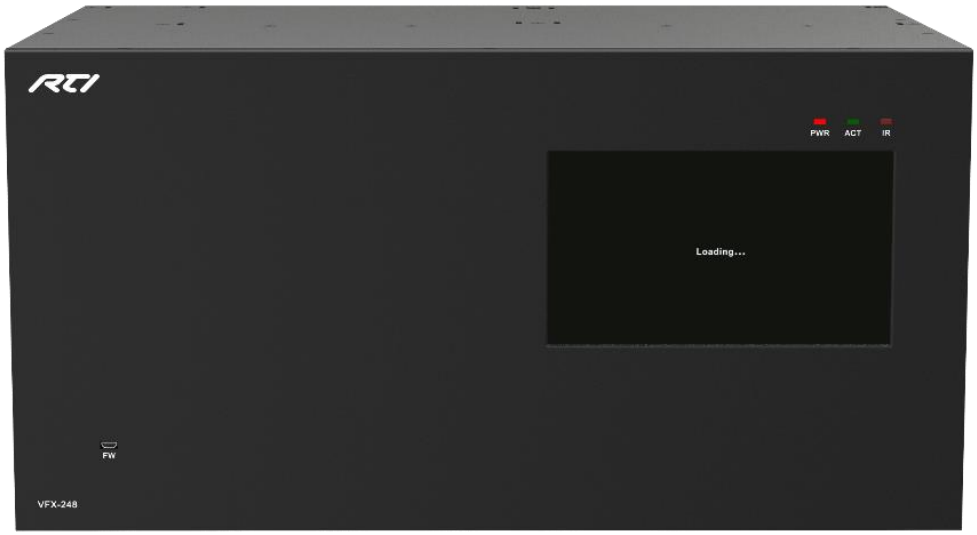
VFX-248

32 Card Modular Flexible Video Matrix Chassis



Version: VFX-248_2017V1.0

Trademarks

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:
VFX-248_2017V1.0

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 warrantied 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

INTRODUCTION TO VFX-248

The VFX-248 is a high-performance seamlessly AV modular matrix switcher providing 24 flexible PCIE slots for single HDMI/HDBaseT/VGA input/ output cards and 8 fixed slots for output signal cards.

With its advanced modularization design, Freedom combination of single HDBaseT/HDMI/VGA input/output card can make up different kinds of matrix. All the signal cards support plug-and-play. It supports different video signals with seamless cross switching. Every video or audio signal is transmitted and switched independently to decrease signal attenuation. The switcher can handle all the audiovisual management, including the switching, driving, scaling etc.

FEATURES

- 24 card slots for flexible input/ output combination, and 8 slots for output signal cards.
- Comprehensive signal card compatibility: HDMI/HDBaseT/VGA.
- Automatically recognize input/ output signal card.
- Powerful EDID management.
- UPnP enables quick-connection to GUI.
- Seamless AV distribution through different AV signal.
- Controllable via front panel buttons, touch screen, IR remote, RS232 & TCP/IP.
- Adjustable output resolution.
- Online firmware upgrade via USB port.

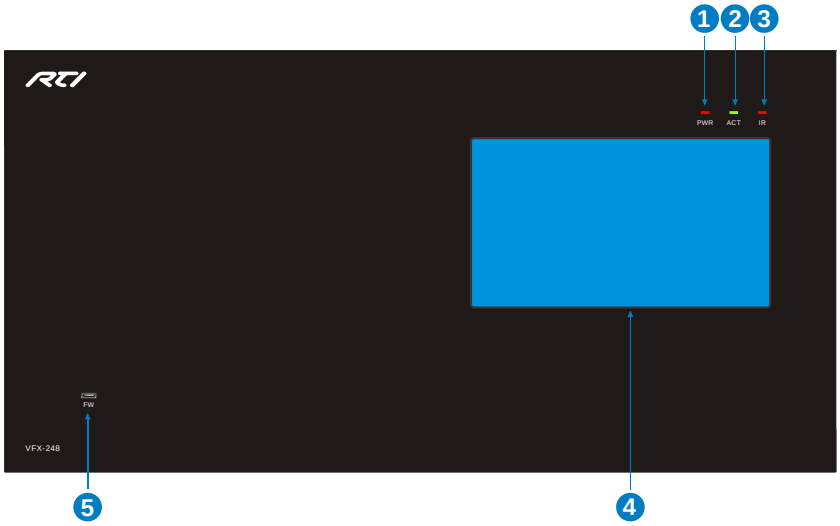
PACKAGE LIST

Signal cards are sold and packed separately, all the items listed above are for the matrix switcher solely. Confirm all the accessories are included, if not, please contact with the dealers.

- 1 x VFX-248
- 2 x Mounting Ears with 4 Screws
- 4 x Plastic Cushions
- 1 x IR Remote
- 1 x User Manual
- 1 x Power Cord
- 1 x Mounting Handles
- 1 x RS232 Cable
- 1 x IR Receiver

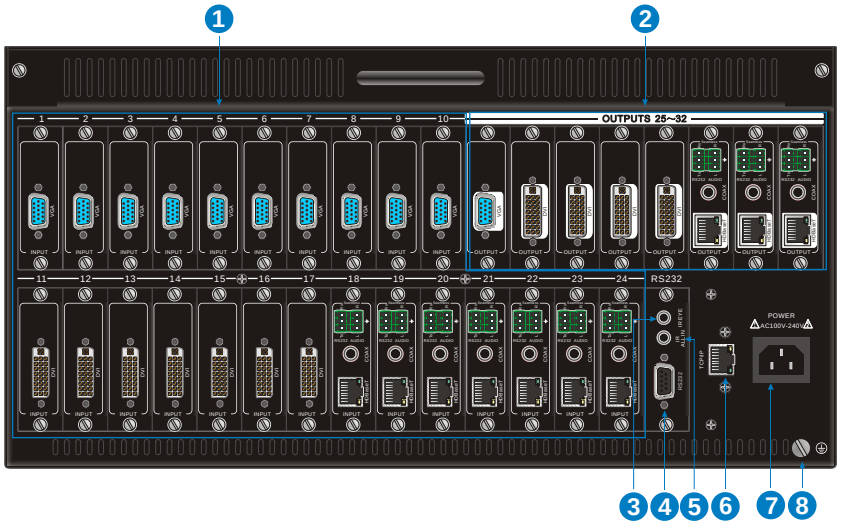
PANEL DESCRIPTION

FRONT PANEL



No.	Name	Description
①	PWR	Power indicator: ▪ Off when there is no power to the device. ▪ Green when the device is in standby mode. ▪ Red when the device is powered on.
②	ACT	RS232 Link indicator: ▪ Off when there is no RS232 serial signal. ▪ Blinking green when there is RS232 serial signal.
③	IR	IR indicator: ▪ Off when there is no IR signal. ▪ Blinking red when the built-in IR sensor receive IR signal.
④	Touch Screen	Touch screen for controlling this unit.
⑤	FIRMWARE	Micro USB port, used for firmware update.

REAR PANEL



No.	Name	Description
①	1~24 Card Slots	Flexible card slots, 24 in total, insert input/ output signal cards here.
②	25~32 Card Slots	8 in total, insert output signal cards here.
③	IR EYE	Connect with IR receiver to control the switcher.
④	RS232	Serial control port, connect with the RS232 port of control device to control the matrix switcher or the 3rd party device connected to VFX-IHT &VFX-OHT.
⑤	IR ALL IN	Input port for IR control signal, connect with IR receiver, and work with IR emitters connected to IR OUT of far-end HDBT receivers.
⑥	TCP/IP	TCP/IP control port, connect with control device (e.g. a PC).
⑦	Power Port	Connect to 100~240V AC outlet with power cord.
⑧	Ground Point	Connect to grounding.

Note: Pictures shown in this manual are only for reference.

SIGNAL CARDS

The matrix switcher boasts 24 card slot for flexible input& output signal card combinations, and 8 card slots for output signal cards, HDMI, HDBT and VGA signal card can be selected, according to specific need. All the signal cards support seamless distribution and hot-plug.

The chart below shows all signal cards:

Input		Output	
Card	**Ports**	**Card**	**Ports**
VFX-IHM	4K HDMI& Analog Audio	VFX-OHM	4K HDMI& Analog Audio
VFX-IHT	4K HDBT& Analog Audio& RS232&IR	VFX-OHT	4K HDBT& Analog Audio& RS232&IR
VFX-IV4	VGA & Analog Audio	VFX-OA1	MIC/LINE IN, MIX OUT & PGM OUT

VFX-IHM & VFX-OHM

Single 4K seamless HDMI signal card (refer to *9.2.1* for detailed specification);

HDMI1.4& HDCP2.2 compliant, capable to transmit HDMI/ DVI-I/DVI-D signal;

Auto-detect input resolution;

Max resolution: 4K×2K@60Hz 4:2:0;

The default output resolution is 4K×2K@30Hz and it can be adjusted via commands or GUI, support 4K×2K@60Hz、1024×768@60Hz、1920×1080p@60Hz、1280×720@60Hz;

Support EDID Management（default EDID: 4K×2K@30Hz）and DDC communication;

Input audio source selectable via command or GUI, including HDMI embedded audio (default), and external analog audio.

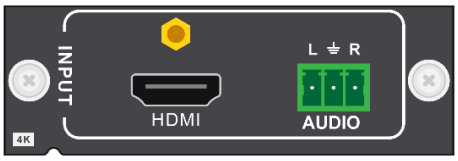


Figure 2- 1 VFX-IHM

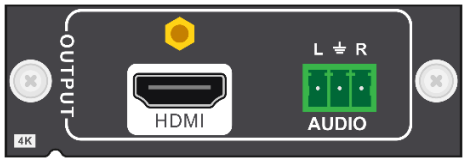
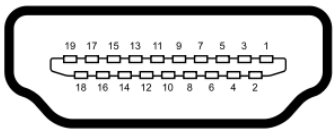


Figure 2- 2 VFX-OHM

Pin layout of the HDMI connector (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**	DDC/CEC Ground
5	TMDS Data 1 Shield	**16**	SDA
6	TMDS Data 1-	**15**	SCL
7	TMDS Data 0+	**14**	N.C.
8	TMDS Data 0 Shield	**13**	CEC
9	TMDS Data 0-	**12**	TMDS Clock-
10	TMDS Clock+	**11**	TMDS Clock Shield

VFX-IHT & VFX-OHT

4K seamless HDBT signal card (refer to *9.2.2* for detailed specification);

Max resolution: 4K×2K@60Hz;

Adaptive HDCP input and support HDCP2.2, the output signal support HDCP1.4;

Work with HDBT transmitter/ receiver to attain long-distance transmission (up to 70m via qualified CAT6 cable for 1080P or 40m for 4K signal);

Real-time work status indicator: yellow LED blinks once powered on; green LED lights when the port is connected with HDBT devices;

HDBT port supports PoE;

Input audio source selectable via command or GUI, including HDMI embedded audio (default), and external analog audio;

The default output resolution is 4K×2K@30Hz and it can be adjusted via commands or GUI, support 4K×2K@60Hz、1024×768@60Hz、1920×1080p@60Hz、1280×720@60Hz;

Support bi-directional RS232 control;

Support bi-directional IR control, compatible with 5V/12V IR receiver (default: 5V);

Support EDID Management（default EDID: 4K×2K@30Hz）and DDC communication.

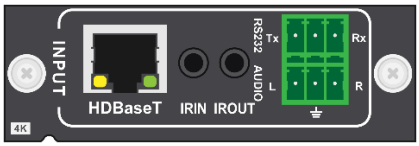


Figure 2- 3 VFX-IHT

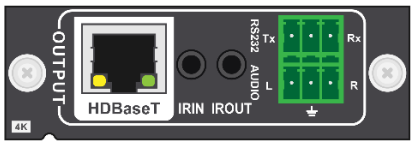
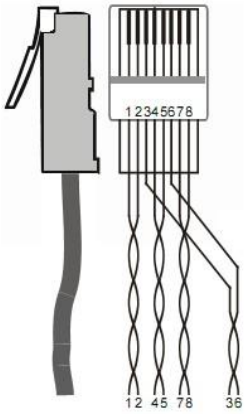


Figure 2- 4 VFX-OHT

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.

VFX-IV4

4K seamless VGA signal input card (refer to *9.2.3* for detailed specification);

Max VGA input resolutions: 1920×1200p@60Hz;

External analog audio input for VGA video signal;

Work with VFX-OHM/VFX-OHT output cards to switch video & audio input signal, and the video signal can be adjusted as 4K@30Hz 4:4:4.

Figure 2- 5 VFX-IV4

Note: When one PC used as input source, due to some models aren't compatible with this input signal card, the video image may not be displayed fully.

VFX-OA1

Audio signal output card (refer to *9.2.4* for detailed specification);

Support external MIC or LINE audio input;

Features MIX OUT port to output MIC/LINE & source audio simultaneously;

Features PGM OUT port to output MIC/LINE & source audio simultaneously, and then the mixed sound volume and channel can be controlled via GUI;

Works with VFX-IHM/ VFX-IHT/VFX-IV4 to output the de-embedded audio.

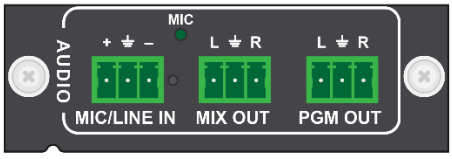


Figure 2- 6 VFX-OA1

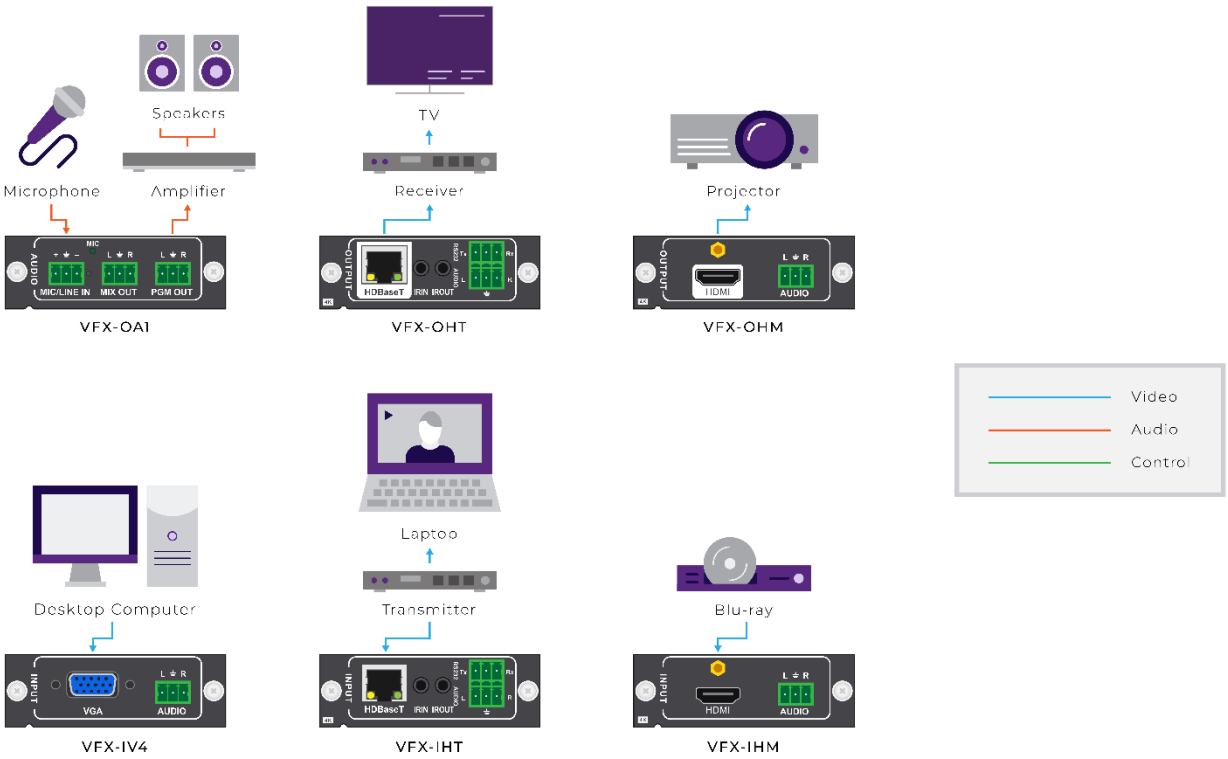
SYSTEM CONNECTION

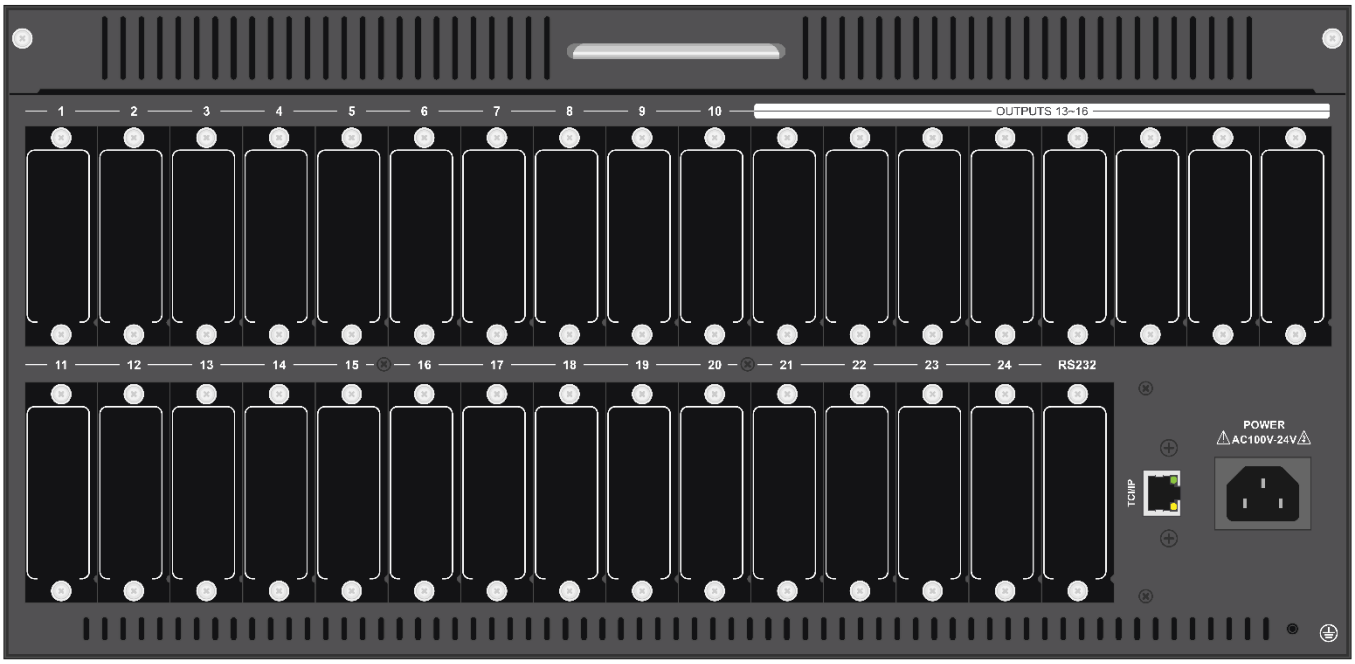
USAGE PRECAUTION

- Verify all components and accessories included before installation.
- System should be installed in a clean environment with proper 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.

SYSTEM DIAGRAM

The following diagram illustrates typical input and output connections that can be utilized with the matrix switcher:





Note: System Diagram shown in this manual are for reference only, more specific schemes depend on real devices.

CONNECTION PROCEDURE

Step1. Insert necessary signal cards to the card slots.

Step2. Connect source device(s) (e.g. Blue-ray DVD) to corresponding input ports.

Step3. Connect displays to corresponding output ports.

Step4. Connect amplifier/ speaker to audio output ports.

Step5. Connect an IR Receiver to **IR EYE** to enable IR control.

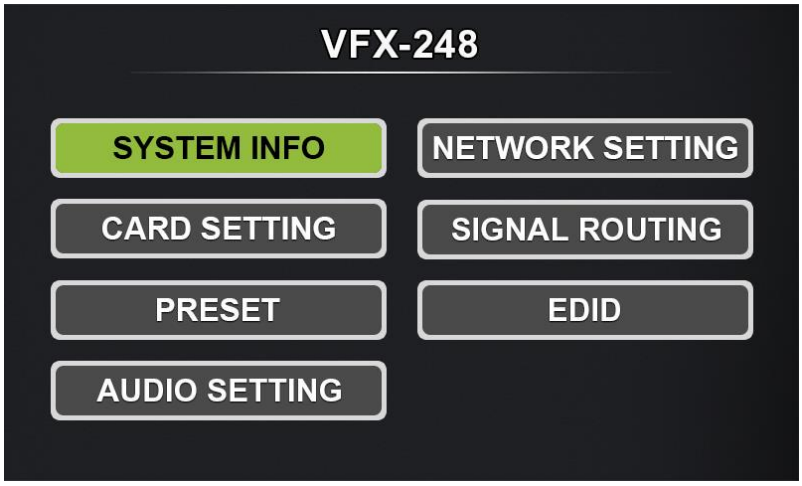
Step6. Connect control device (e.g. a PC) to the RS232 port to enable serial control.

Step7. Connect control device (e.g. a PC) to the TCP/IP port to enable TCP/IP control.

Step8. Insert 100~240V AC outlet via the included power cord.

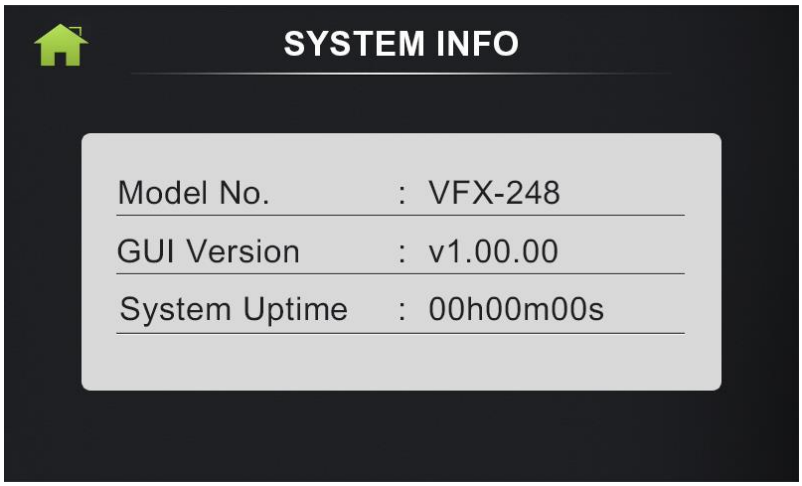
TOUCH SCREEN CONTROL

The matrix switcher provides with convenient touch screen for network setting, Signal Switching, preset management, EDID management, audio setting and system information inquiry. The main menu is shown as below:



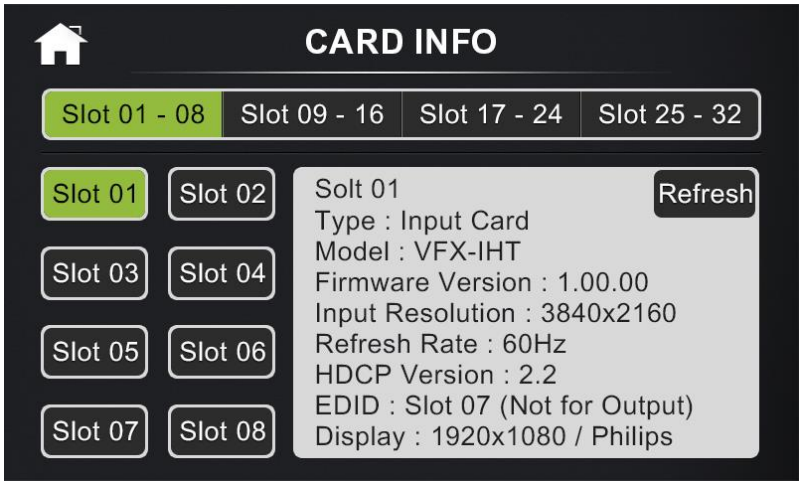
SYSTEM INFORMATION QUERY

Press "**SYSTEM INFO**" to enter the below menu which show product model, GUI version, and system update time



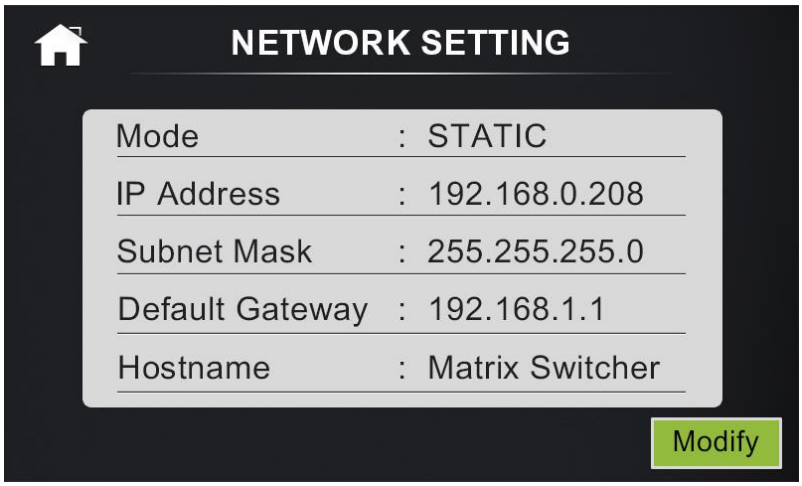
SIGNAL CARD INFORMATION QUERY

Press "**CARD INFO**" to enter the below menu which show signal card information.

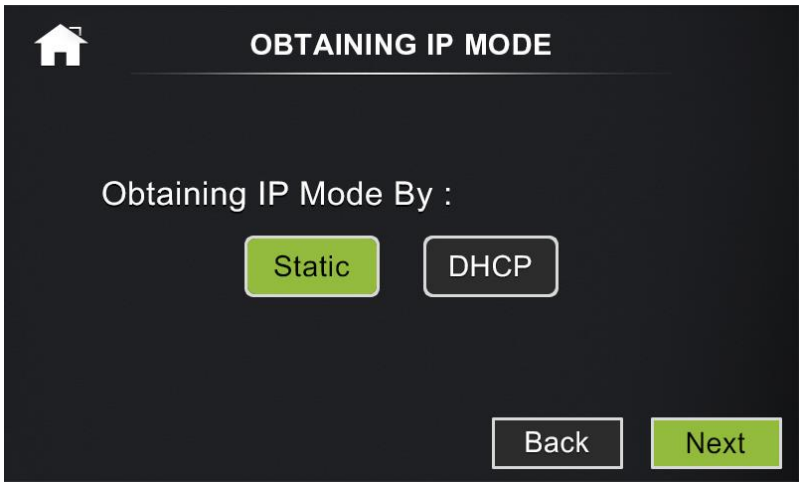


NETWORK SETTING

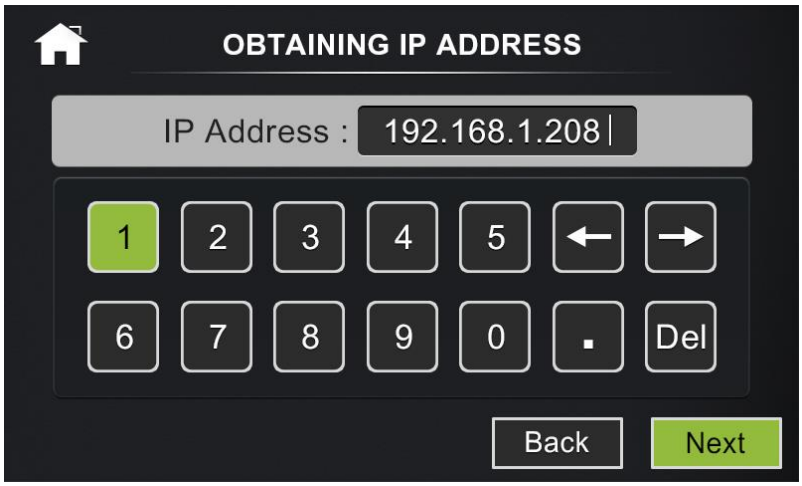
1) Press "**NETWORK SETTING**" to enter the below menu to configure network.



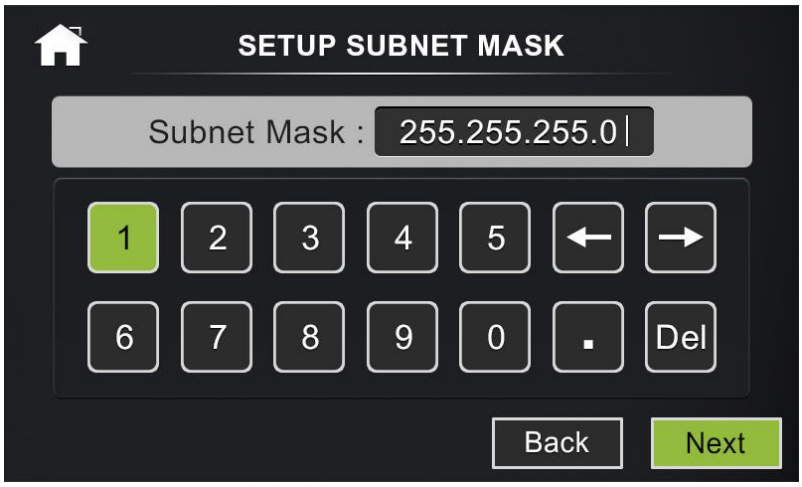
2) Press "**Modify**" to enter the below interface to select IP mode.



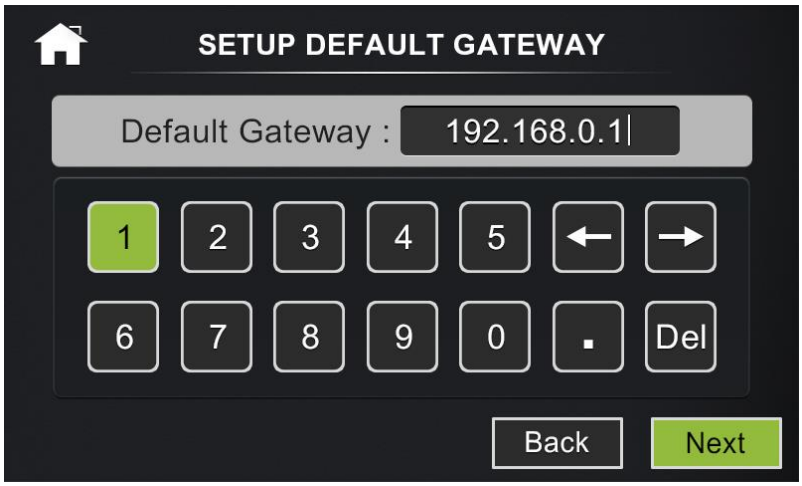
3) Press "**Next**" to enter the below interface to modify IP address.



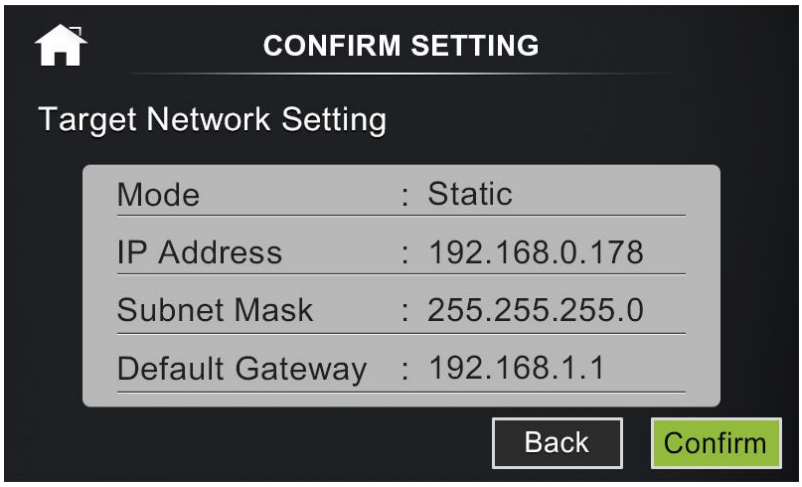
4) Press "**Next**" to enter the below interface to set subnet mask.



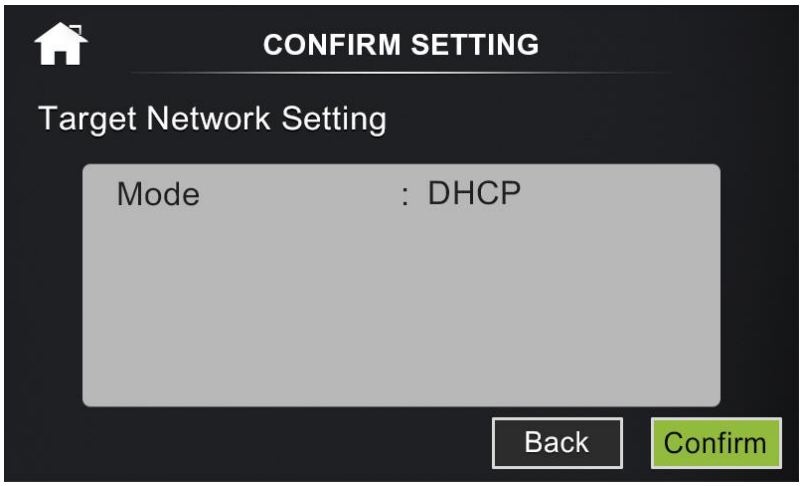
5) Press "**Next**" to enter the below interface to set default gateway.



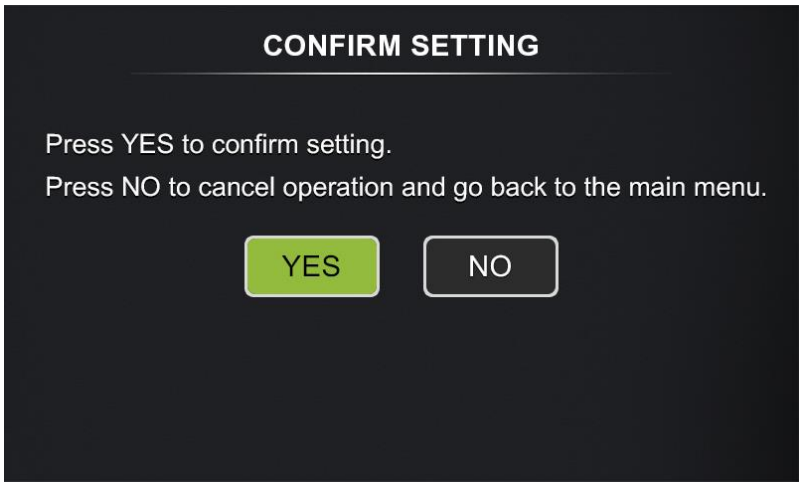
6) Press "**Next**" to enter the below interface to confirm network setting.



7) Press "**Confirm**" to enter the below interface to save IP mode setting.

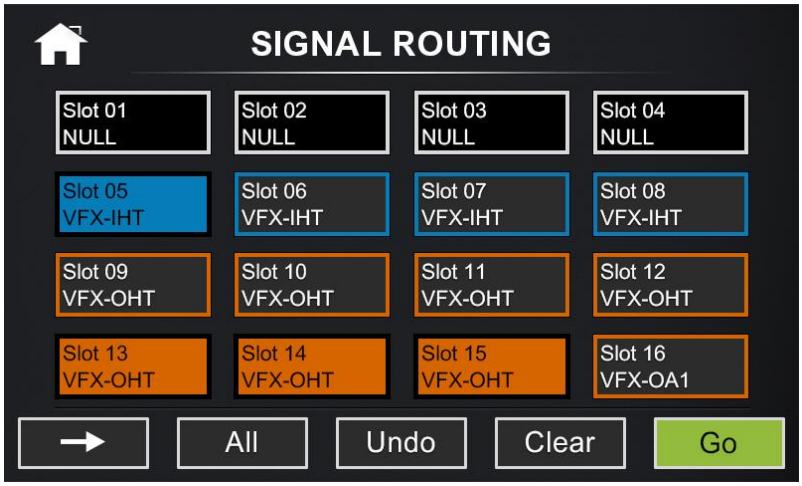


8) Press "**Confirm**" to enter the below interface to save network setting, and then press "**YES**" to confirm setting, or "**NO**" to cancel.



SIGNAL SWITCHING

Press "**SIGNAL ROUTING**" to enter the below menu to switch input and output connection.



Once select any input signal card, the corresponding outputs will highlight it in orange.

Operation:

1) To switch one input to an output:

   Press "**INPUT**" + "**OUTPUT**" + "**GO**"

   Example: Press Slot 05 VFX-IHT + Slot 13 VFX-OHT + Go

2) To switch an input to several outputs:

   Press "**INPUT**" + "**OUTPUT**" + "**OUTPUT**" +… + "**GO**"

   Example: Press Slot 05 VFX-IHT + Slot 13 VFX-OHT + Slot 14 VFX-OHT + Slot 15 VFX-OHT + …. + Go

3) To switch an input to all outputs:

   Press "**INPUT**" + "**ALL**" + "**GO**"

   Example: Press Slot 05 VFX-IHT + All + Go

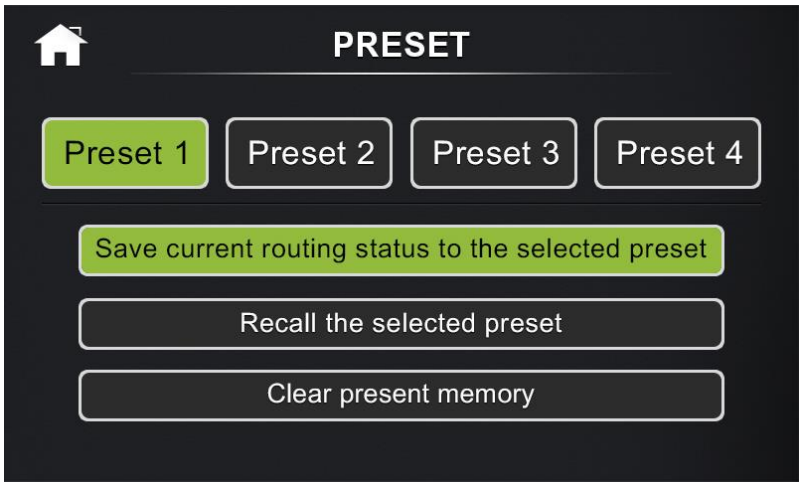
Press ← or → to switch previous or next page.

Press Clear to cancel operations before pressing Go.

Press Undo to return the previous signal routing setting.

PRESET MANAGEMENT

The current signal switching status can be stored to preset 1~4. Press "**PRESET**" to enter the below menu to save, recall, or clear the preset.

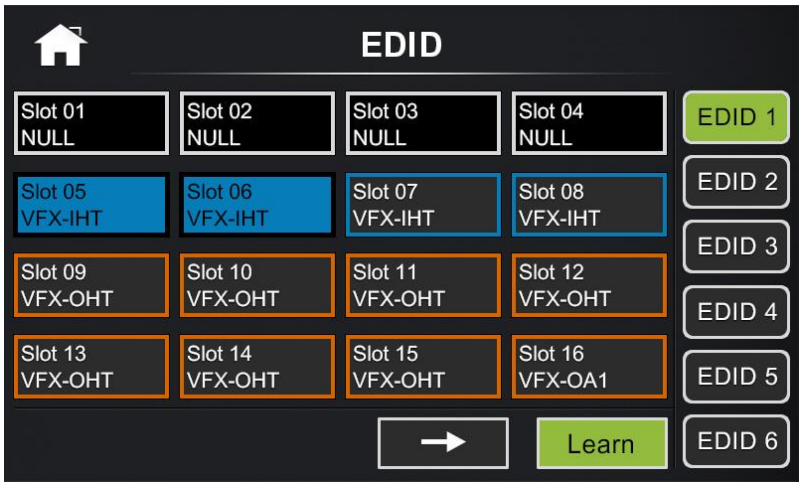


Operation example:

1) Press Preset 1, and then press Save current routing status to the selected preset to save the signal switching status on **SIGNAL ROUTING** menu to **Preset 1**.
2) Press Preset 2, and then press Recall the selected preset to recall **Preset 2**.
3) Press Preset 3, and then press Clear present memory to clear **Preset 3**.

EDID MANAGEMENT

The Matrix Switcher features EDID management to maintain compatibility between all devices. Press "**EDID**" to enter the below menu to set the EDID of input source device.



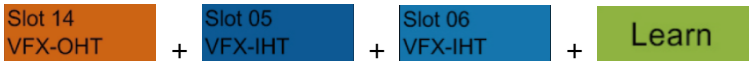
Press  or  to switch previous or next page.

EDID setting operation:

1) Set one output EDID to one or several input.

   Press "**OUTPUT**" + "**INPUT**" + "**INPUT**" + …. + "**LEARN**"

   Example 1: press 

   Example 2: press 

2) Invoke the embedded EDID to one or several input.

Press "**EDID [Z]**" + "**INPUT**" + "**INPUT**" + …+ "**LEARN**"

EDID [Z] (Z=1~6)	Video Resolution	Audio Format
1	1920x1080P@60HZ 8-bit	Stereo
2	1920x1080P @60HZ 8-bit	Dolby Digital / DTS 5.1
3	3840x2160P@30HZ 8-bit	Stereo
4	3840x2160P@30HZ 8-bit	Dolby Digital / DTS 5.1
5	3840x2160P@60HZ 8-bit 4:2:0	Stereo
6	3840x2160P@60HZ 8-bit 4:2:0	Dolby Digital / DTS 5.1

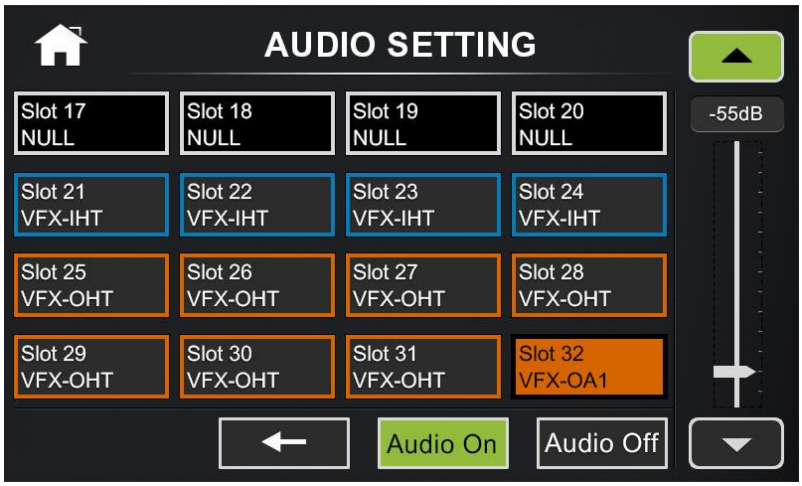
Example 1: press 

Example 2: press 

AUDIO SETTING

Press "**AUDIO SETTING**" to enter the below menu to set audio signal card.

This menu is only used for VFX-OA1 signal card. When select audio signal card, then volume adjuster will show on the right side of the interface.



Press  or  to switch previous or next page.

Operation procedure:

① Select one audio signal card, such as 

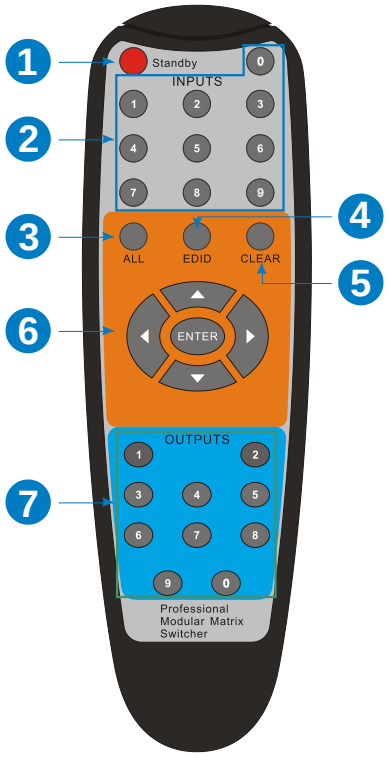
② Press  or  to switch on or off source and MIC/LINE audio.

③ When switch on audio, then move the scroll bar on the right to increase or decrease the volume of source and MIC/LINE audio.

IR REMOTE CONTROL

Connect an IR receiver to **IR EYE** on the rear panel, users can control the switcher with the included IR remote (shown as below):

IR REMOTE



① **Standby**: Enter/ exit standby mode

② **INPUTS**: Input selection buttons, channels 1~16 should be pressed as 01~16.

For example, press input "**0**", and then press input "**1**" to select the first input channel.

③ **ALL**: Select all inputs or outputs.

④ **EDID**: Press this to enter EDID management menu.

⑤ **Clear**: Press this to cancel the operations before pressing "**ENTER**".

⑥ Arrow keys (**Up, Down, Left** and **Right**) and **ENTER** button

- Press "**Left**" key at any interface can enter **SIGNAL ROUTING** menu.
- Press "**Up**" and "**Down**" key to select the embedded EDID in the EDID management menu.
- Press "**Right**" key at any interface can enter EDID menu.
- Press "**ENTER**" to confirm operation.

⑦ **OUTPUTS**: Output selection buttons, channels 1~16 should be pressed as 01~16.

For example, press output "**0**", and then press input "**2**" to select the second output channel.

SIGNAL SWITCHING

The IR remote can be used for signal switching.

1) To switch one input to an output:

Press "**Left**" key + "**INPUT [XX]**" + "**OUTPUT [YY]**" + "**ENTER**"

Example: press "**Left**" key + "**INPUT [06]**" + "**OUTPUT [09]**" + "**ENTER**"

2) To switch an input to several outputs:

Press "**Left**" key + "**INPUT [XX]**" + "**OUTPUT [YY]**" +"**OUTPUT [YY]**" +…+ "**ENTER**".

Example: Press "**Left**" key + "**INPUT [06]**" + "**OUTPUT [09]**" + "**OUTPUT [10]**" + "**OUTPUT [11]**" + "**ENTER**"

3) To switch an input to all outputs:

Press "**Left**" key + "**INPUT [XX]**" + "**ALL**" + "**ENTER**"

Example: Press "**Left**" key + "**INPUT [06]**" + "**ALL**" + "**ENTER**"

Press "**Clear**" to cancel the operations before pressing "**ENTER**".

EDID MANAGEMENT

The IR remote can be used for learning EDID and invoking the embedded EDID.

1) Set one output EDID to one or several input.

Press "**EDID**"/ "**Right**" key +"**OUTPUT [YY]**" + "**INPUT [XX]**" + **INPUT [XX]**" + …. + "**ENTER**"

Example 1: Press "**EDID**" +"**OUTPUT [09]**" + "**INPUT [06]**" + "**ENTER**"

Example 2: Press "**EDID**" +"**OUTPUT [09]**" + "**INPUT [06]**" + "**INPUT [07]**" + "**ENTER**"

2) Invoke the embedded EDID to one or several input.

① Press "**EDID**"/ "**Right**" key to enter EDID management menu.

② Press the "**Up**"/ "**Down**" key to select the embedded EDID [Z], and then press "**INPUT [XX]**", finally, press "**ENTER**" to confirm.

EDID [Z] (Z=1~6)	Video Resolution	Audio Format
1	1920x1080P@60HZ 8-bit	Stereo
2	1920x1080P @60HZ 8-bit	Dolby Digital / DTS 5.1
3	3840x2160P@30HZ 8-bit	Stereo
4	3840x2160P@30HZ 8-bit	Dolby Digital / DTS 5.1
5	3840x2160P@60HZ 8-bit 4:2:0	Stereo
6	3840x2160P@60HZ 8-bit 4:2:0	Dolby Digital / DTS 5.1

Example 1: Press "**EDID**" +"**Up**"/ "**Down**" to select the embedded EDID [1] + "**INPUT [06]**" + "**ENTER**"

Example 2: "**EDID**" +"**Up**"/ "**Down**" to select the embedded EDID [1] + "**INPUT [06]**" + "**INPUT [07]**" + "**ENTER**"

RS232 COMMAND CONTROL

The matrix switcher provides with one RS232 port for serial port control. Connect the matrix switcher to the control device (e.g. a PC) with RS232 cable and set the correct parameters, the control device is capable to control the matrix switcher via designed software.

RS232 CONTROL SOFTWARE

Installation: Copy the control software file to the computer connected with the matrix switcher.

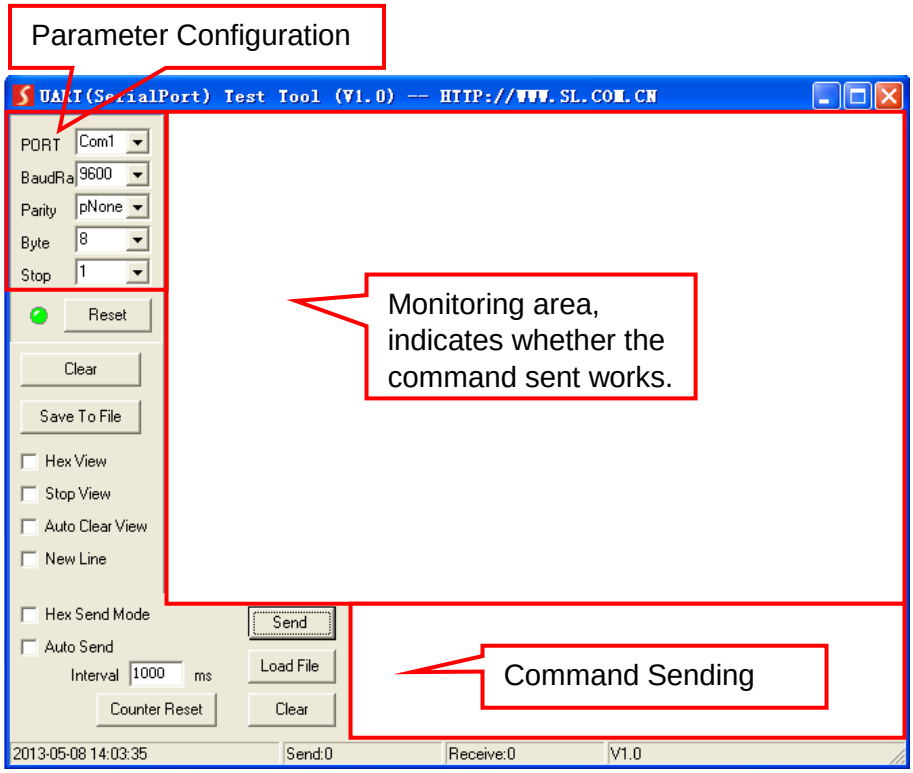
Uninstallation: Delete all the control software files in corresponding file path.

Basic Settings:

Firstly, connect the matrix switcher with an input device and an output device. Then, connect it with a computer which is installed with RS232 control software. Double-click the software icon to run this software.

Here we take the software **CommWatch.exe** as example. The icon is showed as below:

The interface of the control software is showed as below:



Please set the parameters of COM number, bound rate, data bit, stop bit and the parity bit correctly, only then will you be able to send command in Command Sending Area.

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

RS232 COMMAND

SYSTEM COMMAND

Command	Description	Feedback Example
#MOD?!	Report system model	@MOD:VFX-248
#IPA?!	Return IP address	@IPA:192.168.0.178!
#RST!	Factory reset.	
#POW?!	Report power status	@POW:ON!
		@POW:OFF!
#POW:ON!	Power on the system.	@POW:ON!
#POW:OFF!	Power off the system.	@POW:OFF!
#POW:STANDBY!	Turn the system to standby mode, can be awaken by the front panel.	@POW:STANDBY!
#FPL?!	Report front panel lock status.	@FPL:UNLOCKED!
		@FPL:LOCKED!
#FPL:LOCK!	Lock front panel button.	@FPL:LOCKED!
#FPL:UNLOCK!	Unlock front panel button (Default).	@FPL:UNLOCKED!
#FWV?!	Report front panel version.	@FWV:1.0.0!
#FBK:OFF!	Disable feedback message	@FBK:OFF!
#FBK:ON!	Enable feedback message	@FBK:ON!

#CRD:ALL?!	Get all signal card type. @CRD: [XX] [Y][Z]! 1) @ = start 2) CRD = CARD 3) [XX] = card slot number (i.e. 1~32) 4) [Y] = I is Input; O is Output 5) [Z] = card type number (1-VGA, 2-DVI, 4-BT, 5-SDI, 6-HDMI) 6) [Y][Z] = NC is no card ! = end	@CRD: 01 I6! @CRD: 02 I6! @CRD: 03 I6! @CRD: 04 I6! @CRD: 05 I6! @CRD: 06 I4! …. @CRD: 32 O6!
#CRDFWV:[XX]?!	Report the firmware version of signal card [XX].	@CARD15 FWV:1.0.2!
#DSPINFO:[XX]?!	Report the information of display device that connected to output [XX].	@CARD12 RES: 3840x2160, BRA:VSC!
#REFDSP:[XX]!	After changing the display device that connected to output [XX], send this command to refresh the information.	@CARD12 RES: 3840x2160, BRA:VSC!

SIGNAL SWITCHING COMMAND

Command	Description	Feedback Example
#UDO!	Cancel the previous operation.	@UDO!
#RAV:[XX]AVALL!	Switch input [XX] AV to all output	@RAV:VIDEO 02 TO OUT ALL!
#RAV:[XX]V[Y1](&[Y2]….)!	Switch Input[XX] AV signal to output [Y1](and all target output in[Y2] and so on).	@RAV:VIDEO 06 TO OUT 25! @RAV:VIDEO 06 TO OUT 26! @RAV:VIDEO 06 TO OUT 27! @RAV:VIDEO 06 TO OUT 28!

Command	Description	Feedback Example
		@RAV:VIDEO 06 TO OUT 29! @RAV:VIDEO 06 TO OUT 30! @RAV:VIDEO 06 TO OUT 31!
#RPT:[YY]?!	Report the input channel on output [YY].	@RAV:VIDEO 07 TO OUT 16!
#RPT:ALL?!	Report the input channel on output channel one by one.	@RAV:VIDEO 06 TO OUT 25! @RAV:VIDEO 06 TO OUT 26! @RAV:VIDEO 06 TO OUT 27! @RAV:VIDEO 06 TO OUT 28! @RAV:VIDEO 06 TO OUT 29! @RAV:VIDEO 06 TO OUT 30! @RAV:VIDEO 06 TO OUT 31! @RAV:VIDEO 01 TO OUT 32!
#RAV:ALLAVOFF!	Turn off all video output.	@RAV:VIDEO 00 TO OUT ALL!
#RAV:ALLAVON!	Turn on all video output.	@RAV:VIDEO FF TO OUT ALL!
#RAV:[XX]AVOFF!	Turn off the video output [XX].	@RAV:VIDEO 00 TO OUT 16!
#RAV:[XX]AVON!	Turn on the video output [XX].	@RAV:VIDEO FF TO OUT 16!

PRESET MANAGEMENT COMMAND

Command	Description	Feedback Example
#PST:[YY]STO!	Store the current status to preset [YY]. [YY] ranges from 01 to 10.	@PST:10 STO!

#PST:[YY]RCL!	Recall preset [YY].	@PST:06 RCL! @RAV:VIDEO 03 TO OUT 08! @RAV:VIDEO 03 TO OUT 09! @RAV:VIDEO 03 TO OUT 10! @RAV:VIDEO 03 TO OUT 11! @RAV:VIDEO 03 TO OUT 12! @RAV:VIDEO 03 TO OUT 13! @RAV:VIDEO 03 TO OUT 14!
#PST:[YY]CLR!	Clear the preset [YY].	@PST:10 CLR!

EDID MANAGEMENT COMMAND

Command	Description	Feedback Example
#EDD:RST!	Reset the EDID to factory default.	
#EDD:SET[YY]TO[XX]!	Set the EDID data of output [YY] on input [XX].	@EDD:SET OUT 31 TO INP 01!

RESOLUTION SELECTION COMMAND

Command	Description	Feedback Example
#RES:ALL?!	Return video resolution of all output.	@RES:OUT 27 1920x1080P60! @RES:OUT 28 4Kx2K 30! @RES:OUT 29 4Kx2K 30! @RES:OUT 30 4Kx2K 30! @RES:OUT 31 1920x1080P60!"
#CFG:OUT[YY]RES720P!	Set the output resolution of output [YY] to 720P.	@RES:OUT 16 1280x720P60!

#CFG:OUT[YY]RES1080P!	Set the output resolution of output [YY] to 1080P.	@RES:OUT 16 1920x1080P60!
#CFG:OUT[YY]RESXGA!	Set the output resolution of output [YY] to 1024x768@60Hz	@RES:OUT 16 1024x768P60!
#CFG:OUT[YY]RES2160P30!	Set the output resolution of output [YY] to 3840x2160@30Hz	@RES:OUT 12 3840x2160P30!
#CFG:OUT[YY]RESUHD!	Set the output resolution of output [YY] to 3840x2160@60Hz	@RES:OUT 12 3840x2160P60!
#CFG:OUT[YY]RST!	Reset the output resolution of output [YY] to factory default.	@CFG:OUT 11 RST!
#RES:OUT[XX]?!	Report the resolution of output [YY].	@RES:OUT 16 4Kx2K 30!

AUDIO SETTING COMMAND

Command	Description	Feedback Example
#CFG:INP[YY]AUDIOHDMI!	Select HDMI embedded audio for HDMI input [XX].	@CFG:INP 07 AUDIOHDMI!
#CFG:INP[YY]AUDIOANA!	Select external analog audio for HDMI input [XX].	@CFG:INP 07 AUDIOANA!
#CFG:INP[YY]RST!	Reset the audio input of HDMI input [XX] to factory default (HDMI embedded audio).	@CFG:INP 07 RST!

RS232 PASS-THROUGH CONTROL COMMAND

Command	Description	Feedback Example
#CMD:[ZZ]/[XX]/[YY]/[DATA]/!	**CMD** = Command / = separator **[ZZ]** = 00,01,02 00 => when matrix is working 01 => when matrix is PWON 02 => when matrix is PWOFF **[XX]** = port number of HDBaseT receiver (01~32) **[YY]** = buad rate (01=2400, 02=4800, 03=9600, 04=19200, 05=38400, 06=57600, 07=115200) **[DATA]** = data to other device through RS-232, **[FEEDBACK]** = feedback from other device through RS-232	#CMD:[ZZ]/[XX]/[YY]/[DATA]/!

#CFG:INP[YY]RS232M1!	RS232 pass-through control mode 1: Control far-end device from the RS232 port of this input card.	@CFG:INP 05 RS232M1!
#CFG:INP[YY]RS232M2!	RS232 pass-through control mode 2 (factory default): Control far-end device from the RS232 port of this Matrix Switcher.	@CFG:INP 05 RS232M2!
#CFG:OUT[YY]RS232M1!	RS232 pass-through control mode 1: Control far-end device from the RS232 port of this output card.	@CFG:OUT 31 RS232M1!
#CFG:OUT[YY]RS232M2!	RS232 pass-through control mode 2 (factory default): Control far-end device from the RS232 port of this Matrix Switcher.	@CFG:OUT 31 RS232M2!

TCP/IP CONTROL

The matrix switcher boasts TCP/IP port for IP control.

Default settings: IP: 192.168.0.178; Subnet Mast: 255.255.255.0; Gateway: 192.168.0.1; Serial Port: 4001.

IP& gateway can be changed as you need, Serial Port cannot be changed.

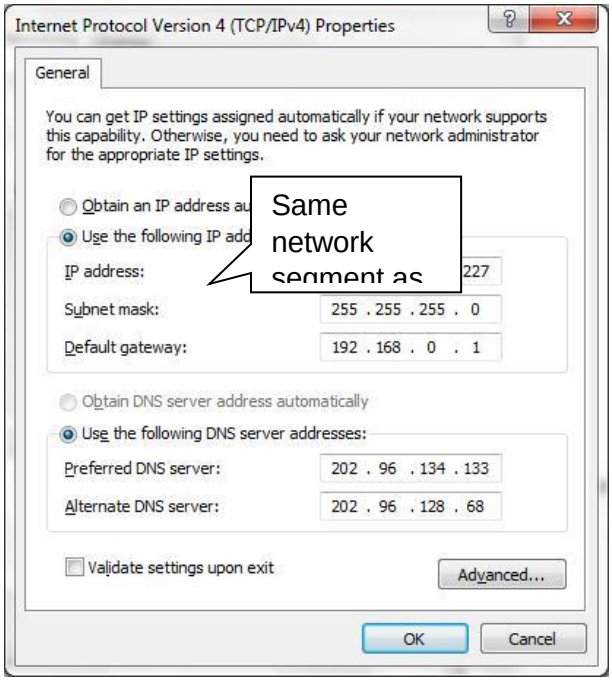
Connect the Ethernet port of control device and TCP/IP port of the matrix switcher, and set same network segment for the 2 devices, users are able to control the device via GUI or designed TCP/IP communication software.

CONTROL MODE

The matrix switcher can be controlled by PC without Ethernet access or PC(s) within a LAN.

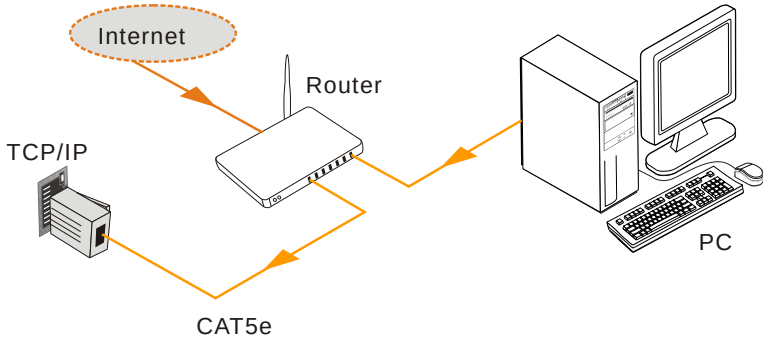
- **Controlled by PC without Ethernet access**

Connect a computer to the TCP/IP port, and set its network segment to the same as the matrix switcher's.



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

Connect the matrix switcher, a router and several PCs to setup a LAN (as shown in the following figure). Set the network segment of the matrix switcher to the same as the router's, then PCs within the LAN are able to control the matrix switcher.



Follow these steps to connect the devices:

Step1. Connect the TCP/IP port of the matrix switcher to Ethernet port of PC with straight-thru CAT5e/6.

Step2. Set the PC's network segment to the same as the matrix switcher's.

Step3. Set the matrix switcher's network segment to the same as the router.

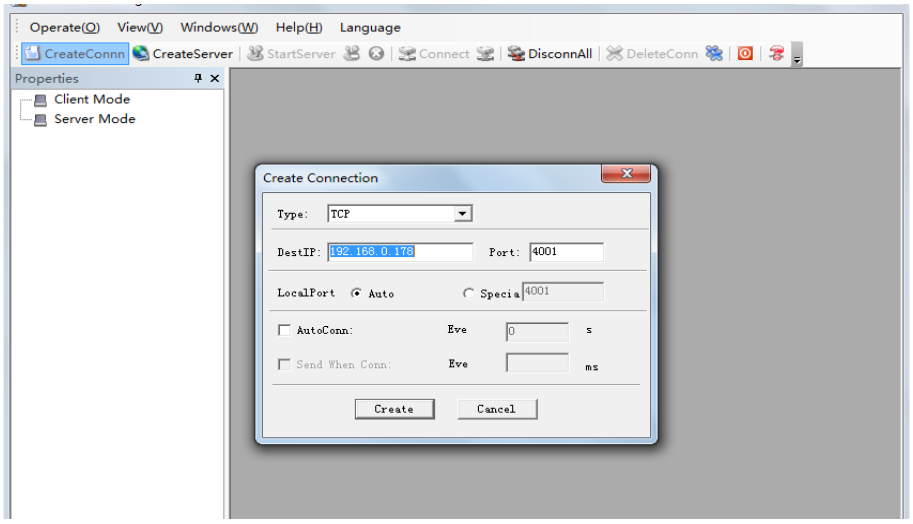
Step4. Set the PC's network segment to the original ones.

Step5. Connect the matrix switcher and PC(s) to the router. PC(s) within the LAN is able to control the matrix switcher asynchronously.

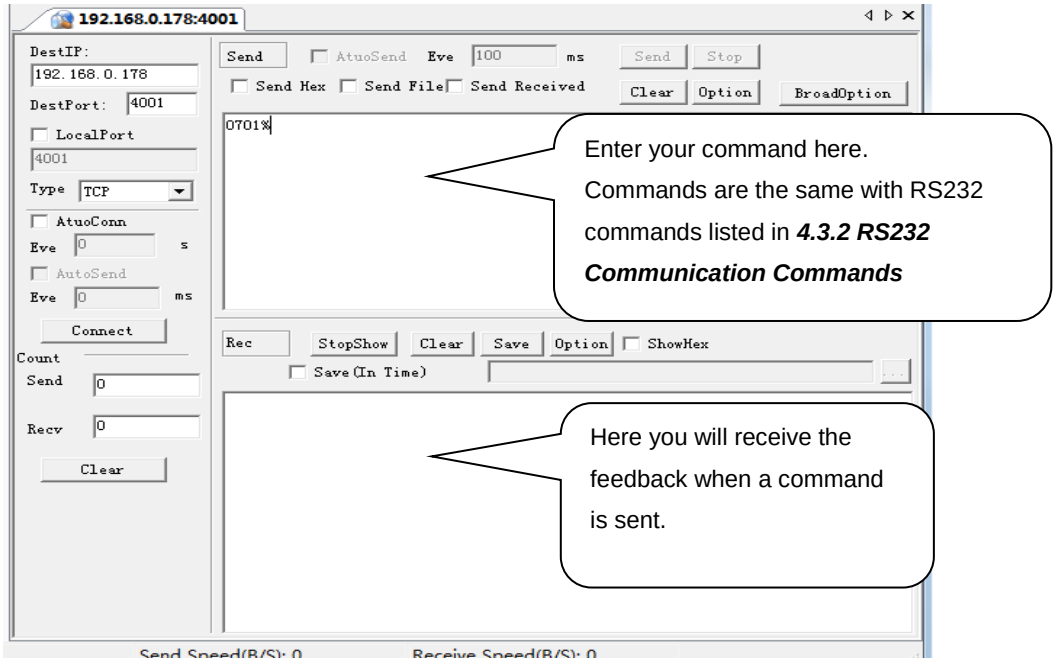
TCP/IP COMMUNICATION SOFTWARE CONTROL

(Exampled by TCPUDP software)

1) Connect a computer and the matrix switcher 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 the matrix switcher (default IP: 192.168.0.178, port:4001):



2) After connect successfully, we can enter commands to control the matrix switcher, as below:



GUI CONTROL

The matrix switcher provides with built-in GUI for convenient TCP/IP control. GUI allows users to interact with the matrix switcher through graphical icons and visual indicators.

Access GUI interface through any one of the following methods:

- Access through UPnP: Go to **My Network Place** in your PC, and click the icon named the matrix switcher.
- Access through web browser: type the IP of the device (default: 192.168.0.178, changeable) in the browser.

Note: PCs running Windows XP system may occur issues in finding UPnP icon, follow these steps to switch on UPnP protocol:

① Add UPnP component: go to "**Control Panel**" -> double-click "**Add/ Delete Programs**" -> double-click "Add/ Delete windows component" ->tick "UPnP" -> click "Next" -> click "OK"

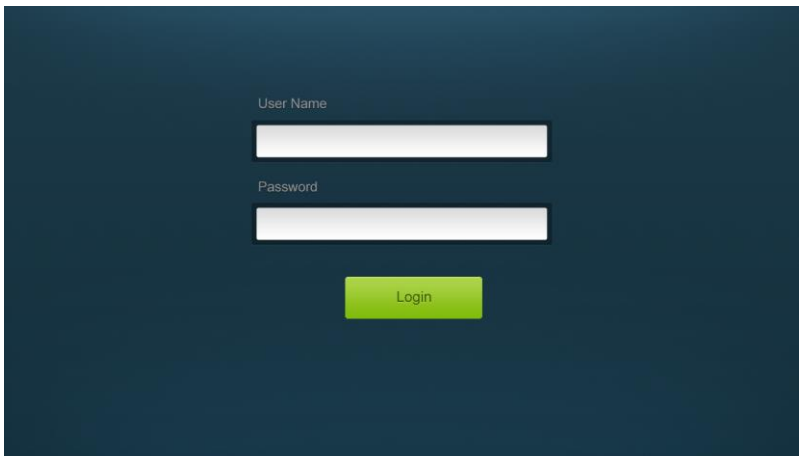
② Enable Windows Firewall: go to "**Control Panel**" -> double-click "**Windows Firewall**" -> click "Others" -> tick "UPnP framework"

③ Enable UPnP auto-starting: go to "**Control Panel**" -> double-click "**Administrative Tools** " -> double-click "Services" -> find and click **SSDP Discovery Servic** and **Universal Plug and Play Device Host** -> click "OK"

UPnP will now automatically start when you turn on your computer.

④ Reboot the device.

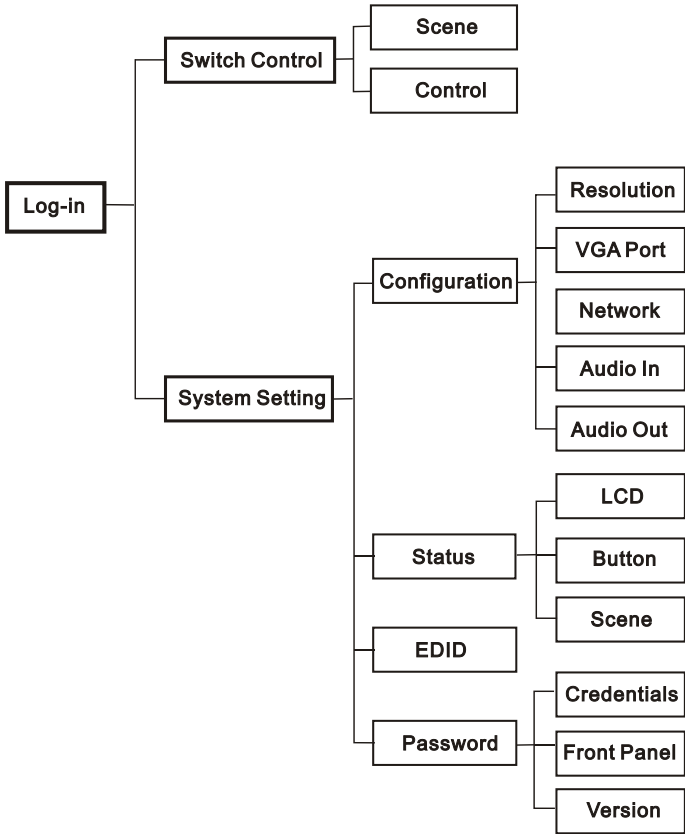
The log-in interface is shown below:



There are 2 selectable accounts to log in. Type the right name and password in relative column and click **Login** to enter configuration interfaces.

- **Name**: admin; **Password**: admin (default setting, changeable via GUI).
- **Name**: user; **Password**: user (default setting, changeable via GUI).

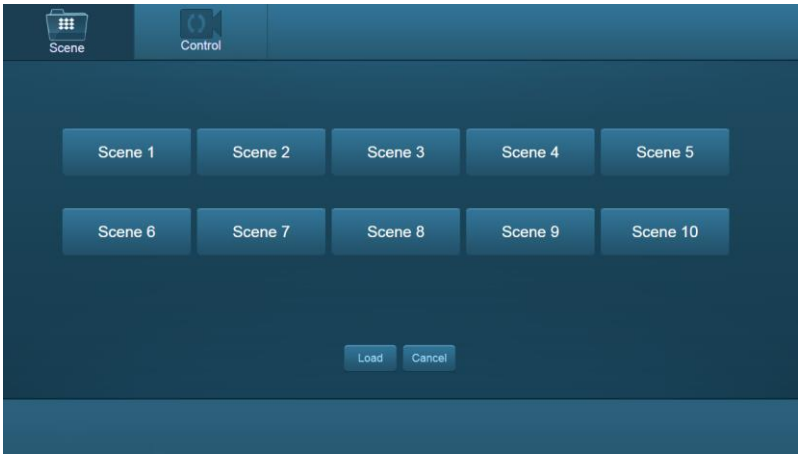
It will enter scene management interface (left) after log-in, which provides direct scene switch. The chart below illustrates the main structure of GUI interfaces:



The GUI system can be divided into Switch Control and System Setting menu, but log in as user will only access Switch Control.

- Click at the left-bottom corner to enter Switch Control menu.
- Click at the left-bottom corner to enter System Setting menu.

SCENE MANAGEMENT



All ten scenes are shown in above interface. Select a scene and then click "**Load**" can invoke the selected scene. Click "**cancel**" to cancel the current operation.

SIGNAL SWITCHING

The button matrix displays every possible connection between every input and output; users can carry on the connections by clicking corresponding button.

For example:

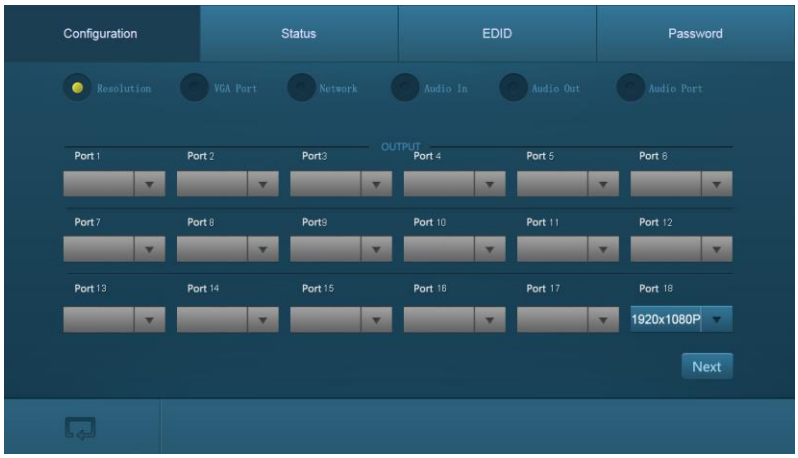
Step1: Select button1 at INPUT column

Step2: Select button 10 at OUTPUT column (If all OUTPUT ports in needed, you only need to click "**All**".)

Step3: Choose a scene that you want to save.

Step4: Click "**Confirm**" to save the setting or Click "**Clear**" to clear set up.

OUTPUT RESOLUTION SELECTION

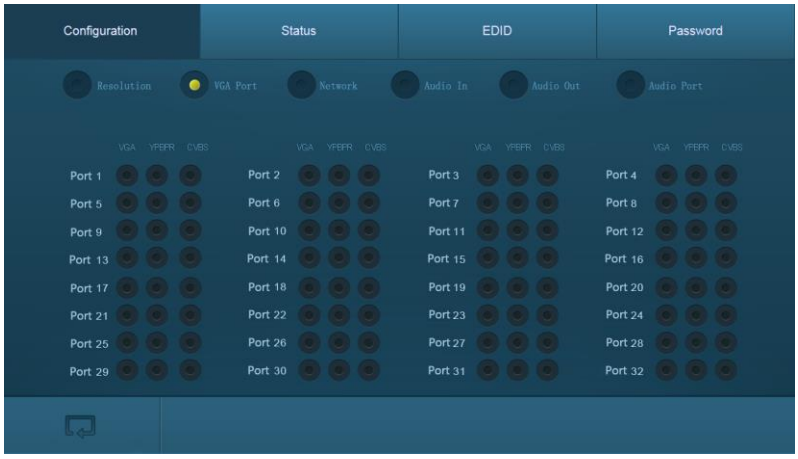


The output resolution can be selected.

VFX-OHM& VFX-OHT: support 4K×2K@60Hz、4K×2K@30Hz、1024×768@60Hz、1920×1080p@60Hz、1280×720@60Hz.

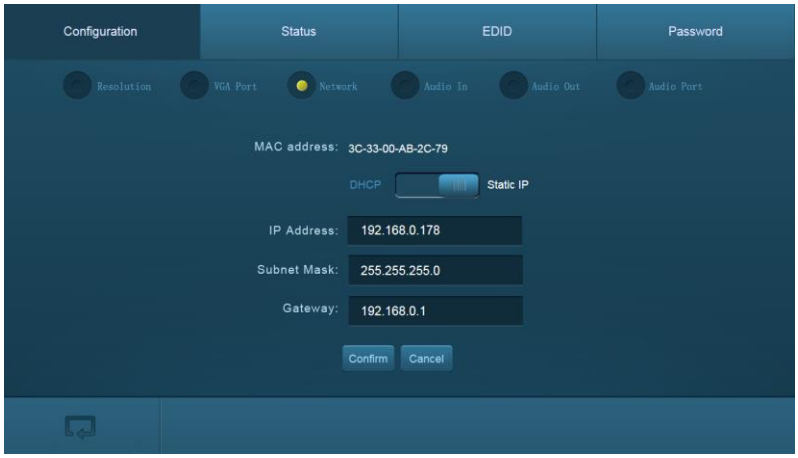
VFX-OA1: Unavailable.

VGA Signal Format Setting



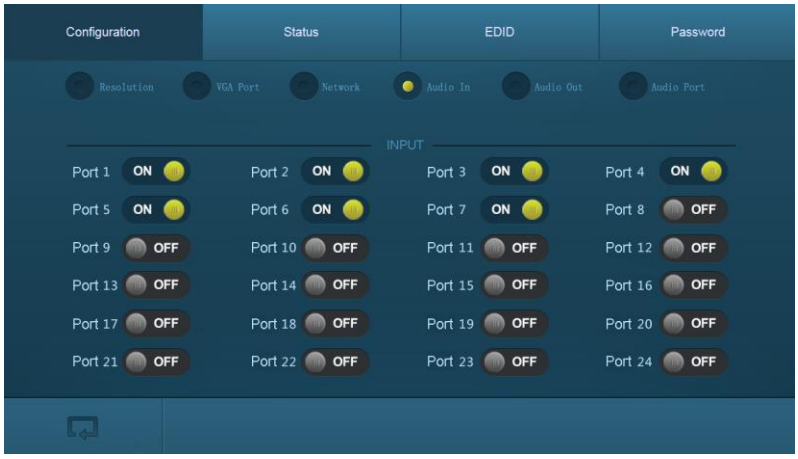
The VGA signal format of VFX-IV4 can be set as VGA, YPBPR or CVBS.

Network Setting



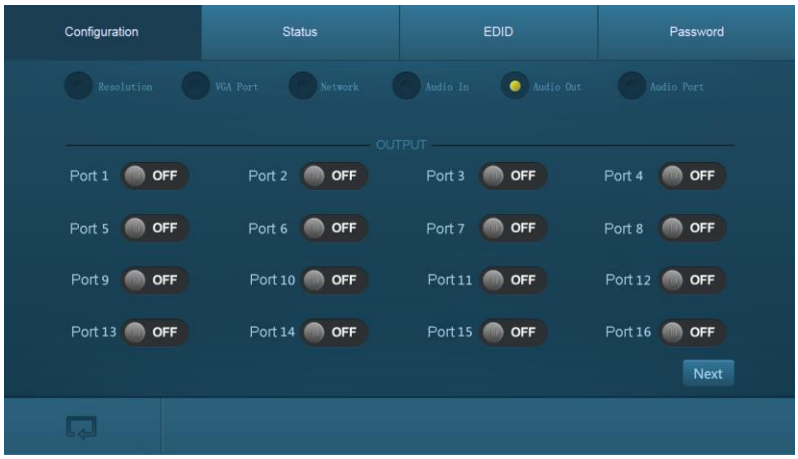
DHCP (automatically assign IP by router) or static IP (manually set IP) can be selected.

Audio Input Setting



Enable or disable the audio input port of VFX-IHM, VFX-IHT, and VFX-IV4. VFX-OA1: Unavailable.

Audio Output Setting



Enable or disable the audio output port for 1080p signal cards.

***Note**: If the audio output can't be set, its button will turns gray.*

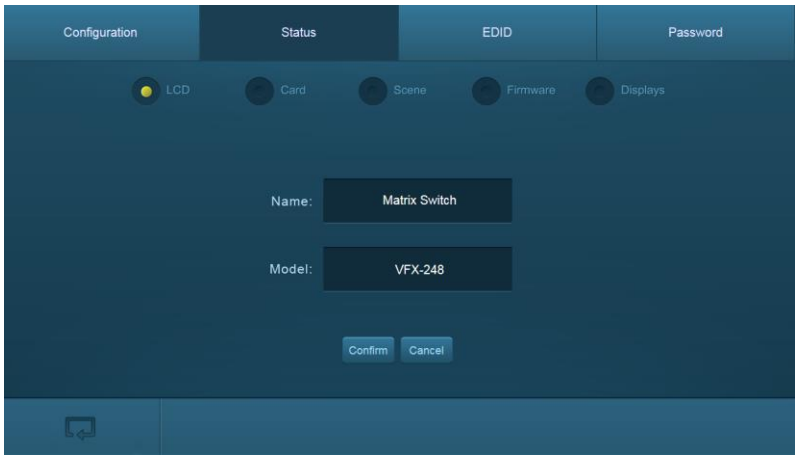
PGM OUT AUDIO PORT SETTING

This menu is only used for controlling the PGM port of VFX-OA1 signal card.

It supports MIC/LINE input selection and stereo/mono audio output selection.

The mixed audio volume can be adjusted.

PRODUCT NAME AND MODEL SETTING

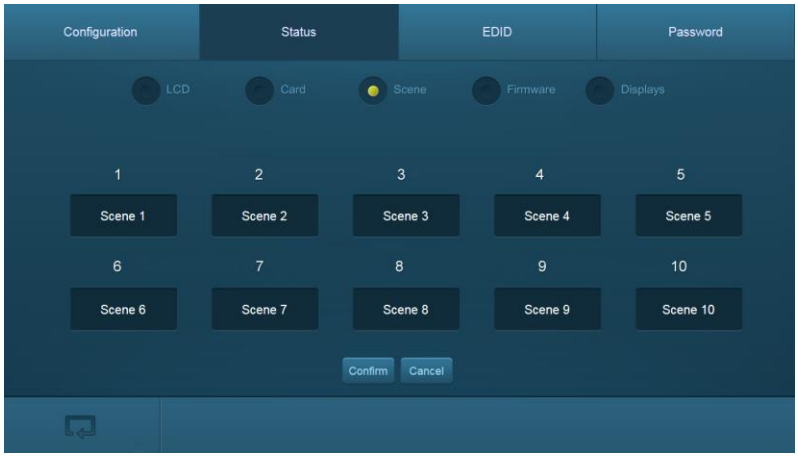


The product name and model can be renamed (max at 16 numbers/ letters).

SIGNAL CHANNELS LABEL SETTING

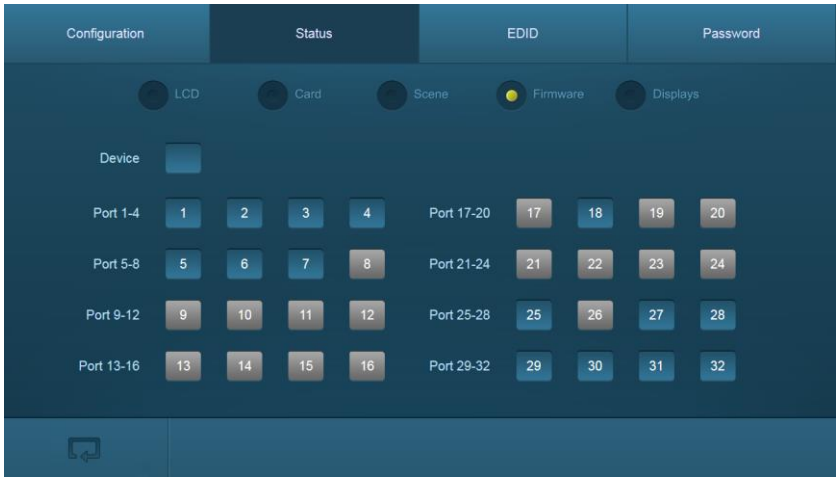
The input and output channels label can be reset (max at 7 numbers/ letters/ Chinese characters).

SCENE NAME SETTING



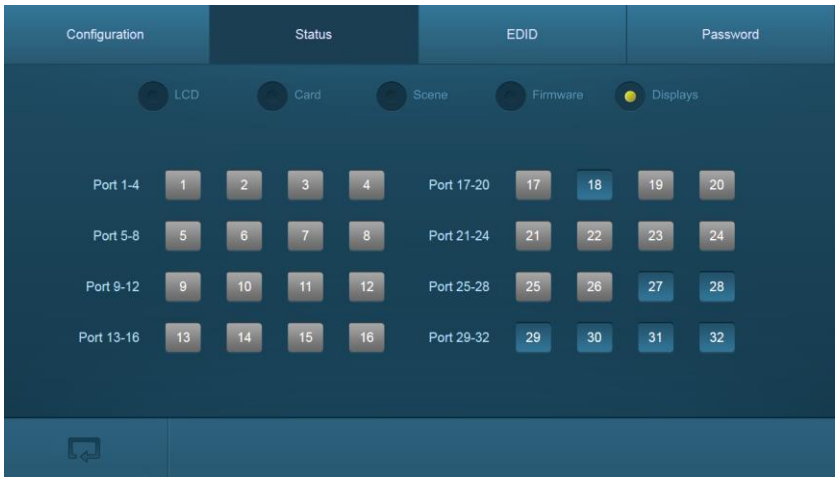
The scene can be rename (max at 7 numbers/ letters/ Chinese characters).

Firmware Version Query



Click the corresponding button to get the firmware version of device or signal card.

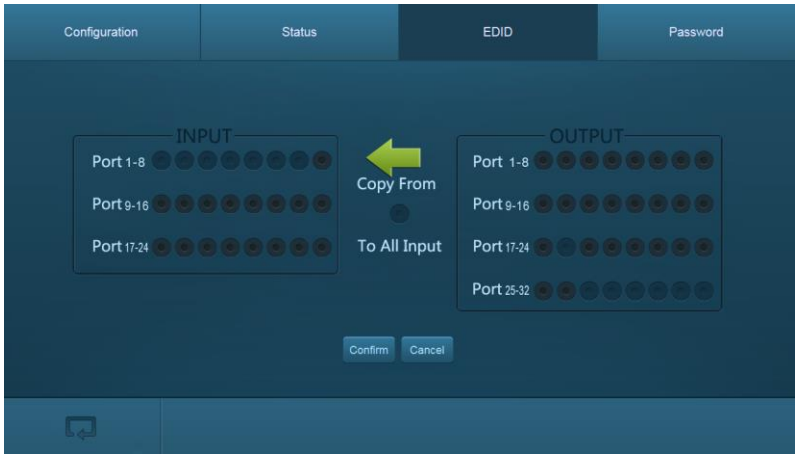
Display Resolution and Brand Query



Click the corresponding button to get the display resolution and brand from output port.

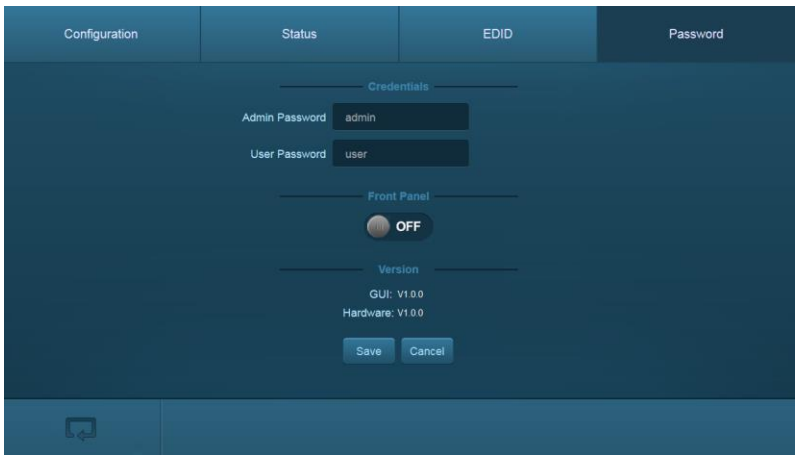
EDID LEARNING

On EDID management interface, enable one/all input(s) capture and learn the EDID data from one output.



- One input learns EDID from one output: **Output** + **Input** + **Confirm**
- All inputs learn EDID from one output: **Output** + **To All Input**
- Undo the previous input: Click "**Cancel**"

PASSWORD SETTING



The password can be reset (max at 10 numbers/ letters).

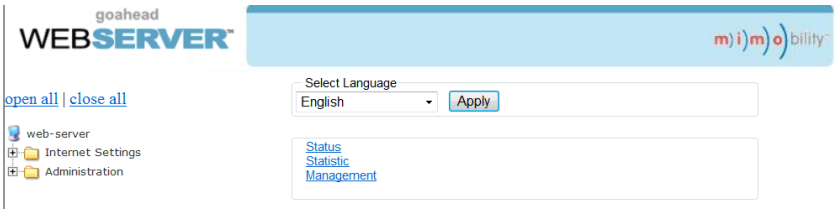
GUI and Hardware version can be inquired.

Note: *Clear the cache of the browser beforehand to ensure reliable GUI operation.*

PORT MANAGEMENT

Type the designed website 192.168.0.178:100 (Default, changeable via GUI) in your browser. Enter correct username and password (same with GUI name and password) to log in the WebServer:

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.

FIRMWARE UPGRADE

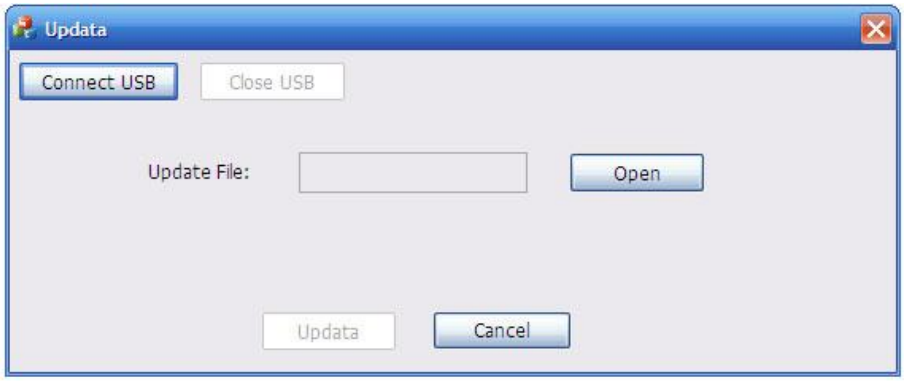
The switcher boasts a USB port for online firmware upgrade on the front panel. Follow these steps to upgrade firmware:

Step1. Copy the upgrade software and the latest upgrade file (.bin) to PC.

Step2. Connect the USB ports of the switcher and the PC via USB cable.

Step3. Double-click the update software icon (see as below).

It will enter the upgrade interface shown as below:



Step4. Click **Connect USB**.

Step5. Click **Open** to load the upgrade file, then click **Updata** to start firmware upgrading.

Note:

- *To ensure available control, the COM number of the PC should be 1~9.*
- *If the update progress bar can't go on, please cut off power, and then restart this machine to update firmware again.*

SPECIFICATION

MAIN UNIT

Connectors	
Control	(1) IR ALL IN, (1) IR EYE, (1) RS232, (1) TCP/IP
Card Slot	32 PCI-E
Control Connectors	(2) 3.5mm mini jack; (1) DB9; (1) RJ45
General	
Power Supply	100~240V AC
Power Consumption	26W（no load）
Operation Temperature	0 ~ +40˚C
Storage Temperature	-10 ~ +55˚C
Relative Humidity	10% ~ 90%
Dimension (W*H*D)	19.0” (483mm) x 8.72” (221.5mm) x 15.08” (383mm)

SIGNAL CARDS

VFX-IHM& VFX-OHM

VFX-IHM	
Input	(1) HDMI;(1) Analog audio
Input Connector	(1) 19-pin Type A Female HDMI; (1) 3-pin pluggable terminal block
Power Consumption	4w (max)
VFX-OHM	

Output	(1) HDMI; (1) Analog audio
Output Connector	(1) 19-pin Type A Female HDMI; (1) 3-pin pluggable terminal block
Power Consumption	1.5w (max)
General	
Switching Speed	< 100ns
Standard	HDMI1.4 & HDCP2.2
Operation Temperature	0 ~ +40˚C
Storage Temperature	-10 ~ +55˚C
Relative Humidity	10% ~ 90%
EDID	Supports EDID Management
Output Resolution	Auto, 4Kx2K@60Hz 4:2:0, 4Kx2K@30Hz, 1024x768@60Hz, 1920x1080p@60Hz, 1280x720@60Hz

VFX-IHT& VFX-OHT

VFX-IHT	
Input	(1) HDBT; (1) Analog audio; (1) RS232; (1) IR IN; (1) IR OUT
Input Connector	(1) Female RJ45; (2) 3-pin pluggable terminal block; (2) 3.5mm mini jack
Power Consumption	15w (max)
VFX-OHT	
Output	(1) HDBT; (1) Analog audio; (1) RS232; (1) IR IN; (1) IR OUT

Output Connector	(1) Female RJ45; (2) 3-pin pluggable terminal block; (2) 3.5mm mini jack
Power Consumption	17w (max)
General	
Transmission Distance	1080p ≤230ft/70m(Cat6); 4Kx2K ≤131ft/40m(Cat6)
Switching Speed	< 100ns
Operation Temperature	0 ~ +40˚C
Storage Temperature	-10 ~ +55˚C
Relative Humidity	10% ~ 90%
Standard	HDMI2.0 & HDCP2.2
Audio	PCM
EDID	Supports EDID Management
Output Resolution	Auto, 4Kx2K@60Hz, 4Kx2K@30Hz, 1024x768@60Hz, 1920x1080p@60Hz, 1280x720@60Hz

VFX-IV4

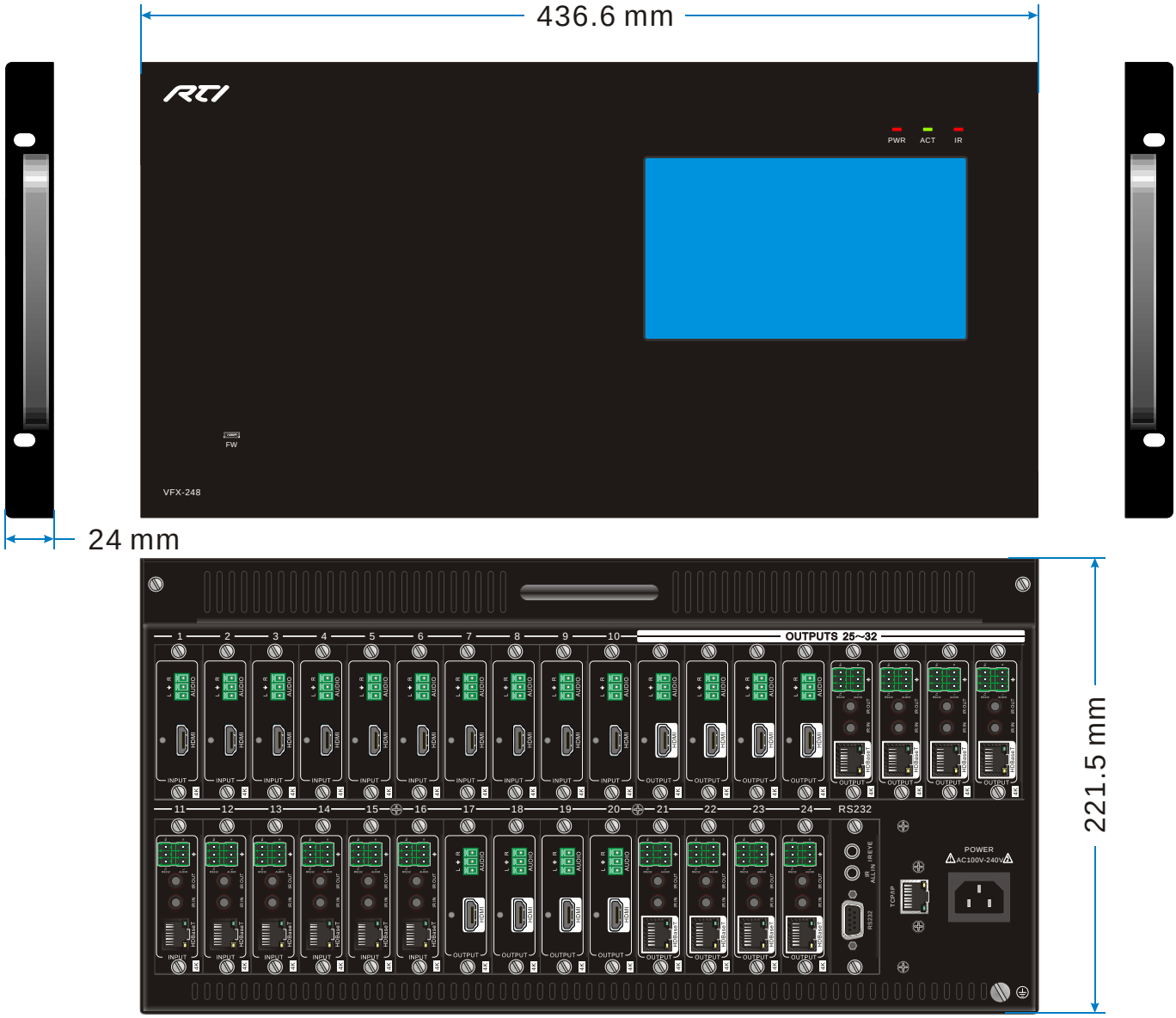
Video	
Input	(1) VGA
Input Connector	(1) Female 15 pin HD
Input Resolution	Up to 1920x1200@50/60Hz
Audio	
Input	(1) Analog audio
Input Connector	(1) 3-pin pluggable terminal block
Signal Format	PCM

Frequency Response	20Hz~20KHz, ±0.5dB
CMRR	>85dB@20Hz~20KHz
General	
Power Consumption	2w (max)
Switching Speed	< 100ns
Operation Temperature	0 ~ +40˚C
Storage Temperature	-10 ~ +55˚C
Relative Humidity	10% ~ 90%

VFX-OA1

Input	(1) MIC/LINE IN
Input Connector	(1) 3-pin pluggable terminal block
Output	(1) MIX OUT; (1) PGM OUT
Output Connector	(2) 3-pin pluggable terminal block
General	
Signal Format	PCM
Power Consumption	5W
Frequency Response	20Hz~20KHz, ±0.5dB
CMRR	>85dB@20Hz~20KHz
Operation Temperature	0 ~ +40˚C
Storage Temperature	-10 ~ +55˚C
Relative Humidity	10% ~ 90%

PANEL DRAWING



TROUBLESHOOTING & MAINTENANCE

Problems	Potential Causes	Solutions
Color losing or no video signal output in HDMI display.	The connecting cables may not be connected correctly or it may be broken.	Check whether the cables are connected correctly and in working condition.
No HDMI signal output in display while local input is working normally.	Loose cable connection.	Reconnect the devices and make sure they're well contacted.
	The display doesn't support the resolution.	Set output resolution to other supportive ones or Auto.
Splash screen in output devices.	Poor quality of the connecting cable.	Change for another cable of good quality.
	Poor contact at the input/ output end.	Reconnect the devices and make sure they're well contacted.
Cannot control the device via front panel buttons.	Front panel buttons are locked.	Send "#FPL:UNLOCK!" to unlock.
Cannot control the matrix switcher by control device (e.g. a PC) through RS232 port.	Wrong RS232 communication parameters.	Make sure the RS232 communication parameters are correct.
	The matrix switcher is broken.	Send it to authorized dealer for repairing.
Static becomes stronger when connecting the video connectors.	Bad grounding.	Check the grounding and make sure it is connected well.

If your problem persists after following the above troubleshooting steps, seek further help from 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

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

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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