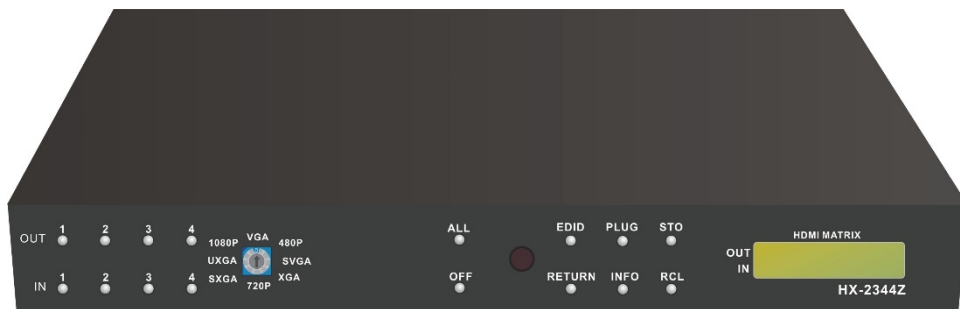




User Manual



Seamless HDBaseT Matrix Switcher

with HDMI x 4 (IN) / RJ-45 x4 (OUT) solutions

4x4

HX-2344Z

V.2014HX2344Z.02

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BEFORE YOU BEGIN

- Follow all instructions marked on the device during using.
- Provide proper ventilation and air circulation and do not use near water.
- It is better to keep it in a dry environment.
- Place the device on a stable surface (example cart, stand, table, etc.).
- The system should be installed indoor only. Install either on a sturdy rack or desk in a well-ventilated place.
- Make sure the rack is level and stable before extending a device from the rack.
- Make sure all equipments installed on the rack including power strips and other electrical connectors are properly grounded.
- Only use the power cord supported with the device.
- Do not use liquid or aerosol cleaners to clean the device.
- Always unplug the power to the device before cleaning.
- Unplug the power cord during lightning or after a prolonged period of non-use to avoid damage to the equipment.
- Do not stand on any device while installing the device to the rack.
- Do not attempt to maintain the device by yourself, any faults, please contact your vendor.
- Save this manual properly for future reference.

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CHAPTER 1 SWITCHER SYSTEM OVERVIEW

1.1 Introduction











The HX-2344Z Seamless HDBaseT Matrix switcher is a high performance HDMI routing equipment combining with video and audio. It is used for input/output cross switching of image signals. Through the extensible accessory devices with RJ-45 connector, it can transmit images separately to each output equipment for an over long distance about 70 meter by applying HDBaseT zero compression technology. Thereby minimizing signal attenuation and ensuring high definition, integrating high fidelity graphics and audio signal output.

The HX-2344Z is used mainly in TV broadcasting projects, multi-media conference halls, and large display projects, TV teaching and command control centers. It boasts features of power interruption protection during power surge, LCD display and synchronous and integrate audio/visual routing functions. HX-2344Z supports 4 HDMI Type A for input and 4 RJ-45 for output connectors. Beside it also supports a RS-232 communication port enables convenient communication with remote control equipment to configure the signals.



Figure 1-1 HX-2344Z Seamless HDBaseT Matrix Switcher

1.2 Packing

	HX-2344Z *1
	RS-232 Cable *1
	Power Cord *1
	IR Extended Line *1
	Female 1x3 Pole Captive Screw Socket *4
	Female 1x5 Pole Captive Screw Socket *2
	RJ-45 Cable *1
	Remote Controller *1
	AAA battery *2
	Software CD *1 (Includes User Manual)

CHAPTER 2 FEATURES

- Truly seamless, glitch-free switching between each input
- 4 HDMI Inputs with 4 HDBaseT Outputs
- Any Input can be route/broadcast to any Output
- Supports up to 70 meters zero compression extension via one single CATx cable
- Supports Power over Cable
- Supports interlaced video to progressive video. (like 1080i => 1080P)
- Supports up convert. (like VGA => 1080P@60)
- Supports down convert. (like 1080P@60 => VGA)
- Supports cross convert. (like 576i@50 => 1080P@60)
- HDTV resolution up to 1080p (12Bits)
- Compliant with the specification of HDMI
- Supports 2 * aspect ratio modes: “FULL” mode, and “1:1” mode. “1:1” mode keeps the output screen have the same horizontal and vertical ratio as the input video. That makes the output video has no distortion
- Supports 8 * output resolution: VGA, 480P, SVGA, XGA, 720P, SXGA, UXGA, 1080P60
- HDCP Compliant
- EDID management (Copy from OUT port 1)
- IR pass-through supports all IN and OUT ports
- IR pass-through supports all kinds of IR frequency band
- IR pass-through supports duplex transmission between IN and OUT ports
- Support IR remote control
- Support IR Mini-Controller to select the input channel through Output configuration
- Support RS-232 control
- Support RS-485 serial control
- Support Ethernet control
- Internal universal power supply
- Memory control can up to 8 sets
- Support High Definition Audio (Dolby TrueHD, Dolby Digital Plus and DTS-HD MA)
- Remote controller for operation
- Hot pluggable
- Auto skips over the power-off and unplugged port
- 1U rack design

CHAPTER 3 SPECIFICATIONS

Hardware	
Input Connector	HDMI Type A Female x 4
Output Connector	RJ-45 x 4
RS-232 Connector	1 x DB-9 Female
LAN Connector	RJ-45 x 1
RS-485 Connector	2
3 Pins Dip Switcher	1
8 Pins Dip Switcher	2
LCD Module	1
Power	100VAC~240VAC, 50/60Hz, internal
Housing	Black Aluminum
Mounting	Rack mountable (1U-rack-mount kits)
Weight	3950g
Dimensions (LxWxH)	332x482x44 mm (full rack wide without grips)
Multimedia	
Max. Resolution	1080P@60Hz
Highest TMDS Frequency	225MHz
Control Information	
HDMI Cable Distance	At least 10 meters
Cat.5e Cable Distance	70 meters (Max.)
Baud Rate	9600bps; 8 data bits, 1 stop bit, no parity
Ethernet Protocol	HTTP, DHCP, TCP/IP, ICMP (ping)
Program Control	Web Server, AVM Application
Serial Control Port	RS-232; 9 Pin Female D Type Connector RS-485: 1x5 Pole Captive Screw
Control Sequence	Matrix
Remote Control	Remote Controller, IR Receiver, IR Blaster
Web Server	LAN, RJ-45

CHAPTER 4 DEVICE INSTALLATION

HX-2344Z has a black metallic housing. It can be placed on a sturdy desk directly or installed on a bracket. See Figure 4-1 below:



Figure 4-1 Mount HX-2344Z on a Standard Bracket with 1U Rack-mount

CHAPTER 5 FRONT/REAR PANELS

5.1 Front Panel

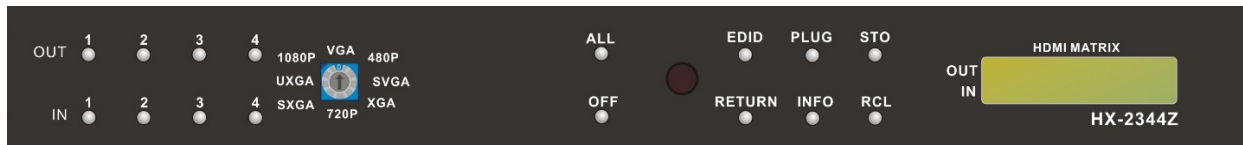


Figure 5-1 HX-2344Z Front Panel

The HX-2344Z supports up to 4 Output/Input routing keys on the Front Panel allowing you to route signal quickly. Also refer to [Chapter 8 Operation Examples](#) about below descriptions.

Operation methods as follows:

“Output Channel” + “Input Channel”

- **OUT 1~4 keys** (output channel): Indicate the Channel 1~Channel 4 for RJ-45 single output to peripheral displays. You can also use these keys to adjust the status or access the configurations.
- **IN 1~4 keys** (input channel): Indicate the Channel 1~Channel 4 for HDMI single input. You can also use these keys to switch the source signals come from the individual channel or use them to instead of number keys upon memory selections.

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- **Resolution:** The HX-2344Z Switcher supports you VGA, 480P, SVGA, XGA, 720P, SXGA, UXGA and 1080P output resolutions. It can convert the input source resolution to correspond the output resolution.
- **ALL:** This key allows you to set single input channel to all output channels. The usage of “ALL” key is the same as the output key.
 - Press the “ALL” key.
 - Select the one of the IN 1~4 keys.
 - The selected **IN x** key will route the input signal to all output channels.
 - You can also press the “ALL” key and then press the “OFF” key to disable all the displayed routing settings.
- **OFF:** Disable the entire output channels. Press one of the **OUT x** keys that want to be disabled for the output channel, then press the “OFF” key. Likewise, press the “ALL” key and then press the “OFF” key to disable all the displayed routing settings. In addition to routing port menu, press “OFF” key can return to the main screen during implementing in other menu. You can also press “OFF” key to disable the light of LCD screen for saving power.
- **IR:** Infrared receiver can receive signals from the Matrix Switcher Remote Controller
- **EDID: FIX** (fix mode) and **OUT1** (access the first output channel) selection key.
 - **FIX mode:** The **HX-2344Z** will supply a set of fixed **EDID** values to support up to only 1080P high performance TV.
 - **OUT1 mode:** The **HX-2344Z** will access the **EDID** values of high performance TV that connected to the first output channel, and copy the **EDID** value to all the input channels so that the DVD player can support to all the HDTV.
- **RETURN:** Press this key to go back main screen.
- **PLUG:** Press this key to show you the status of all connected input/output jacks on the rear panel. If the jack is in HPD (hot plug detect), it will appear “O” on the screen. Alternatively, it will appear “X” specified the jack is unused.
- **INFO:** Press this key to show you the device’s version and ID information.
- **STO:** The “Store Key” saves all current output/input corresponding relations up to 4 sets for a memory control.
 - Press the “STO” key firstly.
 - Arrange memory location. (Support up to 4 sets of memories, you can select the memory location through OUT1~OUT4/IN1~IN4.)
 - The relation among all settings will be saved in the memory permanently.

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- **RCL:** The “**Retriever Key**” retrieves all the settings that are saved in the memory.
 - Press the “**RCL**” key firstly.
 - Then make a random to select one of output/input channel key 1~4.
 - The system will retrieve the saved all status and implement current status routing if the previously saving channel is selected.
 - **LCD:** LCD display shows current Matrix Switcher and operation status.
- ☞ Press any keys on the front panel or controller to enable the light of LCD momentarily.
This function cannot be controlled by RS-232 or LAN.

5.2 Rear Panel

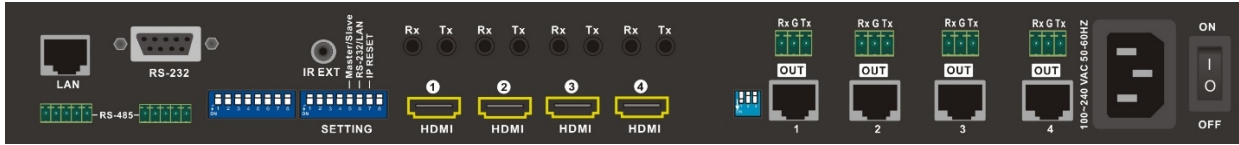


Figure 5-2 HX-2344Z Rear Panel

HX-2344Z supports up to 4 output jacks (RJ-45) on the rear panel, each female terminal separately from the output jacks. HX-2344Z terminal channels numbered as OUT1~4 are for signals output. The input terminal supplies you to connect to different equipment including CD/DVD player, Blue Ray player, PS3, Video Camera, STB and so on.

- **Power port:** The Power Port is applicable for 100~240VAC, 50~60Hz connected to the outlet of power source. Refer to [6.4 Power Connection](#).
- **Power switcher:** To switch power ON or OFF the Matrix Switcher.
- **IR Tx1~4 ports:** Used to connect to the IR Blaster cable for IR pass-through.

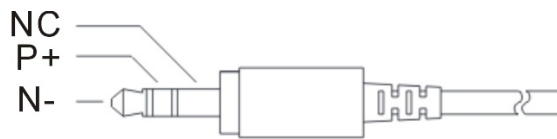


Figure 5-3 IR Blaster Pin Definitions

- **IR Rx1~4 ports:** Used to connect to the IR Receiver cable for IR pass-through.

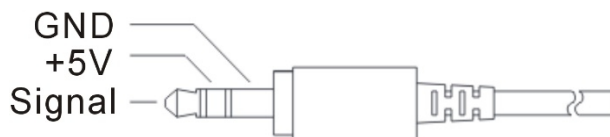


Figure 5-4 IR Receiver Pin Definitions

- **IR EXT port:** This is used to connect the IR Receiver Cable for the Matrix Switcher Remote Controller.
- **Input ports (HDMI1~4):** You can use the HDMI input ports to connect the CD/DVD player, Blue Ray player, PS3, Video Camera, STB and so on.
- **Output ports (OUT1~4):** You can use the output RJ-45 ports for over long connections via the extensible accessory devices.

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- **RS-232:** Use a 9-pin RS-232 cable to connect both computer serial port (COM1 or COM2) and Matrix Switcher RS-232 communication port, refer to [6.7.1 RS-232](#). The computer then can be deployed to control the Matrix Switcher after installing of application software. Refer to [7.1 Software Introduction](#) for a software control or [Appendix E RS-232 Communication Protocol](#) for an individual configuration.
- **RS-485:** Connection ports allow you to connect/control more than one Matrix product, refer to [6.7.2 RS-485](#).
- **LAN port:** Use the RJ-45 connection cable to connect both of the PC and the Matrix Switcher for an Internet configuration. The entire PCs at the same network can control the Matrix Switcher through the LAN port. Refer to [6.7.4 LAN Port](#).
- **Switchers:** The HX-2344Z supports 2 sets of 8 pins DIP switcher and a 3 pins DIP switcher for connected configurations. For more information, refer to [6.7 Ports and Switchers](#)
- **RxGTX:** Use the transmission line with RS-232 to connect the remote control PC for a data transmission between local and remote.
 - Rx: Receive RS-232-level signal pin. (data in)
 - G: GND
 - Tx: Transmit RS-232-level signal pin. (data out)

CHAPTER 6 CONNECTIONS

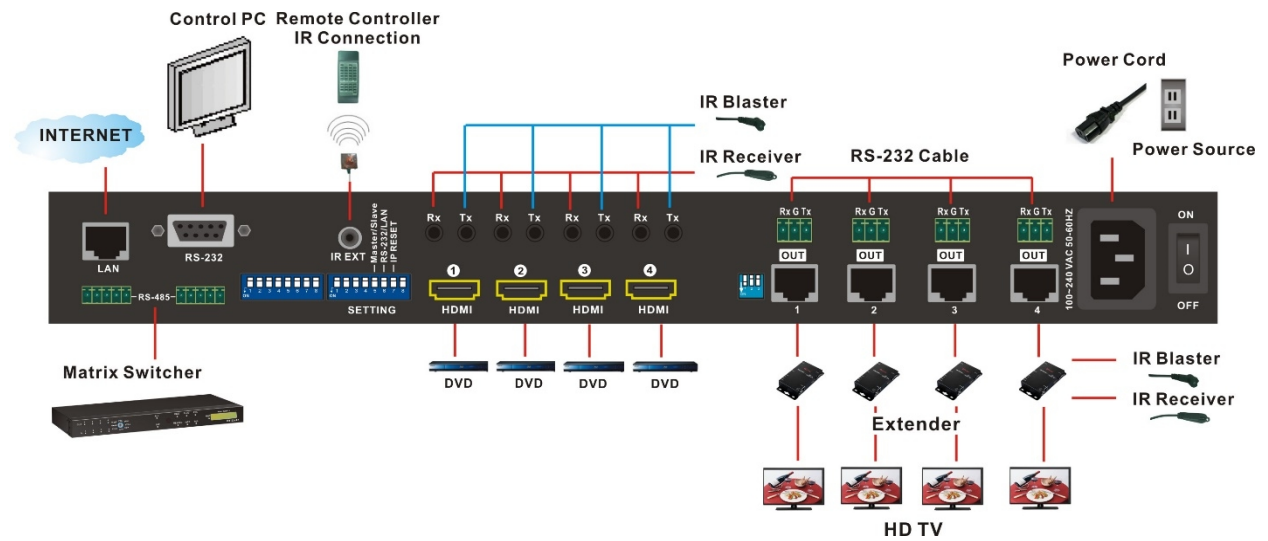


Figure 6-1 HX-2344Z Connections

6.1 Input/Output Connections

Use the HDMI connecting cable to connect the Input serial jack (HDMI 1~4) to the HDMI jack of the Blu-ray/DVD player/graphics workstations/number displays. Use the Cat.5e cable to connect the output RJ-45 jack (OUT1~4) to the LINK IN jack of Extenders. Through the Extender, you can extend the connection of projector, video recorder, display or multiplexer to your HX-2344Z.



Figure 6-2 Input Connection

SEAMLESS HDBASET MATRIX SWITCHER – HX-2344Z

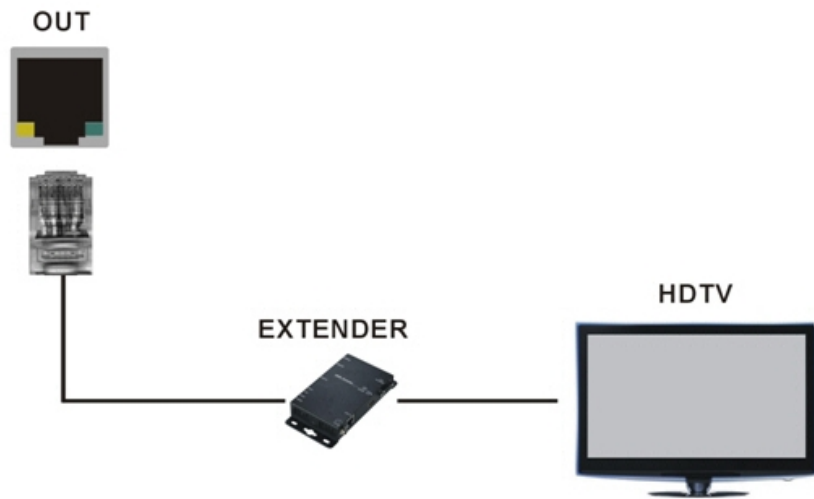
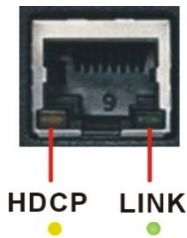


Figure 6-3 Output Connection

☞ All of the output HDTVs' brands must be the same so that they can display normally.

6.1.1 Output LED

HX-2344Z supports HDBaseT output for a long distance signal transmission. Output connector is RJ-45 jack with two LED indicators. The LED indicators show you the status of output transmission.



- * The left of RJ-45 output jack is specified for HDCP LED (Yellow).
- * The right of RJ-45 output jack is specified for LINK LED (Green).

☞ The LED indicators are only designed for the Output – RJ-45 jack of HX-2344Z.

LED Indicators:

LED	Off	Blink	On
LINK (Green)	No Link	Low Power Mode	HDBaseT Link
HDCP (Yellow)	No HDMI Signals	-	HDCP Encryption

6.1.2 Output Cable

HDBaseT was designed to provide Full HD performance up to 100 meters of Cat.5e or superior cables. In a typical installation, the cable is stretched to its full length between the HDBaseT Transmitter device and the HDBaseT Receiver device. However sometimes, especially, in demonstrations or in a lab environment, the cable is rolled randomly in small turns for convenience. The randomly rolled UTP cable suffers additional signal impairments (compared to straight cable) and therefore the maximal operating reach might be reduced. When a Cat.5e cable is randomly rolled, it is recommended to limit its length to approximate 50 meters. Rolling a Cat.5e cable around a 100cm fixed diameter plastic drum has just a minor effect on the FEXT (Far End Cross Talk) when compared to a fully stretched cable.

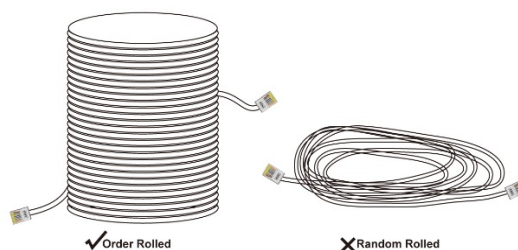


Figure 6-4 Output LAN Cable

SEAMLESS HDBASET MATRIX SWITCHER – HX-2344Z

The VS100/VS010 family features as below:

When the VS100/VS010 is in low power mode (LPPF1/2), the sample rate of the PDIF channel is reduced to 100 KHz. This implies that high data rates may not be used when the VS100/VS010 is in LPPF.

Enables 10.2 Gbps of HDMI 1.4 traffic (including HDCP) and 100Mbps Ethernet in parallel over a single LAN cable according to the following specifications:

VS100:

Cable Type	Range	Supported Video
CAT5e/CAT6	100 meters	Most common full HD formats: <ul style="list-style-type: none">- Up to 1080, 60Hz, 36bpp- Data rates lower than 5.3 Gbps or below 225 MHz TMDS clock
	70 meters	Ultra HD video formats:
CAT6a/CAT7	100 meters	Deep color: 1080p, 60Hz, 48bpp 4K x 2K Data rates higher than 5.3 Gbps or above 225MHz TMDS clock

VS010:

Cable Type	Range	Supported Video
CAT5e/CAT6	60 meters	Most common full HD formats:
CAT6a/CAT7	70 meters	<ul style="list-style-type: none">- Up to 1080, 60Hz, 36bpp- Data rates lower than 5.3 Gbps or below 225 MHz TMDS clock
CAT5e/CAT6	35 meters	Ultra HD video formats:
CAT6a/CAT7	40 meters	<ul style="list-style-type: none">- Deep color: 1080p, 60Hz, 48bpp 4K x 2K- Data rates higher than 5.3 Gbps or above 225MHz TMDS clock

Full HD support: 1080P@60Hz@48b/pixels, 3D, 4K x 2K

6.2 IR Pass-Through Connection

HX-2344Z provides an IR Receiver cable and IR Blaster cable accessories for IR pass-through. IR Receiver cable can be connected to RX port. On the other hand, IR Blaster cable can be connected to TX port on the rear panel.

- Supports you an IR channel to control the player from TV or control the TV from player.
- Supports all kinds of IR frequency band
- IR pass-through route (channel) is based on HDMI routed (channel)

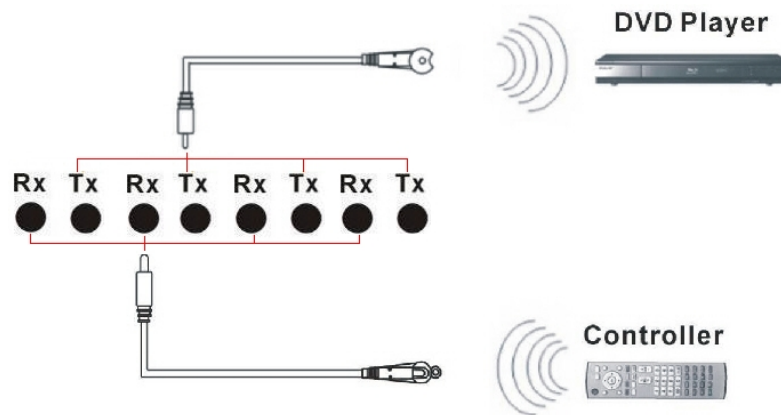


Figure 6-5 IR Extended Aiming - Multimedia

☞ The Output - IR Tx/Rx are designed on the Extender (HX-SRPUW). IR OUT is specified for IR Tx, alternatively, IR IN is specified for IR Rx. Refer to [Appendix B Extender](#)

6.3 IR EXT Connection

The Matrix Switcher provides an IR Receiver Cable for more convenient to react to the Matrix Switcher Remote Controller. If it is difficult for you to aim at IR Receiver on the front panel due to the location of Matrix switcher, please connect IR Receiver Cable to the IR EXT port located on the rear panel for optional position.

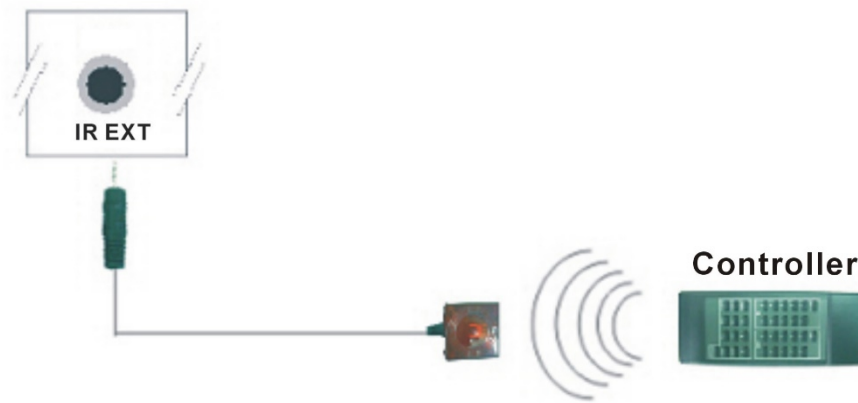


Figure 6-6 IR EXT Connection

6.4 Power Connection

Use the included power cord to connect the power source from the power port on the rear panel of HX-2344Z to the outlet.

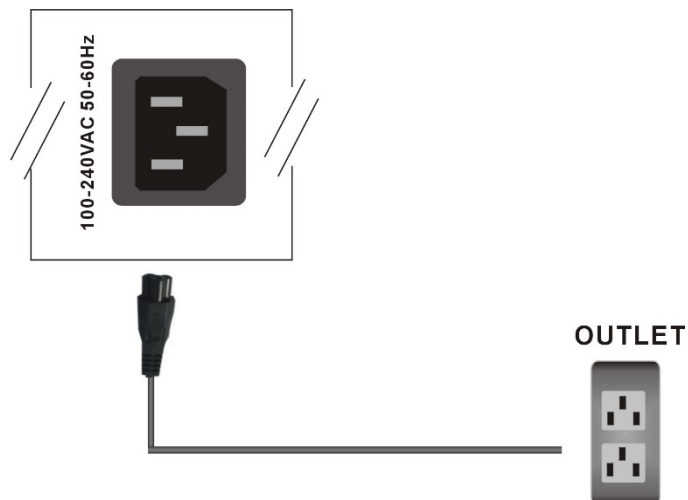


Figure 6-7 Power Connection

6.5 Matrix Switcher Remote Control

Use the RS-232 connecting cable to connect the computer serial communication port (COM1 or COM2) to the RS-232 communication port of the Matrix Switcher. The computer can then be used to control the Matrix Switcher after installing of application software. Aside from using the front panel keys for routing operation, you are also permitted to use the RS-232 connection port for remote operation.

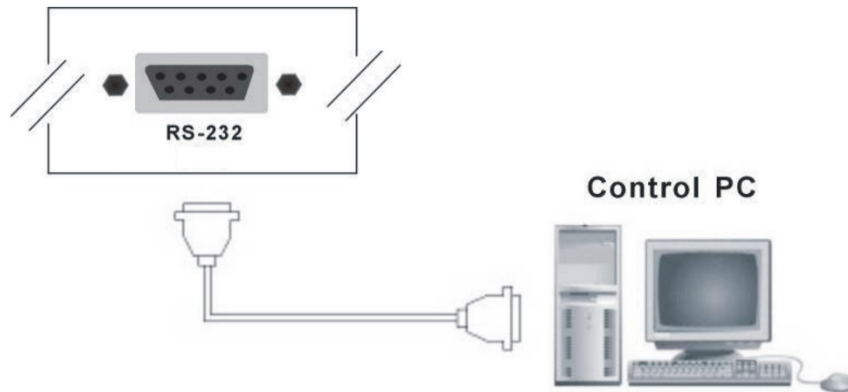


Figure 6-8 RS-232 and Control PC connection

6.6 LAN Connection

Matrix Switcher also supports a LAN port allows you to control all the series connection devices through PC Browser.

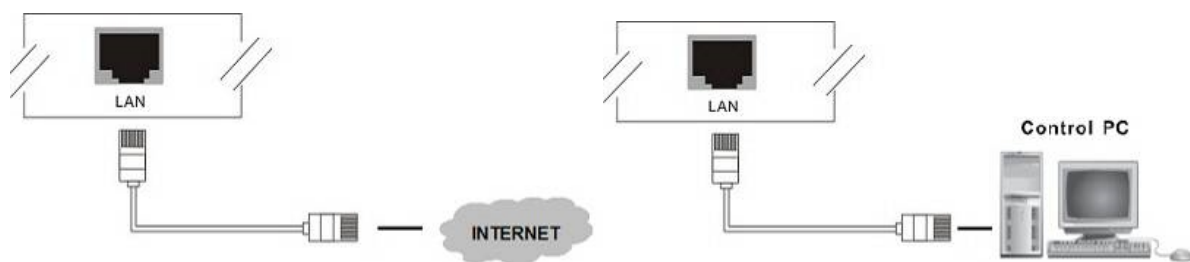


Figure 6-9 RS-232 and Control PC connection

☞ Matrix Switcher supports RS-232 and RS-485 on the rear panel for a remote control and allows you to operate settings via the keys located on the front panel.

6.7 Ports and Switchers

The Matrix Switcher provides standard RS-232 and RS-485 serial communication ports. Beside the front panel for key routing operation, you can also use the RS-232 or RS-485 serial communication port to carry out remote operation.

6.7.1 RS-232

The RS-232 Pin functions are described as below:

Pin No.	Abbreviation	Description
1	N/u	Null
2	TXD	Send
3	RXD	Receive
4	N/u	Null
5	GND	Ground
6	N/u	Null
7	N/u	Null
8	N/u	Null
9	N/u	Null

☞ The Matrix RS-232 port is defined by DCE.

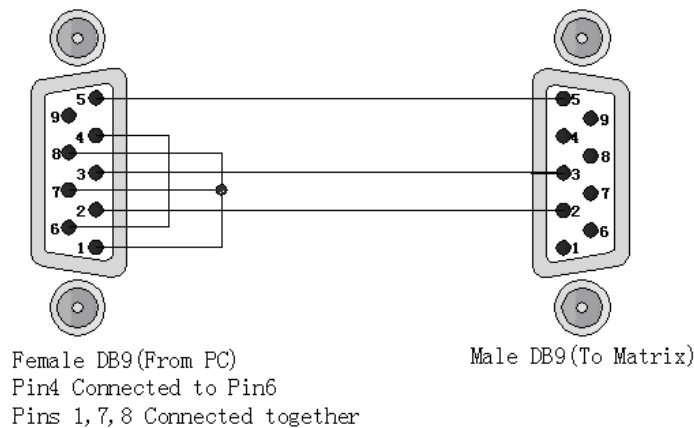


Figure 6-10 (a) RS-232 – From Female DB9 (PC) to Male DB9 (Matrix)

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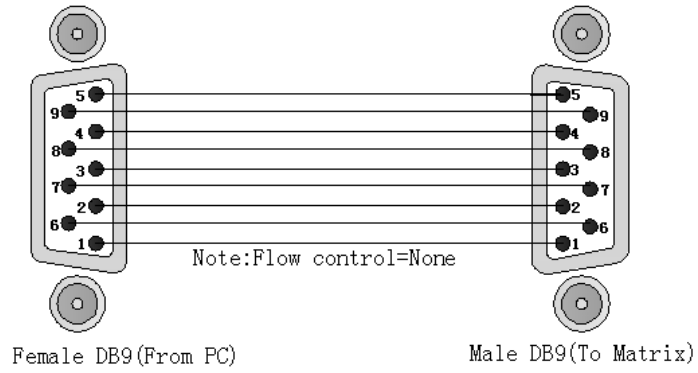


Figure 6-10 (b) RS-232 – From Female DB9 (PC) to Male DB9 (Matrix)

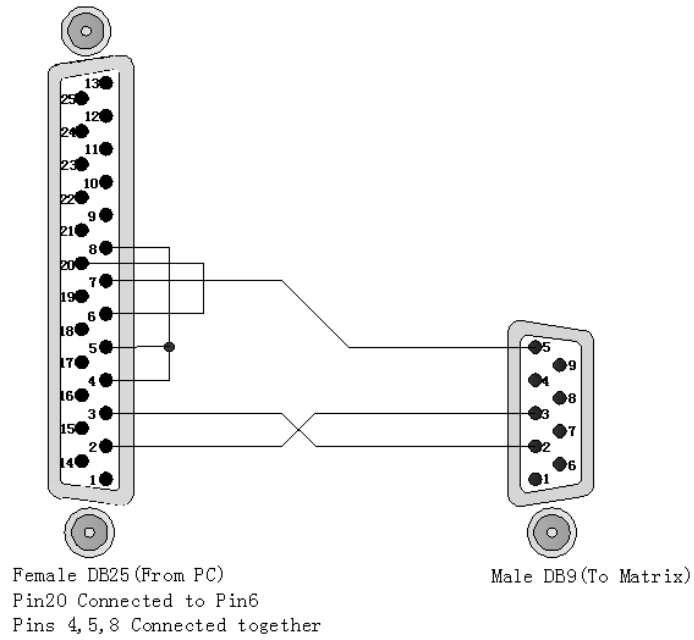


Figure 6-10 (c) RS-232 – From Female DB25 (PC) to Male DB9 (Matrix)

6.7.2 RS-485

RS-485 is a standard defining the electrical characteristics of drivers and receivers for use in balanced digital multipoint systems. Digital communications networks implementing the RS-485 standard can be used effectively over long distances and in electrically noisy environments. This Matrix Switcher supports up to two RS-485 ports allows you to control more than one Matrix Switcher. If the master device is specified for LAN, it allows you to control all the series devices with web browser. Remember all the ID of each device upon series connection has to be uniquely.

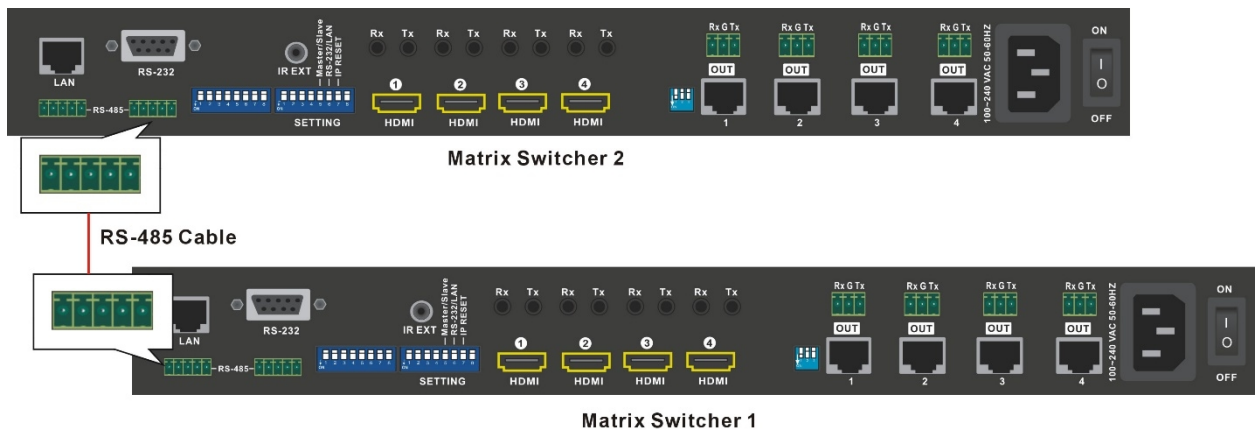


Figure 6-11 RS-485 Connection for HX-2344Z

See Pin definitions as below:

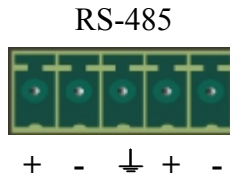


Figure 6-12 RS-485 Port

- Pin1 TX (+) : TX (+) --- Transmitted Data +
- Pin2 TX (-) : TX (-) --- Transmitted Data -
- Pin3 GND : (Ground)
- Pin4 RX (+) : RX (+) --- Received Data +
- Pin5 RX (-) : RX (-) --- Received Data -

☞ RS-232 and RS-485 baud rates: 9600bps, no odd or even calibration address, 8bit data transmission address, 1bit stop address (9600, N, 8, 1).

6.7.3 RxGTx Port

See Pin definitions as below:



Figure 6-13 RxGTx Port

Pin1 Rx : Receive RS-232-level signal pin. (data in)

Pin2 G : GND

Pin3 Tx : Transmit RS-232-level signal pin. (data out)

6.7.4 LAN Port

HX-2344Z supports RJ-45 registered jacks using 8P8C modular connector, which specifies the physical male and female connectors as well as the pin assignments of the wires in a telephone cable. (A common LAN cable is available.)

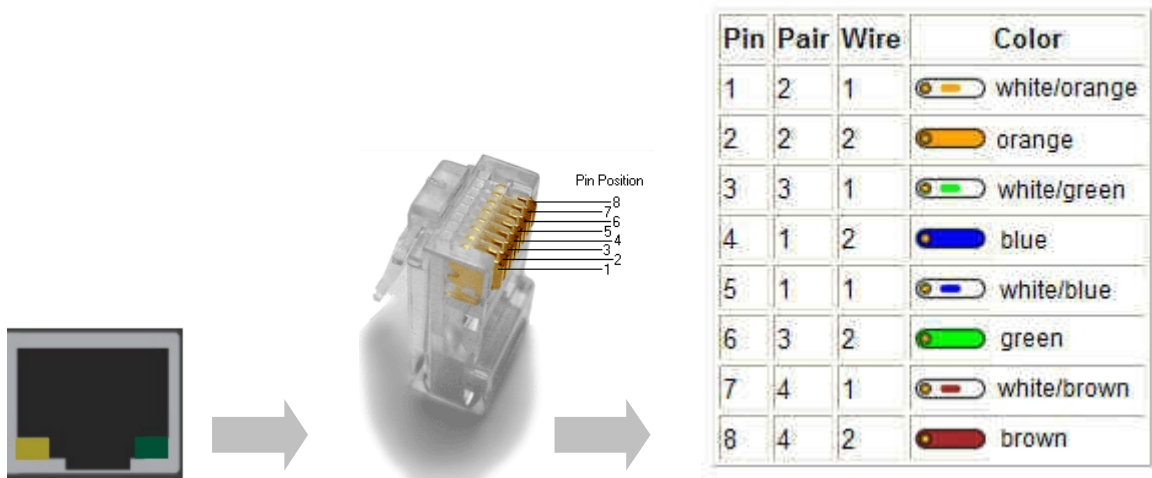


Figure 6-14 RJ-45 Connector

6.7.5 DIP Switchers for 8 Pins

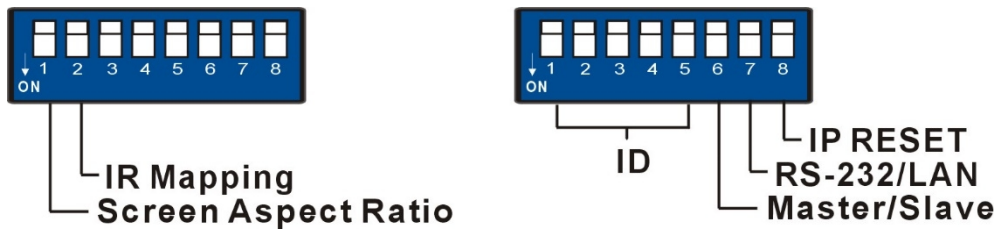


Figure 6-15 DIP Switchers for 8 Pins

Left DIP Switcher:

A. DIP Switcher Pin 1: Switch the screen aspect ratio between 1:1 and Full Screen.

ON: Screen aspect ratio => 1:1

OFF: Screen aspect ratio => Full Screen

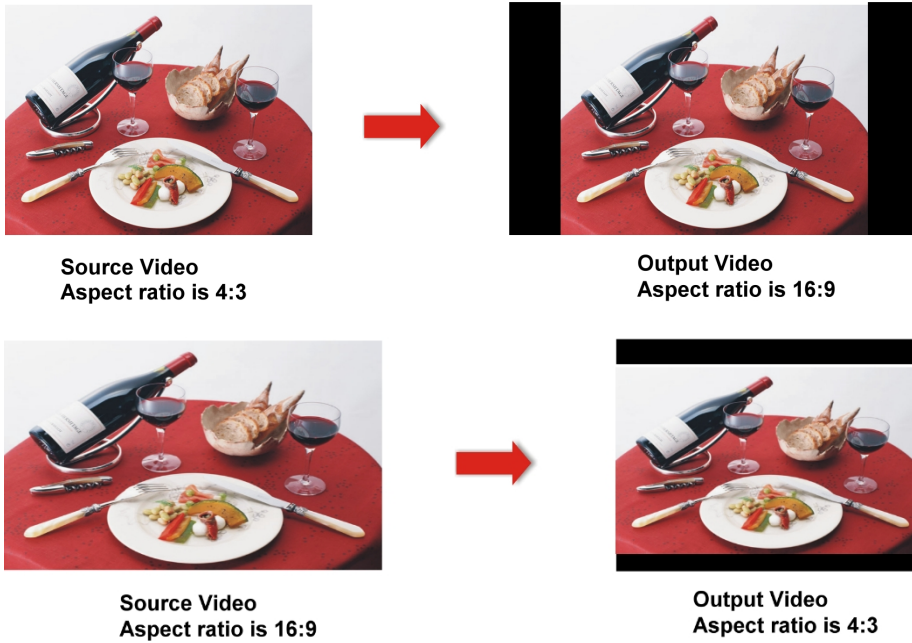


Figure 6-16 Aspect Ratio for 1:1

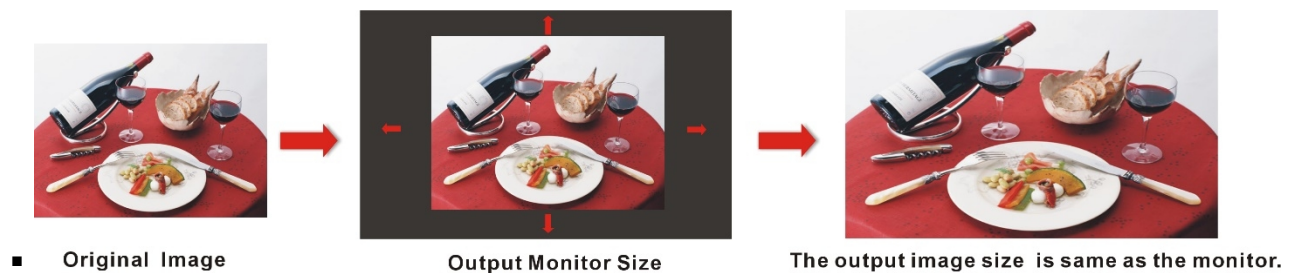


Figure 6-17 Aspect Ratio for Full Screen

B. DIP Switcher Pin 2: IR mapping configurations

ON: IR mapping (remote => local) by channel route, remote user can control the selected local DVD player by IR.

OFF: IR mapping (local and remote) fixed.

Right DIP Switcher:

A. DIP Switcher Pin 1 to 5: Switch to down (ON) is specified for “0”, on the other hand to up (OFF) is specified for “1”. For Device ID settings refer to [6.7.7 Device ID Settings](#)
[錯誤! 找不到參照來源。](#)

B. DIP Switcher Pin 6: Mater/Slave Enable/Disable. Only one Matrix Switcher can be connected to other device and control PC via RS-232/LAN that is specified as Master, others are specified as Slave.

ON: RS-485 Serial Master and RS-232 / LAN Enable.

OFF: RS-485 Serial Slave and RS-232 / LAN Disable.

C. DIP Switcher Pin 7: Switch between RS-232 port and LAN port connection.

ON: RS-232

OFF: LAN

D. DIP Switcher Pin 8: Reset the web server IP address to **192.168.0.3**

The steps are as below:

1. Please adjust the Pin8 to ON and re-start the Matrix Switcher.
2. After the Matrix Switcher re-starts about 10 seconds, shut down it.
3. For a normal operation, please adjust the Pin8 to OFF, then power on the Matrix Switcher again. The IP address will be restored to the default value: **192.168.0.3**

6.7.6 DIP Switcher for 2 Pins

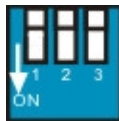


Figure 6-18 DIP Switcher for HD-BaseT Setting

A. Pin 1: Local F/W upgrade.

B. Pin 2: Normal.

C. Pin 3: Normal.

6.7.7 Device ID Settings

The Device ID determines the position of a Matrix system. When multiple Matrix products are connected to one PC or when the Matrix products are serially connected, the Device ID decides which Matrix product is to be controlled. Device ID must not set to same number. Use the ON/OFF switches 1, 2, 3, 4, 5 on the rear panel to set the ID number as below:

錯誤! 找不到參照來源。 **Number Setting Table**

ID Address (Decimal)	ID Address (Hexadecimal)	ID Address (Binary)	ON/OFF Switching Positions				
			SW5	SW4	SW3	SW2	SW1
0	00	00000	ON	ON	ON	ON	ON
1	01	00001	ON	ON	ON	ON	OFF
2	02	00010	ON	ON	ON	OFF	ON
3	03	00011	ON	ON	ON	OFF	OFF
4	04	00100	ON	ON	OFF	ON	ON
5	05	00101	ON	ON	OFF	ON	OFF
6	06	00110	ON	ON	OFF	OFF	ON
7	07	00111	ON	ON	OFF	OFF	OFF
8	08	01000	ON	OFF	ON	ON	ON
9	09	01001	ON	OFF	ON	ON	OFF
10	0A	01010	ON	OFF	ON	OFF	ON
11	0B	01011	ON	OFF	ON	OFF	OFF
12	0C	01100	ON	OFF	OFF	ON	ON
13	0D	01101	ON	OFF	OFF	ON	OFF
14	0E	01110	ON	OFF	OFF	OFF	ON
15	0F	01111	ON	OFF	OFF	OFF	OFF
16	10	10000	OFF	ON	ON	ON	ON
17	11	10001	OFF	ON	ON	ON	OFF
18	12	10010	OFF	ON	ON	OFF	ON
19	13	10011	OFF	ON	ON	OFF	OFF
20	14	10100	OFF	ON	OFF	ON	ON
21	15	10101	OFF	ON	OFF	ON	OFF
22	16	10110	OFF	ON	OFF	OFF	ON
23	17	10111	OFF	ON	OFF	OFF	OFF
24	18	11000	OFF	OFF	ON	ON	ON
25	19	11001	OFF	OFF	ON	ON	OFF
26	1A	11010	OFF	OFF	ON	OFF	ON

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27	1B	11011	OFF	OFF	ON	OFF	OFF
28	1C	11100	OFF	OFF	OFF	ON	ON
29	1D	11101	OFF	OFF	OFF	ON	OFF
30	1E	11110	OFF	OFF	OFF	OFF	ON
31	1F	11111	OFF	OFF	OFF	OFF	OFF

CHAPTER 7 SWITCHER APPLICATION SOFTWARE

7.1 Software Introduction

The 《AV Matrix》 matrix control software applies to different input/output matrixes.

7.1.1 Software Description

The 《AV Matrix》 matrix testing software is an application tool developed for matrix testing and application. The software operation environment is as below:

- Window7/98/2000/NT/XP/VISTA operating systems
(For more information, please refer to:/software/readme.txt before the installation.)
- 32M internal memory or above
- 10M hard disk space or above
- CD-ROM
- At least one serial communication port

7.1.2 Software Activation

Power on the computer: Implement the **AV Matrix.msi** in the bundled CD-ROM to activate installation window as below, click **“Next”**. And follow the instructions on window to finish the installation.

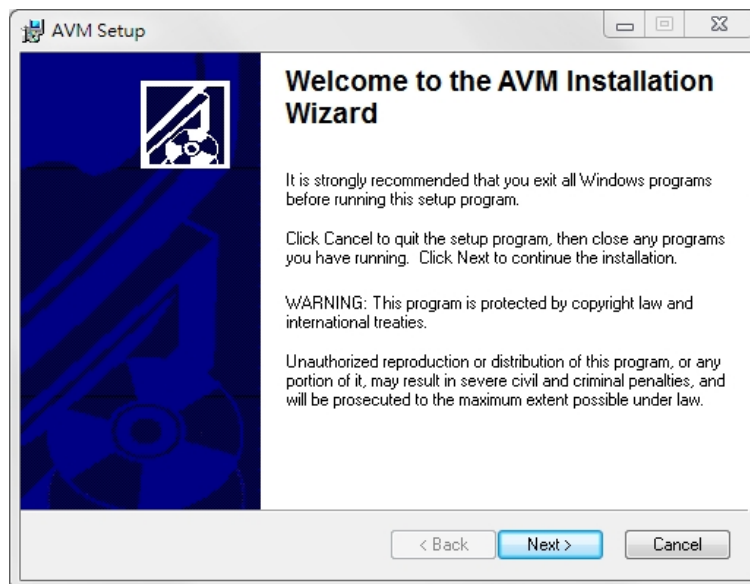
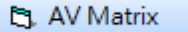


Figure 7-1 AV Matrix Installation Window

7.1.3 Connect HX-2344Z and PC

You must power off the HX-2344Z Switcher. Then, connect the Switcher RS-232 port to the PC RS-232 port with the bundled communication cable. And make sure the DIPs on the rear panel are set to Master and RS-232. (Refer to the previous section [6.7.1 RS-232](#))

7.2 Switcher Configuration

After finishing installation, click  to active AV Matrix Application. In the “Options” window, select the connected PC Port number and Baud rate, and then click “OK”.

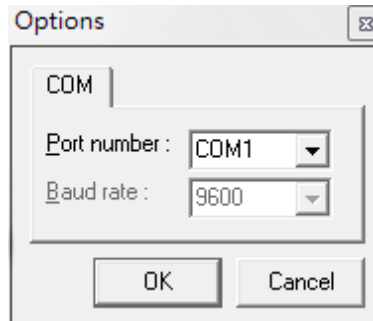


Figure 7-2 AV Matrix Options Window

The software controls signal connection between the corresponding input port and output port as required. The AV Matrix software application main window is shown as below:

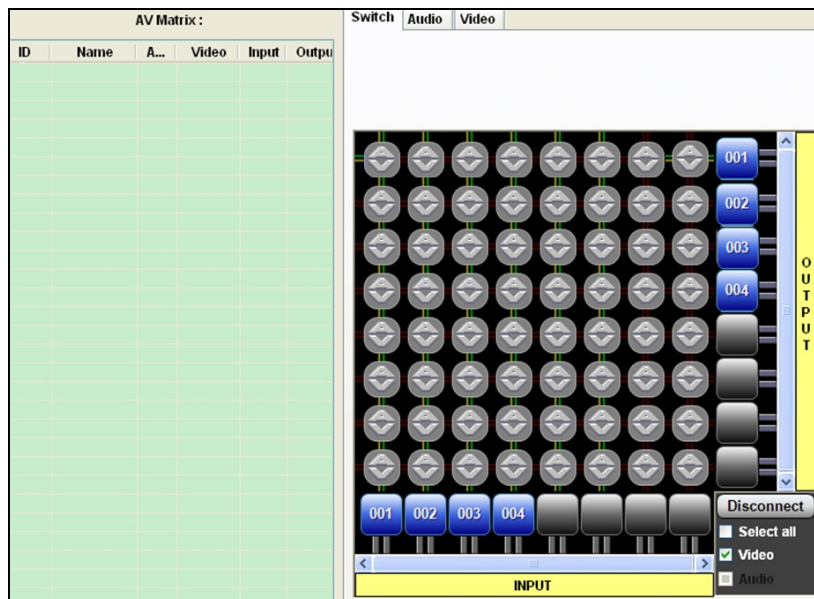


Figure 7-3 《AV Matrix》 Software Application Main Window

 The Device ID is based on the DIP of switcher located on the rear panel.

Slide the scrollbar on the lower left area of main window to view all contents (including ID, Name, Audio, Video, Input, Output, Memory, VI Plug, AI Plug, VO Plug, AO Plug, EDID Type, Volume, Bass, Treble, Subwoofer, Delay, Delay Unit, Max Delay and Version) as described below:

ID: Specify the ID address of selected Switcher.

Name: The name of selected Switcher.

Audio/Video: Specify the character of audio or video. Or both of audio and video are supported will both show “**Support**”.



Input/Output: Ports quantities of Input and Output.

7.2.1 Main Operation Interface

You can slide the scrollbar on the Input / Output area to view all configured ports. For the basic operation is described as below:

Examples for routing functions:

Example: Now there is an HX-2344Z Switcher having all the input/output ports properly connected to the equipment. If you want to set channel 1 input to output displayer 1, please follow the ways and steps to finish the functions:

First way: Directly click on the corresponding icons on the AV Matrix  to transform it into  to complete the switching operation.

Second way:

First select the “**Output**” number keys 001, and select the “**Input**” number key 001 to the bottom. This way, you have selected “**INPUT**” 001 and “**OUTPUT**” 001.

Upon completion of the above ways, you have actually completed the routing operation of having channel 1 input to the output displayer 1

The main configuration window also shows you some function buttons to easy operation:

Switch Tab: Click “**Switch**” tab to show the main configuration window about routing.

Audio Tab: Click the “**Audio**” tab to show the audio related configuration window.

Video Tab: Click the “**Video**” tab to show the video related configuration window.

Disconnect: To disable the connections. After you had configured the connection between input and output ports, you can click this button to disable the connections

Select all: Click this button to select all output ports.

Video check box: Used for video configurations.

Audio check box: Used for audio configurations.

Scan: To search the device controlled by the AV Matrix Application configuration. When the device name located on the left of main configuration window is empty, you can click the **Scan** to research and update the device **ID** and **Name** and other related information. End the **Scan** function by pressing the Scan again during scanning process. And the left of main configuration window will show you the detected information presently.

Options: Allows you to configure the **Port number** and **Baud rate**.

Exit: Click this button to exit the configuration window.

For more information and operations, please refer to next chapters.

7.2.2 Disconnect Function Key

Disable all the unused output ports.

A specific example of operation is described as below:

The present input and output relations are shown in Figure 7-4 below:

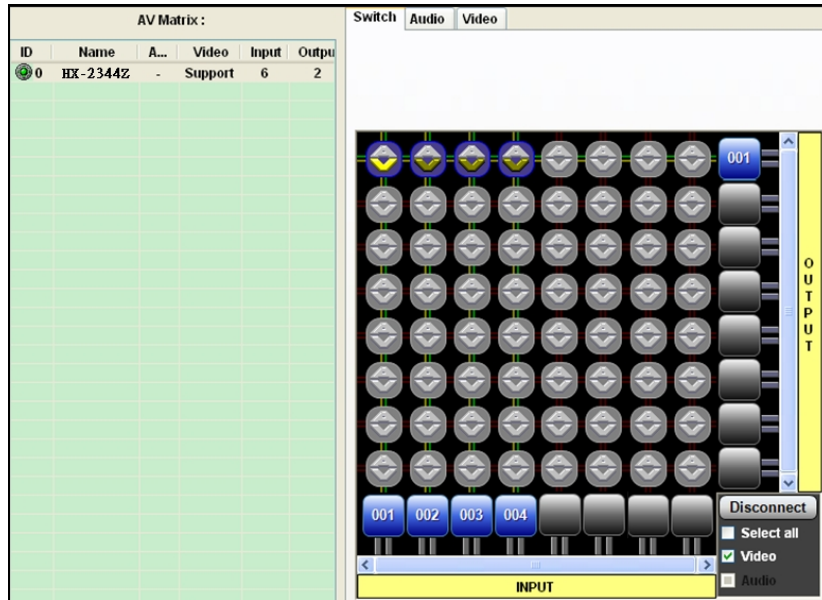


Figure 7-4 Disconnect Function Key

7.2.3 Options Function

Activation Function:

In the main configuration menu, select **Options** to prop-up the **Options Window** as shown in Figure 7-5 (a)

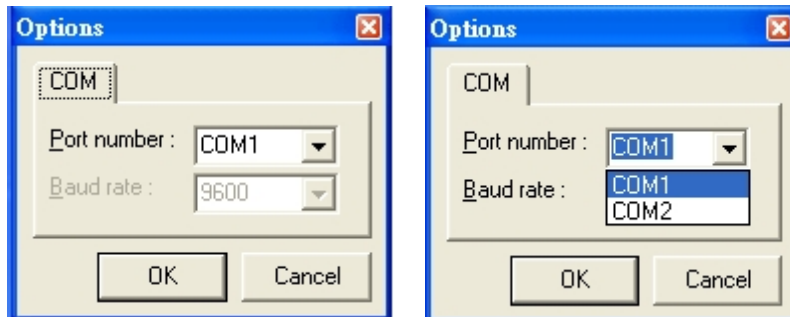


Figure 7-5 Options (a)

Figure 7-5 Options (b)

Function Description:

Linking Methods: In “**Port number**” select one of the COM ports as shown in Figure 7-5 (b) for an example; in “**Baud rate**” select 9600 for signal transmission as shown in Figure 7-5 (a)

7.2.4 Communication Protocol/Control Command Code

Communication Protocol: Baud rate 9600bps, no odd or even calibration bit address, 8bit transmission address, 1bit stop address. Please refer to the “**Command list.pdf**” in the CD-ROM for more relative **Command Code** information. Also see [Appendix E RS-232 Communication Protocol](#).

7.3 LAN Web Configuration

Open the **Browser** on your PC, key in the default IP address: <http://192.168.0.3> to login the **AV MATRIX Control** configuration window. Once the default IP address is changed, please use the changed IP to login.

The software controls signal connection between the corresponding input port and output port as required. The LAN main configuration window is as below:

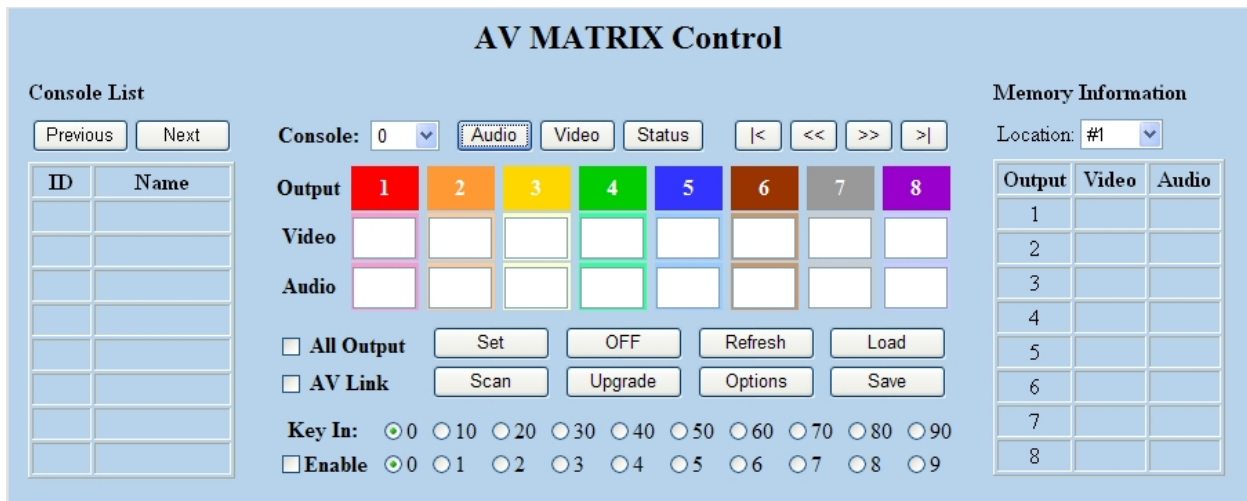


Figure 7-6 LAN Web Configuration Window

☞ HX-2344Z Switcher is integrated HDMI routing equipment. You can only key in the Output Channel No. into the **Video** field for configuration.

☞ HX-2344Z Switcher’s Device ID is based on the DIP of switcher located on the rear panel.

Set: Click this button to set the connected combinations both output and input ports.

OFF: Disable the entire output channels.

Refresh: To refresh the values of the configuration window. Any changed settings directly on the HX-2344Z Switcher will not respond to the AV Matrix operating interface, you have to click the “**Refresh**” button to refresh the configuration window so that showing the changed values.

Load: Click this button to retrieve the previously saved settings.

Scan: To search the device controlled by the LAN Web Configuration. When the **Console List** content is empty, you can click the “**Scan**” to research and update the

Console List. If your Switchers are over 8 devices, you can click “Previous” or “Next” to view console list by paging.

Upgrade: Use for firmware upgrade. For more information, refer to [Appendix D Firmware Upgrade](#).

Options: Allow you to configure the IP address.

Save: Click this button to save the connected combinations of output and input ports. It also includes the present input/output routing relations and all settings.

All Output: A Hot Key for you to set the same value to all output channels. Select the **All Output** check box, then key in example “4” value in the channel 1 output. Click anywhere on the window, the all channels output will become “4” value.



Figure 7-7 All Output Check Box Function

AV Link: Link between audio and video.

Key In: A Hot key that is for key in the value 0~99 quickly. After setting the value, click “Enable” to take effect.

Previous and Next: If your Switchers are over 8 devices, you can click “Previous” or “Next” to view the console list by paging.

7.3.1 Video Configuration

For video configuration, click **Video** button directly to pop-up “**Video Settings**” window.



Figure 7-8 Video Operation

In “**Video Settings**” window, you can click **Change** button to switch EDID Output1 and Default port.

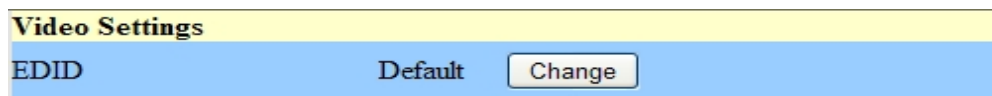


Figure 7-9 Video Configurations – Default port used

☞ The LCD will appear **FIX** when you switch to **Default**, alternately, it will appear **OUT1** with **Output1** selection.

If the Switcher does not support video function, it will appear “**Not Support**”. The **Change** button will useless.

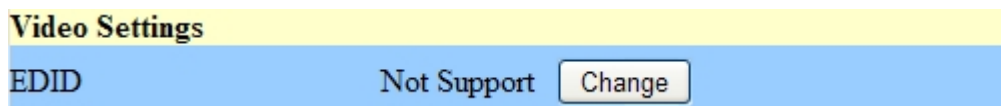


Figure 7-10 Video Configuration – Not Support

7.3.2 Device Status Information

Click **Status** button pop-up “**Device Status Information**” window as below.

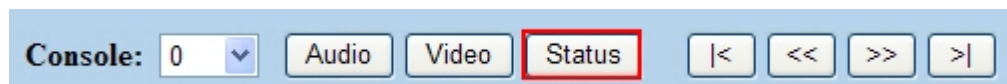


Figure 7-11 Device Status

The “**Device Status Information**” window will show you **Device Name**, **Device ID**, **Firmware Version**, **Total Memory**, **Total Output** and **Total Input** information. Click “**Refresh**” button to renew related information in real time.

Device Status Information	
Device Name	HX-2344Z
Device ID	0
Firmware Version	0.0.1
Total Memory	4
Total Output	4
Total Input	4
<input type="button" value="Refresh"/>	

Figure 7-12 Device Status Information

7.3.3 LAN IP Function

In the main configuration menu, select **Options** button to pop-up the **Browser** ex. “**Windows Internet Explorer**” dialog box, click “**OK**” to show the IP configuration window as shown in Figure 7-13.

Network Settings	
	<input type="checkbox"/> Enable DHCP
Static IP Address	<input type="text" value="192.168.0.3"/>
Static Subnet Mask	<input type="text" value="255.255.255.0"/>
Static Default Gateway	<input type="text" value="192.168.0.1"/>
Static DNS Server	<input type="text" value="192.168.0.1"/>
Physical Address	e4-46-bd-03-02-04
<input type="button" value="Apply"/> <input type="button" value="Default"/> <input type="button" value="Reboot"/>	

Figure 7-13 Network Settings

In the “**Network Settings**” window, you can set the IP information by yourself (Fix IP) or click the **Enable DHCP** check box to get the IP from the DHCP (Float IP).

☞ Click the **Default** button to restore to default IP address. After changing the IP, you have to restart (power off then power on) the Device to make the changed values take effectively.

☞ You can also use the blue **Switcher** on the rear panel of the Device to reset the ignored IP.

7.3.4 Other Application

The software utility will show you at least 32 units Device ID and Name. You can click the **Console** down list to select which device that you want to configure output /input values. The entire connected Device name will be showed on the **Console List** as Figure 7-14. For this model, the software utility will show at least 1 up to 32 devices. The example as below shows you an ID: 0 for the Name: HX-2344Z Switcher presently.

☞ When the **Console List** is empty, please pay attention to the location of switcher pin on the rear panel of Device is correctly. Then, click **Scan** to research the configured.

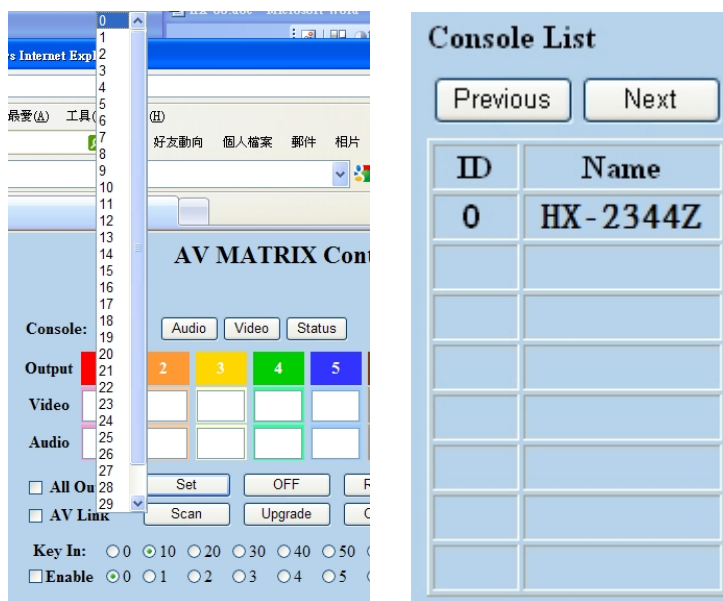


Figure 7-14 Other Application

CHAPTER 8 OPERATION EXAMPLES

During channel switching, the specified output channel will flicker, if idling about 2 seconds, it will stop flickering.

Example 1: Route the NO.1 input signal to the NO.2 output channel.

Key	LCD Display	Operation												
	<p>HDMI MATRIX</p> <table border="1"> <tr> <td>OUT</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>EDID</td> </tr> <tr> <td>IN</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>FIX</td> </tr> </table>	OUT	1	2	3	4	EDID	IN	0	0	0	0	FIX	1. Press the key - OUT 2, then the input channels flicker.
OUT	1	2	3	4	EDID									
IN	0	0	0	0	FIX									
	<p>HDMI MATRIX</p> <table border="1"> <tr> <td>OUT</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>EDID</td> </tr> <tr> <td>IN</td> <td>0</td> <td>1</td> <td>0</td> <td>0</td> <td>FIX</td> </tr> </table>	OUT	1	2	3	4	EDID	IN	0	1	0	0	FIX	2. Press the key - IN 1.
OUT	1	2	3	4	EDID									
IN	0	1	0	0	FIX									

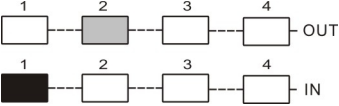

Example 2: Route the NO.1 and NO.2 input signals to NO.1 and NO.2 output channels respectively.

Key	LCD Display	Operation												
	<p>HDMI MATRIX</p> <table border="1"> <tr> <td>OUT</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>EDID</td> </tr> <tr> <td>IN</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>FIX</td> </tr> </table>	OUT	1	2	3	4	EDID	IN	0	0	0	0	FIX	1. Press the key - OUT 1, then the input channels flicker.
OUT	1	2	3	4	EDID									
IN	0	0	0	0	FIX									
	<p>HDMI MATRIX</p> <table border="1"> <tr> <td>OUT</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>EDID</td> </tr> <tr> <td>IN</td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td>FIX</td> </tr> </table>	OUT	1	2	3	4	EDID	IN	1	0	0	0	FIX	2. Press the key - IN 1.
OUT	1	2	3	4	EDID									
IN	1	0	0	0	FIX									
	<p>HDMI MATRIX</p> <table border="1"> <tr> <td>OUT</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>EDID</td> </tr> <tr> <td>IN</td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> <td>FIX</td> </tr> </table>	OUT	1	2	3	4	EDID	IN	1	0	0	0	FIX	3. Press the key - OUT 2, then the input channels flicker.
OUT	1	2	3	4	EDID									
IN	1	0	0	0	FIX									
	<p>HDMI MATRIX</p> <table border="1"> <tr> <td>OUT</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>EDID</td> </tr> <tr> <td>IN</td> <td>1</td> <td>2</td> <td>0</td> <td>0</td> <td>FIX</td> </tr> </table>	OUT	1	2	3	4	EDID	IN	1	2	0	0	FIX	4. Press the key - IN 2.
OUT	1	2	3	4	EDID									
IN	1	2	0	0	FIX									

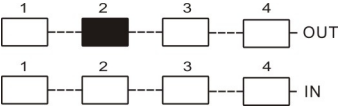
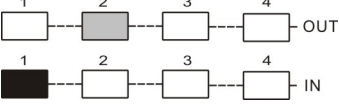

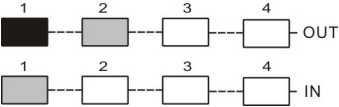


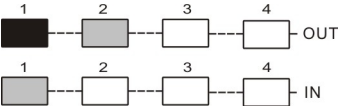
Example 3: Delete “All” settings.

Key	LCD Display	Operation												
	<p>HDMI MATRIX</p> <table border="1"> <tr> <td>OUT</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>EDID</td> </tr> <tr> <td>IN</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>FIX</td> </tr> </table>	OUT	1	2	3	4	EDID	IN	0	0	0	0	FIX	1. Press the key - OUT 2, then the input channels flicker.
OUT	1	2	3	4	EDID									
IN	0	0	0	0	FIX									

SEAMLESS HDBASET MATRIX SWITCHER – HX-2344Z

	<p>HDMI MATRIX</p> <table style="margin-left: auto; margin-right: auto;"> <tr><td>OUT</td><td>1</td><td>2</td><td>3</td><td>4</td><td>EDID</td></tr> <tr><td>IN</td><td>0</td><td>1</td><td>0</td><td>0</td><td>FIX</td></tr> </table>	OUT	1	2	3	4	EDID	IN	0	1	0	0	FIX	<p>2. Press the key - IN 1.</p>
OUT	1	2	3	4	EDID									
IN	0	1	0	0	FIX									
<p>ALL OFF</p> 	<p>HDMI MATRIX</p> <table style="margin-left: auto; margin-right: auto;"> <tr><td>OUT</td><td>1</td><td>2</td><td>3</td><td>4</td><td>EDID</td></tr> <tr><td>IN</td><td>0</td><td>0</td><td>0</td><td>0</td><td>FIX</td></tr> </table>	OUT	1	2	3	4	EDID	IN	0	0	0	0	FIX	<p>3. Press the “ALL” key on the front panel, and then press the “OFF” key to cancel all the settings.</p>
OUT	1	2	3	4	EDID									
IN	0	0	0	0	FIX									

Example 4: “STO” and “RCL” functions.

Key	LCD Display	Operation												
	<p>HDMI MATRIX</p> <table style="margin-left: auto; margin-right: auto;"> <tr><td>OUT</td><td>1</td><td>2</td><td>3</td><td>4</td><td>EDID</td></tr> <tr><td>IN</td><td>0</td><td>0</td><td>0</td><td>0</td><td>FIX</td></tr> </table>	OUT	1	2	3	4	EDID	IN	0	0	0	0	FIX	<p>1. Press the key - OUT 2, then the input channels flicker.</p>
OUT	1	2	3	4	EDID									
IN	0	0	0	0	FIX									
	<p>HDMI MATRIX</p> <table style="margin-left: auto; margin-right: auto;"> <tr><td>OUT</td><td>1</td><td>2</td><td>3</td><td>4</td><td>EDID</td></tr> <tr><td>IN</td><td>0</td><td>1</td><td>0</td><td>0</td><td>FIX</td></tr> </table>	OUT	1	2	3	4	EDID	IN	0	1	0	0	FIX	<p>2. Press the key - IN 1.</p>
OUT	1	2	3	4	EDID									
IN	0	1	0	0	FIX									
<p>STO</p> 	<p>HDMI MATRIX</p> <table style="margin-left: auto; margin-right: auto;"> <tr><td>OUT</td><td>1</td><td>2</td><td>3</td><td>4</td><td>EDID</td></tr> <tr><td>IN</td><td>0</td><td>1</td><td>0</td><td>0</td><td>FIX</td></tr> </table>	OUT	1	2	3	4	EDID	IN	0	1	0	0	FIX	<p>3. Press the “STO” key on the front panel, then the output channels flicker.</p>
OUT	1	2	3	4	EDID									
IN	0	1	0	0	FIX									
	<p>HDMI MATRIX</p> <table style="margin-left: auto; margin-right: auto;"> <tr><td>OUT</td><td>Save to 1</td><td></td><td></td><td></td><td>EDID</td></tr> <tr><td>IN</td><td>0</td><td>1</td><td>0</td><td>0</td><td>FIX</td></tr> </table>	OUT	Save to 1				EDID	IN	0	1	0	0	FIX	<p>4. Press the key - OUT 1 to save the setting in the memory #1.</p>
OUT	Save to 1				EDID									
IN	0	1	0	0	FIX									
<p>ALL OFF</p> 	<p>HDMI MATRIX</p> <table style="margin-left: auto; margin-right: auto;"> <tr><td>OUT</td><td>1</td><td>2</td><td>3</td><td>4</td><td>EDID</td></tr> <tr><td>IN</td><td>0</td><td>0</td><td>0</td><td>0</td><td>FIX</td></tr> </table>	OUT	1	2	3	4	EDID	IN	0	0	0	0	FIX	<p>5. Press the “ALL” key on the front panel, and then press the “OFF” key to cancel the setting.</p>
OUT	1	2	3	4	EDID									
IN	0	0	0	0	FIX									
<p>RCL</p> 	<p>HDMI MATRIX</p> <table style="margin-left: auto; margin-right: auto;"> <tr><td>OUT</td><td>1</td><td>2</td><td>3</td><td>4</td><td>EDID</td></tr> <tr><td>IN</td><td>0</td><td>0</td><td>0</td><td>0</td><td>FIX</td></tr> </table>	OUT	1	2	3	4	EDID	IN	0	0	0	0	FIX	<p>6. Press the “RCL” key on the front panel, then the output channels flicker.</p>
OUT	1	2	3	4	EDID									
IN	0	0	0	0	FIX									
	<p>HDMI MATRIX</p> <table style="margin-left: auto; margin-right: auto;"> <tr><td>OUT</td><td>Load from 1</td><td></td><td></td><td></td><td>EDID</td></tr> <tr><td>IN</td><td>0</td><td>0</td><td>0</td><td>0</td><td>FIX</td></tr> </table>	OUT	Load from 1				EDID	IN	0	0	0	0	FIX	<p>7. Press the key - OUT 1 to Load the previously saving.</p>
OUT	Load from 1				EDID									
IN	0	0	0	0	FIX									

CHAPTER 9 TROUBLESHOOTING

1. What to do if LCD is fail in display?

Answer: Check the connection of power cord is not loosening and the power cord is in a good status having no any damage. Check the power source is normally.

2. What to do if the Matrix Switcher front panel keys operating not responsive?

Answer: The Matrix Switcher front panel keys employ scanning testing and require longer response time. Press the keys for 2 seconds and then release. This way, keys will be responsive in operation.

3. What to do if the serial port (usually refer to the computer serial port) fails to control the Matrix Switcher?

Answer: Check that the communication port set by the control software is correctly connected to the corresponding serial port of the equipment. Also, check if the computer communication port is in good order. Check the ID address and DIP Switcher are configured correctly. Refer to [6.7.7 Device ID Settings](#) and [6.7.6 DIP Switcher for 2 Pins](#).

4. What to do if the corresponding audio signal fails to output during Matrix routing?

Answer:

- (1) Check if there is signal on the input end. If there is no input signal, it could be that the input connection cable is broken or the connector gets loosen. You are advised to replace the connection cable.
- (2) Check if there is signal on the output end. If there is no output signal, it could be that the cable is broken or the connector gets loosen. You are advised to replace the connection cable.
- (3) Check if the output port number is the same as the controlled port number.
- (4) Check the connections of input and output ports are correctly.
- (5) If none of the above circumstances happen, it could be internal failure of the product itself. You must send for repair by qualified technical engineers.

5. What to do if you sense the power leakage during plugging or unplugging of the input/output ports?

Answer: It could be that the equipment power is not properly grounded. You must

properly ground your equipment; otherwise product life can easily be shortened.

6. What to do if the Matrix Switcher panel keys and communication ports are out of order?

Answer: Check if the equipment power input is in good contact and the computer communication ports are in good order. If yes, it could be some internal failure of the product, please send for repair by qualified technical engineer.

7. What to do if operation and function failure occurred?

Answer: Check if the equipment and the Matrix system are in proper connection. If the problem persists, send the product to the maintenance center for repair.

8. How to avoid the equipment failure due to the high temperature?

Answer: Place the equipment in a ventilate location. If it is still not to be improved, please check with the built-in fan whether is damaged. Or contact your agency for helping.

9. What to do if IR function failure occurred?

Answer: Check the remote controller is with a well battery and the IR connector is not loosening. Check whether the remote controller is aiming at the IR receiver accurately.

APPENDIX A CONTROLLER

Matrix Switcher Remote Controller

The Matrix Switcher supports a remote control interface allows you to control the channels and features routing of Matrix Switcher through remote controller.



- OSD, SCAN, ▲, ▼, AUDIO, VIDEO and +10 keys are useless.
- Power key: Press Power key to disable the LCD light.

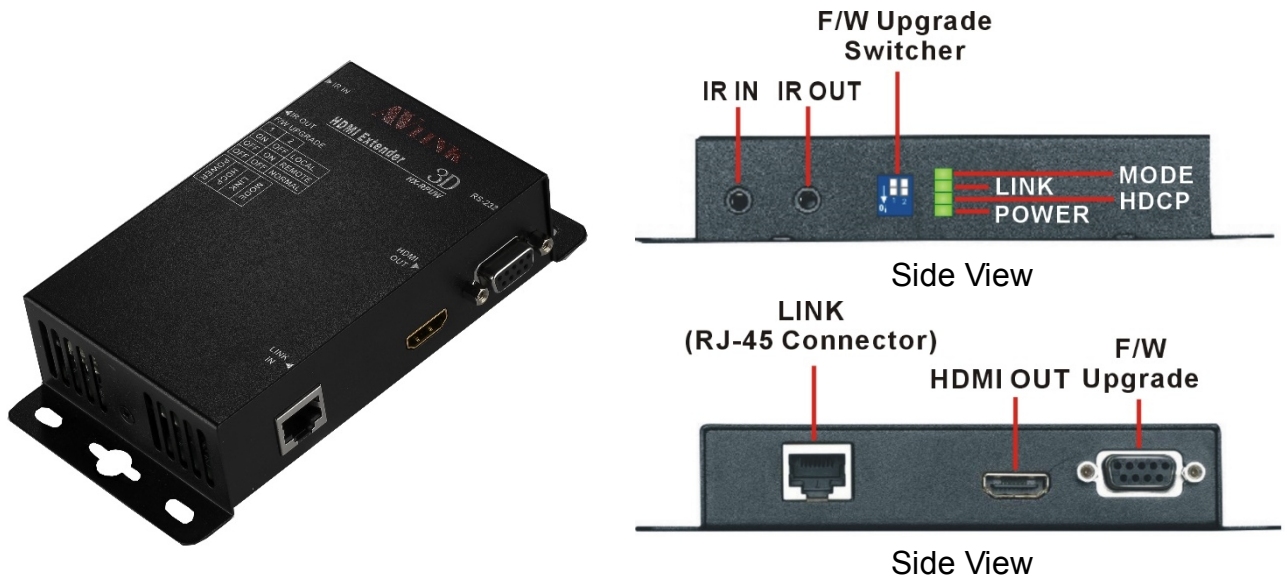
APPENDIX B EXTENDER

The extension of HDMI video signal device supports up to 70 meter away by using an Extender and Cat.5e cable.

HDMI Extender is ideal for:

- Test bench facilities
- Data Center
- Help desks

HX-SRPUW Extender



LED Indicators (Green):

LED	Off	Blink	On
MODE	-	Power Connected	-
LINK	No Link	Low Power Mode	HDBaseT Link
HDCP	No HDMI Signals	-	HDCP Encryption
POWER	Power Off	-	Power On

HX-SRPUW Extender: F/W Upgrade Switcher (2-Pin)

	Pin 1	Pin 2	Description
REMOTE	ON	OFF	Through the RS-232 connection to upgrade Extender unit.
LOCAL	OFF	ON	No function.
NORMAL	OFF	OFF	Extend the RS-232 Signal Transmission

Features

- Through the Extender, you can use the output of HX-2344Z to display identical image and extension of HDMI signal up to 70 meter on HDTV
- HDCP Compliant
- Supports F/W Upgrade
- Supports Power over Cable
- Supports 3D pass-through
- Supports all frequency band IR pass-through
- Supports IR/RS-232 extension function
- One Cat.5e cable extension
- Supports resolution up to 4K x 2K
- HDBaseT technology
- Use Cat.5e cable to install easily

Specifications

Hardware	
HDMI OUT	HDMI A-Type Female x 1
LINK	RJ-45 Connector x 1
IR OUT	3.5ψ Stereo Jack x 1
IR IN	3.5ψ Stereo Jack x 1
2 Pins Dip Switcher	F/W Upgrade Setting
RS-232 Connector	DB9 Female x 1 that can used to F/W Upgrade
LED indicators	MODE/LINK/HDCP/POWER
Power Supply	From Link Ethernet Cable
Housing	Metal
Weight	HX-SRPUW: 328g
Dimensions (LxWxH)	150x75x33mm
Multimedia	
Max. Resolution	4K x 2K@30Hz, 8-bit
Highest TMDS Frequency	300MHz
Control Information	
HDMI Cable Distance	10 meters (At least)
Cat.5e Cable Distance	70 meter (Max.)
Remote Control	IR Receiver, IR Blaster

IR Receiver Cable Directions

Put IR Receiver cable into the Extender “**IR IN**” port and place the IR Receiver Cable, so that you can aim at it easily with your IR remote controller.

IR Receiver Cable:



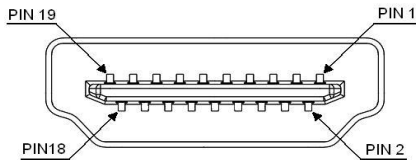
IR Blaster Cable Directions

Plug IR Blaster cable into Extender “**IR OUT**” port located on the front-panel.

IR Blaster Cable:



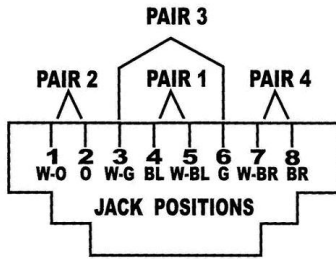
HDMI Connector



HDMI Type A Connector host assignment:

Pin #	Signal	Pin #	Signal
1	TMDS Data 2+	11	TMDS Clock Shield
2	TMDS Data 2 Shield	12	TMDS Clock -
3	TMDS Data 2-	13	NC
4	TMDS Data 1+	14	NC
5	TMDS Data 1 Shield	15	DDC SCL
6	TMDS Data 1-	16	DDC SDA
7	TMDS Data 0+	17	DDC/CEC Ground
8	TMDS Data 0 Shield	18	+5 Power
9	TMDS Data 0-	19	Hot Plug Detect
10	TMDS Clock+		

Wiring Information for Link Connector



Conductor Identification	RJ-45 Pin Assignment	Color Code for Conductor
Pair 1	5	White-Blue
	4	Blue
Pair 2	1	White-Orange
	2	Orange
Pair 3	3	White-Green
	6	Green
Pair 4	7	White-Brown
	8	Brown

APPENDIX C HDBASET FIRMWARE UPGRADE

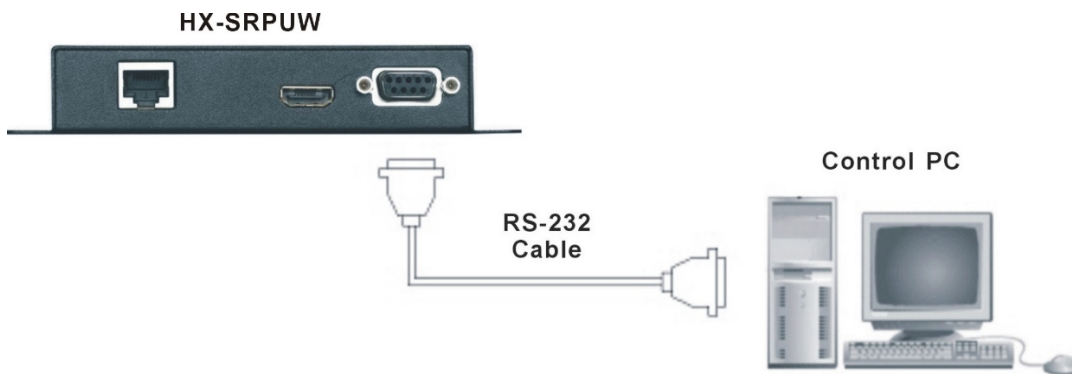
Process the Update TX_ xxx.bat or UpdateRX_ xxx.bat file to upgrade firmware. (xxx is specified for firmware version)

- The UpdateTX_ xxx.bat file is used to upgrade the splitter or D.A system firmware.
- The UpdateRX_ xxx.bat file is used to upgrade the Extender firmware.

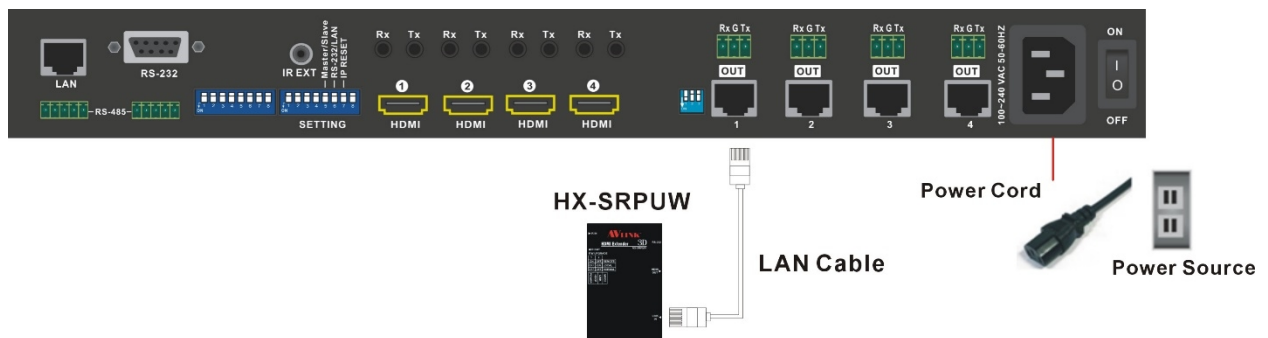
HX-SRPUW HDBaseT F/W Upgrade

Follow the steps as below to upgrade the Extender firmware:

1. Connect the control PC and HX-SRPUW with a RS-232 cable.



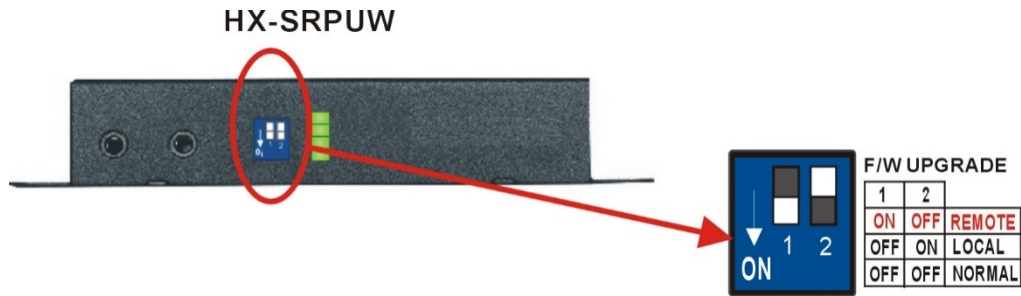
2. Connect the LAN cable to the LINK IN port on the panel of HX-SRPUW. The other end of the LAN cable connected to the OUT LAN port of HX-2344Z. Through the LAN cable connection, the HX-SRPUW will get the power source to process firmware upgrade.



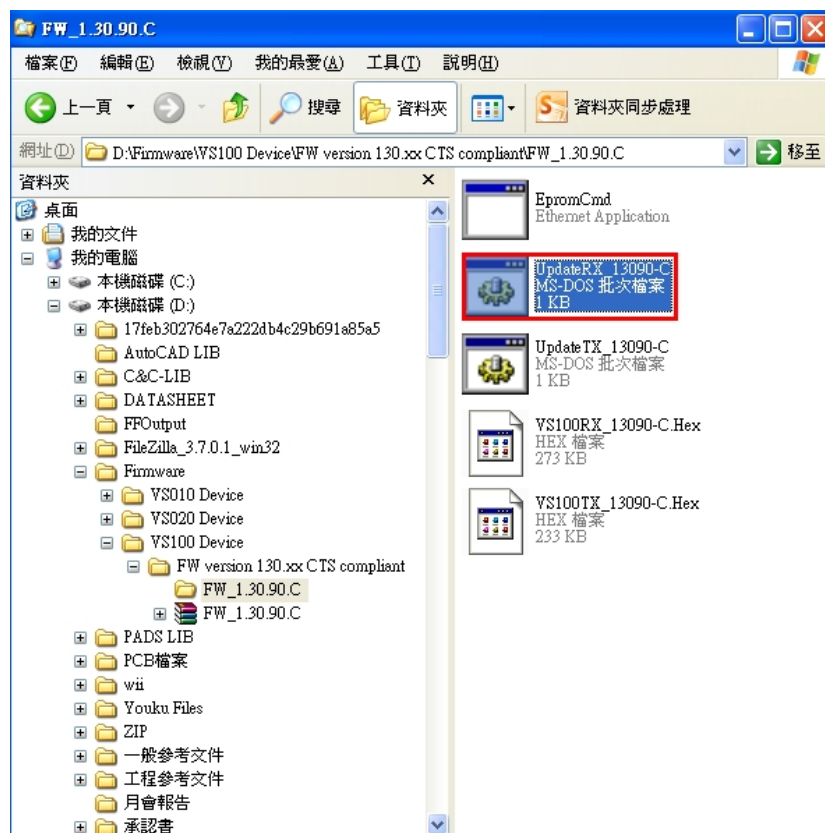
- Adjust the switcher on the Extender to REMOTE mode for upgrading the HX-SRPUW F/W.

REMOTE (HX-SRPUW Extender) Firmware Upgrade

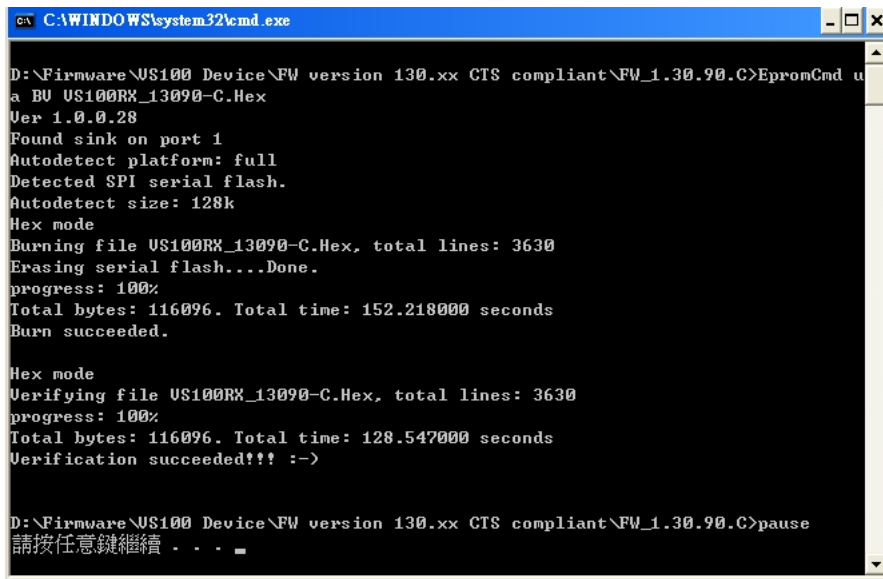
	Pin 1	Pin 2
REMOTE	ON	OFF



- Enable the HX-2344Z power.
- On the control PC, process the UpdateRX_13090-C.bat file to upgrade Extender firmware. (The update file name is only for reference, it will be different based on version.)



6. Final, the update is finished as below.



```

C:\WINDOWS\system32\cmd.exe
D:\Firmware\US100 Device\FW version 130.xx CTS compliant\FW_1.30.90.C>EpromCmd u
a BU US100RX_13090-C.Hex
Ver 1.0.0.28
Found sink on port 1
Autodetect platform: full
Detected SPI serial flash.
Autodetect size: 128k
Hex mode
Burning file US100RX_13090-C.Hex, total lines: 3630
Erasing serial flash...Done.
progress: 100%
Total bytes: 116096. Total time: 152.218000 seconds
Burn succeeded.

Hex mode
Verifying file US100RX_13090-C.Hex, total lines: 3630
progress: 100%
Total bytes: 116096. Total time: 128.547000 seconds
Verification succeeded!!! :->

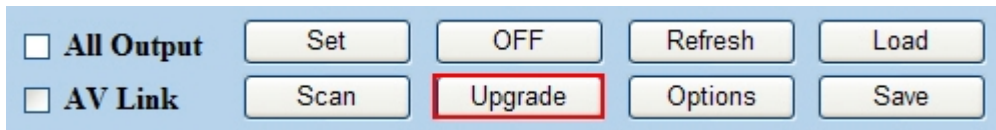
D:\Firmware\US100 Device\FW version 130.xx CTS compliant\FW_1.30.90.C>pause
請按任意鍵繼續 . . . =
```

APPENDIX D FIRMWARE UPGRADE

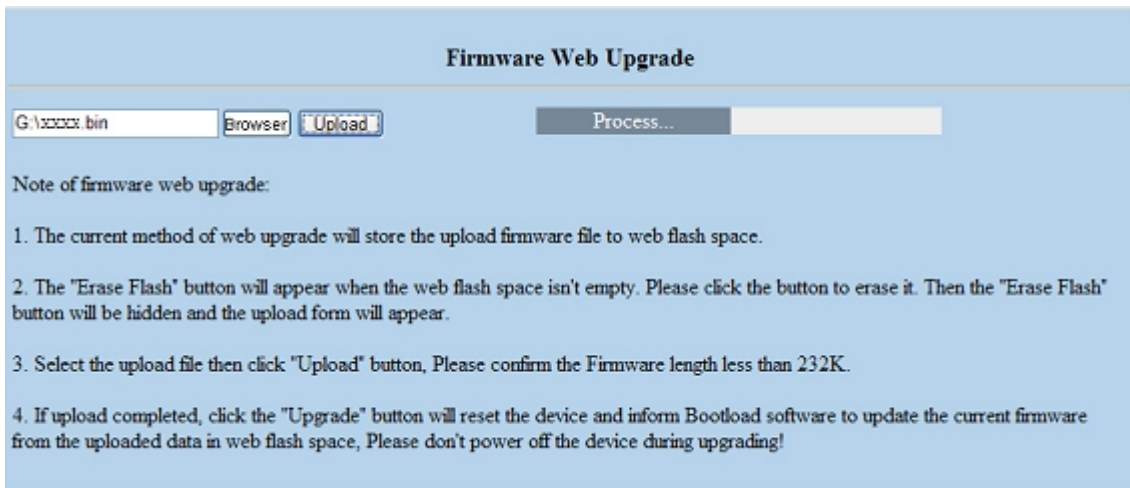
This Chapter will introduce you how to upgrade firmware on your web browser. For firmware upgrade, you have to upload the firmware file to your web server and then upload it to your device from web server.

Follow the steps as below to upgrade the firmware:

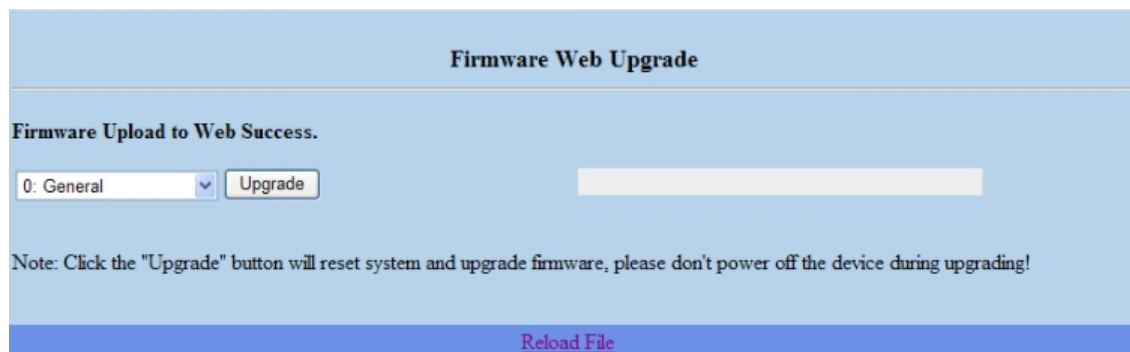
1. Open the **Browser** on your PC, key in the default IP address: <http://192.168.0.3> to login the AV MA TRIX Control configuration. Click **“Upgrade”** to begin firmware upgrade.



2. Click **“Browser”** to select upgraded .bin firmware, then click **“Upload”** to upload the firmware to web server.



3. Select **“0: General”** from the drop-down list and click **“Upgrade”** to upload the firmware to your device.

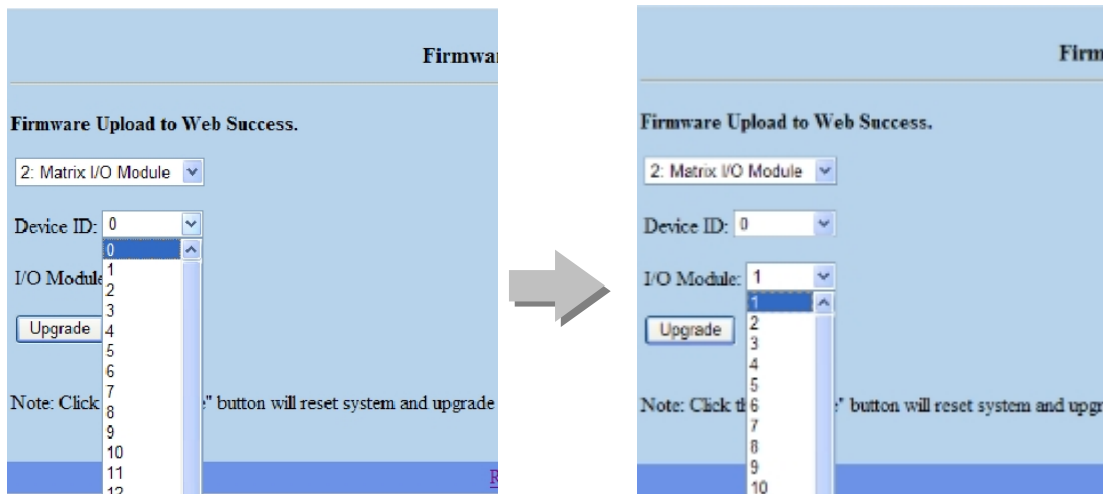


☞ For **0: General** selecting, you have to adjust the switcher ID on the real panel to “**0**” that means the device with ID “**0**” will be upgraded.

- 4. For **1: Matrix Device** will allow you to select target device based on ID 0 to 31 for upgrading firmware.

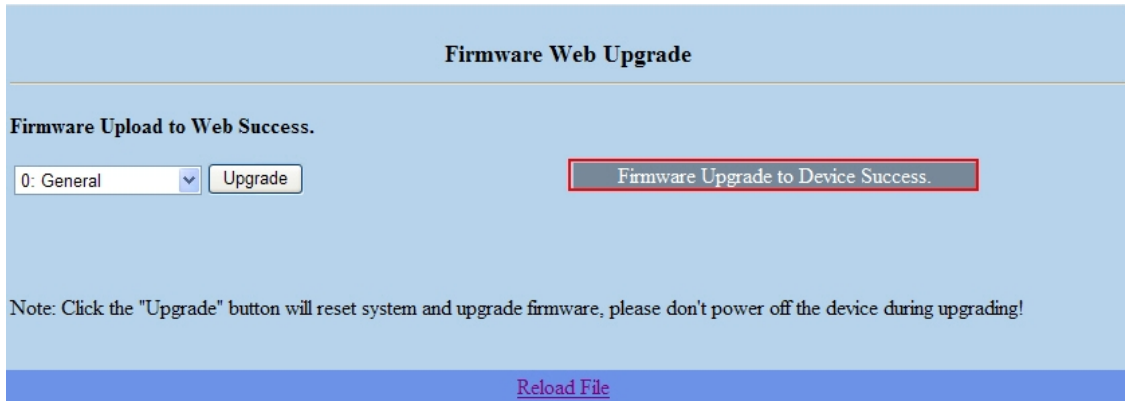


- 5. Select “**2: Matrix I/O Module**” will allow you to upgrade I/O modules. You have to decide which device you want to configure, and then select the suitable Device ID and I/O Module from the drop-down menu. Click “**Update**” to upgrade.



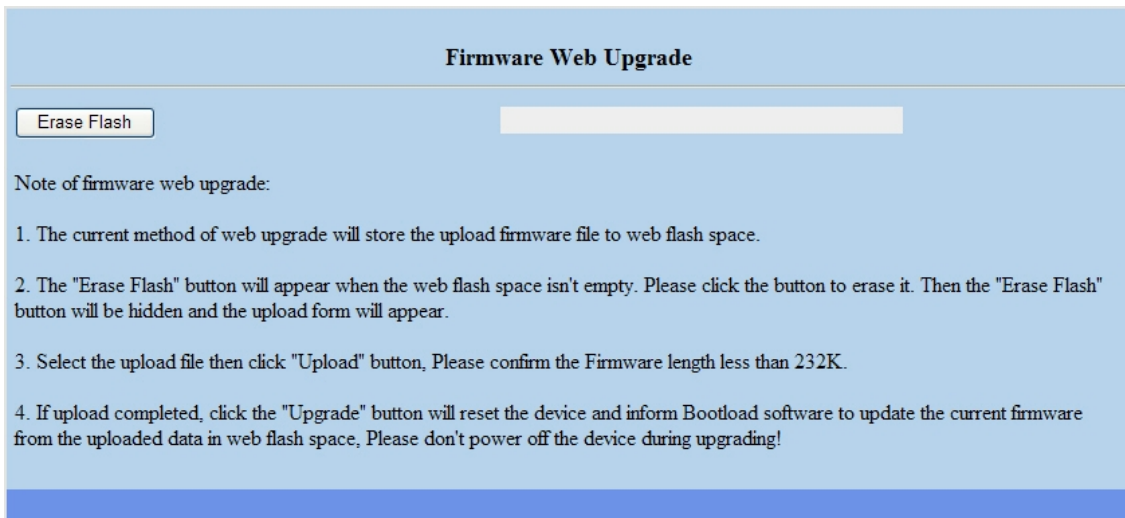
☞ The Matrix Switcher supports modules for upgrading; you have to upgrade each module individually.

6. After finishing firmware upgrade successfully, “**Firmware Upgrade to Device Success**” information will appear as below.



Besides, the firmware upgrade will not stop even though the web connection is fail suddenly. Please check with the LCD screen to confirm the firmware upgrade has been finished successfully or wait at least 2 minutes then power off to restart your PC.

7. If there is a firmware already existed on the web server during firmware upgrade. The “**Erase Flash**” information window will appear to notice you to remove the existed firmware before upgrading the new one.



APPENDIX E RS-232 COMMUNICATION PROTOCOL

This AV Matrix RS-232 communication protocol uses fixed length with 5 bytes of information as define below. The default baud rate is 9600 bps, no parity, 8 data bit and 1 stop bit. Command timeout is 300 milliseconds, and byte to byte timeout is 30 ms.

Use the RS-232 connecting cable to connect the computer serial port to the RS-232 communication port of the Matrix Switcher. The computer can control the Matrix Switcher via RS-232. Aside from using the front panel keys for operation, you are also permitted to use the RS-232 connection port for remote operation.

E-1 Host Request

A standard command is 5 bytes:

Device + Request + Index + Value + CRC

Byte 1: Device Byte (DB)

Byte 2: Request Byte (RB)

Byte 3: Index Byte (IB)

Byte 4: Value Byte (VB)

Byte 5: CRC Byte (CB)

☞ Host must send CRC code to follow the last byte.

E-1.1 Device Byte

Name	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
DB	BT	0	1	Device ID (0 - 31)				

BT: Broadcast Command Flag.

0 - Instruction for Device ID only

1 - Instruction for all devices. (Device ID must be written 0)

☞ Devices will not response, when receiving the broadcast command.

0: Reserve, Always 0.

1: Identifier, Always 1.

Device ID: Device id ranges from 0 to 31. (Please refer to device's user manual)

E-1.2 Request Byte

Request Byte (RB)

Name	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
RB	0	0	Request Type (0 - 63)					

Request Type: Please refer to "Table - Host Request List".

0: Reserve, Always 0.

Table - Host Request List

Request	Description	Index	Value	ACK	Note
0x00	Dummy call	-	-	A	1, 2
Route Tools					
0x01	Route Video Output Channel	Output	Input	A	2
0x02	Route Audio Output Channel	Output	Input	A	2
0x03	Store Video Status	Setting	Memory	A	2, 3
0x04	Store Audio Status	Setting	Memory	A	2, 3
0x05	Recall Video Status	Setting	Memory	A	2
0x06	Recall Audio Status	Setting	Memory	A	2
0x07	Request Video Output Channel	Output	Memory	B	
0x08	Request Audio Output Channel	Output	Memory	B	
Plug Detect					
0x09	Request Video Input Plug Status	Input	0	B	
0x0A	Request Audio Input Plug Status	Input	0	B	
0x0B	Request Video Output Plug Status	Output	0	B	
0x0C	Request Audio Output Plug Status	Output	0	B	
Audio Control					
0x10	Control Audio Output Mute	Output	Enable	A	2
0x11	Request Audio Output Mute Status	Output	Memory	B	
0x12	Control Audio Output Volume	Output	Level	A	2
0x13	Request Audio Output Volume	Output	Memory	B	
0x14	Control Audio Output Bass	Output	Level	A	2
0x15	Request Audio Output Bass	Output	Memory	B	

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0x16	Control Audio Output Treble	Output	Level	A	2
0x17	Request Audio Output Treble	Output	Memory	B	
0x18	Control Audio Output Subwoofer	Output	Level	A	2
0x19	Request Audio Output Subwoofer	Output	Memory	B	
0x1C	Control Audio Output Delay Low	Output	Delay1	A	2
0X1D	Request Audio Output Delay Low	Output	Memory	B	
0X1E	Control Audio Output Delay High	Output	Delay2	A	2
0X1F	Request Audio Output Delay High	Output	Memory	B	
Video Control					
0x20	Select Input EDID Type	0	EDID	A	2
0x21	Request Input EDID Type	1	0	B	
0x24	Select Screen Aspect Ratio	0	Screen Aspect Ratio	A	2
0x25	Request Screen Aspect Ratio	1	0	B	
0x26	Select Video Output Resolution	0	Video Output Resolution	A	
0x27	Request Video Output Resolution	1	0	B	
Device Information					
0x30	Request Protocol Version	0	0	C	1
0x31	Request Firmware Version	0	0	C	
0x3F	Request Device Information	0	0	D	1
0x3F	Request Extend Information	1	0	E	

Command Note:

1. All devices support the command.
2. Support broadcast commands.
3. Memory #0 is the current status, it can't be stored. Memory #1 – 8 is allowed to be stored.
4. Use 0x3F to confirm the device connected is properly and supported commands.

E-1.3 Index Byte

Index Byte (IB)

Name	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
IB	Index							

Index: Please refer to "Table - Host Request List" and "Table - Command Index List".

Table – Command Index List

Index	Description
Output	The output that will be selected. (Port 1 = 1, Port 2 = 2... Port n = n) 0: All outputs
Input	The input that will be selected. (Port 1 = 1, Port 2 = 2... Port n = n) 0: All inputs
Setting	The setting type that will be selected. 0: All Settings 1: Route Settings only 2: Video/Audio Settings only
-	Don't care

E-1.4 Value Byte

Value Byte (VB)

Name	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
VB	Value							

Value: Please refer to "Table - Host Request List" and "Table - Command Value List".

Table – Command Value List

Value	Description
Input	The input that will be connected. (Port 1 = 1, Port 2 = 2... Port n = n) 0: Disconnect
Memory	Select Memory Location 0 : Current Status (Can't be stored)
Enable	1: Enable Status (example: Mute, Plug) 0: Disable Status (example: Unmute, Unplug)
Level	Level Range (0 – 100) 0x81: Increase a step 0x82: Decrease a step
Delay	Audio delay time is 16-bit data. (Unit: 5 ms or 10 ms) Delay1 - The audio delay time low byte. (Bit0 – Bit7) Delay2 - The audio delay time high byte. (Bit8 – Bit15) The audio delay time unit decided by the DTUF flag of the extend information. The maximum Delay decided by the DTMAX flag of the extended information.
EDID	EDID Type 0: Fixed (Device default EDID) 1: Output 1 (Copy the EDID from the output 1)
-	Don't care

E-1.5 CRC Byte

CRC Byte (CB)

Name	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
CB	CRC (cyclic redundancy check)							

CRC: Host must send CRC code to follow the last byte.

Table – CRC Table

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	5E	BC	E2	61	3F	DD	83	C2	9C	7E	20	A3	FD	1F	41
10	9D	C3	21	7F	FC	A2	40	1E	5F	01	E3	BD	3E	60	82	DC
20	23	7D	9F	C1	42	1C	FE	A0	E1	BF	5D	03	80	DE	3C	62
30	BE	E0	02	5C	DF	81	63	3D	7C	22	C0	9E	1D	43	A1	FF
40	46	18	FA	A4	27	79	9B	C5	84	DA	38	66	E5	BB	59	07
50	DB	85	67	39	BA	E4	06	58	19	47	A5	FB	78	26	C4	9A
60	65	3B	D9	87	04	5A	B8	E6	A7	F9	1B	45	C6	98	7A	24
70	F8	A6	44	1A	99	C7	25	7B	3A	64	86	D8	5B	05	E7	B9
80	8C	D2	30	6E	ED	B3	51	0F	4E	10	F2	AC	2F	71	93	CD
90	11	4F	AD	F3	70	2E	CC	92	D3	8D	6F	31	B2	EC	0E	50
A0	AF	F1	13	4D	CE	90	72	2C	6D	33	D1	8F	0C	52	B0	EE
B0	32	6C	8E	D0	53	0D	EF	B1	F0	AE	4C	12	91	CF	2D	73
C0	CA	94	76	28	AB	F5	17	49	08	56	B4	EA	69	37	D5	8B
D0	57	09	EB	B5	36	68	8A	D4	95	CB	29	77	F4	AA	48	16
E0	E9	B7	55	0B	88	D6	34	6A	2B	75	97	C9	4A	14	F6	A8
F0	74	2A	C8	96	15	4B	A9	F7	B6	E8	0A	54	D7	89	6B	35

Example: Route output 6 to the input 3.

Byte 1 (DB) is 0x20 – Device: Identifier + Device ID = 0x20 + 0 = 0x20

Byte 2 (RB) is 0x01 – Request: Route Video Output Channel = 0x01

Byte 3 (IB) is 0x06 – Index: Output 6 = 6

Byte 4 (VB) is 0x03 – Value: Input 3 = 3

Byte 5 (CB) is 0x93 – CRC code from Byte 1 to Byte 4. (CRC4)

CRC Calculation

CRC 0 = 0 (initial value)

CRC 1 = CRC_ TABLE [CRC 0 ^ **Byte 1**] = CRC_ TABLE [0x00 ^ 0x20] = 0x23

CRC 2 = CRC_ TABLE [CRC 1 ^ **Byte 2**] = CRC_ TABLE [0x23 ^ 0x01] = 0x9F

CRC 3 = CRC_ TABLE [CRC 2 ^ **Byte 3**] = CRC_ TABLE [0x9F ^ 0x06] = 0x8D

CRC 4 = CRC_ TABLE [CRC 3 ^ **Byte 4**] = CRC_ TABLE [0x8D ^ 0x03] = 0x93

E-2 Device ACK Packet

When the device receives supported commands comes from the host, and then will response with following ACK:

Table – ACK Type List

Ack Type	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	...	Last Byte
Type A	AB							CB
Type B	AB	LB	Index 1	Value 1	Index 2	Value 2	...	CB
Type C	AB	LB	Data 1	Data 2				CB
Type D	AB	LB	INF	OP	IP	Name 1	...	CB
Type E	AB	LB	EXINF	VEINF	AEINF	PLUG	...	CB

E-2.1 ACK Type A

ACK Byte + CRC Byte (Total 2 Bytes)

Name	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
AB	ACC	0	0	Device ID (0 – 31)				
CB	CRC							

ACC: The devices acknowledge status. Accept or Reject.

1: device accepts this request. (ACK; acknowledge)

0: device rejects this request. (NAK; negative acknowledge)

☞ The device sends the Nak packet is always 2 bytes. (NAK + CRC)

0: Reserve, Always 0.

1: Identifier, Always 1.

Device ID: Device id ranges from 0 to 31. (Please refer to device’s user manual)

CRC: Device always sends the CRC code to follow the last byte.

E-2.2 ACK Type B

ACK Byte + LB + Index1 + Value1 + Index2 + Value2 +.....+ CRC Byte

Name	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
AB	ACC	0	0	Device ID (0 – 31)				
LB	Length for the total data bytes (Index + Value)							
IB n	Index							
VB n	Value							
...	...							
CB	CRC							

AB & CB: These are the same as the ACK Type A.

LB: LB value is equal to the total data bytes (Index + Value), not include the CRC byte.

The maximum LB value of the ACK Type B is twice the total number of output or input.

IB: Often means that the input or output port number. (Port 1 = 1, Port 2 = 2... Port n = n)

VB: Response the status refers to the table.

Request	Description	Index	Value
0x07	Request Video Output Channel	Output	Input
0x08	Request Audio Output Channel		
0x09	Request Video Input Plug Status	Input	Enable 1: Plug 0: Unplug
0x0A	Request Audio Input Plug Status		
0x0B	Request Video Output Plug Status	Output	
0x0C	Request Audio Output Plug Status		
0x11	Request Audio Output Mute Status	Output	0: Unmute, 1: Mute
0x13	Request Audio Output Volume		Level Range (0 – 100)
0x15	Request Audio Output Bass		
0x17	Request Audio Output Treble		
0x19	Request Audio Output Subwoofer		Delay1
0x1D	Request Audio Output Delay Low		
0x1F	Request Audio Output Delay High		Delay2
0x21	Request Input EDID Type	Input	EDID Type

Please refer to “Table – Command Index List” and “Table – Command Value List”.

E-2.3 ACK Type C

ACK Byte + LB + Data 1 + Data 2 + CRC Byte (Total 5 Bytes)

Name	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
AB	ACC	0	0	Device ID (0 – 31)				
LB	Length for the total data bytes (This byte is always 2)							
DB 1	Data 1							
DB 2	Data 2							
CB	CRC							

AB & CB: These are the same as the ACK Type A.

LB: LB value is always 2 (Data 1 + Data 2). Not include the CRC byte.

DB: Data Bytes as define below.

Request	Description	Data 1		Data 2
0x30	Request Protocol Version	VER1		VER2
0x31	Request Firmware Version	VERA	VERB	VERC

Version Type A:

RS-232 Protocol Version contains the VER1 and VER2 (ex: VER1.VER2)

VER1: Data 1, Bit 7 - Bit 0 (Range 0 - 99)

VER2: Data 2, Bit 7 - Bit 0 (Range 0 - 99)

If the Data 1 is 0x01 and Data 2 is 0x07; VER1 = 1 and VER2 = 7; RS-232 protocol version is v1.07

If the Data 1 = 0x23 and Data 2 = 0x45; VER1 = 0x23 = 35 and VER2 = 0x45 = 69; RS-232 protocol version is v35.69

Version Type B:

Firmware Version contains the VERA, VERB and VERC (ex: VERA.VERB.VERC)

VERA: Data 1, Bit 7 - Bit 4 (Range 0 - 9)

VERB: Data 1, Bit 3 - Bit 0 (Range 0 - 9)

VERC: Data 2, Bit 7 - Bit 0 (Range 0 - 99)

If the Data 1 is 0x10 and Data 2 is 0x07; VERA = 1, VERB = 0 and VERC = 7; Firmware version is v1.0.07

If the Data 1 = 0x23 and Data 2 = 0x45; VERA = 2, VERB = 3 and VERC = 69; Firmware version is v2.3.69

E-2.4 ACK Type D

ACK Byte + LB + INF + OP + IP + Name 1 + Name 2 + Name 3 +.....+ CRC Byte

Name	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
AB	ACC	0	0	Device ID (0 - 31)				
LB	Length for the total data bytes (INFO +.....+ Name n)							
INFO	Audio	Video	Extend	0	Total Memory Location (0 - 15)			
OP	Total Output Port							
IP	Total Input Port							
NB 1	Device Name (ASCII code)							
...	...							
NB n	Device Name (ASCII code)							
CB	CRC							

AB & CB: These are the same as the ACK Type A.

LB: LB value is the total length of the data bytes, not include the AB, LB and CB.

The maximum LB value of the ACK Type D is 19.

INFO: Device information

Bit 7: 1 - Support Audio route tools request. (Request 0x02, 0x04, 0x06 and 0x08)
0 - Not support Audio route tools request.

Bit 6: 1 - Support Video route tools request. (Request 0x01, 0x03, 0x05 and 0x07)
0 - Not support Video route tools request.

Bit 5: 1 - Extended information exists. (Request 0x3F [0x01])
0 - Extended information does not exist.

Bit 4: Reserve, always 0.

Bit 3~0: Total Memory location ranges from 0 to 15.

☞ Request [Index], if 0x3F [0x01] → Request = 0x3F and Index = 0x01

OP: The total number of output.

IP: The total number of input.

NB: Device Name (ASCII code). (The maximum length is 16)

E-2.5 ACK Type E

ACK Byte + LB + EXTI + VIDT + AUDI + PLUG +.....+ CRC Byte

Name	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
AB	ACC	0	0	Device ID (0 - 31)				
LB	Length for the total data bytes (EXINF +.....+ DTMAX)							
EXINF	LBMAX		0	0	0	0	0	FWVER
VEINF	EDID	0	0	0	0	0	0	0
AEINF	DTUF	DELAY	0	0	SW	TRE	BASS	VOL
PLUG	0	0	0	0	AOPD	VOPD	AIPD	VIPD
DTMAX	Delay Time Maximum (unit: 100 ms)							
CB	CRC							

AB & CB: These are the same as the ACK Type A.

LB: LB value is the total length of the data bytes, not include the AB, LB and CB.

EXINF: Device extended information

LBMAX - defines the maximum LB value of the variable length command

- 0 - The maximum LB is 64 Bytes (default)
- 1 - The maximum LB is 128 Bytes
- 2 - The maximum LB is 254 Bytes (255 is reserved)
- 3 - Reserved

The LB value of the Ack packet is not limited by LBMAX.

If the extended information does not exist, the default maximum length is 128.

FWVER - Firmware version command flag. (Request 0x31)

- 1 - Support Firmware version command.
- 0 - Not support Firmware version command.

VEINF: Video Extend Information

EDID - Input EDID type select command flag. (Request 0x20 and 0x21)

- 1 - Support Input EDID type select command.
- 0 - Not support Input EDID type select command.

AEINF: Audio Extend Information

VOL - Volume and Mute command flag. (Request from 0x10 to 0x13)

- 1 - Support Volume and Mute command.
- 0 - Not support Volume command.

BASS - Bass command flag. (Request 0x14 and 0x15)

- 1 - Support Bass command.
- 0 - Not support Bass command.

TRE - Treble command flag. (Request 0x16 and 0x17)

1 - Support Treble command.

0 - Not support Treble command.

SW - Subwoofer command flag. (Request 0x18 and 0x19)

1 - Support Subwoofer command.

0 - Not support Subwoofer command.

DELAY – Audio delay command flag. (Request from 0x1C to 0x1F)

1 - Support audio delay command.

0 - Not support audio delay command.

DTUF - defines the audio delay time scale units.

1 - Audio delay time scale unit is 10ms

0 - Audio delay time scale unit is 5ms (default)

☞ If the AEINF is not equal to 0, the device support Request 0x04[0x02] and 0x06[0x02].

PLUG: Plug Detect Support Information.

VIPD - Video input plug detection command flag. (Request 0x09)

1 - Support Video input plug detection.

0 - Not support Video input plug detection.

AIPD - Audio input plug detection command flag. (Request 0x0A)

1 - Support Audio input plug detection.

0 - Not support Audio input plug detection.

VOPD - Video output plug detection command flag. (Request 0x0B)

1 - Support Video output plug detection.

0 - Not support Video output plug detection.

AOPD - Audio output plug detection command flag. (Request 0x0C)

1 - Support Audio output plug detection.

0 - Not support Audio output plug detection.

Others - Bit 7~4 are reserve, always 0

DTMAX: defines audio maximum delay time. (Unit: 100 ms)