

# Matrix switcher system

## User manual

Please read this manual carefully before using this system

**matrix switcher system**

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## MATRIX DESCRIPTION

This manual is applicable to conventional slotted matrices and seamless matrices, and the operation methods of the two matrices are consistent except for special marked functions.

### EDID learning function:

Seam matrix supports EDID learning function; Seamless matrix does not support EDID learning, but can support setting output resolution;

### Regarding web control:

1. Both seamless matrix and seam matrix can be equipped with web control function as an option;
2. After customizing the web page control function at the factory, it is not possible to send instructions through the TCP/IP network port to achieve central control. The PC control software cannot control the matrix through TCP/IP, but the central control and PC control software can control the device through the serial port;
3. Factory customized routine programs allow for central control and PC control software control through both TCP/IP network and serial ports, but cannot be controlled through web pages;
4. Web control and regular shipping programs can only be chosen between two options, and once the factory leaves, users cannot choose between web and regular programs;

## MATRIX SYSTEM PACKAGING INSTRUCTIONS



Hybrid matrix switcher host

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Infrared remote control

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RS-232 communication cable

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power cable

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TK-MT matrix control software CD

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Equipment user manual and warranty card

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## MATRIX HOST INSTALLATION

The matrix host adopts an all metal chassis, which can be placed together with various devices. In addition, the matrix host also provides a standard machine installation bracket, allowing users to install the host on a standard industrial cabinet.

# MATRIX AND PERIPHERAL DEVICE CONNECTION

## Input and Output Interface Description

The product adopts a plug-in design method, and the input and output can be freely configured in quantity according to demand. The input and output modules supporting the matrix switch are all single card 4-way, and currently can be configured with HDMI, DVI, VGA, and SDI input boards; The slotted matrix supports HDMI, DVI, and VGA output boards, while the seamless matrix supports HDMI output boards. All boards are single card four way.

## Communication port and connection method

Both matrices provide standard RS-232 serial communication ports and LAN network control (either web or standard program).

## Connection method between matrix and computer signal input and output device

TK-MT series matrix switcher can be equipped with DVI and HDMI input/output modules. Users can connect various computer signals, audio and video signal devices, such as DVD players, desktop computers, graphics workstations, digital display consoles, etc. according to different occasions. The terminals can be connected to projectors, video recorders, computer monitors, amplifiers, etc.

## System topology:

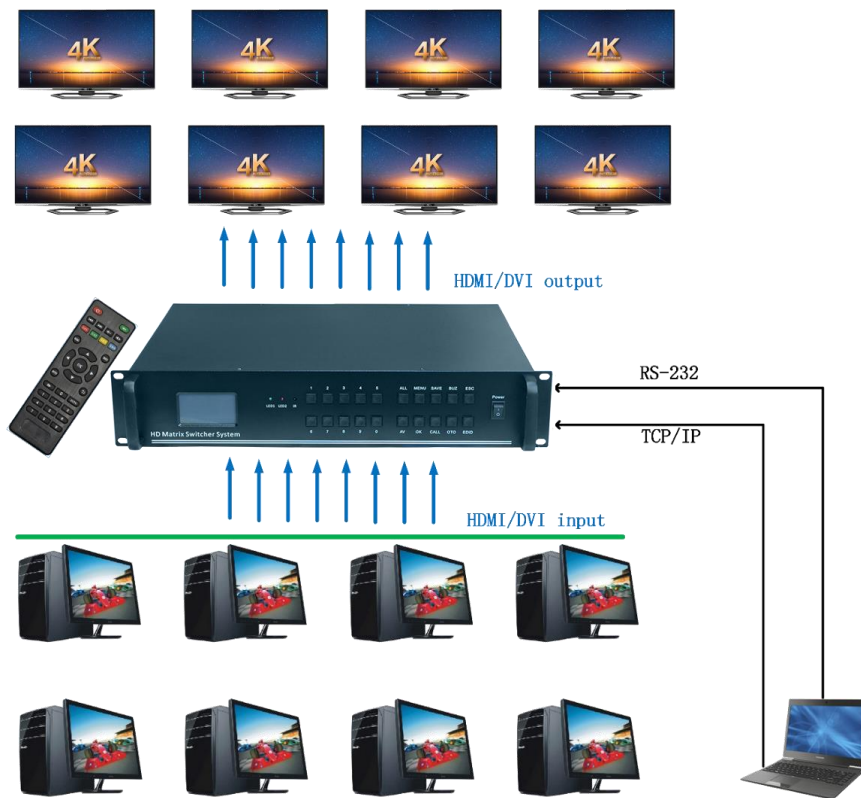


Figure 5-4 System connection diagram of matrix switcher

# CONTRON PANEL INSTRUCTIONS

## 7.1 Front panel schematic



## 7.2 Front panel function operation

The following is the front panel operation mode:

### 7. 2. 1 Key Description:

1, 2, 3, 4, 5, 6, 7, 8, 9, 0: number keys, fast switching scene keys, number selection keys;

In the operation interface, directly press the No. 1-3 button on the host or remote control, which means to select the item;

In the WELCOME menu, press the 1-9 button on the main unit or remote control to quickly switch the saved scene number.

AV: Signal switching setting;

ALL: Switch to all;

MENU: MENU;

SAVE: save the scene mode;

BUZ: scene mode setting;

ESC: Exit/cancel;

EDID: EDID information binding setting key;

CALL: scene mode call;

OTO: corresponding to switch, input 1, 2, 3, 4 switch to output 1, 2, 3, 4, and so on;

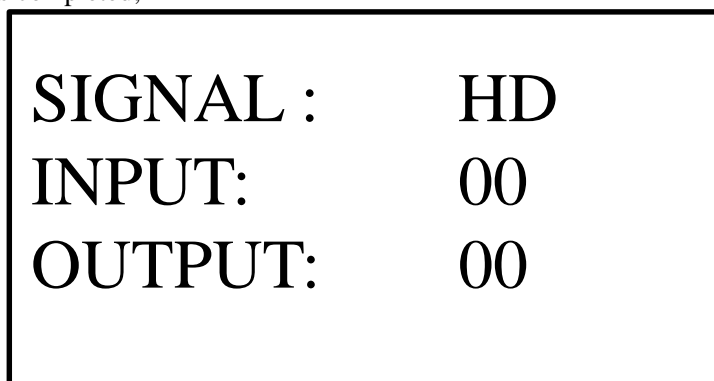
OK: Confirm / select;

### 7. 2. 2 Signal switching

After pressing the **AV** button, the small LED screen displays the signal switching interface as shown below. Press the number keys to select the input signal channel to be switched. After selecting the LED screen cursor, it will automatically move to the output channel column, press the channel you want to switch to, and then press **OK** key, the switch is completed.

Example 1, such as switching from input 2 port to output 8 interface: **AV**→**0**→**2**→**0**→**8**→**OK**, the cutting is completed;

Example 2: If the input 2 port is switched to all output interface switching modes: **AV**→**0**→**2**→**All**→**OK**, the cutting is completed;



### 7. 2. 3 Scene save

Save the set channel switching mode in the matrix switcher so that you can quickly call the mode later. For example, save the switched mode in the 3rd key, press the chassis button **SAVE** button to enter the system operation and select the scene save. as follows:

**SAVE**→**0**→**3**→**OK**, End of save;

### 7. 2. 4 Scene call

Call up the saved channel switch model, press the **CALL** button to enter the shortcut call, enter the desired scene number, and then press the **OK** button to complete the call; The specific operation is as follows:

**CALL**→**0**→**3**→**OK**, End of save;

### 7. 2. 5 reset

To completely restore the machine to the factory settings, press the **BUZ** button to enter the system operation, select to restore the factory press **OK** to complete;

### 7. 2. 6 Buzzer setting

Turn on or cancel the prompt sound when the matrix switcher is operating, press the MENU button to enter the system settings and select the buzzer setting, select on/off by the number 1 button and press the OK button to complete the setting;

### 7. 2. 7 Identification code setting

Many times, it is necessary to control multiple matrix switchers through one computer, so it is necessary to set the code of each machine to selectively control and control a certain machine. Press the Menu button to enter the system setting selection ID setting, enter the identification code number and press the OK button to complete the setting;

### 7. 2. 8 language settings

The matrix switcher can be set to two languages, simplified Chinese and English, enter the system setting through the MENU button, select the language setting, and switch the required language through the number 1 button; the specific operations are as follows:

**MENU**→**3**→**OK**→**1**→**OK**, End of save;

#### 7.2.9 Burning EDID information

Insert the signal source into the input port that needs to write EDID information;

Connect output 1 to the display unit that needs to match the EDID signal;

Start to operate the buttons about 1 minute after the machine is powered on. For example, the process of reading the EDID button is as follows:

**EDID**→**1**→**OK**, then the red indicator light flashes, the small LCD screen displays the EDID information read successfully, if it fails, it will display failure;

The process of burning port 2 into the EDID button is as follows:

**EDID**→**2**→**OK**→**0**→**2**→**OK**, the red indicator light flashes, and the EDID information writing is completed.

Note: The machine cannot be restarted immediately after writing the EDID, otherwise the writing will fail.

## EDID MANAGEMENT OPERATIONS

The slotted matrix can read the EDID information of the display device through operation and write it into the input boards of HDMI and DVI, making the resolution and refresh rate of the input signal compatible with the display device;

### 1. EDID information burning

Connect output terminal 1 to the display unit that needs to match the EDID signal;

Start operating the buttons approximately 1 minute after the machine is powered on, such as reading the EDID button. The process is as follows:

**EDID** → **1** → **OK**, the rear red indicator light flashes, and the small LCD screen displays that the EDID information has been successfully read. If it fails, it displays a failure;

The process of burning Port 2 into the EDID button is as follows:

**EDID** → **2** → **OK** → **0** → **2** → **OK**, the rear red indicator light flashes, and the small LCD screen displays that the EDID information has been successfully written, indicating that the writing of the EDID information is complete.

The process of burning all ports into the EDID button is as follows:

**EDID** → **2** → **OK** → **ALL** → **OK**, the rear red indicator light flashes, and the small LCD screen displays that the EDID information has been successfully written, indicating that the writing of the EDID information is complete.

Note: After writing the EDID, the machine cannot be restarted immediately, otherwise it will cause the write to fail

# Infrared remote control instructions



The device can be set by infrared remote control. The function is the same as the setting of the chassis key. This section lists the buttons and profiles corresponding to the remote control and the chassis keys.:

**Switch:** Signal switching key, the same function as the AV button of the chassis. After pressing the Switch button, press the number to set the input and output ports, and press the OK button to complete the switch;

**Menu:** Same chassis button Menu button;



: Same chassis button Esc button function;

**OK:** Same as the chassis button OK;

**SOURCE:** BUZ with the chassis button, press to enter the system operation;

**Number key:** same as the number selection key of the chassis;

**AUTO:** Same as the EDID key of the chassis;



: Same as chassis OTO button;



: Same as the case SAVE button;



: CALL key in the same chassis;



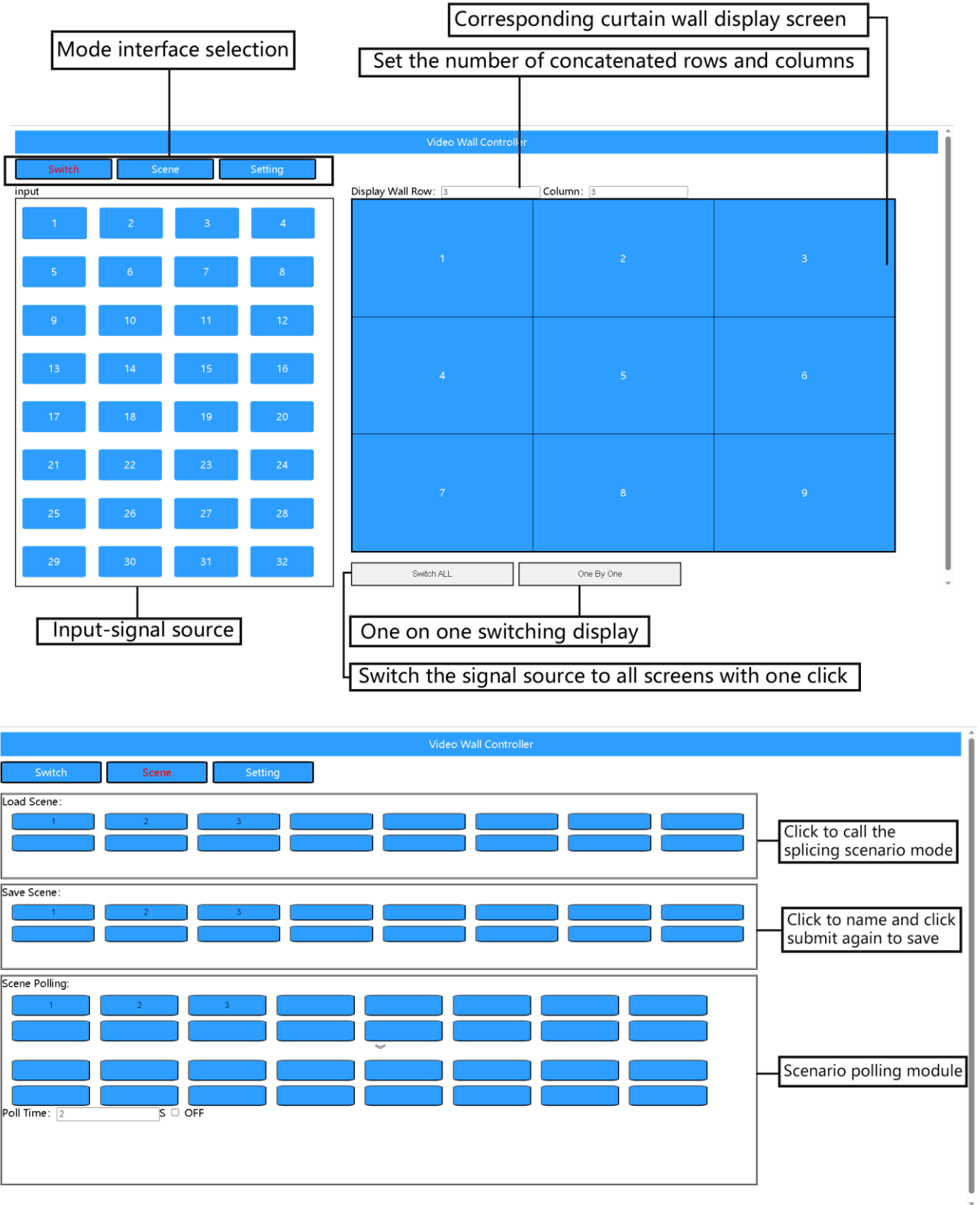
: Same as the chassis All button, set to switch to all outputs;

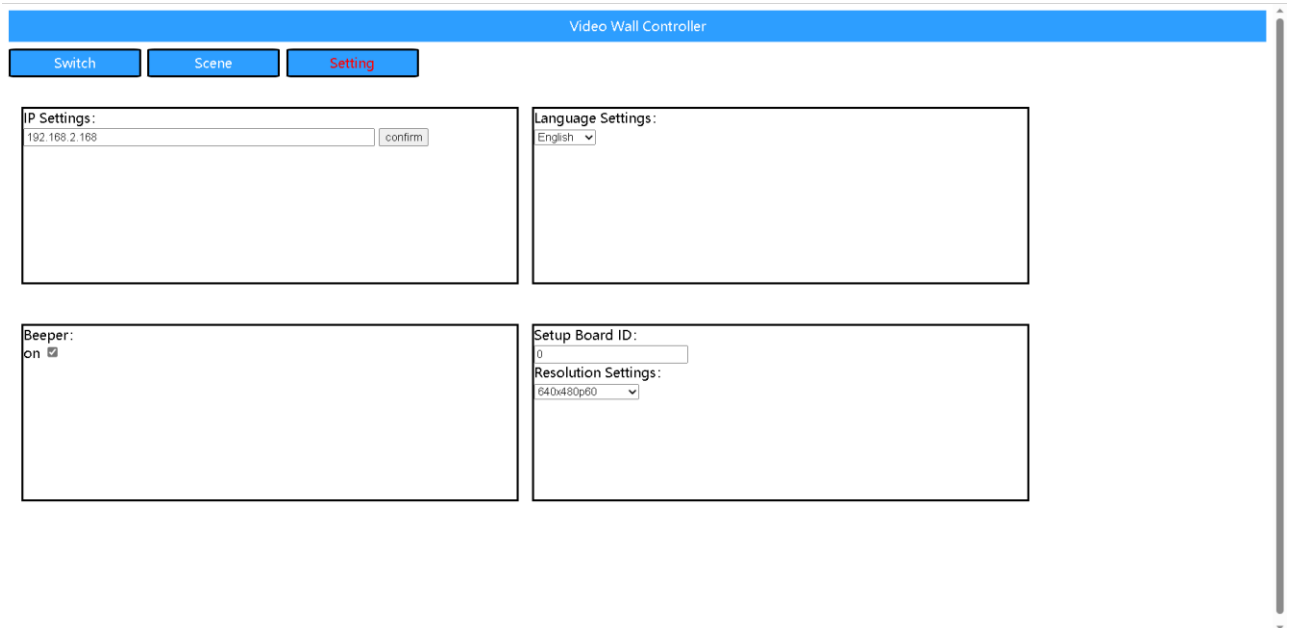


# Web Control

Note: Web control and TCP/IP control can only have one choice from two.

Connect the device to the local area network through a network cable, control the device on a computer, tablet, or phone through a web page, or connect the device directly to the computer through a network cable, and control the device through a web page. The following is a web side diagram:





### WEB operation method:

1. The control end is directly connected through a network cable or connected to the same local area network as the machine.
2. Open Google Chrome, enter the initial IP 192.168.2.168 in the address bar, and enter the login password 123456 in the pop-up login interface.
3. If the network segment is not 2 segments and is connected through a local area network, it needs to be modified to another network segment IP. Use a serial port to connect to the machine, set the baud rate to 9600, and send the following command through the serial port assistant:  
HWS192.168.1.172.255.255.0.192.168.1.1 (1 after 168 can be modified to any network segment) or directly use the upper computer software to modify it, refer to point 10 of Chapter 9.
4. Set the number of curtain wall rows corresponding to the large screen.
5. Switch signal sources, hold down the signal source with the mouse and drag it to the corresponding display screen on the right curtain wall.
6. One click to switch to all, first click on the signal source, and then click on the one click to switch to all buttons; One to one switching, click to switch signal sources one by one.
7. Mode saving: After setting the splicing screen, click the scenario save button, enter the scenario name, click submit, and the scenario will be saved in the corresponding mode. Click the corresponding button in the scenario call column to call it up.
8. Scenario polling function: Click the corresponding scenario mode above the arrow of the polling module to add it to the polling column below the arrow. If you want to cancel, click the scenario corresponding to the polling column below the arrow; Enter the time and click to check to start polling.
9. Language settings, click on the dropdown box to select the language; Buzzer switch, click to check to turn on and off the buzzer;

# HOST COMPUTER OPERATION INSTRUCTIONS

Communication via RS-232 serial port or TCP/IP, control the device through the control software on the computer, and the lower computer diagram:

The screenshot shows the TuuKoo control software interface. It includes sections for 'Com Setting' (COM1, Baud 9600), 'Net Setting' (IP 192.168.1.168, Port 6800), 'Scene Save' (1-16 buttons), 'Scene Load' (1-16 buttons), 'Matrix In' (input channels 1-16), and 'Matrix Out' (output channels 1-16). There are also buttons for 'Buzz On', 'Buzz Off', 'VGA Auto', 'Switch', 'Switch All', and 'One By One'. A 'Tset code' field is at the bottom with a 'send' button.

**Obtain the IP address of the matrix**  
 Machine IP address, if the LAN segment or computer IP network segment is 1 segment, check the IP address and click the connection to control the matrix.

**Connect to the matrix after connection**  
 Baud rate, choose 9600  
 Serial number recognized by computer

**Quickly recall saved patterns**  
 Save the set switching mode for quick recall  
 Pull down to set the matrix ID number and language  
 When the VGA signal input image has an offset, press this button to correct it.  
 Click off, there is no beep when controlling the matrix  
 Click to open, you can beep when controlling the matrix

**Instruction code issued by the host computer**  
 Currently only audio and video sync switching  
 Select the input channel

**Enter the corresponding command for quick transmission**  
 The command received by the host computer  
 Select the channel to switch to the output  
 Select the input channel and output channel and press this button to switch  
 Select 1 output channel, press this button to switch the channel signal to all output channels  
 After switching, 1 input channel is switched to 1 output port, and 2 input channel is switched to 2 output port.

1. Communication connection: First, connect the computer and device through RS-232 serial cable, or connect the device directly to the computer or connect to the local area network through a network cable;
2. The RS-232 connection must correspond to the corresponding COM slogan on the computer. The serial

port number can be queried on the device manager of the control panel, with a baud rate of 9600;

3. Through TCP/IP control, it is necessary to set the local area network or computer IP network segment to 1 segment, or modify the machine IP address to the computer network segment;

4. Open the control software: Open the file in the Software file, and the following software interface will pop up. Click on the serial port connection or select the IP address of the IP machine, and then click on the connection to operate the matrix switch.

5. Channel naming: For the convenience of memory, the input and output channels of the control software can be renamed in Chinese or English. The naming method is to right-click on the corresponding input or output channel with the mouse;

6. Rename scenario saving or scenario loading: right-click the corresponding button to rename the scenario;

7. After successfully connecting through RS-232 or TCP/IP, the device still cannot be controlled. Please check whether the device ID number on the control software matches the ID number queried by the matrix through buttons. Only when the ID number is consistent can the device be controlled.

8. Modification of matrix IP address - The default IP address of the matrix is 192.168.1.168. If you need to modify the IP address for other reasons, please follow the following steps to modify it:

8.1. Firstly, ensure normal communication with the device through the serial port;

8.2. Follow the following steps to modify the IP address:

8.2.1. Open the control software, connect to the serial port, and select a baud rate of 9600;

8.2.2. Click Add to open the network settings window;

8.2.3. After modifying the IP address inside, click OK. The IP address must be in the same network segment as the control computer or local area network;

8.2.4. Right click on the IP address, pop up the settings window again, and then click OK again (note: IP cannot be checked before clicking on the IP address);

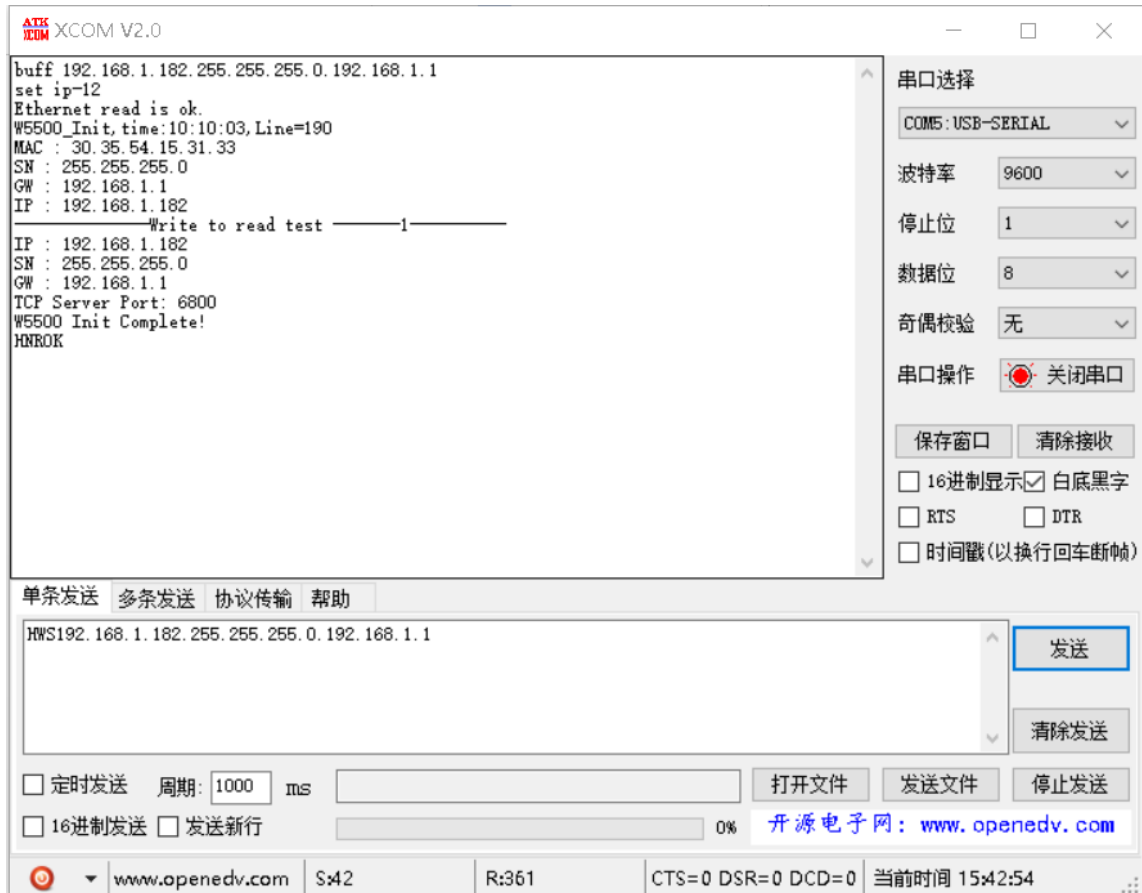
8.2.5. Check the IP address and click Connect. The connection will display a disconnected status, indicating that the IP address has been successfully set;

9. IP address query: After entering the HWC point and sending it through the serial port assistant, you can view the existing IP address in the assistant window;

The baud rate is set to 9600 and sent in non hexadecimal format. Please refer to the following figure for details:



10. Modify IP address: Use the serial assistant to input the instruction HWS192.168.1.182.255.255.255.0.192.168.1.1 to modify the IP address. The previous 192.168.1.182 is the IP address, and the following 192.168.1.1 is the gateway



## Communication control parameter protocol

### 1. Network control parameter

#### 1.1. Query IP command: HWC

HNW192.168.1.172,6800,255.255.255.0,192.168.1.1,54.82.52.115.119.23

#### 1.2. Reset operation Instruction: HWR

#### 1.3. Set the IP command: HWS

Example: HWS192.168.1.172.255.255.255.0.192.168.1.1

After setting the IP, the host computer communication needs to be reconfigured and reconnected in order to normal communication control.

#### 1.4: Port number support: 6800 / 6900 / 7000 / 7100

### 2. Serial port control parameters

The baud rate is set to 9600, 8-bit data bit, 1 stop bit, no parity bit, communication mode: asynchronous half-duplex serial communication.

### 3. Communication control protocol

The following protocols support matrices for all models, including the VGA series, DVI series, and HDMI series:

Matrix ID	ID identifier	Enter ID	Switch identifier	Output ID1	Separator	Output ID2	Terminator
ID	D	IN	V	OUT1	,	OUT2	.

Example: 1D1V1, 2, 3.

When the ID is 0, all matrices can be used. The ID value is 0~99.

Put the matrix with matrix ID 1 and input channel 1 to switch to output 1, 2, 3 channels.

16X16 matrix.

12D12V12, 2, 14, 1.

Put the matrix ID 12 into a matrix, and switch the input channel 12 to the output channel 12, 2, 15, and 1 channels at a time.

Switch one input channel to all output channels

Matrix ID	ID identifier	IDH	IDL	T	O	A	L	L
ID	D	INPUT ID		Protocol identification				

12D01TOALL sets the matrix with matrix ID 12, and switches input channel 1 to all output channels.

12D12TOALL puts a matrix with a matrix ID of 12, switching input channel 12 to all output channels

Switch one input channel to one-to-one correspondence

Matrix ID	T	O	O	N	E
ID	Protocol identification				

12TOONE puts the matrix with the matrix ID as 12, and the input channels are one-to-one corresponding to the output channel.

Calling a profile

Matrix ID	CALL	ID
ID	Protocol identification	Profile ID

Example: 12CALL2 calls scene mode 2 with matrix ID 12

Save profile

Matrix ID	S	A	V	E	ID
ID	Protocol identification				Profile ID

Example: 12SAVE2 saves scene mode 2 with matrix ID 12

12BUZON matrix ID is 12, buzzer on

12BUZOFF matrix ID is 12, buzzer off

Resolution protocol: (seamless matrix)

Example: AA0100590100005B switches and modifies the resolution of the first output card to 640x480p60.

HEAD <sub>0</sub>	ADDRESS_H <sub>0</sub>	ADDRESS_L <sub>0</sub>	CMD <sub>0</sub>	DATA_H <sub>0</sub>	DATA_L <sub>0</sub>	TID <sub>0</sub>	CHECKSUM <sub>0</sub>
0xAA <sub>0</sub>	ADDRESS <sub>0</sub>	0x00 <sub>0</sub>	0x59 <sub>0</sub>	DATA <sub>0</sub>	0x00 <sub>0</sub>	0x00 <sub>0</sub>	SUM <sub>0</sub>

The protocol can only be changed with the ADDRESS-H, DATA-H, and CHECKSUM bits. The corresponding values for the board address represented by ADDRESS-H and the resolution represented by DATA-H can be found in the table, and the value SUM of the CHECKSUM bit=the sum of all previous values. Example: AA+01+59+01=5B

ADDRESS Value Description

ADDRESS Value	Output Card Number	Jumper cap (0: installed, 1: not installed) Fixed the highest bit to 1, set the board address (output card number)	Example of instructions
0x01	1	1000 0001	Instructions to modify the resolution of the first output card to 640x480p60 AA0100590100005B
0x02	2	1000 0010	
0x03	3	1000 0011	
0x04	4	1000 0100	Instructions to modify the resolution of the fourth output card to 800x00p60 AA040059560000B3
0x05	5	1000 0101	
0x06	6	1000 0110	
0x07	7	1000 0111	
0x08	8	1000 1000	
0x09	9	1000 1001	
0x0A	10	1000 1010	
0x0B	11	1000 1011	
0x0C	12	1000 1100	
0x0D	13	1000 1101	
0x0E	14	1000 1110	
0x0F	15	1000 1111	
0x10	16	1001 0000	

## DATA Value Description

DATA Value	Output Resolution	Example of instructions	Jumper cap (0: installed, 1: not installed) The highest bit is fixed to 0, and the default output resolution is set for startup
0x01	640x480p60	AA0000590100005A	0000 0001
0x11	720x576p50		0001 0001
0x56	800x600p60		0101 0110
0x51	1024x768p60		0101 0001
0x47	1280x720p25		0100 0111
0x48	1280x720p30		0100 1000
0x13	1280x720p50		0001 0011
0x04	1280x720p60	AA0000590400005D	0000 0100
0x55	1280x768p60 RB		0101 0101
0x53	1280x768p60		0101 0011
0x28	1280x800p60 RB		0010 1000
0x29	1280x800p60		0010 1001
0x4D	1280x1024p60	AA0000594D0000A6	0100 1101
0x52	1360x768p60 RB		0101 0010
0x2A	1360x768p60		0010 1010
0x2B	1408x1050p60 RB		0010 1011
0x2C	1408x1050p60		0010 1100
0x50	1440x900p60	AA000059500000A9	0101 0000
0x4E	1600x900p60		0100 1110
0x4F	1600x900p60 RB		0100 1111
0x2D	1600x1200p60	AA0000592D000086	0010 1101
0x4C	1680x1050p60 RB		0100 1100
0x2E	1680x1050p60	AA0000592E000087	0010 1110
0x20	1920x1080p24		0010 0000
0x21	1920x1080p25		0010 0001
0x22	1920x1080p30		0010 0010
0x14	1920x1080i50		0001 0100
0x05	1920x1080i60	AA0000590500005E	0000 0101
0x1F	1920x1080p50		0001 1111
0x10	1920x1080p60		0001 0000
0x4B	1920x1200p60	AA0000594B0000A4	0100 1011