User Manual

Fixed Seamless HDMI Matrix Switch

Document Description

Before using this product, please read this manual carefully and store it properly for future reference. Please read the safety operation manual carefully and pay attention to the warning symbols for danger and caution.

This manual is only for user operation instructions and is not intended for maintenance services. The deadline for the described functions is July 25, 2023. Any changes to the functions or related parameters after this date will be supplemented and explained separately without further notice. Detailed information can be obtained from various dealers.

Trademark Declaration: All other trademarks or registered trademarks mentioned in this document are owned by their respective owners.

This manual takes the 4x4 fixed seamless switching matrix rendering as an example for explanation. The product images are for reference only, please refer to the actual product.

#	Name	Panel Color	Height	Max Input channels	Max Output channels	Power
1	4x4 fixed seamless switching matrix	black	1U	4	4	DC5V
2	8x8 fixed seamless switching matrix	black		8	8	DC12V
3	16x16 fixed seamless switching matrix	black		16	16	

This article applies to the following types of hybrid card processors:

Safe Operation Guidelines

To ensure the reliable use of equipment and the safety of personnel, please follow the following precautions during installation, use, and maintenance:

⚡ danger
● There are live parts inside the equipment. Non professionals are not allowed to disassemble the equipment without permission to avoid electric shock.
● Do not disassemble the equipment when powered on or in operation to avoid the risk of electric shock.
● Do not operate with wet hands to prevent electric shock.
● It is strictly prohibited to use the product in an environment containing flammable substances, explosive gases, or heat sources.

⚠ Attention
● This is an A-level product that may cause radio interference in living environments, and users need to take practical and feasible measures to prevent interference.
● It is strictly prohibited to sprinkle any corrosive chemicals or liquids on or near the equipment.
● Do not block the heat dissipation holes and maintain good ventilation in the working environment, so that the heat generated by the equipment during operation can be discharged in a timely manner to avoid damage to the equipment due to excessive temperature.
● Do not place the device on an unstable surface to prevent it from falling and causing damage.
● To avoid equipment damage caused by strong vibrations during transportation, it is recommended to use appropriate packaging or original packaging during transportation.
● Do not use heavy objects to squeeze the power cord and equipment.
● The equipment must use a grounded power supply.
● When handling equipment, be careful not to drop it and avoid causing personal injury or equipment damage.
● When in a humid environment or when not in use for a long time, the main power supply of the equipment should be turned off.
● The equipment must be inspected and tested before use after being stored for a long time.
● Before cleaning the equipment, it must be powered off and cleaned with a dry cloth.
● Equipment scrap should be treated as industrial waste and incineration is strictly prohibited.

Table of Contents

1. Product Introduction

1.1. Functional Features

- Supports seamless and fast switching from multiple inputs to multiple outputs.
- Supports multiple fixed and splicing modes.
- Supports HDMI/DVI for both inputs and outputs, supports resolution up to 3840x2160@30Hz.
- Input and output color space support RGB4:4:4, YCbCr4:4:4,YCbCr4:2:2, etc..
- Built-in 7 different EDID for inputs, default 1920x1080@60Hz 2ch, supports user defined.
- Input is compatible with DVI / HDMI signal.
- Output support combo port default 9 output resolutions selectable.
- Output signal combination port format support HDMI, DVI.
- Support low power consumption standby and power cut off memory.
- Supports continuous hot-plugging and unplugging of HDMI interface.
- Support two-way serial port control, panel key control, optional network port control.
- 1U height 19-inch standard cabinet mount chassis.

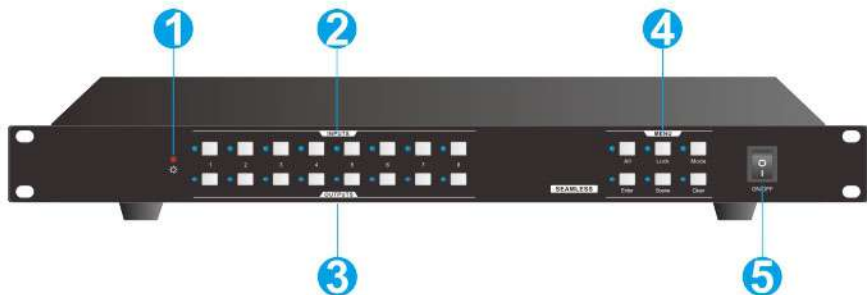## 1.2. Packing List

- 1 x Fixed Seamless HDMI Matrix Switch
- 1 x RS232 Cable (3-pin to DB9)
- 1 x Power Adaptor (5V DC 1A)
- 1 x User Manual

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

2. Product Appearance

2.1. Front Panel

NO.	Name	Describe
①	Power indicator light	• The equipment is working normally, and the indicator light is always red; • In standby mode, the indicator light is off; • Power off, indicator light off
②	INPUTS	White input channel switch button;
③	OUTPUTS	White output channel switch button;
④	MENU function button area	**All**: Select All button • Switch one input signal to all output channels; **Lock**: • Lock: Press and hold the lock button for 3 seconds. • Unlock: Press and hold for 3 seconds to unlock the button. **Mode**: Scene Save: →Mode+INPUTS 1+Enter **ENTER**: Confirm operation. **SCENSE**: Scene call button to call the scene. **CLEAR**: Clear button to clear an unfinished action.
⑤	ON/OFF switch	Power on/off

Attention: The product pictures are for reference only, please refer to the actual product.

2.2. Rear Panel

NO.	Name	Describe
①	**INPUTS**	HDMI input port, connecting to HDMI signal source, automatically detecting connection status;
②	**OUTPUTS**	HDMI output port, connected to display, automatically detecting connection status;
③	**RS232-IN**	Connect control devices, such as PC computers, and control the local computer through upper computer software;
④	**RS232 OUT**	Connect other peripherals, such as matrices, splicers, etc., to control peripherals; Choose between network port and DB9 *Note: 16x16 without control network port*
⑤	**Power interface**	Connect the power supply DC5V;
⑥	**RJ45**	Optional, enhanced support for network control.
⑦	**Grounding terminal**	Grounding terminal

Attention: *The product pictures are for reference only, please refer to the actual product.*

3. System Connection

3.1. Matters Needing Attention

- The installation and use environment of the system should be kept clean, with appropriate temperature and humidity, and good ventilation, without blocking the heat dissipation holes;

- All power switches, plugs, sockets, and power cords of the equipment in the system must ensure insulation safety;

- Connect the peripheral devices and finally power up the system.

3.2. Connection Diagram

3.3. Connection Steps

- Step 1: Connect an HDMI source, such as DVD, to the HDMI input port in the INPUTS area with an HDMI cable.

- Step 2: Connect a display device such as HDTV to the HDMI output port of the OUTPUTS area using an HDMI cable.

- Step 3: Connect the control device (e.g., PC) to the RS232 IN port with an RS232 serial cable.

   The machine can be controlled by command or by the upper computer.

- Step 4: Connect the power adapter to the power connector.

4. Panel Switching Control

The front panel buttons consist of channel buttons and function buttons, which can be used to control the machine, such as signal switching and scene calling.

4.1. Signal switching

This machine includes multiple input channels and multiple output channels, and can switch any one input signal to one output or all channel outputs. The operation method is as follows:

1) **To convert 1 input to 1 output:**

    Example: Input 1 to Output 2

    → Press **INPUTS 1** + **OUTPUTS 2** + **ENTER** button.

2) **To convert 1 input to ALL outputs:**

    Example: Input 1 to ALL

    → Press **INPUTS 1** + **ALL** button.

3) **To convert 1 input to 2~3 outputs:**

    Example: Input 1 to Output 2, Output 3, Output 4.

    → Press **INPUTS 1** + **OUTPUTS 2, Output 3, Output 4** + **ENTER** button.

4.2. Scenario Management

Save Scene

Example: → Press **Modle** + **INPUTS 1** + **ENTER** button. Supports 4 groups of scenes.

Scene Recall

Example: → Press **Scene** + **INPUTS 1** + **ENTER** button. Supports 4 groups of scenes.

4.3. Clear outstanding operations

Please press the CLEAR button if want to withdraw an operation before the ENTER button comes into effect, meanwhile, the matrix will return to the previous status.

## 4.4. LOCK Function

Long press the LOCK button for three seconds, all buttons on the front panel disable to work. And then long press the LOCK button for three seconds again or unlock on GUI control, the front panel button will unlock.

5. Serial Port Control

The Seamless HDMI Matrix Switch is connected to the control computer, and the Seamless HDMI Matrix Switch can be controlled by the RS232 serial port software, the RS232 IN port is a 9-pin female connector, and the RS232 OUT port is a 9-pin male connector; the RS232 OUT1 port is a network port, and the pin descriptions are as follows:
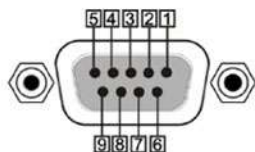
DB9 Female head

Pin	Name	Function
1	N/u	null
2	Tx	Send
3	Rx	Receive
4	N/u	null
5	Gnd	GND
6	N/u	null
7	N/u	null
8	N/u	null
9	N/u	null
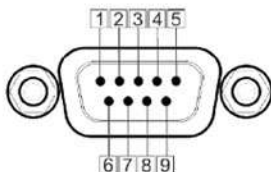
DB9 Male head

Pin	Name	Function
1	N/u	null
2	Rx	Receive
3	Tx	Send
4	N/u	null
5	Gnd	GND
6	N/u	null
7	N/u	null
8	N/u	null
9	N/u	null

RJ45 插头

Pin	colour	Name	Function
1	Orange White	N/u	null
2	orange	Tx	null
3	Green White	Rx	TX sending
4	blue	N/u	Public land
5	Blue White	Gnd	Public land
6	green	N/u	RX reception
7	Brownish white	N/u	null
8	Brown	N/u	null

5.1. Control Software Operation

Taking SSCOM32 as an example for serial port control software.

Installation method: Copy the RS232 serial port control software to a working control device PC in the system.

Uninstall method: Delete the folder where the entire serial port control software is located.

Basic settings: Double click on the software running icon in the installation package (as shown below) to install the RS232 software on the computer.

Enter the main interface of the software, as shown in the following figure:
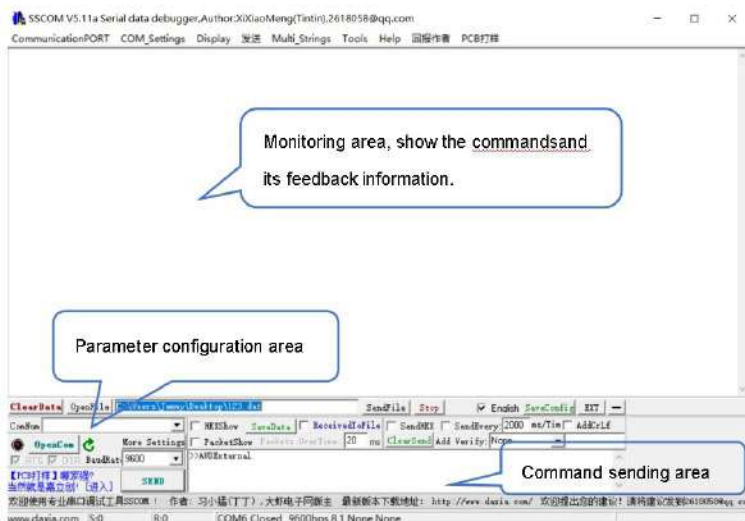
Correctly fill in the serial port number, baud rate, data bits, stop bits, and check bits of the communication protocol in the parameter configuration area to input commands in the command input area and control the local or remote receiver.

5.2. RS232 Instruction

Communication protocol: Default baud rate: 11520 Data bits: 8 Stop bits: 1 Check bits: None

1) The instructions include host function settings, channel switching, status query, output resolution settings, and other operations. Please refer to the instruction table for details.

2) In the following instructions, "[" and "]" are non sending characters, and "," and "." cannot be omitted. Additionally, in the instructions, "()", characters, and punctuation are input in English input mode;

3) Pay attention to distinguishing between uppercase and lowercase in instructions;

4) Please note that certain instructions are set for different ports and have been clearly marked in the corresponding instruction function description section;

5) Some instructions may have different feedback code information depending on the device status, and the article only provides examples of feedback information;

5.3. Host Control Commands

RS232 instruction	Function Description	Return code	Remarks
(Stand by)	**system standby**	System off OK	
(wakeup)	System wake-up	System on OK	
(reset)	Restore factory settings	Factory reset OK	
(info, dev)	Query device information	MUH0404S System on Unlock OK	
(info, link)	Query port connection status	Ch 1 2 3 4 In Y Y N N Out Y Y N N OK	
(ver)	Version Query	Mcu ctrl v1.0.0 OK	
(rename, product, [param])	Set product name Param=MUH0404S	Product name: MUH0404S OK	Example: (rename, product,

RS232 instruction	Function Description	Return code	Remarks
			MUH0404S)
(lock, [param])	Key lock Param=0~1	Lock OK	Example: (lock, 1)
(lock, [param])	1=lock 0=unlock	Unlock OK	Example: (lock, 0)
(update, edid, [param])	Write custom EDID Param 1-4 1. Custom 1 2. Custom 2 3. Custom 3 4. Custom 4	Please send edited file in 15s Okay Edid 1 updated OK	Example: (update, edid, 1) Overtime feedback: Edid update time out OK
(edid, config, [inch], [param])	Calling EDID Inch=1-8 Param=1-10 1 1024x768@60Hz Dual channel 2 1280x720@60Hz Dual channel 3 1360x768@60Hz Dual channel 4 1920x1200@60Hz Dual channel 5 1600x1200@60Hz Dual channel 6 1920x1080@60Hz Diphthong Dao (default) 27 3840x2160@30Hz Dual channel 7. Custom 1 8. Custom 2 9. Custom 3 10. Custom 4	In 1 edid 1 OK	Example: (edid, config, 1,1)

RS232 instruction	Function Description	Return code	Remarks
(edid, config, [inch], [param])	EDID Learning Param=11~14 Inch=1-16 11. Learning the EDID of output 1 12. Learning the EDID of output terminal 2 13. Learning the EDID of output terminal 3 14. Learning the EDID of output 4 26. Learn the EDID of output terminal 16	In 1 edid 14 OK	Example (edid, config, 1,14)
(get, i.edid, [inch])	Query EDID status	In 1 edid 4 OK	Example: (get, i.edid, 1)
(sw, [inch], [output])	One input switching one output Input=Input channel Outch=Output channel	Out 2 in 1 OK	Example: (sw, 1,2)
(sw, [inch], a)	Switching all outputs through one input Input=Input channel	Out 1 in 1 Out 2 in 1 Out 3 in 1 Out 4 in 1 OK	Example: (sw, 1, a)
(get, sw)	Query switching status	Out 1 in 1 Out 2 in 1 Out 3 in 1 Out 4 in 1 OK	
(get, i.res, [inch])	Obtain the current resolution of the input Ch=1-16	In 1 res 1280x720@60Hz OK	Example: (get, i.res, 1)

RS232 instruction	Function Description	Return code	Remarks
(scene, save, [Param])	Save Scene Param=Scene number (1-32)	Scene 1 saved OK	Example: (scene, save, 1)
(scene, call, [Param])	Call scenario Param=Scene number (1-32)	Scene 1 called OK	Example: (scene, call, 1)
(scene, del, [Param])	Scene deletion Param=Scene number (1-32)	Scene 1 deleted OK	Example: (scene, del, 1)
(set, o.format, [output], [mode])	Set output signal format Outch=1-16 Mode=0-HDMI Mode=1-DVI	Output hdmi 1 format is hdmi OK	Example: (set, o.format, 1,0)
(get, o.format, [output])	Query output signal format Outch=1-16	Output hdmi 4 format is HDMI OK	Example: (get, o.format, 4)
(get, o.res, [ch])	Query output resolution Ch=1-16	Out 1 res 1920x1200@60Hz OK	Example: (get, o.res, 1)
(set, o.res, [ch], [param])	Set output resolution Ch=输出 1~4 Param=1-12 1 1920x1200@60Hz 2 1920x1080@60Hz 3 1280x720@60Hz 4 1360x768@60Hz five 1280x1024@60Hz 6 1024x768@60Hz 7 1600x1200@60Hz 8 1440x900@60Hz 9 1600x900@60Hz 10 1280x720@50Hz 11 1920x1080@50Hz 12 3840x12160@30Hz	Out 1 res 1920x1200@60Hz OK	Example: (set, o.res, 1,1)

| RS232 instruction	Function Description	Return code	Remarks
(set, i.baud, [param])	Set input RS232 baud rate Param=1~5 1-9600 2-19200 3-38400 4-57600 5-115200 (default)	In baudrate 9600 OK	Example: (set, i.baud, 1)
(get, i.baud)	Query input RS232 baud rate	In baudrate 9600 OK	
(set, o.baud, [param])	Set output RS232 baud rate Param=1~5 1-9600 2-19200 3-38400 4-57600 5-115200 (default)	Out baudrate 115200 OK	Example: (set, o.baud, 5)
(get, o. baud)	Query output RS232 baud rate	Out baudrate 115200 OK	
(set, uart, [param])	Set serial port control mode Param=1 Both RS232 in and out can control this machine	RS232 mode: in&out control local OK	Example: (set, uart, 1)
	Set serial port control mode Param=2 RS232 in control can control local or RS232 in → RS232 out Control Third Party	RS232 mode: in control local&out OK	Example: (set, uart, 2)

6.　Client Control

6.1.　Software Installation

Control software: Contact the supplier to obtain it.

- Installation: Copy the control software installation package to the control computer, double-click the upper computer installation file, and follow the prompts to install the client software;

- Uninstall: Click on the start menu, find this control software in the "Programs and Features" section of the control panel, select it, right-click, and choose to uninstall this software. Finally, follow the instructions to uninstall this control software.

6.2.　Login

1) Double click on the matrix controller control software to open the upper computer software and enter the login interface

2) Click on "Connection Settings" to enter the connection settings interface

3) Select the control method "TCP/IP" or "COM port", and the default is COM connection.

4) Click on the 'Remember Password' option to log in again without entering the password again.

5) Click 'Exit' to exit the login interface.
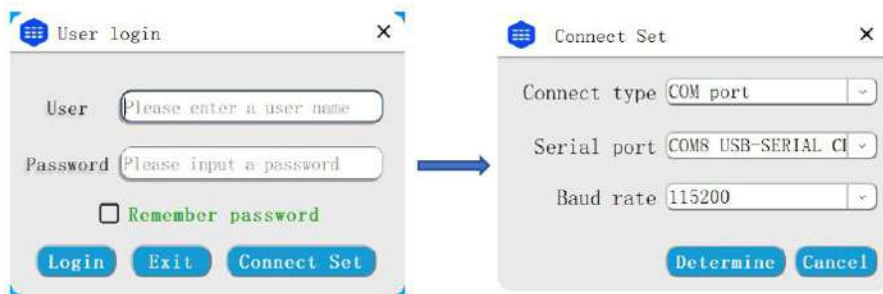
The default administrator account is admin, and the default password is "123456". For the user account, the default password is "123". If you need to modify the password, please go to the user management interface for operation. The login interface includes four parts of operation settings: remember password, login, exit, and connection settings.

📖Description: This machine supports 9600, 19200, 38400, 57600, and 115200, and can be set through command switching.

6.3.　Software Operation

After logging in and connecting to the software, enter the main interface, as shown in the following figure:
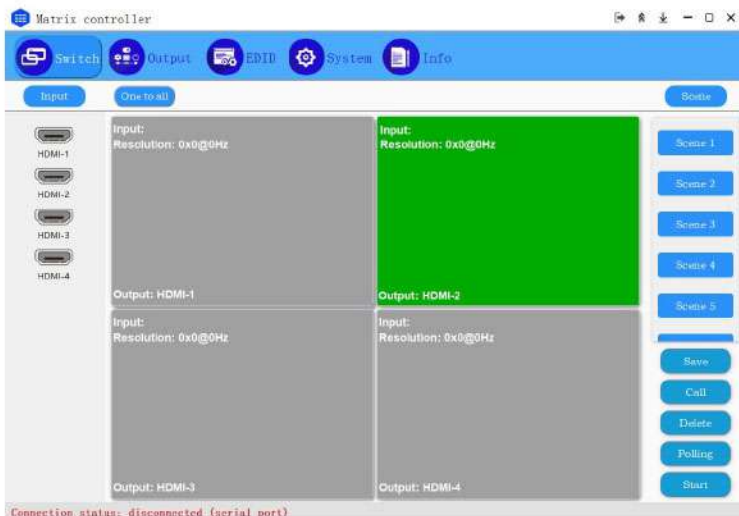
1.　Menu bar: mainly includes 5 operation interfaces, including "Signal Switching", "Output Settings", "EDID Settings", "System Settings", and "System Information";

2.　Input list: contains 1-4 input operable buttons;

3.　Status display: displays the current connection status and control method;

4.　Operation interface: The operation interface is divided into 1-4 output status information displays, with each display window displaying the current switched status information and the resolution of the current input signal source;

5.　Scene list: mainly includes functions such as "scene save", "scene call", "scene delete", and scene polling settings;

6.3.1. Signal Switching Interface

The signal switching interface mainly involves switching between input signal sources, scene saving, calling, and scene polling operations.

● **Signal switching method:**

1. Directly selecting the corresponding input and clicking on the output end of the operation interface can achieve switching from one input to one output or from one input to multiple outputs.

2. Simply select the corresponding input and click "One to All" to switch from one input to all outputs.

● **Scenario operation method:**

Can save 1-16 scenes and call saved scenes at will

● **Scene save:**

Directly click on the scene button in the list and corresponding click on the scene save to achieve the scene save function.

● **Call scenario:**

Directly clicking on the saved scene button corresponds to clicking on the scene call to achieve scene call

● **Scenario deletion:**

Simply click on the saved scene button corresponding to the scene deletion button to achieve scene deletion

● **Scenario Polling:**

1. Click directly to enter the polling settings, add existing scenes to the polling scene list, set the time interval, and confirm to save.

2. Click on "Start Polling" to implement the scene polling function.
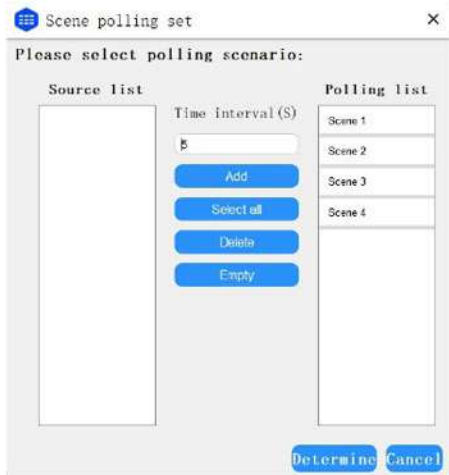
6.3.2. Output Setting

The output setting interface mainly allows for setting the resolution, output signal format, and brightness contrast function settings of the output end.
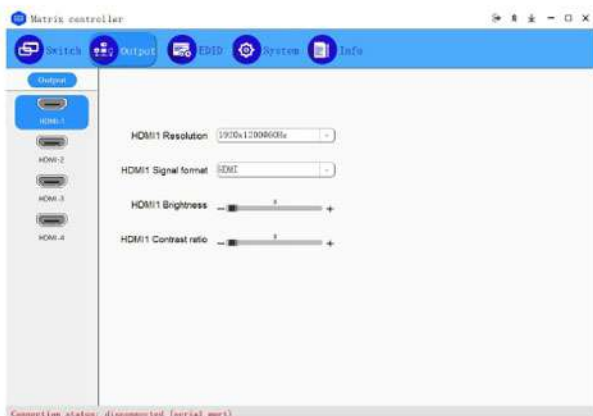
6.3.3. EDID Settings

The EDID setting interface can call or learn built-in, customized, and output EDID data to the input end.

📖Explanation:

1. 7 built-in EDIDs

2. Copy Output 1 to Copy Output 4 are the EDID data of the output end.

3. 'Custom EDID1'~'Custom EDID4' are customizations that require uploading the EDID file data before being called

6.3.4. System Settings

This operation interface includes 5 settings interfaces, namely: "Model Settings", "User Management", "Connection Settings", "Firmware Upgrade", "Device Control", "Language Settings", and "Channel Naming".

1. Model setting: Modify the device name.

2. User management: For modifying administrator accounts and ordinary user account passwords, etc.

3. Connection settings:

   ● IP settings: Set IP related parameters.

   ● Serial port setting: Set the baud rate for RS232 input and RS232 output.

4. Firmware upgrade: Upgrade the device microcontroller program online.

5. Device control: includes 5 function keys, namely: "Restore to factory", "System standby", "System wake-up", "Key lock", "Key unlock". Click on the above function keys to achieve the function.

6. Language selection: Modify the upper computer language version to support both Chinese and English.

7. Channel naming: can name input and output scenes

📖 **Explanation:**

1) Devices without network ports do not support IP related settings, please do not operate.

2) RS232 input and output baud rates cannot be modified simultaneously;

3) Both administrator and regular user names cannot be modified.

6.3.5. System Information

The system information includes two operation interfaces: "Port Status" and "About".
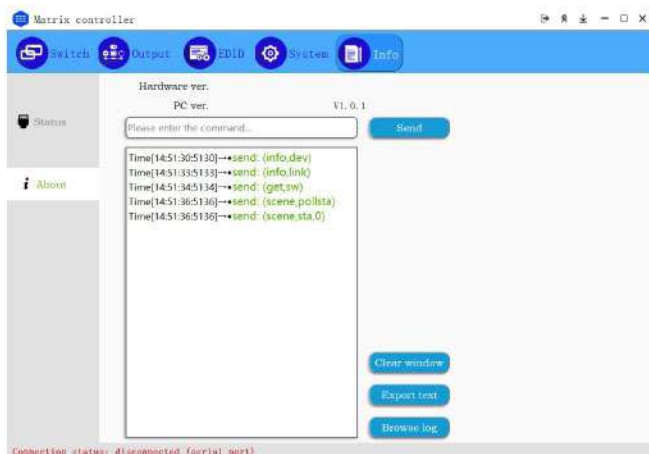
1. Port status: Display the connection status and current resolution of the input terminals (HDMI1~HDMI4) on the operation interface, and display the connection status and current resolution of the output terminals (HDMI1~HDMI4).

2. About: The interface displays the software and hardware version information currently used by the device. The operation bar below the version information can be used as a serial port tool to send instructions for control and display feedback information.

3. Clear Window: Clear the feedback information displayed on the interface.

4. Export Text: Export the record of the current operation. If there are any abnormalities, it is convenient for R&D personnel to troubleshoot problems.

5. View log: Similar to text, you can view operation records.

📖 **Explanation:**

The port status interface cannot automatically monitor the connection status and current resolution. You need to manually click the "Refresh Port Status" button on the interface.

7. Technical Parameter

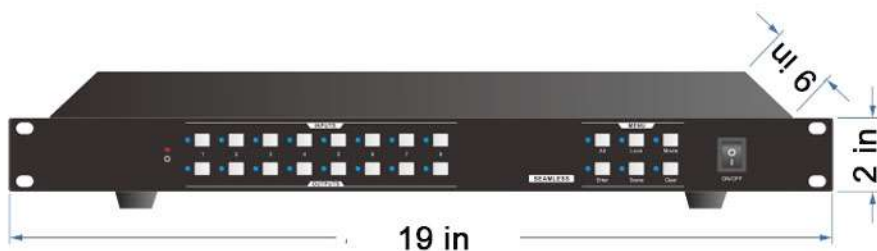|	4 x 4	8 x 8	16 x 16
Input signal	(4) Road HDMI	(8) Road HDMI	(16) Road HDMI
Input connector	Type A 19-pin female head		
Input resolution	highest 4K@30Hz RGB4:4:4, YCbCr4:4:4, YCbCr4:2:2		
output signal	(4) Road HDMI	(8) Road HDMI	(16) Road HDMI
Output connector	Type A 19-pin female head		
Output resolution	highest 4K@30Hz RGB 4:4:4,		
HDMI standard	HDMI1.4		
HDMI embedded audio	PCM		
control			
Control Port	(2) RS232, (1) Ethernet port		
Port connector	(1) DB9 RS232 input female connector, (1) DB9 RS232 output male connector, (1) RJ45 232 output		
Keys	White button, supporting switching and scene calling		
routine			
transmission distance	1080P ≤ 15m; 4K ≤ 5m; 1080P fiber optic cable HDMI interface with a maximum length of 50m; 4K fiber optic cable HDMI interface with a maximum length of 30m;		
bandwidth	10.2Gbps		
working temperature	0 ℃~+40 ℃		
Storage temperature	-10 ℃~+50 ℃		
relative humidity	10%~90%		
source	DC 5V 1A	DC 12V 2A	DC12V 2A
Size (W * D * H)	437mm * 236mm * 44mm		
Net weight	About 2 kg	About 3kg	About 3.5kg

8. Dimensional Drawing

4x4 fixed seamless switching matrix
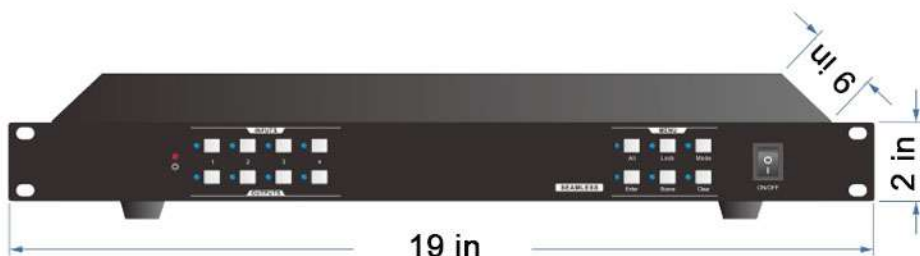
8x8 fixed seamless switching matrix

16x16 fixed seamless switching matrix