch EDGE D4 and Monarch EDGE S1 **Decode** section in Monarch EDGE Command Center.

NOTE The image below is for the Monarch EDGE S1. On a Monarch EDGE S1, you would only see a single SDI output displayed as there is only one SDI output on the device itself.

However, the settings are the same for both Monarch EDGE D4 and Monarch EDGE S1 devices.



Setting	Description
Enable output	Enable the selected SDI output.
Output stream selector	Select which of your input streams you want to assign to the selected SDI output. You must create your input streams before they are available in the drop-down list.
Follow input stream resolution	When selected, Monarch EDGE will detect the input resolution and adjust the output resolution to match.
Output settings	
Resolution	Select the resolution for your SDI output. Whenever possible, try to match the resolution and frame rate of the stream sent from the encoder. This will produce the best results.
Include	Select what needs to be included in your SDI output: **Video**, **AudioAndVideo**, or **AudioVideoAndVanc**.

Setting	Description
Enable caching	Enable this option when the cadence of the incoming video packets from a non-Matrox third-party encoder is irregular, causing output stuttering. Increasing the caching of the incoming stream can help in situations like streaming a high-action sporting event.
Cache size (µs)	If you enable caching, enter a value greater than zero here to set the optimal cache size for your needs (in microseconds). Keep in mind that a larger cache size will lead to higher latency in the incoming video.

Genlock

This section describes the **Genlock** settings for your Monarch EDGE D4 and Monarch EDGE S1 **Decode** section in Monarch EDGE Command Center.

Setting	Description
Genlock source	Select your genlock source, **Internal** or **External**.
Genlock family	If you genlock to the Monarch EDGE's internal clock, you will need to select your frame rate family.

Audio Output

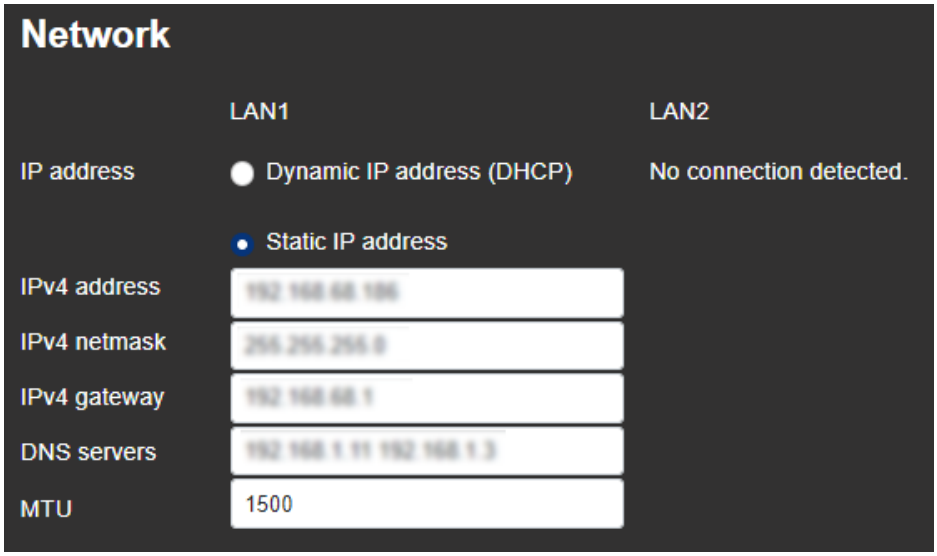
This section describes the **Audio Output** settings for your Monarch EDGE D4 and Monarch EDGE S1 **Decode** section in Monarch EDGE Command Center.

NOTE This section only appears when the Talkback feature is enabled.

Setting	Description
Audio source	Select which audio source to output through the Monarch EDGE headphone jack.
Volume	Increase, decrease, or mute the headphone volume.

Configuring Network settings

This section describes the **Network** settings in Monarch EDGE Command Center.



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.
MTU	This is the maximum transmission unit value (default is 1500) that can be transmitted without packet fragmentation. This value is typically set by a network administrator to optimize network throughput.

Configuring Tally settings

This section describes the **Tally** settings in Monarch EDGE Command Center. This includes both dedicated Tally signals and general purpose interface (GPI) inputs and outputs.

When the 15-pin Tally connector is connected to the Monarch EDGE, the Tally and GPI circuits allow you to turn on camera tally lights or trigger actions on other equipment. This feature is used with the Monarch EDGE E4, Monarch EDGE D4 and/or Monarch EDGE S1 devices working together to combine each device's encoder and decoder capabilities.

For example, signals can be sent from the production switcher to the D4 or S1 decoder input, which transfers these signals to the E4 or S1 encoder output for output to the cameras.

The Tally section in Monarch EDGE Command Center allows you to test your Tally and GPI connections, and then pair your devices for a real Tally workflow.

NOTE The Monarch EDGE S1 can be paired with another Monarch EDGE S1, a Monarch EDGE E4, or a Monarch EDGE D4. When paired with another S1 or E4 device, four GPI inputs and outputs are usable on each device (tally connections 5, 6, 7, and 8 are not available). When paired with a D4 device, the Tally behavior works similar to the Monarch E4 to D4 behavior.

About Test Mode and Live Mode

The Monarch EDGE Tally feature provides you with two modes:

Test mode: This mode allows you to test your wiring connections against the Tally signals in the Command Center user interface. Since the encoding and decoding pins are not directly mappable, use the information in "*Tally and GPIO circuits*" on page *93* to properly wire your connector, and then use Test mode to validate your connections.

Live mode: After you have tested your connections and verified the pins are mapped correctly, you can pair your Monarch EDGE devices, then turn on Live mode to use the Tally feature.

Testing your Tally and GPI connections

The Test mode feature of the Monarch EDGE allows you to test your Tally and GPI signals with a connected device to ensure that your Tally connector pin mapping is correct. For detailed information on the connector wiring pinout, see the section "*Tally and GPIO circuits*" on page *93*.

To use **Test mode**:

Step 1. Make sure your 15-pin connector has been wired according to the information in the section "*Tally and GPIO circuits*" on page *93*.

Step 2. Connect your peripheral device to the Monarch EDGE **Tally** port (see "*Matrox Monarch EDGE E4 and D4 rear connections*" on page *7*).

Example: If you are testing the E4, connect your camera tally system to the Monarch EDGE to test the tally lights.

Step 3. From the **Tally and Talkback** page of Monarch EDGE Command Center, under **Tally and GPI - Inputs and Outputs**, select **Test mode**.

Step outcome: The **Output Signal** toggle buttons will become active.

Step 4. Toggle one of the signals to ON.

Example: On an E4, turn on **Tally 1 (Pin 4)**.

Step 5. Verify that the tally light on the camera (in this example) connected to pin 4 turns on.

Step 6. Continue this process to validate all your pinout connections.

Result of this task: You have successfully validated the Tally and GPI pinout connections.

Using your Tally and GPI connections

After you have validated your pinout connections, you can put the Monarch EDGE into **Live mode** to pair your devices. Then you can use the Tally and GPI connections in your workflow.

Step 1. In the **Paired device** field, type the IP address (e.g. https://192.168.123.45) of the Monarch EDGE you want to pair with, then click **Pair**.

Step 2. From the **Tally and Talkback** page of Monarch EDGE Command Center, under **Tally and GPI - Inputs and Outputs**, select **Live mode**.

Step 3. Go to the same page for the Monarch EDGE device you just paired to, and pair back to the IP address of the Monarch EDGE in the previous step. Pairing must occur on both devices.

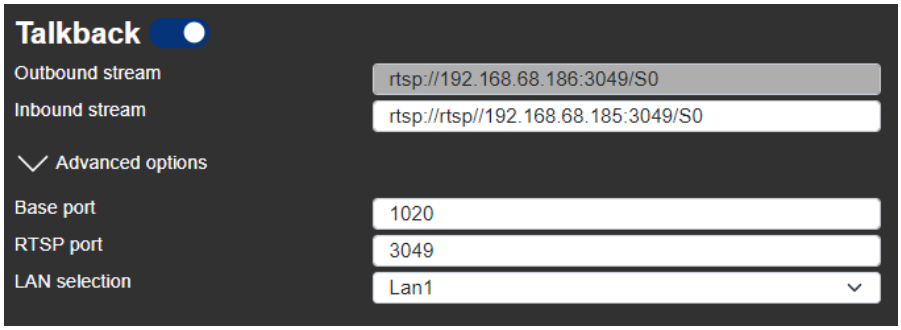
Step 4. Connect your peripheral devices (e.g. cameras, production switcher, etc) to the Monarch EDGE Encoder and Decoder.

Result of this task: Your devices are ready for a Tally and GPI workflow.

Configuring Talkback settings

The Talkback feature allows directional communication between two Monarch EDGE devices. This section describes the **Talkback** settings in Monarch EDGE Command Center.

Step 1. On the first Monarch EDGE, turn on **Talkback**, then click **Apply**.



More info: This makes analog audio (i.e. the XLR connections) unavailable for primary streaming functions.

Step 2. Do the same thing on your second Monarch EDGE.

Step 3. Copy the **Outbound stream** from the *first* Monarch EDGE and paste it to the **Inbound stream** field of the *second* Monarch EDGE, then click **Apply**.

Step 4. (Optional) Configure **Advanced** settings:

- **Base port** - Specify your base port for Talkback if you want a different port than your stream settings.
- **RTSP port** - Specify your RTSP port for Talkback if you want a different port than your stream settings.
- **LAN selection** - Select which of the Monarch EDGE LAN connections is used for Talkback.

Step 5. Do the same thing from the second Monarch EDGE device to the first.

More info: The outbound stream of one Monarch EDGE becomes the inbound stream of the other.

Result of this task: This allows bi-directional communication from one device to the other through the Monarch EDGE analog audio connectors.

When done, remember: You will not be able to use the XLR connection for program audio when the Talkback feature is active. If needed, you can verify if Talkback inbound and/or outbound streams are active from the main status page of Monarch EDGE Command Center.

Configuring Genlock settings

This section describes the **Genlock** settings in Monarch EDGE Command Center for the Monarch EDGE E4 only. For the Monarch EDGE D4 and Monarch EDGE S1 genlock settings, see "*Configuring Decode settings* on page *64*.

Toggle the **Genlock** on to synchronize SDI outputs to the device's internal clock. You can genlock your SDI devices/cameras to either an NTSC-based or PAL-based resolution.

Configuring DP Output settings

This section describes the **DP Output** settings in Monarch EDGE Command Center.

Turn on **DisplayPort output** to turn on the Monarch EDGE preview feature. You can view the video preview on a monitor connected to the Monarch EDGE DisplayPort connector. Select the **Audio source** and **Video source(s)** for your preview from the drop-down lists provided.

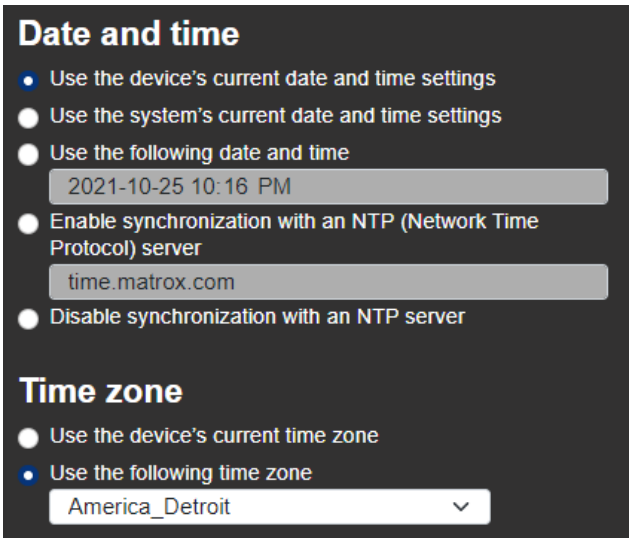
NOTES

- The preview feature will affect the Monarch EDGE encoding and decoding performance. If you use preview while the Monarch EDGE is streaming, you may experience performance-related issues.

- Setting RTMP streaming to a 10-bit pixel format results in a green-tinted video preview using Wowza or Adobe players. The actual streaming output is not affected, only the video preview.

Configuring Date and Time settings

This section describes the **Date and Time** settings in Monarch EDGE Command Center.

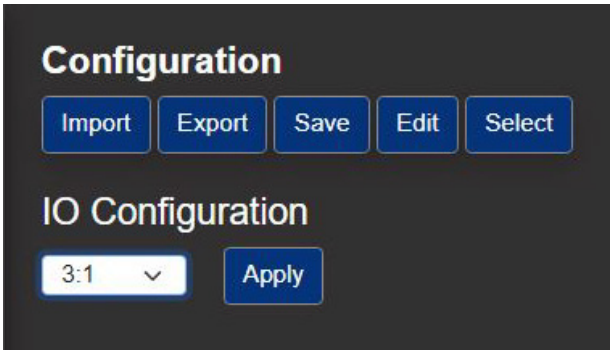


Setting	Description
Date and time	
Use current date and time settings of the device	Keep the current date, time, and NTP (Network Time Protocol) synchronization settings for your devices. This is the default.
Use date and time of the current system	Use the date and time of your controller system to update 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.

Managing configurations

This section describes the **Configuration** settings in Monarch EDGE Command Center.



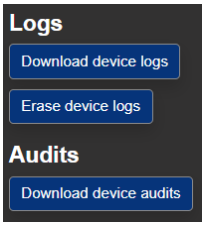
Setting	Description
Configuration	
Import	Import configuration settings from your computer.
Export	Export your configuration settings to your computer.
Save	Save your Monarch EDGE's configuration settings.

Setting	Description
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.
Select	Select and load a previously-saved configuration, or load the Monarch EDGE's default configuration.
IO Configuration[1]	
Apply	Select an input:output configuration then click **Apply** to apply the configuration and reboot the device. If an IO configuration with at least one output was selected[2], the Decode tab will appear (see "*Configuring Decode settings*" on page *64*).

1. For 10-bit encoders only.
2. On the back of the Monarch EDGE, from left to right, the first SDI connectors will be inputs and the last connectors will be outputs.

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.

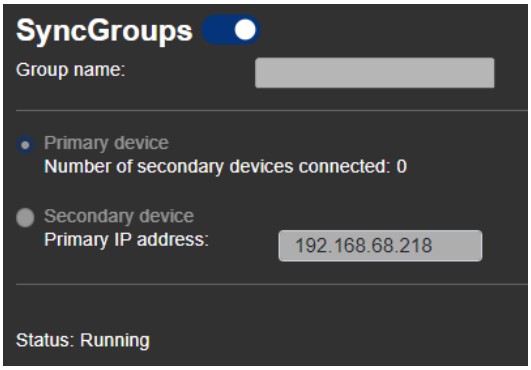
Managing SyncGroups

This section describes the **SyncGroups** settings in Monarch EDGE Command Center.

Sync groups are groups of Monarch EDGE E4 and S1 devices only, as you can only synchronize encoder-capable devices. Sync groups share a common timestamp value to allow for synchronization of streams by decoders (SRT and MPEG-2 TS only). Devices in a Sync group will have an SG# displayed depending on how many groups you have (e.g. SG1, SG2, SG3, etc).

To group devices together, you must set up your device as either a primary or secondary device:

Step 1. From the **SyncGroups** section of Monarch EDGE Command Center, turn on **SyncGroups**.



Step 2. Set up this Monarch EDGE as a primary or secondary device:

a. If you are setting up this EDGE device as a primary device, click **Primary device**, then enter your **Group name**.

b. If you are setting up this EDGE device as a secondary device, click **Secondary device**, then enter the IP address of the primary EDGE device you want to synchronize to.

Step 3. Continue adding other EDGE devices to your SyncGroup as needed.

Result of this task: Your secondary devices are synchronized to the primary device, and streams will start and end in sync.

Configuring User management settings

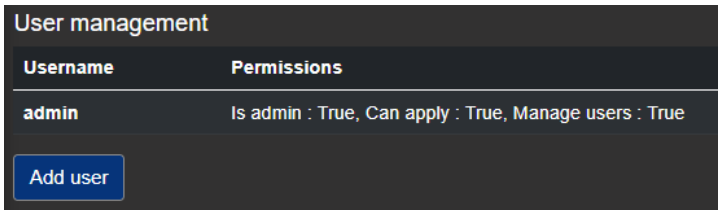
This section describes the **User management** settings in Monarch EDGE Command Center.

User management in Monarch EDGE Command Center is a simplified version of user management in Monarch EDGE Control Hub. The difference being that you can configure users on a single device, and that device inherits any settings that have already been configured in Control Hub.

Also, if you are using your Monarch EDGE for the first time, the username and password you log in with *becomes* the administrator account for that device. This is the equivalent of taking control of the device as described in the Control Hub user management chapter (see "*User and device management*" on page *21*).

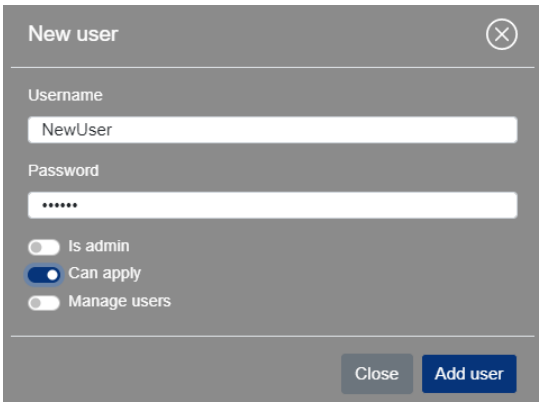
To configure users, follow the steps below:

Step 1. Go to the **User management** section in Monarch EDGE Command Center.



More info: You will see all the users that have permissions on this device. In this example, the only user is the admin user that was created when you initially logged in to this particular EDGE. The **Permissions** are shown.

Step 2. To add a new user, click **Add user**.



The **Add user** window appears.

Step 3. Type the **Username** and **Password** for the user you want to add, then specify their permissions:

- **Is admin** Gives the new user the same administrator rights as you have, including the two other permissions below.
- **Can apply** Allows the user to change and apply settings.
- **Manage users** Allows the user to manage their own account and manage other users. This permission does *not* allow the user to create new users, only manage existing ones.

Step 4. Click **Add user**.

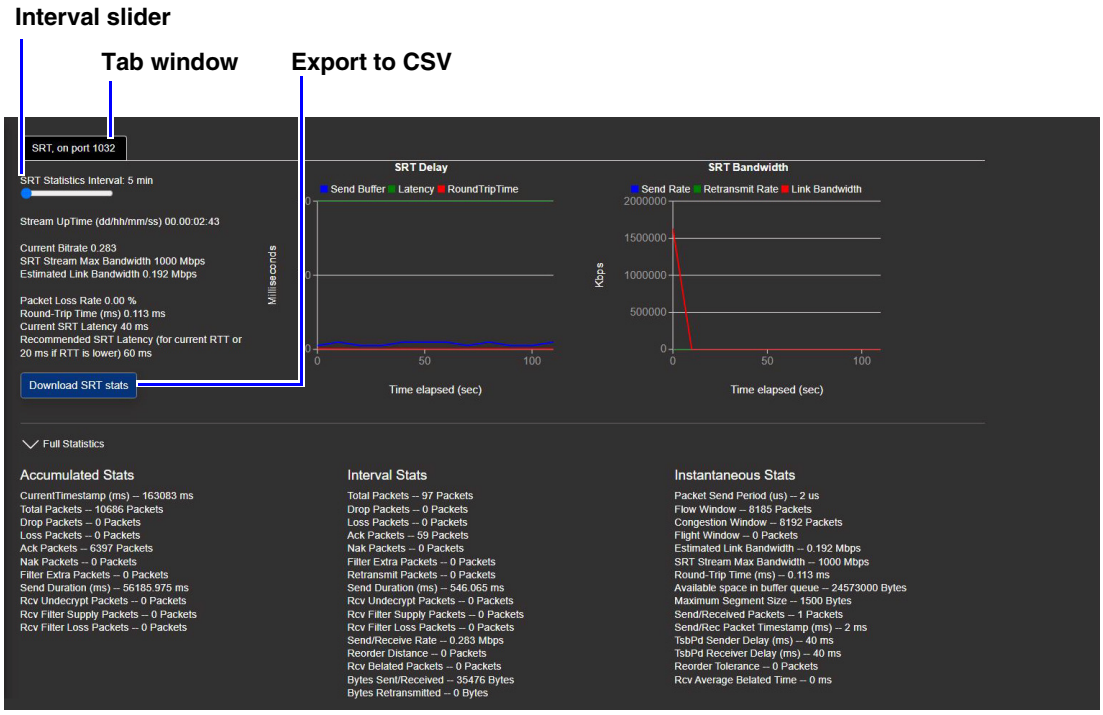
Step 5. (Optional) Click **Change password** to change the user's password. The username cannot be changed.

Result of this task: Your new user has been created.

Viewing SRT statistics

This section describes the **SRT statistics** settings in Monarch EDGE Command Center.

The information on this page can help you monitor and optimize your SRT streaming workflow. There are two graphs (**SRT Delay** and **SRT Bandwidth**) that you can customize to show the information you need.



The graphs will start running when you open the **SRT statistics** page. If you navigate away from the page, you will lose the information and have to start over. However, since Monarch EDGE Command Center is a web-based application, you can choose to open the **SRT statistics** page in a new browser window to keep the statistics running while you perform other tasks in the user interface.

Some of the things you can do on this page:

- Under each graph, select which statistics to include in the graphs.
- Drag the interval slider to modify the granularity of your graphs.
- If you have multiple SRT streams, you'll have a tab for each one. Click on each tab to view the information.
- Export the information to a CSV file.

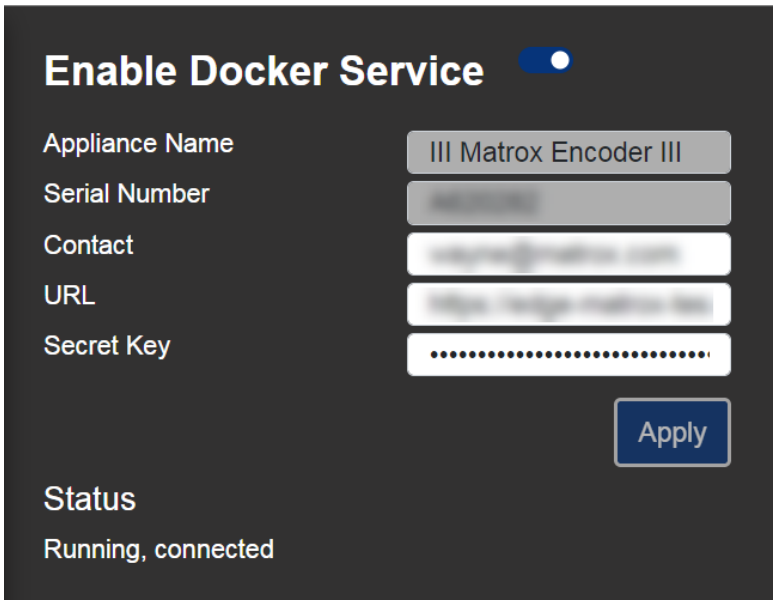
Connecting to Docker

This section describes how to connect to **Docker** in Monarch EDGE Command Center.

NOTE Note the following:

- To use Docker, you must join a group that is eligible for Docker service (see "*Using Updater*" on page *81*) and obtain your contact, URL, and secret key from our Docker partner.
- If you change the name of your Monarch EDGE device while Docker Service is enabled, you will need to disable and re-enable the service to see the change in Docker.

Once you enter your credentials and click **Apply**, Monarch EDGE will negotiate a connection with our Docker partner. When a connection is established, the **Status** will be *Connected*.

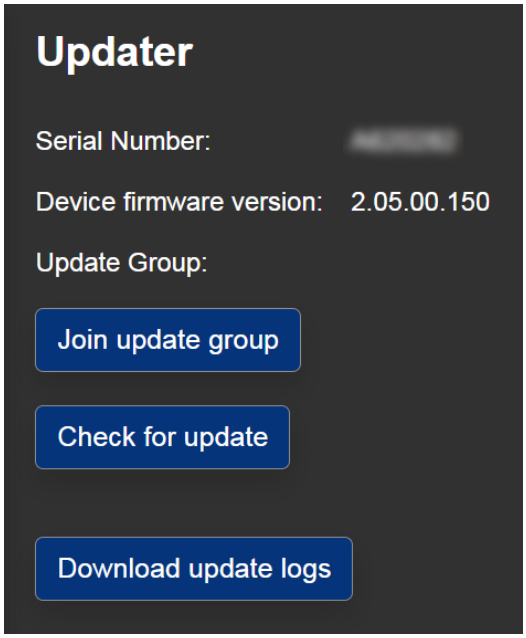


Setting	Description
Enable Docker Service	Enables your Docker service.
Appliance Name	The name of your Monarch EDGE device.
Serial Number	The Serial Number of your Monarch EDGE device.
Contact	Enter your contact name.
URL	Enter your URL.
Secret Key	Enter your secret key.

Using Updater

This section describes the **Updater** options in Monarch EDGE Command Center.

NOTE The Monarch EDGE Command Center Updater will only update the firmware of the device you are logged in to. For more information, see "*Updating the Monarch EDGE firmware*" on page *14*.



Setting	Description
Join update group	By default, devices are part of the Matrox Monarch EDGE update group, which allows firmware updates. To include Docker with your updates, you must join another update group. You will need to specify the name of the group and apply a GUID provided by our Docker partner.
Check for update	Checks if a newer version of the firmware is available and notifies you if the device is not up to date. To update the firmware, click **Start update**. If you have joined a group that is eligible to use Docker, it will be installed with your firmware.
Download update logs	Saves the update logs to your local Downloads folder.

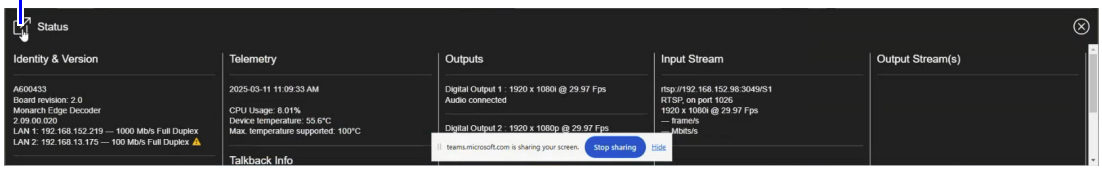
Checking Status

This section describes the **Status** settings in Monarch EDGE Command Center. The information on this page can help you monitor your Monarch EDGE device.

Status quick view

The **Status** quick view displays a summary of your device's settings, divided by category.

Open the Status page

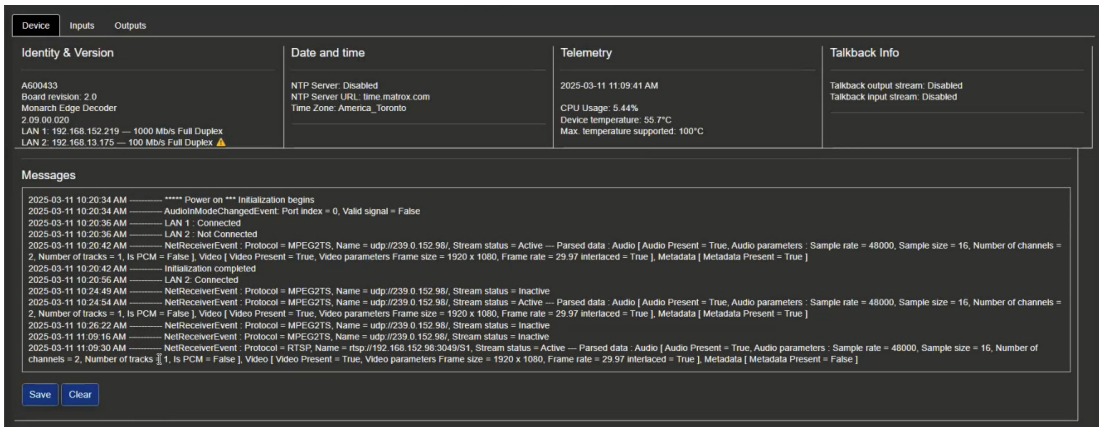


Status page

You can click the arrow in the upper-left corner of the **Status** quick view to open the **Status page** in a new browser tab (e.g. https://192.168.123.45/edge/AdvancedStatus). This page contains further details about your Monarch EDGE device.

Device settings

This tab reflects the device settings of your Monarch EDGE.



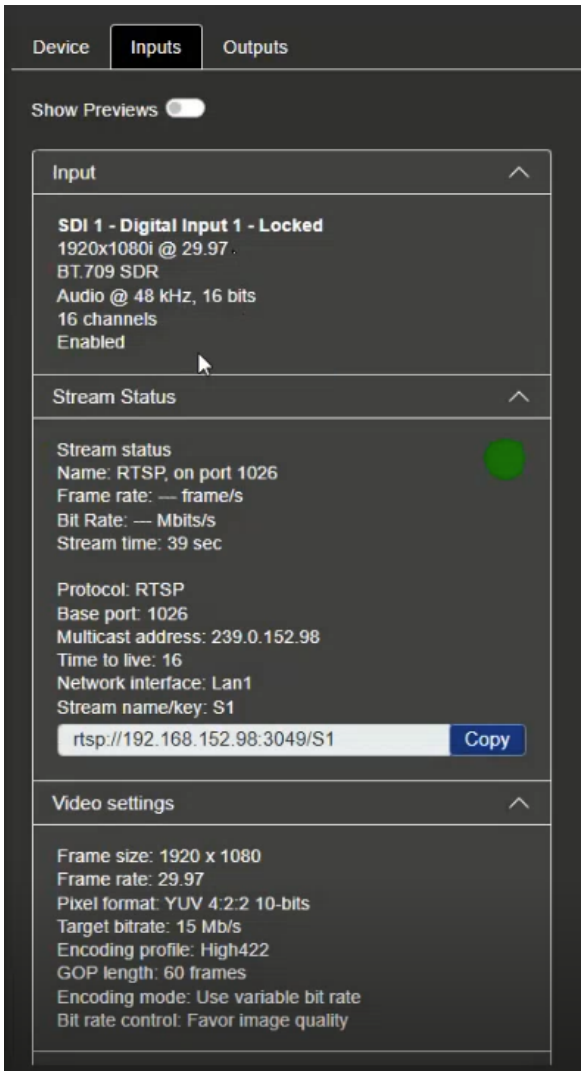
Settings	Description
Identity & Version	Identification and version information for your device, as well as the speed of the network for each LAN.
Date and time	Date and time settings.
Telemetry	Telemetry data.
Talkback Info	Talkback info settings.
Messages	Some messages that may appear here are power on, LAN connection status, and changes to inputs or streams. To export the message log, click **Save**. To clear all messages, click **Clear**. **NOTE** Logs will be reset upon reboot or power cycle.

Inputs settings

This tab reflects your Monarch EDGE's Encode settings. For Monarch EDGE D4 decoders, this tab will be blank.

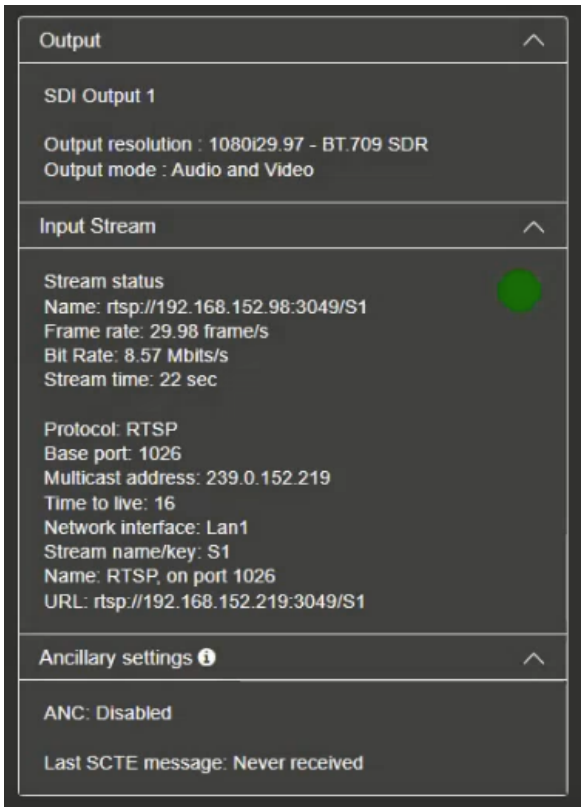
From here, you can enable or disable **Show Previews** and copy the RTSP URL to the clipboard.

When a stream is enabled, its status indicator is green. When the stream is disabled, the status indicator is red.



Outputs settings

This tab reflects your Monarch EDGE's Decode settings. If your Monarch EDGE does not have an output associated to an input stream, this tab will be blank.



CHAPTER 8

Technical specifications

This chapter includes the following topics:

General

These specifications apply to the following Monarch EDGE devices:

- **MDG4/E10/I:** Monarch EDGE appliance with 4:2:0 8-bit, 4:2:0 10-bit, and 4:2:2 10-bit encoding. Includes IEC-C14 power cord (US, UK, AUS, EUR).
- **MDG4/E8/I:** Monarch EDGE appliance with 4:2:0 8-bit encoding. Includes IEC-C14 power cord (US, UK, AUS, EUR).
- **MDG4/D/I:** Monarch EDGE appliance with 4:2:0 8-bit, 4:2:0 10-bit, and 4:2:2 10-bit decoding.
- **MDG2/ED10/I:** Monarch EDGE appliance with 4:2:0 8-bit, 4:2:0 10-bit, and 4:2:2 10-bit encoding and decoding.

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 V DC
- Connector: DIN4
- Total power consumption: 48 Watts (60 max)

Power Supply:

- Line voltage: 100-240 VAC
- Frequency: 50-60 Hz
- Input connector: IEC320-C14
- 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

MDG4/E10/I, MDG4/E8/I, and MDG4/D/I devices

SDI connections:

- MDG4/E10/I and MDG4/E8/I
  - 1× 12G SDI input per SMPTE ST 2082
  - 3× 3G SDI inputs per SMPTE ST 425 (Level A and Level B)
- MDG4/D/I
  - 1× 12G SDI output per SMPTE ST 2082
  - 3× 3G SDI outputs per SMPTE ST 425 (Level A mapping only)
- Supported video formats (auto-detected):
  - 3840 × 2160p at 50, 59.94, and 60 fps[1]
  - 1920 × 1080p at 23.98, 24, 29.97, 30, 50, 59.94, and 60 fps
  - 1920 × 1080i at 25, 29.97, and 30 fps
  - 1280 × 720p at 50, 59.94, and 60 fps
- Audio processing
  - Embedded or analog audio channels can be compressed as a stereo pair or processed as PCM[1] (uncompressed audio). Multi-channel audio is supported as separate audio pairs.
  - 16 channels of embedded SDI audio is supported per input.
  - 16 channels of audio is supported per encoding using SRT or MPEG-2 TS.
  - SDI embedded audio is 24-bit, 48 kHz sample rate, and synchronous.

1. Currently, UHD supports square-division only when using 4 x 3G SDI to transport the video.

- 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:

- D4: Bi-level genlock output
- Decoder: Bi-level or tri-level genlock input

Tally I/O:

- 8x tally signals (sent to cameras - encoder)
- 8x tally signals (sent from switcher - decoder)
- Tally ports available via a 15-pin D-SUB connector
- See more here: "*Tally and GPIO circuits*" on page *93*.

MDG2/ED10/I

SDI connections:

- 1× 3G SDI input per SMPTE ST 425 (Level A and Level B)
- 1× 3G SDI output per SMPTE ST 425 (Level A mapping only)
- Supported video formats (auto-detected):
  - 1920 × 1080p at 23.98, 24, 29.97, 30, 50, 59.94, and 60 fps
  - 1920 × 1080i at 25, 29.97, and 30 fps
  - 1280 × 720p at 50, 59.94, and 60 fps
- Audio processing

1. To be supported in a future release.

  - Embedded or analog audio channels can be compressed as a stereo pair or processed as PCM[1] (uncompressed audio). Multi-channel audio is supported as separate audio pairs.
  - 16 channels of embedded SDI audio is supported.
  - 16 channels of audio is supported per encoding using SRT or MPEG-2 TS.
  - SDI embedded audio is 24-bit, 48 kHz sample rate, and 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 or tri-level genlock input

Tally I/O:

- 8x tally signals (sent to cameras - encoder)
- 8x tally signals (sent from switcher - decoder)
- Tally ports available via a 15-pin D-SUB connector
- See more here: "*Tally and GPIO circuits*" on page *93*.

1. 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 controls:

- Up to 5.2 level support
- GOP size and structure
- Variable and constant bit rate support
- Average max/min data rate controls
- Encoding frame rates offered independent of input frame rates

Decoding controls:

- Scaling of HD/UHD resolutions
- Frame rate conversions

Profile:

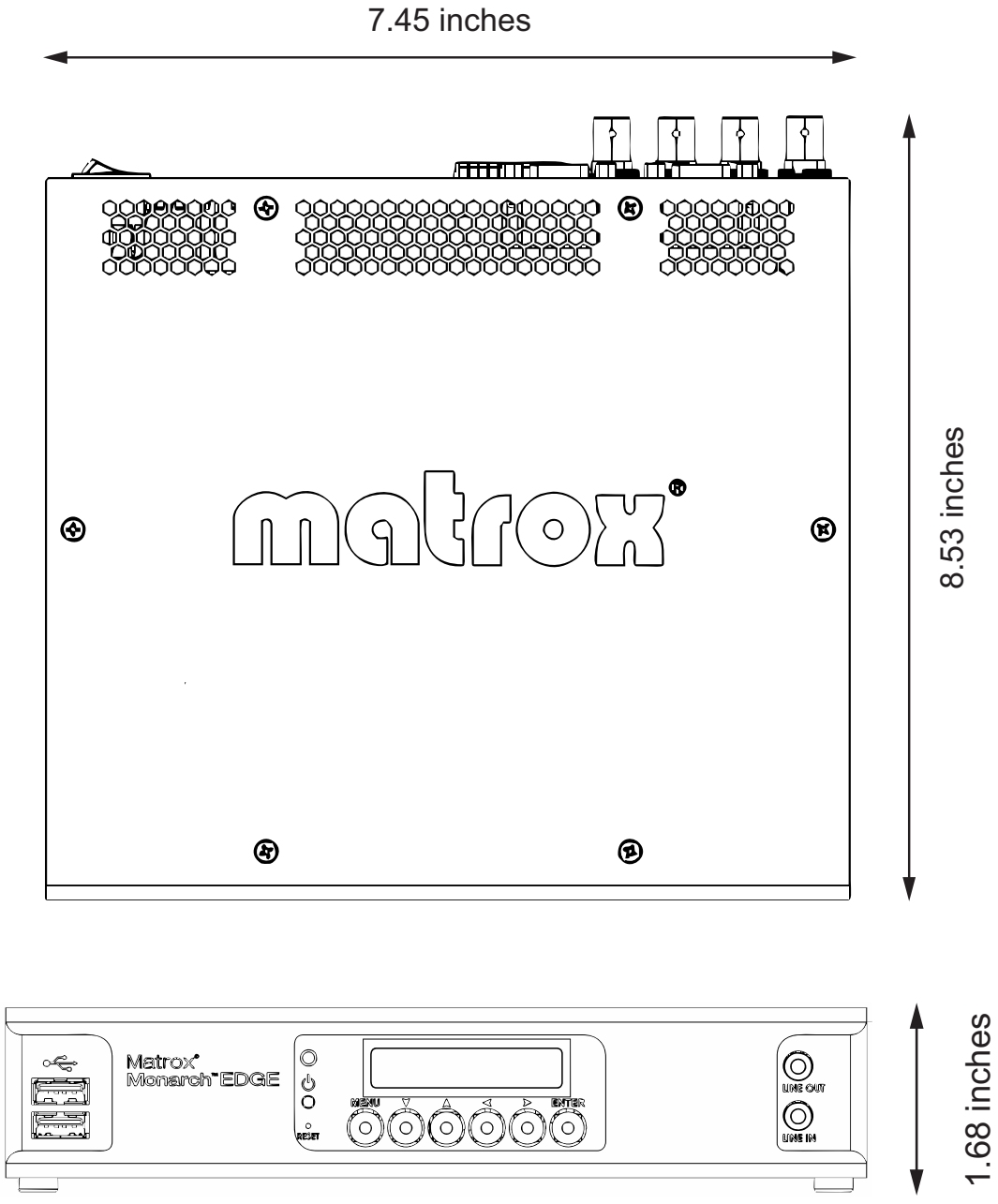
- Up to High 4:2:2 Profile (Hi422P)

Latency:

- Encode/Decode latency as low as 100ms glass-to-glass (network transfers not included in value)

Dimensions

Although these images are of the Monarch EDGE E4/D4 device, the Monarch EDGE S1 has the same dimensions except for the two additional SDI connectors.



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)

CHAPTER 9

Tally and GPIO circuits

This chapter includes the following topics:

Monarch EDGE E4 and S1

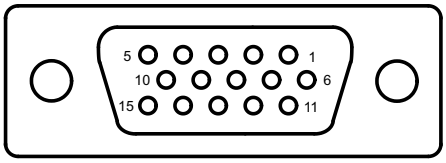
Electrical characteristics

The following table describes the electrical characteristics of the GPIO circuit.

Parameter	Conditions	Typical	Maximum	Units
Output operation voltage	N/A	12	N/A	V
Output current sink	Typical: using 10k pull-up resistor.	1.2	100	mA
Input operation voltage	N/A	12	N/A	V

Connector wiring pinout

The following table shows the connector pinout for the Tally connector.

Connector	Pin	Description	Comments
Female DSUB-15 Connector 	1	GPI IN 1	
	2	GPI IN 2	
	3	Key Lock	No Connect
	4	TALLY OUT 1	
	5	Ground	Isolated Ground
	6	TALLY OUT 2	
	7	TALLY OUT 5	
	8	TALLY OUT 6	
	9	TALLY OUT 7	
	10	TALLY OUT 8	
	11	Ground	Isolated Ground
	12	TALLY OUT 3	
	13	GPI IN 3	
	14	GPI IN 4	
	15	TALLY OUT 4	
	Shield	Chassis	Chassis Ground

Monarch EDGE D4

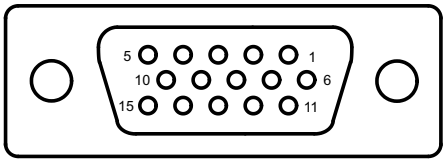
Electrical characteristics

The following table describes the electrical characteristics of the GPIO circuit.

Parameter	Conditions	Typical	Maximum	Units
Output operation voltage	N/A	12	N/A	V
Output current sink	Typical: using 10k pull-up resistor.	1.2	100	mA
Input operation voltage	N/A	12	N/A	V

Connector wiring pinout

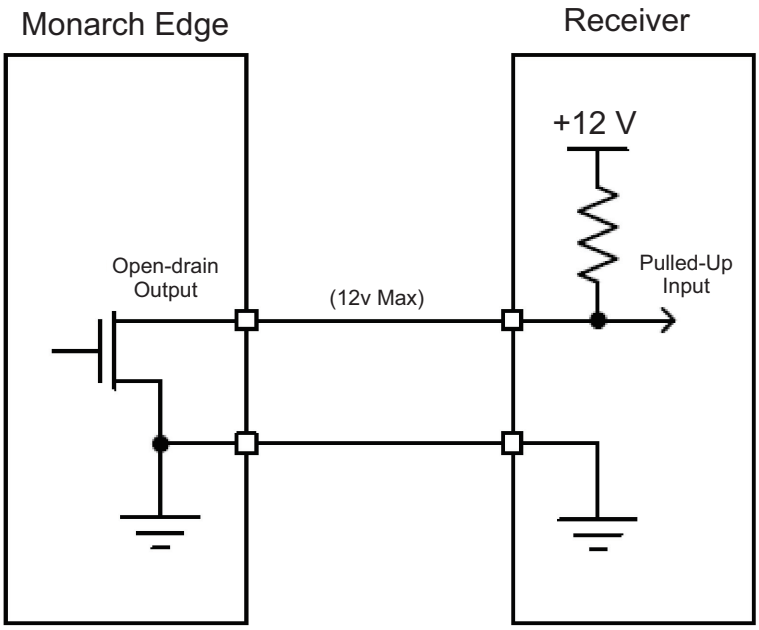
The following table shows the connector pinout for the Tally connector.[1]

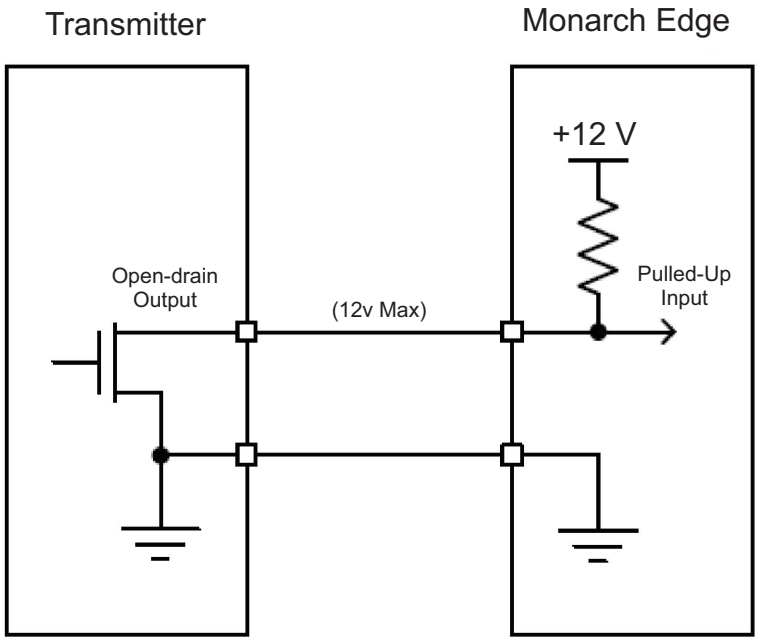
Connector	Pin	Description	Comments
Female DSUB-15 Connector 	1	TALLY IN 1	
	2	TALLY IN 2	
	3	Key Lock	No Connect
	4	GPI OUT 1	
	5	Ground	Isolated Ground
	6	GPI OUT 2	
	7	TALLY IN 5	
	8	TALLY IN 6	
	9	TALLY IN 7	
	10	TALLY IN 8	
	11	Ground	Isolated Ground
	12	GPI OUT 3	
	13	TALLY IN 3	
	14	TALLY IN 4	
	15	GPI OUT 4	
	Shield	Chassis	Chassis Ground

1. The Monarch EDGE S1 uses the identical pinouts as the Monarch EDGE E4. When an S1 device is paired to another S1 device, the GPI input pins of one device are paired to the Tally output pins of the other device. The last four Tally output pins (5, 6, 7, and 8) of the device will remain unmapped.

Output wiring

An output should be wired as indicated below.





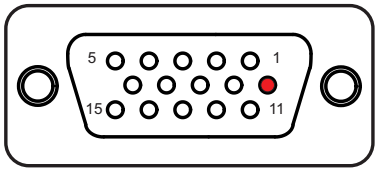
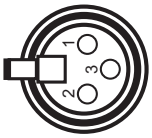
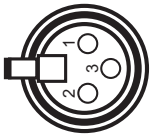
CHAPTER 10

Analog audio cable specification

This chapter includes the following topics:

XLR audio cable connector pinouts

The following table shows the pinouts for the XLR connectors on the analog audio I/O cable and the D-SUB audio connector on the Monarch Edge device.

DSUB-15 connector (on Monarch EDGE)	Pin	Audio channel	XLR pin	Description	XLR audio cable[1]
	1	Output right	3	-	XLR FEMALE INPUT LEFT BALANCED  XLR FEMALE INPUT RIGHT BALANCED  XLR MALE OUTPUT LEFT BALANCED  XLR MALE OUTPUT RIGHT BALANCED 
	2	Output right	1	Ground	
	3	Output right	2	+	
	4	Ground	N/A	N/A	
	5	Output left	3	-	
	6[2]	Output left	1	Ground	
	7	Output left	2	+	
	8	Ground	N/A	N/A	
	9	Input right	3	-	
	10	Input right	1	Ground	
	11	Input right	2	+	
	12	Ground	N/A	N/A	
	13	Input left	3	-	
	14	Input left	1	Ground	
	15	Input left	2	+	

1. (MDG/AUD/CBL) - Monarch EDGE break out audio cable. Provides two input channels and two output channels. DB15 to XLR I/O.
2. Pin is plugged, as shown in the illustration.

Compliance Statements

USA

FCC Compliance Statement
Remark for the Matrox hardware products supported by this guide

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

WARNING

Changes or modifications to this unit not expressly approved by the party responsible for the compliance could void the user's authority to operate this equipment. The use of shielded cables for connection of equipment and other peripherals to the card is required to meet FCC requirements.

Canada

(English) Innovation, Science and Economic Development Canada
CAN ICES-3 (A)/NMB-3 (A)
Remark for the Matrox hardware products supported by this guide

These digital devices do not exceed the Class A limits for radio noise emission from digital devices set out in the Radio Interference Regulation of Innovation, Science and Economic Development Canada.

(Français) Innovation, Sciences et Développement économique Canada
CAN ICES-3 (A)/NMB-3 (A)
Remarque sur les produits matériels Matrox couverts par ce guide

Ces appareils numériques n'émettent aucun bruit radioélectrique dépassant les limites applicables aux appareils numériques de Classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par Innovation, Sciences et Développement économique Canada.

Europe

CE

(English) European user's information – Declaration of Conformity
Remark for the Matrox hardware products supported by this guide

These devices comply with EC Directive 2014/30/EU for a Class A digital device. They have been tested and found to comply with EN55032/CISPR32 and EN55024/CISPR24. In a domestic environment these products may cause radio interference in which case the user may be required to take adequate measures. To meet EC requirements, shielded cables must be used to connect equipment and other peripherals. These products have been tested in a typical Class A compliant host system. It is assumed that these products will also achieve compliance in any Class A compliant system.

(Français) Informations aux utilisateurs Européens – Déclaration de conformité
Remarque sur les produits matériels Matrox couverts par ce guide

Ces unités sont conformes à la directive communautaire 2014/30/EU pour les unités numériques de classe A. Les tests effectués ont prouvé qu'elles sont conformes aux normes EN55032/CISPR32 et EN55024/CISPR24. Le fonctionnement de ces produits dans un environnement résidentiel peut causer des interférences radio, dans ce cas l'utilisateur peut être amené à prendre les mesures appropriées. Pour respecter les impératifs communautaires, les câbles de connexion entre l'équipement et ses périphériques doivent être blindés. Ces produits ont été testés dans un système hôte typique compatible classe A. On suppose qu'ils présenteront la même compatibilité dans tout système compatible classe A.

(Deutsch) Information für europäische Anwender – Konformitätserklärung
Anmerkung für die Matrox Hardware-Produktunterstützung durch dieses Handbuch

Diese Geräte entsprechen EG Direktive 2014/30/EU für ein digitales Gerät Klasse A. Sie wurden getestet und entsprechen demnach EN55032/CISPR32 und EN55024/CISPR24. In einer Wohnumgebung können diese Produkte Funkinterferenzen erzeugen, und der Benutzer kann genötigt sein, entsprechende Maßnahmen zu ergreifen. Um EG-Anforderungen zu entsprechen, müssen zum Anschließen des ausrüstung und anderer Peripheriegeräte abgeschirmte Kabel verwendet werden. Diese Produkt wurden in einem typischen, der Klasse A entsprechenden, Host-System getestet. Es wird davon ausgegangen, daß diese Produkte auch in jedem Klasse A entsprechenden System entsprechend funktionieren.

(Italiano) Informazioni per gli utenti europei – Dichiarazione di conformità
Nota per i prodotti hardware Matrox supportati da questa guida

Questi dispositivi sono conformi alla direttiva CEE 2014/30/EU relativamente ai dispositivi digitali di Classe A. Sono stati provati e sono risultati conformi alle norme EN55032/CISPR32 e EN55024/CISPR24. In un ambiente domestico, questi prodotti possono causare radiointerferenze, nel qual caso all'utente potrebbe venire richiesto di prendere le misure adeguate. Per soddisfare i requisiti CEE, l'apparecchiatura e le altre periferiche vanno collegati con cavi schermati. Questi prodotti sono stati provati in un tipico sistema host conforme alla Classe A. Inoltre, si dà per scontato che questi prodotti acquisiranno la conformità in qualsiasi sistema conforme alla Classe A.

(Español) Información para usuarios europeos – Declaración de conformidad
Observación referente a los productos de hardware de Matrox apoyados por este manual

Estos dispositivos cumplen con la directiva de la CE 2014/30/EU para dispositivos digitales de Clase A. Dichos dispositivos han sido sometidos a prueba y se ha comprobado que cumplen con las normas EN55032/CISPR32 y EN55024/CISPR24. En entornos residenciales, estos productos pueden causar interferencias en las comunicaciones por radio; en tal caso el usuario deberá adoptar las medidas adecuadas. Para satisfacer las disposiciones de la CE, deberán utilizarse cables apantallados para conectar el equipo y demás periféricos. Estos productos han sido sometidos a prueba en un típico sistema anfitrión que responde a los requisitos de la Clase A. Se supone que estos productos cumplirán también con las normas en cualquier sistema que responda a los requisitos de la Clase A.

Korea

A 급 기기 (업무용 방송통신기자재)
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라 며 , 가정외의 지역에서 사용하는 것을 목적으 로 합니다 .