MVID-MTX Series: Modular Matrix Switcher
INSTRUCTION MANUAL

Thank you for purchasing the MVID-MTX Modular Matrix Switcher. You will find this unit easy to install and highly reliable but it is essential that you read this manual thoroughly before attempting to use the Modular Matrix Switcher.

118 W. Streetsboro Street, Ste. 125 | Hudson, OH 44236 | Toll Free: (866) 865-7737

SAFETY INFORMATION

1. To ensure the best results from this product, please read this manual and all other documentation before operating your equipment. Retain all documentation for future reference.

2. Follow all instructions printed on unit chassis for proper operation.

3. To reduce the risk of fire, do not spill water or other liquids into or on the unit, or operate the unit while standing in liquid. Keep unit protected from rain, water and excessive moisture.

4. Make sure power outlets conform to the power requirements listed on the back of the unit before connecting.

5. Do not attempt to clean the unit with chemical solvents or aerosol cleaners, as this may damage the unit. Dust with a clean dry cloth.

6. Do not use the unit if the electrical power cord is frayed or broken. The power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords and plugs, convenience receptacles, and the point where they exit from the appliance.

7. Do not force switched or external connections in any way. They should all connect easily, without needing to be forced.

8. Always operate the unit with the AC ground wire connected to the electrical system ground. Precautions should be taken so that the means of grounding of a piece of equipment is not defeated.

9. AC voltage must be correct and the same as that printed on the rear of the unit. Damage caused by connection to improper AC voltage is not covered by any warranty.

10. Turn power off and disconnect unit from AC current before making connections.

11. Never hold a power switch in the "ON" position.

12. This unit should be installed in a cool dry place, away from sources of excessive heat, vibration, dust, moisture and cold. Do not use the unit near stoves, heat registers, radiators, or other heat producing devices.

13. Do not block fan intake or exhaust ports. Do not operate equipment on a surface or in an environment which may impede the normal flow of air around the unit, such as a bed, rug, carpet, or completely enclosed rack. If the unit is used in an extremely dusty or smoky environment, the unit should be periodically "blown free" of foreign dust and matter.

14. To reduce the risk of electric shock, do not remove the cover. There are no user serviceable parts inside. Refer all servicing to qualified service personnel.

15. When moving the unit, disconnect input ports first, then remove the power cable; finally, disconnect the interconnecting cables to other devices.

16. Do not drive the inputs with a signal level greater than that required to drive equipment to full output.

17. The equipment power cord should be unplugged from the outlet when left unused for a long period of time.

18. Save the carton and packing material even if the equipment has arrived in good condition. Should you ever need to ship the unit, use only the original factory packing.

19. Service Information Equipment should be serviced by qualifier service personnel when:

    A. The power supply cord or the plug has been damaged.
    B. Objects have fallen, or liquid has been spilled into the equipment.
    C. The equipment has been exposed to rain
    D. The equipment does not appear to operate normally, or exhibits a marked change in performance
    E. The equipment has been dropped, or the enclosure damaged.

THIS SAFETY INFORMATION IS OF A GENERAL NATURE AND MAY BE SUPERSEDED BY INSTRUCTIONS CONTAINED WITHIN THIS MANUAL

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Dear Customer

Thank you for purchasing this product. For optimum performance and safety, please read these instructions carefully before connecting, operating or adjusting this product. Please keep this manual for future reference.

INTRODUCTION

Congratulations on your purchase of one of the MVID-MTX series matrix switchers. This product has been specially engineered to provide a modular method of converting video signals from one format to another. The four different models provide ample flexibility for different sizes of operations, allowing you to select and customize the model which will best meet your needs. A variety of modular input and output cards allow you to use all current video signal formats and connectors on the market.

SAFETY PRECAUTIONS

Please read all instructions before attempting to unpack, install or operate this equipment and before connecting the power supply. Please keep the following in mind as you unpack and install this equipment:

- Always follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.
- Never spill liquid of any kind on or into this product.
- Never push an object of any kind into this product through any openings or empty slots in the unit, as you may damage parts inside the unit.
- Do not attach the power supply cabling to building surfaces.
- Use only the supplied power supply unit (PSU). Do not use the PSU if it is damaged.
- Do not allow anything to rest on the power cabling or allow any weight to be placed upon it or any person walk on it.
- To protect the unit from overheating, do not block any vents or openings in the unit housing that provide ventilation and allow for sufficient space for air to circulate around the unit.

DISCLAIMERS

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Version 3.0 FEB 2014

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MODELS & PACKAGE CONTENTS

About Modular Matrix Switcher System

The MVID-MTX Series of Matrix switchers are a group of high performance video and audio modular matrix switchers. Various changeable input and output cards make MVID-MTX matrix extremely flexible, allowing it to be an all-in-one solution for a variety of different projects. It is designed so that it can support a variety of different video signals with cross switching.

There are two groups of interchangeable cards designed to work with the MVID-MTX matrix; the Input cards series and the Output card series. All of these cards are designed to support hot plug & play. The cards provide connectivity and processing for different video signal types: HMDI, DVI, VGA, SDI, and HDBaseT.

Each of the MVID-MTX series matrix units can be used with any of the input and output cards for signal conversion.

The MVID-MTX Modular Matrix Switcher comes in four different models, all of which provide the same basic functions. The input and output cards work with all of the modules. The major difference between these models is the number of card slots they provide.

MVID-MTX Modular Matrix Switcher Models

Models	Height	Maximum Slot	Power supplies	RS-232 control	Audio I/O	Network control
MVID-MTX-88-IP-ONLY	2U	2 input card slots & 2 output card slots	Single	✓	Yes	Optional
MVID-MTX-1616-IP	3U	4 input card slots & 4 output card slots	Dual	✓	No	Optional
MVID-MTX-3232-IP	5U	8 input card slots & 8 output card slots	Dual	✓	No	Optional
MVID-MTX-6464-IP	10U	16 input card slots & 16 output card slots	Dual	✓	No	Optional

The MVID-MTX-88-IP-ONLY is unique in this series in that it comes with eight channel audio input and output cards already installed. This card is not available as a separate card, for installation into the other chassis. Of the video formats which the MVID-MTX Matrix series is able to convert, the only ones which contain integral audio are HDMI and HDBaseT. All other video formats do not contain integral audio channels.

MVID-MTX signal card (changeable cards)

The MVID-MTX series input and output cards for installation into the modular matrix switcher chassis are classified into the following models:

MVID-MTX Input cards

Models	Inputs	Signal Format
HDMI-IN-4	4	HDMI
DVI-IN-4	4	DVI
VGA-IN-4	4	VGA, COMPONENT, S-VIDEO. COMPOSITE
3GSDI-IN-4	4	SDI
HDBaseT-IN-4	4	HDMI over HDBaseT

MVID-MTX Output cards

Models	Outputs	Signal Format
HDMI-OUT-4	4	HDMI
DVI-OUT-4	4	DVI
VGA-OUT-4	4	VGA, COMPONENT, S-VIDEO. COMPOSITE
3GSDI-OUT-4	4	SDI
HDBaseT-OUT-4	4	HDMI over HDBaseT

PACKAGE CONTENTS

Before connecting the unit, it is necessary to unpack it from the shipping carton and inspect the unit for any damage. While the cards are hot-swappable, it is recommended to install the cards before connecting the unit. This will make the installation easier.

1. MVID-MTX modular matrix switcher (With empty slot and empty cover)
2. RS-232 Communication cable
3. IR remote w/ battery
4. Power Cord
5. 4 x Plastic cushions to be used as feet when the unit is not rack mounted
6. User Manual
7. Command control software

SPECIFICATIONS

SPECIFICATIONS

Main Unit

Control Parts	
Serial Control Port	RS-232, 9-pin female D connector
Installation	Rack Mountable
Pin Configurations	2 = TX, 3 = RX, 5 = GND
Front panel control	Buttons
Options	TCP/IP control by external device. Switcher does not include a build-in web server.
General	
Power Supply	100VAC ~ 240VAC, 50/60Hz
Temperature	0 ~ 150 °F (-20 ~ +70 °C)
Power Consumption	200W
Humidity	10% ~ 90%

	Case Dimension (WxHxD)	Product Weight
MVID-MTX-88-IP-ONLY	19 x 3.5 x 12.6 in (483x88x320mm) (2U high)	6.6 lbs (3Kg)
MVID-MTX-1616-IP	19 x 5.25 x 12.6 in (483x175x320mm) (3U high)	7.7 lbs (3.5Kg)
MVID-MTX-3232-IP	19 x 8.6 x 12.6 in (483x219x320mm) (5U high)	11 lbs (5Kg)
MVID-MTX-6464-IP	19 x 17.25 x 12.6 in (483x438x320mm) (10U high)	17.6 lbs (8Kg)

CHANGEABLE CARDS
DVI-IN-4 & DVI-OUT-4

Input		Output	
Input	4 DVI	Output	4 DVI
Input Connector	Female DB24+5 DVI-I (DUAL LINK)	Output Connector	Female DB24+5 DVI-I (DUAL LINK)
Input Level	T.M.D.S. 2.9V/3.3V	Output Level	T.M.D.S. 2.9V/3.3V
Input Impedance	75Ω	Output Impedance	75Ω
General			
Gain	0 dB		
Bandwidth	340 MHz (6.75 Gbit/s)		
Signal Type	DVI-I **(SINGLE LINK)**		
Video Signal	DVI 1.0/HDMI 1.3 full digital T.M.D.S signal		
Max Time-delay	5nS (±1nS)		
Switching Speed	200ns (Max)		
Crosstalk	<-50dB@5MHz		
EDID and DDC	Supports Extended Display Identification Data (EDID) and Display Data Channel (DDC) data using DVI and HDMI standards. EDID and DDC signals are actively buffered		
HDCP	Compliant with HDCP using DVI and HDMI 1.3 standards		

SPECIFICATIONS

HDMI-IN-4 & HDMI-OUT-4

Input		Output	
Input	4 HDMI	Output	4 HDMI
Input Connector	Female HDMI	Output Connector	Female HDMI
Input Level	T.M.D.S. 2.9V/3.3V	Output Level	T.M.D.S. 2.9V/3.3V
Input Impedance	75Ω	Output Impedance	75Ω
General			
Gain	0 dB		
Bandwidth	340 MHz (10.2 Gbit/s)		
Video Signal	DVI 1.0/HDMI 1.3 full digital T.M.D.S signal		
Max Time-delay	5nS (±1nS)		
Switching Speed	200ns (Max)		
Crosstalk	<-50dB@5MHz		
EDID and DDC	Supports Extended Display Identification Data (EDID) and Display Data Channel (DDC) data using DVI and HDMI standards. EDID and DDC signals are actively buffered		
HDCP	Compliant with HDCP using DVI and HDMI 1.3 standards		

3GSDI-IN-4 & 3GSDI-OUT-4

Input		Output	
Input	4 SDI	Output	4 SDI
Input Connector	Female BNC	Output Connector	Female BNC
Input Level	0.8Vp-p ± 10%	Output Level	0.8Vp-p ± 10%
Input Impedance	75Ω	Output Impedance	75Ω
General			
Gain	Unity		
Transmission Distance	300M (Max)		
Input Return Loss	<-14 dB @ 1 MHz ~ 1.5 GHz		
Video Standard	SMPTE 292M, SMPTE 259M, SMPTE 424M, ITU-RBT.601, ITU-RBT.1120		
Maximum Data Rate	2.97 Gbps		
Data rate Lock	Auto		
Input Return Loss	<-14 dB @ 1 MHz ~ 1.5 GHz		
Data Type	8bit, 10bit		

SPECIFICATIONS

VGA-IN-4 & VGA-OUT-4

Input		Output	
Input	4 VGA / Stereo Audio	Output	4 VGA
Input Connector	Female 15 pin HD 3P captive screw connectors (3.81mm)	Output Connector	Female 15 pin HD
Input Level	0.5 ~ 2.0Vp-p	Output Level	0.5 ~ 2.0Vp-p
Input Impedance	>10kΩ	Output Impedance	75Ω
Input signal	VGA-UXGA, RGBHV, RGBS, RGsB, RsGsBs, Component Video, S-Video & Composite Video, Stereo Audio		
Input Coupling	AC coupling only		
General			
Gain	0 dB		
Bandwidth	350MHz (-3dB), fully load		
Resolution	1920 x 1080p; XGA (1024 x 768); 1280 x 720p; WXGA (1280 x 800)		
Video Signal	VGA-UXGA, RGBHV, RGBS, RGsB, RsGsBs, component video, S-video & C-video		
Switching Type	Vertical interval		
Switching Speed	200ns (Max.)		
Frequency Response	20Hz~20K Hz		
CMRR	>90dB @20Hz to 20K Hz		
Crosstalk	<-50dB@5MHz		

HDBaseT-IN-4 & HDBaseT-OUT-4

Video Input		Video Output	
Input	4 RJ45, 4IR & RS-232	Output	4 RJ45, 4IR & RS-232
Input Connector	Female RJ45 3.5mm mini jack for IR 3 poles captive screw connector for RS-232	Output Connector	Female RJ45 3.5mm mini jack for IR 3 poles captive screw connector for RS-232
Input Impedance	75Ω	Output Impedance	75Ω
Video General			
Gain	0dB ~ 10dB@100MHz		
Resolution range	800x600 ~ 1920x1200		
SNR	>70dB@ 100MHz-100M		
THD	< 0.005%@1KHz		
HDMI Standard	Support HDMI1.4 and HDCP		
Bandwidth	6.75Gbps		
Transmission Distance	70M(Max)		
Return Loss	<-30dB@ 5KHz		
Min. ~ Max. Level	< 0.3V ~ 1.45Vp-p		
Differential Phasic Erro	±10° @ 135MHz_100M		

FRONT PANEL

FRONT PANEL OPERATION

MVID-MTX-88-IP-ONLY

The front panel of MVID-MTX-88-IP-ONLY is shown as below:
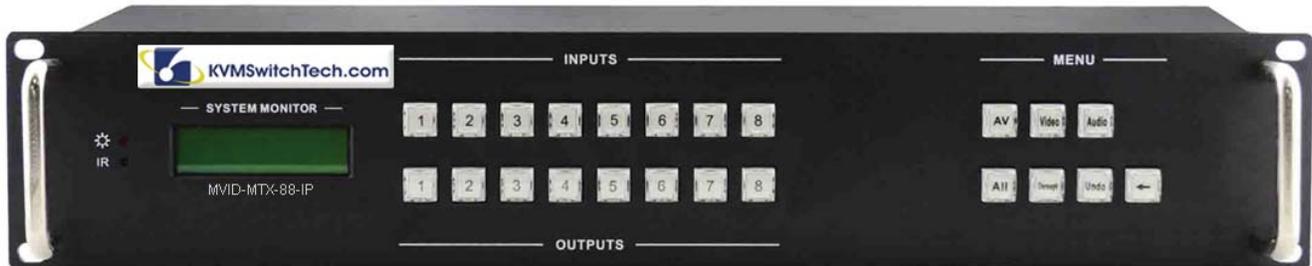
The front panel can be divided into the following sections:

1) Indicators:
   - Power LED to indicate that the system is on.
   - IR reception port for use with remote control.
2) System monitor: shows system switching and status information.
3) Input and output selection buttons: for selecting inputs and outputs for your unit. All switches are backlit in green.
4) Command button menu: for controlling functions of your unit. All switches are backlit in green.

Button Description of MVID-MTX-88-IP-ONLY

Buttons	Function Description
1 8	**"1" to "8"** Input buttons. These buttons are used to select the input channel for the action to be programmed.
1 8	**"1" to "8"** Output buttons. These buttons are used to select the output channel for the action to be programmed.
AV	**AV Synchronal Button:** Used for programming the switcher to transfer video and audio signal synchronously (together). **Operation:** Press buttons in this order - **"AV", "3", "4"**.
VIDEO	**Video Button:** Used for programming the transfer of only video signals from input channel to output channel. **Example:** To transfer video signals from input channel No.3 to output channel No.4. **Operation:** Press buttons in this order - **"VIDEO", "3", "4".**
AUDIO	**Audio Button:** Used for programming the transfer of only audio signals from input channel to output channel. **Example:** To transfer audio signals from input channel No.2 to output channel No.3. **Operation:** Press buttons in this order - **"AUDIO", "2", "3"**
ALL	**All Button:** To transfer a single input channel to all output channels. **Example 1:** To transfer video and audio signals together from input channel No.7 to all output channels. **Operation:** Press buttons in this order - **"7", "ALL"** **Example 2:** To transfer all input signals to the corresponding output channels respectively. In other words, to have **1->1, 2->2, 3->3, 4->4... 8->8** **Operation:** Press buttons in this order - **"ALL", "THROUGH"**
THROUGH	**Through Button:** Used to transfer signals directly from the input channel to the corresponding output channels (channel with the same number). It can also be used in conjunction with the "All" button to switch all channels to their corresponding output channel. **Example 1:** To transfer the signals from input channel No. 3 to the corresponding output channel No. 3 **Operation:** Press buttons in this order - **"3", "THROUGH"** **Example 2:** To transfer all input signals to the corresponding output channels respectively. In other words, to have **1->1, 2->2, 3->3, 4->4... 8->8.** **Operation:** Press buttons in this order - **"ALL," "THROUGH"**
UNDO	**Undo Button:** To eliminate the last command and return the unit to the status that existed before the last command was selected
←	**Backspace Button:** To backspace the latest input button; specifically used for removing the last character button in a two digit channel selection input. It does not undo the last command button pressed.

FRONT PANEL

MVID-MTX-1616-IP/MVID-MTX-3232-IP/MVID-MTX-6464-IP

The switcher models MVID-MTX-1616-IP, MVID-MTX-3232-IP, and MVID-MTX-6464-IP share the same function buttons, the only difference is the chassis height and number of I/O's.

The front panel of MVID-MTX-1616-IP/MVID-MTX-3232-IP/MVID-MTX-6464-IP is shown as below:
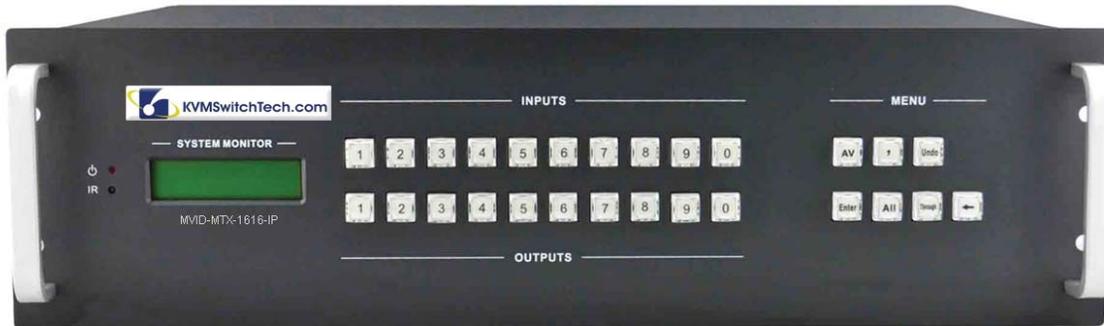
The front panel can be divided into the following sections:

1) Indicators:
  • Power LED to indicate that the system is on.
  • IR reception port for use with remote control.

2) System monitor: shows system switching and status information

3) Input and output selection buttons: for selecting inputs and outputs for your unit. All switches are backlit in green.

4) Command button menu: for controlling functions of your unit. All switches are backlit in green.

Button Description of MVID-MTX-1616-IP/MVID-MTX-3232-IP/MVID-MTX-6464-IP

Buttons	Function Description
0 9	**"0" to "9"** Input buttons. These buttons are used to select the input channel(s) for the action to be programmed.
0 9	**"0" to "9"** Output buttons. These buttons are used to select the output channel(s) for the action to be programmed.
AV	**AV Synchronal Button:** Used for programming the switcher to transfer video and audio signal synchronously (together). Please note that for the audio to be switched requires that the input and output boards are of a format that also contains audio connectivity.
,	**Division Button:** Used to divide the output channels when switching to more than one channel. **Example:** To select output channels 3 and 4 for switching. **Operation:** Press output buttons in this order - **"3," "," "4"**
ENTER	**Confirmation Button:** Confirm the switching operation. The operation will not be executed by the matrix without confirmation. This button needs to be pressed at the end of each command given.
ALL	**All Button:** To transfer a single input channel to all output channels or switch off all the output channels. **Example 1:** To transfer video and audio signals together from input channel No.12 to all output channels. **Operation:** Press buttons in this order - **"12", "ALL"** **Example 2:** To transfer all input signals to the corresponding output channels respectively. In other words, to have **1->1, 2->2, 3->3, 4->4...16->16…** **Operation:** Press buttons in this order - **"ALL", "THROUGH"**
THROUGH	**Through Button:** Used to transfer the signals directly from the input channel to the corresponding output channels (channel with the same number). It can also be used in conjunction with the "All" button to switch all channels to their corresponding output channel. **Example 1:** To transfer the signals from input channel No. 3 to it's corresponding output channel. **Operation:** Press buttons in this order - **"3", "THROUGH"** **Example 2:** To transfer all input signals to the corresponding output channels respectively. In other words, to have **1->1, 2->2, 3->3, 4->4...16->16…** **Operation:** Press buttons in this order - **"ALL," "THROUGH"**

FRONT PANEL

Buttons	Function Description
UNDO	**Undo Button:** To eliminate the last command and return the unit to the status that existed before the last command performed.
←	**Backspace Button:** To backspace the latest input button; specifically used for removing the last character button in a two digit channel selection input. It does not undo the last command button pressed.

Switching Operation: From the front control panel, all of the MVID-MTX matrix operations can be controlled directly and rapidly. To do so, follow the basic format of pressing the buttons, in the order below.

- **MVID-MTX-88-IP-ONLY: "Input Channel" + "Switch Mode" +"Output Channel"**
- **MVID-MTX-1616-IP/MVID-MTX-3232-IP/MVID-MTX-6464-IP: "Input Channel" + "Switch Mode" +"Output Channel"+"Enter"**

1) "Switch Mode": Refers to the Audio & Video synchronal or break away switching modes, which include the buttons **"AV", "Audio", "Video".**

2) "Input Channel": Refers to the channel that is to be directed to an output. Depress the input channel button number for the channel to be controlled. For two digit numbers, the digits must be pressed within five seconds of each other, or the operation will be cancelled. The input channels on the rear panel are counted from left to right, top to bottom.

3) "Output Channel": Refers to the channel that will be receiving the input. Depress the output channel button for the channel to be controlled. The output channels on the rear panel are counted from left to right, top to bottom.

4) Remember that in cases where the input/output channel is a two digits number, the input delay time between two numbers must less than 5 seconds; otherwise the operation will be cancelled.

EXTERNAL CONNECTION

INTRODUCTION OF THE INPUT AND OUTPUT CONNECTORS

- **MVID-MTX-88-IP-ONLY:** Accepts a maximum of 4 card slots in the rear panel, divided as 2 input slots and 2 output slots. The space that would contain the third input and output slots is already occupied by the audio input and output cards (see bottom cards in the picture above).

- **MVID-MTX-1616-IP:** Accepts a maximum of 8 card slots in the rear panel, divided as 4 input slots and 4 output slots.

- **MVID-MTX-3232-IP:** Accepts a maximum of 16 card slots in the rear panel, divided as 8 input slots and 8 output slots.

- **MVID-MTX-6464-IP:** Accepts a maximum of 32 card slots in the rear panel, divided as 16 input slots and 16 output slots.

- **Remarks:** The cards in the pictures above are shown only for reference; with the exception of the audio cards in the bottom slots (on MVID-MTX-88-IP-ONLY only), user can choose different cards in a configuration.

- The card slots are divided so that the left column of slots is for input cards and the right column of slots is for output cards. You cannot use an input card in an output slot or vice-versa.

CHANGEABLE CARDS

CHANGEABLE CARDS INTRODUCTION & INSTALLATION

The various MVID-MTX chassis units are designed to work with various changeable cards, which can be installed in any MVID-MTX empty slot (these cards are hot-swappable). Cards are connection specific, designed to accept signals such as DVI, HDMI, VGA, HDBaseT, and SDI. You will find an introduction to each type of card below:

DVI Signal Card.   DVI-IN-4 & DVI-OUT-4

These cards are fully compatible with HDMI1.3 and HDCP, but do not support analog signal. They have embedded EDID management technology, supporting CEC, DDC.

DVI-IN-4: Is an input card which accepts a maximum of four separate DVI input signals. Input signals can be passed to output devices through DVI-OUT-4, or passed through to other types of outputs, through other output cards in the series.

DVI-OUT-4: Is an output card, which provides a maximum of four separate DVI output signals. Input signals can come from an DVI-IN-4, or from other kinds of input cards in the series.

Pin Layout of the DVI-I connector (Dual-Link). (Female)
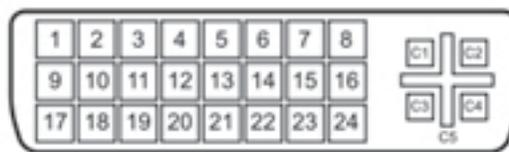
PIN	Function	PIN	Function
1	T.M.D.S.Data2-	13	T.M.D.S.Data3+
2	T.M.D.S.Data2+	14	+5V Power
3	T.M.D.S. Data 2/4 Shield	15	Ground (for +5V)
4	T.M.D.S. Data 4-	16	Hot Plug Detect
5	T.M.D.S. Data 4+	17	T.M.D.S. Data 0-
6	DDC Clock	18	T.M.D.S. Data 0+
7	DDC Data	19	T.M.D.S. Data 0/5 Shield
8	No Connect	20	T.M.D.S.Data5-
9	T.M.D.S.Data1-	21	T.M.D.S.Data5+
10	T.M.D.S.Data1+	22	T.M.D.S. Clock Shield
11	T.M.D.S.Data1/3 Shield	23	T.M.D. S. Clock +
12	T.M.D.S.Data3-	24	T.M.D.S .Clock-

CHANGEABLE CARDS

HDMI Signal Card.   HDMI-IN-4 & HDMI-OUT-4

These cards have embedded EDID management technology, supporting CEC, DDC.

They are also compatible with DVI signal (HDCP required).

HDMI-IN-4: Is an input card which accepts a maximum four separate HDMI input signals. Input signals can be passed to output device through an HDMI-OUT-4, or passed through to other kinds of outputs, through other output cards in the series.

HDMI-OUT-4: Is an output card, which provides a maximum of four separate HDMI output signals. Input signals can come from an HDMI-IN-4, or from other kinds of input cards in the series.

Pin layout of the HDMI connectors (Female)
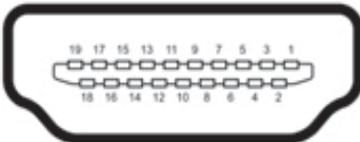
PIN	Signal Name	PIN	Signal Name
1	TMDS Data 2+	11	TMDS Clock Shield
2	TMDS Data 2 Shield	12	TMDS Clock-
3	TMDS Data 2-	13	CEC
4	TMDS Data 1+	14	No Connect
5	TMDS Data 1 Shield	15	DDC Clock
6	TMDS Data 1-	16	DDC Data
7	TMDS Data 0+	17	Ground
8	TMDS Data 0 Shield	18	+5V Power
9	TMDS Data 0-	19	Hot Plug Detect
10	TMDS Clock+	20	SHELL

CHANGEABLE CARDS

VGA Signal Card.   VGA-IN-4 & VGA-OUT-4

These cards scale all inputs to 1080p.

They are compatible with C-Video, YUV, YC (Field Programmable).

The bandwidth is up to 350MHz (-3dB);

Supports RGBHV, RGsB, RGBS, RsGsBs, YUV, S-Video, Component Video and Composite video and supports Analog Stereo Audio.

VGA-IN-4: Is an input card which accepts a maximum of four separate VGA input signals.

Resolutions Supported: 1920 x 1080p; XGA (1024 x 768); 1280 x 720p; WXGA (1280 x 800)

VGA-OUT-4: Is an output card, which provides a maximum of four separate VGA output signal.

Pin layout of the VGA connectors (female):
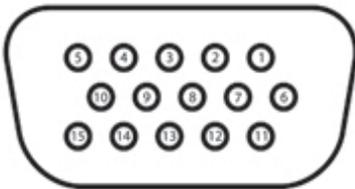
PIN	Signal Name	PIN	Signal Name
1	RED	20	KEY/PWR
2	GREEN	19	GND
3	BLUE	18	ID0/RES
4	ID2/RES	17	ID1/SDA
5	GND	16	HSync
6	RED_RTN	15	VSync
7	GREEN_RTN		
8	BLUE_RTN		

Component Video Dongle   **S-Video or Composite Video Dongle**

CHANGEABLE CARDS

SDI Signal Card.   3GSDI-IN-4 & 3GSDI-OUT-4

These cards are compatible with various different SDI signal formats, including SD/HD/3G-SDI (adaptive)
Every port has looping output for local monitoring.

3GSDI-IN-4: Is an input card which accepts a maximum of four separate SDI input signals. Input signal can be passed to output device through 3GSDI-OUT-4, or passed through other output cards in the series. This card is unique when compared to the other input cards in that it provides a "through" connection for daisy-chainging video devices. Each input signal can be immediately sent back out ("looping" it), without switching capability, to go to individual monitors.

3GSDI-OUT-4: Is an output card which provides a maximum of four separate SDI output signals. Input signals can come from an 3GSDI-IN-4, or from other kinds of input cards in the series.

The BNC connector is shown as the figure below.

BNC Connector
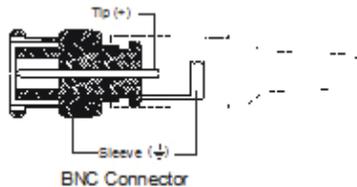
CHANGEABLE CARDS

HDBaseT Twisted Pair Card.   HDBaseT-IN-4 & HDBaseT-OUT-4

These cards are for sending HD audio/video signals across a CAT5 or CAT6 twisted pair, for use in conjunction with a HDMI/DVI extender. Support HDTV, compatible with HDMI1.4 and HDCP

HDBaseT-IN-4: Is an input card which accepts a maximum of input four separate HDMI TP signals. Input signals can be passed to output devices through HDBaseT-OUT-4, or passed through to other types of output cards in the series. This card needs to work in conjunction with an TRA-HDB-2P HDBaseT Transmitter.

HDBaseT-OUT-4: Is an output card which provides a maximum of four separate HDBaseT output signals. Input signals can come from HDBaseT-IN-4, or from other kinds of input cards in the series. This card needs to work in conjunction with an REC-HDB-2P HDBaseT Receiver.

Provision is made within the card for passing RS-232 and IR over the same CAT5 cable. These are specific to the HDBaseT channel. They do not have to be used for the HDBaseT channel to function, but are provided for those situations where they are needed. Please note that this is separate of the RS-232 and IR channels that are provided for the MVID-MTX Matrix unit's controls.

Pin layout of the RJ45 connectors:

Two different connection standards can be chosen; connectors on both ends of the same cable should use the same standard.
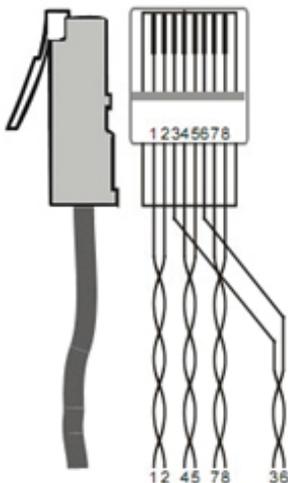
TIA/EIA T568A		TIA/EIA T568B	
PIN	CABLE COLOR	PIN	CABLE COLOR
1	green white	1	orange white
2	green	2	orange
3	orange white	3	green white
4	blue	4	blue
5	blue white	5	blue white
6	orange	6	green
7	brown white	7	brown white
8	brown	8	brown

Notice: Cable connectors MUST be shielded metal ones, and the shielded cable's shield MUST be connected to the connector's metal shell, in order to share the ground.

*** For more information on the TRA-HDB-2P and REC-HDB-2P please see our website.

EXTERNAL CONNECTIONS

IR Input
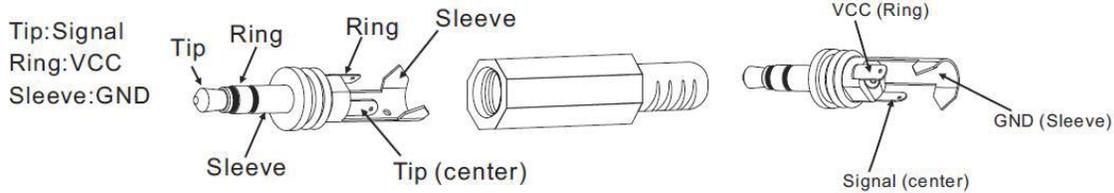
IR Output
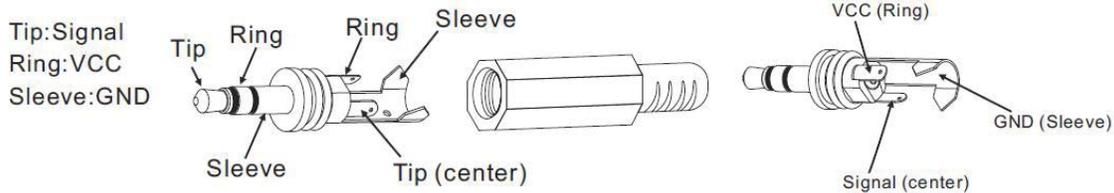
Connection of RS-232 Communication Port

In addition to front panel control, the MVID-MTX matrix can be controlled through TCP/IP or RS-232 communication port.

This RS-232 communication port is a female 9-pin D connector. The definition of its pins is as the table below.
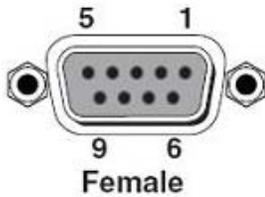
NO.	PIN	FUNCTION
1	N/u	Unused
2	Tx	Transmit
3	Rx	Receive
4	N/u	Unused
5	Gnd	Ground
6	N/u	Unused
7	N/u	Unused
8	N/u	Unused
9	N/u	Unused

Connection with Computer
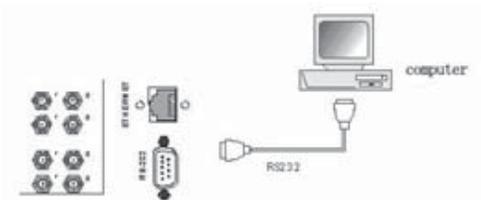
Users can control the MVID-MTX matrix via control software installed in a computer. This requires connecting the RS-232 port on the back of the matrix chassis to a serial RS-232 port on the computer. To control the switcher, users need a Terminal Emulator such as Hyper Terminal installed on the computer.

Connection between MVID-MTX matrix and computer

Connection of TCP/IP Port (Optional Function)

The TP port of MVID-MTX is used for TCP/IP control. Use of the TCP/IP control will be discussed later in this manual. The MVID-MTX chassis do not have a build-in webservers for control. The TCP/IP connection requires you either send comments manually or from a third-party controller.

SYSTEM SETUP DIAGRAM

In our system diagram example we are using an MVID-MTX-3232-IP; however the same connections can be made on any of the MVID-MTX matrix units.
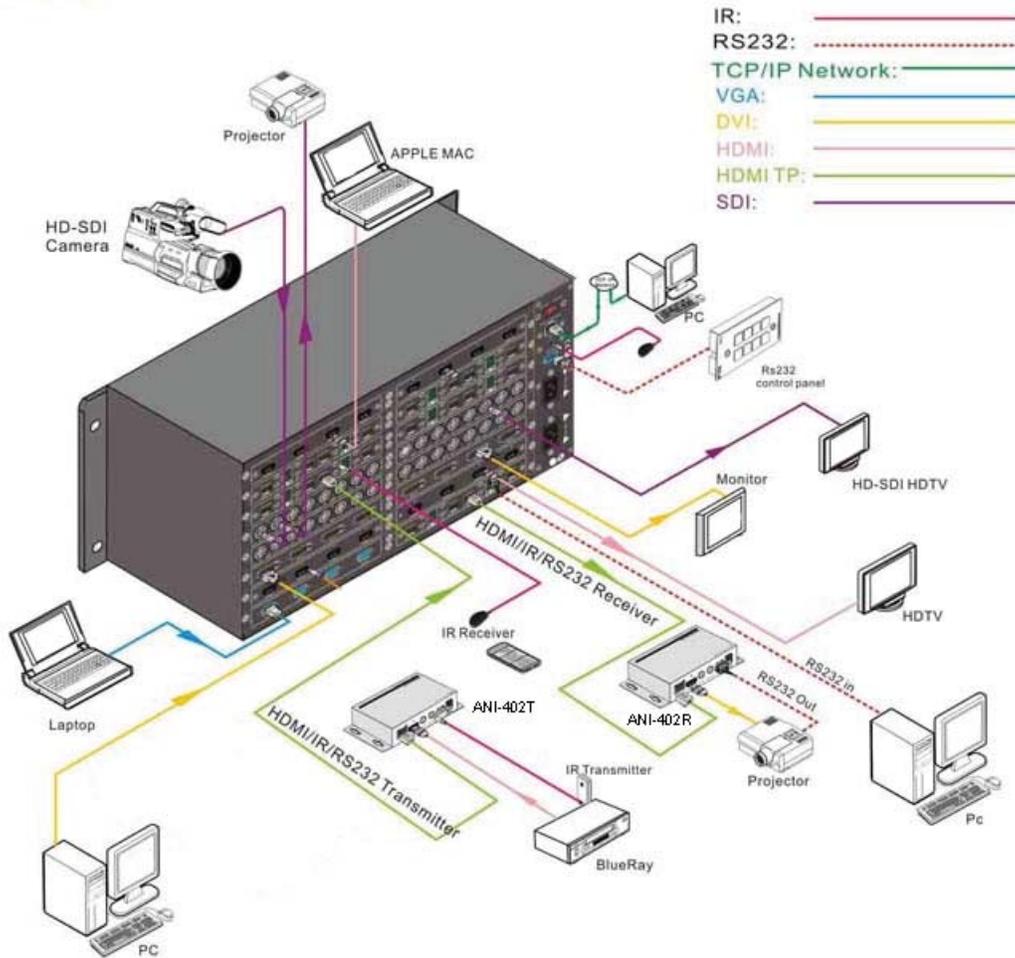
The MVID-MTX Matrix units are designed for installation in a standard 19" rack mount. Should the owner desire to install the unit sitting on a shelf, four plastic cushions, designed to be used as feet are included. These are self-adhesive and should be attached to the bottom of the unit, before installation and setup.

REMOTE CONTROL

The MVID-MTX Matrix series of video switchers all come with a remote control unit. This remote duplicates the series of command buttons that are available on the front panel of the unit. The remote control is divided into three sections:

- Inputs
- Commands
- Outputs

To use the unit, follow the same command protocol used for entering the commands on the front of the unit. This requires entering the command, input, then output.

For Matrix units where more than 10 channels are present, there is a 10+ button provided for both the input and output. So, to input a command, selecting channel 16, you would press the 10+ button, then the 6 button.

REMOTE COMMAND SYSTEM FROM A PERSONAL COMPUTER

The MVID-MTX Matrix series can be controlled remotely from a personal computer. The control signal is brought into the MVID-MTX Matrix through the RS-232 connector on the back panel of the unit. The commands are input through software that comes with the MVID-MTX Matrix, once installed in the computer.

RS-121 Cable Pins Used

```
MATRIX SWITCHER RS 232 PINS OUT          PC 232 PINS
DB-9P , FEMALE socket                     DB-9P , MALE plug

     5 4 3 2 1                              1 2 3 4 5
     9 8 7 6                                6 7 8 9

   NC    1 ○                            ○ 1   NC
   (TX)  2 ●────────────────────────────● 2   (RX)
   (RX)  3 ●────────────────────────────● 3   (TX)
   NC    4 ○                            ○ 4   NC
   (GND) 5 ●────────────────────────────● 5   (GND)
   NC    6 ○                            ○ 6   NC
   NC    7 ○                            ○ 7   NC
   NC    8 ○                            ○ 8   NC
   NC    9 ○                            ○ 9   NC
```
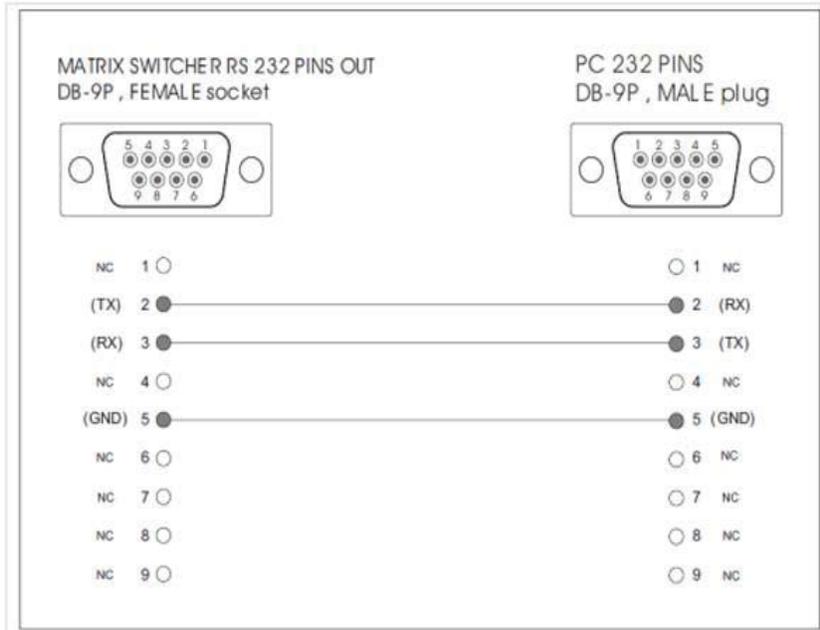
Communications Protocol:

1. Transmission Rate: 9600 bps

2. Data Format: 8 data bits, No parity , 1 start bit, and 1 stop bit

3. Flowing Control: None

Also known as: 9600,8,n,1

Proper settings for the computer's communication protocol are shown in the screen shots below:
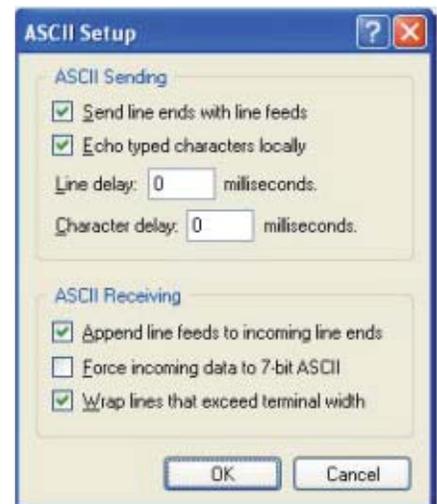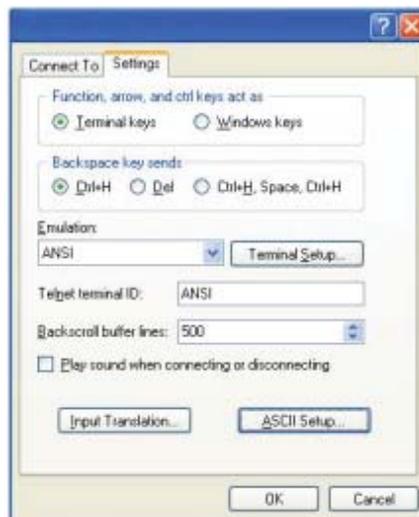
COMMAND CODES

These are the command codes used with the MVID-MTX Matrix control software, included with the unit. With this command system, users are able to control and operate the MVID-MTX Matrix remotely via the RS-232 connection and the appropriate software.

Command Types	Command Codes		Functions
System Command	/*Type;		Inquire the model's information.
	/%Lock;		Lock the keyboard of the control panel on the Matrix.
	/%Unlock;		Unlock the keyboard of the control panel on the Matrix.
	/^Version;		Inquire the version of firmware that the Matrix has installed
	/:MessageOff;		Turn off the feedback command from the com port. It will only show the "switcher OK."
	/:MessageOn;		Turn on the feedback command from the com port.
	Undo.		To cancel the previous operation.
	Demo.		Switch to the "demo" mode, 1->1, 2->2, 3->3 … and so on.
Operation Command	[x1]All.		Transfer signals from one particular input channel [x1] to all output channels
	All#.		Transfer all input signals to the corresponding output channels respectively.
	All$.		Switch off all the output channels.
	[x1]#.		Transfer signals from the input channel [x1] to the output channel [x1].
	[x1]$.		Switch off the output channel [x1].
	MVID-MTX-88-IP-ONLY	[x1] V[x2].	Transfer the video signal only the input channel [x1] to the output channel [x2].
		[x1] V[x2], [x3], [x4].	Transfer the video signal only the input channel [x1] to the output channels [x2], [x3] and [x4].
		[x1] A[x2].	Transfer the audio signal only the input channel [x1] to the output channel [x2].
		[x1] A[x2], [x3], [x4].	Transfer the audio signal only the input channel [x1] to the output channels [x2], [x3] and [x4].
	[x1] B[x2].		Transfer signal from the input channel [x1] to the output channel [x2].
	[x1] B[x2],[x3],[x4].		Transfer signal from the input channel [x1] to the output channels [x2], [x3] and [x4].
	[x1].		Allows you to inquire what source channel is supplying signal to the output channel [x1].
	Status.		Allows you to inquire what input channels are supplying signal to all of the output channels. This information will be provided on a one by one basis (1x3, 2x2, 3x8), where the first number is the destination channel and the second number is the source channel.
	Save[Y].		Save the present operation to the preset command [Y]. [Y] ranges from 0 to 9.
	Recall[Y].		Recall the preset command [Y].
	Clear[Y].		Clear the preset command [Y].
	EDIDMInit.		Recover the factory default EDID (extended display identification data) data.
	EDIDM[X]B[Y].		Manual EDID management. Copy the EDID data of output[X] to the input[Y].
	PWON.		Set the Matrix to normal working status
	PWOFF.		Set the Matrix to stand-by status.
	HDCPON.		Turn on the HDCP (high-bandwidth digital content protection) output.
	HDCPOFF.		Turn off the HDCP output.
	PTN/I/[X]:0622%;		Set the input channel [x] to support VGA signal input. (NOTE 4)
	PTN/I/[X]:0623%;		Set the input channel [x] to support YPbPr signal input. (NOTE4)
	PTN/I/[X]:0624%;		Set the input channel [x] to support SVIDEO signal input. (NOTE1)
	PTN/I/[X]:0625%;		Set the input channel [x] to support CVIDEO signal input. (NOTE 4)
	PTN/I/[X]:0626%;		Scale the resolution of input [x] to 1024*768. (NOTE 4)
	PTN/I/[X]:0627%;		Scale the resolution of input [x] to 1280*720. (NOTE 4)
	PTN/I/[X]:0628%;		Scale the resolution of input [x] to 1280*800. (NOTE 4)
	PTN/I/[X]:0629%;		Scale the resolution of input [x] to 1920*1080. (NOTE 4)

COMMUNICATION PROTOCOL AND COMMAND CODES

General Notes:

1)The letter inside the bracket [ ] is the variable code, which is changeable.

2) The bracket [ ] is not part of the command.

3) Any dot "." after the letters is part of the command.

4) The command begins with PTN (Packet Transmission Network) and applies only to the VGA-IN-4 only; [x] is the channel of the matrix but not the channel of card. For MVID-MTX-88-IP-ONLY, [x] must be one Byte, and for MVID-MTX-1616-IP/MVID-MTX-3232-IP/MVID-MTX-6464-IP, it must be two bytes.

5) [x1], [x2], [x3] and [x4] are the symbols of input or output channels ranged according to the model of the matrix switcher. If the symbols exceed the effective range, it would be taken as a wrong command.

6) In above commands, "["and "]" are symbols for easy reading and do not need to be typed in actual operation.

7) Please remember to end the commands with the ending symbols "." and ";".

Notes when using computer source: The default EDID resolution is 1280 x 1024. When connecting a computer, the matrix attempts to force the screen resolution to 1280 x 1024. If you use a different computer resolution, you will have to tell the switch HDMI Output to learn the Input setting.

To solve this problem, you will need to use the EDID management function to copy the EDID of the display to the matrix. The command is sent via RS-232, using the syntax EDIDM[X]B[Y] where X is the Output channel and Y is the Input channel.

For example; to set the resolution to 1080p;

Assuming;
1. The display is connected to Output 2 of the matrix.
2. The computer is connected to Input 1.
3. In this case, send the command EDIDM2B1. To copy the EDID of the display to Input 1 of the matrix, and the computer will work like it is directly connect to the display.

If there are more than one computer connected or you need all inputs set to 1080p as the default setting, send the command mapping all Inputs/Outputs. The settings are stored in nonvolatile RAM and will be retained until the setting is changed.

Detailed Examples:

1. **Transfer signals from one input channel to all output channels: [x1]All.**
   Example: "3All." to transfer the signal from Input 3 to all output channels.
2. **Transfer the signals formal input channels to corresponding output channels respectively: All#.**
   Example: If this command is carried out, the status of matrix will be: 1->1, 2->2, 3->3, 4->4…… 8->8….
3. **Switch off all the output channels: All$.**
   Example: After running this command, there will be no signals on any of the outputs.
4. **Switch off the detail feedback command from the COM port: /:MessageOff;**
   Explanation: It will leave "switch OK" as the feedback, when you switch the matrix.
5. **Switch on the detail feedback command from the COM port: /:MessageOn;**
   Explanation: It will show the detail switch information when it switch. Example: when switch 1->2, it will feedback "AV01 to 02".
6. **Transfer signals from an input channel to corresponding output channel: [x]#.**
   Example: "5#." to transfer signals from the number 5 input to the number 5 output.
7. **Switch off an output channel: [x]$.**
   Example: "5$." to switch off output channel number 5.
8. **Switch signal: [x1] B[x2].**
   Example: "12B12, 13, 15." to transfer signal from Input channel 12 to Output channels 12,13,15.
9. **Inquire what input channel is providing video signal to the output channel [x]: Status[x].**
   Example: "Status23." to inquire what input channel is providing video signal to output23.
10. **Inquire what input channels are providing video signal to the output channels one by one: Status.**
    Example: "Status. "Provides an output of each channel (1x3, 2x2, 3x8), showing the output channel first, then the input channel associated with it.
11. **Save the present operation to the preset command [Y]: Save[Y].**

    Example: "Save7." to save the present operation to the preset command No. 7.
12. **Recall the preset command [Y]: Recall[Y].**
    Example: "Recall5." to recall preset command No. 5.
13. **Clear the preset command [Y]: Clear[Y].**
    Example: "Clear5." to clear preset command No. 5.
14. **EDID management command: EDIDM[X]B[Y].**
    Example: "EDIDM5B3." to copy the EDID data of the display on output 5 to input 3.
15. **Command for VGA-IN-4: PTNI[X]*****.**
    Example: "PTNI070623%." to set the input 7 to support YPbPr signal, the card is plugged in the second input slot of the matrix.

GUI INTERFACE
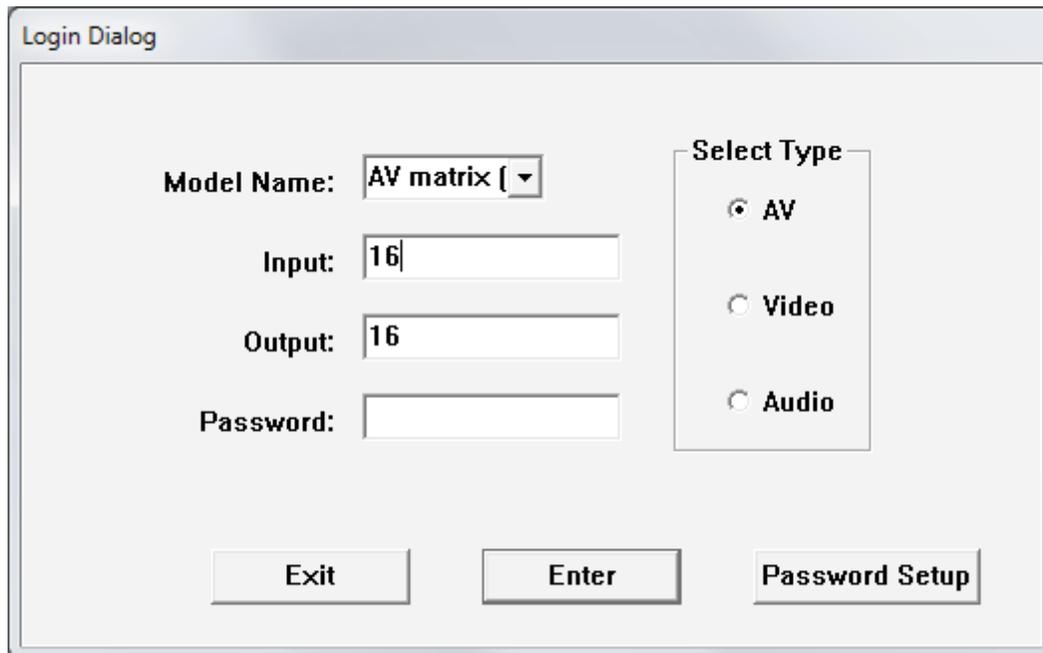
Set your matrix size (Model Name has no affect)
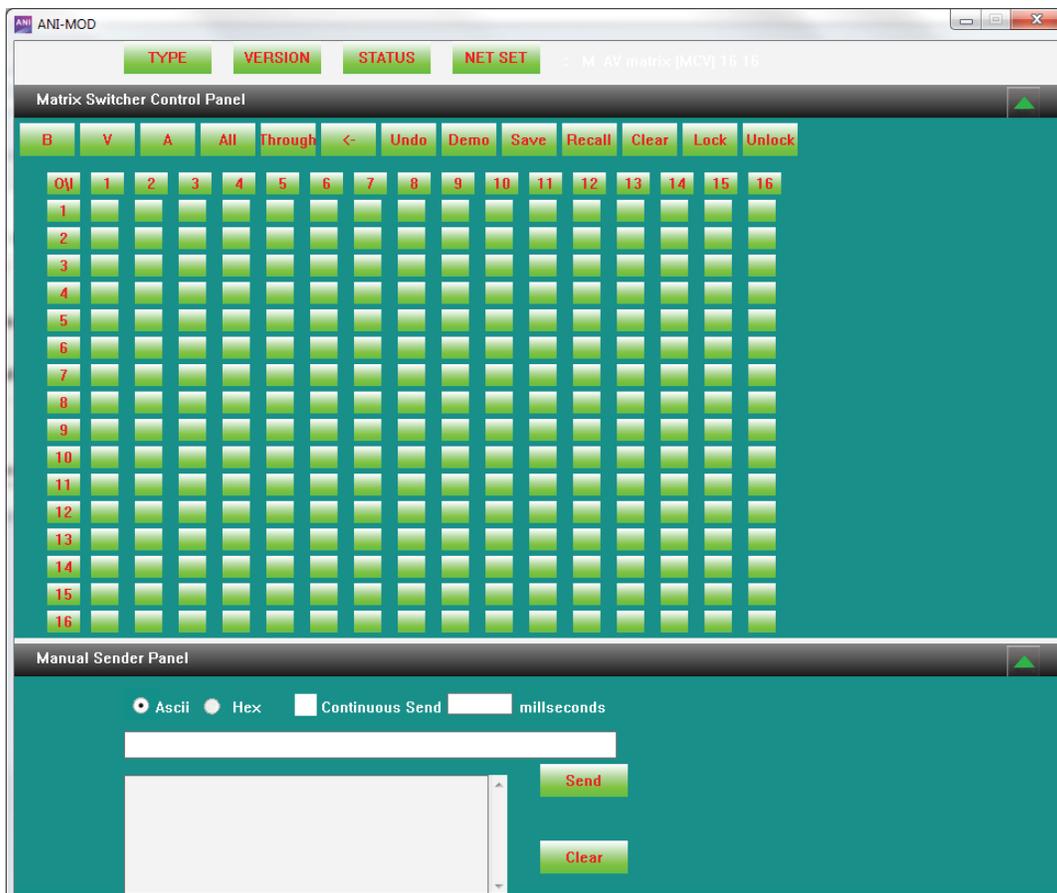
Control switcher using cross points

GUI INTERFACE
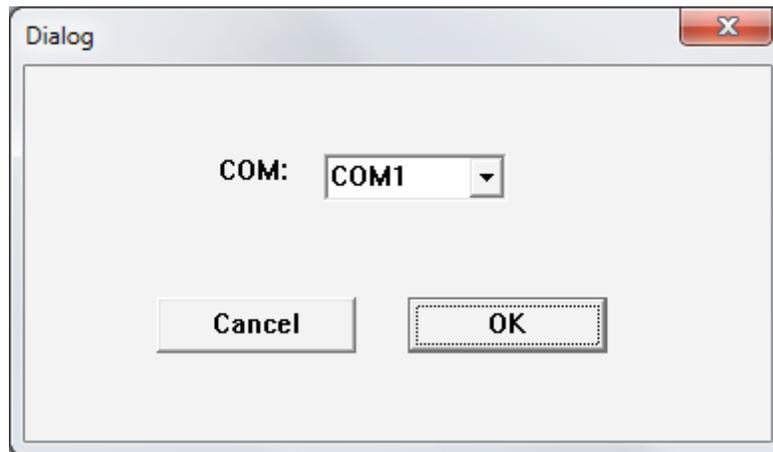
Select from the detected available COM ports

OR
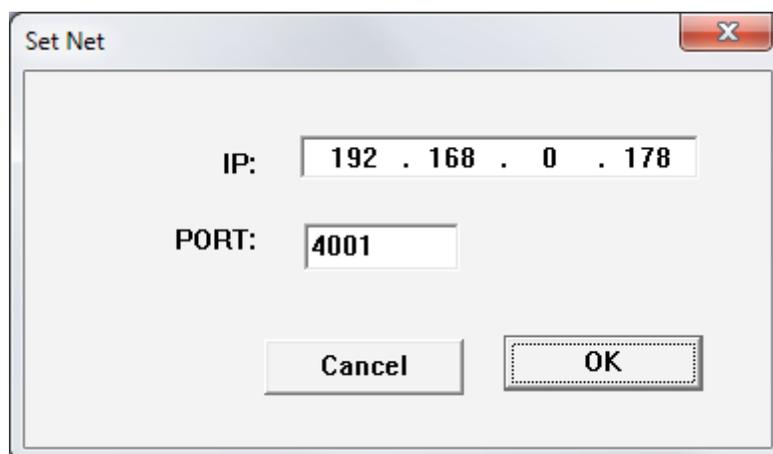
Select connection via TCP/IP

TCP/IP CONTROL (OPTIONAL)

The TCP/IP port of MVID-MTX is used for TCP/IP control. Below is the introduction for TCP/IP control. The MVID-MTX does not have a build-in web server for control. The TCP/IP connection requires you either send comments manually or from a third-party controller.

IP CONFIGURATION

1) Connect a computer to the TCP/IP port with a CAT5 or CAT6 cable.

2) set the MVID-MTX IP to the same IP section, but not the same IP address, as the default IP of MVID-MTX (192.168.0.178). To access this, click on Network Connections in the Windows Control Panel. Then right click on the Local Area Connection and select Properties from the context sensitive menu. In the dialog box that appears, select "Internet Protocol Version 4 (TCP/IP v4). This will open the following dialog box, where you can set the IP address.
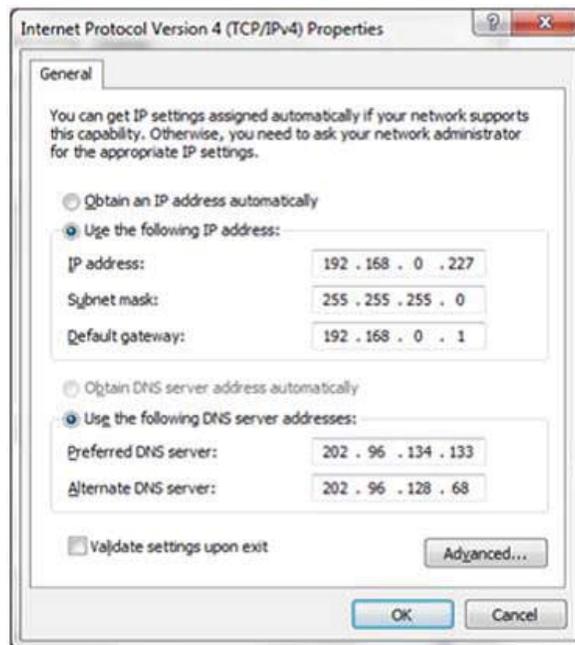
Same IP section but cannot be 192.168.0.178

Figure 1: TCP/IP Setup

3) Enter 192.168.0.178 in your web browser, you should see the LOGIN page.
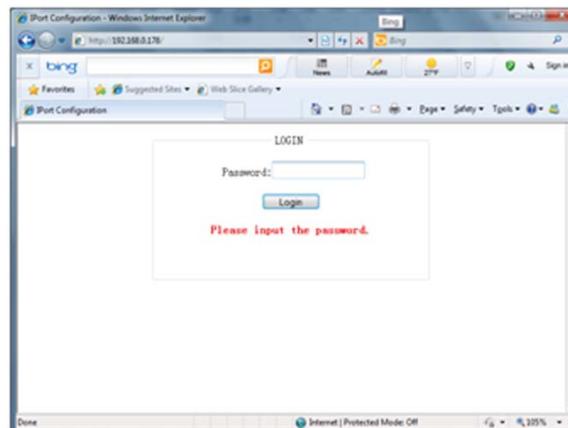
Figure 2: TCP/IP Login Screen

4) Enter the password "88888", you will be presented with "IPort Configuration Web Server" page. From this page, you can manage system settings such as the IP address, IP reset, PW reset etc. See Figure 3: TCP/IP IPort Configuration Web Server

Note: *Serial configuration is fixed and cannot be changed.*

Figure 3a: TCP/IP IPort Configuration Web Server

The following screen shots show typical settings for the MVID-MTX Matrix series of switchers when used along with TCP/IP control.

Figure 3b: System Info Screen

Figure 3c: Serial Info Screen

TCP/IP CONTROL (OPTIONAL)

change password ⟶

Figure 3d: Change Password Screen

After configuration, reset the device, then you can use the new IP address for controlling the MVID-MTX device.

a) Connection and Command Control

1) Connect a computer and MVID-MTX to the same network. Open the NET software (or any other TCP/IP communication software) and create a connection, enter the IP address and port of MVID-MTX (default IP: 192.168.0.178, port:4001):
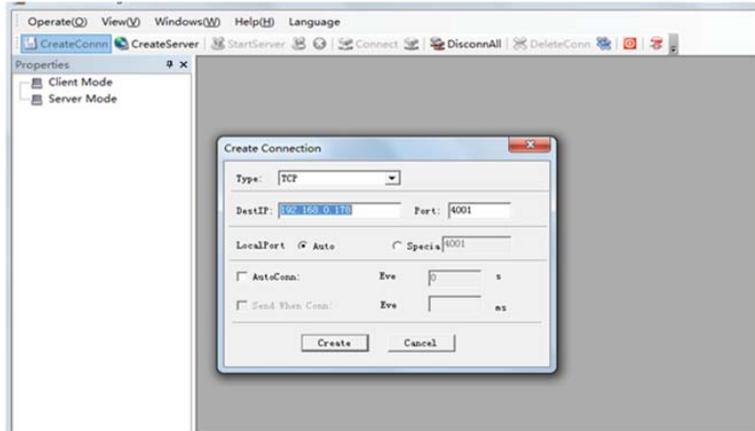
Figure 4: Connection and Command Control

2) After successful connection; you can enter commands to control the MVID-MTX.
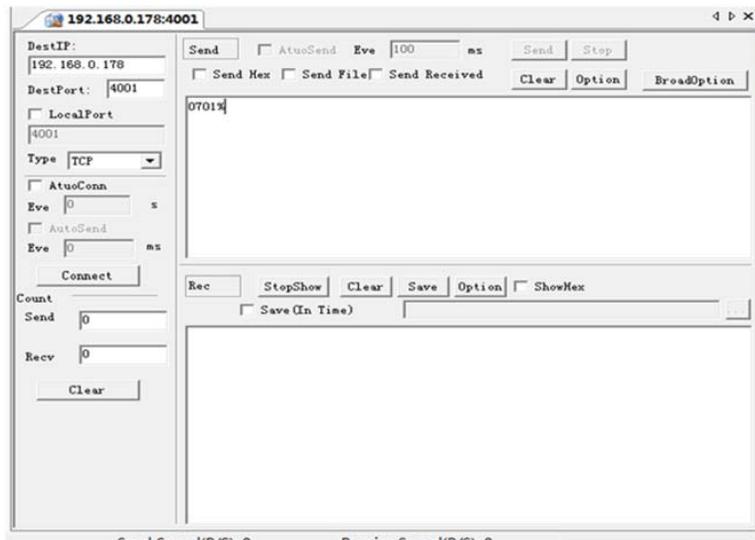
Figure 5: commands to control via TCP/IP

SAFETY OPERATION GUIDE/ TROUBLESHOOTING & MAINTENANCE

Safety Operation Guide

In order to guarantee the reliable operation of the equipment and safety of the staff, please abide by the following proceeding for installing, using and maintaining your MVID-MTX Matrix:

1) Unit must be properly grounded. Please do not use two blades electrical power plugs. Verify that the input power is from 100v to 240v AC and from 50Hz to 60Hz. The MVID-MTX will automatically switch to the right line voltage, as long as it falls within this range.

2) Do not install the switcher in a location where it will be too hot or too cold.

3) As the unit generates heat when running, it is necessary that the working environment is well ventilated, to prevent damage caused by overheating.

4) Turn the unit off at the main power switch in humid weather or when left unused for long periods of time.

5) Before removing the unit for servicing, ensure that the power cord is disconnected. When returning for servicing:

• Remove any cards that you have installed in the equipment.

• Reinstall any cards or other parts which you may have removed from of the equipment.

6) Do not attempt to service the MVID-MTX Matrix unit or any of the input our output cards yourself. There are no user-serviceable parts inside. Please DO NOT open the equipment case for any reason. In the case of damage or failure, return the unit to the factor for servicing.

7) Take proper precautions to ensure that no chemicals or other liquids are splashed on or around the equipment.

Troubleshooting & Maintenance

1) If the output image displayed in the destination device connected to the MVID-MTX matrix switcher has ghosting, first verify the display device's settings and the connecting cord. Low quality cords can cause ghosting, so always use a high quality connection cord.

2) If there is color loss or no video signal output, verify that the input and output connectors are connected tightly. Most video problems are interconnection problems, and not equipment problems.

3) If you cannot control the matrix switcher by computer through its COM port, verify the COM port number in the software and make sure the COM port is in properly connected to the unit.

4) If there is no output image when switching:

• Check for input signal with an oscilloscope or multi-meter. If there is no input signal, try replacing the cord, as it might be broken.

• Check for output signal with an oscilloscope or multi-meter. If there is no output signal, the output cord or its connections may be broken.

• Verify that the settings have been input correctly and that the device is connected to the correct output channel.

• If, after checking the above, there is still no image, it is possible that there is a problem with the switcher. Please send it to the dealer for fixing.

5) If the output image contains snow or interference, verify that the system is properly grounded.

6) If static "snow" in the image becomes stronger when connecting with HDMI connectors, it may be due to improper grounding of the power supply. Please verify that there is a good ground. A poor ground could cause damage to the switcher, shortening its normal life expectancy.

7) If the matrix switcher cannot be controlled by the front panel switches, RS-232 port or remote controller, the unit is probably damaged in some way. Please send it to the dealer for servicing.

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