HDMI 4x4 Matrix Switch 4K/60

Operation Manual

100508

SAFETY PRECAUTIONS

To insure the best performance from the product, please read all instructions carefully before using the device.

Save this manual for future reference.

- Follow basic safety precautions to reduce the risk of fire, electrical shock and injury.
- Do not dismantle the housing or modify the module. It may result in electrical shock or burns.
- Do not open or remove the housing of the device as you may be exposed to dangerous voltage or other hazards.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture and do not install this product near water. Keep the product away from liquids.
- Spillage into the housing may result in fire, electrical shock, or equipment damage. If an object or liquid falls or spills on to the housing, unplug the module immediately.
- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.
- Using supplies or parts not meeting the products' specifications may cause damage, deterioration or malfunction.
- Refer all servicing to qualified service personnel.
- Install the device in a place with adequate ventilation to avoid damage caused by overheat.
- Unplug the power when left unused for a long period of time.
- Information on disposal of devices: do not burn or mix with general household waste, please treat them as normal electrical waste.

NOTICE: Please read this manual carefully before using this product.

Table of Contents

1.Introduction

The HDMI 4x4 Matrix, 4K/60 connects Four (4) HDMI sources to Four (4) displays. This matrix provides Four HDMI outputs, and each HDMI output supports resolutions from 1080p Full HD up to 4K/60 plus all 3D formats. It works with Blu-Ray players, Set-Top boxes, Home Theater PCs, and game consoles that connect to an HDMI display. Any source is accessible at all times to any display, and may be selected via various control methods, including IR Remote Control, RS-232, TCP/IP or by using the selection buttons on the front panel.

2. Features

- HDMI V2.0 supports: 4K x 2K @60Hz, 1080P @120Hz, and 1080P 3D @60Hz.
- Deep Color support 36/30/24-bit.
- HDR 4:2:2 12 Bit
- Supports LPCM 7.1CH, Dolby True HD, Dolby Digital Plus, DTS-HD Master, Dolby Atmos and DTS:X Audio transmission.
- Allows any source to be displayed on multiple displays at the same time.
- Allows any HDMI display to view any HDMI source at any time.
- Supports RS-232 control, TCP/IP Control, IR Remote Control, and On-Panel Control.
- HDMI connectors with Locking nuts

3. Package Contents

- One (1) HDMI 4x4 Matrix Switch, 4K/60
- One (1) 12V/2A DC power adapter
- Three (3) Blades: US, UK and Euro
- One (1) Quick Reference Sheet
- One (1) HDMI Matrix IR Remote
- One (1) RS232 Terminal Block

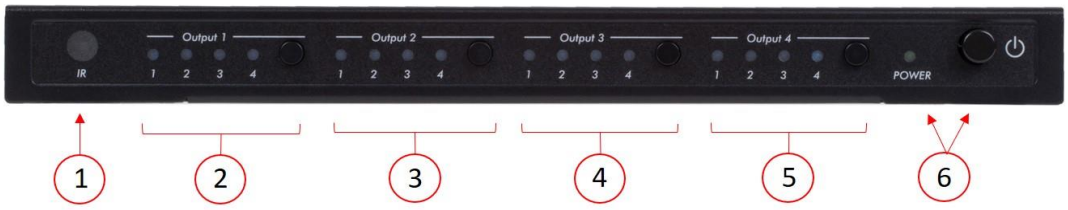
Notes： Confirm that the product and accessories are all included. If not, please contact the supplier from which you purchased the unit.

4. Specifications

Video Bandwidth	594 MHz
Support Video Resolution	480i,576i,480p,576p,720p,1080i,1080p@ 24/30/50/60Hz, 4K@60Hz, 1080P3D@60Hz
Audio	LPCM, compressed (Dolby, DTS) and HBR
HDCP	Revision 1.4 & 2.2
HDR	4:2:2 12 Bit
Input Ports	Four (4) HDMI Receptacle One (1) RS-232 Terminal Block Connector One (1) Ethernet Port (Control)
Output Ports	Four (4) HDMI Receptacle
Control	Push Button, RS232, Telnet, Web GUI & IR
ESD Protection	Human-body Model: ± 8kV (Air-gap discharge) ± 4kV (Contact discharge)
Power Supply	One (1) 110-240V/12VDC/2.0A power supply with interchangeable blades
Dimensions	10.63”4.33”x0.98” (270 × 110 × 25 mm)
Weight	2.40lb (1090 g)
Chassis Material	Metal
Chassis Color	Black
Operating Temperature	0 ºC to 40 ºC / 32 ºF to 104 ºF
Storage Temperature	−20 ºC to 60 ºC / −4 ºF to 140 ºF
Relative Humidity	20 to 90 % RH (non-condensing)
Compliance	Regulatory: FCC, CE, RoHS
Warranty	1 Year
Ordering Information	100508 4X4 HDMI Matrix Switch, 4K/60

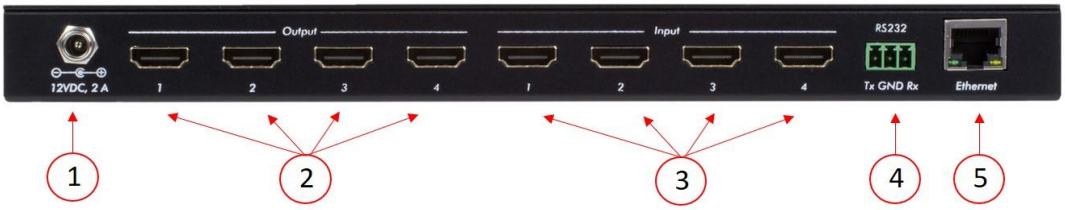
5. Panels Description

5.1 Front Panel



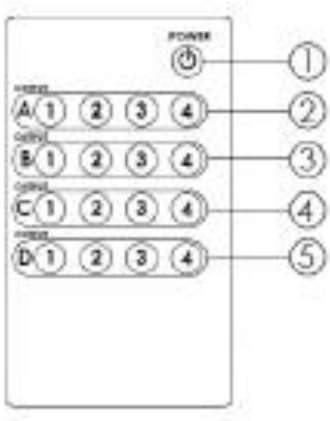
No.	Name	Description
1	IR	IR sensor for the remote control of the 8x8.
2	Output 1	Press the “HDMI OUT 1” button repeatedly to switch to your desired source, and the LED will illuminate to indicate which input source is being selected, and routed to HDMI 1 display
3	Output 2	Press the “HDMI OUT 2” button repeatedly to switch to your desired source, and the LED will illuminate to indicate which input source is being selected, and routed to HDMI 2 display
4	Output 3	Press the “HDMI OUT 3” button repeatedly to switch to your desired source, and the LED will illuminate to indicate which input source is being selected, and routed to HDMI 3 display
5	Output 4	Press the “HDMI OUT 4” button repeatedly to switch to your desired source, and the LED will illuminate to indicate which input source is being selected, and routed to HDMI 4 display
6	Power	The LED will illuminate when the power switch is turned on.

5.2 Rear Panel



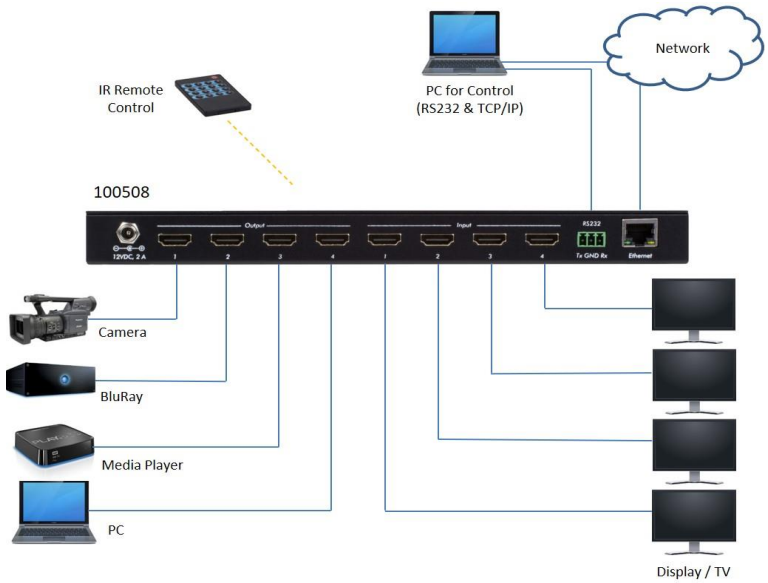
No.	Name	Description
1	Power	Plug the 12VDC/2A power supply adapter into the unit and connect the adaptor to the AC wall outlet.
2	HDMI Input	Connect each of these HDMI input ports to the HDMI output ports of your source equipment, such as a DVD player, set-top-box, etc.
3	HDMI Output	Connect each of these HDMI output ports to the HDMI input ports of an HDMI display.
4	RS232	Connect to a PC or Laptop via RS232 terminal to D-Sub 9-pin cable, for the transmission of RS-232 control commands.
5	Ethernet	Connect to your Ethernet network. May be managed via the device’s web interface, by a PC on the same network.

6. Remote Control



① Power: Press the button to turn on/off the unit.
② Input Select for HDMI Output 1:
Press 1, 2, 3 or 4 to select the desired input source for HDMI Output 1.
③ Input Select for HDMI Output 2:
Press 1, 2, 3 or 4 to select the desired input source for HDMI Output 2.
④ Input Select for HDMI Output 3:
Press 1, 2, 3 or 4 to select the desired input source for HDMI Output 3.
④ Input Select for HDMI Output 4:
Press 1, 2, 3 or 4 to select the desired input source for HDMI Output 4.

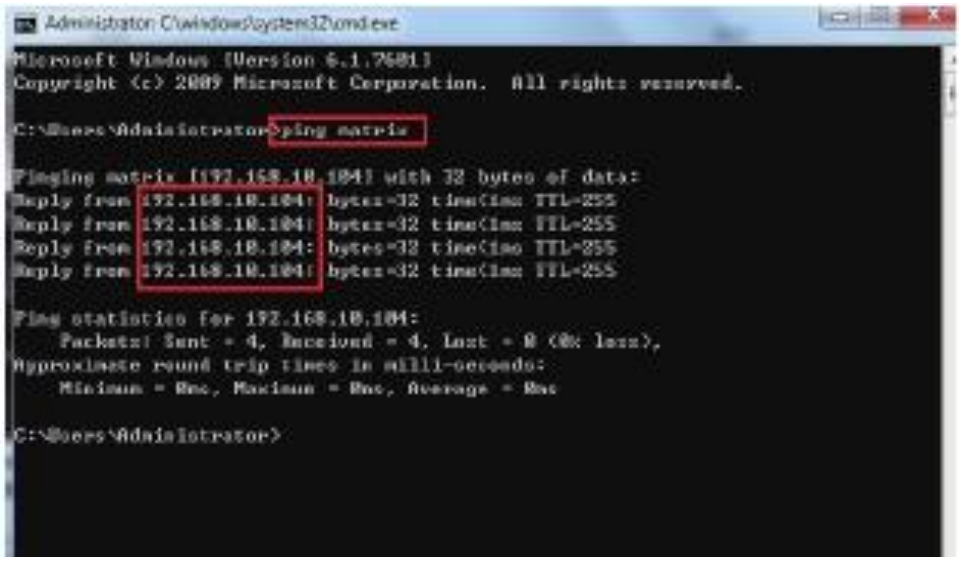
7. Operate and Connect



1. Make sure all equipment is powered off. Insert and connect cables carefully with the power SWITCHED OFF. Connecting and disconnecting cables while the unit is powered can result in damage to equipment.
2. Connect upto 4 sources such as a Blu-Ray Player, a game console, an A/V Receiver, a Cable or Satellite Receiver, etc. to the HDMI inputs on the unit. Note that high-quality/premium 4K HDMI cables are recommended.
3. Connect the HDMI output ports to Ultra High-Definition displays such as an 4K TVs and projectors that support HDMI connectivity. Note that high-quality/premium 4K HDMI cables are recommended.
4. For power, plug in the unit power jack first, and then plug in the power supply to the wall.
5. Power on each device in the same sequence. At this point each display connected should display the assigned source (input 1 at default when powered on initially), scroll through each of the sources on each display to ensure everything is in proper working order. Use the included IR remote to test the switching function. If a display is having difficulty receiving the HDMI signal, access the display's menu and adjust the resolution (lowest to highest until signal is displayed). Please note that a 24 Hz vertical refresh rate may work better than 60 Hz or higher.

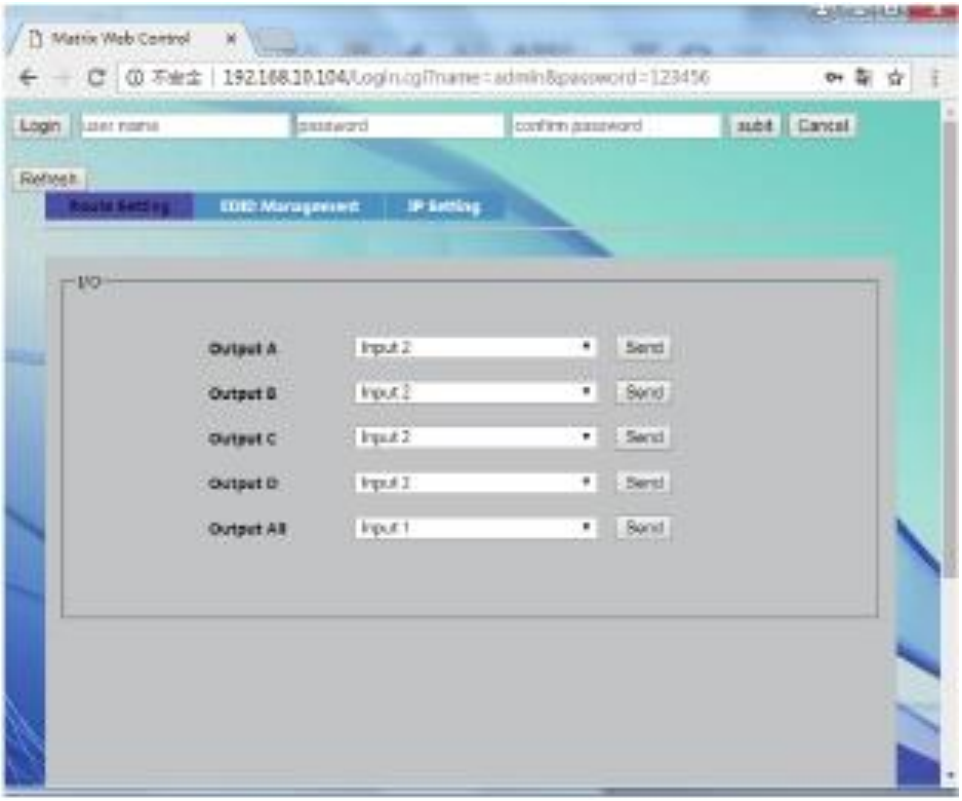
8. Web GUI Interface

1. Use an Ethernet cable to connect the LAN port on the matrix switch to an unused, active port on the Ethernet Switch or Router.
2. Get the IP Address by CMD.exe. Enter “ping matrix” into CMD windows as follows.

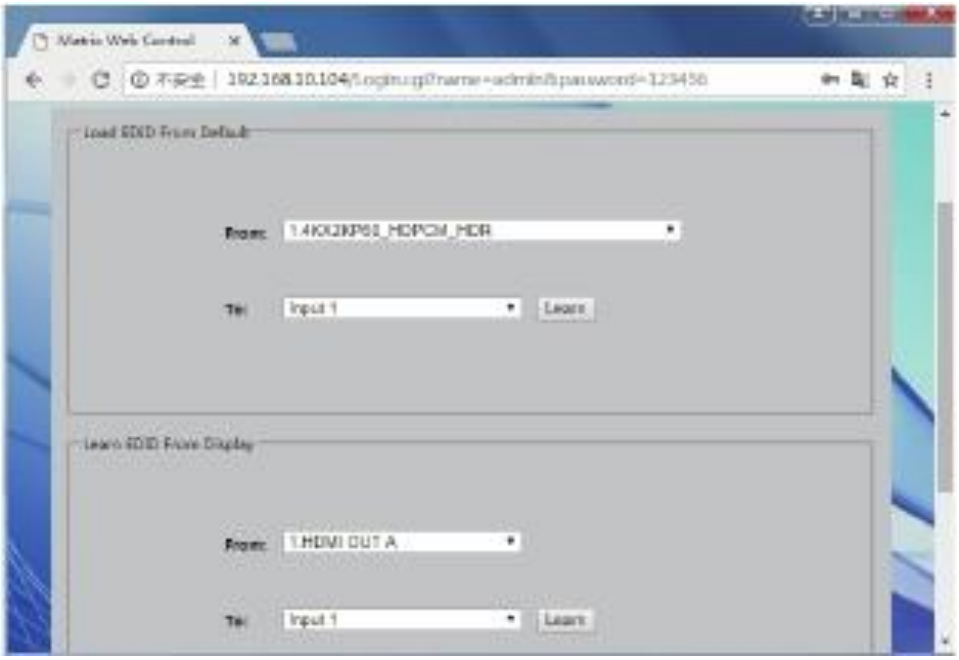


3. Enter the IP Address into any web browser as follows.

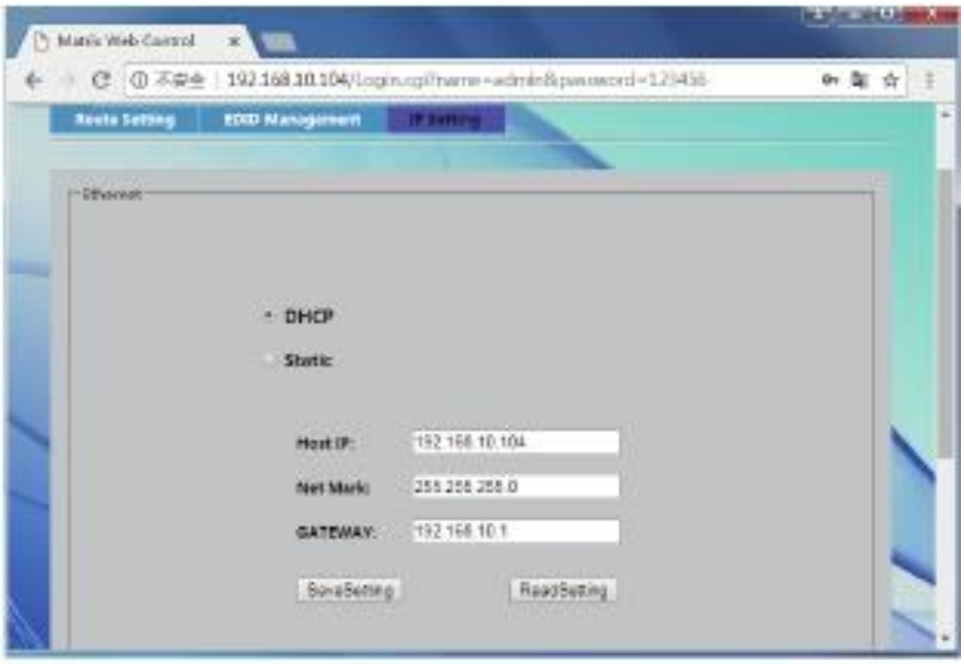
4. Enter Username and Password to login the Web GUI
Default Username is: admin
Default Password is: admin



Under the Route Setting tab, the User can set any input port to any output port, one by one, or set any input port to one or more output ports.



In the EDID Management interface, the User can load a Default EDID to any input port, and you can also learn the EDID from any output port to any input port.



In the IP Settings tab, you can set the IP Settings such as:

· Enable or disable DHCP

· Host IP

· Net Mask

· Gateway

NOTE: Default IP setting is with “DHCP” enabled.

9. Control Protocol

Overview

All control commands are supported via the UART interface or TCP interface.

1.1 UART control configuration

Refer to the below configuration for accessing the UART.

1. Set baud rate to 115200bps
2. Set data to 8 bits
3. Set parity to none
4. Set stop bit to 1
5. Flow control is none

1.2 TCP control

How to get the HDMI Matrix IP Address?
Power on the Matrix Switch, and then connect to the Ethernet Switch or Router. Get the Matrix switch IP address through one of the below two methods.

1. Run cmd.exe from the PC, then input “ping matrix”.
2. Use the UART PORT to send the “get current IP address command”.

The TCP port is 8080.

2. Command Description

2.1 Command Format (in Hex)

Header Code （2bytes）	Command Type （1byte）	Length (2byte)	Parameters	Checksum (1byte)
0xCC 0xDD	----------	N	Data[0]~data[N-1]	

The commands are in Hex.

2.1.1 Header code

All the commands start with 0xCC 0xDD.

2.1.2 Command type

Command type	code
EDID Manage	0x01
Matrix port map manage	0x02
Network configuration	0x05

2.1.3 Checksum

Checksum equal to
0xCC^0xDD^CommandType^length[0]^length[1]^Parameter[0]…^parameter[i]
Example: 0Xcc 0Xdd 0x01 0x00 0x03 0x05 0x03 0x01 0x14

0xCC xor 0xDD xor 0x01 xor 0x00 xor 0x03 xor 0x05 xor 0x01=0x14

3. Command detail

3.1 EDID Manage（0x01）

EDID Manage Command is used to configure the input HDMI EDID, This matrix supports two EDID management modes:
1. Select a fixed EDID, which is the system default method (10 EDID types)
2. Learn the EDID from the SINK device
There are two sub-commands used for EDID manage, the first data portion of the parameter is used for the sub-command.

Sub-command	code
Select fixed EDID	0x05
Learn EDID from SINK	0x04

3.1.1 Select fixed EDID

Head Code（2bytes）	Command type（1byte）	Length (2byte)	parameters	Checksum (1byte)
0xCC 0xDD	0x01	0x00 0x03	0x05 Data[1] Data[2]	0xXX

Parameter description：
Data[0] (0x05)：sub-command, used for selecting fixed EDID.
Data[1]：select EDID index, which is the matrix switch default method. Refer to the below table.

DATA[1] index	EDID type
0	4KX2KP60_HDPCM_HDR
1	4KX2KP60_HDPCM
2	4KX2KP60_dolby_DTS5.1_HDR
3	4KX2KP60_dolby_DTS5.1
4	4KX2KP60_2Ch PCM Audio_HDR
5	4KX2KP60_2Ch PCM Audio
6	4KX2KP30_HD Audio_HDR
7	4KX2KP30_HD Audio
8	4KX2KP30_dolby_DTS5.1_HDR
9	4KX2KP30_dolby_DTS5.1
10	4KX2KP30_2CH AUDIO_HDR
11	4KX2KP30_2CH AUDIO
12	1080P60 HD PCM_HDR
13	1080P60 HD PCM
14	1080P60 Dolby_DTS5.1_HDR
15	1080P60 Dolby_DTS5.1
16	1080P60 2Ch audio_HDR
17	1080P60 2Ch audio
18	1080i60 HD AUDIO
19	1080i60 Dolby DTS 5.1

20	1080i60 2Ch audio

Data[2]:select the HDMI input port which needs to configure the EDID.

Data[2]	HDMI input port
0	Input 1
1	Input 2
2	Input 3
3	Input 4

Example: HDMI input2 configure to 4KX2KP60_dolby_DTS5.1.
Command is: 0xCC 0xDD 0x01 0x00 0x03 0x05 0x03 0x01 0x14

3.1.2 Learn EDID from Sink

This command is used for learn the EDID from output HDMI port to input HDMI port. If sending this command, the matrix switch will get the EDID from the selected output HDMI port first, and then update the selected input HDMI port. If the selected output HDMI doesn't connect to any sink, this command is invalid.

Head Code（2bytes）	Command type（1byte）	Length (2byte)	parameters	Checksum (1byte)
0xCC 0xDD	0x01	0x00 0x03	0x04 Data[1] Data[2]	0xXX

Parameter description:
0x04:sub-command for EDID manage, indicates that this command is used to learn the EDID from the sink device.
Data[1]: Select the output HDMI port which matrix switch gets the EDID.

DATA[1]	Sink
0	HDMI OUT 1
1	HDMI OUT 2
2	HDMI OUT 3
3	HDMI OUT 4

Data[2]:Select the input HDMI port which needs to learn the EDID from the select output HDMI port

Data[2]	HDMI input port
0	Input 1
1	Input 2
2	Input 3
3	Input 4

Example: Learning EDID from HDMI input 1 port to HDMI output 3 port.
Command is: 0xCC 0xDD 0x01 0x00 0x03 0x04 0x02 0x00 0x15

3.2 Matrix port map manage（0x02）

The matrix port map manage has four sub-commands (the first data of parameters is used for sub-command), sub-commands are

defined as shown below:

Sub-command	code
Map the selected output port to the specify input port	0x01
Map all the output ports to an input port	0x02
Read all the output mapping information	0x05

3.2.1 Map the selected output port to the specify input port

Head Code（2bytes）	Command type（1byte）	Length (2byte)	parameters	Checksum (1byte)
0xCC 0xDD	0x02	0x00 0x03	0x01 Data[1] Data[2]	0xXX

Parameter description：

0x01: sub-command, this command is used to map one HDMI output port to the specify HDMI input port

Data[1]: HDMI input port index

0→Input 1

1→Input 2

2→Input 3

3→Input 4

Data[2]：HDMI output port index

0→Output 1

1→Output 2

2→Output 3

3→Output 4

Example: Connecting HDMI output port 3 to HDMI input port 2.

Command is: 0xCC 0xDD 0x02 0x00 0x03 0x01 0x01 0x02 0x12

3.2.2 Map all the output ports to an input port

Head Code（2bytes）	Command type（1byte）	Length (2byte)	parameters	Checksum (1byte)
0xCC 0xDD	0x02	0x00 0x02	0x02 Data[1]	0xXX

Parameter description：

0x02: sub-command, used to set all the HDMI output ports to a selected input port

Data[1]: Connecting an HDMI input port to all the HDMI output ports

0→Input 1

1→Input 2

2→Input 3

3→Input 4

Example: Connect all the HDMI output ports to HDMI input 3

Command is: 0xCC 0xDD 0x02 0x00 0x02 0x02 0x02 0x11

3.2.3 Read all the output mapping information

Command: PC→ matrix, gets the matrix switch mapping information

Head Code（2bytes）	Command type（1byte）	Length (2byte)	parameters	Checksum (1byte)
0xCC 0xDD	0x02	0x00 0x02	0x05 0x00	0x14

Parameter area description：

0x05: sub-command

0x00: reserve

Matrix switch responds to PC.

Head Code（2bytes）	Command type（1byte）	Length (2byte)	parameters	Checksum (1byte)
0xCC 0xDD	0x02	0x00 0x05	0x05 Data[1]data[2]data[3] data[4]	0xXX

Parameter area description：

0x05: Sub-command

Data[1]: indicates HDMI output 1 links to which HDMI input port

Data[2]: indicates HDMI output 2 links to which HDMI input port

Data[3]: indicates HDMI output 3 links to which HDMI input port

Data[4]: indicates HDMI output 4 links to which HDMI input port

index	port
0	Input 1
1	Input 2
2	Input 3
3	Input 4

3.3 Network configuration（0x05）

Network setting has three sub-commands (the first data parameter is used for the sub-command). The sub-command is defined as shown below:

Network setting Sub-command	code
Set static IP address	0x01
Read Matrix current IP information	0x02
Configure DHCP/static IP mode	0x04

3.3.1 Network setting Sub-command

Before setting static IP Address, you need to configure the matrix switch to work in static IP mode.

Head Code（2bytes）	Command type（1byte）	Length (2byte)	parameters	Checksum (1byte)
0xCC 0xDD	0x05	0x00 0x0D	0x01 Data[1]~Data[12]	0xXX

Parameter area description:

0x01: sub-command, set static IP address

Data[1]~Data[4]: these four bytes indicates the setting IP address, example 192.168.31.113

Data[1]—0xC0 (192)
Data[2]—0xA8 (168)
Data[3]—0x1F (31)
Data[4]—0x71 (113)

Data[5]~Data[8]:these four bytes indicatess the net mask，example:255.255.255.0

Data[5]—0xFF (255)
Data[6]—0xFF (255)
Data[7]—0xFF (255)
Data[8]—0x00 (0)

Data[9]~Data[12]:these four bytes indicates the gateway，example:192.168.31.1

Data[9]---0xC0 (192)
Data[10]—0xA8 (168)
Data[11]—0x1F (31)
Data[12]—0x01 (1)

3.3.2 Read Matrix switch current IP information

Command: PC→matrix

Head Code（2bytes）	Command type（1byte）	Length (2byte)	parameters	Checksum (1byte)
0xCC 0xDD	0x05	0x00 0x02	0x02 0x00	0x14

Matrix responds to PC.

Head Code（2bytes）	Command type（1byte）	Length (2byte)	parameters	Checksum (1byte)
0xCC 0xDD	0x05	0x00 0x0E	0x02 DATA[1]~DATA[13]	0x14

0x02: sub-command, reading matrix switch current IP address

Data[1]~Data[4]: these four bytes indicates the setting IP address, example 192.168.31.113

Data[1]—0xC0 (192)
Data[2]—0xA8 (168)
Data[3]—0x1F (31)
Data[4]—0x71 (113)

Data[5]~Data[8]: these four bytes indicates the net mask, example:255.255.255.0

Data[5]—0xFF (255)
Data[6]—0xFF (255)
Data[7]—0xFF (255)
Data[8]—0x00 (0)

Data[9]~Data[12]: these four bytes indicates the gateway, example:192.168.31.1

Data[9]---0xC0 (192)
Data[10]—0xA8 (168)
Data[11]—0x1F (31)
Data[12]—0x01 (1)

Data[13]:This byte indicates the DHCP/static IP mode the matrix switch is set to, 1—DHCP mode, 0—static IP mode

3.3.3 Configure DHCP/static IP mode

Head Code（2bytes）	Command type （1byte）	Length (2byte)	parameters	Checksum (1byte)
0xCC 0xDD	0x05	0x00 0x02	0x04 Data[1]	0xXX

Parameter Area description:
0x04: sub-comand, setting DHCP/static IP mode
Data[1]: indicates DHCP mode/static IP mode， 1—DHCP mode, 0—static IP mode
Example: setting matrix switch to static IP mode
Command is: 0xCC 0xDD 0x05 0x00 0x02 0x04 0x00 0x12

Regulatory Compliance

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CE/FCC & Recycling Information

CE Certification

This equipment complies with the requirements relating to Electromagnetic Compatibility Standards EN55022/EN55024 and the further Standards cited therein. It must be used with shielded cables only.
It has been manufactured under the scope of RoHS compliance.

FCC Certification

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.
You are cautioned that changes or modification not expressly approved by the party responsible for compliance could void your authority to operate the equipment.
This device complies with part 15 of the FCC Rules.
Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation

WEEE (Waste of Electrical and Electronic Equipment), Recycling of Electronic Products

In 2006 the European Union introduced regulations (WEEE) for the collection and recycling of all waste electrical and electronic equipment. It is no longer allowable to simply throw away electrical and electronic equipment. Instead, these products must enter the recycling process.
Each individual EU member state has implemented the WEEE regulations into national law in slightly different ways. Please follow your national law when you want to dispose of any electrical or electronic products. More details can be obtained from your national WEEE recycling agency.

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