TAIDEN®

TMX Series Mixed Card Matrix Switchers

Professional Matrix Switchers

Installation and Operation Manual

V 1.2

Remarks:

- 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 Industrial 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 Industrial 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.

Contents

About this manual

This manual is a comprehensive guide to the installation and operation of **TAIDEN** Mixed Card Matrix Switchers. It includes: connection and operation, protocol and control code, etc.

The manual is divided into the following chapters:

Chapter 1: Mixed Card Matrix Switchers

Descriptions in detail of the functions and indications, installation and connection, configuration and operation of Mixed Card Matrix Switchers.

Chapter 2: Input/Output Signal Cards

Introduction into the function of the input/output signal cards.

Chapter 3: IR Remote Control

Introduction into the operation of IR remote control.

Chapter 4: Communication protocol and control code

Detailed description of codes and their function.

Chapter 5: Technical data

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

This manual is applicable to:

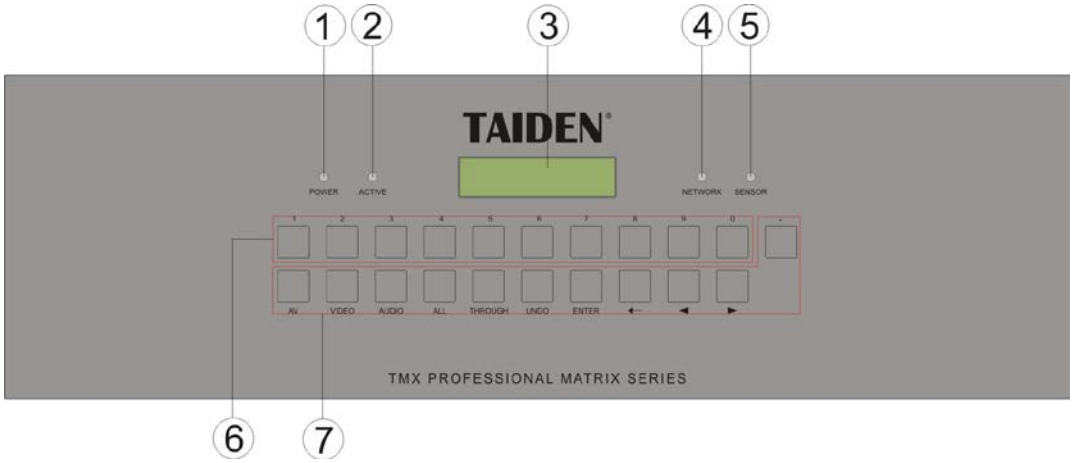
TMX-1616MX
16×16 Mixed Card Matrix Switcher
TMX-0808MX
8×8 Mixed Card Matrix Switcher

TMX-HDMI-4IN
4 Channels HDMI Input Card
TMX-DVI-4IN
4 Channels DVI-I Input Card
TMX-SDI-4IN
4 Channels SDI Input Card
TMX-VGA-4IN
4 Channels VGA Input Card
TMX- HDBaseT-4IN
4 Channels HDBaseT Input Card

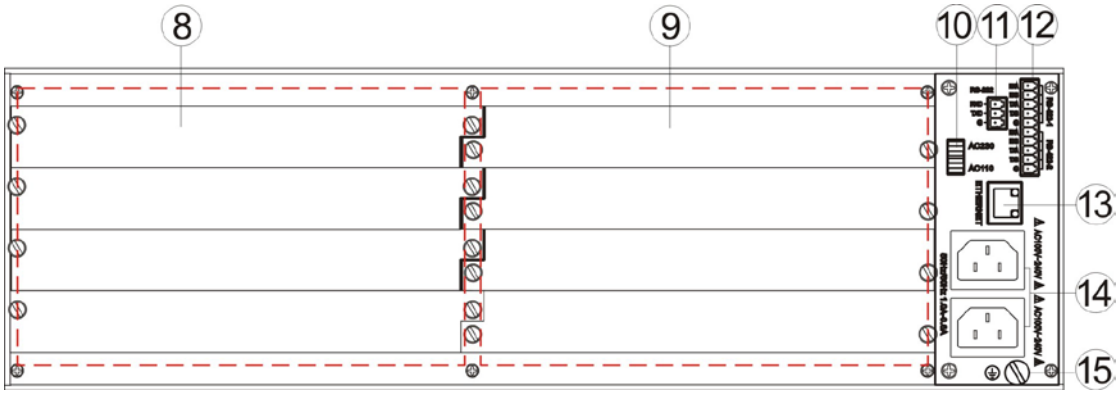
TMX-HDMI-4OUT
4 Channels HDMI Output Card
TMX-DVI-4OUT
4 Channels DVI-I Output Card
TMX-SDI-4OUT
4 Channels SDI Output Card
TMX-VGA-4OUT
4 Channels VGA Output Card
TMX- HDBaseT-4OUT
4 Channels HDBaseT Output Card

Chapter 1. Mixed Card Matrix Switchers

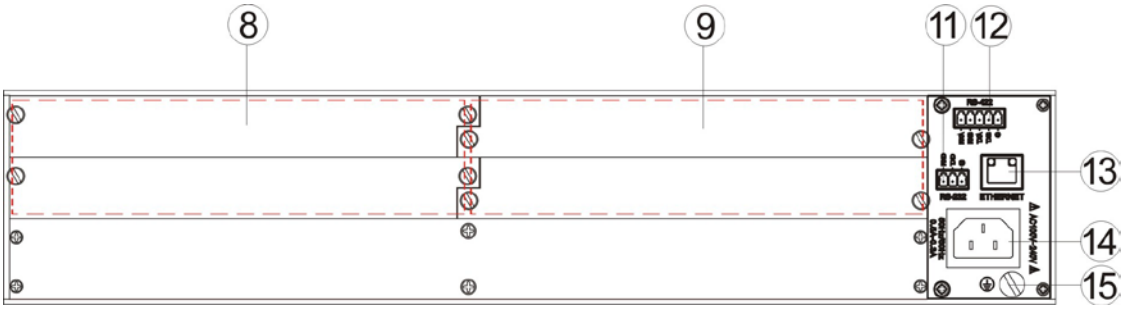
1.1 Functions and indications



Front panel



Real panel of TMX-1616MX



Real panel of TMX-0808MX

Figure 1.1 Panels of Mixed Card Matrix Switcher

Figure 1.1:

1. **"POWER"** indicator
2. **"ACTIVE" indicator**
   - ♦ Indicator will be turned on if Matrix Switcher executes switching.
3. **LCD**
4. **"NETWORK" indicator**
   - ♦ Indicator flashes if Matrix Switcher is connected with conference main unit.
5. **IR receiving window**
   - ♦ Receives IR signals from the remote control; make sure that the remote control aims at the window.

6. Number keys

- 0 to 9, used to select input or output channel，0 means no signal that can close the selected output channel.

7. Function buttons

- “AV”: Composite audio and video switch key;
- “VIDEO”: Switch video signal only;
- “AUDIO” (reserved);
- “ALL”: Switch one input channel to all output channels;
- “THROUGH”: Audio or video switch through from input channel to corresponding output channel;
- “UNDO”: Undo last switch operation;
- “ENTER”: Confirm or execute command;
- “←”: Backspace key, delete last input number or command;
- “◄”: For left, backward and subtract;
- “►”: For right, forward and plus;
- “,”: Used to separate output channels if more than one channel is operated.

8. Input signal card slots

9. Output signal card slots

10. Power switcher

11. RS-232 interface

- for connecting to center control main unit;
- for upgrade.

12. RS-422 interface

- RS-422 for connecting to dome camera;

13. Ethernet

- For communicating with PC under TCP/IP protocol to realize remote controlling; furthermore, it enables remote controlling by wireless touch panel through central control system.

14. Power cable interface

- TMX-1616MX has two power cable interfaces, one is back-up for another

15. Grounding point

1.2 Installation and connection

1.2.1 Installation

Mixed Card Matrix Switchers can be fixed in an exactly fitting standard cabinet.

A couple of mounting brackets ① are attached to the product package. First release the screws ② from the lateral sides of the matrix. Bolt on the brackets to the housing by using the screws previously released. Now put the unit into the cabinet, and fix it by screws. As figure 1.2.

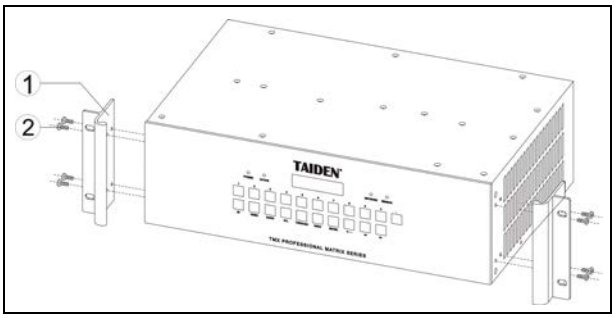


Figure 1.2 Installation

1.2.2 Connection with control devices

Mixed Card Matrix Switcher can be controlled by Central Control System via RS-232 interface. This interface also can be used for upgrading. As figure 1.3.

1.2.3 Connection with input/output cards

TAIDEN Mixed Card Matrix Switcher is a high-performance AV professional switcher, it is compatible with manifold signal formats of input/output signal cards, used for cross switching, and offers separate audio and video input/output ports. It can be combined with different signal cards (HDMI, DVI, VGA, SDI) to resolve integrative audiovisual resolution.

Mixed Card Matrix Switcher has power failure protection function and RS232 interface which can be expediently connected to PC, remote control system and other remote control devices. It is widely used in the place of radio & television engineering, multimedia conference hall, large screen display engineering, TV teaching and leadership office.

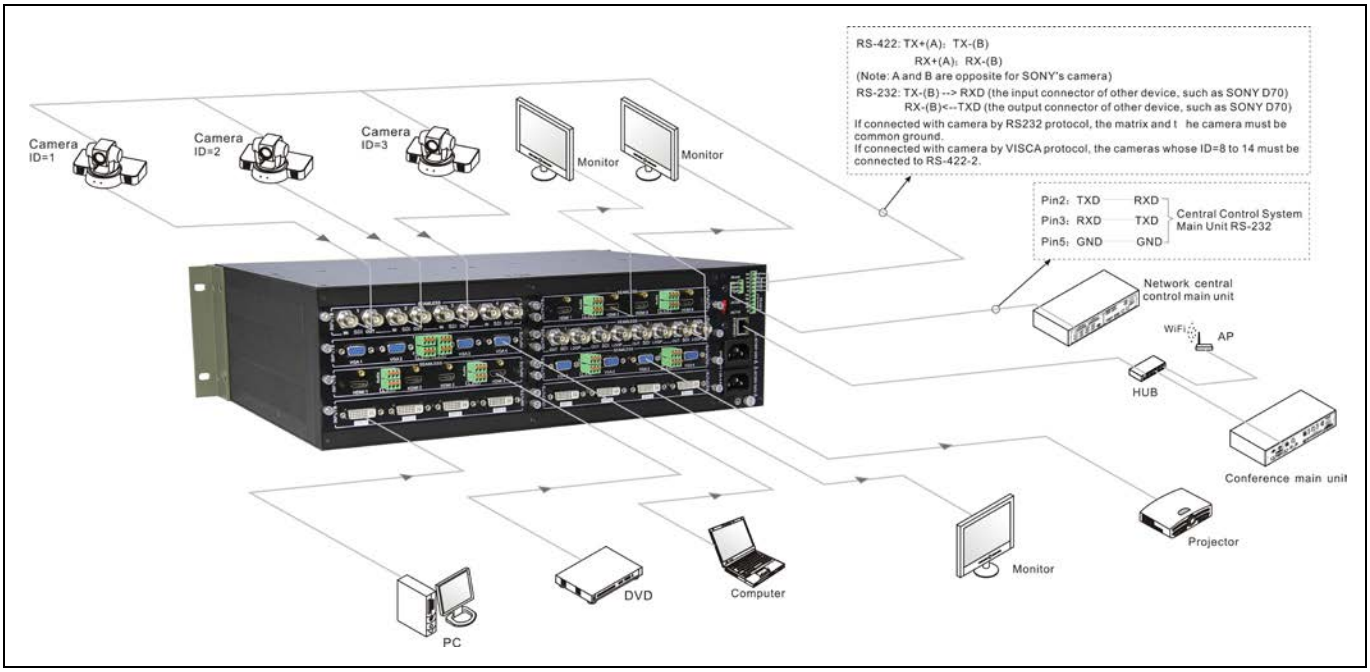
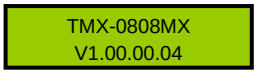


Figure 1.3 Connection for input and output devices to Mixed Card Matrix Switcher

1.3 Setup and Operation

1.3.1 Menu setup

TMX-1616MX main interface:



Press “ENTER” to enter setup menu, including:

1. Setting

2. Status

3. Net Setting

4. Set Number

5. Set RS-232

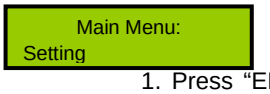
6. VISCA over IP

1.3.1.1 Setting

1. Ring

Buzzer ring on-off.

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



⇩ 1. Press “ENTER” to enter setup menu and press “◄/►” until “Ring” prompts;

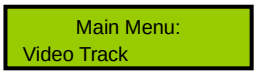
⇩ 2. Press “ENTER” and press “◄/►” to select parameter;

⇩ 3. Press “ENTER” to confirm;

2. Video Track

Video track on or off.

- ON: video track is on;
- OFF: video track is off.



⇩ 1. Press “ENTER” and press “◄/►” until “Video Track” prompts;

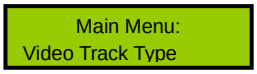
⇩ 2. Press “ENTER” to enter setup;

⇩ 4. Press “◄/►” to adjust parameter;

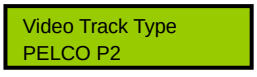
⇩ 5. Press “ENTER” to confirm.

3、Video Track Type

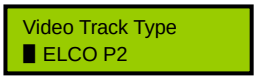
When video track is on, camera protocol can be selected from HCS-3316RS232/ HCS-3316RS485/ HUAWEI VPC620/ SONY HD1/ PELCO D/ PELCO P1/ PELCO P2/ SONY D70/ SONY D100/ SONY BRC-Z330/ SONY BRC300/ SONY BRC700/ SONY SRG-X400. Please select correct protocol according to actual device type.



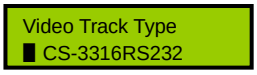
⇩ 1. Press “ENTER” and press “◄/►” until “Video Track Type” prompts;



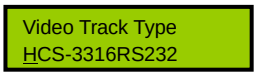
⇩ 2. Press “ENTER” to enter setup;



⇩ 3. Press “◄/►” to select parameter;



⇩ 4. Press “ENTER” to confirm;



The maximal number of cameras that can be connected to the Mixed Card Matrix Switcher is shown in follow:

Protocol	predefined position	Camera No.	Total
TMX-1616MX			
PELCO-D	64	16	1024
PELCO-P	64	16	1024
VISCA	64	14	896
TMX-0808MX			
PELCO-D	64	8	512
PELCO-P	64	8	512
VISCA	64	7	448

4. Video Track Delay

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

Main Menu:
Video Track Delay

1. Press “ENTER” and press “◄/►” until “Video Track Delay” prompts;

Video Track Delay:
0.5 s

2. Press “ENTER” to enter setup;

Video Track Delay:
▌.5 s

3. Press “◄/►” to adjust parameter;

Video Track Delay:
▌.0 s

4. Press “ENTER” to confirm;

Video Track Delay:
6.0 s

1.3.1.2 Status

Request corresponding state of input and output channels.

Main Menu:
Status

1. Press “ENTER” and press “◄/►” until “Status” prompts;

Video: 3→: 1

2. Press “ENTER” to request corresponding status and press “◄/►” to request next status.

Video: 5 →: 2

1.3.1.3 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:
Net Setting

1. Press “MENU” and press “◄/►” until “Net Setting”;

Net Setting
1. IP Address

2. Press “ENTER” to enter and press “◄/►” to select “IP Address”;

IP Address
192.168. 2.200

3. Press “◄/►” to select the parameter and press “ENTER” to enter;

IP Address
192.168. 2.20▌

4. Press “◄/►” to adjust the parameter and press “ENTER” to confirm.

IP Address
192.168. 2.219

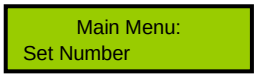
Note:

- ☞ The set up of Subnet mask, Gateway and Host IP are the same chronological order as for the “IP address” set up
- ☞ The Host IP must be the same as the IP address of the conference main unit in system.

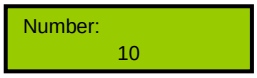
1.3.1.4 Net Number

Set the number of the Mixed Card Matrix Switcher, range: 1 to 16.

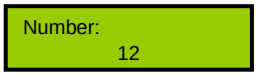
Example: set the number as 12.



⇩ 1. Press “MENU” and press “◄/►” until “Set Number”;



⇩ 2. Press “ENTER” to enter and press “◄/►” to select the number.

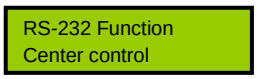


1.3.1.5 Set RS-232

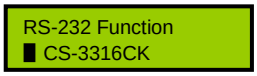
Set the RS-232 interface used for center control or HCS-3316CK control keyboard.

Example: set the RS-232 interface used for HCS-3316CK.

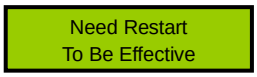
⇩ 1. Press “MENU” and press “◄/►” until “Set RS-232”;



⇩ 2. Press “ENTER” to enter and press “◄/►” to select “HCS-3316CK”.



⇩ 3. Press “MENU” to confirm and reboot the switcher.



Note:

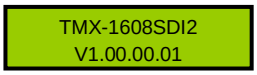
- ☞ The baud rate of center control is 115200;
- ☞ The baud rate of HCS-3316CK keyboard is 9600.

1.3.1.6 VISCA over IP

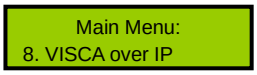
Set VISCA over IP, includes: Set On/Off, set the camera IP.

1. Setting

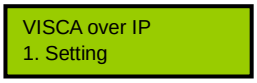
Example 1: Set VISCA over IP on.



⇩ 1. Press “MENU” and press “⇦/⇨” until “VISCA over IP” prompts;



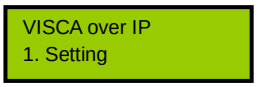
⇩ 2. Press “MENU” and press “⇦/⇨” until “1. Setting” prompts;



⇩ 3. Press “MENU” to enter setup;

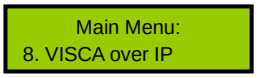
⇩ 4. Press “⇦/⇨” to adjust parameter;

⇩ 5. Press “MENU” to confirm and return.

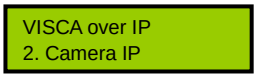


2. Camera IP

Example 2: set the camera IP address as 192.168.2.129.

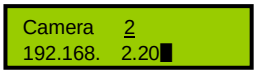


⇩ 1. Press “MENU” and press “⇦/⇨” until “VISCA over IP”;

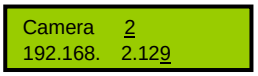


⇩ 2. Press “MENU” 2 times to enter camera selection and press “⇦/⇨” to select “2”;

⇩ 3. Press “MENU” and press “⇦/⇨” to select the IP parameter and press “MENU” to enter;



⇩ 4. Press “⇦/⇨” to adjust the parameter and press “MENU” to confirm.



Note:

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

1.3.2 Switch operation

Note:

- ☞ The functions of buttons in this section have been introduced in section 1.1; “V” stands for video.
- ☞ “Input channel” and “output channel” number must be less than matrix type.

1. VIDEO

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

Example: Switch Video signal of input channel 7 to output channel 8

TMX-0808MX
V1.00.00.04

⇩ 1. Press “7”;

Switch Video
7

⇩ 2. Press “Video”;

Switch Video
7 V

⇩ 3. Press “8”

Switch Video
7 V 8

⇩ 4. Press “ENTER” to confirm

Switch OK !

Note:

- ☞ If output channel select “All”, input channel is switched to all output channels;
- ☞ If there are more than one output channels, use “,” to separate them.

2. THROUGH

Video signals switch through from input channel to corresponding output channel.

Example 1: Switch video signals from input channel 2 to corresponding output channel 2.

TMX-0808MX
V1.00.00.04

⇩ 1. Press “2”;

Switch Video
2

⇩ 2. Press “THROUGH” to execute switch.

Switch OK!

Example 2: Switch video signal from all input channels to all corresponding output channels respectively, i.e. 1→1, 2→2, 3→3, 4→4…

TMX-0808MX
V1.00.00.04

⇩ 1. Press “ALL”;

Switch Video
All

⇩ 2. Press “THROUGH” to execute switch;

Switch OK!

3. UNDO

Undo last completely terminated and validated switch operation, and come back to the status before executing the last switch.

TMX-0808MX
V1.00.00.04

⇩ Press “UNDO” to execute.

Switch OK!

Chapter 2. Input/Output Signal Card

Manifold Signal formats of input/output signal cards can be inserted into the card slots of Mixed Card Matrix Switcher, such as HDMI, DVI, VGA, SDI, etc.. The signal cards do not support of hot plug, but the signal slots on the signal card support hot plug. They are explained explicitly for every signal card as below:

2.1 4 Channels HDMI Input/Output Signal Card

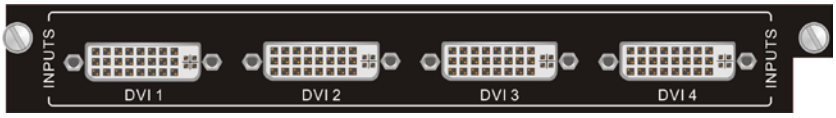
TMX-HDMI-4IN

TMX-HDMI-4OUT

Figure 2.1 4 Channels HDMI Input/Output Signal Card

- Seamless input/output signal card;
- Support HDMI1.3 and HDCP1.4, compatible with DVI signal;
- The maximum resolution is 1080P@60Hz;
- Every channel's output resolution of TMX-HDMI-4OUT can be adjusted: 1280x720p@60Hz, 1280x720p@50Hz, 1280x720p@30Hz, 1280x720p@25Hz, 1920x1080i@60Hz, 1920x1080i@50Hz, 1920x1080p@60Hz, 1920x1080p@50Hz, 1920x1080p@30Hz, 1920x1080p@25Hz, 1920x1200p@60Hz;
- Audio input mode (built-in HDMI audio or extend analog audio) can be selected via input control code (see to chapter 4), the default is built-in HDMI audio;
- Analog audio output can be set to be on/off via control code (see to chapter 4), the default is on;
- The resolution of input signal sources that connect to every channel of input signal card must be the same when seamless switch between the output signal card and the input signal card.

2.2 4 Channels DVI-I Input/Output Signal Card



TMX-DVI-4IN

TMX-DVI-4OUT

Figure 2.2　4 Channels DVI-I Input/Ouput Signal Card

- Seamless input/output signal card (only support HD signal);
- compatible with HDMI1.3 and HDCP1.4;
- Input/Output interfaces support manifold signal formats, include DVI、HDMI、VGA、YPbPr and C-VIDEO;
- Automatic identification input signal format without manual setting;
- The output signal format can be set via code (see to chapter 4);
- Every channel's output resolution of TMX-DVI-4OUT can be adjusted via code: 1280x720p@60Hz, 1280x720p@50Hz, 1280x720p@30Hz, 1280x720p@25Hz, 1920x1080i@60Hz, 1920x1080i@50Hz, 1920x1080p@60Hz, 1920x1080p@50Hz, 1920x1080p@30Hz, 1920x1080p@25Hz, 800x600p@60Hz, 800x600p@75Hz, 1024x768p@60Hz, 1024x768p@75Hz, 1280x1024p@60Hz, 1280x1024p@75Hz, 1360x768p@60Hz, 1400x1050p@60Hz, 1600x1200p@60Hz, 1440x900p@60Hz, 1440x900p@75Hz, 1920x1200p@60Hz;
- with embedded EDID manage technology, supporting DDC control;
- The resolution of input signal sources that connect to every channel of input signal card must be the same when seamless switch between the output signal card and the input signal card;
- The output standard can be set as PAL or NTSC (the default is PAL) when the output signal card in CVBS format.

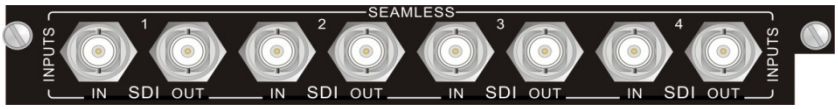
Note:

The converter plugs (cables) below can be used when the signal format is VGA, YPbPr or C-VIDEO:

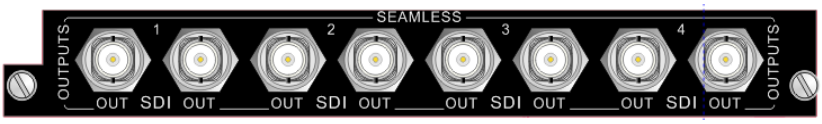
DVI to YPbPr/C-VIDEO

DVI to VGA

2.3 4 Channels SDI Input/Output Signal Card



TMX-SDI-4IN

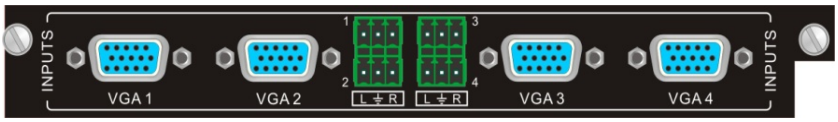


TMX-SDI-4OUT

Figure 2.3 4 Channels SDI Input/Ouput Signal Card

- Seamless input/output signal card;
- Every channel of input signal card with a SDI loop-output;
- Every channel of output signal card with a SDI loop-output;
- Supporting SDI, HD-SDI, 3G-SDI;
- Input signal card has build-in upscaling function, and can convert low input signal into 1080P output;
- The transmission distance of SDI output signal (1080P) can up to 70-100 m via coaxial cable;
- The resolution can be adjusted, supporting 280x720p@60Hz, 1280x720p@50Hz, 1920x1080i@60Hz, 1920x1080i@50Hz, 1920x1080p@60Hz, 1920x1080p@50Hz, 1920x1080p@30Hz.

2.4 4 Channels VGA Input/Output Signal Card



TMX-VGA-4IN

TMX-VGA-4OUT

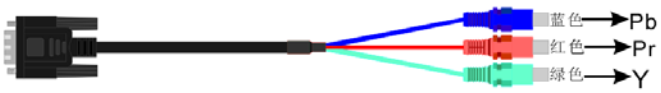
Figure 2.4 4 Channels VGA Input/Ouput Signal Card

- Seamless input/output signal card;
- Input signal card has build-in upscaling function, and can convert into 1080P or 1920x1200 output;
- Signal type can be set manually: VGA（RGBHV）, YPbPr, S-VIDEO, C-VIDEO;
- The input signal card can extend 4 stereo audio inputs which can be set to be on/off via control code (see to chapter 4), the default is on;
- Every channel's output resolution of TMX-VGA/O can be adjusted via code: 1280x720p@60Hz, 1280x720p@50Hz, 1280x720p@30Hz, 1920x1080p@60Hz, 1920x1080p@50Hz, 1920x1080p@30Hz, 800x600p@60Hz, 800x600p@75Hz, 1024x768p@60Hz, 1024x768p@75Hz, 1280x1024p@60Hz, 1280x1024p@75Hz, 1360x768p@60Hz, 1400x1050p@60Hz, 1600x1200p@60Hz, 1440x900p@60Hz, 1440x900p@75Hz;
- Output signal card supports embedded audio which is synchronous of video signal, namely, the embedded audio could not be transmitted without video;
- Seamless switch can be realized between seamless input signal card and output signal card;
- The resolution of input signal sources that connect to every channel of input signal card must be the same when seamless switch between the output signal card and the input signal card.

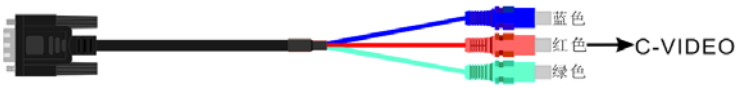
Note:

The converter cables below can be used to connect to the signal source and the displayer when the signal format is YPbPr or C-VIDEO:

- *The signal format is YPbPr:*

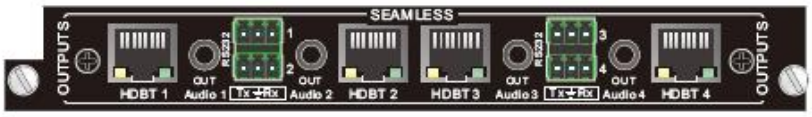


- *The signal format is C-VIDEO:*



2.5 4 Channels HDBaseT Input/Output Signal Card

TMX-HDBaseT-4IN

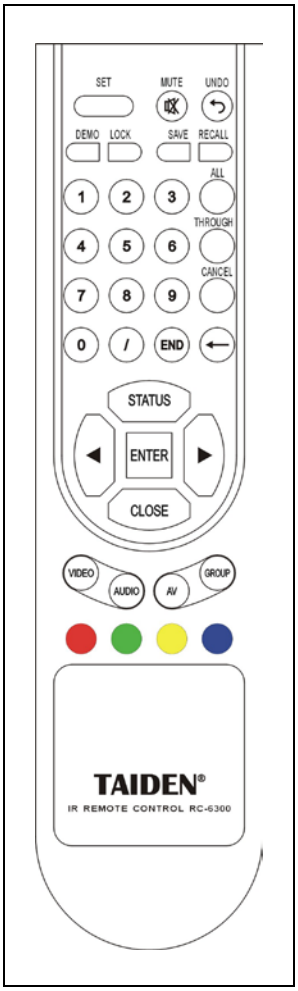


TMX-HDBaseT-4OUT

Figure 2.5 4 Channels HDBaseT Input/Ouput Signal Card

- Seamless input/output signal card;
- Audio can be packed or unpacked from video stream, default audio input is embedded audio, default audio output is unpacked;
- RS232 can be used for peer-to-peer remote communications;
- Maximum transmission distance of 1080p is 70m;
- Output card supports 1080p seamless switch, with default 1920x1200@60Hz;
- HDBaseT terminal indicator: when powered on, yellow light blinks if twisted-pair not connected; yellow light blinks and green light turns on if twisted-pair connected;
- Each HDBaseT terminal contains 1 audio output and 1 RS232 control signal.

Chapter 3. 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.

This IR remote control also can realize scene save, scene recall and demo functions:

Scene save: press “SAVE” and then press the number button to select a scene, press “ENTER” to save the scene;

Scene recall: press “RECALL” and then press the number button to select a scene, press “ENTER” to save the scene;

Demo: press “DEMO” to enter demo mode, the input/output channels will switch one by one in file, the time interval is 2 seconds.

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

Chapter 4. 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	[x]All.	Input channel [x] switch to all output channels
	All#.	Setup all channels one-to-one correspondence: 1->1, 2->2, 3->3…
	All$.	Close all channels
	[x]#.	Input channel [x] switch to output channel [x]
	[x]$.	Close output channel [x] (Audio & Video)
	[x1]V[x2].	Video of input channel [x1] switch to output channel [x2]
	[x1] V[x2],[x3],[x4].	Video of input channel [x1] switch to output channel [x2], [x3], [x4]. (10 channels at most)
	[x1]A[x2].	Audio of input channel [x1] switch to output channel [x2]
	[x1]B[x2].	Video and audio of input channel [x1] switch to output channel [x2]
	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 at the first time and exit when send the code again
	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)
	V00.	Query the version of the real panel
	V1[x].	Query the version of input signal card whose marking is [x]
	V2[x].	Query the version of output signal card whose marking is [x]
	HDCPON.	Open the HDCP
	HDCPOFF.	Open the HDCP
	GetResolution[x].	Get the resolution of output channel [X]
	GetVGAPortMode[x].	Query the status of VGA ports [x]

	USER/[Y]/[X]:*****;	"*****" is the code write by use, for example: 0623%; [Y] means I/O, [x] is the number of port
TMX-VGA-4IN	USER/I/[x]:02xx%;	Set image brightness (xx: 00-99) of input signal of channel [x]
	USER/I/[x]:03xx%;	Set image contrast (xx: 00-99) of input signal of channel [x]
	USER/I/[x]:04xx%;	Set image chroma (xx: 00-99) of input signal of channel [x]
	USER/I/[x]:05xx%;	Set image acutance (xx: 00-99) of input signal of channel [x]
	USER/I/[x]:0622%;	Set the input signal source of channel [x] to be VGA
	USER/I/[x]:0623%;	Set the input signal source of channel [x] to be YPbPr
	USER/I/[x]:0624%;	Set the input signal source of channel [x] to be S-VIDEO
	USER/I/[x]:0625%;	Set the input signal source of channel [x] to be C-VIDEO
	USER/I/[x]:0648%;	Open audio of channel [x]
	USER/I/[x]:0649%;	Close audio of channel [x]
	USER/I/[x]:0684%;	Set the input chromaticity space of channel [x] to be YCBCR
	USER/I/[x]:0685%;	Set the input chromaticity space of channel [x] to be RGB
	USER/I/[x]:0686%;	Set the input chromaticity space of channel [x] to be HDMI
	USER/I/[x]:0687%;	Set the input chromaticity space of channel [x] to be DVI
	USER/I/[x]:0617%;	Factory reset the input signal of channel [x]
	USER/I/[x]:0606%;	VGA input signal automatic correction of channel [x]
TMX-VGA-4OUT	USER/O/[x]:0804%;	Set the output resolution of channel[x] to be 1280x720p@60Hz
	USER/O/[x]:0806%;	Set the output resolution of channel[x] to be 1280x720p@50Hz
	USER/O/[x]:0807%;	Set the output resolution of channel[x] to be 1280x720p@30Hz
	USER/O/[x]:0813%;	Set the output resolution of channel[x] to be1920x1080p@60Hz
	USER/O/[x]:0815%;	Set the output resolution of channel[x] to be 1920x1080p@50Hz
	USER/O/[x]:0816%;	Set the output resolution of channel[x] to be 1920x1080p@30Hz
	USER/O/[x]:0822%;	Set the output resolution of channel[x] to be 800x600p@60Hz
	USER/O/[x]:0823%;	Set the output resolution of channel[x] to be 800x600p@75Hz
	USER/O/[x]:0824%;	Set the output resolution of channel[x] to be 1024x768p@60Hz
	USER/O/[x]:0825%;	Set the output resolution of channel[x] to be 1024x768p@75Hz
	USER/O/[x]:0826%;	Set the output resolution of channel[x] to be 1280x1024p@60Hz
	USER/O/[x]:0827%;	Set the output resolution of channel[x] to be 1280x1024p@75Hz
	USER/O/[x]:0828%;	Set the output resolution of channel[x] to be 1360x768p@60Hz
	USER/O/[x]:0830%;	Set the output resolution of channel[x] to be 1400x1050p@60Hz
	USER/O/[x]:0831%;	Set the output resolution of channel[x] to be 1600x1200p@60Hz
	USER/O/[x]:0832%;	Set the output resolution of channel[x] to be 1440x900p@60Hz
	USER/O/[x]:0833%;	Set the output resolution of channel[x] to be 1440x900p@75Hz
	USER/O/[x]:0201%;	Set the output format of channel[x] to be YPbPr
	USER/O/[x]:0202%;	Set the output format of channel[x] to be VGA
	USER/O/[x]:0203%;	Set the output format of channel[x] to be C-VIDEO
	GetVGAPortMode[x].	Query the status of VGA output channel [x]
	USER/O/[x]:0900%;	Set the standard of CVBS format as NTSC, sequential scanning, the refresh rate is 60Hz (625 lines)
	USER/O/[x]:0901%;	Set the standard of CVBS format as PAL, interlaced scanning, the refresh rate is 50Hz (525 lines)
	USER/O/[x]:0400%;	Reduce image brightness of input signal
	USER/O/[x]:0401%;	Add image brightness of input signal
	USER/O/[x]:0410%;	Reduce image contrast of input signal

	USER/O/[x]:0411%;	Add image contrast of input signal
	USER/O/[x]:0420%;	Reduce image chroma of input signal
	USER/O/[x]:0421%;	Add image chroma of input signal
TMX-DVI-4IN	USER/I/[x]:02xx%;	Set image brightness (xx: 00-99) of input signal of channel [x]
	USER/I/[x]:03xx%;	Set image contrast (xx: 00-99) of input signal of channel [x]
	USER/I/[x]:04xx%;	Set image chroma (xx: 00-99) of input signal of channel [x]
	USER/I/[x]:05xx%;	Set image acutance (xx: 00-99) of input signal of channel [x]
	USER/I/[x]:0606%;	VGA input signal automatic correction of channel [x]
	USER/I/[x]:0607%;	Set image color temperature of input signal of channel [x]
	USER/I/[x]:0608%;	Set image proportion of input signal of channel [x]
	USER/I/[x]:0614%;	Set image mode of input signal of channel [x], and different image modes switch circularly
	USER/I/[x]:0617%;	Factory reset the input signal of channel [x]
	USER/I/[x]:0686%;	Set the input signal format of channel [x] to be HDMI
	USER/I/[x]:0687%;	Set the input signal format of channel [x] to be DVI
TMX-DVI-4OUT	USER/O/[x]:0804%;	Set the output resolution of channel [x] to be 1280x720p@60Hz
	USER/O/[x]:0806%;	Set the output resolution of channel [x] to be 1280x720p@50Hz
	USER/O/[x]:0807%;	Set the output resolution of channel [x] to be 1280x720p@30Hz
	USER/O/[x]:0808%;	Set the output resolution of channel [x] to be 1280x720p@25Hz
	USER/O/[x]:0810%;	Set the output resolution of channel [x] to be 1920x1080i@60Hz
	USER/O/[x]:0812%;	Set the output resolution of channel [x] to be 1920x1080i@50Hz
	USER/O/[x]:0813%;	Set the output resolution of channel [x] to be 1920x1080p@60Hz
	USER/O/[x]:0815%;	Set the output resolution of channel [x] to be 1920x1080p@50Hz
	USER/O/[x]:0816%;	Set the output resolution of channel [x] to be 1920x1080p@30Hz
	USER/O/[x]:0818%;	Set the output resolution of channel [x] to be 1920x1080p@25Hz
	USER/O/[x]:0822%;	Set the output resolution of channel [x] to be 800x600p@60Hz
	USER/O/[x]:0823%;	Set the output resolution of channel [x] to be 800x600p@75Hz
	USER/O/[x]:0824%;	Set the output resolution of channel [x] to be 1024x768p@60Hz
	USER/O/[x]:0825%;	Set the output resolution of channel [x] to be 1024x768p@75Hz
	USER/O/[x]:0826%;	Set the output resolution of channel [x] to be 1280x1024p@60Hz
	USER/O/[x]:0827%;	Set the output resolution of channel [x] to be 1280x1024p@75Hz
	USER/O/[x]:0828%;	Set the output resolution of channel [x] to be 1360x768p@60Hz
	USER/O/[x]:0830%;	Set the output resolution of channel [x] to be 1400x1050p@60Hz
	USER/O/[x]:0831%;	Set the output resolution of channel [x] to be 1600x1200p@60Hz
	USER/O/[x]:0832%;	Set the output resolution of channel [x] to be 1440x900p@60Hz
	USER/O/[x]:0833%;	Set the output resolution of channel [x] to be 1440x900p@75Hz
	USER/O/[x]:0837%;	Set the output resolution of channel [x] to be 1920x1200p@60Hz
	USER/O/[x]:0201%;	Set the output format of channel[x] to be YPbPr
	USER/O/[x]:0202%;	Set the output format of channel[x] to be VGA
	USER/O/[x]:0203%;	Set the output format of channel[x] to be C-VIDEO
	GetVGAPortMode[x].	Query the status of VGA output channel [x]
	USER/O/[x]:0900%;	Set the standard of CVBS format as NTSC, sequential scanning, the refresh rate is 60Hz (625 lines)
	USER/O/[x]:0901%;	Set the standard of CVBS format as PAL, interlaced scanning, the refresh rate is 50Hz (525 lines)
	USER/I/[x]:02xx%;	Set image brightness (xx: 00-99) of input signal of channel [x]

TMX-HDMI-4OUT	USER/I/[x]:03xx%;	Set image contrast (xx: 00-99) of input signal of channel [x]
	USER/I/[x]:04xx%;	Set image chroma (xx: 00-99) of input signal of channel [x]
	USER/I/[x]:05xx%;	Set image acutance (xx: 00-99) of input signal of channel [x]
	USER/I/[x]:0607%;	Set image color temperature of input signal of channel [x]
	USER/I/[x]:0608%;	Set image proportion of input signal of channel [x]
	USER/I/[x]:0614%;	Set image mode of input signal of channel [x], and different image modes switch circularly
	USER/I/[x]:0617%;	Factory reset the input signal of channel [x]
	USER/I/[x]:0686%;	Set the input signal format of channel [x] to be HDMI
	USER/I/[x]:0711%;	Set the input signal of channel [x] to be built-in HDMI audio
	USER/I/[x]:0712%;	Set the input signal of channel [x] to be extend analog audio
TMX-HDMI-4OUT	USER/O/[x]:0804%;	Set the output resolution of channel [x] to be 1280x720p@60Hz
	USER/O/[x]:0806%;	Set the output resolution of channel [x] to be 1280x720p@50Hz
	USER/O/[x]:0807%;	Set the output resolution of channel [x] to be 1280x720p@30Hz
	USER/O/[x]:0808%;	Set the output resolution of channel [x] to be 1280x720p@25Hz
	USER/O/[x]:0810%;	Set the output resolution of channel [x] to be 1920x1080i@60Hz
	USER/O/[x]:0812%;	Set the output resolution of channel [x] to be 1920x1080i@50Hz
	USER/O/[x]:0813%;	Set the output resolution of channel [x] to be 1920x1080p@60Hz
	USER/O/[x]:0815%;	Set the output resolution of channel [x] to be 1920x1080p@50Hz
	USER/O/[x]:0816%;	Set the output resolution of channel [x] to be 1920x1080p@30Hz
	USER/O/[x]:0818%;	Set the output resolution of channel [x] to be 1920x1080p@25Hz
	USER/O/[x]:0837%;	Set the output resolution of channel [x] to be 1920x1200p@60Hz
	GetResolution[x].	Get resolution of output channel [x]
	USER/O/[x]:0110%;	Open output analog audio of channel [x]
	USER/O/[x]:0111%;	Close output analog audio of channel [x]
TMX-SDI-4IN	USER/I/[x]:02xx%;	Set image brightness (xx: 00-99) of input signal of channel [x]
	USER/I/[x]:03xx%;	Set image contrast (xx: 00-99) of input signal of channel [x]
	USER/I/[x]:04xx%;	Set image chroma (xx: 00-99) of input signal of channel [x]
	USER/I/[x]:05xx%;	Set image acutance (xx: 00-99) of input signal of channel [x]
	USER/I/[x]:0607%;	Set image color temperature of input signal of channel [x]
	USER/I/[x]:0608%;	Set image proportion of input signal of channel [x]
	USER/I/[x]:0614%;	Set image mode of input signal of channel [x], and different image modes switch circularly
	USER/I/[x]:0617%;	Factory reset the input signal of channel [x]
TMX-SDI-4OUT	USER/O/[x]:0804%;	Set the output resolution of channel [x] to be 1280x720p@60Hz
	USER/O/[x]:0806%;	Set the output resolution of channel [x] to be 1280x720p@ 50Hz
	USER/O/[x]:0810%;	Set the output resolution of channel [x] to be 1920x1080i @60Hz
	USER/O/[x]:0812%;	Set the output resolution of channel [x] to be 1920x1080i@50Hz
	USER/O/[x]:0813%;	Set the output resolution of channel [x] to be 1920x1080p@60Hz
	USER/O/[x]:0815%;	Set the output resolution of channel [x] to be 1920x1080p@50Hz
	USER/O/[x]:0816%;	Set the output resolution of channel [x] to be 1920x1080p@30Hz

Note:

- [x1], [x2], [x3], [x4] is channel number of input or output; only 1~16 available (depend on the number of the matrix's input/output channels), 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 5. Technical data

5.1 Mixed Card Matrix Switcher

Type / Spec.	TMX-0808MX	TMX-1616MX
Max. size	8×8	16×16
Signal cards	2 input signal cards, 2 output signal cards	4 input signal cards, 4 output signal cards
Input card	HD-SDI, HDMI, DVI, VGA, HDBaseT	
Output card	HDMI, DVI, VGA, HD-SDI, HDBaseT	
Resolution	Max. 1920×1200@60 Hz, compliant with VESA and HDTV normal standards	
Control interface	RS232, TCP/IP	
Power supply	100 V AC ~ 240 V AC, 50/60 Hz	
Temperature	Operating: 0°C ~ +50°C Storage:-20°C ~ +70°C	
Humidity	Storage and operating: 10% ~ 90%	
Dimensions h × w ×d (mm)	88×478×310 (2U high)	132×478×310 (3U high)
Weight (incl. baffles, excl. input/output cards)	3.9 kg	5.9 kg
Mean time between failures	30，000 hours	

5.2 Signal Cards

5.2.1 VGA input/output signal card

Type / Spec.	TMX-VGA-4IN	TMX-VGA-4OUT
Video		
Input/output signal	4 × VGA input signal	4 × VGA output signal
Coupling input	AC	--
Switching type	--	Vertical spacing
Interface	15-pin female D connector	
Level	0.5 - 2.0 Vp-p	
Impedance	75 Ω	
Audio		
Input/output signal	4 × analog audio	
Interface	3-pin Phoenix	
Frequency respones	20 - 20 kHz	
Input impedance	>10 kΩ	--
Impedance	75 Ω	
Normal		
Gain	0 dB	
Switching speed	Max. 200 ns	
Video signal	VGA(RGBHV), YpbPr, S-VIDEO, C-VIDEO	
Bandwidth	YPbPr: 170MHz, C-VIDEO: 150MHz, VGA: 170MHz	
Crosstalk	<-50 dB@5 MHz	
Weight	0.2 kg	

5.2.2 DVI input/output signal card

Type / Spec.	TMX-DVI-4IN	TMX-DVI-4OUT
Input/output signal	4 × DVI input signal	4 × DVI output signal
Interface	Female DB24+5	
Level	T.M.D.S 2.9V ~ 3.3V	
Impedance	75 Ω	
Gain	0 dB	
Switching speed	Max. 200 ns	
Delay	Max. 5 ns (±1 ns)	
Video signal	DVI, HDMI, VGA, C-VIDEO, YPbPr	
Bandwidth	340MHz(10.2Gbit/s)	
Crosstalk	<-50 dB@5 MHz	
Data types	8 bit	
Audio output format	PCM	
Audio sampling rate	32 K, 44.1 K, 48 K, 88.2 K, 96 K, 176.4 K, 192 K	
EDID and DDC manage	Supporting EDID and DDC, used DVI and HDMI standard	
HDCP manage	Supporting HDCP, used DVIand HDMI1.3 standard	
Weight	0.2 kg	

5.2.3 HDMI input/output signal card

Type / Spec.	TMX-HDMI-4IN	TMX-HDMI-4OUT
Input/output signal	4 × HDMI signal (compatible with DVI), 4 × analog audio signal	
Interface	Type A 19P female	
Power consumption	7.1 W	7.9 W
Color depth	8 & 10 & 12 bit	8 bit
Signal types	DVI，HDMI	
Bandwidth	6.75 Gpbs	
Audio format	PCM	
Standard	Supporting HDMI1.3	
EDID manage	Supporting EDID learning function	
Weight	0.2 kg	

5.2.4 SDI input/output signal card

Type / Spec.	TMX-SDI-4IN	TMX-SDI-4OUT
Input/output signal	4 × SDI signal with a SDI looping out	
Interface	BNC connector	
Level	T.M.D.S 2.9 V - 3.3 V	
Impedance	75 Ω	
Video signal	SDI, HD-SDI, 3G-SDI	
Color depth	8 & 10 & 12 bit	
Distance	1080P≤100 m (excellent line)	
Bandwidth	6.75 Gpbs	
Resolution	Max. 1080P@60Hz	
Weight	0.3 kg	

5.2.5 HDBaseT input/output signal card

Type / Spec.	TMX-HDBaseT-4IN	TMX- HDBaseT-4OUT
Input/output signal	4 × HDBaseT signal with 1 audio output and 1 RS232 control signal	
Interface	RJ45	
Level	T.M.D.S 2.9 V - 3.3 V	
Impedance	75 Ω	
Distance	1080P≤70 m (excellent line)	
Bandwidth	10.2 Gpbs	
Resolution	Max. 1920 × 1200@60Hz	
Standard	Supporting HDMI1.3	
Weight	0.2 kg	

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