

TMX-xxxxSDI2 Series High Definition Digital Video Tracking Matrix Switcher

Professional Matrix Switchers



Installation and Operation Manual

V 1.2

Remark:

- All rights reserved for translation, reprint or reproduction
- Contents may change without prior announcement
- All technical specifications are guideline data and not guaranteed features
- Taiden Co., Ltd. is not responsible for any damage caused by improper use of this manual
- The equipment must be connected to earth!
- This product conforms to the rules of the European directive 2014/30/EU.
- If any detailed information needed, please contact your local agent or TAIDEN service center in your region.
Any feedback, advice and suggestion about the products is appreciated
- TAIDEN is the registered trademark of TAIDEN Co., Ltd.

Important Safety Instruction

1. Read and keep these instructions.
2. Heed all warnings and follow all instructions.
3. The apparatus shall not be exposed to dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on the apparatus.
4. The MAINS plug serving as a disconnection device, should be easy to operate.
5. The apparatus should be connected to the MAINS socket-outlet with protective earth.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade and the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. Do not place the equipment on any uneven or unstable stand; original product package or appropriate package should be used to avoid damage caused by strong impacts during transportation.
16. Power supply cords:
AC 100 V-240 V 50 Hz/ 60 Hz
17. The quantity of connected units in one system should not exceed prescribed quantity. For service, please contact the nearest TAIDEN Service Center.
18. Use ONLY specified connection cable to connect the system equipment.
19. All TAIDEN products are guaranteed for definite time (see the WARRANTY CARD for details) excluding the following cases:
 - A. All damage or malfunction caused by human negligence;
 - B. Damage or malfunction caused by improper operating by operator;
 - C. Parts damage or loss caused by disassembling the product by non-authorized personnel.
20. Upon receipt of the product, please fill out the Warranty Card enclosed and post it to TAIDEN Service Center nearby in your region.



TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

CAUTION: To reduce the risk of electric shock, DO NOT open covers, no user serviceable parts inside. Refer servicing to qualified service personnel only.

CAUTION: DO NOT use alcohol, ammonia or petroleum solvents or abrasive cleaners to clean the devices.



The lightning flash with an arrowhead symbol, with an equilateral triangle, is intended to alert the user to the presence of uninsulated 'dangerous voltage' within the products enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

Important Safety Instruction



The exclamation mark within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING: To reduce the risk of fire or electric shock, DO NOT expose units to rain or moisture.



Attention: Installation should be performed by qualified service personnel only in accordance with the National Electrical or applicable local codes.



Power Disconnect: Units with or without ON – OFF switch have power supplied to the unit whenever the power cord is inserted into the power source; however, the unit is operational only when the ON – OFF switch is in the ON position. The power cord is the main power disconnect for all units

WARNING: The apparatus should be connected to a mains socket outlet with a protective earthing connection.

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Installation & User Guide

About this manual

This manual is a comprehensive guide to the installation and operation of **TAIDEN** SDI Series High Definition Digital Video Tracking Matrix Switchers. It includes: connection and operation, protocol and control code, etc.

The manual is divided into the following chapters:

Chapter 1: High Definition Digital Video Tracking Matrix Switchers

Descriptions in detail of the functions and indications, installation and connection, configuration and operation of High Definition Digital Video Tracking Matrix Switchers.

Chapter 2: IR Remote Control

Introduction into the operation of IR remote control.

Chapter 3: Communication protocol and control code

Detailed description of codes and their function.

Chapter 4: Technical data

Mechanical and electrical details of the High Definition Digital Video Tracking Matrix Switchers.

This manual is applicable to:

TMX-1608SDI2

16x8 High Definition Digital Video Tracking Matrix Switcher (SD/HD/3G)

TMX-1604SDI2

16x4 High Definition Digital Video Tracking Matrix Switcher (SD/HD/3G)

TMX-0808SDI2

8x8 High Definition Digital Video Tracking Matrix Switcher (SD/HD/3G)

TMX-0804SDI2

8x4 High Definition Digital Video Tracking Matrix Switcher (SD/HD/3G)

TMX-0404SDI2

4x4 High Definition Digital Video Tracking Matrix Switcher (SD/HD/3G)

Chapter 1. High Definition Digital Video Tracking Matrix Switchers

1.1 Functions and indications

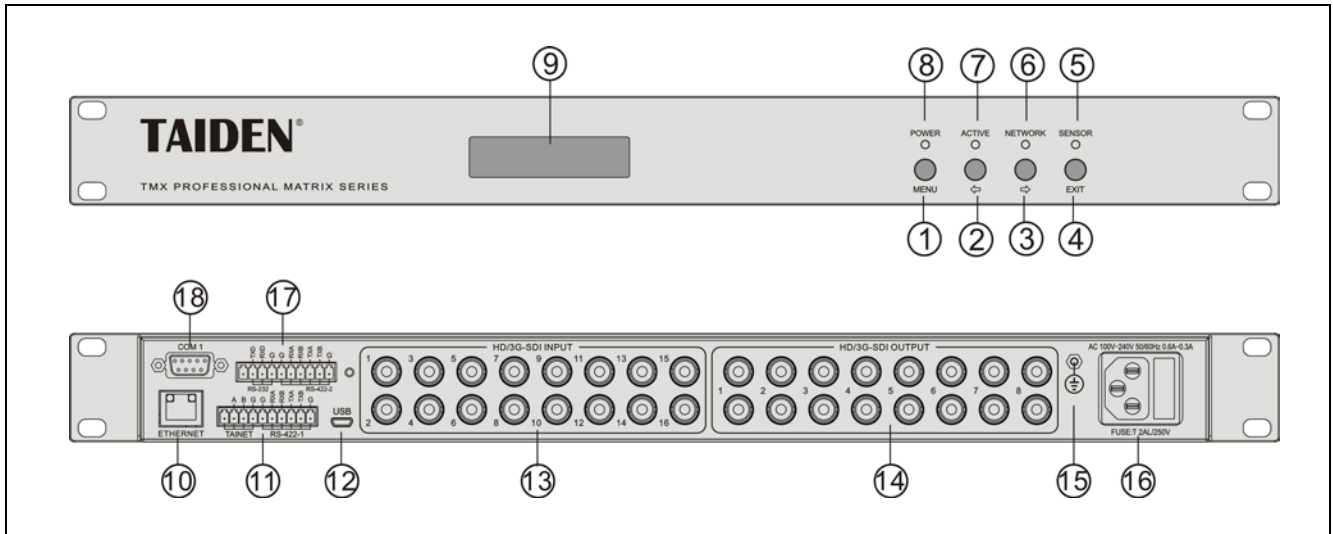


Figure 1.1 Panels of SDI Matrix Switcher

Front panel:

1. **“MENU” button**
 - a) If in current state, press “MENU” go to main menu;
 - b) If in menu state, press “MENU” go to sub menu;
 - c) Select/Deselect in network configuration.
2. **“←” (Left) button**
3. **“→” (Right) button**
4. **“Exit” button**
 - ◆ Return to previous directory or root.
5. **IR receiving window**
 - ◆ Receives the IR signals from remote control; make sure the remote control aims at the window.
6. **“NETWORK” indicator**
 - ◆ Indicator flashes if Matrix Switcher is communicating with conference main unit.
7. **“ACTIVE” indicator**
 - ◆ Indicator will be turned on if Matrix Switcher executes switch instructions.
8. **“POWER” indicator**
9. **LCD**

Rear panel:

10. **RJ45 interface**
 11. **RS-422/TAINET interface**
 - ◆ RS-422 for connecting to dome camera;
 - ◆ TAINET for connecting to VIDEO SWITCH of main unit.
 12. **USB interface for upgrade**
 13. **Video inputs**
 14. **Video outputs**
- Note:**

☞ If only one connector of an output channel (Full-HD/ 1080p50/ 60Hz) connects a SDI device, please connect a 75 ohm dummy load for the other connector.
15. **Grounding point**
 16. **Power cable interface**
 17. **RS-422/232 interface**
 - ◆ RS-422 for connecting to dome camera;
 - ◆ RS-232 for connecting to keyboard (Baud rate: 9600).
 18. **Control interface COM1**

1.2 Installation and connection

1.2.1 Installation

1U High Definition Digital Video Tracking Matrix Switcher just needs to put it into the cabinet, and fix it by screws. As figure 1.2.

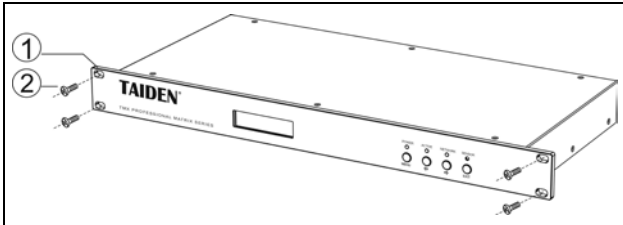


Figure 1.2 Installation

1.2.2 Connection with control devices

High Definition Digital Video Tracking Matrix Switcher can be controlled by Central Control System via RS-232 interface COM1. It also offers a USB interface used for software upgrade. As figure 1.3.

1.2.3 Connection with input, output devices

High Definition Digital Video Tracking Matrix Switcher supports various digital video signal sources, including: full HD (3G), HD and SD. As figure 1.3.

Please use good quality Twisted Pair cable to connect input and output device, i.e. RG59 and RG60.

Control Interface:

Control Type	
COM (RS-232)	9 pin female D connector
COM1	Baud rate: 115200, data: 8 bits, stop: 1 bit, no parity check bit
RJ45	TCP/IP
TAINET	Baud rate: 19200, to TO VIDEO SWITCHER of main unit
RS-422	Baud rate: 9600, to dome camera
RS-232	Baud rate: 9600, to keyboard

Note:

☞ If connected with camera by RS232 protocol, the matrix switcher and the camera must be common ground.

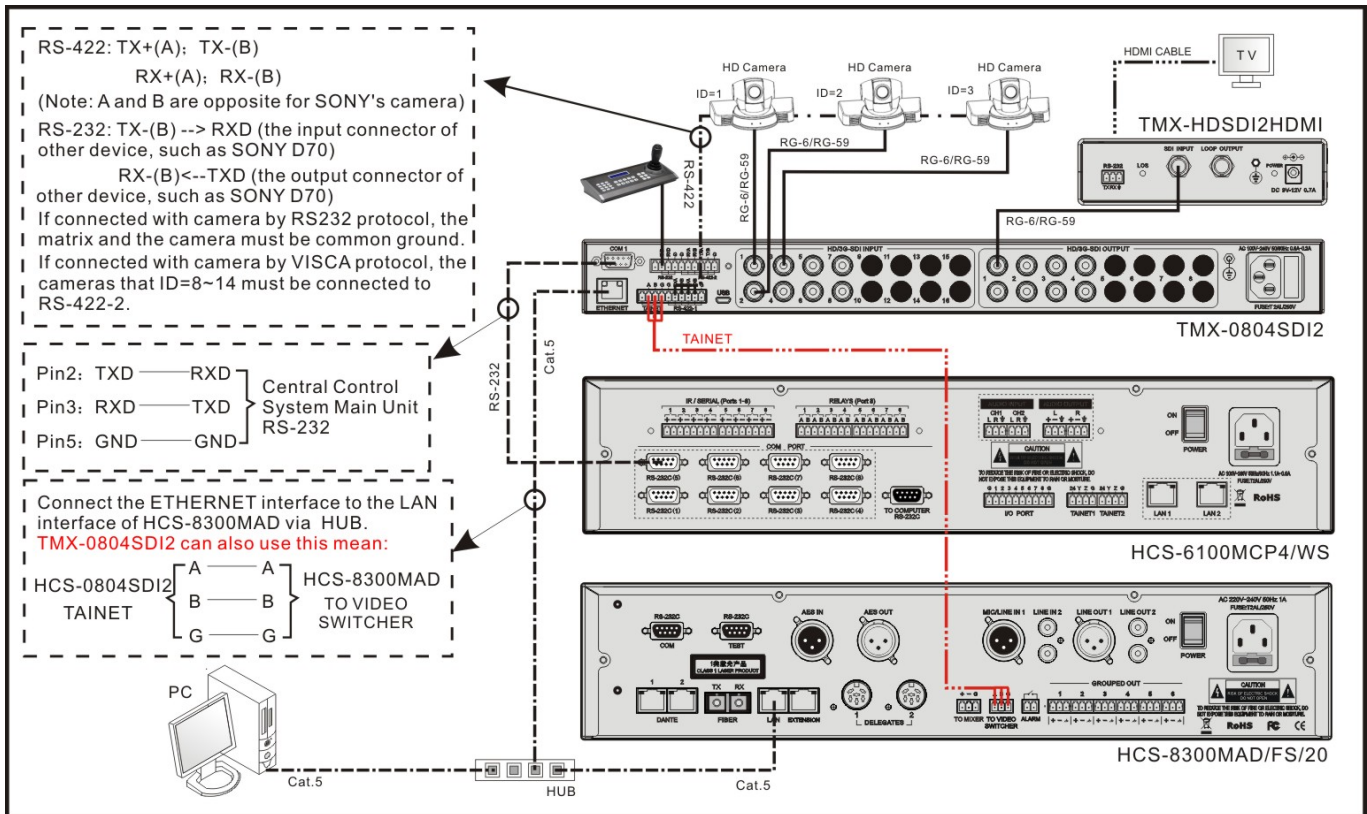


Figure 1.3 Connection for input and output devices

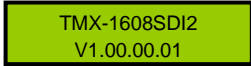
1.3 Setup and Operation

1.3.1 Menu setup

1.3.1.1 Menu setup

To explain menu setup of SDI series Matrix Switcher, TMX-1608SDI2 serves as example.

TMX-1608SDI2 main interface:



Press "MENU" to enter main menu and press "←/→" until "Setting" prompts; Press "MENU" again to enter setup menu, including:

- 1. Ring
- 2. Video Track
- 3. Video Track Type
- 4. Video Track Delay

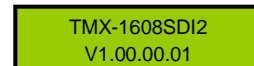
Press "EXIT" to exit menu.

Menu 1 to menu 4 are explained explicitly:

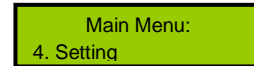
1. Ring

Buzzer ring on-off of this unit. If buzzer ring is setup "on", the buzzer will ring when front panel operation or IR remote control. The buzzer ring can be setup "off".

- ON: buzzer is on ;
- OFF: buzzer is off.



1. Press "MENU" to enter setup menu and press "←/→" until "Setting" prompts;



2. Press "MENU" and press "←/→" until "Ring" prompts;



3. Press "MENU" to enter setup;



4. Press "←/→" to select parameter;



5. Press "MENU" to confirm.



2. Video Track

Select the function of video track on or off.

TMX-1608SDI2
V1.00.00.01

↓ 1. Press "MENU" and press "←/→" until "Setting" prompts;

Main Menu:
4. Setting

↓ 2. Press "MENU" and press "←/→" until "Video Track" prompts;

Video Track
OFF

↓ 3. Press "MENU" to enter setup;

Video Track
FF

↓ 4. Press "←/→" to adjust parameter;

Video Track
N

↓ 5. Press "MENU" to confirm.

Video Track
ON

3. Video Track Type

When Video Track is on, camera protocol can be selected from HCS-3316RS232/ HCS-3316RS485/ HUAWEI VPC620/ SONY HD1/ PELCO D/ PELCO P1/ PELCO P2/ SONY D70/ SONY D100/ SONY BRC-Z330/ SONY BRC300/ SONY BRC700/ SONY SRG-X400. Please select correct protocol according to actual device type.

TMX-1608SDI2
V1.00.00.01

↓ 1. Press "MENU" and press "←/→" until "Setting" prompts;

Main Menu:
4. Setting

↓ 2. Press "MENU" and press "←/→" until "Video Track Type" prompts;

Video Track Type
PELCO P1

↓ 3. Press "MENU" to enter setup;

Video Track Type
ELCO P1

↓ 4. Press "←/→" to select parameter;

Video Track Type
ELCO P2

↓ 5. Press "MENU" to confirm.

Video Track Type
PELCO P2

The maximal number of cameras that can be connected to the HD Digital Video Tracking Matrix Switcher is shown in follow:

Protocol	predefined position	Camera No.	Total
TMX-16xxSDI2			
PELCO-D	64	16	1024
PELCO-P	64	16	1024
VISCA	64	14	896
TMX-08xxSDI2			
PELCO-D	64	8	512
PELCO-P	64	8	512
VISCA	64	7	448
TMX-04xxSDI2			
PELCO-D	64	4	256
PELCO-P	64	4	256
VISCA	64	4	256

4. Video Track Delay

The interval ranges from 0 second to 8 seconds by steps of 0.5 seconds.

TMX-1608SDI2
V1.00.00.01

- ↓ 1. Press "MENU" and press "←/→" until "Setting" prompts;

Main Menu:
4. Setting

- ↓ 2. Press "MENU" and press "←/→" until "Video Track Delay" prompts;

VideoTrackDelay:
2.0 S

- ↓ 3. Press "MENU" to enter setup;

VideoTrackDelay:
0.0 S

- ↓ 4. Press "←/→" to adjust parameter;

VideoTrackDelay:
0.5 S

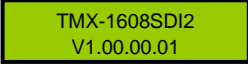
- ↓ 5. Press "MENU" to confirm.

VideoTrackDelay:
2.5 S

1.3.2 Switch operation

To explain menu operation of SDI series Matrix Switcher, TMX-1608SDI2 type serves as example. All SDI series Matrix Switcher can refer to it.

TMX-1608SDI2 main interface:



Press "MENU" to enter switch menu, including:

1. Switch Video

2. Switch Through

* Switch through one channel or all channels.

3. Close

* Close one output or all outputs.

4. Setting

* Setup menu.

5. Status

* Request channel state.

6. Net Setting

7. Set Number

8. VISCA over IP

Note:

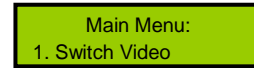
- ☞ "Input channel" and "output channel" number must be less than matrix type.
- ☞ This operation only supports the SDI resolution not more than 1080P60 and the operation time less than 1 ms.

Menu 1 to menu 6 are explained explicitly:

1. Switch Video

Video switch key, switches one input video signal to any or all output channels.

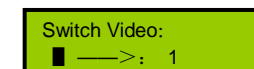
Example: Switch Video signal of input channel 1 to output channel 8



↓ 1. Press "←/→" to select "Switch Video";



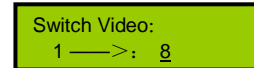
↓ 2. Press "MENU" to select input channel;



3. Press "←/→" to adjust input channel as "1"

↓ and press "MENU" to confirm;

4. Press "→" and press "←/→" to adjust output channel as "8";



↓ 5. Press "MENU" to confirm and press "EXIT" to switch;



Note:

- ☞ If input channel displays "0", output channel is closed.
- ☞ If output channel displays "All", input channel is switched to all output channels.

2. Switch Through

Switch through one input channel or all input channels to corresponding output channel(s).

Example: Switch through channel 2.

Main Menu:
2. Switch Through

↓ 1. Press “←/→” to select “Switch through” prompts;

Switch Through:
1

↓ 2. Press “MENU” to enter “Switch through”;

Switch Through:
█

↓ 3. Press “←/→” to select channel “2”;

Switch Through:
2

↓ 4. Press “MENU” to confirm and press “EXIT” to switch;

Switch OK !

Note:

☞ Select “All” standing for switch through all channels.

3. Close

Close one output channel or all output channels.

Example: Close output channel 2.

Main Menu:
3. Close

↓ 1. Press “MENU” and press “←/→” until “Close” prompts;

Close
1

↓ 2. Press “MENU” to enter “Close” menu;

Close
█

↓ 3. Press “←/→” to select channel “2”;

Close
2

↓ 4. Press “MENU” to confirm and press “EXIT” to switch;

Switch OK !

Note:

☞ Select “All” stands for closing all channels.

4. Setting

Setup menu (refer to section [1.3.1](#) for details).

Main Menu:
4. Setting

↓ 1. Press “MENU” and press “←/→” until “Setting” prompts;

2. Press “MENU” to enter setup status.

Ring
OFF

5. Status

Request corresponding state of input and output channels.

Main Menu:
5. Status

↓ 1. Press “MENU” and press “←/→” until “Status” prompts;

Video: 3 → :1

↓ 2. Press “MENU” to request corresponding status;

3. Press “←/→” to request next status.

Video: 5 → :2

6. Net Setting

Set up the IP address, Subnet mask, Gateway and Host IP.

Example: set the IP address as 192.168.2.219.

Main Menu:
6. Net Setting

↓ 1. Press "MENU" and press "←/→" until "Net Setting";

Net Setting
1. IP Address

↓ 2. Press "MENU" to enter and press "←/→" to select "IP Address";

IP Address
192.168. 2.200

↓ 3. Press "←/→" to select the parameter and press "MENU" to enter;

IP Address
192.168. 2.20

↓ 4. Press "←/→" to adjust the parameter and press "MENU" to confirm.

IP Address
192.168. 2.219

Note:

- ☞ The set up of Subnet mask, Gateway and Host IP are the same chronological order as for the "IP address" set up;
- ☞ When the Host IP is set the same as the IP address of the conference main unit, the NETWORK indicator will blink that means the communication between the matrix and the conference main unit is set;
- ☞ Use the IR remote control can set the IP address more quickly.

7. Set Number

Set the number of the Matrix Switcher.

Example: Set the number as 3.

Main Menu:
7. Set Number

↓ 1. Press "MENU" and press "←/→" until "Set Number" prompts;

Number:
1

↓ 2. Press "MENU" to enter setup;

Number:
█

↓ 3. Press "←/→" to select number "3";

Number:
3

8. VISCA over IP

Set VISCA over IP, includes: Set On/Off, set the camera IP.

Example 1: Set VISCA over IP on.

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V1.00.00.01

↓ 1. Press "MENU" and press "←/→" until "VISCA over IP" prompts;

Main Menu:
8. VISCA over IP

↓ 2. Press "MENU" and press "←/→" until "1. Setting" prompts;

VISCA over IP
1. Setting

↓ 3. Press "MENU" to enter setup;

VISCA over IP
OFF

↓ 4. Press "←/→" to adjust parameter;

VISCA over IP
ON

↓ 5. Press "MENU" to confirm and return.

VISCA over IP
1. Setting

Example 2: set the camera IP address as 192.168.2.129.

Main Menu:
8. VISCA over IP

- ↓ 1. Press "MENU" and press "←/→" until "VISCA over IP";

VISCA over IP
2. Camera IP

- ↓ 2. Press "MENU" 2 times to enter camera selection and press "←/→" to select "2";

Camera █
192.168. 2.200

- ↓ 3. Press "MENU" and press "←/→" to select the IP parameter and press "MENU" to enter;

Camera 2
192.168. 2.20█

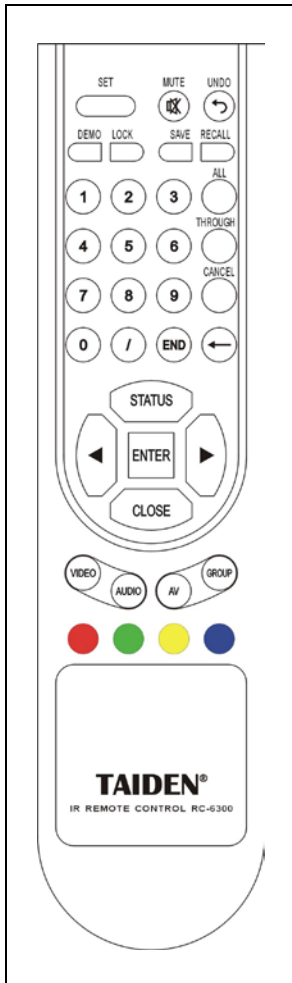
- ↓ 4. Press "←/→" to adjust the parameter and press "MENU" to confirm.

Camera 2
192.168. 2.129

Note:

- ☞ Use the IR remote control can set the IP address more quickly.

Chapter 2. IR Remote Control



Users can use remote control to operate matrixes, the function of remote control key is the same as matrix front panel key (Please refer to chapter 1 for detailed instructions).

Please refer to sections of menu operation for detailed operation method of remote control key.

The remote control can be used for all **TAIDEN** matrix main units with IR receipt function.

Chapter 3. Communication protocol and control code

This code system is used for controlling and operating **TAIDEN** professional Matrix Switchers by central control system or user programming software.

Protocol: Baud Rate: 115200; Data: 8 bits; Stop: 1 bit;
Parity Check Bit: No.
UDP port: 1600.

Type	Code	Description
Operation Code	[x1]All.	Input channel [x1] switch to all output channels
	All#.	Setup all channels one-to-one correspondence: 1->1, 2->2, 3->3...
	All\$.	Close all channels (Audio & Video)
	[x1]#.	Input channel [x1] switch to output channel [x1] (Audio & Video)
	[x1]\$.	Close output channel [x1] (Audio & Video)
	[x1]V[x2].	Video of input channel [x1] switch to output channel [x2] (Video)
	[x1]A[x2].	Audio of input channel [x1] switch to output channel [x2] (Audio)
	[x1]B[x2].	Video and audio of input channel [x1] switch to output channel [x2] (Audio & Video)
	Save[X].	Save current status to scene [X] (X: 0 ~ 9)
	Recall[X].	Recall scene [X] (X: 0 ~ 9)
	Clear[X].	Clear scene [X], status of all output channel are closed (X: 0 ~ 9)
	Type*.	Query the matrix type
	Version.	Query the matrix version
	Status[x].	Query the input status of the output channel [x]
	Status.	Query the input status of all output channels
	Default.	Factory reset
	Demo.	Work in demo mode
	Undo.	Cancel the current operation and return to the last switch status
	Camera%2d%2d%2d.	Camera control %2d: camera ID (01 to 16) %2d: type (00 stop, 01 right, 02 left, 03 up, 04 down, 05 far, 06 near) %2d: speed control (01 slow, 02 fast)
	SetPreset%2d%2d.	Predefine position settings %2d: camera ID (01 to 16) %2d: predefine position (01 to 64)
	CallPreset%2d%2d.	Predefine position recall %2d: camera ID (01 to 16) %2d: predefine position (01 to 64)

Note:

- ☞ [x1], [x2] is channel number of input or output; only 1~16 (depend on the number of the matrix's input/output channel) available, otherwise regarded as error.
- ☞ "[" and "]" do not send code;
- ☞ End each command by code such as ".", ",", "

Command examples:

1. **[x1]All.**

For example: Input channel 3 switch to all output channels, code is "3All."

2. **All#.**

Setup all channels one-to-one correspondence:
1->1, 2->2, 3->3...8->8.

3. **All\$.**

Close all output channels.

4. **[x]#.**

For example: Input channel 5 switch to output channel 5, code is "5#."

5. **[x]\$.**

For example: Close output channel 5, code is "5\$."

6. **[x1]V[x2].**

For example: Video of input channel 3 switch to output channel 5, code is "3V5.". Video of input channel 3 switch to output channel 8, 9, 12, code is "3V8,9,12."

7. **[x1]B[x2].**

For example: Video and audio of input channel 1 switch to output channel 2, 3, 5, code is "1B2,3,5."

8. **Save[x].**

For example: Save current status to scene 7, code is "Save7."

9. **Recall[x].**

For example: Recall scene 5, code is "Recall5."

Chapter 4. Technical data

Spec. \ Type	TMX-1608SDI2	TMX-1604SDI2	TMX-0808SDI2	TMX-0804SDI2	TMX-0404SDI2
Video					
Date rates	143 Mbps - 2.97 Gbps				
Date types	8 bit or 10 bit				
Video input					
Connectors	16 BNC females		8 BNC females		4 BNC females
Input cable equalization	Typical equalization cable length (RG60/ Ø1.0 mm standard cable): ≥ 50 m @ 2.97 Gbps (odd channel) ≥ 60 m @ 2.97 Gbps (even integer channel) > 90 m @ 1.485 Gbps				
Input level	0.7 V - 1.2 Vp-p				
Nominal level	0.8 Vp-p				
Impedance	75 Ohm				
Return loss	20 dB - 30 dB @ 5 MHz to 1.5 GHz				
Video output					
Connectors	8 × double-decker BNC female	4 × double-decker BNC female	8 × double-decker BNC female	4 × double-decker BNC female	
Nominal level	0.8 V±7%				
Output level	0.5 V - 1.6 Vp-p				
Impedance	75 Ohm				
Return loss	>15 dB @ 5 MHz to 1.5 GHz				
DC offset	± 100 mV with no offset at input				
Jitter	20 ps - 30 ps @ HD/3G rate; 40 ps - 60 ps @ SD rate				
Rise and fall time (20~80%)	SD: 600 ps HD/3G: 100 ps				
Control					
COM (RS-232)	RS-232, 9 pin female D connector				
COM1	Baudrate: 115200, data: 8 bits, stop: 1 bit, no parity				
RJ45	TCP/IP				
RS-422	Baud rate: 9600, to dome camera				
RS-232	Baud rate: 9600, to keyboard				
General spec.					
Power supply	100 V AC - 240 V AC, 50/60 Hz				
Temperature	Operating: 0 °C to + 50 °C; storage: -20 °C to + 70 °C				
Humidity	Storage and operating: 10% to 90%				
Dimensions h x w x d (mm)	483×208×43 (1U high, full rack width)				

Spec. \ Type	TMX-1608SDI2	TMX-1604SDI2	TMX-0808SDI2	TMX-0804SDI2	TMX-0404SDI2
Weight	3.2 kg	3.0 kg	3.0 kg	2.8 kg	2.7 kg
Mean time between failures	30, 000 hours				

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