



Instruction Manual

MX-6388
HDMI v1.3 8x8 Matrix Switcher

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1.0 INTRODUCTION

Thanks for purchasing this MX-6388 8x8 HDMI Matrix Switcher from tvONE. The MX-6388 is designed to distribute up to 8 HDMI inputs (with 3D support) to 8 different destinations or to one destination. This matrix also enables the distribution of multiple video outputs to multiple displays. The MX-6388 supports HDMI (with HDCP) video with Deep Color, EDID and 7.1 channel audio. The video quality is excellent and the switcher uses single link (225MHz/6.75Gbps) video processing circuitry. The MX-6388 HDMI Matrix Switcher offers a convenient and cost effective method for the switching of high quality HDMI video. The MX-6388 is ready to provide a HDMI matrix switching solution ideal for boardroom, showroom, or exhibition use. Regardless of whether you use the IR remote, RS-232, Ethernet, or the front panel push button operation, control of the MX-6388 couldn't be easier.

Our professional video conversion products have been serving the industry for over twenty years. tvONE offers a full line of high quality Seamless Switchers, Video Scalers, Up/Down/Cross Converters, Analog-Digital Converters (SD/HD-SDI, HDMI, DVI), Format Converters, Standards Converters, TBC/Frame Synchronizers, Matrix Routing Switchers, Signal Distribution Amplifiers and Cat.5/6 Transmission Systems.

1.1 Liability Statement

Every effort has been made to ensure that this product is free of errors. tvONE cannot be held liable for the use of this hardware or any direct or indirect consequential damages arising from its use. It is the responsibility of the user of the hardware to check that it is suitable for his/her requirements and that it is installed correctly. All rights reserved. No parts of this manual may be reproduced or transmitted by any form or means electronic or mechanical, including photocopying, recording or by any information storage or retrieval system without the written consent of the publisher.

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1.2 Features

The MX-6388 has many features that enable it to perform in a superior manner. Among those features you will find:

- 8x HDMI inputs via HDMI Connectors
- 8x HDMI outputs via HDMI Connectors
- Supports HDMI Deep Color and 3D video signals
- Supports 7.1 Channel Digital Audio
- Power-fail protection provided by switcher memory
- Front panel button controllable
- RS-232 controllable
- IR remote controllable
- Ethernet controllable
- 1RU Rack mountable

2.0 SPECIFICATIONS

Video Inputs	
HDMI v1.3 (DVI Compatible)	8x via HDMI Type A Connectors
Video Outputs	
HDMI v1.3 (DVI Compatible)	8x via HDMI Type A Connectors
Additional I/O	
RS-232 Control	1x via DB9 Connector
Ethernet Control	1x via RJ45 Connector
Supported Signals & Protocols	
Industry Standards	HDMI v1.3, HDCP v1.1, DVI 1.0, 3D, Infrared
General Specifications	
Video Bandwidth	Single-Link , 225 MHz/6.75 Gbps
Maximum Resolutions	HD to 1080p@60Hz, PC to 1920x1200@60Hz
Color Depth	8-bit/10-bit/12-bit
HD Audio Formats Supported	7.1 LPCM, Dolby TrueHD, DTS-HD Master Audio
Control Methods	
Local Control	Front Panel via 21x Buttons
Remote Control	IR, RS-232 and Ethernet
Warranty	
Limited Warranty	3 Years Parts and Labor
Mechanical	
Size (H-W-D) (Standalone)	44x440x310mm (1.75"x17"x12.2")
Size (H-W-D) (w/Rackmount Kit)	44x482x310mm (1.75"x19"x12.2")
Weight (Net)	3.326 kg (7.3 lbs.)
Environmental	
Operating Temperature	0° to +40°C (+32° to +104°F)
Operating Humidity	20% to 90%, Non-condensing
Storage Temperature	-20° to +60°C (-4° to +140°F)
Storage Humidity	20% to 90%, Non-condensing
Power Requirement	
Internal Power Supply	100-240VAC, 50-60Hz, 60 Watts
Regulatory Approvals	
Main Unit	FCC, CE, RoHS
Power Supply	UL, CUL, CE, PSE, GS, RoHS
Accessories Included	
1x AC Power Cord	US, UK or Euro Type
1x IR Remote Control	
1x IR Receiver	
1x Rack Mount Kit	
1x Operations Manual	

3.0 PACKAGE CONTENTS

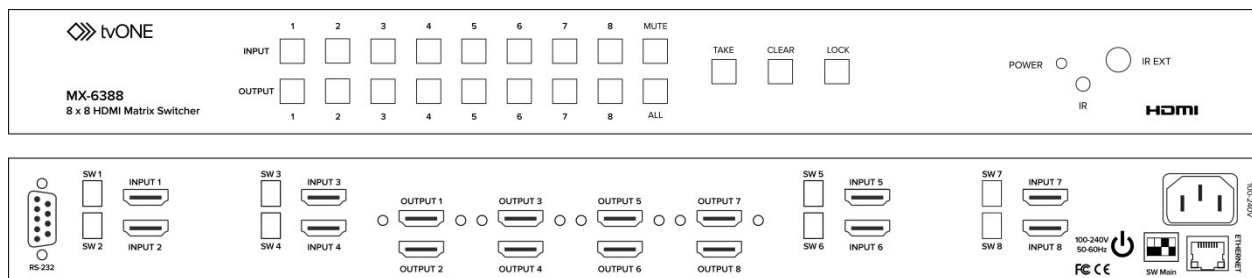
Before attempting to use this unit, please check the packaging and make certain the following items are contained in the shipping carton:

- 1x MX-6388 Matrix Switcher
- 1x IR Remote Control
- 1x IR Receiver
- 1x AC Power Cable
- 1x Rack Mount Kit
- 1x Software CD
- 1x Operations Manual

Note: Please retain the original packing material should the need ever arise to return the unit. If you find any items are missing, contact your reseller or tvONE immediately. Have the Model Number, Serial Number and Invoice available for reference when you call.

4.0 CONNECTING THE HARDWARE

Please study the panel drawings below and become familiar with the signal inputs, outputs, power requirements plus any controls present.



The MX-6388 is an 8x8 HDMI Matrix Switcher capable of switching HDMI signals including 3D, 12 bit deep color signals with HDCP encryption. Also provided is EDID capability for most monitors, including a learn mode feature.

To begin to configure the system, mount the unit with the supplied rack mounting hardware or place the unit on a flat surface that offers security and accessibility. Ensure that there is adequate ventilation and make sure that there is access to the rear and front panels.

Ensure that the MX-6388 power switch is in the “Off” position and turn off any equipment that will be part of the installed system. Next, connect the input and output cables as required. When you plug in the cables, connect them securely and relieve the strain on the cables as much as possible so that they will not become unplugged.

Next connect the supplied AC cable to the MX-6388 and then to a working AC outlet. If you are using the RS-232 control function, connect the RS-232 cable at this time. If you are instead using the Ethernet functionality, connect the Ethernet cable at this time. Note: You cannot use both RS-232 AND Ethernet. You must choose one or the other.

Turn the input and destination equipment on and then turn on the MX-6388 Matrix Switcher.

Note: To realize the full bandwidth capability of the switcher, you must use the highest quality cables available. Using poor quality cables or cables that are damaged will degrade the performance of the switcher and may result in an absence of signals entirely.

5.0 OPERATING THE UNIT

The MX-6388 is a special type of device called a Matrix Routing Switcher. A Matrix Switcher allows any input to be routed to any (or all) outputs whereas a regular routing switcher only allows the operator to select an input that will be sent to one dedicated output.

The MX-6388 can be controlled via any of four (4) methods: From the front panel, by use of the included Infrared Remote Controller, via Ethernet or via the RS-232 functionality. (See sections 5.2, 5.3 and 5.4 for IR, RS-232 and Ethernet control.)

If you have not done so already, press the Power Switch and observe that the Power “On” LED illuminates. If it does not, make certain that the AC socket is providing the appropriate AC voltage and the AC cable is securely plugged in at both ends.

5.1 Control via the Switches

There are eight input and eight output selectors, a “Mute” button, a “Take” button, A “Clear” button, a “Lock” button and a button labeled “All”.

Using these buttons, you can control all switching actions possible with the MX-6388. These actions are described below:

- To select one input and one output, select the input first and then the output. Both buttons will light up, and when you press the “Take” button, the selected path will be completed from the input to the output.
- To cause one input to appear on multiple outputs, select the input followed by the outputs (press each one separately – not all at once). Each button pressed will light up to indicate that it has been selected. When the “Take” button is pressed the selected paths will be completed from the input to all designated outputs. (Note that the “All” button can be selected if you desire the source to appear on all outputs.)

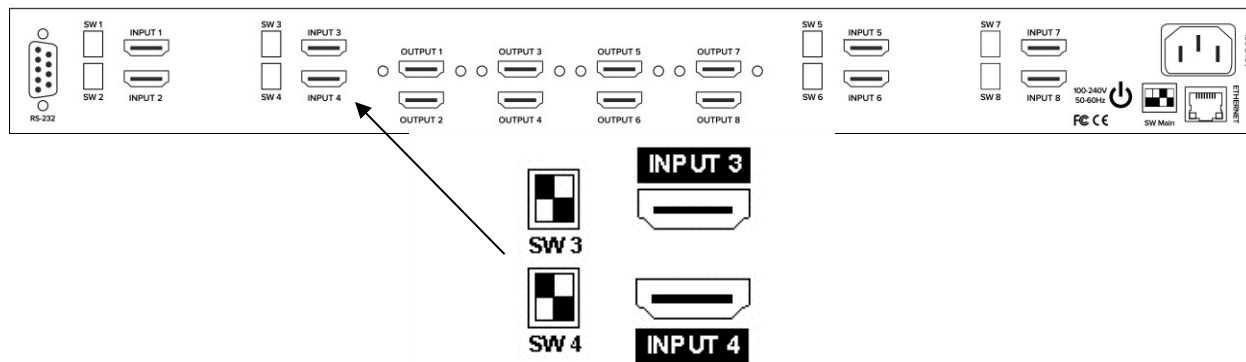
- The MX-6388 has EDID support that should be suitable for most needs. Each input has two DIP switches that are used to configure the EDID capability for the individual input(s).

DIP Switch Position		Video	Audio	Description
Pin#1	Pin#2			
OFF [↑]	OFF [↑]	Up to 1080p	Surround	Default Mode 1 – EDID up to 1080p video & surround sound audio output up to 7.1ch (DTS-HD Master & Dolby TrueHD)
OFF [↑]	ON [↓]	Up to 1080p	Stereo	Default Mode 2 – EDID up to 1080p video and stereo audio for basic compatibility among HDTVs
ON [↓]	OFF [↑]	Up to 720p/1080i	Stereo	Safe Mode – EDID up to 720p/1080i video and stereo audio for basic compatibility among HDTVs
ON [↓]	ON [↓]	Bypass	Bypass	EDID Learning Mode – for learning EDID from the display while playing any received HDMI audio format

Note

- 1** The factory default setting of [SW1]-[SW8] is pin-1 to OFF & pin-2 to OFF for 1080p video and surround sound audio.
- 2** If the monitor displays video but no audio, try setting the audio mode to stereo.
- 3** If you encounter any unsolved audio/video output problem during system installation, try setting the relevant [SW1]-[SW8] pin-1 switch to ON[↓] & pin-2 switch to OFF (safe mode) to select EDID up to 720p(1080i) video and stereo audio for system check.
- 4** Bypass means the matrix will use the EDID learned from activating Learning Mode. Note that this could cause compatibility issues with some displays. If you cannot get audio and/or video output, please change the DIP switch setting to default mode or even safe mode and verify the functionality of the device.

Here's an enlarged view of the rear panel showing one of the EDID DIP switches. Each of the eight EDID selections operate in the same manner as described above.



Operational Tips

Here are some operational tips that will allow you to use the MX-6388 most efficiently:

- When a source or output is selected, the current live configuration will be lighted to allow the user to know what paths are active. Example: When selecting a new path for source 1, you'll see what outputs already have source 1 active. When selecting output 1, you'll see what source is already active on that output. This will help prevent you from making changes to paths that are critical.
- There is a function called "Group Selection" which allows you to split the 8 inputs and 8 outputs into combinations of single and multiple paths. For example, you could select source 1 and destination (output) 2, then source 2 and destinations 3 and 4. Next, you could select source 3 and set its output path to destination 5. After making these selections, you would press the "Take" button and complete all the paths at once as three distinct groups. Note that until you press the "Take" button, you can revise your selections as required if you've made a mistake or the mission has changed.

The function of each of the remaining buttons is as follows:

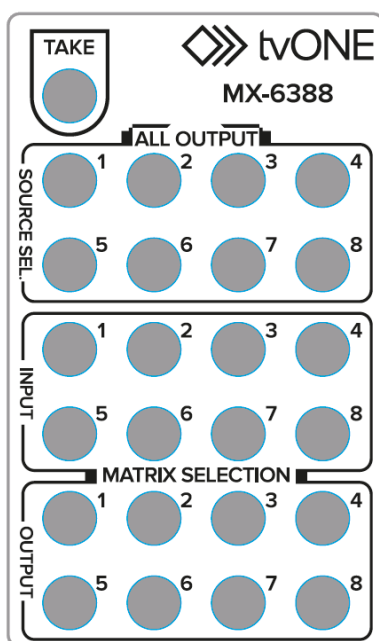
- The "Clear" button resets all selections made between the time you begin the process and when you press the "Take" button. All lighted buttons will go dark when you press the "Clear" button to indicate that you've changed your mind. You can then begin again with new selections.
- The "Mute" button functions as a "no signal" source which can be routed to an individual or multiple outputs. Select the "Mute" button followed by the outputs you wish to blank out followed by the "Take" button. (Note that there will be no sync signal present on a muted output, so the connected display may go to sleep or enter power save mode.)
- The "Take" button causes the actual switch to be made and will remain lighted until all the selected paths have switched.

- The “Lock” button will freeze/un-freeze the operation of the front panel and disable the front panel buttons (Note that RS-232/Ethernet commands will still function normally).

Note: Deselecting outputs when a source is going to more than one output is accomplished by selecting the source (which will then indicate the current output destinations), and then pressing the already active outputs you wish to de-select followed by pressing the “Take” button. This action will “mute” the selected output(s) but still maintain the source path to any other destinations you had previously selected. (You can accomplish the same thing by using the mute function as described above.)

5.2 Control via the Infrared Controller

The included Infrared Remote Controller has three sections of selector buttons that can be used to control the MX-6388.



Normal matrix functions are performed by pressing the numbered button of the input you wish to route from the two rows of “INPUT” buttons followed by pressing the numbered button(s) of the desired output(s) from the two rows of “OUTPUT” buttons.

After selecting your preferred input and output(s) you must press the “TAKE” button on the remote to make the switch take place.

Pressing any of the numbered “SOURCE SEL.” buttons will result in that input being sent to ALL outputs after you press “TAKE”.

If the “TAKE” button is not pressed within 5 seconds of your initial input selection then all un-taken remote selections will be cleared.

Note: The front panel buttons will not light up when using the IR remote to control the unit.

5.3 Control via RS-232 Option

Using appropriate control codes, it's possible to switch any input to any output under control of a computer or other hardware control device. To use this functionality, first prepare a control cable by reference to the table below. Make certain that you have continuity between the pins as shown.

The RS-232 control connections are as follows:

MX-6388			Controller	
Pin Number	Definition		Pin Number	Definition
1	NC		1	NC
2	Tx	→	2	Rx
3	Rx	←	3	Tx
4	NC		4	NC
5	GND		5	GND
6	NC		6	NC
7	NC		7	NC
8	NC		8	NC
9	NC		9	NC

RS-232 transmission format:

Baud Rate: 9600 bps

Data bit: 8 Bits

Parity: None

Stop Bit: 1 bit

The RS-232 control codes used by the MX-6388 are as follows:

ASCII Code	Meaning
VR	Displays Firmware Version
INn (eg IN1)	Input 1 through 8
IN0 (Zero)	"Muted" Input
OUTn (eg OUT1)	Output 1 through 8
ALL	All Outputs
>	Routing Indicator

CODE EXAMPLES:

"IN1 > OUT3" [Route Input 1 to Output 3]

"IN1 > ALL" [Route Input 1 to ALL Outputs]

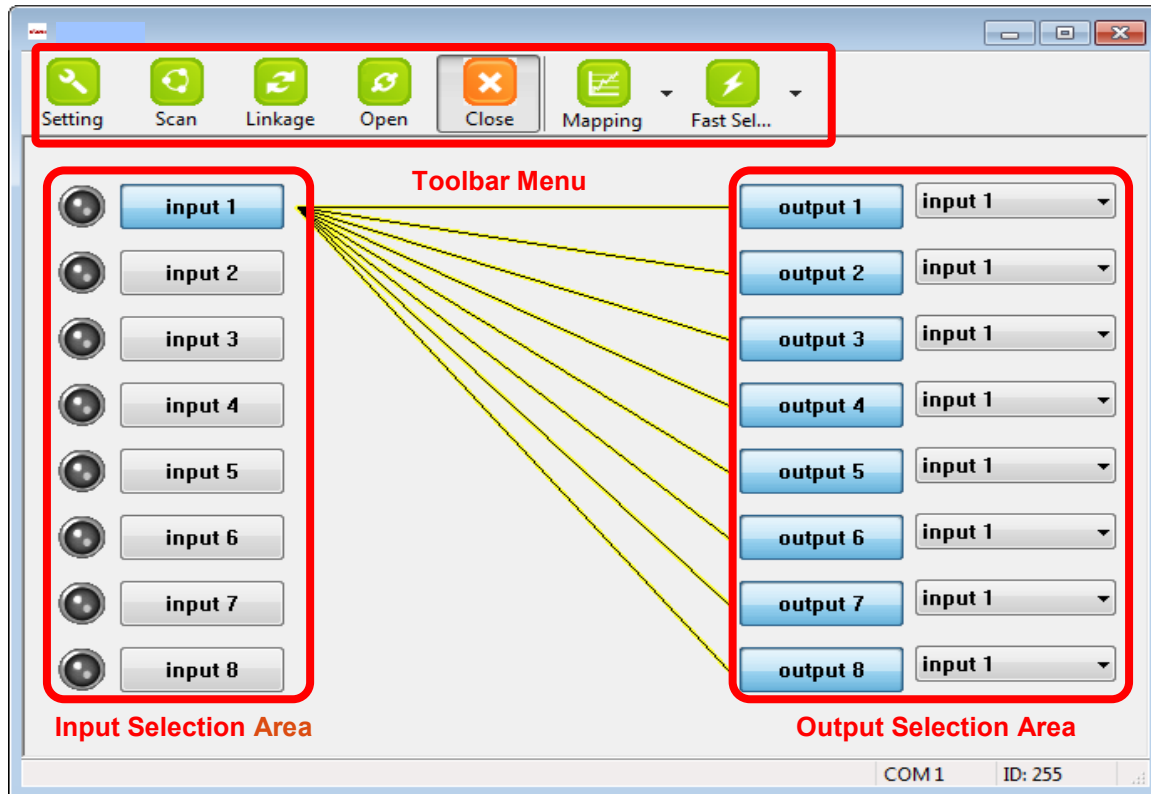
"IN0 > OUT2" [Mute Output 2]

Note: Full command lines must be followed by an ASCII Carriage Return[0x0D] for the command to be processed.

5.4 Control via the Included Control Software by RS-232 or Ethernet

Using the control software located on the included software CD, it is possible to fully control the matrix switch by either RS-232 or Ethernet connection.

There are three primary sections of the control software interface: the toolbar at the top, the input selection area on the left and the output selection area on the right. The input and output selections are intuitive. The Toolbar details are explained below.



Setting

The “Setting” button brings up the communication configuration menu with the following controls:

- The “Get” button reads the connected device’s ID number.
- The “Set” button assigns a new device ID number to the connected device.
- The “Rename” button opens up the String Table menu which allows you to assign custom names to inputs and outputs within the software.
- The “Ethernet” section allows the user to read and write Ethernet settings from/to the unit. Ethernet setting changes must be made while under RS-232 control. Select the “Write To Device” button to store your setting changes.
- The “Communication” section allows the user to select between RS-232 and Ethernet control.

The Setting dialog box contains the following sections:

- Get Device ID:** A text field showing '255' and a 'Get' button.
- Set Device ID:** A text field showing '255' and a 'Set' button.
- GUI String Table:** A 'Rename' button.
- Ethernet:** A table for configuring network settings.

IP	192	168	1	225
MASK	255	255	255	0
GATEWAY	192	168	1	1
DNS1	192	168	1	100
DNS2	192	168	1	101

Below the table are 'Write To Device' and 'Read From Device' buttons.
- Communication:** Radio buttons for 'RS232' (selected) and 'Ethernet'.
- Buttons:** 'OK' and 'Cancel' at the bottom.

Note: After making changes to the Ethernet settings the user must power cycle the unit for the new settings to become effective. If the unit receives commands from both Ethernet and RS-232 ports at the same time the Ethernet commands will have priority.

Scan

The “Scan” button brings up the Serial Port Scan menu which allows the user to scan the computer’s COM ports for connected units.

- The “Select” section allows you to manually select the COM port and Device ID of the unit you wish to control.
- The “Scan” button will cause the software to scan all available COM ports and display which ports have connected devices.
- After you have selected the device you wish to control, click on “OK” to finalize your selection.

The Serial Port Scan dialog box contains the following sections:

- Select:** Dropdowns for 'Port Number' (set to 'COM 8') and 'Device ID' (set to 'ID 255 (Super)').
- Scan:** A list box showing detected ports: 'COM 3' and 'COM 8 - Detected'.
- Buttons:** A checked checkbox for 'Scan Device ID', a 'Scan' button, and 'OK' and 'Cancel' buttons at the bottom.

Note: Selecting Device ID 255(Super) will cause the software to send commands that will affect units with any Device ID on the selected COM port.

Linkage

The “Linkage” button will cause the software to re-read the active Input and Output routes on the matrix switch. You may need to use this if you have made changes to the matrix switch by some method other than the control software.

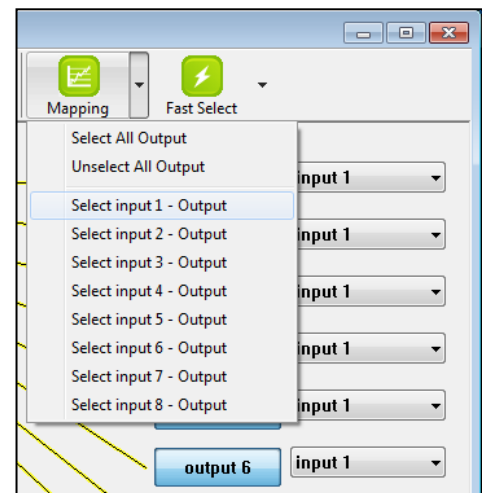
Open/Close

The “Open” and “Close” buttons are used to open and close the COM port or Ethernet connection to the matrix switch.

Mapping

The “Mapping” button provides an alternate method for selecting the Outputs you wish to begin connecting your Input to.

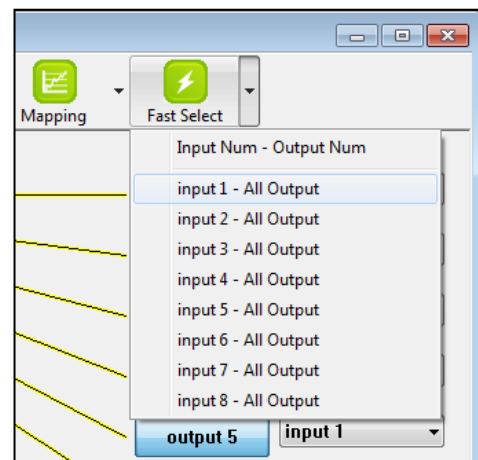
- Choose the “Select All Output” menu item then select an Input from the Input Selection Area on the left side to send that Input to all Outputs.
- Choose the “Unselect All Output” menu item to de-select all currently selected Outputs from the currently selected Input.
- Choose one of the “Select Input n” menu items to make that Input your active input. Then select all of the Outputs you wish to send that Input to from the list of Outputs in the Output Selection Area on the right side.

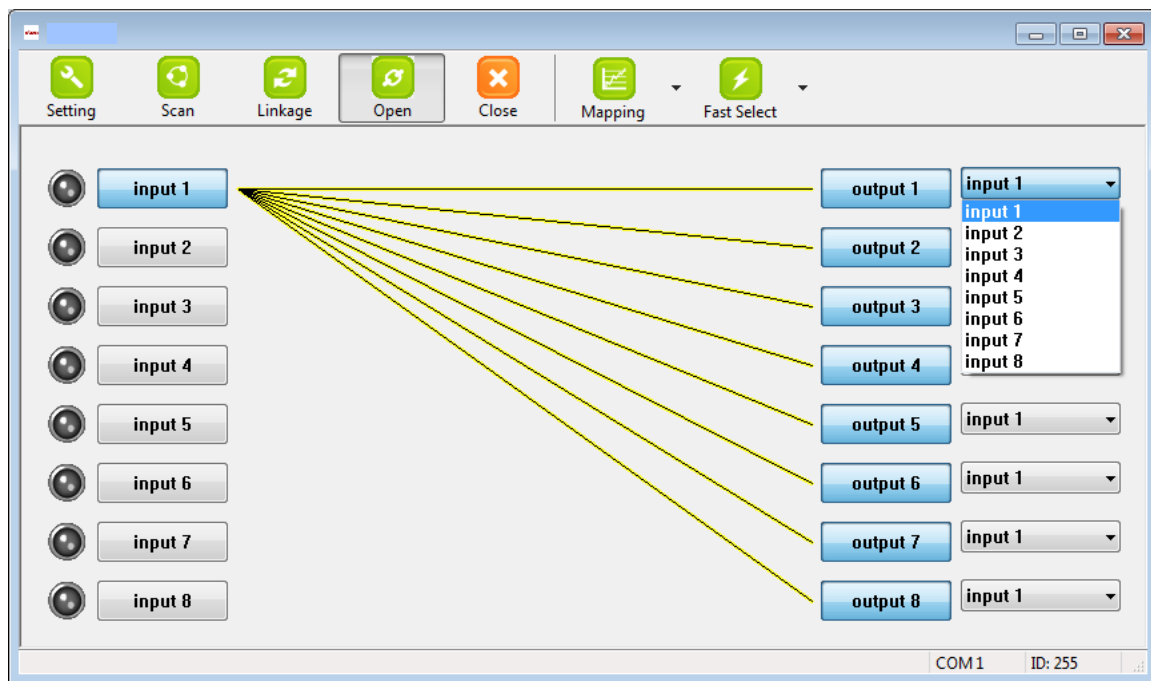


Fast Select

The “Fast Select” drop down allows you to quickly route single Inputs to single Outputs (1:1 mapping) or a single Input to all Outputs.

- Choose the “Input Num - Output Num” menu item to set each Input to route to the Output of the same number. (Input 1 to Output 1, Input 2 to Output 2, etc.)
- Choose one of the “Input n - All Output” menu items to send the selected Input to all Outputs.





Direct Input/Output Selection Area

It is also possible to directly select Inputs and Outputs using the buttons and drop down menus located in the Input and Output Selection Areas to the left and right.

- To directly send an input to an output, open up the drop down menu to the right of the Output and select the Input to route to it. The connection line will move to indicate the new route.
- To route an Input to more than one Output, select the Outputs you wish to affect in the Output Selection Area on the right (each button will turn grey to indicate it is selected). After you have selected all of the Outputs you wish to affect, select the Input you wish to send to those Outputs from the buttons in the Input Selection Area on the left. The connection lines will move to indicate the new routes.

EDID Learning Function:

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 levels 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. In this case, 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 by performing the procedures stated below.

Note

SW1-SW4 Pin#1 and Pin#2 must be set "ON" & "ON" for EDID Learning Mode

<i>DIP Switch Position</i>		<i>Video</i>	<i>Audio</i>	<i>Description</i>
<i>Pin 1</i>	<i>Pin 2</i>			
ON [↓]	ON [↓]	<i>Bypass</i>	<i>Bypass</i>	<i>EDID Learning – for learning EDID from the receiver</i>

1. Identify the number of the "Output" that is connected to the monitor you wish to clone the EDID from. Press and hold the associated "Output" button until the light blinks rapidly and then stops. Once the blinking stops you can release the "Output" button. Next, select each of the "Input" buttons that you wish to assign the selected monitor's EDID to. After selecting all of the desired inputs, and having verified that their LEDs are lit, you can press the "Take" button to begin the cloning process. The selected LEDs will turn off one by one as the EDID is cloned to each input. Once the process is completely finished all of the "Input" LEDs will have turned off. This process can take more than a minute if all 8 inputs were selected.
2. To return an input to using the default internal EDID, press and hold the "All" button until the LED blinks rapidly and then stops. Once the blinking stops you can follow the procedure outlined above and the EDID of the selected inputs will return to using the internal default.

6.0 TROUBLESHOOTING

Aside from faulty AC or DC power, most problems with the MX-6388 relate to damaged/poor quality cables, incorrect signal levels or EDID incapability.

If some inputs function correctly and others do not, interchange cables between sources and see if the problem moves with the cables. If it moves, a bad cable or cable connector is the probable reason for the trouble. If the problem remains with one particular input, connect that source to a different input using the same cable and see if the problem moves. If it does, the problem is with the source.

Note: It is strongly recommended that you use premium cables in order to achieve maximum distance cable runs and the best performance possible.

As a final step before contacting technical support, use the Web GUI to perform a system reset will return the unit to the default settings. After trying the above suggestions should the problem still persist, contact your dealer for additional suggestions before contacting tvONE. Should the dealer's technical personnel be unable to assist you, contact tvONE via our support website: <http://tvone.crmdesk.com>. Create a technical support request on the site and our support team will respond within a short period of time.

7.0 LIMITED WARRANTY

tvONE warrants the original purchaser that the equipment it manufactures or sells 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 defined below.

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, CX, A2 or S2.
2. tvONE products, other than those based on tvONE's CORIO technology mentioned above, are warranted for a period of three years from the date of purchase. This includes products with the model number prefix of 1T, with the exception of 1T-C2.
3. 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.

Should a product, in tvONE's opinion, prove defective within this warranty period, tvONE, at its option, will repair or replace this product without charge. Any defective parts replaced become the property of tvONE. This warranty does not apply to those products which have 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.

LIMITATIONS - All products sold are "as is" and the above Limited Warranty is in lieu of all other warranties for this product, expressed or implied, and is strictly limited to two years from the date of purchase. tvONE assumes 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. The liability of tvONE with respect to any defective products will be limited to the repair or replacement of such products. In no event shall tvONE be responsible or liable for any damage arising from the use of such defective products whether such damages be direct, indirect, consequential or otherwise, and whether such damages are incurred by the reseller, end-user or any third party.

8.0 REGULATORY COMPLIANCE

The MX-6388 Matrix Switcher has been tested for compliance with the 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 is RoHS compliant.

9.0 CONTACT INFORMATION

Should you have questions or require assistance with this product in areas not covered by this manual, please contact tvONE at the appropriate location shown below.

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End of Manual