



# VMX-16

Modular Matrix Switcher 16x16



## Operation Guide

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Version: VMX-16 V1.4

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## Federal Communications Commission Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the device.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and the receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received including interference that may cause undesired operation.

## Industry Canada Compliance Statement

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received including interference that may cause undesired operation.

Cet appareil est conforme avec Industrie Canada exempts de licence standard RSS (s). Son fonctionnement est soumis aux deux conditions suivantes:

1. Ce dispositif ne peut causer des interférences nuisibles.
2. Cet appareil doit accepter toute interférence reçue y compris des interférences qui peuvent provoquer un fonctionnement indésirable.



**Version: Modular Matrix  
Switcher**

## Safety Suggestions

**Read and Follow Instructions.** Read all safety and operating instructions before operating the unit.

**Retain Instructions.** Keep the safety and operating instructions for future reference.

**Heed Warnings.** Adhere to all warnings on the unit and in the operating instructions.

**Heat.** Keep the unit away from heat sources such as radiators, heat registers, stoves, etc., including amplifiers that produce heat.

**Power Sources.** Connect the unit only to a power supply of the type described in the operating instructions, or as marked on the unit.

**Power Cord Protection.** Route power supply cords so that they are not likely to be walked on or pinched by items placed on or against them, paying particular attention to the cord plugs at power receptacles and at the point at which they exit from the unit.

**Water and Moisture.** Do not use the unit near water—for example, near a sink, in a wet basement, near a swimming pool, near an open window, etc.

**Object and Liquid Entry.** Do not allow objects to fall or liquids to be spilled into the enclosure through openings.

**Servicing.** Do not attempt any service beyond that described in the operating instructions. Refer all other service needs to qualified service personnel.

**Damage Requiring Service.** The unit should be serviced by qualified service personnel when:

- The power supply cord or the plug has been damaged.
- Objects have fallen or liquid has been spilled into the unit.
- The unit has been exposed to rain.
- The unit does not appear to operate normally or exhibits a marked change in performance.
- The unit has been dropped or the enclosure has been damaged.

## Limited Warranty

RTI warrants new products for a period of three (3) years (excluding consumables such as rechargeable batteries which are warranted for one (1) year) from the date of purchase by the original purchaser (end user) directly from RTI / Pro Control (herein referred to as "RTI"), or an authorized RTI dealer.

Warranty claims may be initiated by an authorized RTI dealer using the original dated sales receipt or other proof of warranty coverage. In the absence of the receipt of purchase from the original dealer, RTI will provide warranty coverage extension of six (6) months from the date code of the product. Note: RTI warranty is limited to the provisions set forth in this policy and does not preclude any other warranties offered by third parties who are solely responsible for those other warranties.

Except as specified below, this warranty covers defects in product material and workmanship. The following are not covered by the warranty:

- Product purchased via unauthorized sellers or internet sites will not be serviced- regardless of purchase date.
- Damages caused by accident, misuse, abuse, neglect or acts of God.
- Cosmetic damage, including, but not limited to, scratches, dents and normal wear and tear.
- Failure to follow instructions contained in the Product Installation Guide.
- Damages due to products used in an application or environment other than that for which it was intended, improper installation procedures or adverse environmental factors such as incorrect line voltages, improper wiring, or insufficient ventilation.
- Repair or attempted repair by anyone other than RTI and Pro Control or authorized service partners.
- Failure to perform recommended periodic maintenance.
- Causes other than product defects, including lack of skill, competence or experience of user.
- Damage due to shipment of this product (claims must be made to the carrier).
- Altered unit or altered serial number: defaced, modified or removed.

RTI is also not liable for:

- Damages caused by its products or for failure of its products to perform, including any labor costs, lost profits, lost savings, incidental damages, or consequential damages.
- Damages based upon inconvenience, loss of use of the product, loss of time, interrupted operation, commercial loss, any claim made by a third party or made on behalf of a third party.
- Loss of, or damage to, data, computer systems or computer programs.

RTI's liability for any defective product is limited to repair or replacement of the product, at the sole discretion of RTI.

In cases where the warranty policy conflicts with local laws, the local laws will be adopted.

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# INTRODUCTION

## ABOUT VMX-16

The VMX-16 is a high-performance modular matrix HDMI switcher, delivering professional distribution of up to 16 video sources to 16 displays. Various input and output cards allow the switch to be customized to the exact needs of any project.

With its flexible design, VMX-16 is the perfect solution for signal switching and distribution in commercial multimedia applications, such as conference rooms, control rooms, hotels, or retail spaces.

The VMX-16 enables cross-point switching from any input to any output and supports high resolution video output up to 4K. The HDBaseT outputs deliver HDMI video over a Cat5e/Cat6 cable to an HDBaseT receiver up to 130 feet (40 meters) away.

The VMX-16 can be controlled via RS-232, Ethernet or via the front panel buttons.

## FEATURES

- Provides routing of up to 16 video sources to 16 displays / projectors.
- Optional input cards for HDMI, HDBaseT, DVI, VGA or SDI available.
- Optional output cards for HDMI, HDBaseT or VGA available
- HDCP 1.2 or 1.4 compliant, supporting HDMI 1.3/1.4. (Depending on card used).
- Powerful EDID management.
- HDBaseT outputs transmit a 1080p video signal up to 230 feet (70m) or 4K up to 130ft (40m) over a Cat5E/6 cable. (Depending on card used).
- Supports multiple control methods, including front panel, RS232, and TCP/IP.
- LCD indicator shows connection status, switching status, HDCP status, and output resolution.
- Easy installation with rack-mount design.

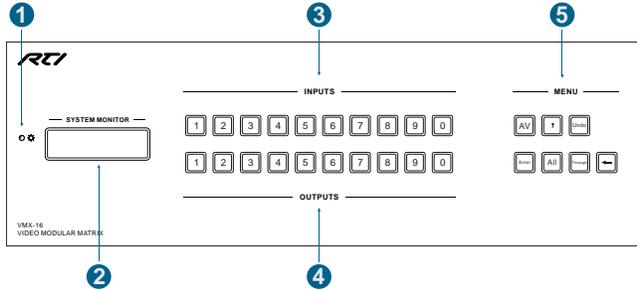
## PACKAGE LIST

- 1 x VMX-16
- 1 x Power cord
- 1 x RS-232 cable
- 4 x Plastic cushions
- 1 x Reference Guide

**Note:** Please contact your distributor immediately if any damage or defects in the components is found.

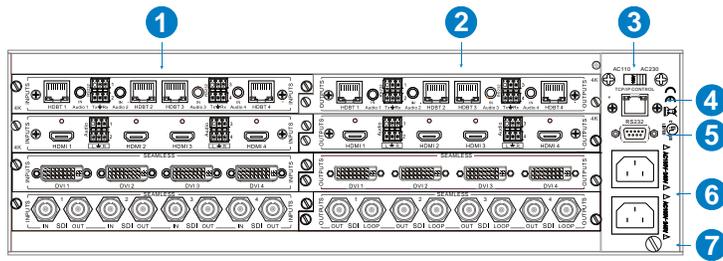
# PANEL DESCRIPTION

## FRONT PANEL



No.	Name	Description
1	Power LED	Illuminates red when powered on
2	LCD screen	Display real-time operation status
3	INPUTS	Back-lit buttons for input selection, ranges from 0~ 9, 16 selectable channels in total.
4	OUTPUTS	Back-lit buttons for output selection, ranges from 0 ~ 9, 16 selectable channels in total.
5	MENU	<b>AV:</b> transfer video and audio signal synchronously
		,: division button, to divide the output channels when switching to more than one channel.
		<b>UNDO:</b> Undo button, to resume to the status before the command just performed.
		<b>ENTER:</b> confirm switching operation. Operation will not be executed by the matrix without confirmation.
		<b>ALL:</b> select all input/output channel
		<b>THROUGH:</b> To transfer the signals directly to the corresponding output channels.
		<b>←:</b> Backspace button, to backspace the last press.

## REAR PANEL



No.	Name	Description
1	INPUTS	Input signal card slots, 4 in total. IMPORTANT NOTE: Please remove power cord before installing signal cards.
2	OUTPUTS	Output signal card slots, 4 in total. IMPORTANT NOTE: Please remove power cord before installing signal cards.
3	Power Switch	Switch between AC110V and AC230V to access different power.
4	TCP/IP	Used for TCP/IP control, connect to Ethernet network.
5	RS232	Serial control port, connect with RS232 port of control device.
6	Power ports	Connect main alternating current power to one of the ports. The second port is an optional connection for redundant power (backup power supply in case primary power source is lost).
7	GND connector	Used for system grounding.

**Note:** There are 4 input and 4 output slots for VMX-16, and the input/output cards can be changed based on your needs.

## INPUT/OUTPUT CARDS

The VMX-16 supports expansion through various changeable input/output cards of different signals including DVI, HDMI, VGA, HDBaseT, SDI etc. Here is a brief introduction to the changeable cards.

Model	Description
<b>Input Cards</b>	
VMX-IM1	1080p seamless HDMI input card with 4 HDMI and 4 external L+R audio ports.
VMX-ID1	1080p seamless DVI input card with 4 DVI ports.
VMX-IV1	1080p VGA input card with 4 VGA and 4 external L+R audio ports.
VMX-IS1	1080p seamless SDI input card with 4 SDI input and 4 loop output ports.
VMX-IM4	4K HDMI input card with 4 HDMI, and 4 external L+R audio ports.
VMX-IT4	4K HDBaseT input card with 4 HDBT, 4 RS232 and 4 external stereo audio ports.
VMX-IT1	1080p HDBaseT input card with 4 HDBT, 4 RS232 and 4 external stereo audio ports.
<b>Output Cards</b>	
VMX-OM1	1080p seamless HDMI output card with 4 HDMI and 4 external L+R audio ports.
VMX-OM4	4K HDMI output card with 4 HDMI and 4 external L+R audio ports.
VMX-OT1	1080p HDBaseT output card with 4 HDBT, 4 RS232 and 4 external stereo audio ports.
VMX-OT4	4K HDBaseT output card with 4 HDBT, 4 RS232 and 4 external stereo audio ports.
VMX-OV1	1080p seamless VGA output card with 4 VGA and 4 external L+R audio ports.

## VMX-ID1

Seamless DVI input signal card.

It is fully compatible with HDMI1.3& HDCP, and supports seamless transmission for high-definition DVI, HDMI, VGA, AV, YPbPr signals. Signal format can be modified via RS232 commands.

It boasts embedded EDID management (only for HDMI/ DVI signal), supporting DDC.

**VMX-ID1:** seamless input card, maximum four input signal. It can automatically identify the format of input signal. Input signal can pass to output device through DVI signal output card.



**Note:** When connecting to VGA, YPbPr or C-VIDEO signal, insert converting cables according to specific pin definitions (see the figures below):

### DVI- C-VIDEO:



Pin	Signal
C1	Yellow
C5	GND
Other pins are unused.	

### DVI- YPbPr:



Pin	Signal	Pin	Signal
C1	RED	C2	GREEN
C3	BLUE	C5	GND
Other pins are unused.			

### DVI- VGA (female):



Pin	Signal	Pin	Signal
C1	RED	C2	GND
C3	GREEN	C4	Horizontal Sync Analog
8	Vertical Sync Analog		
Other pins are unused.			

### VMX-IM1 & VMX-OM1

Seamless HDMI signal card with auxiliary audio port. Provides real-time audio & video switching; support HDMI1.3 & HDCP1.2, compliant with DVI signal;

HDMI embedded audio and auxiliary stereo audio supports PCM format, audio source selectable via designed command (default: HDMI embedded audio);

Built in scaler handles various resolution, output resolution adjustable via command.

**VMX-IM1:** input card, maximum four input signal. Input signal can pass to output device through VMX-OM1, or other kinds of output cards.



**VMX-OM1:** output card, maximum four output signal, output signals from VMX-IM1, or other kinds of input cards.



**Note:** When VMX-OM1 works with input cards except VMX-IM1, to ensure reliable seamless output, adjust all the input signals to the same designed resolution: 1024x768, 1280x720, 1600x1200, 1920x1080, or 1920x1200.

### VMX-IM4 & VMX-OM4

4K HDMI signal card.

Supports HDMI 1.4a & HDCP 1.4 compliance; Compatible with DVI signal; Support high-definition HDMI source up to 4kx2k, 1080p 3D compliance; It also boasts embedded EDID management.

Provide auxiliary audio port as supplement to HDMI embedded audio, audio source selectable via command "AUDIO[X][Z].", [X] stands for output port, [Z] stands for audio source (0 is for HDMI embedded audio, 1 is for analog audio)

**VMX-IM4:** input card, maximum four input signal. Input signal can pass to output device through VMX-OM4, or other kinds of output cards.

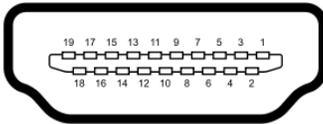


**Note:** When matching with output cards that do not support 4kx2k, adjust the input resolution to 1080p to enable reliable output.

**VMX-OM4:** output card, maximum four output signal, output signals from VMX-IM4, or other kinds of input cards, HDCP compliant status settable via RS232 command



Pin layout of the HDMI connectors (female).



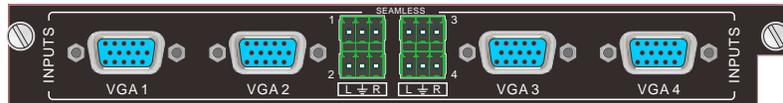
No.	Signal	No.	Signal
1	TMDS Data 2+	20	SHELL
2	TMDS Data 2 Shield	19	Hot Plug Detect
3	TMDS Data 2-	18	+5V Power
4	TMDS Data 1+	17	Ground
5	TMDS Data 1 Shield	16	DDC Data
6	TMDS Data 1-	15	DDC Clock
7	TMDS Data 0+	14	No Connect
8	TMDS Data 0 Shield	13	CEC
9	TMDS Data 0-	12	TMDS Clock-
10	TMDS Clock+	11	TMDS Clock Shield

### VMX-IV1

VGA signal card.

Scale all inputs to 1080p or 1920x1200; Supports VGA (RGBHV) output; 4 stereo audio inputs.

**VMX-IV1:** input card, maximum four VGA inputs and four stereo audio inputs. Input signal can pass to output device through any kinds of output cards.



### VMX-OV1

Seamless VGA signal output card.

The output resolution can be selected by RS232 commands. 4 stereo audio inputs.

**VMX-OV1:** input card, maximum four VGA inputs and four stereo audio inputs. Input signal can pass to output device through any kinds of output cards.

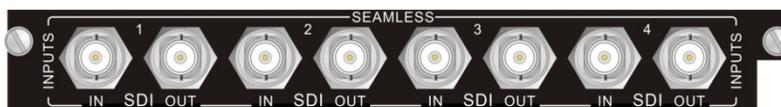


### VMX-IS1

Seamless SDI signal card

It is compatible with different SDI signal formats, including SD/HD/3G-SDI (adaptive), support seamless transmission for high-definition signal up to 1080p. Auto-detect input resolution and scale to 1080p@60Hz (default resolution, adjustable via command). Every port has loop output for local monitoring.

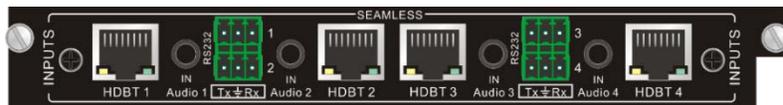
**VMX-IS1:** input card, maximum four input signal. Input signal can pass to output device through SDI signal output card.



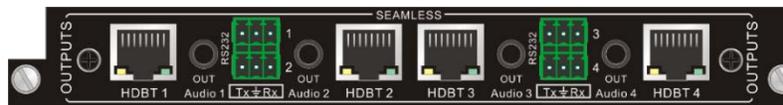
## VMX-IT1 & VMX-OT1

Seamless 1080p Twisted pair card; Support 1080p@60Hz., compatible with HDMI1.4 and HDCP1.4; Extend HDBT signal up to 70m at 1080p; Bi-directional RS232 transmission on single cable; Audio source selectable via corresponding command; Auxiliary audio ports support stereo signal. It also boasts embedded EDID management.

**VMX-IT1:** input card, maximum input four HDBT signal. Input signal can pass to output device through VMX-OT1, or other kinds of output cards, need to work with HDBT transmitters.



**VMX-OT1:** output card, maximum output four HDBT signal, output signals from VMX-IT1, or other kinds of input cards, need to work with HDBT receivers.

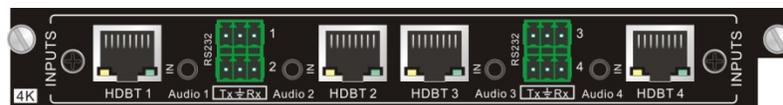


## VMX-IT4 & VMX-OT4

4K HDBaseT card

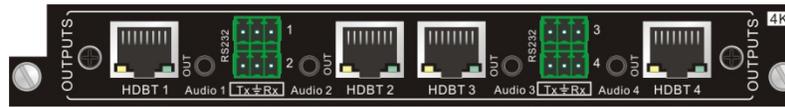
Supports HDTV, compatible with HDBT 1.0, HDMI1.4a & HDCP1.4; Wide resolution range from 480p~4kx2k, 1080p 3D compliant; Extend HDBT signal up to 70m at 1080p or 40m at 4k; Bi-directional RS232 transmission on single cable; Audio source selectable via corresponding command; Auxiliary audio ports support stereo signal. It also boasts embedded EDID management.

**VMX-IT4:** input card, maximum input four HDBT signal. Input signal can pass to output device through VMX-OT4, or other kinds of output cards, need to work with HDBT transmitters.



**Note:** When matching with output cards that do not support 4kx2k, adjust the input resolution to 1080p to enable reliable output.

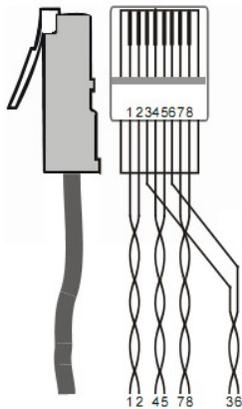
**VMX-OT4:** output card, maximum output four HDBT signal, output signals from VMX-IT4, or other kinds of input cards, need to work with HDBT receivers.



**How the indicators work:**

Color	Definition	Status
Yellow	Power Indicator	Blink once powered on; Turn off when there is no power.
Green	Link Indicator	Light when the port is connected with CAT5e/6; Turn off when there is no connection.

Pin layout of the HDBT connector:



Pin	Color
1	orange white
2	orange
3	green white
4	blue
5	blue white
6	green
7	brown white
8	brown

1st Group	4--5
2nd Group	1--2
3rd Group	3--6
4th Group	7--8

**Note:** Cable connectors MUST be metal one, and the shielded layer of cable MUST be connected to the connector's metal shell, to well share the grounding.

# SYSTEM CONNECTION

## USAGE PRECAUTIONS

- System should be installed in a clean environment and has a prop temperature and humidity.
- All of the power switches, plugs, sockets and power cords should be insulated and safe.
- All devices should be connected before power on.

## CONNECTION DIAGRAM

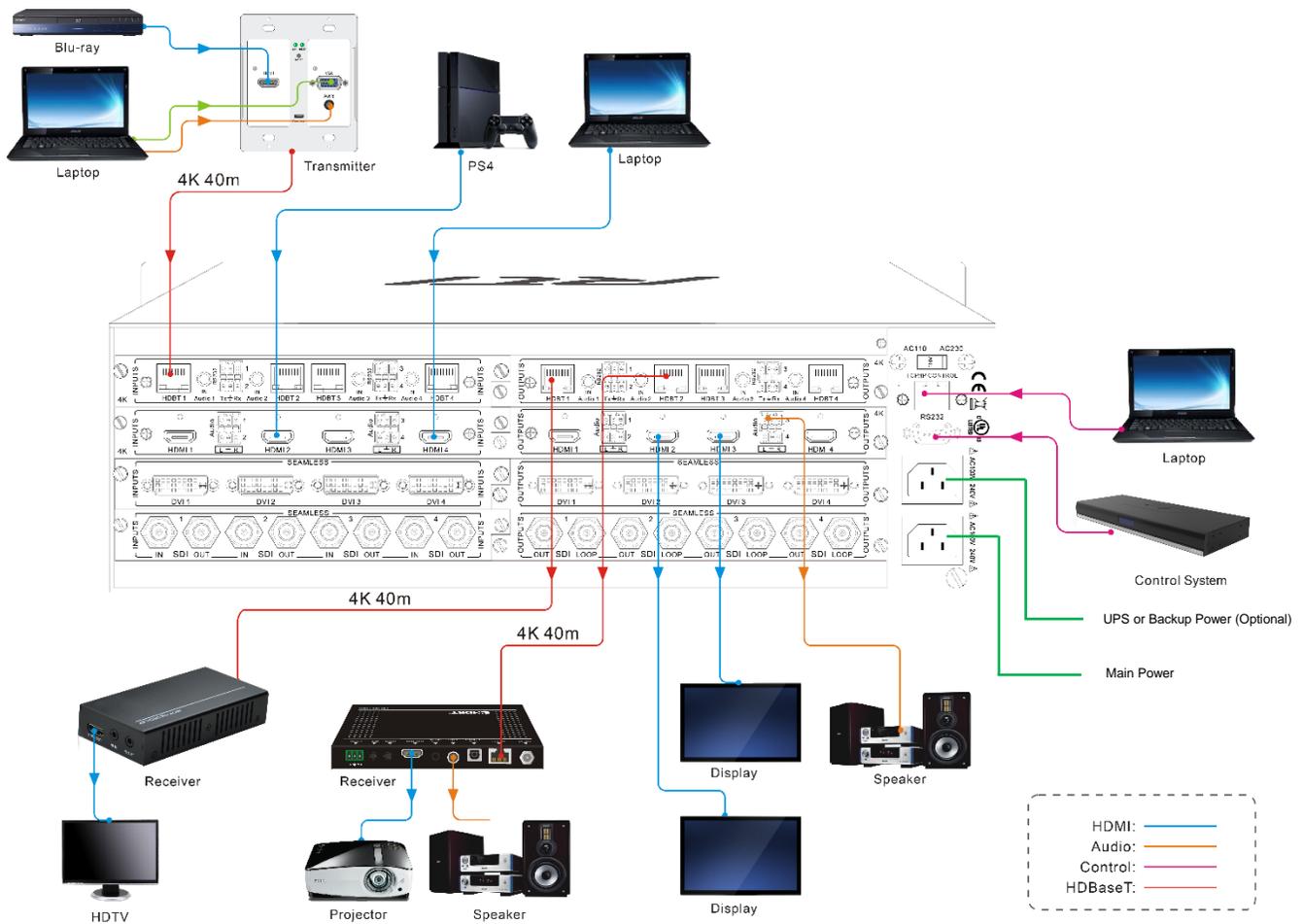


FIGURE 3-1 SYSTEM DIAGRAM

**Note:** All input/output signal cards don't support hot-plug.

# CONTROL OPERATIONS

## FRONT PANEL BUTTON CONTROL

Users can control VMX-16 directly with its front panel buttons. To switch AV signal, please operate the buttons under the following format:

Format: **“Input Channel” + “AV” + “Output Channel” + “Enter”**

**Note:**

- “Input Channel”: Fill with the number of input channel to be controlled,
- “Output Channel”: Fill with the number of output channels to be controlled. Press “All” to select all the outputs.
- Use “,” button to separate multiple I/O channels, and press “ENTER” button to confirm the operation.
- The input/output channels on the rear panel are counting from left to right, top to bottom.
- The input delay time between two numbers of every input& output channel must be less than 5 seconds; otherwise the operation will be cancelled.

Example:

1. To transfer input 1 to output 11, press input “1”, output “1” “1” and “Enter”.
2. To transfer signals from input 1 to all output channels, press buttons in this order: “1”, “All”.

**Other Functional Buttons:**

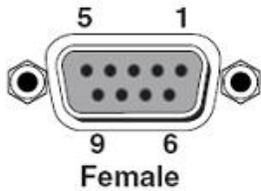
Buttons	Description	Operation
<b>UNDO</b>	Return to the previous status	Status 1: Input 6 -> output 6  Press input “6” + “AV” + output 4 to change the connection. Press “Undo” to return to Status 1.
←	Backspace the last operation	If you press buttons “1”, “AV”, “2”, “←” in order, then “2” will be canceled.
<b>THROUGH</b>	Get straight I/O connection, e.g. input 1-> output 1, input 2-> output 2.	Format: “Input Channel” + ”Through”  If you press buttons “ALL”, “THROUGH” in order, then the result will be like input 1→ output 1, input 2→output 2, input 3→output 3 ... input 16→output 16.

## RS-232 CONTROL

### CONNECTION OF RS-232 COMMUNICATION PORT

VMX-16 can be controlled by a control system via the RS-232 communication port.

This RS-232 communication port is a female 9-D connector. The definition of its pin layout is shown in 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

When VMX-16 connects to the RS232 port of a computer with control software, users can control it by that computer. To control the switcher, users need to use RS232 control software.

## RS-232 COMMUNICATION COMMANDS

To control the VMX-16 using serial communication from a control system, wire the RS-232 output of the control system to the RS-232 DB9 connector. Visit the [rticorp.com](http://rticorp.com) dealer website to access the driver store and follow the instructions for installation.

**Note:**

- Please disconnect all the cables before sending command “**EDIDUpgrade[X]**”.
- End the commands with the ending symbols “.” or “;”.
- Type the command carefully, it is case-sensitive.
- Commands pertaining to EDID only avails for signal cards that support EDID management.
- VMX-16 has 6 built-in EDID data, the chart below illustrates the detailed information:

No.	Detailed Information
1	1080p 2D 5.1CH
2	1080p 2D 2.0CH
3	720p 2D 5.1CH
4	720p 2D 2.0CH
5	4kx2k 2D 5.1CH
6	4kx2k 2D 2.0CH

Update in-built EDID data by sending command **UpgradeIntEDID[x]**..

**Communication protocol:** Baud rate: 9600; Data bit: 8; Stop bit: 1; Parity bit: none.

## SYSTEM COMMANDS

Command	Function	Feedback Example
/*Type;	Report system model	VMX-16
/^Version;	Report firmware version	Vx.x.x

/:MessageOff;	Disable feedback message	Closed The Message Return.
/:MessageOn;	Enable feedback message (Default)	Enabled The Message Return.
Undo.	Cancel the previous operation	Undo
Demo.	Switch to testing mode, switch AV 1>1, 2>2 and so on.	Demo Mode AV: 01->001 ... ..
/V00.	Report hardware version	Vx.x.x
%0911.	Restore factory default. All I/O connection will be restored to straight through: 1->1, 2->2,...; saved operation status will remain the same.	

LOCK/UNLOCK COMMANDS

Command	Function	Feedback Example
/%Lock;	Lock front panel button	System Locked!
/%Unlock;	Unlock front panel button (Default)	System Unlock!

SWITCHING COMMANDS

Command	Function	Feedback Example
[x]All.	Switch input [X] AV to all output	[X] To All
All#.	Switch all input signal to the corresponding output channel	All Through
All\$.	Switch off all output	All Closed.
[x]#.	Switch input [X] to output [X]	[X] Through
[x]\$.	Turn off output [X]	AV: [X] Closed.
All@.	Turn on all output	All Open.
[x]@.	Turn on output [X]	[X] Open.
[X]V[Y1] [Y2].	Switch input [X] only video to output [Y1] (and all target output in [Y2] and so on).	V: [X]-> [Y1] [Y2]...

[X]A[Y1] [Y2].	Switch input [X] only audio to output [Y1](and all target output in [Y2] and so on)	A: [X]-> [Y1] [Y2]...
[X]B[Y1] [Y2].	Switch input [X] AV signal to output [Y1](and all target output in [Y2] and so on)	AV: [X]-> [Y1] [Y2]...
Status[Y].	Report the input channel on output [Y]	V: [X]-> [Y] A: [X]-> [Y]
Status.	Report the input channel on output channel one by one	V: [X]-> [Y] A: [X]-> [Y] ...
PWON.	Power on the system	PWON
PWOFF.	Turn the system to standby mode	PWOFF

SCENE COMMANDS

Command	Function	Feedback Example
Save[Y].	Store the current status to present [Y]. [Y] ranges from 1 to 9	Save To F[Y]
Recall[Y].	Recall present [Y]	Recall From F[Y]
Clear[Y].	Clear the present [Y]	Clear F[Y]

HDCP COMPLIANCE

Command	Function	Feedback Example
HDCPON.	Turn on HDCP output.	HDCPON
HDCPOFF.	Turn off HDCP output.	HDCPOFF

EDID CONFIGURATION

Command	Function	Feedback Example
UpgradeIntEDID[X].	Upgrade built-in EDID data. When the command applied, system prompts to upload the EDID file (.bin). [X] ranges 1 - 6	Prompt to upload EDID file ..... Upload EDID to system completed

EDIDUpgrade[X].	Upgrade the EDID data of the input port [X]. When the command applied, system prompts to upload the EDID file (.bin). Operation will be cancelled in 10 seconds	Prompt to upload EDID file ..... Upload EDID to input card completed
EDID/[X]/[Y].	Set the built-in EDID data type [Y] to input port [X]	Set system EDID[Y] to input [X]
EDIDG[X].	Get the EDID data from output port [X] and display on serial port	
EDIDMInit.	Reset all input card EDID to all input card	EDIDMInit
EDIDM[Y]B[X].	Set the EDID data of output [Y] on input [X]	EDIDM2B1

## TCP/IP CONTROL

To control the VMX-8 using TCP/IP protocol from an RTI control system or PC, wire the Ethernet port of VMX-8 to the Ethernet Network. Visit the [rticorp.com](http://rticorp.com) dealer website to access the driver store and follow the instructions for installation.

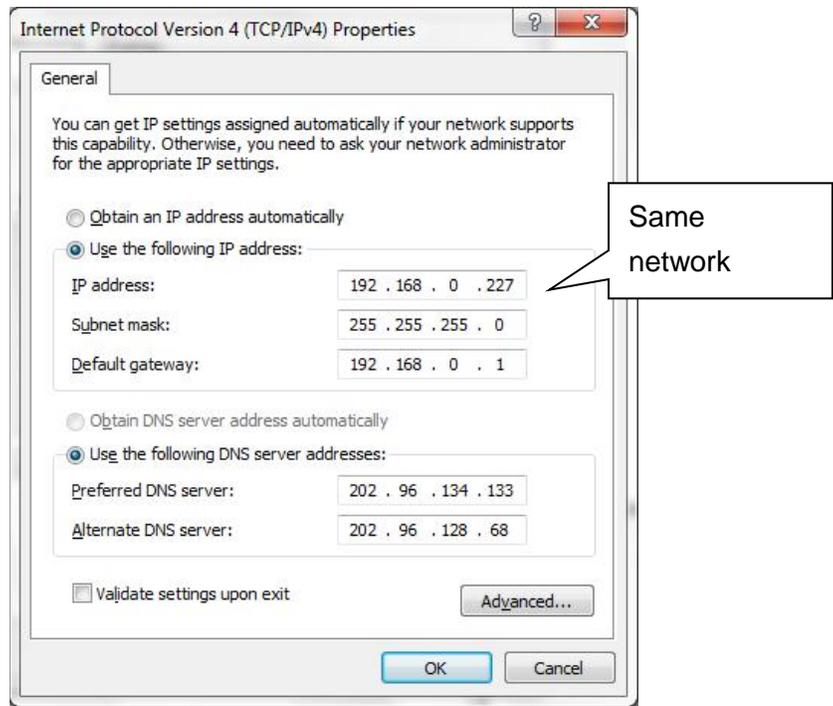
## IP SETTINGS

TCP/IP default settings: IP is 192.168.0.178, Gateway is 192.168.0.1, and Serial Port is 4001. IP & Gateway can be changed as you need, Serial Port cannot be changed.

**NOTE:** Network settings may also be adjusted using the web interface (see Web Interface section)

- **Controlled by Single PC**

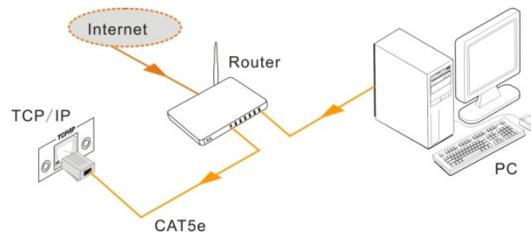
Connect a computer to the TCP/IP port of the VMX-16, and set its network segment to the same as the default IP of the VMX-16 (192.168.0.178).



- **Controlled by PC(s) in LAN**

The VMX-16 can be connected to a router to allow control via the LAN. The VMX-16's network segment must be the same with the router. Connect as the following figure for LAN control.

**NOTE:** Network settings may also be adjusted using the web interface (see Web Interface section)

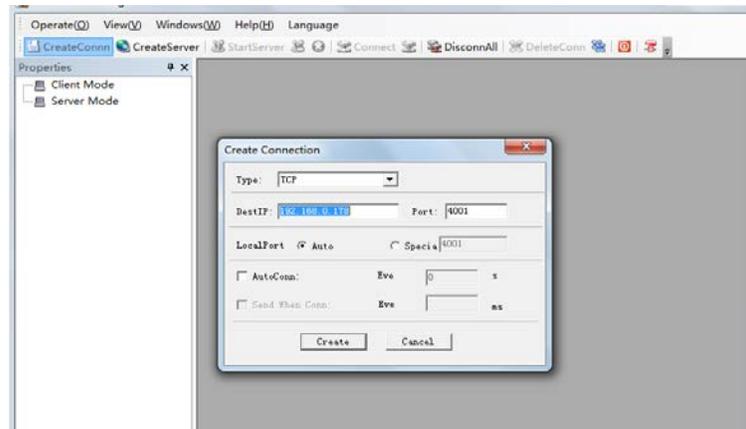


- Step1.** Connect the TCP/IP port of the VMX-16 to Ethernet port of PC with twisted pair.
- Step2.** Set the PC's network segment to the same as the VMX-16. Remember the PC's original network segment.
- Step3.** Set the VMX-16's network segment to the same as the router.
- Step4.** Set the PC's network segment to the original one.
- Step5.** Connect the VMX-16 and PC(s) to the router. In the same LAN, each PC is able to control the VMX-16 asynchronously via a TCP/IP communication software.

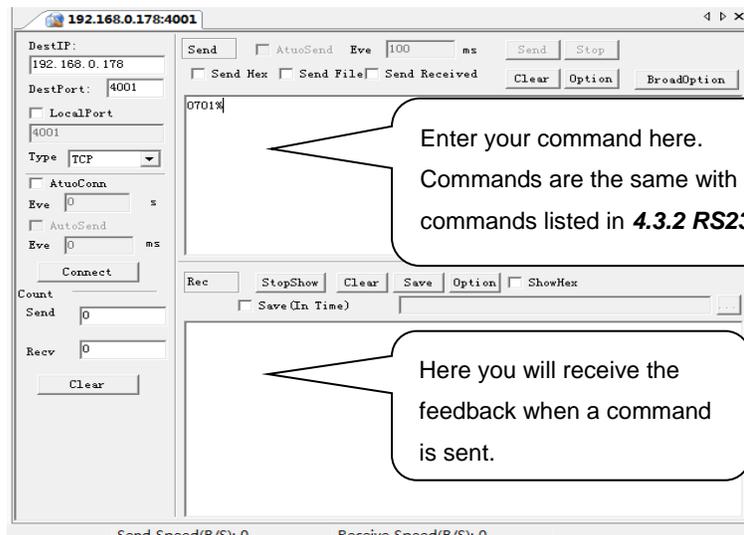
## CONTROL VMX-16 VIA TCP/IP COMMUNICATION SOFTWARE

(Exemplified by TCPUDP software)

- 1) Connect a computer and VMX-16 to the same network. Open the TCPUDP software (or any other TCP/IP communication software) and create a connection, enter the IP address and port of VMX-16 (default IP: 192.168.0.178, port:4001):



- 2) After connect successfully, we can enter commands to control the VMX-16, as below:



- 3)

## WEB INTERFACE

Type the designed website 192.168.0.178:100 in your browser. Enter correct username and password to log in the WebServer:

**Username:** admin; **Password:** admin

Here is the main configuration interface of the WebServer:



### In this interface, you can:

- Change website display language
- Modify network settings: Go to Internet Settings -> WAN
- Upgrade TCP/IP module: Go to Administration -> Upload Program -> Select program file -> Start upgrading  
Reboot the device after upgrading.

# SPECIFICATION

## MAIN UNIT

<b>Control parts</b>	
Serial control port	RS-232, 9- female D connector
Configurations	2 = TX, 3 = RX, 5 = GND
Installation	Rack Mountable
Front panel control	Buttons
Options	TCP/IP control
<b>General</b>	
Power supply	100VAC ~ 240VAC, 50/60Hz
Power consumption	84W (Max)
Temperature	-10 ~ +40°C
Humidity	10% ~ 90%
Dimension (W*H*D)	483 x 133x 320mm (3U high)
Net Weight	3.5Kg

## SIGNAL CARDS

### VMX-ID1

<b>VMX-ID1</b>	
Input	4 DVI
Input Connector	Female DB24+5/HDMI
Input Level	T.M.D.S. 2.9V~3.3V
Input Impedance	75Ω
<b>General</b>	

Gain	0 dB
Bandwidth	340 MHz (10.2 Gbit/s)
Video Signal	DVI,HDMI,VGA,C-VIDEO,YPbPr
Switching Speed	200ns (Max.)
Max Time-delay	5nS ( $\pm 1nS$ )
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

## VMX-IM1 & VMX-OM1

<b>VMX-IM1</b>	
Input	4 HDMI 4 Analog Audio
Input Connector	19-pin Type-A Female 3-pin pluggable terminal block
Power Consumption	8W
Color Depth	8, 10, 12 bit
<b>VMX-OM1</b>	
Output	4 HDMI 4 Analog Audio
Output Connector	19-pin Type-A Female 3-pin pluggable terminal block
Power Consumption	12W
Color Depth	8 bit
<b>General</b>	
Video Signal	HDMI, DVI
Audio Signal	PCM
Bandwidth	6.75 Gbps
Standards	HDMI1.3& HDCP1.2
Work Temperature	0~50°C
Relative Humidity	10%~90%
EDID and DDC	Supports Extended Display Identification Data (EDID) and Display Data Channel (DDC) data

### VMX-IV1

<b>Video</b>	
Input	4 VGA
Input Connector	Female 15 pin HD
Input Level	0.5 ~ 2.0Vp-p
Input Impedance	75Ω
<b>Audio</b>	
Input	4 Stereo Audio
Input Connector	3-pin Pluggable Terminal Block
CMRR	>90dB @20Hz ~ 20KHz
Input Impedance	>10KΩ
<b>General</b>	
Gain	0 dB
Bandwidth	YPbPr:170MHz; C-video:150MHz; VGA:170MHz
Video Signal	VGA (RGBHV), YPbPr, S-video, C-video& CVBS
Switching Speed	200ns (Max.)
Crosstalk	<-50dB@5MHz

### VMX-IS1

<b>Input</b>	
Input	4 SDI
Input Connector	Female BNC
<b>Output</b>	

Output	4 SDI
Output Connector	Female BNC
<b>General</b>	
Audio Signal	SDI, HD-SDI, 3G-SDI
Color Depth	8, 10, 12 bit
Transmission Distance	1080p ≤ 100M
Max Resolution	1080p
Bandwidth	6.75Gbps
Power Consumption	8.7W
Work Temperature	0~50°C
Relative Humidity	10%~90%

### VMX-IM4 & VMX-OM4

<b>VMX-IM4</b>	
<b>Video Input</b>	
Input	4 HDMI
Input Connector	Female HDMI
Min.~Max. Level	T.M.D.S. 2.9V~3.3V
Input Impedance	100Ω (Differential)
<b>Audio Input</b>	
Input	4 Analog
Input Connector	3.5mm pluggable terminal block
Input Impedance	75Ω
Frequency Response	20Hz~20K Hz
<b>VMX-OM4</b>	

<b>Video Output</b>	
Output	4 HDMI
Output Connector	Female HDMI
Min.~Max. Level	T.M.D.S. 2.9V~3.3V
Output Impedance	100Ω (Differential)
<b>Audio Output</b>	
Output	4 Stereo
Output Connector	3.5mm Stereo audio connector
Output Impedance	75Ω
Frequency Response	20Hz~20K Hz
<b>General</b>	
Gain	0dB
Max Resolution	4Kx2K
Transmission Distance	1080P≤70m; 4Kx2K ≤ 40m
Switching Speed	200ns (Max.)
Work Temperature	0~50°C
Relative Humidity	10%~90%
SNR	>70dB@ 100MHz-100M
Return Loss	<-30dB@ 5KHz
Supported Audio Format	Embedded HDMI audio: PCM, Dobby Digital, DTS, DTS-HD Analog audio: PCM
HDMI Standard	Support HDMI1.4& DVI1.0
EDID& HDCP Management	Compliant with HDCP 1.4; Support manual EDID management

VMX-IT4 & VMX-OT4

<b>VMX-IT4</b>	
<b>Video Input</b>	
Input	4 HDBT
Input Connector	4 Female RJ45 (with dual-color indicator)
Min.~Max. Level	T.M.D.S 2.9V~3.3V
Input Impedance	100Ω (Differential)
<b>Audio Input</b>	
Input	4 Stereo
Input Connector	3.5mm Stereo audio connector
Input Impedance	75Ω
Frequency Response	20Hz~20K Hz
<b>VMX-OT4</b>	
<b>Video Output</b>	
Output	4 HDBT
Output Connector	4 Female RJ45 (with dual-color indicator)
Min.~Max. Level	T.M.D.S 2.9V~3.3V
Output Impedance	100Ω (Differential)
<b>Audio Output</b>	
Output	4 Stereo
Output Connector	3.5mm Stereo audio connector
Output Impedance	75Ω
Frequency Response	20Hz~20K Hz
<b>Control Part</b>	
Control Signal	4 RS232

Control Connector	3-pin pluggable terminal block
Protocol	TCP/IP
<b>General</b>	
Gain	0dB
Bandwidth	10.2Gbps
Max Resolution	4Kx2K
Crosstalk	<-50dB@5MHz
Transmission Distance	1080P≤70m; 4Kx2K ≤ 40m
Switching Speed	200ns (Max.)
Work Temperature	0~50°C
Relative Humidity	10%~90%
Supported Audio Format	Embedded HDMI audio: PCM, Dobby Digital, DTS, DTS-HD Analog audio: PCM
HDMI Standard	Support HDMI1.4a
HDMI Version	1.4
HDCP Version	1.4
EDID Management	Manual EDID management

VMX-IT1 & VMX-OT1

<b>VMX-IT1</b>	
<b>Video Inputs</b>	
Input	4 HDBT
Input Connector	4 Female RJ45 (with dual-color indicator)
Min.~Max. Level	T.M.D.S 2.9V~3.3V
Input Impedance	100Ω (Differential)

<b>Audio Input</b>	
Input	4 Stereo
Input Connector	3.5mm Stereo audio connector
Input Impedance	75Ω
Frequency Response	20Hz~20K Hz
<b>VMX-OT1</b>	
<b>Video Output</b>	
Output	4 HDBT
Output Connector	4 Female RJ45 (with dual-color indicator)
Min.~Max. Level	T.M.D.S 2.9V~3.3V
Output Impedance	100Ω (Differential)
<b>Audio Output</b>	
Output	4 Stereo
Output Connector	3.5mm Stereo audio connector
Output Impedance	75Ω
Frequency Response	20Hz~20K Hz
<b>Control Part</b>	
Control Signal	4 RS232
Control Connector	3-pin pluggable terminal block
Protocol	TCP/IP
<b>General</b>	
Gain	0dB
Bandwidth	10.2Gbps
Max Resolution	4Kx2K
Crosstalk	<-50dB@5MHz

Transmission Distance	1080p≤70m
Switching Speed	200ns (Max.)
Work Temperature	0~50°C
Relative Humidity	10%~90%
Supported Audio Format	Embedded HDMI audio: PCM, Dobby Digital, DTS, DTS-HD Analog audio: PCM
HDMI Version	1.4
HDCP Version	1.4
EDID Management	Manual EDID management

## TROUBLESHOOTING & MAINTENANCE

Problems	Potential Causes	Solutions
Output image with ghost	Bad quality of the connecting cable	Try another high quality cable
	Improprate image setting of the displayer	Adjust corresponding image settings
Output image with color losing or no video signal output	Fail connection	Reconnect the display and the matrix
No output image when switching	No signal at the input / output end	Check with oscilloscope or multimeter if there is any signal at the input/ output end.
	Failed or loose connection	Make sure the connection is good
	The switcher is broken	Send it to authorized dealer for repair.
<b>POWER</b> indicator doesn't work or no respond to any operation	Failed connection of power cord.	Make sure the power cord connection is good.
EDID management does not work normally	The HDMI cable is broken at the output end.	Change for another HDMI cable which is in good working condition.
There is a blank screen on the display when switching	The display does not support the resolution of the video source.	Switch again.
		Manage the EDID data manually to make the resolution of the video source automatically compliant with the output resolution.
Static becomes stronger when connecting the video connectors	Bad grounding	Check the grounding and make sure it is connected well.

Cannot control the device by control device (e.g. a PC) through RS232 port	Wrong RS232 communication parameters	Type in correct RS232 communication parameters.
	Broken RS232 port	Send it to authorized dealer for checking.
Cannot control the device by front panel buttons while can control it through RS232 port	The front panel buttons are locked	Send command <b>!%Unlock;</b> to unlock the front panel buttons.

If your problem persists after following the above troubleshooting steps, seek further help from an authorized dealer or our technical support.

## CONTACTING RTI

For news about the latest updates, new product information, and new accessories, please visit our web site at:

[www.rticorp.com](http://www.rticorp.com)

For general information, you can contact RTI at:

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5775 12th Ave. E Suite 180

Shakopee, MN 55379

Tel. (952) 253-3100

Fax (952) 253-3131

[info@rticorp.com](mailto:info@rticorp.com)

## SERVICE & SUPPORT

If you are encountering any problems or have a question about your RTI product, please contact RTI Technical Support for assistance (see the Contacting RTI section of this guide for contact details).

RTI provides technical support by telephone or e-mail. For the highest quality service, please have the following information ready, or provide it in your fax or e-mail.

- Your Name
- Company Name
- Telephone Number
- E-mail Address
- Product model and serial number (if applicable)

If you are having a problem with hardware, please note the equipment in your system, a description of the problem, and any troubleshooting you have already tried.

Please do not return products to RTI without a return authorization.



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