User Manual

VitBest®

M-0404SE

4x4 HDMI Matrix with RS-232 Control

Brief Introduction

M-0404SE HDMI matrix with 12V power adapter for multiple HDMI sources to multiple display devices by different routing. With high reliability,low power consumption, high bandwidth (support HDMI 1.4) features, M-0404SE can achieve up to 4x4 size.

User can control the matrix operation by panel buttons, PC serial port.

User Control

1. Front Panel

SEL A:Select the input source for HDMI output A

SEL B:Select the input source for HDMI output B

SEL C:Select the input source for HDMI output C

SEL D:Select the input source for HDMI output D

1,2,3,4 :Shows the input source which is selected

Act : Shows if the corresponding input signal is active

Link : Shows if the sink device is connected

SEL EDID:EDID option

Auto: Auto parse EDID;

Manual：User can configure the EDID with PC Tool
2D：EDID option_2D
3D：EDID option_3D
IR：For Remoter control (optional)

2. Back Panel

INPUT：HDMI input 1,2,3,4 which connected to source devices
OUTPUT：HDMI output A,B,C,D connected to sink devices
RS232：PC tool interface
ONOFF：Power on/off switching
DC/12V:12V adapter input

PC tool user guide-RS232

The PC tool can control the matrix via COM port,and there will be two parts of operation guide,which consists of the connection operation of COM port and the control operation of matrix.

Instruction of connection via COM port:

1）Connect the PC and M-0404SE matrix with RS232 cable,and please make sure that the driver of RS232 is working well.

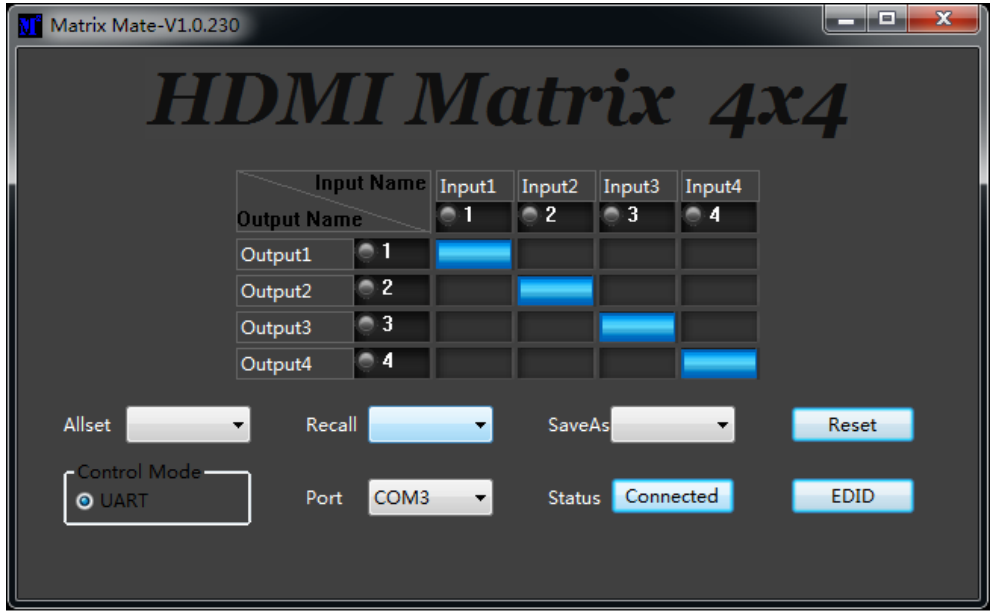
2）Double click the PC **tool software**.It will automatically connect to the matrix via COM port.

3）If the connection is **successful**, the corresponding display will be blue

4) If the connection is **failed**, please **check** the causes and **retry** again according to the software's hint.Usually,the causes may be as follows: No COM port connected to the computer,the COM port is used by other programmes ,the matrix is not working well,and so on.

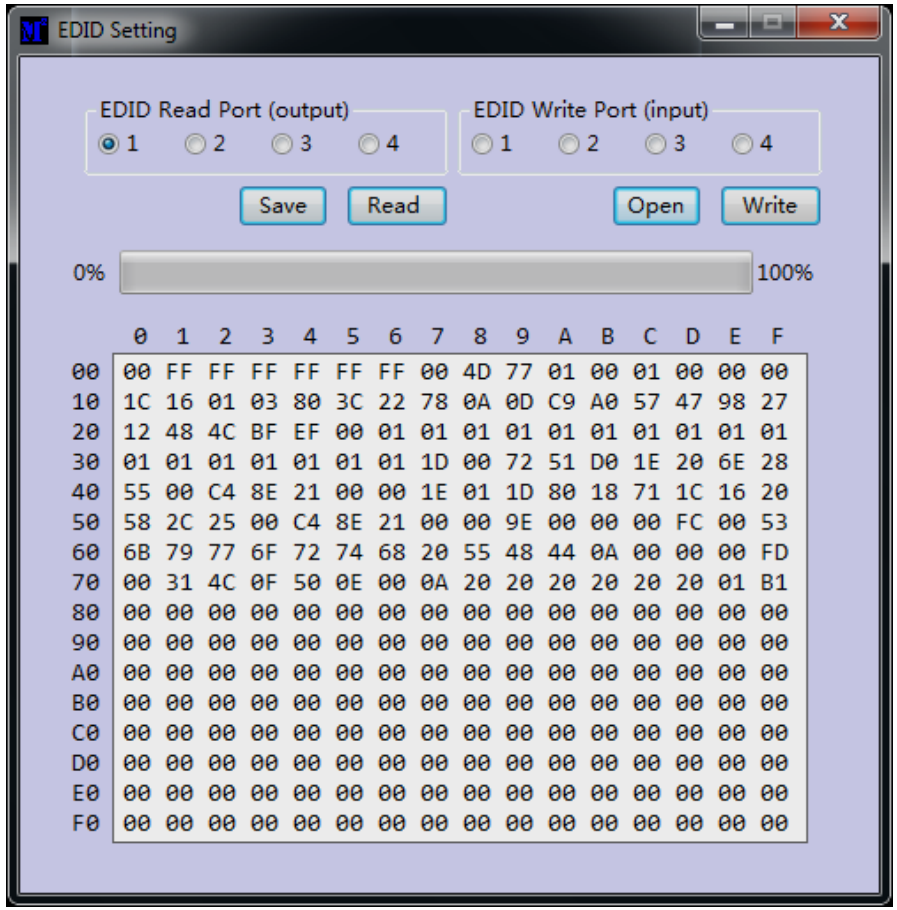
6) The C**omboBox** on the right of Port shows the COM ports that connected to the computer. If there's no COM port connected,it will shows COM0,COM1…COM9.

7) The **button** on the right of Status indicates the current status of connection.You can switch the connection status by pressing this button.



Instruction of control operation of matrix:

1) Click the **rectangle** which is on the right of output port and on the bottom of the input port can switch output port's input source.And the rectangle's color will change to **blue** if the operation is successful. Otherwise,you can try it again.
2) **All set**: Click the drop-down menu to select a input source which will be routed to all HDMI output port.
3) **Recall:** The drop-down menu to recall the item N routing
4) **Saveas:** The drop-down menu to save the current routing status to item N status.
5) **Reset:** Reset the matrix configuration.
8) **EDID:** You can open or close the IDID control window by clicking this button.The instruction of operation of EDID control is as below:
EDID Read Port(Output): Select a output port which will do EDID operation.
EDID Write Port(Input): Select input ports which will do EDID operation.
Save：Save IDID data to file on your computer.
Open：Open and show a file of EDID data.
Read：Read EDID data from the selected HDMI port(output).
Write：Write EDID data to the selected HDMI port(input).



Note:

When read EDID from the Sinks,please make sure the cable between Matrix and Sinks(such as TV) connected well,and can normally display.

M-0404SE **Parameters**

Electrical parameters	
Interface	HDMI-A
HDMI version	HDMI1.4
Bandwidth	300MHz
Resolution	Up to 4Kx2K@30Hz
Clock Jitter	<0.15 Tbit (1080p@60)
RiseTime	<0.3Tbit (20%--80%)
RiseTime	<0.3Tbit (20%--80%)
Transmission Delay	5ns
Amplitude	T.M.D.S +/- 0.4Vpp
Differential impedance	100±15ohm
RS232 control	
Baud rate and protocol	Baud rate：9600,data bit：8， stop bit：1,No parity checking
Power	
Max Consumption	10W
Adapter	12V/3A
Matrix Mechanical dimensions	
Size(mm)	300(L)X130(W)X32(H)
Weight	1.4Kg

Accessories List

Item	Quantity
Power Adapter 12V/3A	1
Remote	1
Matrix	1

Troubleshooting and Maintenance

1) When flicker or flash point on the screen, please check if the connection is reliable, whether the source is a standby or replace the HDMI cable

2) When user can ’t control matrix with PC, please check if com port No. is wrong settle on the PC tool

3）When the POWER led not lighted and no picture displayed, please check if the power adapter connected well and if the power switch in OFF.

HDMI Matrix Serial communication protocol

1 Serial communication protocol format:

Baud Rate: 9600

Data bits: 8

Parity: None

Stop bits: 1

Command head (2 byte)	Command index (1 byte)	Command length (1 byte)	Command body (CMD_LENGTH bytes)	Check-sum (1 byte)	Command tail (2 byte)
CMD_HEAD	CMD_INDEX	CMD_LENGHT	CMD_BODY	CMD_CHECKSUM	CMD_TAIL
{{					}}
0x7b 0x7b					0x7d 0x7d

Note: Check-sum is the low 8bits of the sum of CMD_HEAD,CMD_INDEX,CMD_LENGHT,CMD_BODY and CMD_TAI
The length of all the command is CMD_LENGHT+7;

Example: 7B 7B 01 02 01 01 F5 7D 7D
7b 7b: Command head
01: Command index（Change routing command）
02: Command length: the length of the command body
01 01: Command body
F5: Check-sum
7d 7d: Command tail

2 . Serial communication protocol list:

(0x01)Switching（0x01）:

Command head (2byte)	Command index (1byte)	Command length (1byte)	Command body (CMD_LENGTH byte)		Check-sum (1byte)	Command tail (2byte)
{{	0x01	0x02	Input	Outputs		}}
0x7b 0x7b	0x01	0x02				0x7d 0x7d

Note:

(1) Every bit of the "Outputs" byte means whether to switch the input to this output port. 1: switch the input to the output port. 0: Do nothing

(2) Bit 0~Bit7 of the "Outputs" byte represent HDMI output port 1~8;

(3) The "input" byte represent the input port index, 0~7 represent HDMI input port 1~8

Example:

Switch the input 2 to output 1	Switch the input 4 to all the Output ports(Output port 1~8)
Command: 7B 7B 01 02 01 01 F5 7D 7D	Command: 7B 7B 01 02 03 FF F5 7D 7D
7b 7b: Command head 0: Command index 02: Command length 02 01: Command body F5: Check-sum 7d 7d: Command Tail	7b 7b: Command head 01: Command index 02: Command length 03 ff: Command body F5: Check-sum 7d 7d: Command Tail
Return: 7B 7B 01 02 01 01 F5 7D 7D	Return: 7B 7B 01 02 03 FF F5 7D 7D

After the devices received the command successfully, will send back the whole command back..

(0x02)Routing configuration save: Save the current routing configuration

Command head (2byte)	Command index (1byte)	Command length (1byte)	Command body (CMD_LENGTH byte)	Check-sum (1byte)	Command tail (2byte)
{{	0x02	0x01	Routing configuration Index		}}
0x7b 0x7b	0x02	0x01			0x7d 0x7d

Note :

（1）The device supports store 8 different routing configuration. From 0~7, represent Routing configuration index 1~8

Example:

Save the current routing configuration to index 1	Save the current routing configuration to index 8
Command: 7B 7B 02 01 00 F3 7D 7D	Command: 7B 7B 02 01 07 FA 7D 7D
7b 7b: Command head 02: Command index 01: Command length 00: Command body ,0x00 means Routing configuration index 1;（0~7 **represent** Routing configuration index 1~8） F3: Check-sum 7d 7d: Command tail	7b 7b: Command head 01: Command index 01: Command length 07: Command body ,0x07 means Routing configuration index 8;（0~7 **represent** Routing configuration index 1~8） FA: Check-sum 7d 7d: Command tail
Return: Don’t return any command	Return: Don’t return any command

(0x03)Recall the routing configuration that saved before (0x03): To set the current routing configuration the same as the routing configuration index xx that saved before

Command head (2byte)	Command index (1byte)	Command length (1byte)	Command body (CMD_LENGTH byte)	Check-sum (1byte)	Command tail (2byte)
{{	0x03	0x01	Routing configuration Index		}}
0x7b 0x7b	0x03	0x01			0x7d 0x7d

Note:

（1）The device support 8 different Routing configuration

Example:

Recall the routing configuration index 1	Recall the routing configuration index 8
Command: 7B 7B 03 01 00 F4 7D 7D	Command: 7B 7B 03 01 07 FB 7D 7D
7b 7b: Command head	7b 7b: Command head

03: Command index 01: Command length 00: Command body，00：Means 1 routing configuration index 1（0~7 represent routing configuration index 1~8） F4: Check-sum 7d 7d: Command tail	03: Command index 01: Command length 07: Command body，07：Means 1 routing configuration index 8（0~7 represent routing configuration index 1~8） FB: Check-sum 7d 7d: Command tail
Return: 7B 7B 11 04 00 01 02 03 0B 7D 7D（Please refer to command index 0x11）	Return: 7B 7B 11 04 00 01 02 03 0B 7D 7D (Please refer to command index 0x11）

（0x11）The routing configuration information（0x11）

Command head (2byte)	Command Index (1byte)	Command length (1byte)	Command body (CMD_LENGTH byte)					Check-sum (1byte)	Command tail (2byte)
{{	0x11		The input port index of the output 1	The input port index of the output 2	The input port index of the output 3	The input port index of the output 4	……		}}
0x7b 0x7b	0x11		0~7 means Input 1~8	0~7 means Input 1~8	0~7 means Input 1~8	0~7 means Input 1~8	……		0x7d 0x7d

Note:

（1） The Command length is determined by the HDMI device outputs port counter;

Example:

HDMI 4x4 Matrix: The current routing information is 1-1,2-2,3-3,4-4	HDMI 4x4 Matrix: The current routing information is 1-1,1-2,1-3,1-4
Command: 7B 7B 11 04 00 01 02 03 0B 7D 7D	Command: 7B 7B 11 04 00 00 00 00 05 7D 7D

7b 7b: Command head 11: Command index 04: Command length 00 01 02 03: Command body, Means input 1 to output 1, input 2 to output 2, input 3to output 3, input 4 to output 4, 0B: Check-sum 7d 7d: Command tail	7b 7b: Command head 11: Command index 04: Command length 00 00 00 00: Command body. Means input 1 to output 1, input 1 to output 2, input 1 to output 3, input 1 to output 4, 05: Check-sum 7d 7d: Command tail
Return: Don't return any command	Return: Don't return any command

(0x15)EDID Read Command (0x15): Read the EDID data of the device that connect to the HDMI output
Need to read 16 times, due to each time will return only 16 bytes EDID data.

Command head (2byte)	Command Index (1byte)	Command length (1byte)	Command body (CMD_LENGTH byte)		Check-sum (1byte)	Command tail (2byte)
{{	0x15	2	Output port index, 0~7 means port 1~8	The beginning of the EDID index to read from		}}
0x7b 0x7b	0x15	2				0x7d 0x7d

Note: After device received this command, will return 16 bytes EDID data, from the EDID data index that set by the command. If failed, then the device will return read failed command, please refer to command index 0x16.
Please make sure that the port which to read EDID data from, do have picture display well, otherwise, will failed;
Example: Read the EDID data from the device that connected to HDMI output 1

Receive（With respect to the HDMI device）	Send（With respect to the HDMI device）
7B 7B 15 02 00 00 07 7D 7D	7B 7B 15 12 00 00 00 FF FF FF FF FF FF 00 4D 77 01 00 01 00 00 00 D7 7D 7D
7B 7B 15 02 00 10 07 7D 7D	7B 7B 15 12 00 10 1C 16 01 03 80 3C 22 78 0A 0D C9 A0 57 47 98 27 90 7D 7D
7B 7B 15 02 00 20 07 7D 7D	7B 7B 15 12 00 20 12 48 4C BF EF 00 01 01 01 01 01 01 01 01 01 01 95 7D 7D
7B 7B 15 02 00 30 07 7D 7D	7B 7B 15 12 00 30 01 01 01 01 01 01 01 1D 00 72 51 D0 1E 20 6E 28 D2 7D 7D

7B 7B 15 02 00 40 07 7D 7D	7B 7B 15 12 00 40 55 00 C4 8E 21 00 00 1E 01 1D 80 18 71 1C 16 20 B6 7D 7D
7B 7B 15 02 00 50 07 7D 7D	7B 7B 15 12 00 50 58 2C 25 00 C4 8E 21 00 00 9E 00 00 00 FC 00 53 70 7D 7D
7B 7B 15 02 00 60 07 7D 7D	7B 7B 15 12 00 60 6B 79 77 6F 72 74 68 20 55 48 44 0A 00 00 00 FD 97 7D 7D
7B 7B 15 02 00 70 07 7D 7D	7B 7B 15 12 00 70 00 31 4C 0F 50 0E 00 0A 20 20 20 20 20 20 01 B1 ED 7D 7D
7B 7B 15 02 00 80 07 7D 7D	7B 7B 15 12 00 80 02 03 29 74 4B 84 10 1F 05 13 14 01 02 11 06 15 92 7D 7D
7B 7B 15 02 00 90 07 7D 7D	7B 7B 15 12 00 90 26 09 7F 03 11 7F 18 83 01 00 00 6D 03 0C 00 10 10 7D 7D
7B 7B 15 02 00 A0 07 7D 7D	7B 7B 15 12 00 A0 00 B8 3C 2F 80 60 01 02 03 01 1D 00 BC 52 D0 1E DA 7D 7D
7B 7B 15 02 00 B0 07 7D 7D	7B 7B 15 12 00 B0 20 B8 28 55 40 C4 8E 21 00 00 1E 01 1D 80 D0 72 CD 7D 7D
7B 7B 15 02 00 C0 07 7D 7D	7B 7B 15 12 00 C0 1C 16 20 10 2C 25 80 C4 8E 21 00 00 9E 8C 0A D0 81 7D 7D
7B 7B 15 02 00 D0 07 7D 7D	7B 7B 15 12 00 D0 8A 20 E0 2D 10 10 3E 96 00 13 8E 21 00 00 18 8C F8 7D 7D
7B 7B 15 02 00 E0 07 7D 7D	7B 7B 15 12 00 E0 0A D0 90 20 40 31 20 0C 40 55 00 13 8E 21 00 00 75 7D 7D
7B 7B 15 02 00 F0 07 7D 7D	7B 7B 15 12 00 F0 18 00 00 00 00 00 00 00 00 00 00 00 00 00 00 22 41 7D 7D

(0x16)EDID Read failed return command (0x16):

Command head (2byte)	Command Index (1byte)	Command length (1byte)	Command body (CMD_LENGTH byte)		Check-sum (1byte)	Command tail (2byte)
{{	0x16	2	Output port 0~7 represent 1~8	The beginning of the EDID index to read from		}}
0x7b 0x7b	0x16	2				0x7d 0x7d

Example: Read from EDID data index 0x60 failed, the device will Return:7B 7B 16 02 00 60 68 7D 7D

(0x18)Write EDID (0x18):

Command head (2byte)	Command Index (1byte)	Command length (1byte)	Command body (CMD_LENGTH byte)			Check-sum (1byte)	Command tail (2byte)
{{	0x18	0x12	0~7 represent HDMI input 1~8	The beginning of the EDID index to write to	16 bytes data that to write		}}
0x7b 0x7b	0x18	0x12					0x7d 0x7d
Return	If write successes, will return the same command as that the device received						

Note: After device received this command, will write the 16 bytes EDID data, from the EDID data index that set by the command. If write successes, will return the same command as that the device received. Please make sure that the port which to write EDID data to be normal, otherwise, will fail;

Example:

Receive（With respect to the HDMI device）	Send（With respect to the HDMI device）
7B 7B 18 12 00 00 00 FF FF FF FF FF FF 00 4D 77 01 00 01 00 00 00 DA 7D 7D	7B 7B 18 12 00 00 00 FF FF FF FF FF FF 00 4D 77 01 00 01 00 00 00 DA 7D 7D
7B 7B 18 12 00 10 1C 16 01 03 80 3C 22 78 0A 0D C9 A0 57 47 98 27 93 7D 7D	7B 7B 18 12 00 10 1C 16 01 03 80 3C 22 78 0A 0D C9 A0 57 47 98 27 93 7D 7D
7B 7B 18 12 00 20 12 48 4C BF EF 00 01 01 01 01 01 01 01 01 01 01 98 7D 7D	7B 7B 18 12 00 20 12 48 4C BF EF 00 01 01 01 01 01 01 01 01 01 01 98 7D 7D
7B 7B 18 12 00 30 01 01 01 01 01 01 01 1D 00 72 51 D0 1E 20 6E 28 D5 7D 7D	7B 7B 18 12 00 30 01 01 01 01 01 01 01 1D 00 72 51 D0 1E 20 6E 28 D5 7D 7D
7B 7B 18 12 00 40 55 00 C4 8E 21 00 00 1E 01 1D 80 18 71 1C 16 20 B9 7D 7D	7B 7B 18 12 00 40 55 00 C4 8E 21 00 00 1E 01 1D 80 18 71 1C 16 20 B9 7D 7D
7B 7B 18 12 00 50 58 2C 25 00 C4 8E 21 00 00 9E 00 00 00 FC 00 53 73 7D 7D	7B 7B 18 12 00 50 58 2C 25 00 C4 8E 21 00 00 9E 00 00 00 FC 00 53 73 7D 7D
7B 7B 18 12 00 60 6B 79 77 6F 72 74 68 20 55 48 44 0A 00 00 00 FD 9A 7D 7D	7B 7B 18 12 00 60 6B 79 77 6F 72 74 68 20 55 48 44 0A 00 00 00 FD 9A 7D 7D
7B 7B 18 12 00 70 00 31 4C 0F 50 0E 00 0A 20 20 20 20 20 20 01 B1 F0 7D 7D	7B 7B 18 12 00 70 00 31 4C 0F 50 0E 00 0A 20 20 20 20 20 20 01 B1 F0 7D 7D
7B 7B 18 12 00 80 02 03 29 74 4B 84 10 1F 05 13 14 01 02 11 06 15 95 7D 7D	7B 7B 18 12 00 80 02 03 29 74 4B 84 10 1F 05 13 14 01 02 11 06 15 95 7D 7D

7B 7B 18 12 00 90 26 09 7F 03 11 7F 18 83 01 00 00 6D 03 0C 00 10 13 7D 7D	7B 7B 18 12 00 90 26 09 7F 03 11 7F 18 83 01 00 00 6D 03 0C 00 10 13 7D 7D
7B 7B 18 12 00 A0 00 B8 3C 2F 80 60 01 02 03 01 1D 00 BC 52 D0 1E DD 7D 7D	7B 7B 18 12 00 A0 00 B8 3C 2F 80 60 01 02 03 01 1D 00 BC 52 D0 1E DD 7D 7D
7B 7B 18 12 00 B0 20 B8 28 55 40 C4 8E 21 00 00 1E 01 1D 80 D0 72 D0 7D 7D	7B 7B 18 12 00 B0 20 B8 28 55 40 C4 8E 21 00 00 1E 01 1D 80 D0 72 D0 7D 7D
7B 7B 18 12 00 C0 1C 16 20 10 2C 25 80 C4 8E 21 00 00 9E 8C 0A D0 84 7D 7D	7B 7B 18 12 00 C0 1C 16 20 10 2C 25 80 C4 8E 21 00 00 9E 8C 0A D0 84 7D 7D
7B 7B 18 12 00 D0 8A 20 E0 2D 10 10 3E 96 00 13 8E 21 00 00 18 8C FB 7D 7D	7B 7B 18 12 00 D0 8A 20 E0 2D 10 10 3E 96 00 13 8E 21 00 00 18 8C FB 7D 7D
7B 7B 18 12 00 E0 0A D0 90 20 40 31 20 0C 40 55 00 13 8E 21 00 00 78 7D 7D	7B 7B 18 12 00 E0 0A D0 90 20 40 31 20 0C 40 55 00 13 8E 21 00 00 78 7D 7D
7B 7B 18 12 00 F0 18 00 00 00 00 00 00 00 00 00 00 00 00 00 00 22 44 7D 7D	7B 7B 18 12 00 F0 18 00 00 00 00 00 00 00 00 00 00 00 00 00 00 22 44 7D 7D

（0xAA）Restore to factory default setting:

Command head (2byte)	Command Index (1byte)	Command length (1byte)	Command body (CMD_LENGTH byte)		Check-sum (1byte)	Command tail (2byte)
{{	0xAA	0x02	0x01	0x01	0x9c	}}
0x7b 0x7b	0xAA	0x02	0x01	0x01	0x9c	0x7d 0x7d

After the device received this command, will restore to the factory default setting, and will return the routing configuration information by command 0x11

（0x13）IP Configuration: （0x13）(If the HDMI device has ETHERNET control function)

Auto obtains IP address: 7B 7B 13 01 01 05 7D 7D

Command head (2byte)	Command Index (1byte)	Command length (1byte)	Command body (CMD_LENGTH byte)	Check-sum (1byte)	Command tail (2byte)
{{	0x13	0x01	0x01	0x05	}}
0x7b 0x7b	0x13	0x01	0x01	0x05	0x7d 0x7d

Manual set the IP address:

Command head (2byte)	Command Index (1byte)	Command length (1byte)	Command body (CMD_LENGTH byte)	Check-sum (1byte)	Command tail (2byte)
{{	0x13	0x05			}}
0x7b 0x7b	0x13	0x05			0x7d 0x7d

Example: Set the IP to 192.168.1.1:

7B 7B 13 05 00 C0 A8 01 01 72 7D 7D

7B 7B: Command head

13: Command index

05: Command length

00: Manual

C0 A8 01 01: The Hex of 192.168.1.1

72: check-sum

7d 7d: Command tail