



**VIS-PHD Series 4K All-In-One
Matrix User Manual**







V1.0

VISSONIC ELECTRONICS LIMITED


The meaning of symbols

■ Safety instructions

For your safe and correct use of equipments, we use a lot of symbols on the equipments and in the manuals, demonstrating the risk of body hurt or possible damage to property for the user or others. Indications and their meanings are as follow. Please make sure to correctly understand these instructions before reading the manual.

	<p>This is A level product, which may cause radio interference in the living environment. In this case, users may need to take the feasible measures to get around the interference.</p>
	<p>Remind users that the dangerous voltage without insulation occurring within the equipment may cause people suffer from shock</p>
	<p>CE certification means that the product has reached the directive safety requirements defined by the European Union. Users can be assured about the use of it</p>
	<p>SGS certification means that the product has reached the quality inspection standards proposed by the world's largest SGS.</p>
	<p>This product passed the ISO9001 international quality certification (certification body: TUV Rheinland, Germany).</p>
	<p>Warning: in order to avoid electrical shock, do not open the machine cover, nor is the useless part allowed to be placed in the box. Please contact the qualified service personnel.</p>

■ General information instructions

	<p>It lists the factors leading to the unsuccessful operation or set and the relevant information to pay attention to</p>
---	---

Important note



Warning

In order to ensure the reliable performance of the equipment and the safety of the user, please observe the following matters during the process of installation, use and maintenance:

The matters needing attention of installation

- ◆ Please do not use this product in the following places: the place of dust, soot and electric conductivity dust, corrosive gas, combustible gas; the place exposed to high temperature, condensation, wind and rain; the occasion of vibration and impact . Electric shock, fire, wrong operation can lead to damage and deterioration to the product, either;
- ◆ In processing the screw holes and wiring, make sure that metal scraps and wire head will not fall into the shaft of controller, as it could cause a fire, fault, or incorrect operation;
- ◆ When the installation work is over, it should be assured there is nothing on the ventilated face, including packaging items like dust paper. Otherwise this may cause a fire, fault, incorrect operation for the cooling is not free;
- ◆ Should avoid wiring and inserting cable plug in charged state, otherwise it is easy to cause the shock, or electrical damage;
- ◆ The installation and wiring should be strong and reliable, contact undesirable may lead to false action;
- ◆ For a serious interference in applications, should choose shield cable as the high frequency signal input or output cable, so as to improve the anti-jamming ability of the system.

Attention in the wiring

- ◆ Only after cutting down all external power source, can install, wiring operation begin, or

it may cause electric shock or equipment damage;

- ◆ This product grounds by the grounding wires .To avoid electric shocks, grounding wires and the earth must be linked together. Before the connection of input or output terminal, please make sure this product is correctly grounded;

- ◆ Immediately remove all other things after the wiring installation. Please cover the terminals of the products cover before electrification so as to avoid cause electric shock.

Matters needing attention during operation and maintenance

- ◆ Please do not touch terminals in a current state, or it may cause a shock, incorrect operation;
- ◆ Please do cleaning and terminal tighten work after turning off the power supply. These operations can lead to electric shock in a current state;
- ◆ Please do the connection or dismantle work of the communication signal cable , the expansion module cable or control unit cable after turning off the power supply, or it may cause damage to the equipment, incorrect operation;
- ◆ Please do not dismantle the equipment, avoid damaging the internal electrical component;
- ◆ Should be sure to read the manual, fully confirm the safety, only after that can do program changes, commissioning, start and stop operation;

Matters needing attention in discarding product

- ◆ Electrolytic explosion: the burning of electrolytic capacitor on circuit boards may lead to explosion;

Preface

This manual describes the performance parameters of the VISSONIC VIS-PHD series matrix switchers and how to use and troubleshoot them.

The manufacturer will update the version number of the manual upon the change of technical parameters and system use. Please use the latest product manual.

VISSONIC Electronics Limited possesses the copyright of this manual. This manual is protected by the Copyright Law of the People's Republic of China and other intellectual property laws. No part or all of this manual may be copied or modified without permission.

Version	Description	Date
1.0	Released	2022-06-08

Table of Contents

Chapter 1	Overview	6
1.1	Main Features	6
1.2	Controller installation	8
1.3	System connection diagram	9
Chapter 2	Hardware description	9
Chapter 3	Front and rear panels	10
Chapter 4	Command table	11
Chapter 5	Web control	13
5.1	Connection	13
5.2	Interface and functions	14
Chapter 6	Instructions for lower computer keys	17
6.1	Matrix switch	17
6.2	Saving and calling the switch state	18
6.3	Query and setting	18
Chapter 7	Troubleshooting	20

Chapter 1 Overview



The VISSONIC VIS-PHD series HDMI matrix switchers are of high performance and applicable to computer and video signals with resolutions up to 4K/60 and 4:4:4 chroma sampling. They support HDMI 2.0 parametric standards, including data rates up to 10.2 Gbps, color depth of 12 bits, 3D, HD lossless audio format, and CEC. These HDCP1.4-compliant matrix switchers adopt EDID Manager and Key Manager technology, as well as HDMI input equalization and output pre-emphasis to adapt to different cables and long transmission distances and ensure reliable system operation. To simplify integration, digital audio from either output can be de-embedded and output through a digital or analog stereo port. Available in fixed sizes from 4x4 to 16x16, the VISSONIC VIS-PHD series is ideal for applications requiring reliable, high-performance matrix switching of 4K/60 HDMI video and audio signals.

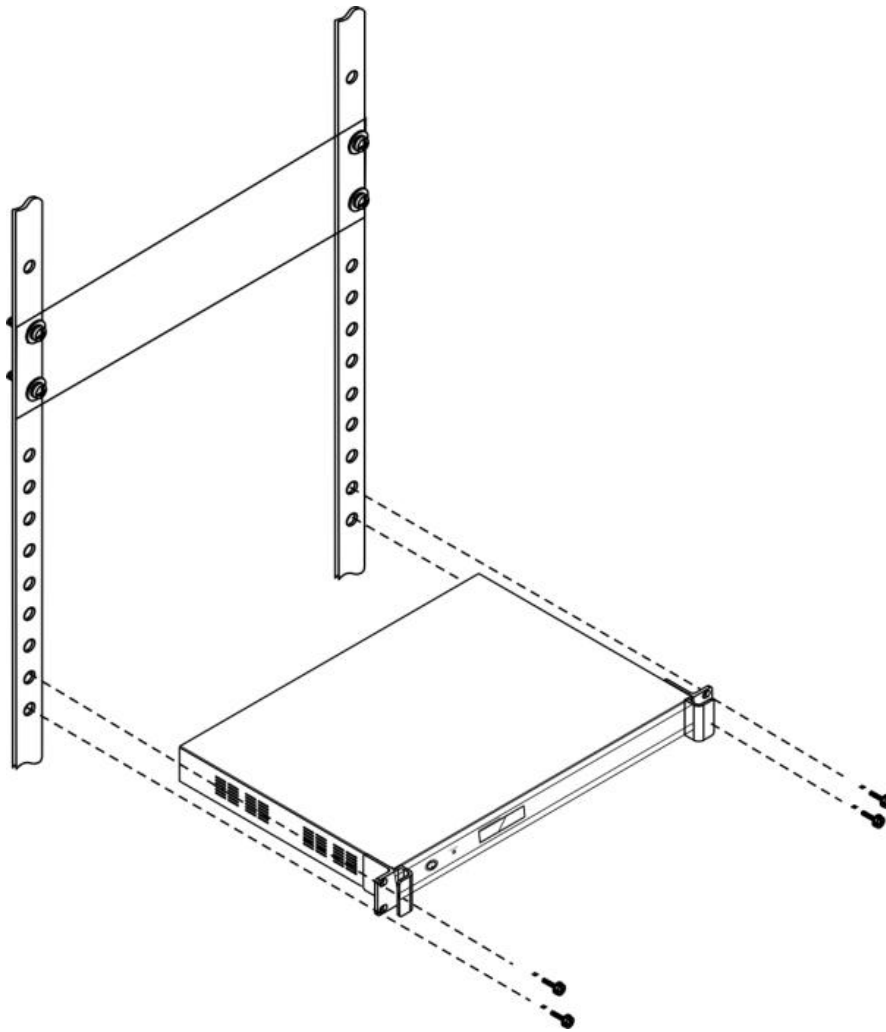
The VISSONIC VIS-PHD series matrix switchers can work with computers equipped with a 4K graphics card, 4K media players, 4K Blu-ray players, and other similar signal sources, as well as display devices with a physical resolution of 4K. With a maximum data rate of 10.2 Gbps, the matrix switchers support computer and video signals in 4:4:4 color space, 8-bit color depth, and a resolution up to 4096x2160/60 Hz. In addition, they provide full support for 1080p/60 signals with 12-bit color depth. To maintain signal integrity, the matrix switchers exploit automatic cable equalization and output clock recovery to reorder and recover the timing of each HDMI output video signal. When combined with the VISSONIC VIS-PHD series high-speed HDMI cables, these features enable 4K signal transmission with a longer distance and compensate for signal loss from weak source signals or during long-distance transmission, thereby reducing the use of additional signal conditioning devices. The output also provides power (+5 VDC, 50 mA) for peripheral devices.

1.1 Main Features

- 1) Fixed input/output sizes from 4x4 to 16x16.
- 2) Support for resolutions up to 4Kx2K (YcbCr420)@60 Hz and 4Kx2K@30 Hz.
- 3) Support for HDMI 2.0 parametric standards, including data rates up to 10.2 Gbps, color depth of 12 bits, 3D, HD lossless audio format, and CEC.

- 4) **HDMI audio de-embedding, with digital-analog stereo audio output:** The VISSONIC VIS-PHD series can extract embedded HDMI dual-channel LPCM audio to the analog audio output. HDMI audio can be in compressed or uncompressed format. The output frequency ranges from 32 kHz to 192 kHz, and the analog audio can be 48 KHz.
- 5) **CEC - Consumer Electronics Control:** The control system can trigger built-in standard CEC commands to operate displays or other video and audio devices connected by HDMI. Depending on the device manufacturer's settings, functions such as power on/off, input selection, or volume level are controllable.
- 6) **Comprehensive EDID management:** Read the EDID of the output display to the input HDMI port, or upload a customized EDID file.
- 7) **HDR - High Dynamic Range Video:** Provide the video bandwidth, color depth, and metadata exchange capabilities required for HDR video signals, with support for a larger contrast range and a wider color gamut.
- 8) **Ultra-fast switching for HDCP-encrypted content.**
- 9) **Continuous validation of HDCP standards by Key Manager for fast, reliable switching:** Key Manager validates and maintains continuous HDCP content encryption between input and output devices, ensuring fast, reliable switching in professional video and audio environments. It allows the simultaneous distribution of one source signal to two or more display devices.
- 10) **HDCP 1.4 compliant:** Ensure proper display of content-protected media and interoperability with other HDCP-compliant devices.
- 11) **Support for DDC transmission.**
- 12) **HDMI to DVI interface format correction:** Automatically correct the HDMI source signal format to match the DVI display device.
- 13) **Automatic input cable equalization:** Actively adjust the incoming HDMI signal to compensate for signal loss caused by the use of long cables, inferior cables, or source devices with weak HDMI signal outputs. **Automatic output clock recovery:** Reorganize and restore the timing of each HDMI output signal for long-distance transmission via HDMI cables.
- 14) **+5 VDC, 50mA power provided by HDMI output for powering peripheral devices.**
- 15) **Global presetting:** For medium to large systems, the 4x4 to 16x16 models allow users to save up to 9 common input/output configurations and recall them via the front panel, Ethernet, or serial control. This time-saving feature allows users to set input/output configurations and save them in memory for future use.
- 16) **Front panel controller:** Separate keys for each input and output make operation easier and more intuitive.
- 17) **Viewing input/output modes:** Users can easily view the current switching status of inputs and outputs via the front panel.
- 18) **Audio separation:** Separate analog audio signals from their corresponding video signals.
- 19) **Ethernet monitoring and control:** Provide active monitoring, management, or control via LAN, WAN, or Internet by using standard TCP/IP protocols.
- 20) **RS-232 control port:** The matrix switcher can be integrated into the system by using serial commands.

1.2 Controller installation



1.3 System connection diagram



Chapter 2 Hardware description

Parameters of the PHD series products:

Model	VIS-PHD44	VIS-PHD88	VIS-PHD1616
Input type	4 HDMI	8 HDMI	16 HDMI
Output type	4 HDMI + 4 analog audio	8 HDMI + 8 analog audio	16 HDMI + 16 analog audio
Video protocol	HDMI 1.4b, HDCP 1.3, DVI1.0 compliant		
Maximum resolution	Support for HDMI1.4b, 4Kx2K@30 Hz and HDMI 2.0; YCbCr420 4Kx2K@60 Hz		

HDMI	Type A, 19-pin, female		
Serial interface	RS-232 input, DB9, female; RS-232 output, DB9, male		
Length of input cable	Adaptive equalizer, with cable length up to 30 m		
Length of output cable	≤ 15m		
RJ45 control protocol	TCP/IP		
Ethernet rate adaptive	10M/100M		
Storage environment	Temperature: -20°C to +70°C; Humidity: 10%-90%		
Operating environment	Temperature: -20°C to +70°C; Humidity: 10%-90%		
Power supply	AC 110-240V		
Maximum power consumption	15 W	25 W	45 W
Chassis specification	1U	1U	2U
Dimension	(430x260x44.5) mm	(430x260x44.5) mm	(430x260x89) mm
Weight	3.5 kg	3.5 kg	5.5 kg
MTBF	30,000 hours		
Warranty	1-year warranty, lifetime maintenance		

Chapter 3 Front and rear panels

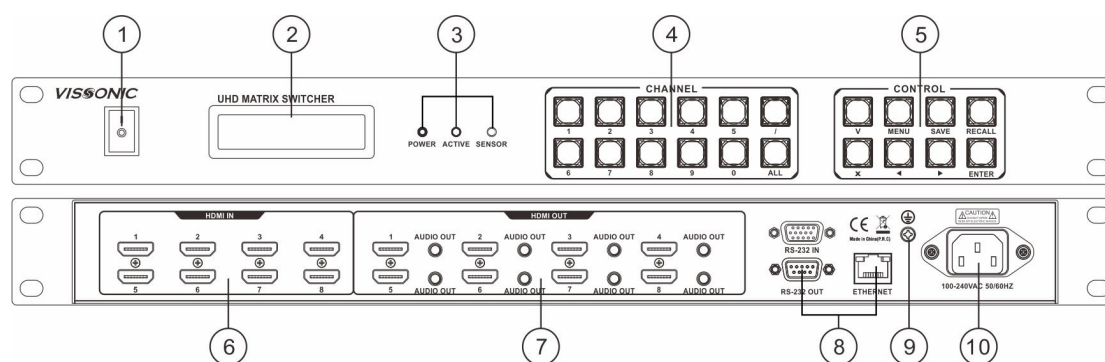


Figure 1 Front and rear panels of the VIS-PHD88 series matrix switcher

The front and rear panels of the PHD88 series 4K all-in-one matrix switcher contain:

1. **Power switch:** Turns on or off the power of the matrix switcher.
2. **Display:** Displays the current matrix status and command input and results.
3. **Signal indicator:** "POWER": Power indicator; "ACTIVE": Command receiving status indicator; "SENSOR": Infrared receiving status indicator.
4. **Channels 0-9:** Input channel number and output channel number buttons. "/": An isolator

- used for selecting multiple channels at the same time; "ALL": Selects all output channels.
5. **Control command button:** Changes IP; "V": Switches commands; "SAVE": Saves scenes; "RECALL": Calls scenes; left, right, and menu selection buttons.
 6. **HDMI IN:** Signal input source. Provides 4/8/16 HDMI input ports for connecting the corresponding input source devices.
 7. **HDMI OUT:** Signal output source. Provides 4/8/16 HDMI output ports and 4/8/16 analog audio output ports for connecting to corresponding output devices.
 8. **RS-232 IN:** Provides a separate RS-232 port (DB9 female) for connecting to a PC or central control device for centralized control of systems. **RS-232 OUT:** Provides a separate RS-232 port (DB9 male) for connecting to a PC or central control device for centralized control of other systems. **ETHERNET:** RJ45 network interface - Ethernet connection port, can be used to connect to LAN, Internet, etc. If the green indicator is on, the connection is normal. If the orange indicator blinks, data is being received or sent.
 9. **Grounding post**
 10. **Power input port:** Working power supply for the system. Supports AC 100-240V 50/60 Hz input.

Chapter 4 Command table

Serial protocol: Baud rate: 9600 Data bit: 8 Stop bit: 1 Checksum bit: None

Ethernet: Protocol: TCP IP: 192.168.1.189

Serial command table:

Command	Function	Parameter description	Returned information
<Version>	Queries the control card version.	None	<MCU:Ver1.2>
/:BellOff;	Turns off the buzzer.	None	<BellOff>
/:BellOn;	Enables the buzzer.	None	<BellOn>
[x]V[y].	Switches input signals of channel [x] to the output of channel [y] for video switching.		V:[x] -> [y]

[x]All.	From the input of channel [x] to the output of all channels. If [X1] is 0, all output videos will be turned off.	The return command is consistent with the command for switching signals.	
All#.	For one-to-one correspondence of videos.		
Save[Y].	Saves the current state to group [Y].		<Save to F1!>
Recall[Y].	Recalls the plan of group [Y].		Returns the save state of the current plan.
Clear[Y].	Clears the plan of group [Y].		<Clear F1!>
<#SIPR[192].[168].[0].[2]>	Sets the matrix network IP address.		<SIPR:[X1].[X2].[X3].[X4]>
<#GAR[192].[168].[0].[1]>	Sets the network gateway number.		<SUBR:[X1].[X2].[X3].[X4]>
<#SUBR[255].[255].[255].[0]>	Sets the network subnet mask.		<GAR:[X1].[X2].[X3].[X4]>
<#SHAR[08]:[15]:[51]:[00]:[50]:[31]>	Sets the network hardware address (hexadecimal).	<SHAR:[X1]:[X2]:[X3]:[X4]:[X5]:[X6]>	<#SHAR[08]:[15]:[51]:[00]:[50]:[31]>
<#NETDEFAULT>	Restores factory settings of the network.		Default: 192.168.1.189
<^NET>	Queries network information.		
<#DEFAULT>	Restores factory settings of the		

	matrix.		
--	---------	--	--

Chapter 5 Web control

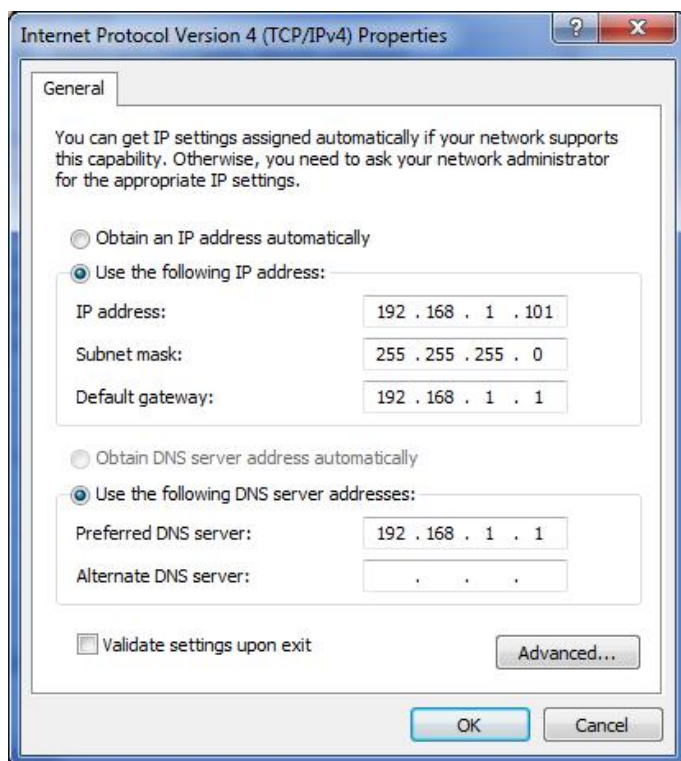
5.1 Connection

1. Connect to the router via a CAT 5 network cable for TCP/IP communication.

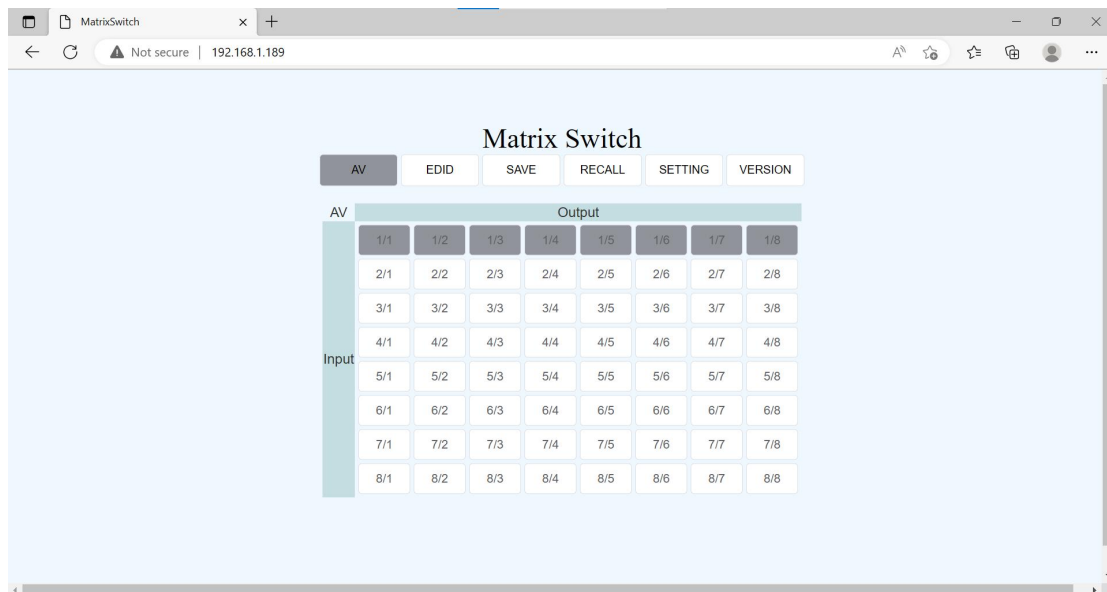


The default IP address of the matrix is 192.168.1.189. Set the same network segment when assigning an address to the router.

2. If you adopt PC-side control, set the following IP address.

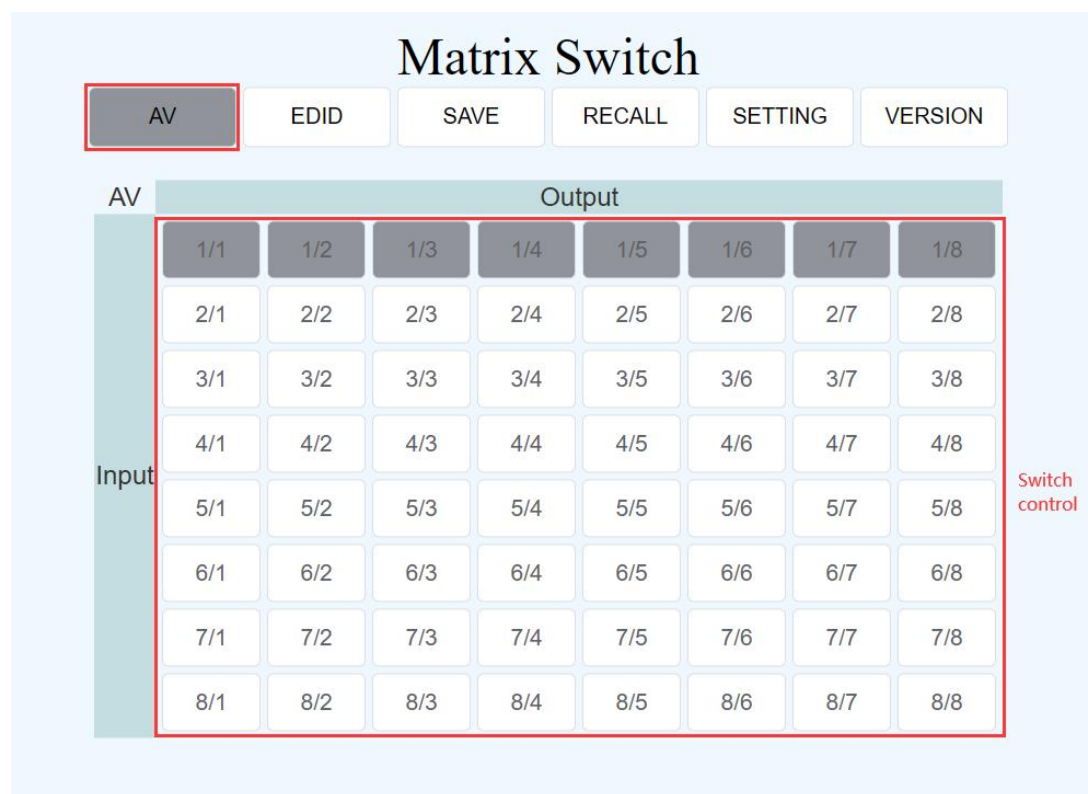


- Open the mobile or PC browser to enter the matrix IP address 192.168.1.189 to enter the control interface.



5.2 Interface and functions

- The connection is successful if you can log in to this interface, where you can perform control. Click "AV" to enter the matrix switch control interface.



5. EDID management: The EDID of the output display can be read to the input HDMI.

Matrix Switch

AV
EDID
SAVE
RECALL
SETTING
VERSION

	Output							
Input	1/1	1/2	1/3	1/4	1/5	1/6	1/7	1/8
	2/1	2/2	2/3	2/4	2/5	2/6	2/7	2/8
	3/1	3/2	3/3	3/4	3/5	3/6	3/7	3/8
	4/1	4/2	4/3	4/4	4/5	4/6	4/7	4/8
	5/1	5/2	5/3	5/4	5/5	5/6	5/7	5/8
	6/1	6/2	6/3	6/4	6/5	6/6	6/7	6/8
	7/1	7/2	7/3	7/4	7/5	7/6	7/7	7/8
	8/1	8/2	8/3	8/4	8/5	8/6	8/7	8/8

EDID Management

6. Save the matrix plan.

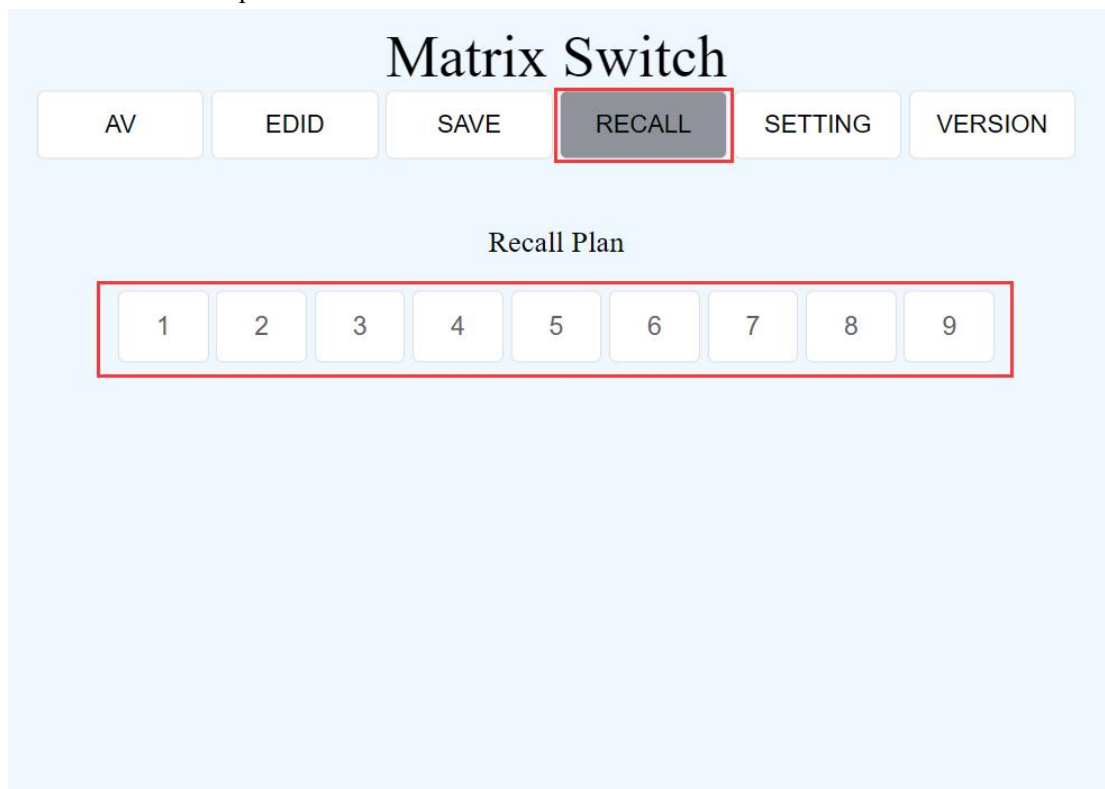
Matrix Switch

AV
EDID
SAVE
RECALL
SETTING
VERSION

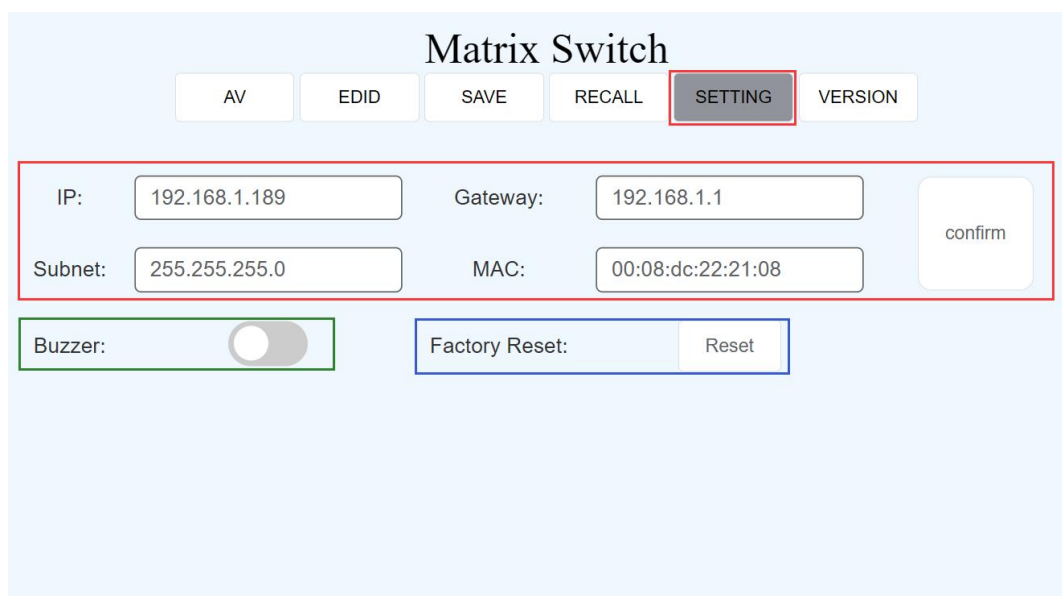
Save Plan

1
2
3
4
5
6
7
8
9

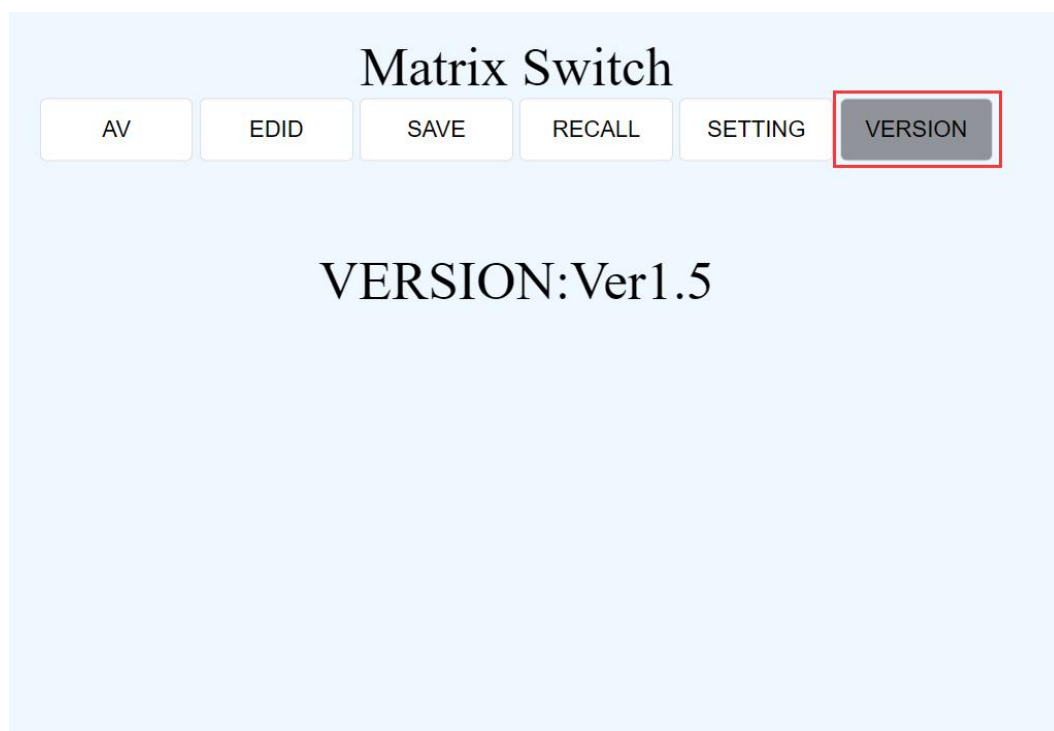
7. Call the matrix plan.



8. Settings include network settings and factory reset. You can modify the matrix IP network, and then restart the matrix.



9. Query the version.



Chapter 6 Instructions for lower computer keys

6.1 Matrix switch

Example 1: Operate the keys as follows to switch "input channel 1" of the matrix to "output channel 2".

Press	Displayed content	Remarks
1	1	Select "input channel 1".
V/M	1V	It means the matrix switch character V if you press it once.
2	1V2	Select "output channel 2".
ENTER	Switch OK!	The switch process is finished.

Example 2: Operate the keys as follows to switch "input channel 1" of the matrix to "output channel 2" and "output channel 3".

Press	Displayed content	Remarks
-------	-------------------	---------

1	1	Select "input channel 1".
V/M	1V	It means the matrix switch character V if you press it once.
2	1V2	Select "output channel 2".
,	1V2,	Separator
3	1V2,3	Select "output channel 3".
ENTER	Switch OK!	The switch process is finished.

Example 3: Operate the keys as follows to switch the "input channel 1" of the matrix to "all output channels".

Press	Displayed content	Remarks
1	1	Select "input channel 1".
ALL	1All.	The switch process is finished.

6.2 Saving and calling the switch state

1. Save the current **PHD matrix** switch state. You can save a maximum of 10 states, which correspond to keys 0-9.

To save the current switch state of the matrix, operate the keys as follows:

Press	Displayed content	Remarks
SAVE	Save Switch Plan	
2	Save OK!	Save to "state 2" successfully.

2. Call the **PHD matrix** switch state.

To call the saved state of the matrix, operate the keys as follows:

Press	Displayed content	Remarks
RECALL	Recall Switch Plan	
2	Recall OK!	Calling "state 2" is successful!

6.3 Query and setting




1. Query the network parameters.

Press	Displayed content	Remarks
MENU	IP SETTING 192.168.001.189	Display the IP address.
MENU	GATEWAY SET	Display the gateway.

	192.168.001.001	
MENU	SubnetMask SET 255.255.255.000	Display the subnet mask.
MENU	PORT SETTING 80	Display the port number.

2. Modify the network parameters.

Example: Modify the original IP address 192.168.001.189 to 192.168.001.180.

Press	Displayed content	Remarks
IP	IP SETTING 192.168.001.189	Display the IP address.
◀		Enter the modification interface. The modification cursor will be displayed.
◀ Or ▶		Move the cursor to the target location.
0		Enter the new value.
ENTER	Set Succeed!	The setup is successful.

The operations for modifying the port number, gateway, and subnet mask are similar to the above operations. Press the "IP" key to enter the corresponding interface, and then press ◀ or ▶ to modify the parameter.

NOTE: After modifying the network parameters, you need to restart the matrix for the modification to take effect.

NOTE: The network parameters of the web page need to be modified in the web interface, and they cannot be modified by key operation

Chapter 7 Troubleshooting

Fault description	Solution
The matrix cannot be switched.	<ul style="list-style-type: none"> • Check whether the command input is correct. The buzzer will beep when the device receives a correct command, and the processing result will be returned.
	<ul style="list-style-type: none"> • Check whether the wiring of the device is normal. The "active" indicator on the front panel will flash when the device receives data.
	<ul style="list-style-type: none"> • Check whether the power supply of the device is normal.
Matrix output has no image.	<ul style="list-style-type: none"> • Send commands or go to the PC web page to check whether the corresponding port of the device is working properly, and check the corresponding firmware version.
	<ul style="list-style-type: none"> • Check the matrix output or PC web page switching to confirm whether input signals enter the matrix. If there is no signal input, "noinput" is displayed.
	<ul style="list-style-type: none"> • The matrix will automatically generate a black signal at the output when there is no input source. Check whether the signal is detected at the display.
	<ul style="list-style-type: none"> • If there is no problem with the above items but no signal is detected, check whether the display device works properly, whether it displays information for the directly connected signal, and whether it supports the current output resolution of the matrix. If the resolution is not supported, change the output resolution of the matrix. You can also connect the matrix directly to the display device and test whether the display device is normal.