MX-H2A, MXV and MX-KIT Series Matrix Switchers

MX-0404-HDMI | MX-0404/0606/0808-H2A | MX-0808-H2A-MK2
MXV-0404-H2A-KIT | MXV-0606-H2A | MXV-0808-H2A
MX-0404-KIT | MX-0808-KIT

Application Programming Interface

Document Revision	v4.0
Document Date	April 2021
Supported Firmware	Refer to Supported Product Firmware/Software for details.

Contents

1. Overview

The following contains the connection and commands to control MXV and H2A series matrix switchers, not including the H2A kit. By following the content contained in this document, the switcher can be controlled and configured via a 3rd party RS-232 control system.

IMPORTANT NOTE!

Due to differences between matrix series and model versions within a series, some commands have different parameters based on the model and version. These differences are noted where applicable and should be followed as sending an incorrect parameter may cause the unit to lock up and become inoperative.

1.1 Supported Product Firmware/Software

The following products and firmware versions are supported by this version of the API. The firmware versions listed are the minimum supported at time of publication; firmware may be higher except where otherwise noted.

Product	Status Since Last Doc Rev	Supported Product Versions
MX-0404-H2A	Unchanged	v1 or higher
MX-0404-HDMI	New	v1 or higher
MX-0606-H2A	Unchanged	v1 or higher
MX-0808-H2A	Unchanged	v1 or higher
MX-0808-H2A-MK2	New	v1 or higher
MXV-0404-H2A-KIT	Unchanged	v1 or higher
MXV-0408-H2A	Unchanged	v1 or higher
MXV-0606-H2A	Unchanged	v1 or higher
MXV-0606-H2A-70	Unchanged	v1 or higher
MXV-0808-H2A	Unchanged	v1 or higher
MXV-0808-H2A-70	Unchanged	v1 or higher
MX-0404-KIT	Unchanged	v1 or higher
MX-0808-KIT	Unchanged	v1 or higher

1.2 Before You Begin

Verify that the following items are on hand and that all documentation is reviewed before continuing:

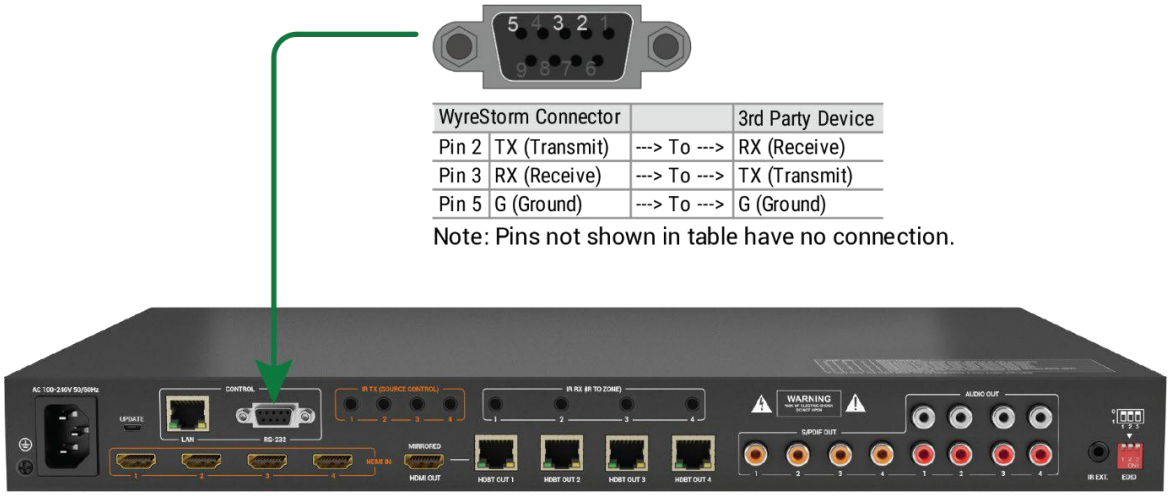
Configured and Operational MX-H2A, MXV or MX-KIT Matrix ☐
Refer to Supported Product Firmware/Software for a complete list of supported products and versions.
Control System and Control System Documentation ☐
PC or Mac for configuring product and telnet communications ☐
Network Connection with Network Passwords ☐
Current Product Firmware (if available), Software, and Documentation downloaded from WyreStorm.com ☐

2. Wiring and Communication Configuration

WyreStorm recommends that all wiring for the installation is run and terminated prior to making connections to the switcher. Read through this section in this entirety before running or terminating the wires to ensure proper operation and to avoid damaging equipment.

2.1 RS-232 Connections

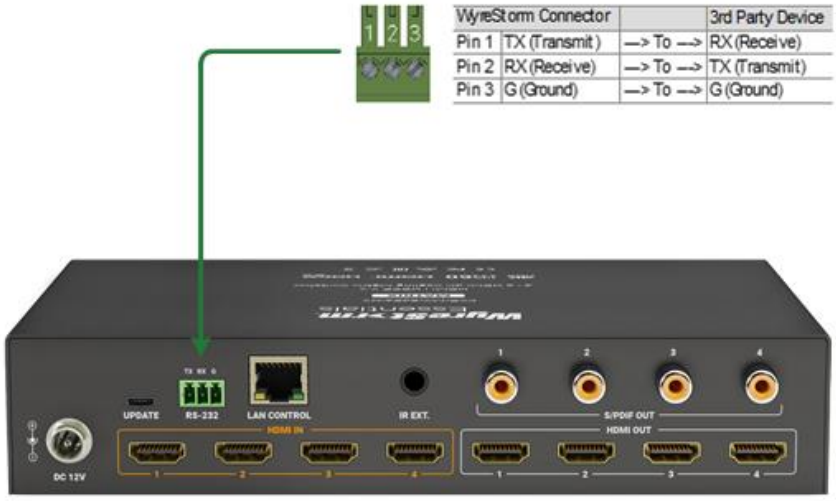
The following wiring diagrams show the pinouts for the WyreStorm device. While not shown, connect the TX (transmit) to RX (receive) pins at the control system or PC side of the cable. Most control systems and computers are configured for Digital Terminal Equipment (DTE) where pin 2 is RX and pin 3 is TX. This can vary from device to device, refer to the documentation for the connected device for pin functionally to ensure that the connect connections can be made.



WyreStorm Connector			3rd Party Device
Pin 2	TX (Transmit)	---> To --->	RX (Receive)
Pin 3	RX (Receive)	---> To --->	TX (Transmit)
Pin 5	G (Ground)	---> To --->	G (Ground)

Note: Pins not shown in table have no connection.

Note: MX-0404-H2A-KIT shown above. Port may be in different location for the various models.



WyreStorm Connector			3rd Party Device
Pin 1	TX (Transmit)	—> To —>	RX (Receive)
Pin 2	RX (Receive)	—> To —>	TX (Transmit)
Pin 3	G (Ground)	—> To —>	G (Ground)

Note: MX-0404-HDMI shown above. Port may be in different location for the various models.

RS-232 Port Settings

Baud rate:	9600bps | 115200bps (MX-0404-HDMI)
Data Bits:	8bits
Parity:	None
Stop Bits:	1bit
Flow Control:	None

2.2 Network Connections

2.2.1 IP Settings

Default IP Address	MXV & HDMI Series Version 1: 192.168.11.143 All other models are set by Auto IP method. Refer to IP Addressing and Web UI Access
Default IP Port	23

IP Addressing and Web UI Access

These matrix switchers use an Auto IP method to generate the initial IP address based on the network connections. By default, the IP address is set to DHCP and will pull the IP address from a connected DHCP server. Should the network not contain a DHCP server, the IP address will be generated based on the unit's MAC address. The above operation will occur unless the IP Address setting in the web UI is set to static.

1. Connect the matrix to the same network as a PC.
2. Using a 3rd party network scanner, scan the network for the IP address of the matrix.
3. Open a web browser and enter the IP Address of the matrix.
4. Enter the password for the matrix. The default password is: admin.

IP Address Notes

- The IP address of the unit can be displayed by pressing and holding the UP and DOWN buttons on the front panel for 3 seconds. The IP address will be displayed on the front panel.
- The installer password and general password are the same by default. WyreStorm recommends changing the password for installer login to avoid any unwanted changes being made to the matrix configuration.

3. Command Overview

3.1 Command Delimiter for Sent Commands

When sending commands using the IPv4 / Telnet API channel, or when using the RS-232 API channel, all command lines sent from the 3rd party controller to the matrix should end with a specific character. This signifies when the command is processed by the matrix. This is usually specified in 3rd party control software as the "command delimiter," "stop character," or "line terminator."

Accepted delimiter characters are:

Character	Shorthand	Hex Notation	Escape Notation	Decimal Notation
Line Feed	LF	0A	\n	10
Carriage Return + Line Feed	CR LF	0D 0A	\r\n	13 10

Please note, most 3rd party control software will either append these characters automatically or an option to specify them will be present.

Note: It is important that the last delimiter character is LF and not CR.

4. Controlling Matrix Switching

4.1 Controlling Video

Switching Video Outputs	
Command structure: SET SW <INPUT> <OUTPUT>	H2A & HDMI Series <INPUT> = hdmiin1~hdmiin8, hdmiin0 <OUTPUT> = hdmiout1~hdmiout8 | all MXV & EXP-KIT Series <INPUT> = hdmiin1~hdmiin8, hdmiin0 <OUTPUT> = out1~out8 | all
Response Syntax: SW <INPUT> <OUTPUT>	
Example Command: SET SW hdmiin4 out1	
Example Response: SW hdmiin4 out1	
Note: <INPUT> value of "hdmiin0" power downs the output.	

Query Video Output Mapping	
Command structure: GET MP <OUTPUT>	H2A & HDMI Series <INPUT> = hdmiin1~hdmiin8, hdmiin0 <OUTPUT> = hdmiout1~hdmiout8 | all MXV & EXP-KIT Series <INPUT> = hdmiin1~hdmiin8, hdmiin0 <OUTPUT> = out1~out8 | all
Response Syntax: MP GET <INPUT> <OUTPUT>	
Example Command: GET MP out1	
Example Response: MP hdmiin4 out1	

4.2 Controlling Audio

Set Audio Switching Mode	
Command structure: SET AUDIOSW_M <PRM>	<PRM> =followvm | independent
Response Syntax: AUDIOSW_M <PRM>	
Example Command: SET AUDIOSW_M independent	
Example Response: AUDIOSW_M independent	
-followvm = audio outputs follow the corresponding HDMI/HDBaseT output of the matrix. For example, audio output 1 will always follow the video on HDMI/HDBaseT output 1. -independent = audio outputs can be discretely switched separately from the HDMI/HDBaseT video outputs. -MX-KIT, HDMI & MXV-KIT models do not support discrete audio routing	

Switching Audio Outputs	
Command structure: SET AUDIOSW <INPUT> <OUTPUT>	<INPUT> = hdmiin1~hdmiin8 <OUTPUT> = audioout1~audioout8 | all
Response Syntax: AUDIOSW <INPUT> <OUTPUT>	
Example Command: SET AUDIOSW hdmiin4 audioout1	
Example Response: AUDIOSW hdmiin4 audioout1	
The above command requires "independent" audio switching mode to be enabled. See "Set Audio Switching Mode" section for details.	

Query Audio Output Mapping	
Command structure: GET AUDIOMP <OUTPUT>	<INPUT> = hdmiin1~hdmiin8 <OUTPUT> = audioout1~audioout8 | all
Response Syntax: AUDIOMP <INPUT> <OUTPUT>	
Example Command: GET AUDIOMP audioout1	
Example Response: AUDIOMP hdmiin4 audioout1	

Muting Audio Outputs	
Command structure: SET MUTE <OUTPUT> <PRM>	<OUTPUT> = audioout1~audioout8 | all <PRM> = on (mute) | off (unmute)
Response Syntax: MUTE <OUTPUT> <PRM>	
Example Command: SET MUTE audioout2 on	
Example Response: MUTE audioout2 on	

Query Audio Mute State	
Command structure: GET MUTE <OUTPUT>	<OUTPUT> = audioout1~audioout8 | all <PRM> = on (mute) | off (unmute)
Response Syntax: MUTE <OUTPUT> <PRM>	
Example Command: GET MUTE audioout2	
Example Response: MUTE audioout2 on	

Query Audio Switching Mode	
Command structure: GET AUDIOSW_M	<PRM> =followvm | independent
Response Syntax: AUDIOSW_M <PRM>	
Example Command: GET AUDIOSW_M	
Example Response: AUDIOSW_M independent	

5. Saving and Recalling an Audio/Video Scene

Save a Scene	
Command structure: SAVE PRESET <PRM>	<PRM> =1~3
Response Syntax: PRESET <PRM>	
Example Command: SAVE PRESET 1	
Example Response: PRESET 1	

Recall a Scene	
Command structure: RESTORE PRESET <PRM>	<PRM> =1~3
Response Syntax: PRESET <PRM>	
Example Command: RESTORE PRESET 1	
Example Response: PRESET 1	

6. Controlling Display Power via CEC

CEC Display Power	
Command structure: SET CEC_PWR <OUTPUT> <PRM>	H2A & HDMI Series <OUTPUT> = hdmiout1~hdmiout8 | all <PRM> = on | off MXV & EXP-KIT Series <OUTPUT> = hdmiout1~hdmiout8 | hdbtout1~hdbtout8 | all <PRM> = on | off
Response Syntax: CEC_PWR <OUTPUT> <PRM>	
Example Command: SET CEC_PWR hdbtout2 on	
Example Response: CEC_PWR hdbtout2 on	

Set CEC Auto Power	
Command structure: SET AUTOCEC_FN <OUTPUT> <PRM>	H2A & HDMI Series <OUTPUT> = hdmiout1~hdmiout8 | all <PRM> = on | off MXV & EXP-KIT Series <OUTPUT> = hdmiout1~hdmiout8 | hdbtout1~hdbtout8 | all <PRM> = on | off
Response Syntax: AUTOCEC_PWR <OUTPUT> <PRM>	
Example Command: SET AUTOCEC_FN hdbtout2 on	
Example Response: AUTOCEC_FN hdbtout2 on	
The matrix can automatically send a CEC Power On command to an output when an HDMI input signal is detected. CEC Power Off commands can also automatically be sent after "X" amount of time when a signal detection is lost. See "Set CEC Auto Power Off Delay" section for details.	

Query CEC Auto Power	
Command structure: GET AUTOCEC_FN <OUTPUT>	H2A Series <OUTPUT> = hdmiout1~hdmiout8 | all <PRM> = on | off MXV & EXP-KIT Series <OUTPUT> = hdmiout1~hdmiout8 | hdbtout1~hdbtout8 | all <PRM> = on | off
Response Syntax: AUTOCEC_FN <OUTPUT> <PRM>	
Example Command: GET AUTOCEC_FN hdbtout2	
Example Response: AUTOCEC_FN hdbtout2 on	

Set CEC Auto Power Off Delay	
Command structure: SET AUTOCEC_D <OUTPUT> <PRM> Response Syntax: AUTOCEC_D <OUTPUT> <PRM> Example Command: SET AUTOCEC_D hdmiout1 5 Example Response: AUTOCEC_FN hdmiout1 5	H2A Series <OUTPUT> = hdmiout1~hdmiout8 | all <PRM> = 1~30 MXV & EXP-KIT Series <OUTPUT> = hdmiout1~hdmiout8 | hdbtout1~hdbtout8 | all <PRM> = 1~30
Note: <PRM> is in minutes. A value of 10 is equal to a 10-minute delay.	

Query CEC Auto Power Off Delay	
Command structure: GET AUTOCEC_D <OUTPUT> Response Syntax: AUTOCEC_D <OUTPUT> <PRM> Example Command: GET AUTOCEC_D hdmiout1 Example Response: AUTOCEC_D hdmiout1 5	H2A Series <OUTPUT> = hdmiout1~hdmiout8 | all <PRM> = 1~30 MXV & EXP-KIT Series <OUTPUT> = hdmiout1~hdmiout8 | hdbtout1~hdbtout8 | all <PRM> = 1~30
Note: <PRM> is in minutes. A value of 10 is equal to a 10-minute delay.	

Send Custom CEC Commands	
Command Structure: SET CEC_CMD <OUTPUT> <PRM> Response Syntax: CEC_CMD <OUTPUT> <PRM> Example Command: SET CEC_CMD hdmiout1 40 04 Example Response: CEC_CMD hdmiout1 40 04	MX-H2A Series <OUTPUT> = hdmiout1 ~ hdmiout8 <PRM> = Custom CEC commands up to 16 characters in hex MXV Series <OUTPUT> = hdmiout1 ~ hdmiout8 | hdbtout1 ~ hdbtout8 <PRM> = Hexadecimal CEC value for your display
Custom CEC commands are only supported on the MX-0808-H2A-MK2 & MXV-0808 version 3 models	

7. Matrix EDID Settings (MX-0404-HDMI Only)

Set Input EDID	
Command structure: SET EDID <INPUT> <PRM> Response Syntax: EDID <INPUT> <PRM>	<INPUT> = hdmiin1~hdmiin4 <PRM> = 1~12 1) Copy form output 1 2) Copy form output 2 3) Copy form output 3 4) Copy form output 4 5) 4K@60Hz 5.1ch audio w/ HDR 6) 4K@60Hz 2.0ch audio w/ HDR 7) 4K@60Hz 2.0ch audio 8) 4K@30Hz 5.1ch audio w/ HDR 9) 4K@30Hz 5.1ch audio w/ Dolby Vision 10) 4K@30Hz 2.0ch audio w/ HDR 11) 4K@30Hz 2.0ch audio 12) 1080P@60Hz 2.0ch audio
Example Command: SET EDID hdmiin1 2	
Example Response: EDID hdmiin1 2	

Get All Input EDID Status	
Command structure: GET EDID <INPUT>	<INPUT> = hdmiin1~hdmiin4 | all <PRM> = 1~14 1) Copy form output 1 2) Copy form output 2 3) Copy form output 3 4) Copy form output 4 5) 4K@60Hz 5.1ch audio w/ HDR 6) 4K@60Hz 2.0ch audio w/ HDR 7) 4K@60Hz 2.0ch audio 8) 4K@30Hz 5.1ch audio w/ HDR 9) 4K@30Hz 5.1ch audio w/ Dolby Vision 10) 4K@30Hz 2.0ch audio w/ HDR 11) 4K@30Hz 2.0ch audio 12) 1080P@60Hz 2.0ch audio
Response Syntax: EDID <INPUT> <PRM>	
Example Command: SET EDID hdmiin1 2	
Example Response: EDID hdmiin1 2	

Set EDID Input Write	
Command structure: SET EDID_W <INPUT> <PRM1> <PRM2> Response Syntax: EDID <INPUT> <PRM1> <PRM3> Example Command: SET EDID_W hdmiin1 block0 XX…XX Example Response: EDID_W hdmiin1 block0 ok	<INPUT> = hdmiin1~hdmiin4 <PRM1> = block0~block1 <PRM2> = one block of 256 bytes EDID ASCII data w/ spaces (HEX data must be converted to ASCII) <PRM3> = ok, error (error= check sum error)

Get EDID Output Read	
Command structure: GET EDID_R <OUTPUT>	<OUTPUT> = hdmiout1~hdmiout4 <PRM1> = block0~block1 <PRM2> = one block of 256 bytes EDID ASCII data w/o spaces (HEX data must be converted to ASCII), error, disconnected
Response Syntax: EDID_R <OUTPUT> <PRM1> <PRM2>	
Example Command: GET EDID_R hdmiout1	
Example Response: EDID_R hdmiout1 block0 XX…XX --- Read EDID ok	

8. Matrix Low Power Mode (Standby)

To save energy when the matrix is not in use a Low Power Mode has been incorporated into the architecture. By turning on this mode the unit will go into Standby, using less power than normal operating mode. While in this mode, the Front Panel display and LEDs will be Off and outputs will be powered down. Once a command is sent via the Front Panel buttons, IR remote/control system, or RS-232/IP control system the unit will wake from Standby and be fully operational. The unit can be placed back into standby via an API command.

Note: The following commands were added after the release of some of the models and are not available on all versions of the supported matrix versions.

Supported Matrix Versions

H2A HDMI Matrix Switchers

- MX-0404-H2A (All Versions)
- MX-0606-H2A (All Versions)
- MX-0808-H2A (All Versions)
- MX-0808-H2A-MK2 (All Versions)

MXV HDBaseT Matrix Switchers

Note: The supported switchers must be version 2 or higher except where otherwise noted below.

- MXV-0408-H2A v2
- MXV-0606-H2A v2
- MXV-0606-H2A-70 v1
- MXV-0808-H2A v2
- MXV-0808-H2A-70 v1

EXP-KIT HDBaseT Matrix Switchers

- EXP-MX-0404-KIT
- EXP-MX-0808-KIT

Place Matrix into Standby	Command: STANDBY	No Parameters
Wake Unit from Standby	Command: WAKE	
Query Standby Status	Command: GET STANDBY Note: response will be the commands listed above.	

9. Infrared Configurations

9.1 Configuring IR System Code

Should the IR for the matrix interfere with other 3rd party devices in the system the IR code can be changed to resolve the conflict. This IR code can be changed within the Web UI or by using the following commands.

Set System IR Code	
Command structure: SET IR_SC <PRM>	<PRM> = mode1 | mode2 | all
Response Syntax: IR_SC <PRM>	
Example Command: SET IR_SC mode2	
Example Response: IR_SC mode2	
Mode1 = IR Code Set 0x00, Mode2 = IR Code Set 0x4e	

Query System IR Code	
Command structure: GET IR_SC	<PRM> = mode1 | mode2 | all
Response Syntax: IR_SC <PRM>	
Example Command: GET IR_SC	
Example Response: IR_SC mode2	
Mode1 = IR Code Set 0x00, Mode2 = IR Code Set 0x4e	

9.2 Configuring Remote Zone IR Callback

The following commands are supported on the MXV series matrix switchers to allow the matrix to be controlled via a remote HDBaseT transmitter. These commands are not available the H2A matrix switchers due to them being HDMI only.

> Note: The following commands were added after the initial release of some of the models and are not available on all versions of the supported matrix versions. This feature is not applicable to H2A HDMI only matrix switchers.

IR Code Commands Supported Matrix Versions

- MXV-0404-H2A-KIT (All Versions)
- MXV-0408-H2A v2
- MXV-0606-H2A v2
- MXV-0808-H2A v2
- EXP-MX-0404-KIT
- EXP-MX-0808-KIT

Set IR Callback Control	
Command structure: SET IRBACK_FN <PRM>	<PRM> = on | off
Response Syntax: IRBACK_FN <PRM>	
Example Command: SET IRBACK_FN on	
Example Response: IRBACK_FN on	

Query IR Callback Control	
Command structure: GET IRBACK_FN	<PRM> = on | off
Response Syntax: IRBACK_FN <PRM>	
Example Command: GET IRBACK_FN	
Example Response: IRBACK_FN on	

10. Routable Serial over HDBaseT

Routing a Serial Command	
Command structure: <HEADER> <OUTPUT> <BAUDRATE> <PARITY> <BITS> <COMMAND>	<HEADER> = 05 55 55 57 (fixed data) <OUTPUT> = 01 ~ 08 <BAUDRATE> = 05 = 4800 06 = 9600 07 = 14400 08 = 19200 09 = 38400 0A = 56000 0B = 57600 0C = 115200 **<PARITY>** = 00 = None 01 = Odd 02 = Even 03 = Mark 04 = Space <BITS> = Bit length of <COMMAND> represented in hexadecimal Support bit length = 1 ~ 25bits Hexadecimal values = 01 ~ 19 <COMMAND> = Command that is to be passed to display (must be hex format).
Response Syntax: <COMMAND>	
Example Command: 05 55 55 57 01 06 00 05 62 67 20 0D 0A	
Example Response: 62 67 20 0D 0A	

Routable serial over HDBaseT is only supported on MXV-0808 version 3 models

<BITS> example: If a <COMMAND> has a bit length of 6 the hexadecimal equivalent would be 06. If a <COMMAND> bit length is 12, the hexadecimal equivalent would be 0C.

11. Troubleshooting

Query IP Address	
Command: GET IPADDR	<PRM> = IPv4 Address
Response Syntax: IPADDR <PRM>	

Query Firmware Version	
Command: GET VER	<PRM> = current installed firmware version
Response Syntax: VER <PRM>	

Reboot Matrix	
Command: REBOOT	No Parameters
Response: REBOOT	

Restore Factory Defaults	
Command: RESET	No Parameters
Response: RESET	

12. Contacting Technical Support

Should further clarification of the content in this document or assistance on troubleshooting be required, please contact WyreStorm technical support.

Phone: UK: +44 (0) 1793 230 343 | ROW: 844.280.WYRE (9973)
Contact Request: http://wyrestorm.com/contact-tech-support

13. Document Revision History

V4.0 – April 2021	
New Matrix Models	MX-0404-HDMI MX-0808-H2A-MK2
V3.0 – April 2021	
New Matrix Models	EXP-MX-0404-KIT EXP-MX-0808-KIT
Reformat	Updated look and feel of document for better readability
V2.0 – July 2019	
Supported Product Firmware/Software	Added version 2 and new models for MXV and version 1 for H2A
Controlling Matrix Switching	Updated various commands to reflect differences between matrix series
Matrix Configuration	Updated various commands to reflect differences between matrix series
V1.0 – April 2019	
All	Initial release of document

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