



LM-MX16H

16x16 Hybrid Matrix Switcher System



User Manual

Note:

LINK-MI Hybrid Series Matrix Switching System User Manual:

This manual is intended only as a user instruction and is not intended for use as a service.

This manual is the copyright of the manufacturer. No part or all of this manual may be used for commercial purposes by any unit or individual without permission.

Safe operation guide

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To ensure the reliable use of the equipment and the safety of personnel, please observe the following when installing, using and maintaining:

1. When installing the device, make sure that the ground wire in the power cord is well grounded. Do not use a two-pin plug. Make sure the input power of the device is 100V-240V 50/60Hz AC.
2. Do not place the device in a location that is too cold or too hot.
3. Keep the working environment well ventilated, so that the heat generated by the equipment during work can be discharged in time to avoid damage to the equipment due to excessive temperature.
4. Turn off the unit's main power supply in a humid condensation environment or when unused for long periods of time.
5. Always unplug the unit's AC power cord from the AC outlet before doing the following:
Remove or reinstall any part of the device.
 - A. Remove or reinstall any part of the device.
 - B. Disconnect or reconnect any electrical plugs or other connections to the device.
6. There are AC high-voltage components in the equipment. Non-professionals are not allowed to disassemble the equipment without permission, so as to avoid the risk of electric shock, and do not repair it privately, so as not to damage the equipment.
7. Do not spill any corrosive chemicals or liquids on or near the equipment.

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1st The Matrix System Description

1.1 About LINK-MI Hybrid Matrix System

LINK-MI Hybrid Series Matrix Switcher is a high-performance video signal professional switching device for cross-switching of multiple video signal input and output. It adopts advanced high-performance image processing chip to minimize signal transmission attenuation, image and the sound signal can be high fidelity output.

The Hybrid Series Matrix support customized multi-channel signal input and multi-channel signal output, support chassis keys, infrared remote control, RS-232 serial port, TCP/IP (non-standard, optional) and open control code for central control.

The Matrix provides a complete modular processor selection solution for multi-signal environments. It is mainly used in broadcasting and television engineering, multimedia conference halls, large-screen display engineering, television teaching, command and control centers and other occasions.

The Hybrid Series Matrix is divided into 2U chassis((**LM-MX88H**)) and 3U chassis(**LM-MX16H**) according to the input and output scale.



Figure 1-1 LINK-MI Mixed Matrix Switcher (**LM-MX16H**)

1.2 Feature:

- With the plug-in design, user can freely select or increase or decrease the input and output signal modules;
- **Input:** HDMI/DVI/VGA/SDI optional;
- **Output:** HDMI/DVI/VGA optional. User can choose different input/output board at will;
- Compatible with HDMI, DVI signal format;
- Interface bandwidth 3.4Gbps (total bandwidth 10.2Gbps), support the highest resolution: 3840x2160P@30;
- Support EDID transparent transmission function, through the matrix can identify the display device EDID signal;

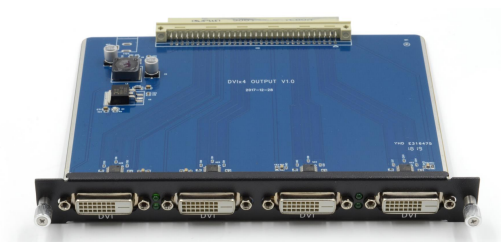
- Support HDCP1.4 version with outstanding security and digital content protection;
- Support Blu-ray DVD or other devices that require HDCP decoding;
- The card supports hot plugging, plug and play;
- With power-down memory function, with power-off field protection function;
- Standard chassis button, infrared remote control, RS-232 serial port, central control, **optional TCP-IP control**;
- International standard power supply support (100~240V AC, 50/60HZ), safety certification.

1.3 The Input and Output Card List:

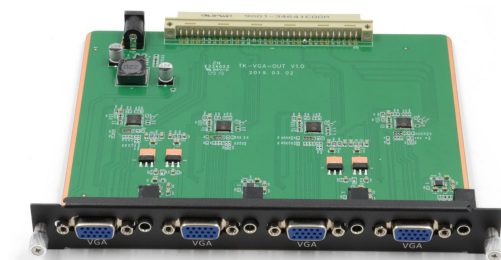
Input Card	HDMIx4 IN	4-channel HDMI signal input
	DVIx4 IN	4-channel DVI signal input
	VGAx4-IN	4-channel VGA signal input
	SDIx4-IN	4-channel 3G-SDI signal input
Output Card	HDMIx4 OUT	4-channel HDMI signal output
	DVIx4 OUT	4-channel DVI signal output
	VGAx4-OUT	4-channel VGA signal output



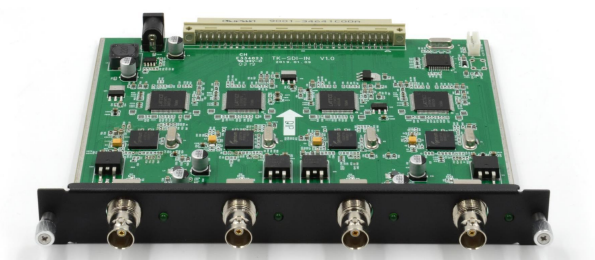
HDMI Input/Output Card



DVI Input/Output Card



VGA Input/Output Card



SDI Input Card

2nd Packaging Instruction



Hybrid matrix switcher host



Infrared remote control



RS-232 communication cable



Power cable



The matrix control software CD



Equipment user manual and warranty card

3rd Installation

The Hybrid Series Matrix Host is housed in an all-metal chassis that can be placed with a variety of devices. In addition, the matrix mainframe also provides standard machine mounting brackets, which users can install on standard industrial cabinets.

4th Front and Rear Panel Schematic

4.1 The Front Panel Schematic

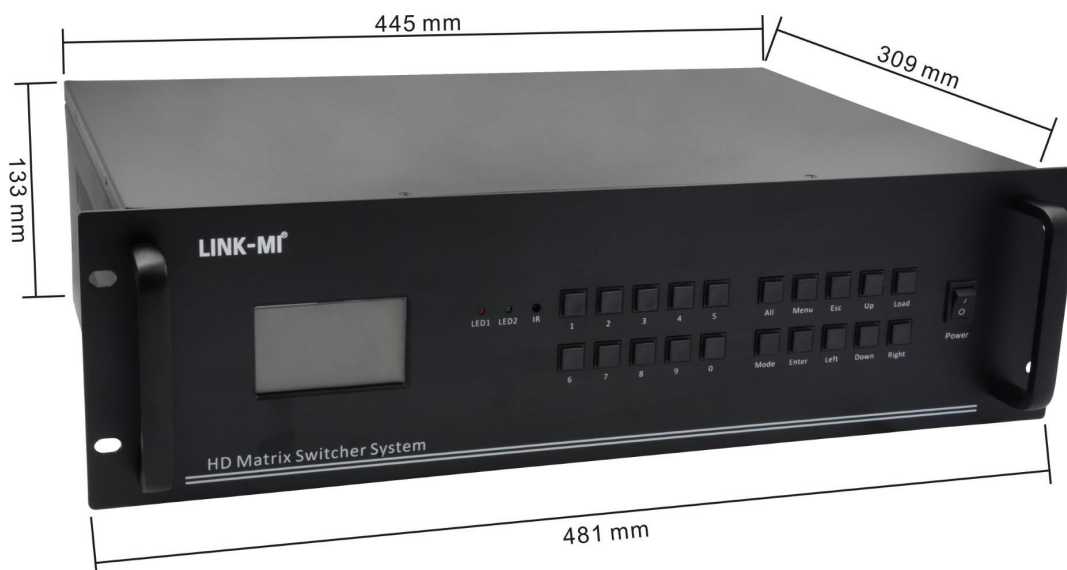


4.2 The Rear Panel Schematic



4.3 Product Size and Picture

16x16 hybrid moment switch - standard 3U industrial chassis



4.4 Technical Parameters

Model	LM-MX16H
Technical Specifications	
Video Input	
Input	Customized HDMI、DVI、VGA、3G-SDI
Input resistance	50 Ω
Video Output	
Output	Customized HDMI、DVI、VGA
Output impedance	50 Ω
Video signal	
Video Signal	HDMI、DVI、VGA
Maximum Support Resolution	3840*2160@30HZ, 1920*1200@60HZ, 1920*1080@60HZ, Backward compatible
EDID Management	Support EDID transparent transmission function
HDCP Management	Support for high bandwidth digital content protection (HDCP) using DVI 1.0 and HDMI 1.4 standards.
Audio Signal	
Digital Audio	Support HDMI audio transmission
Control Section	
Serial Control Port	9-pin female RS-232 connector
Infrared Remote Control	Default infrared remote control
Front Panel Control	Button
Protocol	TCP/IP by controlling PTNET (programmable panel)
Conventional	
Power Supply	100VAC ~ 240VAC, 50/60Hz
Temperature	-20 ~ +70℃
Humidity	10% ~ 90%
Power Consumption	40W
Chassis Size	Length 483x wide 309x high 133 mm
Product Weight	6.75Kg

5th The Matrix and Peripheral Device Connection

5.1 Input and Output Interface Description

The product adopts the plug-in design method, and the input and output can be freely configured according to the demand. The input and output modules of LINK-MI Hybrid Series Matrix Switcher are single card 4 channels. Currently, **HDMI input board, DVI input board, HDMI output board, DVI output board** can be configured.

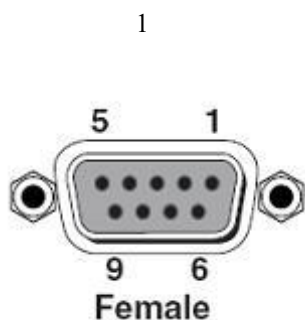
5.2 Communication Port and Connection Method

The matrix provides a standard RS-232 serial communication port and a LAN network control port. In addition to the front panel buttons for switching operations, the matrix allows users to control using various control systems or remotely via Ethernet. Ethernet control can be expanded with optional Ethernet interface accessories.

5.3 The Matrix Connection to Control System

The LINK-MI Hybrid Series matrix can be controlled using a variety of control systems to control the matrix via an RS-232 serial interface or an optional Ethernet control port.

The RS-232 port is a 9-pin female connector with the following pin descriptions:



Number	Pin	Description
2	N/u	null
Rx	receive	
Tx	send	
N/u	null	
Gnd	gnd	
N/u	null	
N/u	null	

N/u null

N/u null

5.4 The Matrix and Control Computer Connection

Use the RS-232 cable to connect the serial communication port (COM1 or COM2) of the computer to the RS-232 communication port of the HDMI matrix host. After installing the application software, you can use the computer to control the mixing matrix. Users can use the application software that comes with the matrix as the computer control software, or they can write their own control software.

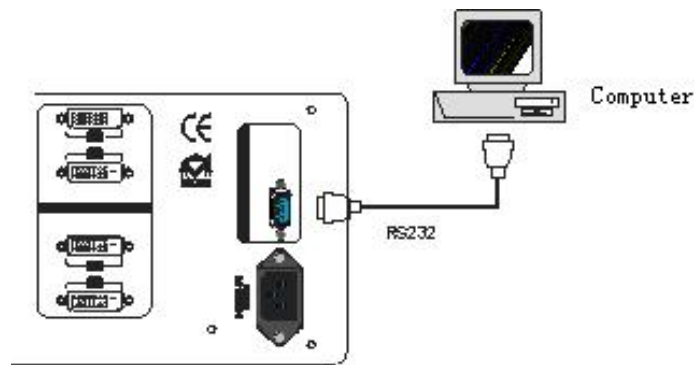


Figure 5-1 RS-232 connection between HDMI matrix and computer

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

LINK-MI Hybrid 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:

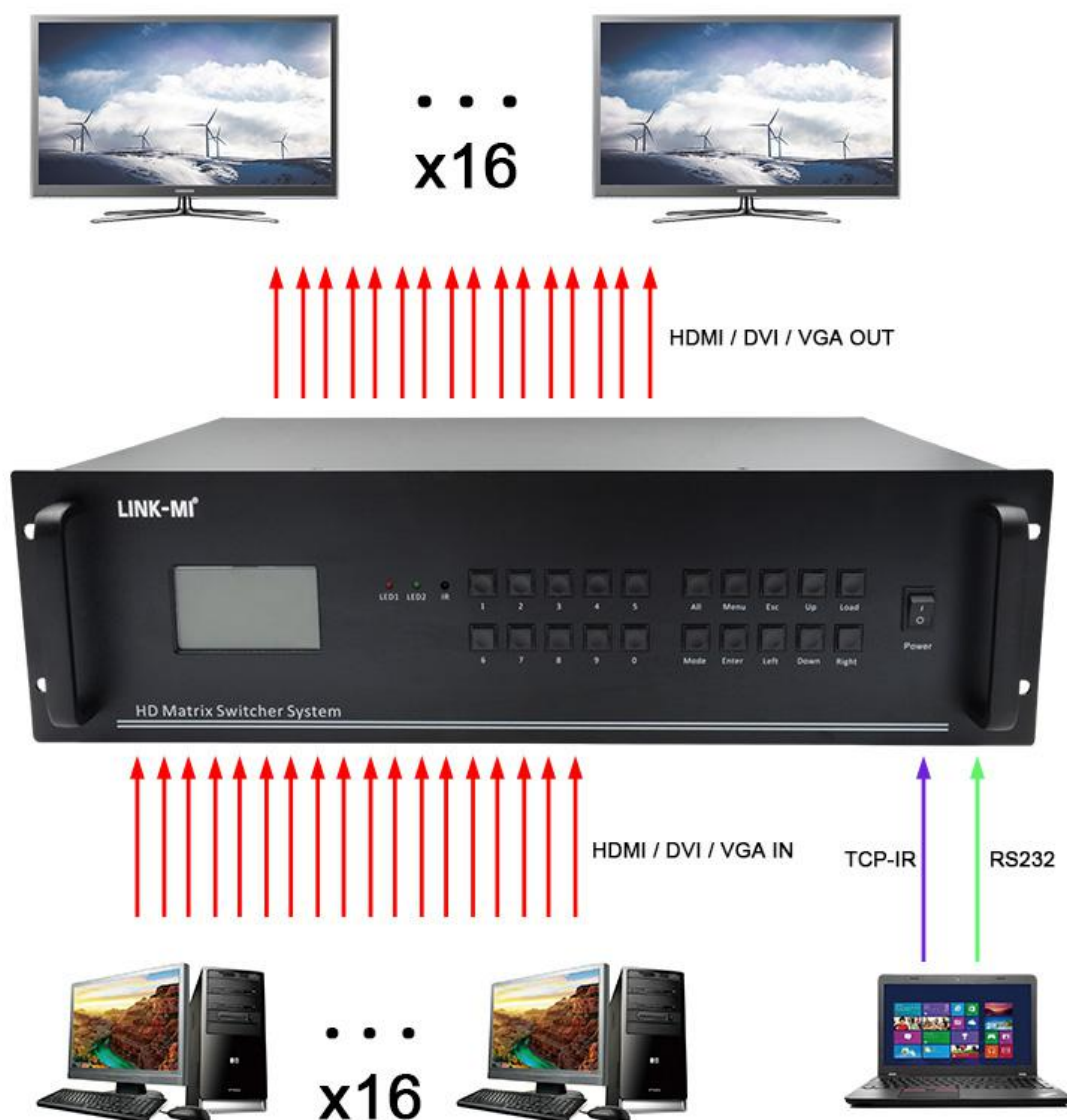


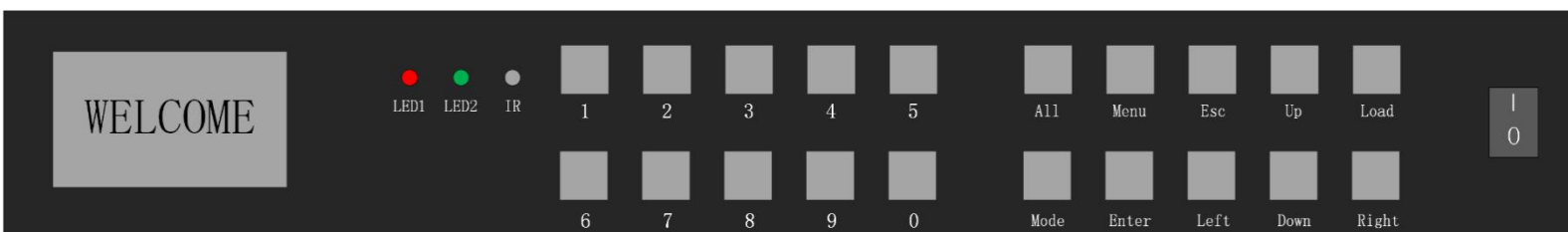
Figure 5-4 System Connection Diagram of LINK-MI Hybrid Series Matrix Switcher

6th EDID Management Operation

The LINK-MI Hybrid Series Matrix Switcher adds EDID data identification to exchange EDID data with display and source machines. When connected to the display and source machine, the display and source exchange EDID data via the Matrix.

7th Control Panel Instruction

7.1 Front Panel Schematic



7.2 Front Panel Function Operation

The small LCD screen on the back panel of the matrix boot shows the WELCOME menu, as shown in the small LED screen above.

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 and quick switch scene keys;

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

Mode: Signal switching setting;

All: Switch to all;

Menu: MENU;

Esc: Exit/cancel;

Up: Arrow keys;

Down: Direction key;

Left: Arrow key left;

Right: Direction key right

Enter: Confirm / select;

7. 2. 2 Signal Switching

After pressing the Mode 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 Enter key, the switch is completed.

Example 1, such as switching from input 2 port to output 8 interface: Mode→0→2→0→3→Enter, the cutting is completed;

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

SIGNAL :	HD
INPUT:	00
OUTPUT:	00

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 Load button to enter the system operation and select the scene save. as follows:

Load→**Down**→**Enter**→**0**→**3**→**Enter**, End of save;

7. 2. 4 Scene call

Call the saved channel switch mode test, press the Load button to enter the system operation, select the scene call, enter the scene number to be called and press Enter to complete;

7. 2. 5 Reset

To completely restore the machine to the factory settings, press the Load button to enter the system operation, select to restore the factory press Enter to complete;

7. 2. 6 Buzzer setting

To turn on or cancel the tone when the matrix switcher is operated, press the Menu button to enter the system setting and select the buzzer setting. Press the Left or Right button to select the on/off button and press the Enter button. The setting is completed;

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 Enter button to complete the setting;

7. 2. 8 Language settings

This matrix switcher can be set to Simplified Chinese and English. Use the Menu button to enter the system settings, select the language setting, and select the desired language;

8th 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: The signal switching button is consistent with the function of the chassis Model button. Press the Switch button and press the number to set the input and output ports, press OK to complete the switch;

Menu: Same chassis button Menu button;



: Same chassis button Esc button function;

OK: Same as the chassis button Enter;

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

Arrow key: With the chassis Left, Right, Down, Up;



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

9th Host Computer Operation Instruction

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

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

The screenshot shows a software interface for controlling a matrix. It includes sections for 'Com Setting' (COM port and Baud rate), 'Net Setting' (IP address and Port), 'Matrix In' and 'Matrix Out' (input/output channels), and a 'Tset code' section. There are also buttons for 'Scene Save', 'Scene Load', 'Buzz On', 'Buzz Off', and 'VGA Auto'. The interface is in Chinese and English.

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 equipment through the RS-232 serial cable, or connect the device directly to the computer or connect to the local area network through the network cable;
2. The RS-232 connection must correspond to the corresponding COM port number on the computer. The serial port number can be queried on the device manager of the control panel;
3. through TCP / IP control, LAN or computer IP network segment must initially be set to 1 segment;
4. Open the control software: Open the file in the Software file, and pop up the following software interface. Click the serial port connection or check the IP address of the IP machine and click Connect. Then you can operate the matrix switcher;
5. channel naming: In order to facilitate memory, you can rename the input and output channels of the control software, the name can be Chinese or English. The naming method is to right-click the corresponding input channel or output channel;
6. Renaming the scene save or scene load: Rename the scene by right-clicking the corresponding button;
7. After the RS-232 or TCP/IP connection is successful, the device still cannot be controlled. Check whether the device ID number on the control software is consistent with the ID number of the matrix query by the button. The ID number is the same to control the device.
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 modify it as follows:
 - 8.1. First ensure that the device can communicate normally through the serial port;
 - 8.2. Perform the following steps to modify the IP address:
 - 8.2.1. Open the control software and connect to the serial port;
 - 8.2.2. Click Add to pop up the network settings window;
 - 8.2.3. After modifying the IP address, make sure that the IP address must be on the same network segment as the control computer or LAN;
 - 8.2.4. Right click on the IP address, pop up the settings window again, and then click OK again (Note: IP can not be selected before clicking the IP address);
 - 8.2.5. Check the IP, click on the connection, the connection shows the disconnected state, and the IP setting is successful.
9. IP address query: through the serial port assistant input HWC point can be sent to view the existing IP address in the assistant window.

10th 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

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