

Matrox Monarch LCS

Dev Tools Reference Guide

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Digital Video Solutions

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Using the Monarch LCS Control API

This chapter describes how to use the Monarch LCS HTTP-based Control API to control the streaming and recording functions for a Monarch device.

Monarch LCS Control API Overview

The Monarch LCS Control API is an HTTP-based API that allows you to control the streaming, recording, and other related functions for a Monarch LCS device using third-party applications and scripting languages.

Users and system integrators can create their own software to control the various functions of a Monarch device, such as starting or stopping streaming/recording, getting the device status, and more.

Commands

Commands can be sent to Monarch LCS using the following URL syntax (HTTPS is also supported):

<http://<username>:<password>@<ipAddress>/Monarch/synconnect/sdk.aspx?command=<command>>

Where:

- <username> and <password> are the username and password set in the Monarch device (default for both is “admin”).



Note Certain web browsers may no longer accept the “username:password” syntax in order to comply with publication RFC 3986 section 3.2.1 which describes the userinfo subcomponent (see <https://www.rfc-editor.org/>).

- <ipAddress> is the network IP address of the Monarch device.
- <command> is one of the following commands:

API commands	
GetStatus	GetRecordFileName
GetInputStatus	SetVideoInput
StartBothEncoders	GetVideoInput
StopBothEncoders	SetAudioInput
SetStreamingVideoDataRate	GetAudioInput
GetStreamingVideoDataRate	SetTransferLocation
SetRTSP	StartTransfer
GetRTSP	StartTransferAll
SetRTMP	StopTransfer
GetRTMP	SetOperatingMode
SetBothRtmpPaths	SetDynamicOutput
SetRecordFileName	AskForReboot



Note For certain Monarch features (such as the file transfer feature), the command syntax is slightly different to accommodate the multiple arguments required. Syntax examples are provided in each command description where applicable.

For examples of how to use the command line in third-party applications, see [“Example third-party tools”](#) on page 14.

GetStatus

This command is used to acquire the current status of a Monarch LCS device.

Returns:

- ENC1:<mode>,<state>,ENC2:<mode>,<state>,FILETRANSFER:<state>,NAME:<devicename>

Where:

- <state> is ON, OFF, READY, or DISABLED
- <mode> is RTSP, RTMP, RECORD, or NONE
- <devicename> is the name of the Monarch LCS device as set by the client in the Monarch LCS Command Center
- RETRY, if two or more commands are sent to the Monarch at the same time, or if the Monarch is executing a command while receiving another. The first command received will execute, and the others will return RETRY.

The following table shows example returns based on the device name, encoding mode, and stream/record status:

	Device name	Encoder modes	Stream status	Record status	File transfer status
Example 1	Device1	ENC 1: Record ENC 2: RTMP	Not streaming	Not recording	ON
	ENC1:RECORD,READY,ENC2:RTMP,READY,FILETRANSFER:ON,NAME:DEVICE1				
Example 2	Device2	ENC 1: Record ENC 2: RTSP	Client not connected	Recording	OFF
	ENC1:RECORD,ON,ENC2:RTSP,READY,FILETRANSFER:OFF,NAME:DEVICE2				
Example 3	Device3	ENC 1: Record ENC 2: None	N/A	Not recording	OFF
	ENC1:RECORD,READY,ENC2:NONE,DISABLED,FILETRANSFER:OFF,NAME:DEVICE3				

GetInputStatus

This command is used to acquire the input resolution(s) of a Monarch.

Returns:

- For Input A, this command will return the active connector (SDI or HDMI) and its resolution and framerate. For Input B, this command returns the resolution and framerate.
Example: SDI A: 1920x1080i, 29.97 fps;HDMI B: 1920x1080p, 60 fps
- If an input does not have an SDI or HDMI cable connected to it, this command will return “No video input”. If the Monarch is in Single-isolated mode, this command will only return the status of the used input.
- RETRY, if two or more commands are sent to the Monarch at the same time, or if the Monarch is executing a command while receiving another. The first command received will execute, and the others will return RETRY.

StartBothEncoders

This command is used to start Encoder 1 and Encoder 2 simultaneously on a Monarch device. The encoders will start in the encoding mode that has been set (e.g. RTSP streaming, RTMP streaming, or Record).

Returns:

- SUCCESS, if both encoders started successfully.
- FAILED, if either one or both encoders could not be started.
- RETRY, if two or more commands are sent to the Monarch at the same time, or if the Monarch is executing a command while receiving another. The first command received will execute, and the others will return RETRY.

StopBothEncoders

This command is used to stop Encoder 1 and Encoder 2 simultaneously on a Monarch device.

Returns:

- SUCCESS, if both encoders stopped successfully.
- FAILED, if either one or both encoders could not be stopped.
- RETRY, if two or more commands are sent to the Monarch at the same time, or if the Monarch is executing a command while receiving another. The first command received will execute, and the others will return RETRY.

SetStreamingVideoDataRate

This command is used to set the data rate (in kb/s) on a Monarch encoder dynamically without stopping a current streaming operation. For this command to work, the selected encoder must be actively streaming. The minimum data rate will be set to

90% of the average, and the maximum data rate will be set to 110% of the average data rate.

Format:

- `SetStreamingVideoDataRate,<encoder>,<average bit rate>`
- Encoder value must be 1 or 2.
- Average bit rate value must be between 50 and 20000.

Returns:

- SUCCESS, if the bit rate is set.
- FAILED, if the value is outside the 50 to 20000 range.
- RETRY, if two or more commands are sent to the Monarch at the same time, or if the Monarch is executing a command while receiving another. The first command received will execute, and the others will return RETRY.

GetStreamingVideoDataRate

This command is used to acquire the average video data rate in kb/s (bit rate) that is currently set on one of the Monarch encoders. The encoder must be in a streaming state for this call to succeed.

Format:

- `GetStreamingVideoDataRate,<encoder>`
- Encoder value must be 1 or 2.

Returns:

- BITRATE: <average bit rate>
- FAILED, if there is a network connection issue and the command cannot get through to the Monarch.
- RETRY, if two or more commands are sent to the Monarch at the same time, or if the Monarch is executing a command while receiving another. The first command received will execute, and the others will return RETRY.

SetRTSP

This command is used to set the RTSP URL and port on a Monarch encoder. This command will always fail unless the Monarch is idle (not streaming or recording).

Format:

- `SetRTSP,<encoder>,<url name>,<port>`.
- Encoder value must be 1 or 2.
- <url name> is the path to connect to and <port> is either 554 or 8554.

Returns:

- SUCCESS, if the settings were applied.
- FAILED, if the device is currently streaming or recording, or the port is not 554 or 8554. The call will also fail if the URL contains invalid characters. Alphanumeric characters are accepted, as well as the following characters in brackets (. : = /).
- RETRY, if two or more commands are sent to the Monarch at the same time, or if the Monarch is executing a command while receiving another. The first command received will execute, and the others will return RETRY.

GetRTSP

This command is used to get the URL and port on a Monarch HDX encoder that is currently programmed for RTSP streaming. Returning this call does not necessarily mean that the device is set to stream in RTSP mode.

Format:

- GetRTSP,<encoder>.
- Encoder value must be 1 or 2.

Returns:

- URL, name, port
- RETRY, if two or more commands are sent to the Monarch at the same time, or if the Monarch is executing a command while receiving another. The first command received will execute, and the others will return RETRY.

SetRTMP

This command is used to configure the RTMP parameters on a Monarch encoder. This command will always fail unless the device is idle (not streaming or recording).

Format:

- <encoder>, <url>, <stream name>, <username>, <password>
- Encoder value must be 1 or 2.
- Username and password are optional.

Returns:

- SUCCESS, if the settings were applied.
- FAILED, if the device is currently streaming or recording. The call will also fail if the URL contains invalid characters. Alphanumeric characters are accepted, as well as the following characters in brackets (. : = /).
- RETRY, if two or more commands are sent to the Monarch at the same time, or if the Monarch is executing a command while receiving another. The first command received will execute, and the others will return RETRY.

GetRTMP

This command is used to get the RTMP settings that are currently programmed on a Monarch encoder. Returning this call does not necessarily mean that the device is set to stream in RTMP mode.

Format:

- GetRTMP,<encoder>
- Encoder value must be 1 or 2.

Returns:

- Url name, stream name
- RETRY, if two or more commands are sent to the Monarch at the same time, or if the Monarch is executing a command while receiving another. The first command received will execute, and the others will return RETRY.

SetBothRtmpPaths

This command is used to set the RTMP parameters for the URL paths, stream names, usernames, and passwords for both Monarch encoders.

Format:

- SetBothRtmpPaths,rtmp://url1,streamname1,username1,password1,rtmp://url2,streamname2,username2,password2
- Usernames and passwords are optional.
- Stream names, usernames, and passwords cannot contain “rtmp://” or “rtmps://” otherwise this command will be invalid.

Returns:

- SUCCESS, if the settings were applied.
- FAILED, if the device is currently streaming or recording. The call will also fail if the URL contains invalid characters. Alphanumeric characters are accepted, as well as the following characters in brackets (. : = /).
- RETRY, if two or more commands are sent to the Monarch at the same time, or if the Monarch is executing a command while receiving another. The first command received will execute, and the others will return RETRY.

SetRecordFileName

This command is used to set the individual filenames in which recorded files are saved to in either encoder. This call will fail if an invalid character is found in the filename.

Format:

- SetRecordFileName,<encoder>,<filename>

Returns:

- SUCCESS, if the setting was applied.
- FAILED, if the device is currently streaming or recording. The call will also fail if the filename contains invalid characters. Alphanumeric characters are accepted, as well as the dash (-) and forward slash (/) characters. When in network recording mode, the acceptable characters are the dash (-), forward slash (/), period (.), and colon (:).
- RETRY, if two or more commands are sent to the Monarch at the same time, or if the Monarch is executing a command while receiving another. The first command received will execute, and the others will return RETRY.

GetRecordFileName

This command is used to get the Record filename of a Monarch encoder.

Format:

- GetRecordFileName,<encoder>.
- Encoder value must be 1 or 2.

Returns:

- RECORD FILENAME: <filename> or <path/filename>
- FAILED
- RETRY, if two or more commands are sent to the Monarch at the same time, or if the Monarch is executing a command while receiving another. The first command received will execute, and the others will return RETRY.

SetVideoInput

This command is used to specify which video content is present at the Monarch LCS input. The input value can be INPUT_A_SDI or INPUT_A_HDMI or INPUT_B_HDMI in single input mode but only INPUT_A_SDI or INPUT_A_HDMI in all other modes.

Format:

- SetVideoInput,<input>
- Input value can be INPUT_A_SDI or INPUT_A_HDMI or INPUT_B_HDMI.

Returns:

- SUCCESS, if the setting was applied.
- FAILED, if the device is currently streaming or recording.
- RETRY, if two or more commands are sent to the Monarch at the same time, or if the Monarch is executing a command while receiving another. The first command received will execute, and the others will return RETRY.

GetVideoInput

This command is used to get the video input currently in use. The return input value can be INPUT_A_SDI or INPUT_A_HDMI or INPUT_B_HDMI in single input mode or INPUT_A_SDI or INPUT_A_HDMI and INPUT_B_HDMI in all other modes.

Returns:

- VIDEO INPUT: INPUT_A_SDI or INPUT_A_HDMI or INPUT_B_HDMI
- RETRY, if two or more commands are sent to the Monarch at the same time, or if the Monarch is executing a command while receiving another. The first command received will execute, and the others will return RETRY.

SetAudioInput

This command is used to specify which audio content is present at the Monarch LCS input. The input value can be INPUT_ANALOG or INPUT_A or INPUT_B.

Format:

- SetAudioInput,<input>
- Input value can be INPUT_ANALOG or INPUT_A or INPUT_B (INPUT_A or INPUT_B are digital).

Returns:

- SUCCESS, if the setting was applied.
- FAILED, if the device is currently streaming or recording.
- RETRY, if two or more commands are sent to the Monarch at the same time, or if the Monarch is executing a command while receiving another. The first command received will execute, and the others will return RETRY.

GetAudioInput

This command is used to get the video input currently in use. The return input value can be INPUT_ANALOG, INPUT_A_SDI or INPUT_A_HDMI or INPUT_B_HDMI.

Returns:

- AUDIO INPUT: INPUT_ANALOG, INPUT_A_SDI or INPUT_A_HDMI or INPUT_B_HDMI (INPUT_A or INPUT_B are digital).
- RETRY, if two or more commands are sent to the Monarch at the same time, or if the Monarch is executing a command while receiving another. The first command received will execute, and the others will return RETRY.

SetTransferLocation

This command is used to specify the file source and file network destination required to use the Monarch's File Transfer feature. This command uses multiple arguments to determine where the files are located and where they are going. Some arguments are optional.

The command syntax used with this command is the same as the syntax described in the section “Commands” on page 2, but includes additional arguments separated by commas (,):

- **Source:** This is the source location for the Monarch files. Values are **USB1**, **USB2**, or **SDCARD**.
- **Destination:** This is the network drive that will receive the transferred files. This drive must be accessible with or without user authentication.
- **Domain:** This is the network domain that hosts the shared folder. This is only required if the Monarch is not on the same domain as the network shared folder. By default, all Windows computers have a domain, the default Windows domain being WORKGROUP.
- **Username:** If required to access the network shared folder.
- **Password:** If required to access the network shared folder.

The command syntax with these additional arguments looks like this:

```
http://<username>:<password>@<ipAddress>/Monarch/synconnect/sdk.aspx?command=<command>,<source>,<destination>,<domain>,<username>,<password>
```

Therefore, a real-world example of the syntax could look like this:

```
http://admin:admin@192.168.12.34/Monarch/synconnect/sdk.aspx?command=SetTransferLocation,USB1,123.456.78.90,WORKGROUP,MYUSERNAME,MYPASSWORD
```



Note Please note the following:

- The **Source** and **Destination** arguments are always required, but the **Domain**, **Username**, and **Password** arguments are optional.
- For **Destination**, **Domain**, and **Username**, the characters you can use are letters, numbers, underscore (), forward (/) and backward (\) slashes, and colon (:).
- The **Password** can be any character accepted in a URL.

Returns:

- SUCCESS, if the network shared folder can be mounted and accessed.
- FAILED, if write access is not allowed on the network shared folder.

- RETRY, if two or more commands are sent to the Monarch at the same time, or if the Monarch is executing a command while receiving another. The first command received will execute, and the others will return RETRY.

StartTransfer

This command is used to start a manual transfer of Monarch files that have not already been transferred to the network location. Before you can call this command, you must follow the instructions described in “[SetTransferLocation](#)” on page 10.

Returns:

- SUCCESS, if the network drive can be mounted and file transfer has started.
- FAILED, if the network drive cannot be mounted.
- RETRY, if two or more commands are sent to the Monarch at the same time, or if the Monarch is executing a command while receiving another. The first command received will execute, and the others will return RETRY.

StartTransferAll

This command is used to start a manual transfer of all Monarch files to the network location. Before you can call this command, you must follow the instructions described in “[SetTransferLocation](#)” on page 10.

Returns:

- SUCCESS, if the network drive can be mounted and file transfer has started.
- FAILED, if the network drive cannot be mounted.
- RETRY, if two or more commands are sent to the Monarch at the same time, or if the Monarch is executing a command while receiving another. The first command received will execute, and the others will return RETRY.

StopTransfer

This command is used to stop a file transfer that is currently in progress.

Returns:

- SUCCESS, if the transfer is stopped.
- RETRY, if two or more commands are sent to the Monarch at the same time, or if the Monarch is executing a command while receiving another. The first command received will execute, and the others will return RETRY.

SetOperatingMode

This command is used to set the Monarch LCS Operating Mode. This command uses multiple arguments to specify all the options related to each operating mode. Some arguments are optional.

The command syntax used with this command is the same as the syntax described in the section “**Commands**” on page 2, but includes additional arguments separated by commas (,):

- **Operating Mode:** The values are as follows:
 - **SINGLEISOLATED**
 - **DUALISOLATED**
 - **PICTUREINPICTURE**
 - **SIDEBYSIDE**
 - **FULLSCREENSWITCH**
- **Video Input:** This specifies which video input to use and, if it is Input A, also specifies SDI or HDMI. Input B can only be used when in Single-isolated operating mode. The values are as follows:
 - **INPUT_A_HDMI**
 - **INPUT_A_SDI**
 - **INPUT_B_HDMI**
- **Audio Input:** This specifies which audio input to use. The values are as follows:
 - **INPUT_ANALOG**
 - **INPUT_A**
 - **INPUT_B**
- **SDI Output:** This specifies which input (A or B) to route through the SDI output. Values are **INPUT_A** or **INPUT_B**.
- **HDMI Output:** This specifies which input (A, B, or both) to route through the HDMI output. Values are **INPUT_A**, **INPUT_B**, or **COMPOSITION**.
 The Composition values are optional, and only needed for Picture-in-picture mode and Side-by-side mode. Default values will be used if the arguments are not included in the command string. The arguments are as follows:
 - **PIP_TL:** Picture-in-Picture located at the Top Left of the screen.
 - **PIP_TR:** Picture-in-Picture located at the Top Right of the screen.
 - **PIP_BL:** Picture-in-Picture located at the Bottom Left of the screen.
 - **PIP_BR:** Picture-in-Picture located at the Bottom Right of the screen.
 - **SBS_AB:** Side-by-Side with Input A on the left and Input B on the right.
 - **SBS_BA:** Side-by-Side with Input B on the left and Input A on the right.
 - **SBS_ACB:** Side-by-Side with Input A on the left and cropped, and Input B on the right.
 - **SBS_BAC:** Side-by-Side with Input B on the left, and Input A on the right and cropped.

- **Picture-in-picture cropping:** This specifies whether or not the Picture-in-picture video is cropped. Values are **TRUE** or **FALSE**. If set to **TRUE**, the crop occurs where specified in the Composition values.



Note Please note the following about the Operating Mode arguments:

- Video Input B is only available when in Single-isolated mode.
- Audio Input A uses the selected input type (SDI or HDMI).
- In Single-isolated mode, the SDI output and HDMI output values always mirror the values set for the corresponding input.
- Picture-in-picture mode does not allow Side-by-side composition values.
- Side-by-side mode does not allow Picture-in-picture composition values.

Here are some examples of the command syntax using the additional Operating mode arguments:

- `http://<IPAddress>/Monarch/synconnect/sdk.aspx?command=SetOperatingMode,DUALINPUT,INPUT_A_HDMI,INPUT_A,INPUT_A,COMPOSITION`
- `http://<IPAddress>/Monarch/synconnect/sdk.aspx?command=SetOperatingMode,SIDEBYSIDE,INPUT_A_SDI,INPUT_A,INPUT_A,COMPOSITION,SBS_BA,FALSE`

Returns:

- **SUCCESS**, if Operating mode is set.
- **FAILED**, if the Operating mode is not set.
- **RETRY**, if two or more commands are sent to the Monarch at the same time, or if the Monarch is executing a command while receiving another. The first command received will execute, and the others will return **RETRY**.

SetDynamicOutput

This command is used for Dual-isolated mode, Switcher mode, and Picture-in-picture mode. It includes the following values:

- **SHOW_A**
- **SHOW_B**
- **HIDE_A**



Note Please note the following:

- This command has no effect if the Monarch is in Single-isolated mode or in Side-by-side mode. If used in those modes, the command will return **SUCCESS**.
- Valid values for Dual-isolated mode and Switcher mode are **SHOW_A** and **SHOW_B**.
- Valid values for Picture-in-picture mode are **SHOW_A** and **HIDE_A**.

Returns:

- SUCCESS, if the output is set, or if the Monarch is in Dual-isolated or Switcher modes.
- FAILED, if the output is not set.
- RETRY, if two or more commands are sent to the Monarch at the same time, or if the Monarch is executing a command while receiving another. The first command received will execute, and the others will return RETRY.

AskForReboot

This command is used to reboot the Monarch.

Returns:

- SUCCESS, the Monarch will reboot.
- RETRY, if two or more commands are sent to the Monarch at the same time, or if the Monarch is executing a command while receiving another. The first command received will execute, and the others will return RETRY.

Example third-party tools

Different tools can be used to send commands to Monarch LCS. Matrox has tested the following applications and scripting languages for use with Monarch LCS:

- GNU Wget
- cURL
- C# (C Sharp)



Note Please note the following:

- In order for third-party applications to send commands to Monarch LCS successfully, they must support username and password authentication.
- Certain web browsers may no longer accept the “username:password” syntax in order to comply with publication RFC 3986 section 3.2.1 which describes the userinfo subcomponent (see <https://www.rfc-editor.org/>).

The following are examples of how to use the Monarch LCS API command line in third-party applications.

GNU Wget

```
wget --user=<username> --password=<password>
http://<ipAddress>/Monarch/syncconnect/sdk.aspx?command=<command>
```

cURL

```
curl http://<username>:<password>@<ipAddress>/Monarch/synccon-
nect/sdk.aspx?command=<command>
```

PHP (cURL)

```
<?php
    ch =
        url_init("http://<username>:<password>@<ipAddress>/Monarch/syn
        connect/sdk.aspx?command=<command>");
    response = curl_exec($ch);
    header_size = curl_getinfo($ch,CURLINFO_HEADER_SIZE);
    rint substr( $response, $header_size );
    url_close($ch);
?>
```

C#

```
using System.Net;
WebClient webclient = new WebClient();
webclient.Credentials = new NetworkCredential("<username>", "<pass-
word>");
string pageContent = string.Empty;
try
{
    using (Stream stream = webclient.OpenRead(new Uri ( "http://<ipAd-
dress>/Monarch/synconnect/sdk.aspx?command=<command>")))
    {
        using (StreamReader reader = new StreamReader(stream))
        {
            pageContent = reader.ReadToEnd();
        }
    }
}
catch (WebException e)
{
}
```

Your notes

2

Configuring the Monarch LCS XML File

This chapter describes how to properly configure an XML file for use with the automatic configuration feature of the Monarch LCS device.

Monarch LCS XML configuration overview

This section explains how to generate an XML file that you can use to automatically configure the Monarch LCS without logging on to the web-based Monarch LCS Command Center.

How it works

Monarch LCS settings can be defined as parameters in an XML file, which you can generate from the Monarch LCS Command Center (see “[Generating an XML file](#)” on page 18). You can then use this XML configuration file to configure other Monarch devices by importing the settings in the following ways:

- From the Monarch LCS Command Center, you can import the settings by loading a previously-generated XML configuration file.
- You can host the XML parameters on a web page, and then have the Monarch LCS download the settings from the web page URL. You can specify the URL through the Command Center, or in a parameter in the XML file.
- You can copy the XML file to a USB device, connect it to the USB2 port on the Monarch, and then perform a factory reset of the Monarch. On startup, the Monarch will automatically import the settings from the XML file located on the USB device.

Importing settings from an XML file makes configuring the Monarch device more convenient, and will minimize or potentially eliminate the need to log on to the Command Center to configure each device individually.

Generating an XML file

Instead of building an XML configuration file from scratch, you can use any Monarch LCS to generate a valid XML file for you. From the Command Center you can configure a single Monarch device with your desired settings, and then generate a configuration file (named *MonarchLCS_Settings.xml* by default) with those settings expressed as valid XML parameters. For more information on how to generate an XML configuration file, see the *Matrox Monarch LCS User Guide*.

If you want to edit the parameters in the file, you can open it with Notepad or a similar text editor. It is recommended that you use a more advanced text editor (such as Notepad++ or a Linux text editor) to see the XML as properly formatted code.

Guidelines for working with the XML file

This section explains some general things you should know about working with the Monarch LCS XML configuration file:

- Some of the parameters are optional, and may not need to be defined.
- An XML tag can be either a *leaf* or a *branch*. A leaf tag defines a specific value, while a branch tag contain other tags. In the Monarch LCS XML configuration

file, all the leaf tags correspond to actual settings in the Monarch LCS Command Center user interface, and they are subject to the same conditions and limitations.

- Parameters can be listed in the XML file in any order. For example, you can have the height tag listed before the width if you choose.
- XML tags are case-sensitive but the content of the tag is not. For example, the tag Deblocking Filter must be written as <deblockingFilter>, but the content for the tag (which is either “true” or “false”) can be written “False”, “FALSE”, or “false”.
- If a tag name has a syntax error, that section will not be parsed but no error will be reported. However, for leaf tags, a specific error will be returned for syntax errors.

For example, the following tag contains a syntax error because there is no such thing as “encoder 0”:

```
– <MatroxMonarch><encoder0>...</encoder0></MatroxMonarch>
```

Only encoder1 and encoder2 are valid tags. In this case, the content of the tag encoder0 will not be processed since it is an invalid tag, but no error will be reported.

Sample XML and parameter descriptions

This section provides a sample of the XML structure in the configuration file, followed by descriptions of each parameter:

```
<?xml version="1.0" encoding="utf-8" standalone="yes" ?> <MatroxMon-
arch xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <deviceName>MonarchLCS</deviceName>
  <monarchSettingsVersion>1.0.0</monarchSettingsVersion>
  <monarchUPnPEnabled>true</monarchUPnPEnabled>
  <hardwareButtonLocked>>false</hardwareButtonLocked>
  <video>
    <videoPort>HDMI</videoPort>
  </video>
  <audio>
    <audioPort>DIGITAL</audioPort>
    <audioBitRateInKbps>192</audioBitRateInKbps>
    <audioSamplingRateInKHz>48</audioSamplingRateInKHz>
    <audioVolume>100</audioVolume>
  </audio>
  <configuration>
    <operatingMode>SINGLE</operatingMode>
    <composition>
      <compositionMode>NONE</compositionMode>
      <compositionDetails></compositionDetails>
```

```

    <compositionCropping>false</compositionCropping>
  </composition>
  <output>
    <HDMI>INPUT1</HDMI>
    <SDI>INPUT1</SDI>
  </output>
  <encoder1>
    <mode>DISABLED</mode>
  </encoder1>
  <encoder2>
    <mode>DISABLED</mode>
  </encoder2>
</configuration>
<encoder1>
  <encoderParam>
    <width>1280</width>
    <height>720</height>
    <framerate>30/25</framerate>
    <videoBitRateInKbps>5000</videoBitRateInKbps>
    <gopStructSize>10</gopStructSize>
    <gopStructPRate>1</gopStructPRate>
    <profile>HIGH</profile>
    <sliceUnit>1</sliceUnit>
    <deblockingFilter>>false</deblockingFilter>
  <minVideoBitrateInKbps>4500</minVideoBitrateInKbps>
  <maxVideoBitrateInKbps>5500</maxVideoBitrateInKbps>
  </encoderParam>
  <recordParam>
    <audioEnabled>>true</audioEnabled>
    <mediatype>USB1</mediatype>
  <fileSwitchDurationInMinutes>0</fileSwitchDurationInMinutes>
  <maxRecordDurationInMinutes>0</maxRecordDurationInMinutes>
    <pathAndFilename>File1</pathAndFilename>
    <credentials>
      <domain></domain>
    </credentials>
    <fileType>MOV</fileType>
    <fileIDMode>DATETIME</fileIDMode>
  </recordParam>
  <streamParam>
    <rtmpMode>DEFAULT</rtmpMode>
    <audioEnabled>>true</audioEnabled>
    <rtspStreamName>Stream1</rtspStreamName>
    <rtspPort>8554</rtspPort>
    <jumboFramesEnabled>>false</jumboFramesEnabled>
  </streamParam>
</encoder1>

```

```

    <rtmpDestinationURL></rtmpDestinationURL>
    <rtmpStreamName></rtmpStreamName>
    <rtmpUsername></rtmpUsername>
    <rtmpPassword></rtmpPassword>
    <wowzaLongToken></wowzaLongToken>
    <streamType>RTSP</streamType>
  </streamParam>
</encoder1>
<encoder2>
  <encoderParam>
    <width>1280</width>
    <height>720</height>
    <framerate>30/25</framerate>
    <videoBitRateInKbps>5000</videoBitRateInKbps>
    <gopStructSize>10</gopStructSize>
    <gopStructPRate>1</gopStructPRate>
    <profile>HIGH</profile>
    <sliceUnit>1</sliceUnit>
    <deblockingFilter>>false</deblockingFilter>
  <minVideoBitrateInKbps>4500</minVideoBitrateInKbps>
  <maxVideoBitrateInKbps>5500</maxVideoBitrateInKbps>
  </encoderParam>
  <recordParam>
    <audioEnabled>>true</audioEnabled>
    <mediatype>USB1</mediatype>
  <fileSwitchDurationInMinutes>0</fileSwitchDurationInMinutes>
  <maxRecordDurationInMinutes>0</maxRecordDurationInMinutes>
    <pathAndFilename>File1</pathAndFilename>
    <credentials>
      <domain></domain>
    </credentials>
    <fileType>MOV</fileType>
    <fileIDMode>DATETIME</fileIDMode>
  </recordParam>
  <streamParam>
    <rtmpMode>DEFAULT</rtmpMode>
    <audioEnabled>>true</audioEnabled>
    <rtspStreamName>Stream1</rtspStreamName>
    <rtspPort>554</rtspPort>
    <jumboFramesEnabled>>false</jumboFramesEnabled>
    <rtmpDestinationURL></rtmpDestinationURL>
    <rtmpStreamName></rtmpStreamName>
    <rtmpUsername></rtmpUsername>
    <rtmpPassword></rtmpPassword>
    <wowzaLongToken></wowzaLongToken>

```

```

        <streamType>RTSP</streamType>
    </streamParam>
</encoder2>
<fileManager>
    <transferLocation>
        <source>USB1</source>
        <destination></destination>
        <transferProtocol>NFS</transferProtocol>
        <domain></domain>
        <user></user>
        <password></password>
        <port></port>
    </transferLocation>
    <transferWindow>
        <startHour>12</startHour>
        <startMin>0</startMin>
        <stopHour>13</stopHour>
        <stopMin>0</stopMin>
    </transferWindow>
<automaticFileTransferMode>DISABLED</automaticFileTransferMode>
<transferredFileLifespan>-1</transferredFileLifespan>
</fileManager>
<kaltura>
    <Enabled>>false</Enabled>
    <ResourceId></ResourceId>
    <PartnerID></PartnerID>
    <AdminSecret></AdminSecret>
    <ServiceURL></ServiceURL>
    <UserID></UserID>
</kaltura>
<scheduler>
    <url></url>
    <pollingInterval>0</pollingInterval>
    <mode>FILE</mode>
</scheduler>
</MatroxMonarch>

```

<MatroxMonarch>

The XML file generated by the Monarch specifies the XML declaration (<?xml version> tag) but this is optional. If you generate your own XML using some kind of application or code, you do not need to include a declaration. If you do include it, make sure that it matches the following line:

```
<?xml version="1.0" encoding="UTF-8" standalone="true"?>
```

The root is the <MatroxMonarch> tag. The XML file generated by the Monarch contains the namespace xmlns:xsd and xmlns:xsi, but you can leave those out and use a simpler <MatroxMonarch> tag such as the following:

```
<MatroxMonarch xmlns:xsd="http://www.w3.org/2001/XMLSchema"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

</MatroxMonarch>
```

Anything outside the <MatroxMonarch></MatroxMonarch> tags is ignored by the Monarch. However, to avoid validation errors with the XML file, you should not have anything outside those root tags.

<deviceName>

This is the name you want to give to this specific device. When you are in the Command Center, this name will be displayed in the browser tab. You can leave this tag blank if you choose.

Example: <deviceName>MonarchLCS</deviceName>

<monarchUPnPEnabled>

This is the option to have the Monarch broadcast itself as a Universal Plug and Play (UPnP) device. This means that it will appear in Windows Explorer (not visible in Mac OS) as if it were a printer, external hard drive, or similar UPnP device.

Example: <monarchUPnPEnabled>true</monarchUPnPEnabled>

<hardwareButtonLocked>

This is the option to lock the **Input Select**, **Switch** and **ENCD** (encode) buttons on the Monarch device. This can prevent someone from inadvertently switching inputs or stopping a streaming or recording session.

Example: <hardwareButtonLocked>>false</hardwareButtonLocked>

<monarchSettingsVersion>

This is the version of the XML configuration file (currently at 1.0.0). You **must** have this tag in the XML file, however it is not related to the version of the Monarch LCS firmware.

Example: <monarchSettingsVersion>1.0.0</monarchSettingsVersion>

<configuration>

This tag allows you to configure the operating mode and related settings for the Monarch LCS. You specify the type of composition you want (e.g. picture-in-picture, side-by-side, etc), as well as the encoder mode with the values RecordingOnly, StreamingOnly, or Disabled.

Example:

```

<configuration>
  <operatingMode>COMPOSITION</operatingMode>
  <composition>
    <compositionMode>PICTUREINPICTURE</compositionMode>
    <compositionDetails>PIP_BR</compositionDetails>
    <compositionCropping>>false</compositionCropping>
  </composition>
  <output>
    <HDMI>COMPOSITION</HDMI>
    <SDI>INPUT1</SDI>
  </output>
  <encoder1>
    <mode>DISABLED</mode>
  </encoder1>
  <encoder2>
    <mode>RECORDINGONLY</mode>
  </encoder2>
</configuration>

```

The configuration tag includes the following sub-tags:

- [<operatingMode>](#)
- [<composition>](#)
- [<output>](#)
- [<encoder1> and <encoder2> modes](#)

<operatingMode>

Specifies the operating mode as single isolated, dual isolated, or one of the “composition” modes (picture-in-picture, side-by-side, or switcher).

The values are:

- **SINGLE:** This mode processes one of the inputs at any given time.
- **DUAL:** This mode processes both inputs independently.
- **COMPOSITION:** This mode displays what is specified in the `<composition>` tags.

Example: `<operatingMode>SINGLE</operatingMode>`

<composition>

This tag is used when **COMPOSITION** is specified in the `<operatingMode>` tag, and specifies the type of composition mode to use along with the related settings.

The tags used inside the `<composition>` tag are:

- `<compositionMode>`

The values are:

- SIDEBYSIDE
- FULLSCREENSWITCH
- PICTUREINPICTURE
- <compositionDetails>

Used only for SIDEBYSIDE and PICTUREINPICTURE compositions, the values are:

 - SBS_ACB: Input A is on the left and cropped, Input B is on the right.
 - SBS_BA: Input B is on the left, Input A is on the right.
 - SBS_AB: Input A is on the left, Input B is on the right.
 - SBS_BAC: Input B is on the left, Input A is on the right and cropped.
 - PIP_TL: Picture-in-picture is at the top left.
 - PIP_TR: Picture-in-picture is at the top right.
 - PIP_BR: Picture-in-picture is at the bottom right.
 - PIP_BL: Picture-in-picture is at the bottom left.
- <compositionCropping>

Used only for PICTUREINPICTURE compositions, this crops the Input A video. The values are TRUE or FALSE.

<output>

This tag is used to specify which input the HDMI and/or the SDI outputs will use, Input A or Input B. The tags used inside the <output> tag are:

- <HDMI>

The values are:

 - INPUT1: The HDMI output displays the input A video.
 - INPUT2: The HDMI output displays the input B video.
 - COMPOSITION: For Single isolated mode this is not available, for Dual isolated mode, it will display input A or input B, and for the other modes it is a channel preview.
- <SDI>

The values are:

 - INPUT1: The SDI output displays the input A video.
 - INPUT2: The SDI output displays the input B video.

<encoder1> and <encoder2> modes

These <encoder> tags specify the encoder modes. The <encoder> tags that specify the settings are set outside the <configuration> tag (see “<encoder1> and <encoder2> parameters” on page 26).

The values are:

- RECORDINGONLY
- STREAMONLY
- DISABLED

<video>

This tag specifies whether HDMI or SDI should be used for Input A on the Monarch LCS. The values are SDI or HDMI.

Example: <videoPort>HDMI</videoPort>

<audio>

This tag contains all the information related to audio encoding. There are three parameters:

- <audioPort>
Specify the audio input as either Analog or Digital.
Example: <audioPort>Digital</audioPort>
- <audioBitRateInKbps>
Specifies the bit rate (in kilobits per second) at which the audio will be encoded. Accepted values are 32, 96, 128, 192, and 256. For analog audio, 32 Kbps must be used with a 22.05 KHz sampling rate
Example: <audioBitRateInKbps>32</audioBitRateInKbps>
- <audioSamplingRateInKHz>
Specifies the audio sampling rate (in kilohertz) at which the audio will be encoded. Accepted values are 22.05, 24, 32, 44.1, and 48. For analog audio, 32 Kbps must be used with a 22.05 KHz sampling rate
Example: <audioSamplingRateInKHz>44.1</audioSamplingRateInKHz>

<encoder1> and <encoder2> parameters

These <encoder> tags specify the encoder settings. The <encoder> tags that specify the modes are set inside the <configuration> tag (see “<encoder1> and <encoder2> modes” on page 25).

You can choose to omit one or both encoder tags in the XML to keep using the parameters that are currently programmed in the Monarch LCS Command Center. The encoder tags include the following branch sub-tags:

- <encoderParam>
- <recordParam>
- <streamParam>

<encoderParam>

This branch tag defines the encoding of the input. All the value tags inside this tag are mandatory, meaning that if you have the <encoderParam> included in your XML file, all the following values must be present and contain valid values:

- <width>
Width of the encoding resolution. Must be between 128 and 1920, and be a multiple of 16. If the connected input resolution width is smaller than this value, the input resolution is used and supersedes this width.
- <height>
Height of the encoding resolution. Must be between 128 and 1080, and be a multiple of 2. If the connected input resolution height is smaller than this value, the input resolution is used and supersedes this height.
- <framerate>
The frame rate to use based on the input resolution. Values are 60/50, 30/25, 24, or 15/12.5. For more information on the frame rate values, see the *Matrox Monarch LCS User Guide*.
Example: <framerate>60/50</framerate>
- <videoBitRateInKbps>
The average video bit rate in kilobits per second. The minimum value is 50. The maximum value is based on the operating mode(s) selected for the encoders. For more information on the maximum bit rates, see the *Matrox Monarch LCS User Guide*.
- <gopStructSize>
The number of frames inside a GOP. Value can be 1 to 1000.
- <profile>
You can have Baseline, Main, and High.
- <sliceUnit>
Number of slices inside a frame. The accepted values are 1, 2, 4, or 8.
- <deblockingFilter>
Enable a deblocking filter to get a better image. Value must be “true” or “false”.
- <minVideoBitrateInKbps>
Lowest acceptable bit rate for video segments that are easy to encode, such as segments with black frames. The minimum value is 50, and the maximum is the value set as the average video bit rate in the parameter <videoBitRateInKbps>.
- <maxVideoBitrateInKbps>
Highest acceptable bit rate for video segments that are difficult to encode. The minimum value is the value set for the average video bit rate in the parameter

<videoBitRateInKbps>. The maximum value is 8x times the average video bit rate.

<recordParam>

This branch tag defines the recording parameters for an encoder. The following parameters are included:

- <audioEnabled>
Specifies whether or not to record audio. Values can be “true” or “false”.
- <fileType>
Specifies if you want to encode a MOV file or a MP4 file. Values can be “MOV” or “MP4”.
- <maxrecordDurationInMinutes>
Enter a Maximum recording duration (in minutes) to set an overall time limit for your recording session. The session will automatically end when this limit is reached, or when the selected storage media is full (whichever occurs first). If you enter a value of 0, the recording session will continue indefinitely, and will stop only when your storage media is full.
- <fileSwitchDurationInMinutes>
Enter a file switching duration (in minutes) to separate your recording session into more than one file at predetermined intervals. For example, if you enter a duration of 30 minutes, Monarch LCS will close the current file and start recording to a new file every 30 minutes. The maximum duration you can set is 290 minutes. If you enter a duration of 0, Monarch LCS will automatically switch to a new file every 290 minutes, as a built-in precaution to avoid possible data loss from having files that are too large.
- <pathAndFilename>
Specify the destination and filename for your recording based on your recording destination. When specifying the path, all folders in the path must already exist.
- <mediaType>
Specify on which media to record (USB1, USB2, SDCard, or Network). For networks, the <recordParam> section can also have a <credentials> section.
- <fileIDMode>
This tag corresponds to the “Save file as” option in the Monarch LCS Command Center, where you can add a customized suffix to the filename when saving it. There are three possible values:
 - Save a file with the filename only (XML value is “Filename”).
 - Save a file with the filename and the date/time (XML value is “DateTime”).
 - Save a file with the filename and a numeric counter (XML value is “Numeric”).

For more information on the various use-cases for each type of filename format, see the *Matrox Monarch LCS User Guide*.

Example:

```
<recordParam>
  <fileIDMode>DATETIME</fileIDMode>
</recordParam>
```

<streamParam>

This branch tag defines the RTMP or RTSP streaming parameters for an encoder. If you configure one stream type, RTSP for example, you can leave the RTMP values blank and vice-versa. You can also choose to program all fields, and the Monarch will use the parameters based on the stream type selected. The following parameters are included:

- <rtmpMode>

Specifies the RTMP mode for the Monarch. Values are DEFAULT, LEGACY, or WOWZACLOUD. This is an optional tag. If this tag is not present in the XML, Monarch will assume the DEFAULT mode.
- <audioEnabled>

Specifies whether or not to stream audio. Values can be “true” or “false”.
- <jumboFramesEnabled>

Specifies whether or not to broadcast data in bigger network packets. Values can be “true” or “false”. The network card on the computer receiving the data must support this option.
- <rtspStreamName>

You can provide a name for the stream. If you leave this blank, the stream name will be “Stream1”.
- <rtspPort>

Specify the port on which to stream. Values can be either “554” or “8554”. If you leave this blank, port 554 will be used by default.
- RTMP parameters:
 - <rtmpDestinationURL>
 - <rtmpStreamName>
 - <rtmpusername>
 - <rtmpPassword>

Specify the destination server URL (must begin with **rtmp://**), stream name, username, and/or password. This information is typically provided by the CDN server administrator. If the stream name, username, and password is included in the URL, you can leave those parameters blank.

<FileManager>

This tag allows you to configure file transfer options and enable/disable automatic file transfer capability.

<transferLocation>

If this tag is present, all elements within it must also be present. They can be empty if not needed (e.g. username and password) but they must be included.

- <source>

This is the source location for the Monarch files. Values can be **USB1**, **USB2**, or **SDCARD**.

- <destination>

This is the network drive that will receive the transferred files. This drive must be accessible with or without user authentication

- <domain>

This is the network domain that hosts the shared folder. This is only required if the Monarch is not on the same domain as the network shared folder. By default, all Windows computers have a domain, the default Windows domain being WORKGROUP

- <user>

The username to access the network shared folder, if applicable.

- <password>

The password to access the network shared folder, if applicable.



Note Please note the following:

- The **Source** and **Destination** elements are always required if the file manager tag is used, but the **Domain**, **Username**, and **Password** elements are optional.
- For **Destination**, **Domain**, and **Username**, the characters you can use are letters, numbers, underscore (_), forward (/) and backward (\) slashes, and colon (:).
- The **Password** can be any character accepted in a URL.

<transferWindow>

This tag is used to configure the time window for the transfer to occur. If this tag is present, all elements within it must also be present and must also have a valid value (e.g. you cannot use 25 for the hour elements).

- <startHour>
- <startMin>
- <stopHour>
- <stopMin>

<isAutomaticTransferEnabled>

This tag is used to enable or disable automatic file transfer.

- <true> to enable transfer.
- <false> to disable transfer.

<transferredFileLifespan>

This tag is used to determine how long the Monarch files should be kept after file transfer is complete. If you set the value to -1, the feature is disabled and files will not be deleted. If you set the value to 0, the files will be deleted immediately after a successful file transfer. Otherwise, set the number of days (1, 2, 3, etc).

<Kaltura>

This tag is used to import Kaltura events to be used with the Monarch Scheduler. For more information on how Kaltura works and integrates with the Monarch, see the *Matrox Monarch LCS User Guide*. The following elements are included with this tag:

- <enabled>

This tag is mandatory if the Kaltura tag is present in the XML. It enables the Kaltura service. Values are <true> to enable or <false> to disable.

- <ResourceId>

The Kaltura resource ID for your calendar events.

- <PartnerID>

Your Kaltura Partner ID found in the Kaltura Management Console under **Settings > Integration Settings > Account Info**.

- <AdminSecret>

Your Kaltura Administrator Secret found in the Kaltura Management Console under **Settings > Integration Settings > Account Info**.



Important For security reasons, the Administrator Secret tag is not automatically populated when generating the XML file from the Monarch Command Center. If you choose to include this information in the XML file, you must copy and paste the information in yourself.

- <ServiceURL>

The URL for the Kaltura API. If the API is hosted by Kaltura the URL is the default <https://www.kaltura.com>. However, you may be hosting locally.

- <UserID>

Your personal Kaltura User ID.

After specifying all your settings here, make sure to also set the <mode> element within the <scheduler> tag to KALTURA.

<scheduler>

This tag configures and enables the Monarch LCS Scheduler mode, which lets you schedule a streaming or recording session for a future date. For more information on how Scheduler mode works, see the *Matrox Monarch LCS User Guide*. This tag includes the following elements:

- <url>
This is the URL from which to load the iCalendar file (.ics). The calendar will be loaded at the next polling interval.
- <pollingInterval>
This is how often in minutes the Monarch should check for schedule changes. If you leave this at zero (0), the Monarch will not check for new schedules and even your initial iCalendar file will not be loaded. This value must be set for your calendar to be loaded.
- <mode>
This tag specifies how Monarch is loading the schedule. Values are FILE, URL, or KALTURA. For more information on the Kaltura service, see “<Kaltura>” on page 31. If the value is set to FILE, it simply indicates that the Monarch Command Center is using that setting. You cannot use the XML to load a file from a network.

Additional XML configuration

In addition to the standard XML tags used in the Monarch XML configuration file, you can also use the tags in this section to further customize the Monarch’s capabilities.

Dynamic bit rate

This XML tag allows you to change the video bit rate while streaming. It can be used for either Monarch HDX encoder but it will not work if the tag <videoBitRateInKbps> is also present in the XML file for that encoder. The encoder must also be configured for streaming only.

This tag contains two other inner or sub-tags, one to define which encoder to set, and the other to define the bit rate. The value chosen for the bit rate must be between 50 and 20000.

```
<dynamicBitrateInKbps>
  <encoder2>
    <bitrate>value</bitrate>
  </encoder2>
</dynamicBitrateInKbps>
```

Call home

Instead of the Monarch importing settings from a USB key or from a network drive, you can host the XML file on a webpage and have the Monarch “call home” to that page to import the settings. You can have the Monarch do this on start-up or on demand.

```
<home>
  <url>value</url>
</home>
```

The URL value must start with the common web-based prefix “http://”. You can disable this feature by leaving the tag blank.

After the Monarch validates the XML file from the webpage, it will send an error to the same URL server, but with the device serial number, error and the status. If the error is 0, then the XML is considered validated. The status is the same as the [GetStatus](#) call described in the control API section of this document.

Here is an example of the response sent by the Monarch after an XML file with a <home> field is loaded:

```
http://url?serialNumber=Bx12345&error=0&status=RECORD:READY,STREAM:R
TSP,READY,NAME:MonarchHDX
```



Note If you generate the XML from the Monarch Command Center, the <home> tag will be included in the XML file if there is a value in the URL field in the Automatic configuration page of the Command Center.

Periodic call home

You can also configure the Monarch to call home (or poll) periodically to check for new configuration instructions by using the tag <MatroxReservedOption1>. The value for this tag can either be “0” which disables polling, or a value in seconds up to 4,230,000.

```
<MatroxMonarch>
  <MatroxReservedOption1>value</MatroxReservedOption1>
</MatroxMonarch>
```

Stop and Start control

You can use this XML tag to stop and start the Monarch encoders. The encoders will behave as configured in the Monarch Command Center.

For more information on the conditions for these commands succeeding or failing, see “[Commands](#)” on page 2.

The available values are:

- Start

- Stop

Example:

```
<control>
  <action>Start</action>
</control>
```

Processing order of the XML tags

You can add any of the XML tags in any order inside the configuration file and they will always be processed in the following order:

- 1 Settings inside these tags (if present):
 - Audio
 - Configuration
 - Encoder 1
 - Encoder 2
- 2 Dynamic bit rate
- 3 If the call home tag <home> is present, the Monarch retrieves the content of the XML at the specified URL, and then follows the regular processing order of XML tags. If a new URL is provided, the Monarch will not retrieve the new settings but will save the name of the new URL.
- 4 Any action specified in the <control> tag (if present).

XML configuration sample scenarios

This section provides some examples of how to configure the XML file to handle a number of real-world Monarch scenarios.

Streaming to a CDN using RTMP only (no recording enabled)

This is an example of what the XML would look like for streaming to a CDN using RTMP only.

```
<?xml version="1.0" encoding="UTF-8" standalone="true"?>
<MatroxMonarch>
  <monarchSettingsVersion>1.0.0</monarchSettingsVersion>
  <encoder2>
    <streamParam>
      <audioEnabled>true</audioEnabled>
      <rtspStreamName> </rtspStreamName>
      <rtspPort></rtspPort>
      <jumboFramesEnabled>false</jumboFramesEnabled>
      <rtmpDestinationURL>rtmp://monarchStream/live</rtmpDestina-
tionURL>
```



```

    <rtmpStreamName>livestream</rtmpStreamName>
    <rtmpUsername> </rtmpUsername>
    <rtmpPassword>
    </rtmpPassword>
    <streamType>RTMP</streamType>
  </streamParam>
</encoder2>
</MatroxMonarch>

```

You don't need the `<encoder1>` tag or the `<encoderParam>` tags inside the `<encoder2>`, but you need all the tags inside `<streamParam></streamParam>`.

Changing encoding parameters for recording

This is an example of what the XML would look like if you wanted to change the encoding parameters for a recording session.

```

<MatroxMonarch>
  <monarchSettingsVersion>1.0.0</monarchSettingsVersion>
  <encoder1>
    <encoderParam>
      <sameResAsInput>true</sameResAsInput>
      <width>1280</width>
      <height>720</height>
      <framerate>Full</framerate>
      <videoBitRateInKbps>4000</videoBitRateInKbps>
      <gopStructSize>15</gopStructSize>
      <gopStructPRate>3</gopStructPRate>
      <profile>Baseline</profile>
      <sliceUnit>1</sliceUnit>
      <deblockingFilter>false</deblockingFilter>
      <minVideoBitrateInKbps>3600</minVideoBitrateInKbps>
      <maxVideoBitrateInKbps>4400</maxVideoBitrateInKbps>
    </encoderParam>
  </encoder1>
</MatroxMonarch>

```

Even though the encoding will use the same resolution as the input, you must still set all the tags inside the encoder tag, including the width and height.

Start streaming

This is an example of what the XML would look like if you wanted to issue a control command to the Monarch to start streaming.

```

<?xml version="1.0" encoding="UTF-8" standalone="true"?>
<MatroxMonarch>
  <monarchSettingsVersion>1.0.0</monarchSettingsVersion>

```

```
<control>
  <action>Start</action>
</control>
</MatroxMonarch>
```

Please note the following:

- The Monarch must be pre-configured for streaming in the Command Center for this command to be successful.
- Since the action value is not case-sensitive, the value “Start” is valid as written. However, you would not be able to write the control tag any other way.

Change bit rate while streaming

This is an example of what the XML would look like if you wanted to change the average video bit rate to 8.5 Mbits/s while the Monarch is streaming.

```
<MatroxMonarch>
  <dynamicBitrateInKbps>
    <encoder2>
      <bitrate>8500</bitrate>
    </encoder2>
  </ dynamicBitrateInKbps >
</MatroxMonarch>
```

3

Using the Monarch LCS Command Line Utility

This chapter describes how to use the Windows command line to remotely reboot or update Monarch LCS devices.

Updating or rebooting the Monarch LCS using the command line

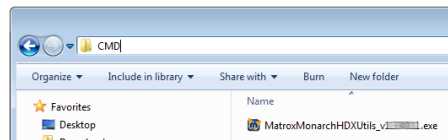
By using the Windows command line utility, you can remotely reboot or update one or more Monarch LCS devices on the same subnet, or on a different subnet if you know the Monarch's IP address(es). You can choose to manually execute the command line calls (from the CMD prompt), or you can develop your own application based on the Monarch LCS command line calls to programatically update and/or reboot the devices.

Please note the following:

- This feature is not supported on Mac OS. It is available only through the Windows command line.
- You must have the Monarch LCS Utils installed, and you must run the command prompt from the folder that contains the Monarch LCS Utils executable (.exe).
- You must know the IP address or the serial number of the Monarch(s) that you want to update or reboot, You can use the serial number if you are on the same subnet, but you must use the IP address if you are on a different subnet. Generally, using the IP address is preferable in all cases.
- If you initiate an update or a reboot, the Monarch device will comply with the command even if it is in an active process at the time. For example, if the Monarch is streaming and/or recording when it receives a reboot command, it will reboot and interrupt the streaming or recording process.

⇒ To update or reboot the Monarch LCS from the command line:

- 1 (Optional) If you do not already have Monarch LCS Utils, download it from our [website](#) and save it to a folder that is accessible from your computer.
- 2 Go to the folder containing the Monarch LCS Utils executable, and then run the Windows command prompt.



Tip A quick way to open command prompt from the folder is to delete the text in the network path field at the top, type **CMD**, and then press **ENTER**.

- 3 From the command prompt, type the following command:

```
MonarchLCSUtils.exe ACTION OPTION MONARCH MONARCH MONARCH MON-ARCH...
```

Where:

- ACTION is **Reboot** or **Update**.
- OPTION is **IP** or **Serial**.
- MONARCH is the IP address or serial number of the Monarch device(s).

You can update or reboot as many Monarch devices as you want by including a single space between each IP address or serial number.

4 Press ENTER.

The Monarch(s) will update or reboot according to the command issued.

Update/reboot command line syntax examples

To help you understand the proper syntax for using the command line update/reboot feature, see the following examples:

Update on a different subnet

To update three Monarch devices on a different subnet (IP addresses needed), use the following syntax:

```
MonarchLCSUtils.exe Update IP 192.168.12.34 192.168.56.78  
192.168.9.10
```

Reboot on the same subnet

To reboot four Monarch devices on the same subnet, you can use the serial numbers or IP addresses.

With serial numbers:

```
MonarchLCSUtils.exe Reboot Serial 123456 654321 654789 987456
```

With IP addresses:

```
MonarchLCSUtils.exe Reboot IP 192.168.12.34 192.168.56.78  
192.168.9.10 192.168.10.11
```

Your notes



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