Instruction Manual

MX-65xx Series
Small HDMI 2.0, 4k HDR Matrices

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1.0   SAFETY PRECAUTIONS

Read all instructions before attempting to unpack, install or operate this equipment, and before connecting the power supply.

- Unpack the equipment carefully and save the original box and packing material for possible future shipment
- Follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.
- Do not dismantle the housing or modify the module. It may result in electrical shock or burn.
- Using supplies or parts not meeting the products' specifications may cause damage, deterioration or malfunction.
- Refer all servicing to qualified service personnel.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.
- Do not put any heavy items on the extension cable in case of extrusion.
- Do not remove the housing of the device as opening or removing housing may expose you to dangerous voltage or other hazards.
- Install the device in a place with fine ventilation to avoid damage caused by overheat.
- Keep the module away from liquids.
- Spillage into the housing may result in fire, electrical shock, or equipment damage. If an object or liquid falls or spills on to the housing, unplug the module immediately.
- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.
- Unplug the power cord when left unused for a long period of time.
- Information on disposal for scrapped devices: do not burn or mix with general household waste, please treat them as normal electrical wastes.

2.0   INTRODUCTION

The MX-65xx Matrix Switcher Series is designed to allow the distribution of HDMI 2.0a (with HDCP) sources to multiple display devices independently or all at the same time using an intuitive front panel, infrared remote control or our control software, MX-tools.

The MX-65xx series is the perfect solution for all your installations including home theaters, classrooms or conference rooms that demand high levels of performance and superior 4:4:4 4K/60 image fidelity.

The MX-6588 is HDMI 2.0a compliant with full support for 4K2K@60 4:4:4 8bit and 10bit processing for superior deep color rendition. 3D signals are also supported. Audio includes 7.1 audio capability including DTS-HD and Dolby TrueHD.

3.0   FEATURES

- HDMI 2.0a compliant
- 4K2K@60 4:4:4 processing with 8bit and 10bit color depth
- HDR for deep color resolution
- HDCP 2.2 compliant
- Save up to 16 Presets
- Control via Front panel buttons, RS-232, TCP/IP, InfraRed and MX-tools
- Supports 7.1 channel digital audio, DTS, Master and Dolby TrueHD
- Auto detect EDID learning and management
- Robust 1RU rack-mountable metal case

4.0   OPERATION CONTROLS AND FUNCTIONS

FRONT PANELS
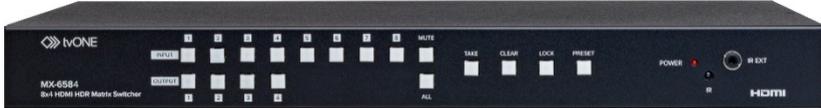
Name	Description
POWER	LED indicator ON when power is applied.
IR	Built-in IR sensor to receive IR signal from IR remote
IR EXT	3.5mm jack for external IR receiver
Inputs	Buttons with LED for routing inputs and Preset recalling and saving
Outputs	Buttons with LED for routing Outputs and Presets recalling and saving
Mute	Press to turn off all video and audio to all outputs
All	Press to select all outputs when routing
Take	Press to execute selected route or recalling a preset
Clear	Press to clear the selected inputs and outputs when routing
Lock	Press to lock all front panel buttons
Preset	Press to enter preset mode for saving or recalling presets

REAR PANELS

Name	Description
Input	HDMI inputs
Output	HDMI outputs
F/W	This USB is for Firmware updates only
Ethernet	Control port for TCP/IP commands
System IR In	IR input for control via Infrared when using an IR extender
RS232	Serial port to control This device via RS232 commands.
DC 12V	Power input
Power Switch	Main power switch

Routing

Routing can be performed via several control methods, IR remote, Serial and TCP/IP, MX-tools, and front panel buttons.

To route inputs to outputs via front panel buttons, follow these steps. First, select an input by pressing and releasing the desired Input, the LED button will illuminate. Then press and release the desired outputs. Each LED button will illuminate when selected. Finally, press the '**TAKE**' Button to execute the desired routing. Once '**TAKE**' is pressed, all the LEDs will turn off.

Other commands:

To '**Mute**' video and audio from a single output	Press **'MUTE'** then press the desired outputs, then press **'TAKE'**	Multiple outputs can be cleared at once in this way
To Mute video **and audio** from all outputs	Press **'MUTE'** and press **'ALL'** then press **'TAKE'**	
To Clear a selection	Press the **'CLEAR'** button to deselect all previously selected buttons	
To Save a Preset	Press **'PRESET'**, then press and hold any input or output button until the LED flashes	Use this after all routing is complete. The I/O button chosen becomes the new preset number (1-16)
To Load a Preset	Press **'PRESET'**, then choose the desired Preset (1-16) by pressing the corresponding I/O button. Then press **'TAKE'**	In preset mode, the I/O buttons represent available preset slots.
To Lock the Front Panel	Press **'LOCK'**	All buttons will be locked (except **'LOCK'**)
To Unlock the Front panel	Press **'LOCK'**	
EDID Learning	Press and hold the desired output button until it flashes, then select the desired inputs (when pressing the inputs, the selected output stops flashing) and Press **'TAKE'**. The illuminated input buttons darken one after another, then the selected output starts flashing, which means the process is complete.	
Execute default EDID	Press and hold **'MUTE'** until it flashes. Then press the desired inputs (when pressing the inputs, the **'MUTE'** stops flashing). Then press **'TAKE'** and the LED of the selected inputs darken one after another and when **'ALL'** starts flashing, it means the process is complete.	

IR Remote Functionality
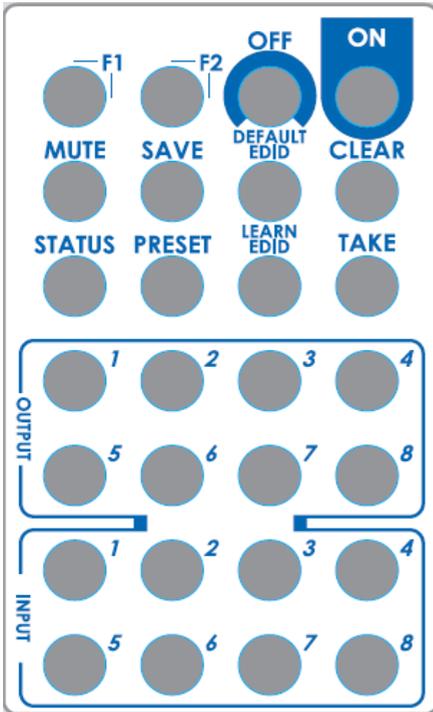
Routing via IR Remote
To route with the Remote control, you must first select the output and then press the input. Repeat this to make several routes.

IN/OUT Switch	Output Number (1~8) + Input Number (1~8)
Ex: Input 2 To Output 3	1. Press output number key "3" to select Output 3
	2. Press input number key "2" to select Input 2

Function Keys

Button	Function
OFF	Standby mode
ON	Power on the matrix switcher
MUTE	Turn off output's video and audio
STATUS	Preset output status
SAVE	Preset Save
PRESET	Load Preset
DEFAULT EDID	Begin default EDID selection
LEARN EDID	Begin EDID learning from one output
CLEAR	Clear the previous IR operation procedure
TAKE	Trigger the previous setting
F1	Reserved
F2	Reserved

IR Functions

Operation	Procedure
Output Status	**Status + Output Number (1~8) + Take**
Ex: Output 4 (Input 2)	1. Press '**STATUS'** button
	2. Press output number key "4" to select Output 4
	3. Press '**TAKE'** button
Saving Preset	Save + Output Number (1-8 storage site) + Take
Ex: Save current routing to Preset 5	1. Press **'SAVE'** button
	2. Press output number key "5" to select the storage site 5
	3. Press **'TAKE'** button
Preset loading	**Preset + Output Number (1-8 storage site) + Take**
Ex: Load Preset 5	1. Press **'PRESET'** button
	2. Press output number key "5" to select the storage site 5
	3. Press **'TAKE'** button
Learn default EDID	**Default EDID + Output Number (1-8 default EDID) + Input Number (input 1~8) + Take**
Ex: Default EDID 2 Input 3	1. Press **'DEFAULT EDID'** button
	2. Press output number key "2" to select default EDID 2
	3. Press input number key "3" to select Input 3
	4. Press **'TAKE'** button
Learn Output EDID	**Learn + Output Number (Output 1~8) +Input Number (input 1~8) + Take**
Ex: Learn Output 4 Input 3	1. Press **'LEARN'** button
	2. Press output number key "4" to select Output 4
	3. Press input number key "3" to select Input 3
	4.Press **'TAKE'** button
Mute Output	**Mute + Output Number (1~8) + Take**
Ex: Mute Output 3	1. Press **'MUTE'** button
	2. Press output number key "3" to select Output 3
	3.Press **'TAKE'** button

5.0   MX-Tools

MX-Tools is the control software for the MX-65xx series and has the following **system requirements**:

- OS Information: MS WinXP/7
- Software size: 1 MB
- Minimum RAM requirement: 256 MB
- Serial Com Port Baud rates: 9600
- TCP/IP

Choose Matrix Model
When you launch the MX-Tools software the first thing you need to do is choose your matrix.
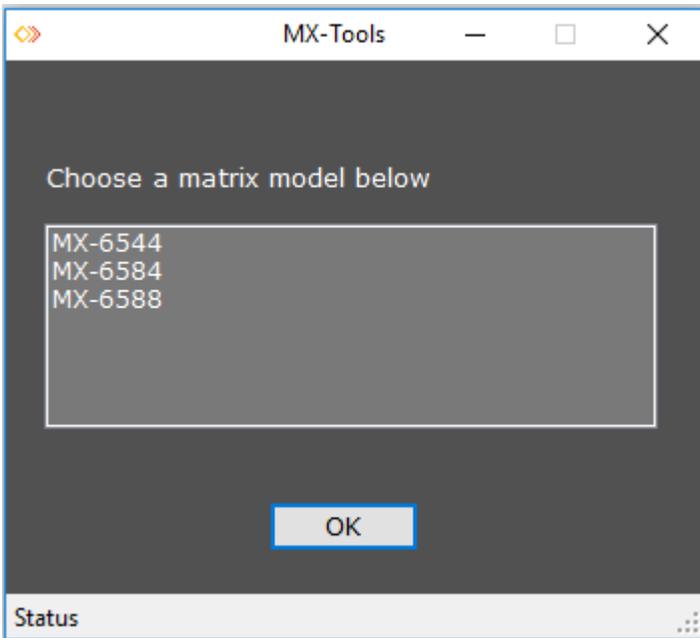
Icons
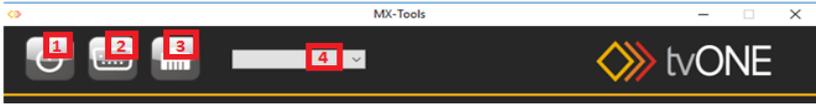
1. Power on/Standby mode
2. Connect and Control MX-Tools via RS-232
3. Connect and Control MX-Tools via TCP/IP
4. COM port selection (when using RS-232)

I/O Routing Tab
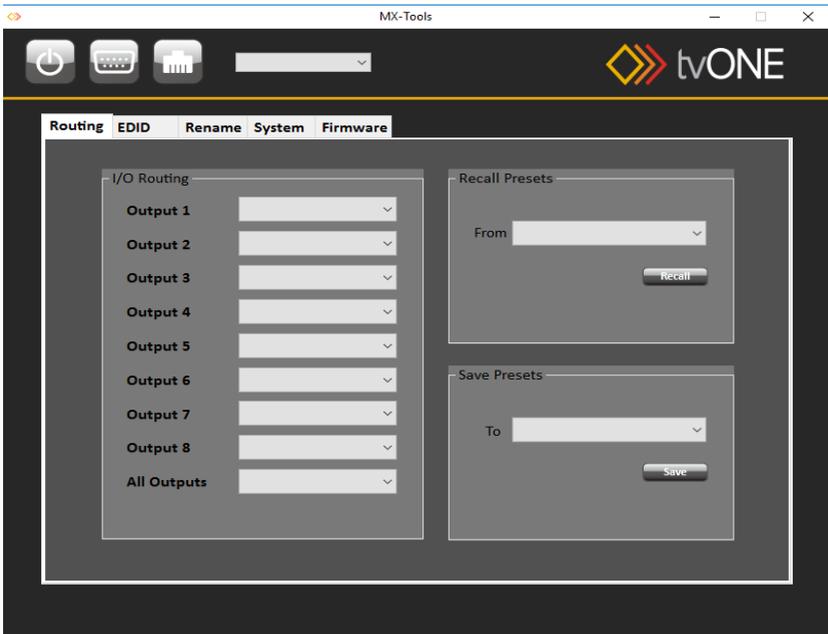
I/O routing
- Selecting the desired input for each available output

Recall Presets
- Select the stored Preset (1-16)
- Click '**Recall**' button to recall previous Presets which are saved

Save Preset

- Select Preset (1-16)
- Click '**Save**' button to save current routing

EDID Management Tab
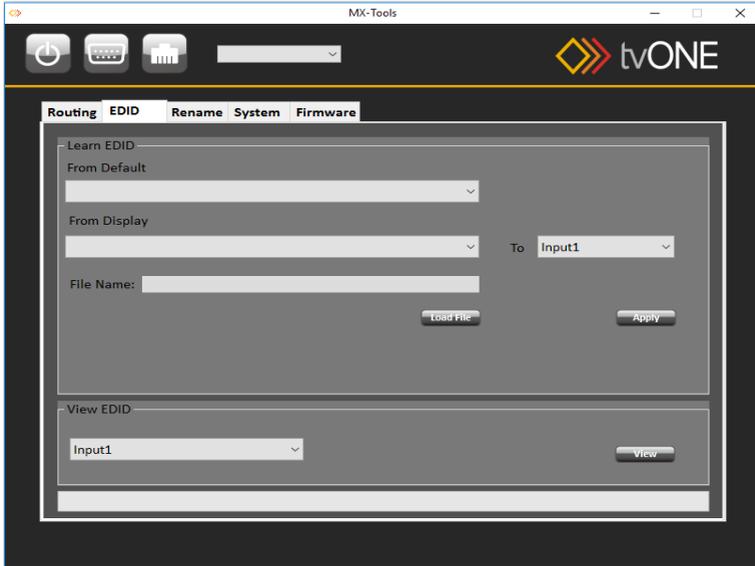
Learn EDID from Default to Input

- Select Default EDID (1-17 Default EDID)
- Select designated Input
- Click '**Apply**' button to learn from default EDID

Learn EDID from Display to Input

- Select Display
- Select designated Input
- Click '**Apply**' button to learn from display EDID

Load EDID File to Input

- Click '**Load File**' button to select the EDID file
- Select designated Input
- Click '**Apply**' button to load EDID File

Auto EDID

- The matrix has an Automatic EDID learning function that generates the correct EDID amongst the connected monitors.

View EDID

- Select Input or HDMI output
- Click '**View**' button to read and analyze the EDID

Rename Tab
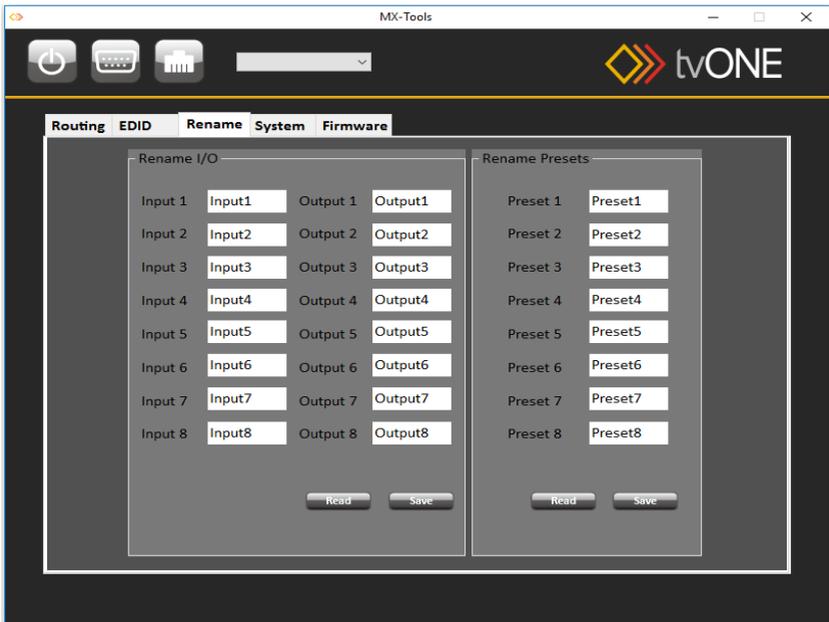
Rename I/O

- Rename the Inputs and Outputs, then click '**Save**'
- To Load previously saved I/O names from the matrix, click '**Read**'

Rename Presets

- Rename the Presets, then click '**Save**'
- To load previously saved preset names from the matrix, click '**Read**'

System Tab
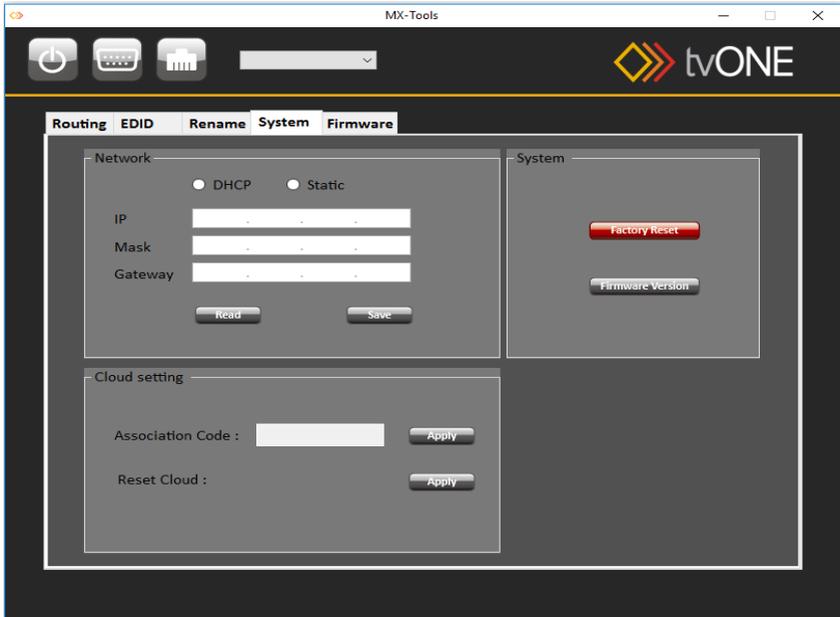
Network-DHCP mode
- Select DHCP and click '**Read**' to automatically get the IP address Information

Network-Static mode
- Click Static, then enter the **'IP'**, '**MASK**' and '**GATEWAY**' information. After setting the IP address, click '**Save**' to store the IP address Information

'Save' Button
- Saves a manually entered IP address

'Read' Button
- Read the IP address from the device
  Note: The default static IP address is 192.168.1.123)

System-Factory Reset
- To perform a factory default reset

Firmware Version
- To get the F/W version information

Cloud setting-Association Code
- This feature is not yet available.

Reset Cloud
- This feature is not yet available.

Firmware Tab
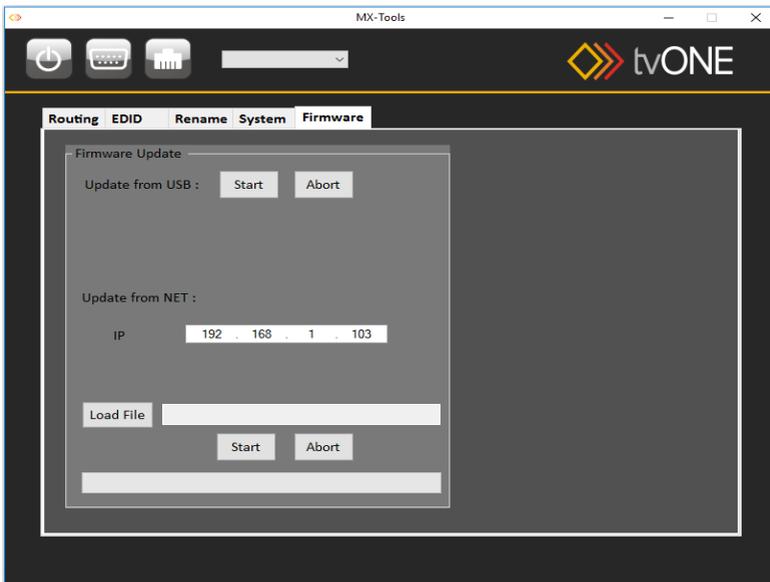
FW Update from USB
- Please ensure the file of new firmware files are in the root directory of USB Flash Drive and the file suffix is **.bin**.
- Connect the USB Flash Drive to the matrix USB interface.
- Click '**Start**' to begin the FW update process
- This process will take approximately 5 minutes

Firmware update from NET
- Enter the '**IP**' address of the Matrix that you want to update the firmware
- Click '**Load file**' to select the new firmware file
- Click '**Start**' to begin the FW update process
- This process will take approximately 5 minutes

Note: The PC & matrix must be on the same domain

6.0   EDID Learning

The EDID learning function is only necessary whenever you encounter any display on the HDMI output port that cannot play audio and video properly. Because the HDMI source devices and displays may have various level of capability in playing audio and video, the general principle is that the source device will output the lowest standards in audio format and video resolutions to be commonly acceptable among all HDMI displays. For Example, a 720p stereo HDMI signal output would be probably the safest choice. Nevertheless, the user can force the matrix to learn the EDID of the lowest capable HDMI display among others to make sure all displays are capable to play the HDMI signals normally.

There are Three methods to do EDID Learning:

1. IR Remote Control: Please refer to the section entitled Operation Controls and Functions, IR Remote Functionality.
2. Software Control: Please refer to the section entitled MX-Tools, EDID Management Tab.
3. Front panel control: Please refer to the section entitled Operation Controls and Functions, Routing.

This is a list of the available default EDID's:

1. Full-HD(1080p@60)-24bit 2D & 2ch
2. Full-HD(1080p@60)-24bit 2D & 7.1ch
3. Full-HD(1080p@60)-24bit 3D & 2ch
4. Full-HD(1080p@60)-24bit 3D & 7.1ch
5. HD(1080i@60)(720p@60)-24bit 2D & 2ch
6. HD(1080i@60)(720p@60)-24bit 2D & 7.1ch
7. Full-HD(1080p@60)-36bit 2D & 2ch
8. Full-HD(1080p@60)-36bit 2D & 7.1ch

9. Full-HD(1080p@60)-24bit 2D & 2ch & Dolby 5.1ch
10. 4k2k@30 2ch
11. 4k2k@30 7.1ch
12. 4k2k@30-3D-PCM2CH(2ch)
13. 4k2k@30-3D-BITSTR(7.1ch)
14. 4k2k@60-420-3D-PCM2CH(2ch)
15. 4k2k@60-420-3D-BITSTR(7.1ch)
16. 4k2k@60-3D-PCM2CH(2ch)
17. 4k2k@60-3D-BITSTR(7.1ch)

7.0   SPECIFICATIONS

TECHNICAL SPECIFICATIONS

HDMI compliance	HDMI 2.0a
HDCP compliance	HDCP 1.4 / HDCP 2.2
Video bandwidth	Single-link 594MHz [18Gbps]
Video support	HDR 4K2K@60 (4:2:0 10bits)
	4K2K@60 (4:4:4 8bits)
Audio support	Surround sound (up to 7.1 channels or stereo digital audio
Input	8 x HDMI (MX-6588/6584)
	4 x HDMI (MX-6544)
	1 x 9-pin D-sub Female (RS-232)
	1 x Ethernet
	1 x 3.5mm IR receiver
	1 x USB Type A (Firmware only)
Output	8 x HDMI (MX-6588)
	4 x HDMI (MX-6584/6544)
Control	Via Front panel button, IR remote control, RS-232 control, TCP/IP and MX-tools
Warranty	2 Years
MTBF (hrs)	MX-6588 51,000
	MX-6584 61,500
	MX-6544 103,000

MECHANICAL

Enclosure	Metal case
Dimensions (H x W x D)	1.7" x 17.3" x 8.6"
	(44 x 440 x 220mm)
	1.6" x 17.3" x 6.9"
	(42 x 440 x 177mm)
Weight (Net)	MX-6588/6584 2.7kg (5.9 lbs)
	MX-6544 2.4kg (5.2 lbs)
Power supply	MX-6588/6584 12V 7.5A DC
	Replacement part; PS-12-75-IEC-LK;
	MX-6544 12V 2A DC
	Replacement part; PS-12-20-IEC-C8-LK
Power Consumption	MX-6588/6584 60 Watts (max)
	MX-6544 25 Watts (max)
Operating Temp	0° to 40°C (32° to 104°F)
Relative Humidity	20% to 90% Non-condensing
Storage Temp	-20° to 60°C (-4° to 140°F)
Regulatory compliance	FCC, CE, RoHS, UL

8.0 ORDERING INFORMATION

MX-6588	8x8 HDMI 2.0 HDR Matrix Switcher
MX-6584	8x4 HDMI 2.0 HDR Matrix Switcher
MX-6544	4x4 HDMI 2.0 HDR Matrix Switcher
PS-12-75-IEC-LK	Replacement PSU 12v 7.5A with IEC 3 pin connector for MX-6588 and MX-6584 (6pin locking connector)
PS-12-20-IEC-C8-LK	Replacement PSU 12v 2A with IEC 2 pin connector for MX-6544 (2pin screw locking connector)
IRC-6	Replacement 28 key IR Remote for the MX-6588, 6584, 6544

9.0   LIMITED WARRANTY

Except for the limited warranty specifically set forth below, no warranty is made, either expressed or implied, including, but not limited to, any implied warranties of merchantability or fitness for a particular purpose. In no event shall tvONE™ be liable for errors found within, or be liable for any direct, indirect or consequential damages or loss in connection with the purchase or use of the Product and any related hardware, software, or manual. The sole and exclusive liability of tvONE™regardless of the form of action shall not exceed the purchase price of the Product described herein.

tvONE™ makes no warranties or representations that the Product or the Software will meet or satisfy the intended use or needs of You. You have the sole and exclusive obligation to make such determination. tvONE™ shall have no obligations of any type to You as a result of the Product and/or Software not satisfying or meeting the intended purpose or need of You.

tvONE™ warrants to the original purchaser that the Product will be free from defects in materials and workmanship for a fixed term from the date of purchase. The warranty term for specific product lines is as follows:

1. tvONE™ branded products based on tvONE™ 's CORIO™ technology are warranted for a period of five years from the date of purchase. This includes products with the model number prefix of C2, 1T-C2, C3, CX, A2, or S2.
2. tvONE™ products (other than (i) those based on tvONE™ 's CORIO™ technology mentioned above, and (ii) the ONErack™ products, mentioned below) are warranted for a period of two years from the date of purchase. This includes products with the model number prefix of 1T, with the exception of 1T-C2.
3. Magenta™ branded products are warranted for a period of three years from the date of purchase.
4. ONErack™ branded products are warranted for a period of one year from the date of purchase.
5. LCD Monitors are warranted for a period of three years from the date of purchase, with the exception of the LCD panels integrated into the monitors that are supplied by third parties. LCD panels are limited to the term and conditions of the warranty offered by the respective LCD panel manufacturer. Such specific LCD panel warranties are available upon request to tvONE™ .

The liability of tvONE™ to the original purchaser with respect to any defective Product (as determined by tvONE™ in its sole but reasonable discretion) will be limited to (i) providing the original purchaser with a credit towards the purchase of additional products in an amount equal to the purchase price paid for the defective Product, (ii) the repair by tvONE™ of the defective Product, or (iii) the replacement by tvONE™ of such defective Product. In no event shall tvONE™ be responsible or liable for any damage arising from the use of such defective Product whether such damages be direct, indirect, consequential or otherwise, and whether such damages are incurred by the reseller, end-user or any third party. You are required to promptly provide written notice to tvONE™ after become aware of a defect in the Product. Should a Product, in tvONE™'s sole but reasonable determination, prove defective within the applicable warranty period, tvONE™ will either, at its discretion,: (i) provide the original purchaser with a credit towards the purchase of additional products in an amount equal to the purchase price paid for the defective Product (in which event the Product must be returned to tvONE™); (ii) repair the defective Product; or (iii) replace the defective Product. Any defective parts replaced become the property of tvONE™. This warranty does not apply to any Product which has been damaged due to accident, unauthorized alterations, improper repair, modifications, inadequate maintenance and care, or use in any manner for which the product was not originally intended.

If repairs are necessary under this warranty policy, the original purchaser must obtain a Return Authorization Number from tvONE™ and return the product to a location designated by tvONE™ , freight prepaid. After repairs are complete, the product will be returned, freight prepaid.

Any lawsuit arising out of, or related to, the sale of the Product (including but not limited to any warranty claims) must be brought within one year of the date the cause of action first accrues and must be brought in a state or federal court located in Hamilton County, Ohio.

Except for the limited warranty specifically set forth above, the Product is sold "as is". The above limited warranty is in lieu of all other warranties for the Product, expressed or implied, and is strictly limited to the applicable stated number of years from the date of purchase. tvONE™ assumes, and shall have, no liability to distributors, resellers or end-users or any third parties for any loss of use, revenue, or profit.

tvONE™ makes no other representation of warranty as to fitness for the purpose or merchantability or otherwise in respect of any of the products sold.

10.0 REGULATORY COMPLIANCE

This product has been tested for compliance with appropriate FCC and CE rules and regulations. The power adaptor/supply has been tested for compliance with appropriate UL, CUL, CE, PSE, GS Rules, regulations and/or guidelines. This product and power adapter is RoHS compliant.

11.0 LIABILITY STATEMENT

This product is intended for professional use. This product is not intended for use in a medical environment and does not have the required certifications for such use. Similarly, use aboard any aircraft or spacecraft while in flight or as an adjunct to any surface, airborne or marine navigation system or any offshore marine activity, including control of any watercraft, or any use similar to those specifically herein mentioned is prohibited. Use in the aforementioned circumstances would require additional testing and certification.
No warranty is made either expressed or implied including but not limited to any implied warranties of merchantability or fitness for a particular purpose. In no event shall the supplier or manufacturer of this product be liable for errors found within, or be liable for any direct, indirect or consequential damages or loss in connection with the purchase or use of this hardware, software or manual. The sole and exclusive liability to the supplier and manufacturer regardless of the form of action shall not exceed the replacement cost of the materials described herein.
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E&OE

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