



User Manual



Distribution Amplifier

1x8 / 1x16

HDMI-E8 / HDMI-E16

V.2012HDMI-E8E16.00

Copyright and Trademarks:

All rights reserved by C&C TECHNIC TAIWAN CO., LTD. No part of this document may be reproduced in any form or by any means without written permission from the product manufacturer. Changes are periodically made to the information in this document. They will be incorporated in subsequent editions. The product manufacturer may make improvements and /or changes in the product described in this document at any time.

All the registered trademarks referred to this manual are belonging to their respective companies.

Before You Begin

- Follow all instructions marked on the device during using.
- Do not attempt to maintain the device by yourself, any faults, please contact your vendor.
- Provide proper ventilation and air circulation and do not use near water.
- It is better to keep it in a dry environment.
- The system should be installed indoor only. Install either on a sturdy rack or desk in a well-ventilated place.
- 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.

Table of Contents

| | |
|--|----|
| 1. System Overview | 4 |
| 1.1 Introduction | 4 |
| 1.2 Packing | 5 |
| 1.3 Accessories (Optional) | 5 |
| 2. Features | 6 |
| 3. Specifications | 7 |
| 4. Device Installation..... | 8 |
| 5. Front/Rear Panels | 9 |
| 5.1 Front Panel | 9 |
| 5.2 Rear Panel | 10 |
| 6. Peripherals Connections | 12 |
| 6.1 Input/Output Connections | 13 |
| 6.1.1 Output LED | 14 |
| 6.1.2 Output Cable | 14 |
| 6.2 IR Pass-through Connection..... | 15 |
| 6.3 IR EXT Connection..... | 16 |
| 6.4 Power Connection | 16 |
| 6.5 Distribution Amplifier Remote Control | 17 |
| 6.6 Ports and Switchers | 18 |
| 6.6.1 RS-232..... | 18 |
| 6.6.2 RS-485..... | 20 |
| 6.6.3 LAN Port | 22 |
| 6.6.4 DIP Switcher 8 Pins | 23 |
| 6.6.5 DIP Switcher 2 Pins | 23 |
| 6.6.6 Device ID Settings | 24 |
| 7. Application Software..... | 26 |
| 7.1 Software Introduction..... | 26 |
| 7.1.1 Software Description..... | 26 |
| 7.1.2 Software Activation..... | 26 |
| 7.1.3 Connect Distribution Amplifier and PC | 27 |
| 7.2 Configuration | 27 |
| 7.2.1 Main Operation Interface | 29 |
| 7.2.2 Disconnect Function Key | 31 |
| 7.2.3 Audio Configuration Function (Not Support for DA)..... | 33 |
| 7.2.4 EDID Configuration Function (Not Support for DA)..... | 36 |
| 7.2.5 RS-232 Memory Function (Not Support for DA)..... | 37 |
| 7.2.6 Options Function | 38 |
| 7.2.7 Communication Protocol/Control Command Code | 38 |

| | |
|--|----|
| 7.3 LAN Web Configuration | 39 |
| 7.3.1 Audio Configuration (Not Support for DA) | 40 |
| 7.3.2 Video Configuration (Not Support for DA) | 41 |
| 7.3.3 Device Status Information | 41 |
| 7.3.4 Device Output View | 42 |
| 7.3.5 LAN Main Operation | 42 |
| 7.3.6 LAN Memory Function (Not Support for DA) | 43 |
| 7.3.7 LAN IP Function | 44 |
| 7.3.8 Other Application | 45 |
| 8. Troubleshooting | 46 |
| Appendix A Remote Controller (Optional) | 48 |
| Appendix B IR Mini-Controller (Optional) | 49 |
| Appendix C Firmware Upgrade | 50 |
| Appendix D RS-232 Communication Protocol | 53 |
| D-1 Host Request | 53 |
| D-1.1 Device Byte | 53 |
| D-1.2 Request Byte | 54 |
| D-1.3 Index Byte | 56 |
| D-1.4 Value Byte | 57 |
| D-1.5 CRC Byte | 58 |
| D-2 Device ACK Packet | 59 |
| D-2.1 ACK Type A | 59 |
| D-2.2 ACK Type B | 60 |
| D-2.3 ACK Type C | 61 |
| D-2.4 ACK Type D | 62 |
| D-2.5 ACK Type E | 63 |
| Appendix E HDMI Extender (HX-RW) | 65 |
| Features | 66 |
| Specifications | 66 |
| Installation | 66 |
| IR Receiver Cable Directions | 67 |
| IR Blaster Cable Directions | 67 |
| HDMI Output Connector | 67 |
| Wiring Information for Link Connector | 68 |
| Firmware Upgrade | 69 |

1. System Overview

1.1 Introduction

HDMI-E8/HDMI-E16 Distribution Amplifier (DA) is high performance HDMI output distribution equipment combining with video and audio. It is used for output distribution of multimedia signals. Through a HDMI source, you can transmit the same multimedia signals to separate output equipment, thereby minimizing signal attenuation and ensuring high definition, integrating high fidelity graphics and audio signal output. Through the extensible accessory devices, HDMI-E8/HDMI-E16 can transmit data or detect signal to over long distances about 100 meters with HDMI extender (HX-RW).

HDMI-E8/HDMI-E16 is used mainly in TV broadcasting projects, multimedia conference halls, and large display performances, TV teaching and command control centers. It boasts features of power interruption protection during power surge and synchronous and integrate audio/visual switching functions. HDMI-E8/HDMI-E16 supports a HDMI Type A for input and some RJ45 jacks for output connectors. Beside it also supports a RS-232 or LAN communication port enables convenient communication with remote control equipment to switch the multimedia output signals.









Figure 1-1 HDMI-E8




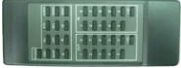




Figure 1-2 HDMI-E16

1.2 Packing

| | |
|---|---|
|  <p>Or</p>  | Distribution Amplifier (DA) * 1 (HDMI-E8 or HDMI-E16) |
|  | Power Cord * 1 |
|  | IR Receiver Cable * 1 |
|  | IR Blaster Cable * 1 |
|  | User Manual * 1 |

1.3 Accessories (Optional)

| | |
|---|-----------------------|
|  | HDMI Extender (HX-RW) |
|  | IR Receiver Cable |
|  | IR Blaster Cable |
|  | Remote Controller |
|  | IR Mini-Controller |
|  | AV Matrix Software CD |

2. Features

- Support 1 HDMI Jack for input and 8/16 RJ45 Jacks for output interfaces
- Mixed use a HDMI cable for input and Cat.5e cables for output connections
- Output supports HDBaseT as a long-distance transmission via a 100m Cat.5e cable
- HDCP Compliant
- Support resolution up to 4K x 2K@30Hz, 8-bit or 1080P@60Hz, 12-bit
- Support original 3D pass through
- Support High Definition Audio (Dolby TrueHD, Dolby Digital Plus and DTS-HD MA)
- IR pass-through supports all IN and OUT ports
- IR pass-through supports all kinds of IR frequency band
- IR pass-through supports Bi-directional transmission between IN and OUT ports
- Support IR remote control
- Support RS-232 control
- Support RS-485 serial control
- Support Ethernet control
- Internal universal power supply
- 2U rack for HDMI-E8 and 3U rack for HDMI-E16

3. Specifications

| Hardware | |
|------------------------|---|
| Input Connector | HDMI Type A x 1 |
| Output Connector | HDMI-E8: RJ45 x 8 HDMI-E16: RJ45 x 16 |
| RS-232 Connector | DB9 Female |
| LAN Connector | RJ45 |
| RS-485 Connector | 2 |
| 2 pins Dip Switcher | 1 |
| 8 pins Dip Switcher | 1 |
| Power | 100VAC~240VAC, 50/60Hz, internal |
| Housing | Black Aluminum |
| Mounting | Rack mountable (2U-rack-mount kits for HDMI-E8) (3U-rack-mount kits for HDMI-E16) |
| Weight | HDMI-E8: 4250g HDMI-E16: 7500g |
| Dimensions (LxWxH) | HDMI-E8: 332x482x87mm HDMI-E16: 336x482x130mm (Full rack wide without grips) |
| Multimedia | |
| Max. Resolution | 4K x 2K@30Hz, 8-bit |
| Highest TMDS Frequency | 300MHz |
| Control Information | |
| HDMI Cable Distance | 10 meter (At least) |
| Cat.5e Cable Distance | 100 meter (Max.) |
| Baud Rate | 9600 bps; 8 data bits, 1 stop bit, no parity |
| Ethernet Protocol | HTTP, DHCP, TCP/IP, ICMP (ping) |
| Program Control | Web Server, AV Matrix Application |
| Serial Control Port | RS-232: 9 Pin Female D Type Connector RS-485: 1X5 Pole Captive Screw |
| Remote Control | Remote Controller, IR Receiver, IR Blaster |
| Web Server | LAN, RJ45 |

4. Device Installation

The Distribution Amplifier (DA) has a black metallic housing. It can be placed on a sturdy desk directly or installed on a 2U (HDMI-E8) or 3U (HDMI-E16) 19in bracket. See below:



Figure 4-1 Mount the Device on a Standard Bracket with 2U Rack-mount (HDMI-E8)



Figure 4-2 Mount the Device on a Standard Bracket with 3U Rack-mount (HDMI-E16)

5. Front/Rear Panels

5.1 Front Panel



Figure 5-1 HDMI-E8 Front Panel



Figure 5-2 HDMI-E16 Front Panel

HDMI-E8/HDMI-E16 supports a power LED indicator on the Front Panel allowing you to detect power status.

5.2 Rear Panel



Figure 5-3 HDMI-E8 Rear Panel for 8 Output Jacks

HDMI-E8 supports 1 input jack (HDMI Type A) and up to 8 output jacks (RJ45) on the rear panel, each female terminals form the signal input/output jacks. The HDMI-E8 signal output terminal channels are numbered as OUT1~8 channels.



Figure 5-4 HDMI-E16 Rear Panel for 16 Output Jacks

The HDMI-E16 supports 1 input jack (HDMI Type A) and up to 16 output jacks (RJ45) on the rear panel, each female terminals form the signal input/output jacks. The HDMI-E16 signal output terminal channels are numbered as OUT1~16 channels. The input terminal channel supplies you to connect to different equipment including Blu-ray/DVD player, graphics workstation, and number display. The output jacks allow you to connect to extensible accessory devices for over long connections with terminals just like projectors, video recorders, displays, multiplexers 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 Switch:** To switch power ON or OFF the Distribution Amplifier (DA).
- **RS-232:** Use a 9-pin **RS-232** cable to connect both computer serial port (COM1 or COM2) and Distribution Amplifier (DA) **RS-232** communication port, refer to [6.6.1 RS-232](#). The computer then can be deployed to control the Distribution Amplifier (DA). Refer to [7.1 Software Introduction](#) for a software control or [Appendix D RS-232 Communication Protocol](#) for an individual configuration.
- **RS-485:** Connection ports allow you to connect/control more than one relative product (ex. Matrix, DA and so on), refer to [6.6.2 RS-485](#).

- **LAN Port:** Use the RJ45 connection cable to connect the Internet and the Distribution Amplifier (DA). The entire PCs at the same network can control the Distribution Amplifier (DA) through the LAN port. Refer to [6.6.3 LAN Port](#).
- **Switchers:** Distribution Amplifier (DA) supports 8 pins DIP and 2 pins DIP switchers for connected configurations. For more information, refer to [6.6 Ports and Switchers](#).
 - Pin 1~Pin5: ID
 - Pin 6: Master/Slave
 - Pin 7: RS-232/LAN
 - Pin 8: IP RESET
- **IR EXT:** This is used to connect the IR Receiver cable for the Distribution Amplifier (DA) Remote Controller. Refer to [6.3 IR EXT Connection](#).
- **INPUT:** Distribution Amplifier (DA) Input jack is connected to the Blu-ray player, DVD player, STB or other source device.

HDMI Type A: Pin Definitions:

| Pin # | Signal | Pin # | Signal |
|-------|-------------------|-------|------------------------|
| 1 | TMDS Data2+ | 11 | TMDS Clock Shield |
| 2 | TMDS Data2 Shield | 12 | TMDS Clock- |
| 3 | TMDS Data2- | 13 | CEC (NC on device) |
| 4 | TMDS Data1+ | 14 | Utility (NC on device) |
| 5 | TMDS Data1 Shield | 15 | DDC-SCL |
| 6 | TMDS Data1- | 16 | DDC-SDA |
| 7 | TMDS Data0+ | 17 | DDC-Ground |
| 8 | TMDS Data0 Shield | 18 | +5V Power |
| 9 | TMDS Data0- | 19 | Hot Plug Detect |
| 10 | TMDS Clock+ | | |

- **OUTPUT1~8 or 16:** Distribution Amplifier (DA) Output jacks are connected to extensible accessory devices (HX-RW) for HDTVs, projectors or other sink devices connections.

☞ OUTPUT1~8 or 16 RJ45 jacks are only used for HDMI Extender connections.

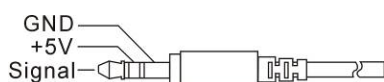
- **IR Tx Port:** Used to connect to the IR Blaster cable for IR pass-through.

IR Blaster Pin Definitions:



- **IR Rx Port:** Used to connect to the IR Receiver cable for IR pass-through.

IR Receiver Pin Definitions:



6. Peripherals Connections

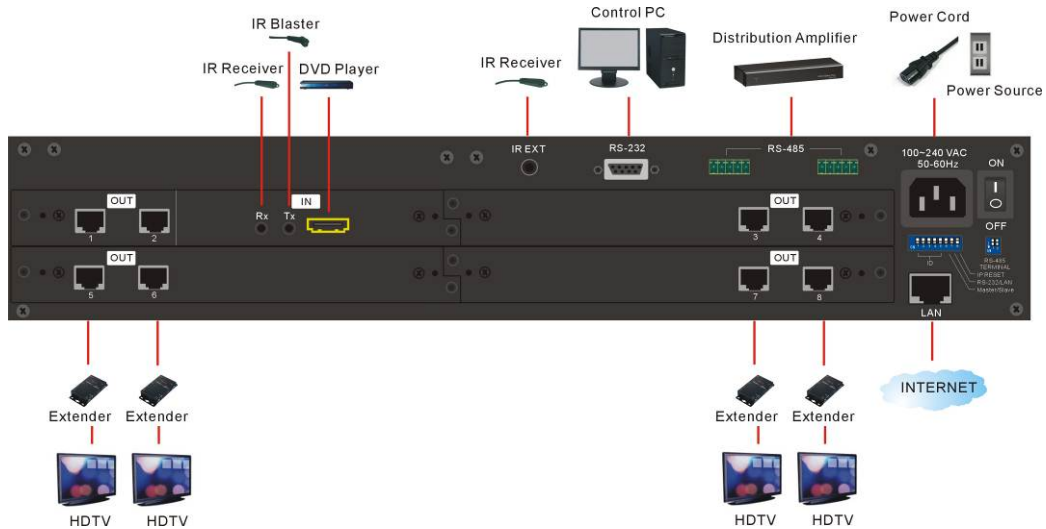


Figure 6-1 HDMI-E8 Connections

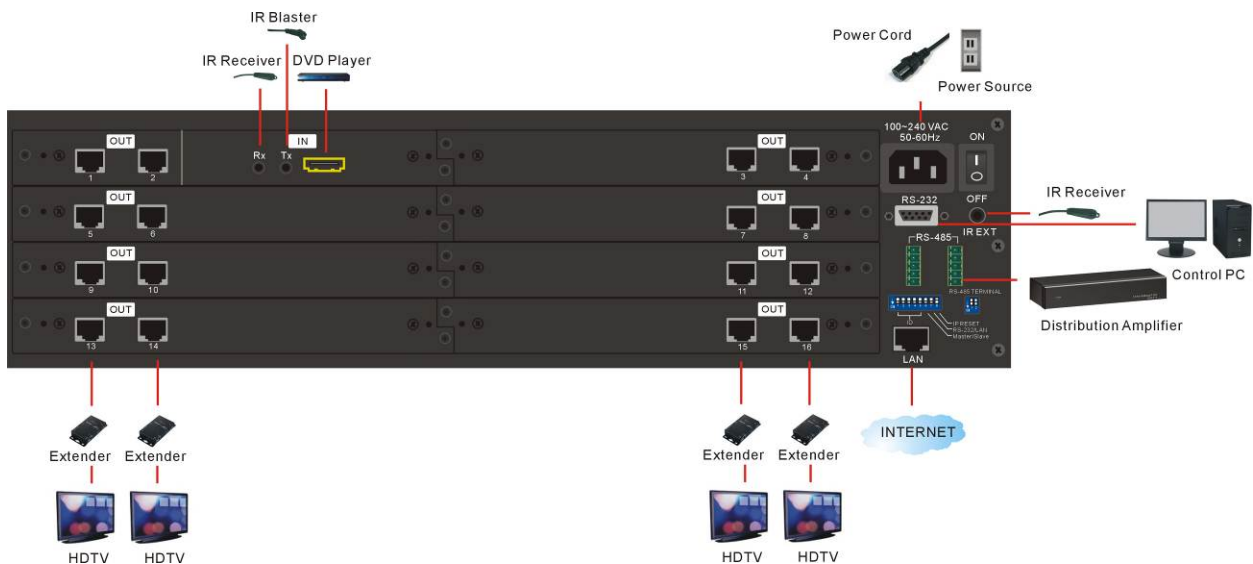


Figure 6-2 HDMI-E16 Connections

The HDMI-E8/HDMI-E16 supports up to 4/8 Output modules for reparation or upgrade. Each module can be configured individually based on module number.

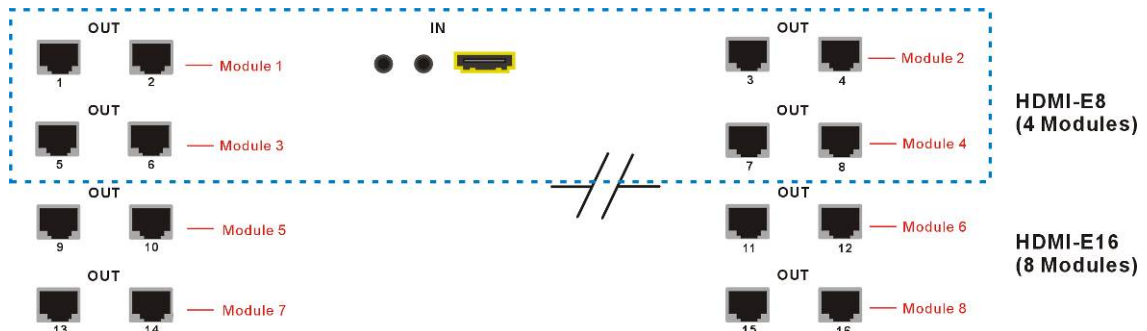


Figure 6-3 Modules Deployment

6.1 Input/Output Connections

Use the HDMI connecting cable to connect the Input jack to the HDMI jack of the Blu-ray, DVD player, graphics workstation or number display. Use the Cat.5e cable to connect the output RJ45 jack (No.1 ~ No. 8 or 16) to the RJ45 jack of HDMI Extenders (HX-RW). Through the HDMI extender (HX-RW), you can extend the connection of projector, video recorder, displayer or multiplexer to your Distribution Amplifier (DA).



Figure 6-4 Input Connection

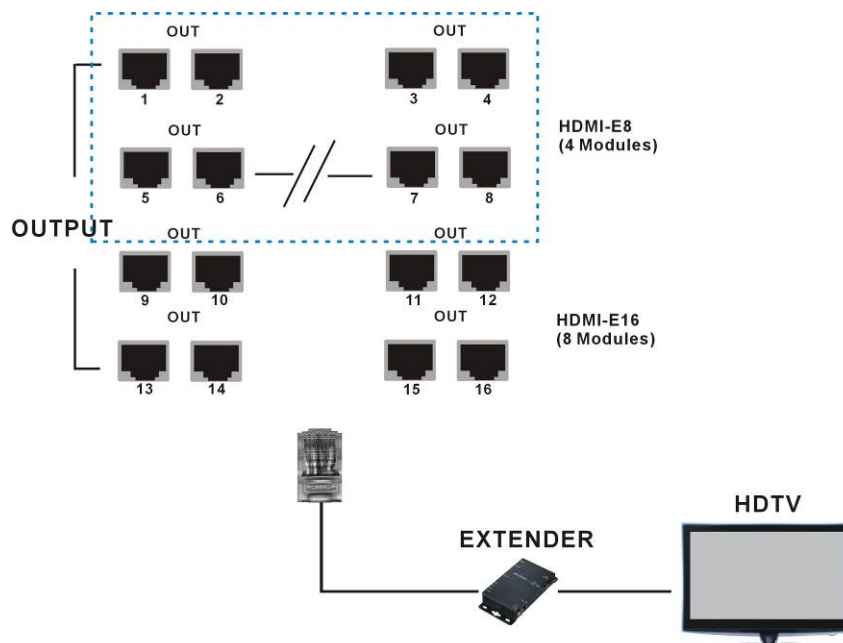


Figure 6-5 Output Connections

6.1.1 Output LED

This Distribution Amplifier (DA) supports HDBaseT output for a long distance signal transmission. Output connector is RJ45 jack with two LED indicators. The LED indicators show you the status of output transmission.



* The left of RJ45 output jack is specified for HDCP LED (Yellow).

* The right of RJ45 output jack is specified for LINK LED (Green).

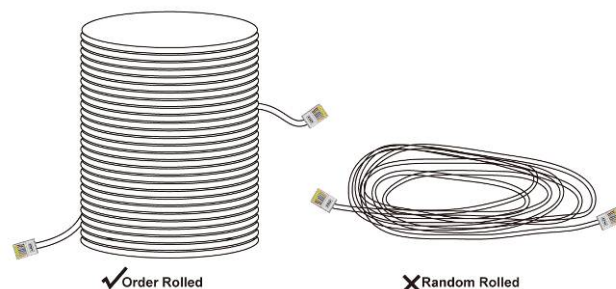
☞ The LED indicators are only designed for the Output – RJ45 jack of DA.

LED Indicators:

| LED | Off | Blink | On |
|--------------------------|-----------------|----------------|-----------------|
| LINK (Green) | No Link | Low Power Mode | HDBaseT Link |
| HDCP (Yellow) | No HDMI Signals | No Encryption | 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 70cm fixed diameter plastic drum has just a minor effect on the FEXT (Far End Cross Talk) when compared to a fully stretched cable.



6.2 IR Pass-through Connection

The Distribution Amplifier (DA) provides an IR Receiver cable and IR Blaster cable accessories for IR pass-through. IR Receiver cable can be connected to IR Rx port or IR EXT on the rear panel. On the other hand, IR Blaster cable can be connected to IR Tx port on the rear panel.

- Support you an IR channel to control the player from TV or control the TV from player.
- Support all kinds of IR frequency band
- IR pass-through switch is based on HDMI switched

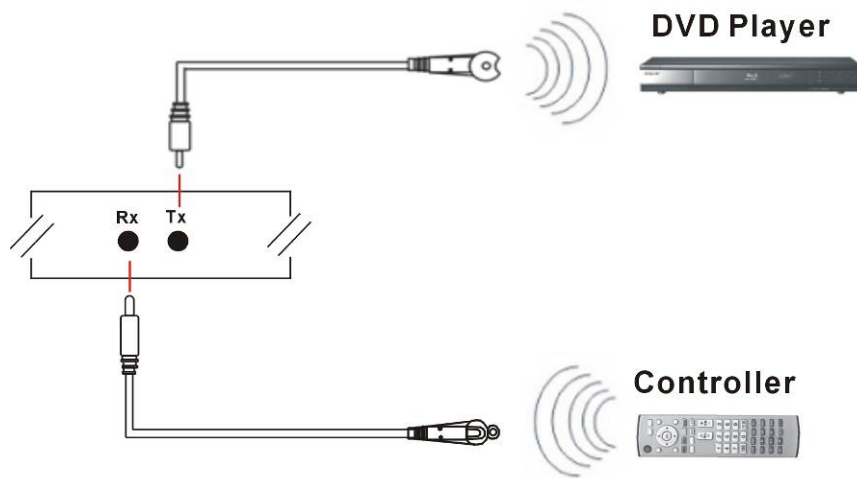


Figure 6-6 IR Extended Aiming – Multimedia

- ☞ The Output - IR Tx/Rx are designed on the HDMI Extender (HX-RW). IR OUT is specified for IR Tx, alternatively, IR1 IN and IR2 IN are specified for IR Rx. Refer to [Appendix E HDMI Extender \(HX-RW\)](#).

6.3 IR EXT Connection

The Distribution Amplifier (DA) provides a reserved IR EXT port for more convenient to Remote Controller. You can connect IR Receiver cable to the IR EXT port located on the rear panel for optional IR aiming position.

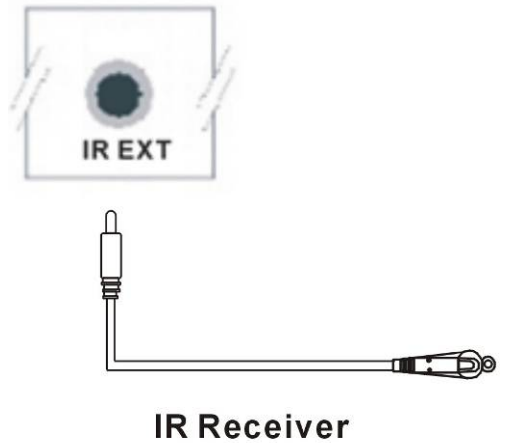


Figure 6-7 IR EXT Connection

☞ The IR EXT Connection is applied to Remote Controller.

6.4 Power Connection

Use the included power cord to connect from the power port on the rear panel of Distribution Amplifier (DA) to the outlet.

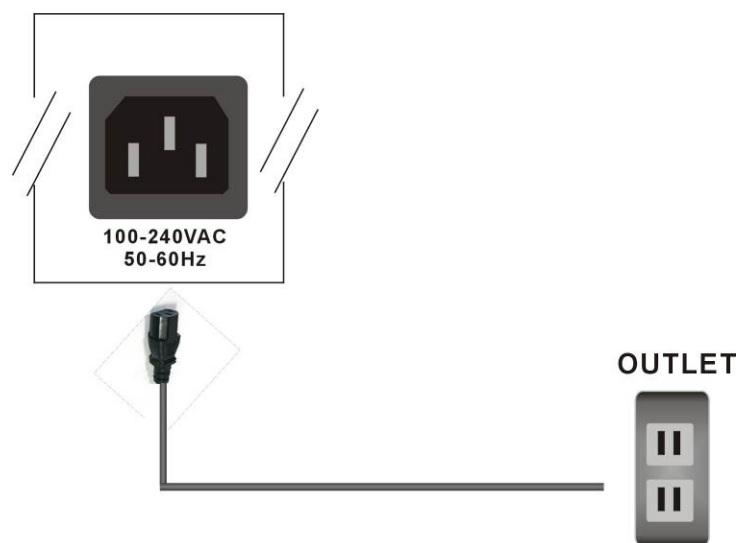


Figure 6-8 Power Connection

6.5 Distribution Amplifier 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 Distribution Amplifier (DA). The computer can then be used to control the Distribution Amplifier (DA).

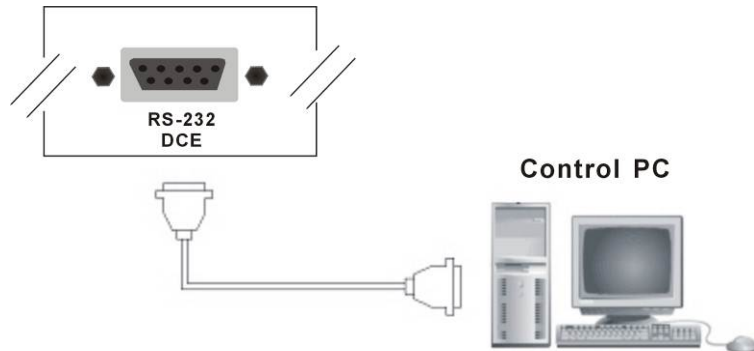


Figure 6-9 RS-232 and Control PC connection

Distribution Amplifier (DA) also supports a LAN port allows you to control all the series connection devices through PC Browser.

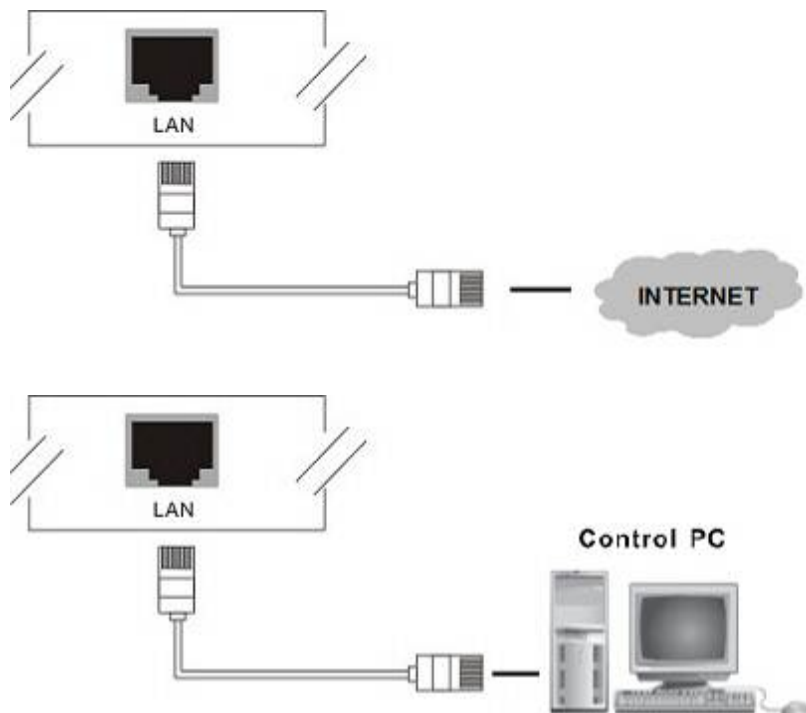


Figure 6-10 LAN port and Control PC Connection

☞ Distribution Amplifier (DA) supports RS-232 and RS-485 on the rear panel for a remote control.

6.6 Ports and Switchers

The Distribution Amplifier (DA) provides standard RS-232 and RS-485 serial communication ports. Use the RS-232 or RS-485 serial communication port to carry out remote operation.

6.6.1 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 |

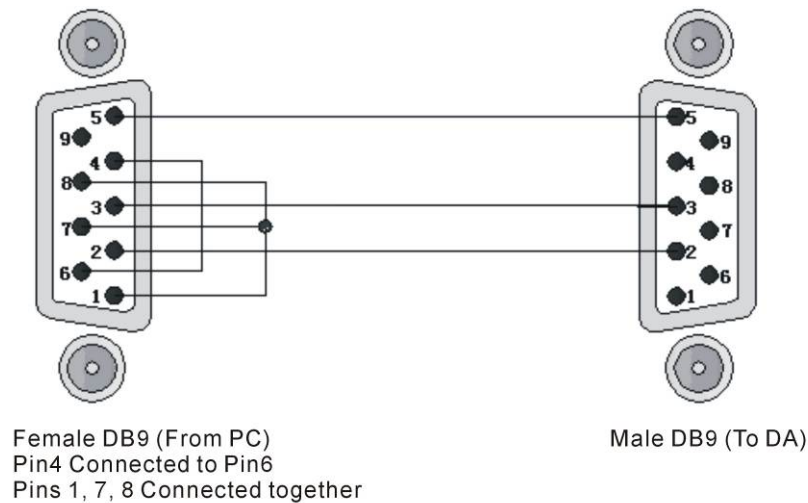


Figure 6-11 (a) RS-232 – From Female DB9 (PC) to Male DB9 (DA)

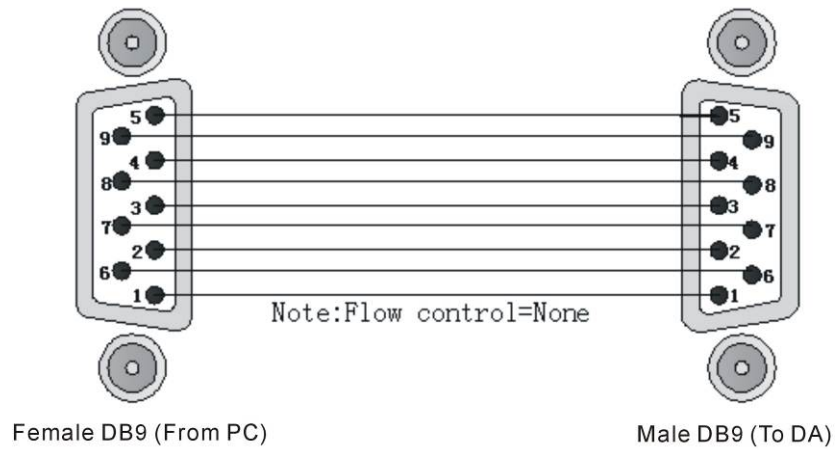


Figure 6-11 (b) RS-232 – From Female DB9 (PC) to Male DB9 (DA)

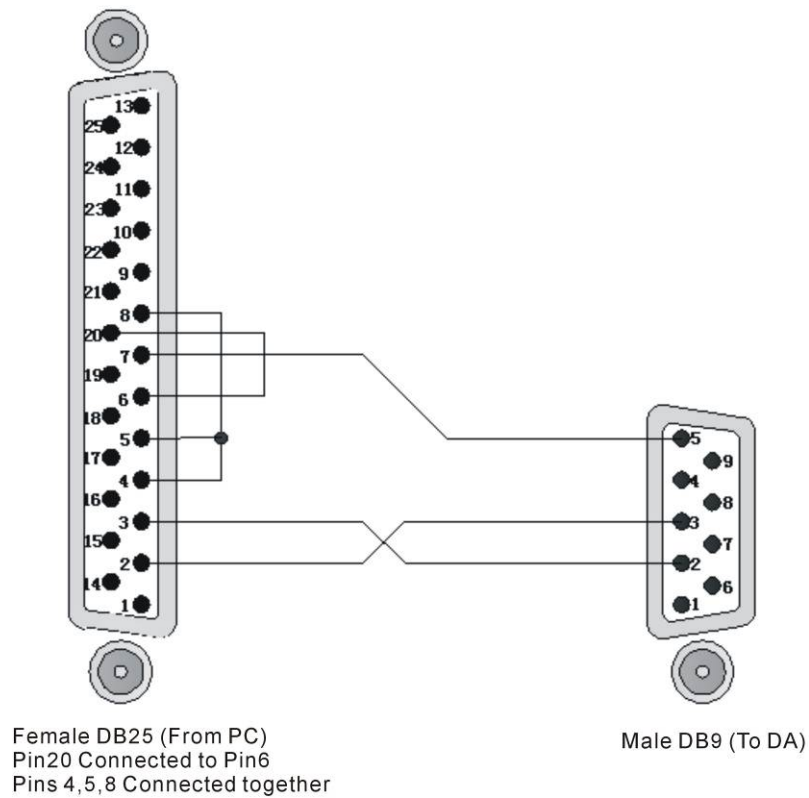


Figure 6-12 RS-232 – From Female DB25 (PC) to Male DB9 (DA)

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

6.6.2 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 Distribution Amplifier (DA) supports up to two RS-485 ports allows you to control more than one relative product (ex. Matrix, DA and so on). 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.

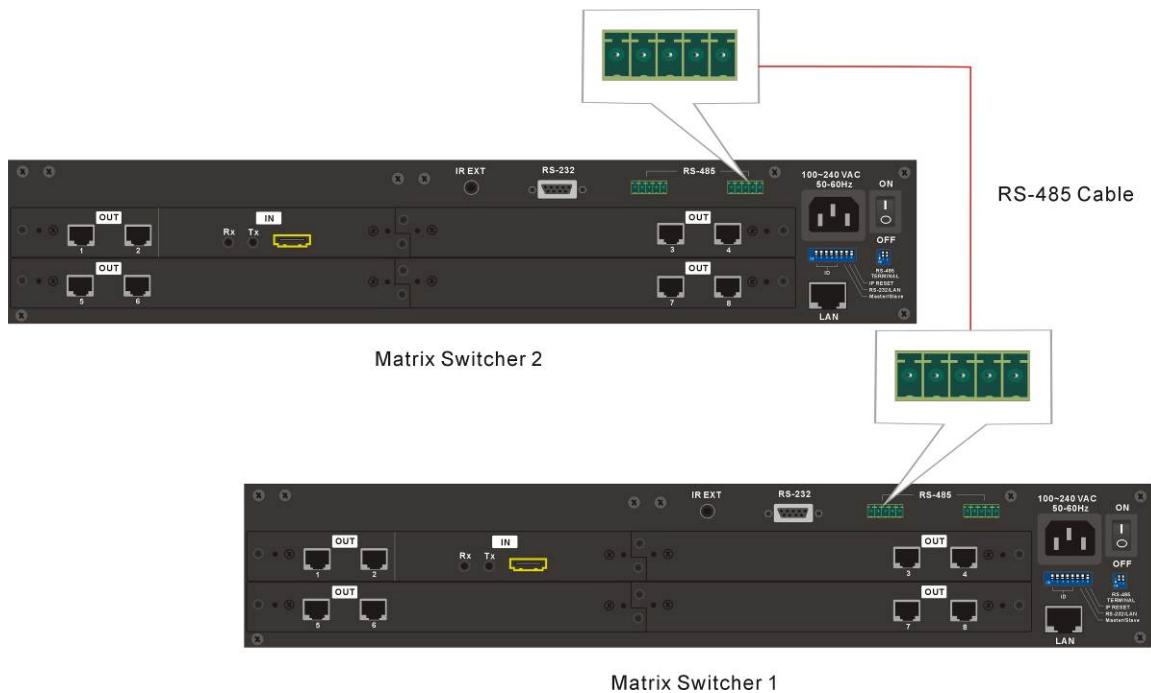


Figure 6-13 RS-485 Connection for HDMI-E8

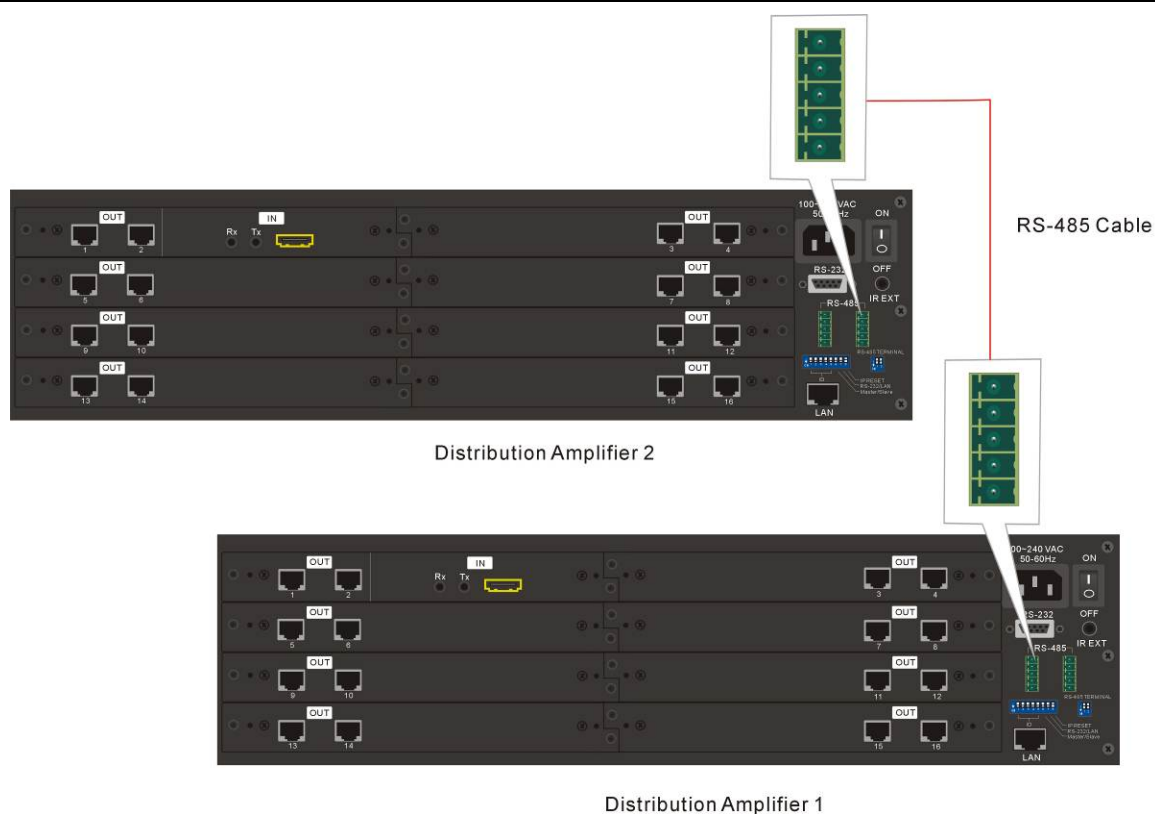


Figure 6-14 RS-485 Connection for HDMI-E16

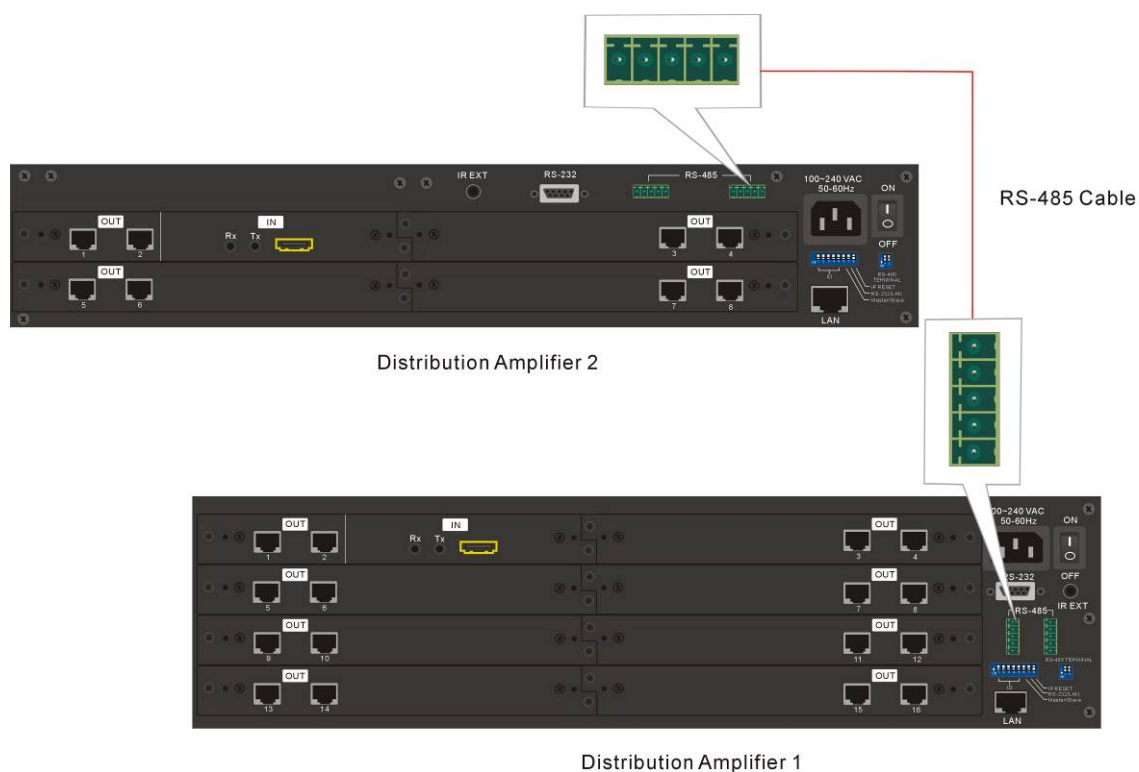


Figure 6-15 RS-485 Connection for HDMI-E8 and HDMI-E16

See Pin definitions as below:

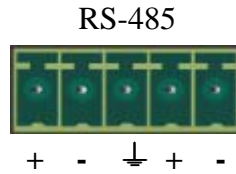


Figure 6-16 RS-485 Port

Serial connection between RS-485:

Pin1 TX (+) \longleftrightarrow TX (+) --- Transmitted Data +

Pin2 TX (-) \longleftrightarrow TX (-) --- Transmitted Data -

Pin3 Gnd \longleftrightarrow (Ground)

Pin4 RX (+) \longleftrightarrow RX (+) --- Received Data +

Pin5 RX (-) \longleftrightarrow RX (-) --- Received Data -

☞ RS-232 and RS-485 baud rates: 9600bps, no odd or even calibration address, 8bit data transmission address, 1bit stop address (96, N, 8, 1).

6.6.3 LAN Port

This Distribution Amplifier (DA) supports a network RJ45 registered jack 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.)

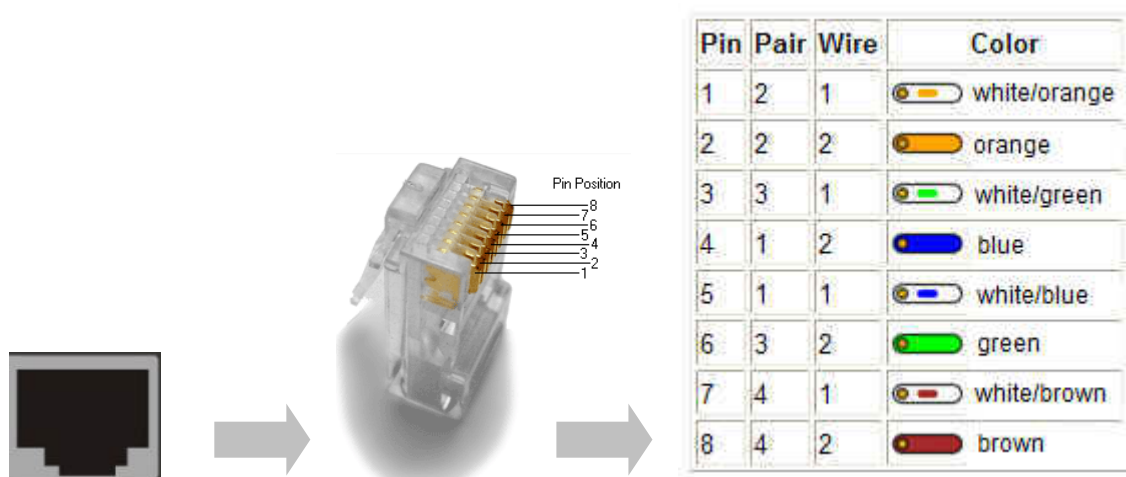


Figure 6-17 RJ45 Connector

6.6.4 DIP Switcher 8 Pins

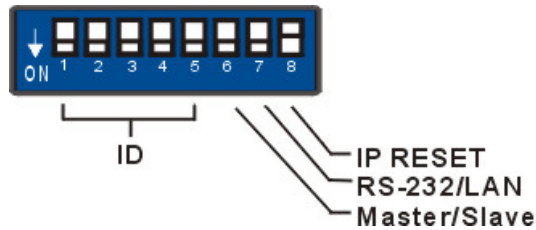


Figure 6-18 DIP Switcher

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 [6.6.6 Device ID Settings](#).

B. DIP Switcher Pin 6: Mater/Slave Enable/Disable. Only one device can be connected to the 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 Distribution Amplifier (DA).
2. After the Distribution Amplifier (DA) re-starts about 10 seconds, shut down it.
3. For a normal operation, please adjust the pin8 to **OFF**, then power on the Distribution Amplifier (DA) again. The IP address will be restored to the default value: **192.168.0.3**

6.6.5 DIP Switcher 2 Pins



Figure 6-19 RS-485 Terminal Switcher

DIP Switch RS-485 Terminator: RS-485 Terminator for ON/OFF

ON: RS-485 Terminator ON.

OFF: RS-485 Terminator OFF.

Proceed Multi devices connections, the RS-485 Terminator for the last device must be set to **ON**. Others must be set to **OFF**.

6.6.6 Device ID Settings

Device ID Settings

The Device ID determines the position of a DA device. When multiple devices are serially connected and connected to one PC, the Device ID decides which device 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:

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 |

Distribution Amplifier (DA)—User Manual

| | | | | | | | |
|----|----|-------|-----|-----|-----|-----|-----|
| 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 |

7. Application Software

7.1 Software Introduction

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

7.1.1 Software Description

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

- Window 98/2000/NT/XP/7/8 operating systems
(For Windows 7/8, please use AV Matrix 3.0.00 version at least)
- 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.

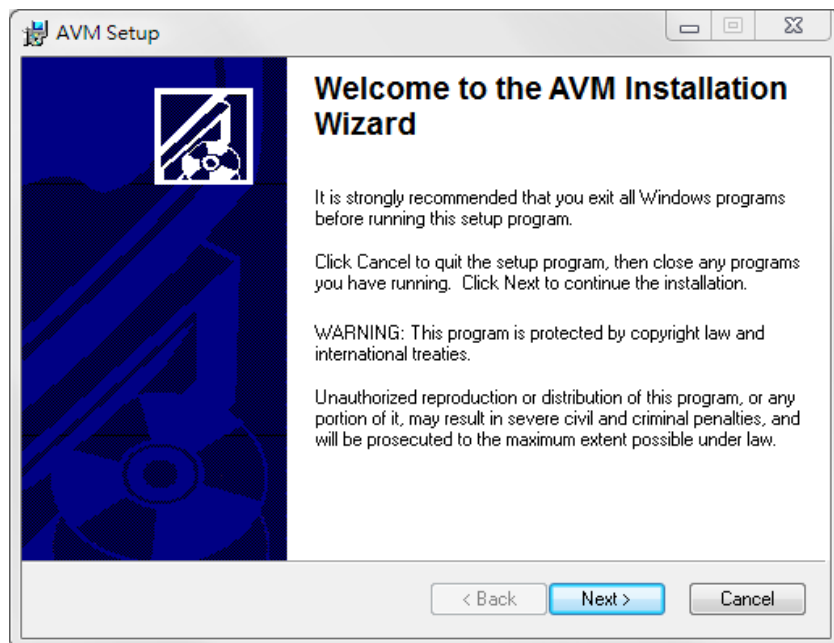



Figure 7-1 AV Matrix Installation Window

7.1.3 Connect Distribution Amplifier and PC

You must power off the Distribution Amplifier (DA). Then, connect the 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 [6.6.1 RS-232](#))

7.2 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”.

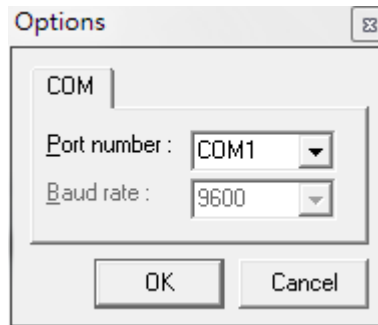


Figure 7-2 AV Matrix Options Window

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:

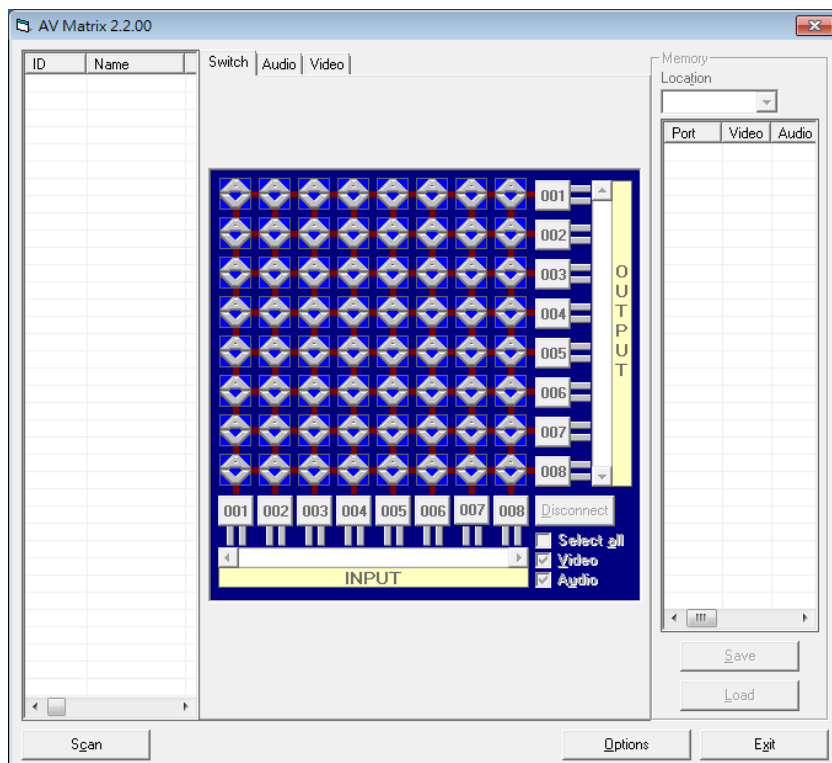


Figure 7-3 《AV Matrix》 Software Application Main Window

☞ 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, A/V, I/O (only for VO/AO reference), 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 Distribution Amplifier (DA).
- **Name:** The name of Distribution Amplifier (DA).
- **A/V:** Specify the character of audio or video. Or both of audio and video are supported will show “**Both**”. (For this Distribution Amplifier (DA) only supports video.)
- **I/O:** Ports quantities of Input and Output.
- **AI/VI Plug:** Enable to detect the status of all input ports for audio/video. (For this Distribution Amplifier (DA) only supports one input port.)
- **AO/VO Plug:** Enable to detect the status of all output ports for audio/video.
- **Version:** Show the version information of Distribution Amplifier (DA).

The functions as below are not supported for Distribution Amplifier (DA):



- **Memory:** Show the quantities of memory sets.
- **EDID Type:** **FIX** (fix mode) and **TV1** (access the first output channel) selection key.
 - **FIX mode:** The Matrix Switcher will supply a set of fixed **EDID** values to support up to only 1080P high performance TV.
 - **Output1 mode:** The Matrix Switcher 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.
- **Volume/Bass/Treble/Subwoofer:** Show the Volume/Bass/Treble/Subwoofer function is Enable or Disable.
- **Delay:** Show whether Enable or Disable the multimedia output delay time function.
- **Delay Unit:** Show the delay time of multimedia output. The unit for delay time is “**ms**”.
- **Max Delay:** Show the maximum permissive delay time. The unit for maximum delay time is “**ms**”.

7.2.1 Main Operation Interface

Refer to the main window as above, the marked blue area shows crossing matrix of output ports 001-008 (HDMI-E8) or 001-016 (HDMI-E16) and input port 001 used. 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 selecting Distribution Amplifier (DA) functions:

Example: Now there is a Distribution Amplifier (DA) having all the input/output ports properly connected to the equipment. If you want to set OUT2, 3 and 4 ports connect to IN1 port. Please follow the ways and steps to finish the switching functions:

- **First way:** Directly click on the corresponding icons on the Matrix  to transform them into  to complete the switching operation.
- **Second way:** Select the “**Output**” number keys 002, then select 003 and final select 004 to the right of the blue configuration area, and select the “**Input**” number key 001 to the bottom. Then, press consecutively the previously selected “**Output**” number keys 002, 003 and 004. This way, you have selected IN1 to OUT2, 3 and 4 configurations.

Upon completion of the above steps, you have actually completed the configurations of having IN1 to OUT2, 3 and 4 successfully.

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

- **Switch Tab:** Click “**Switch**” tab to show the main configuration window.
- **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. For more information, refer to [7.2.4 EDID Configuration Function](#).
- **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 output:** Click this button to select all output ports including output 001~008 (HDMI-E8) or 001-016 (HDMI-E16).
- **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.
- **Save:** Click this button to save the connected combinations both output ports and input ports into the memory set. (Only for Matrix Switcher Series.)
- **Load:** Click this button to retrieve the previously saved settings. (Only for Matrix Switcher Series.)

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 (a) below:

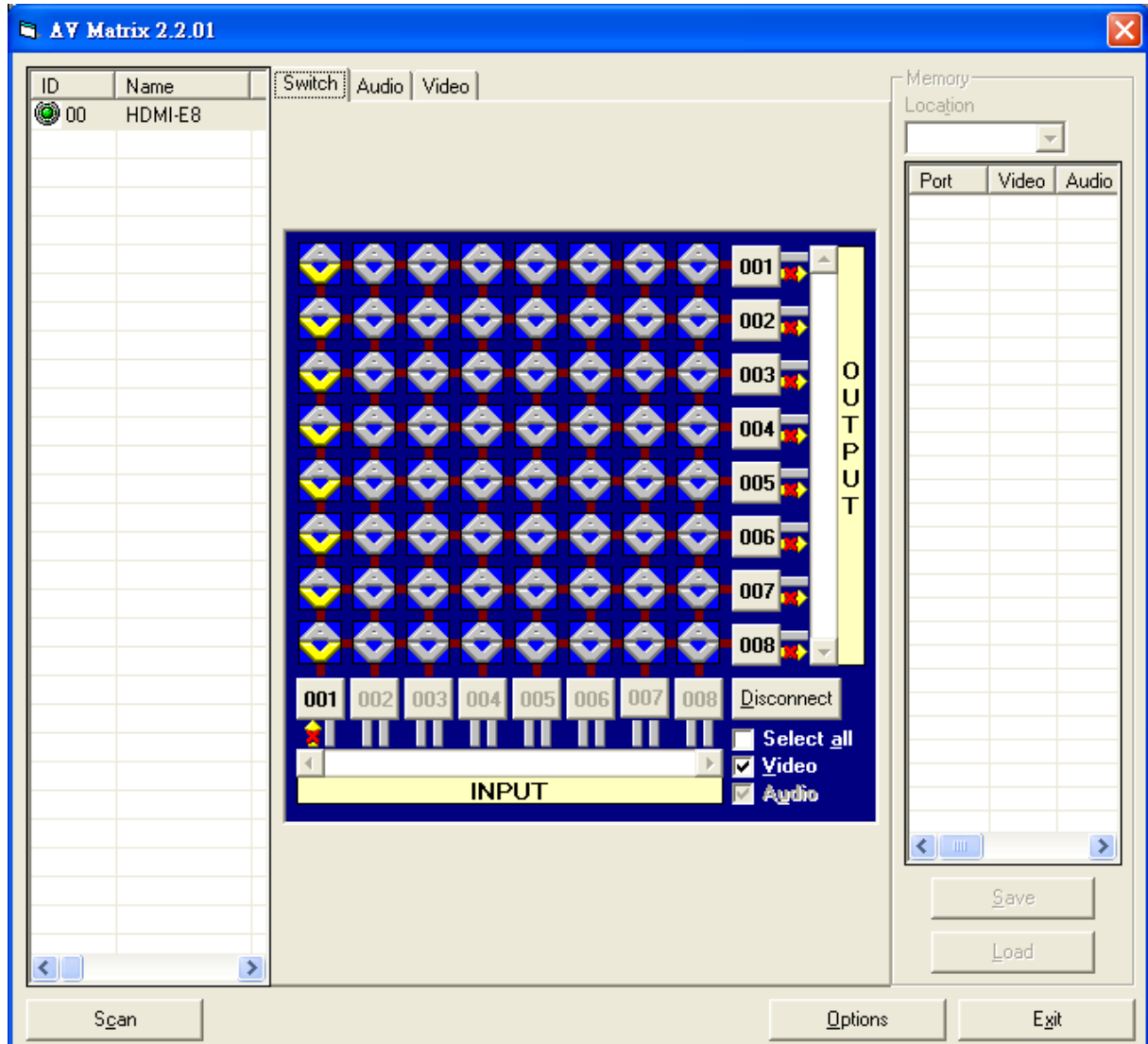


Figure 7-4 (a) Disconnect Function Key for HDMI-E8 Reference

Follow the steps as below to disable the output ports including port 003、002、and 001.

Step 1: First press down the output number keys 003, then 002 and final 001 to the right of the blue configuration area.

Step 2: Press the “Disconnect” key;

Step 3: Press the previously pressed output number keys 003, then 002 and final 001 to complete the operation.

The final results will be as shown in Figure 7-4 (b) below:

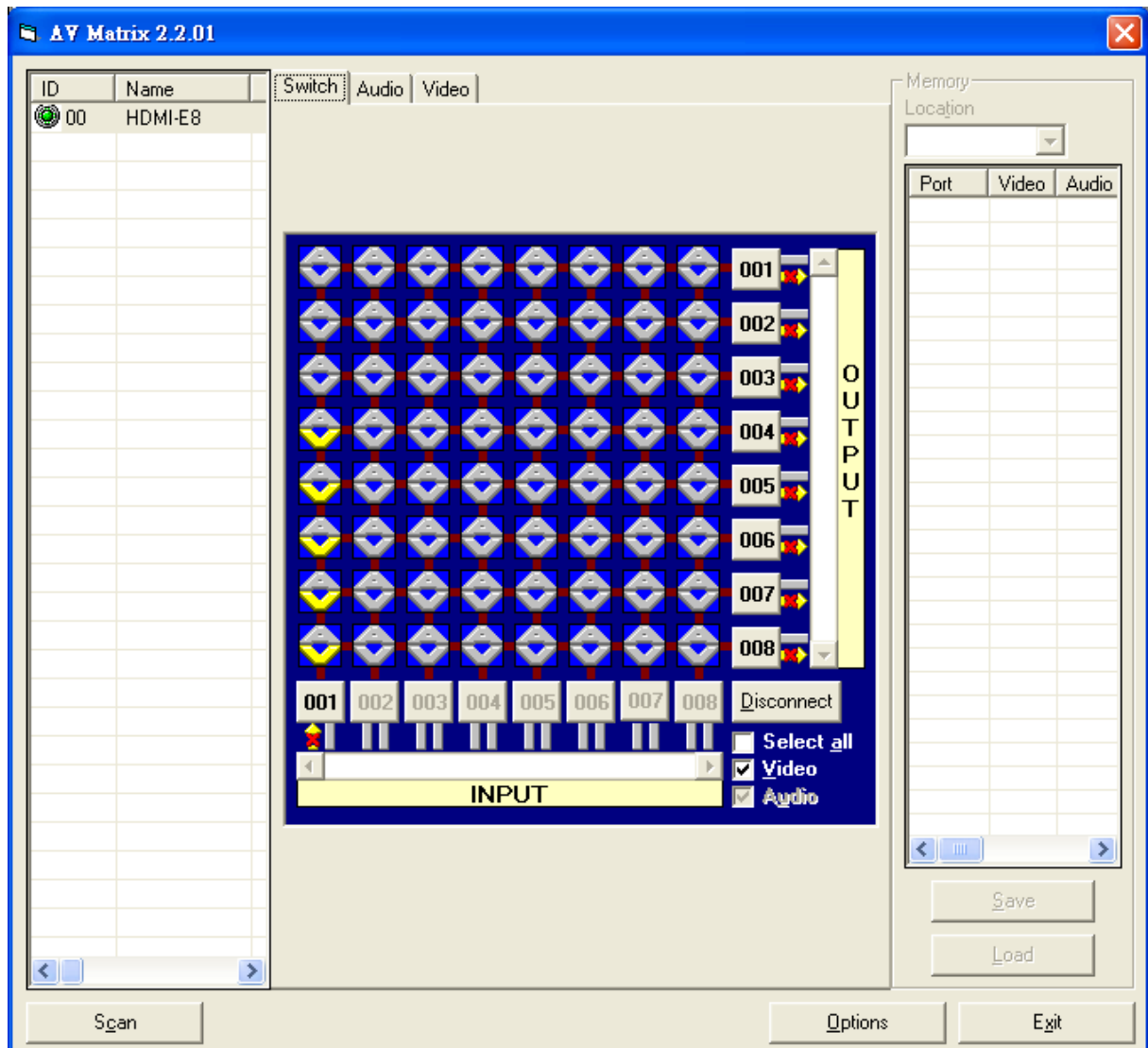


Figure 7-4 (b) Disconnect Function Key for HDMI-E8 Reference

7.2.3 Audio Configuration Function (Not Support for DA)

This function is only for Audio Advanced Matrix Switcher, click “**Audio**” tab to enter the audio configuration window. In the audio configuration window allows you to adjust **Volume**, **Bass**, **Treble**, **Subwoofer** and **Delay** by sliding the scrollbar. You can also enable/disable the “**Mute**” function here.

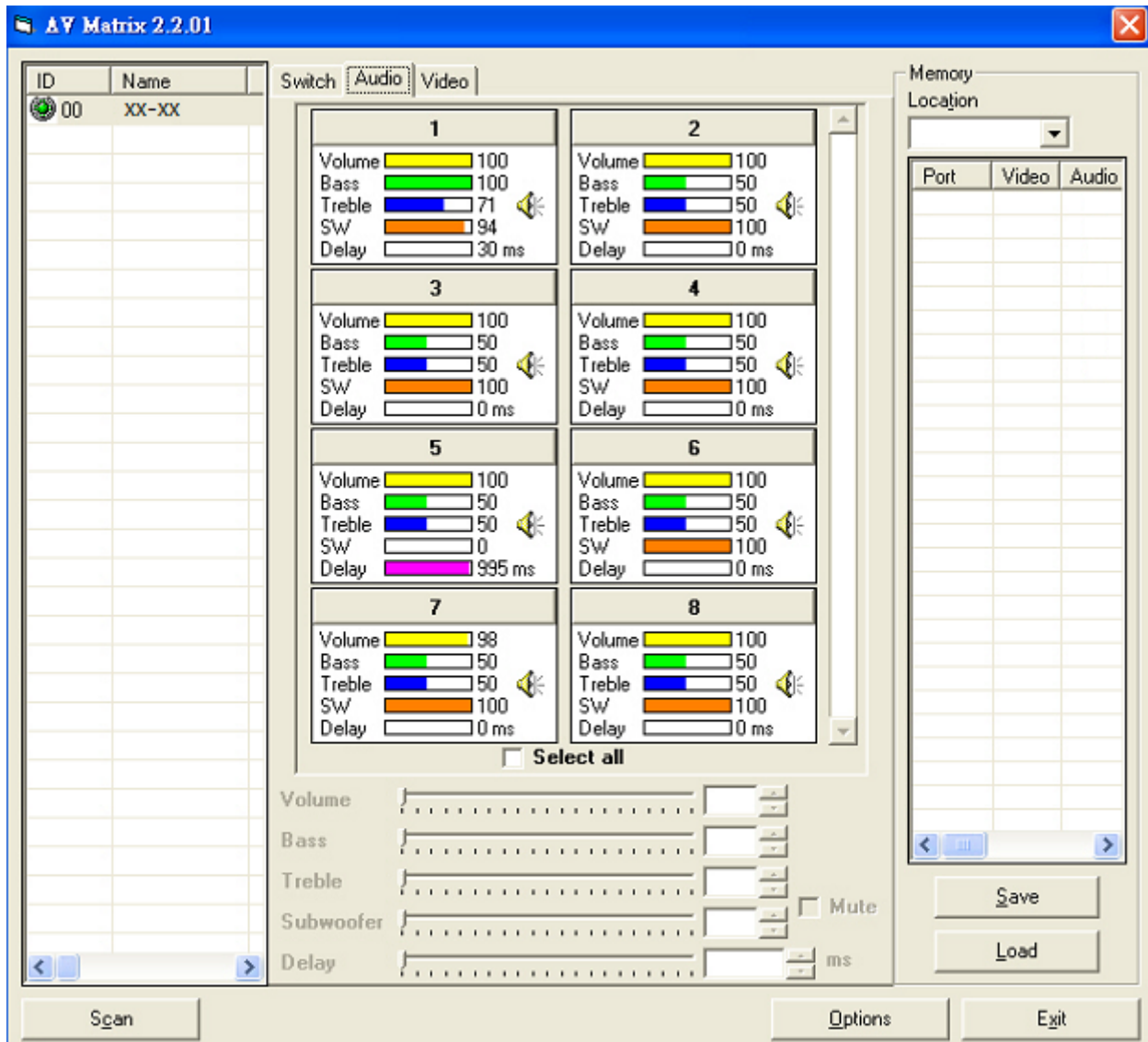




Figure 7-5 Audio Configuration Window

Mute Function Description: To mute the volume.

A specific example of the Mute One Function is described below:

Select one port configuration section as light blue block, then click “**Mute**” check box to mute blocked section. The  icon will become .

☞ This function is only for Audio Advanced Matrix Switcher.

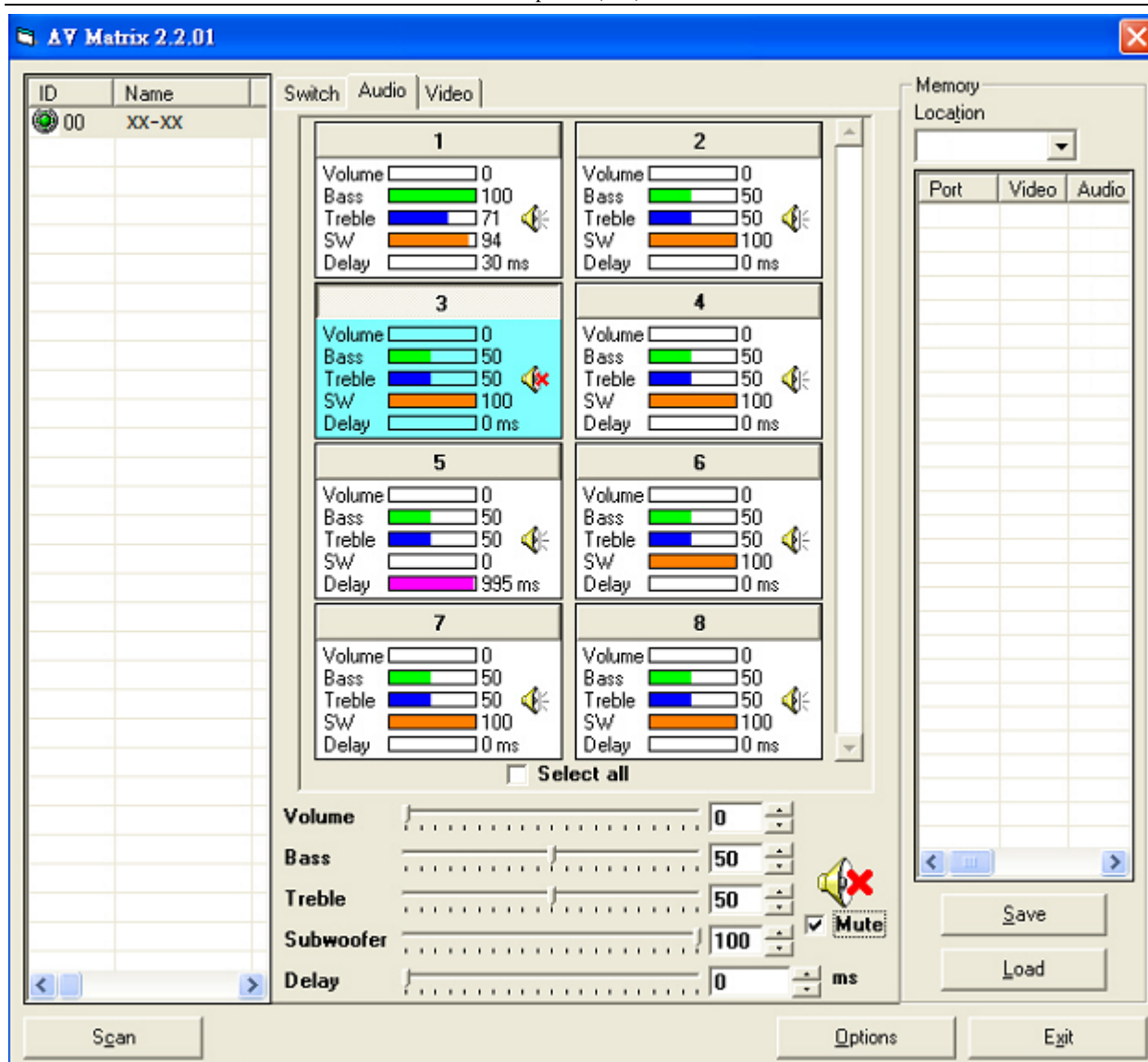



Figure 7-6 Mute One Port Configuration

A specific example of Mute all function is described below:

Click “**Select all**” check box, all of configuration sections will become as light blue block, then click “**Mute**” check box to mute all blocked sections. All of the  icon will become



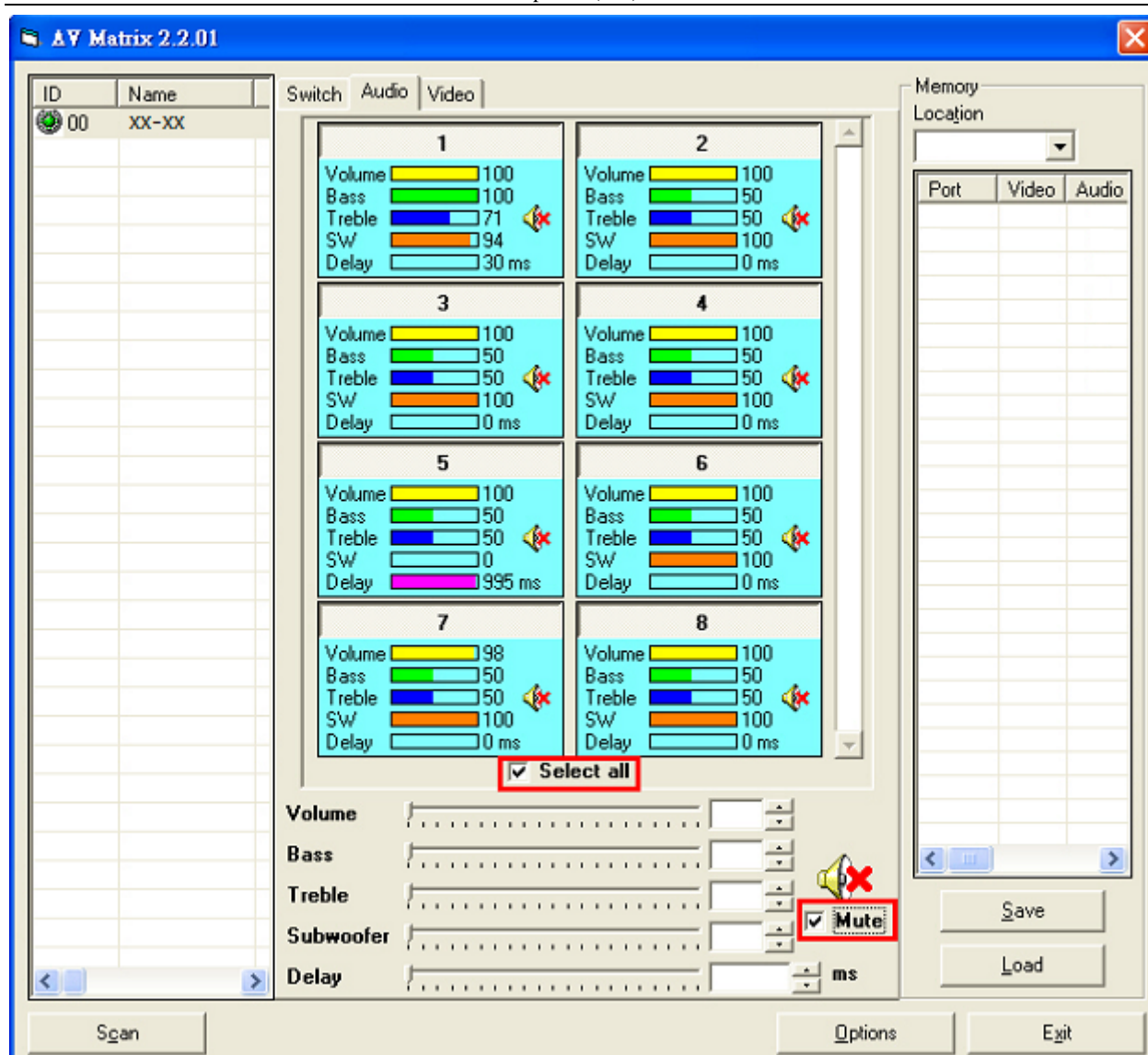


Figure 7-7 Mute All Ports Configuration

7.2.4 EDID Configuration Function (Not Support for DA)

Click “**Video**” tab to enter the video configuration window. In the video configuration window allows you to configure the **EDID** type of channel as **FIX** or **Output1**. In Matrix Switcher, the audio and video can be processed synchronously. Beside, all ports for EDID functions are also processed entirely. You cannot configure the port separately.

FIX mode: The Matrix Switcher will supply a set of fixed **EDID** values to support up to only 1080P high performance TV.

Output1 mode: The Matrix Switcher 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.

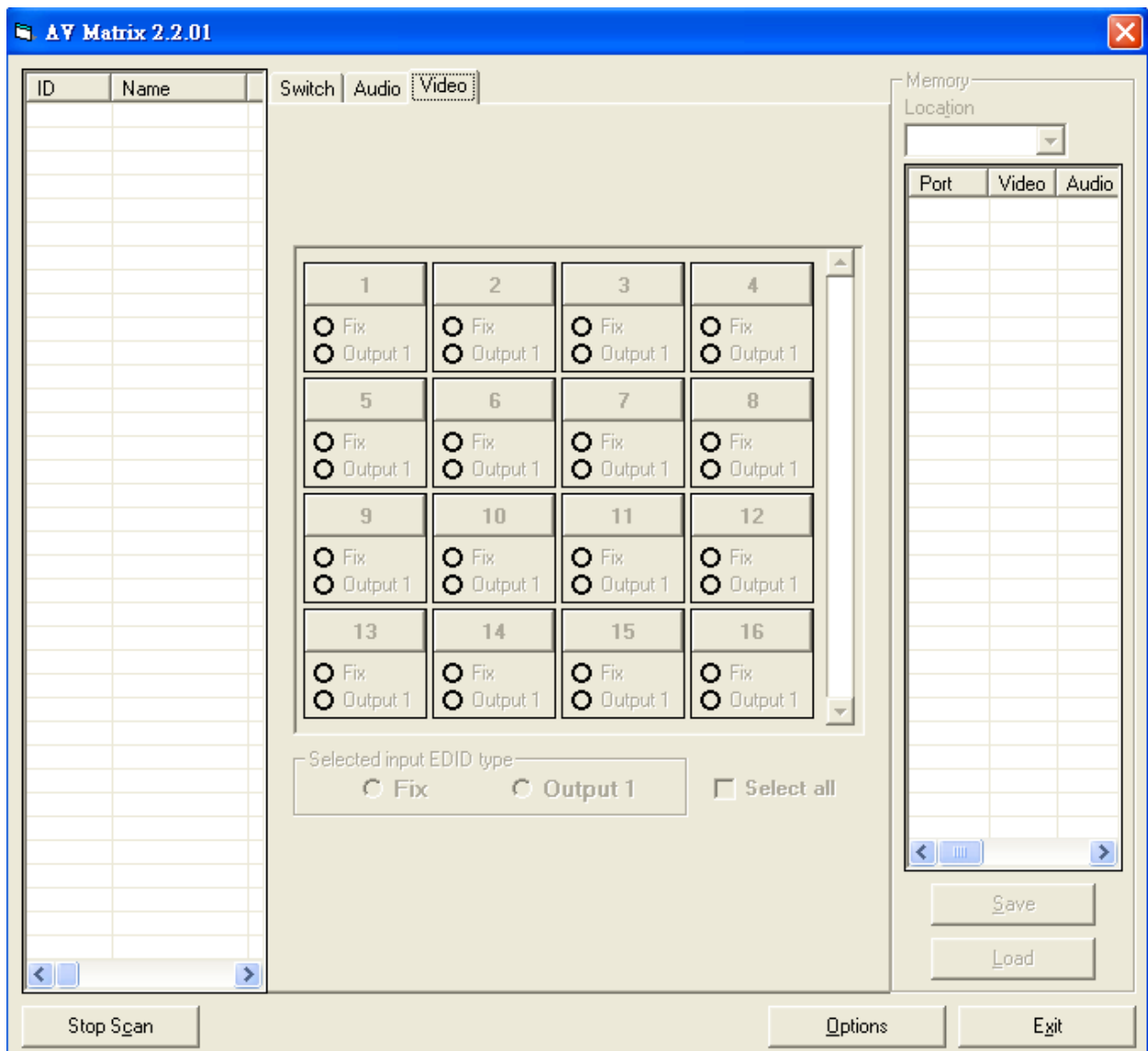


Figure 7-8 Video Configuration Window

7.2.5 RS-232 Memory Function (Not Support for DA)

Function Description: To store and retrieve the settings.

Memory Save Function Description: The function saves all the present input/output switching relations to any Locations from #1 to #8 you desired.

A specific example of the Store Function is described below:

Store all the present input/output switching relations to Location #1. First, select Location #1, as shown below. Then click the **Save** key to save all the present input/output switching relations to Location #1.

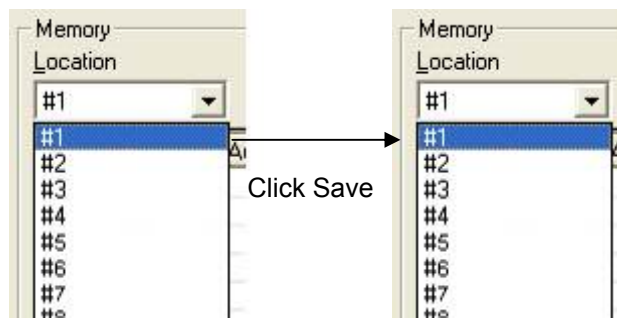


Figure 7-9

Retrieve Function Description: To retrieve the saved input/output switching relations.

A specific example of the Retrieve Function is described below:

To retrieve the all settings saved in Location #1. First, select Location #1 as shown in the figure below. Then click the **Load** key to retrieve all the settings stored in Location #1.

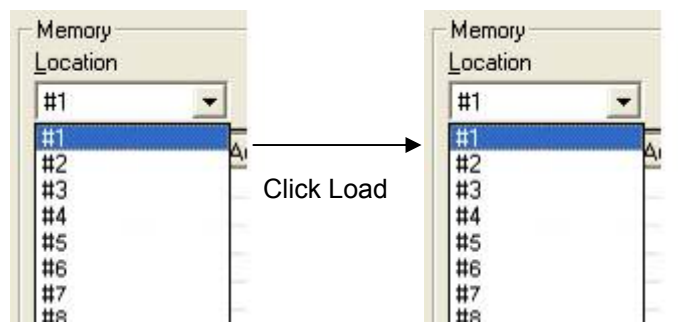


Figure 7-10

In the right main window displays the presently saved switching status as shown in Figure 7-11 below:

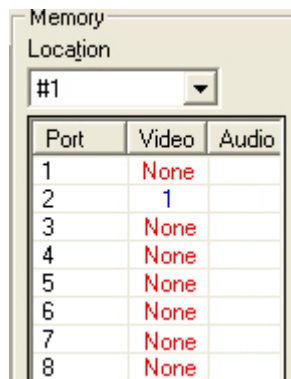


Figure 7-11 Memory Configuration Status

When input corresponding to Output is enabling, it shows the Output ports correspond to the Input ports; when they are disable it will show red “None” in the relative field.

7.2.6 Options Function

Activation Function:

In the main configuration menu, select **Options** to prop-up the **Options Window** as shown in Figure 7-12 (a)

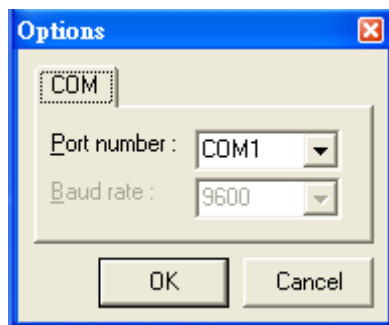


Figure 7-12 Options (a)

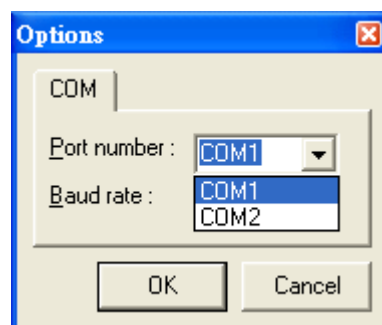


Figure 7-12 Options (b)

Function Description:

Linking Methods: In “**Port number**” select one of the COM ports as shown in Figure 7-12 (b) for an example; in “**Baud rate**” select 9600 for signal transmission as shown in Figure 7-12 (a)

7.2.7 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 [Appendix D RS-232 Communication Protocol](#). Also see the “**Command list.pdf**” in the CD-ROM for more relative **Command Code** information.

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:

AV MATRIX Control

Console List

Previous Next

| ID | Name |
|----|------|
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

Console: 0 [Audio] [Video] [Status] |< << >> >|

Output 1 2 3 4 5 6 7 8

Video [] [] [] [] [] [] [] []

Audio [] [] [] [] [] [] [] []

☐ All Output [Set] [OFF] [Refresh] [Load]

☐ AV Link [Scan] [Upgrade] [Options] [Save]

Key In: 0 10 20 30 40 50 60 70 80 90

☐ Enable 0 1 2 3 4 5 6 7 8 9

Memory Information

Location: #1

| Output | Video | Audio |
|--------|-------|-------|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |

Figure 7-13 LAN Web Configuration Window

- ☞ The Distribution Amplifier (DA) is integrated HDMI switching equipment. You can only key in the Output Channel No. into the **Video** field for configuration.
- ☞ The Distribution Amplifier (DA) device ID is based on the DIP of switcher located on the rear panel. Beside, please adjust the DIPs to LAN and Master for the web control device.
- **Set:** Click this button to Link 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 Distribution Amplifier (DA) 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 the connections of your Distribution Amplifier (DA) are over to 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 C Firmware Upgrade](#).
- **Options:** Allow you to configure the **IP** address.
- **Save:** Click this button to save the connected combinations output and input ports. It also includes the present input/output switching relations and all settings. (Only for Matrix Switcher Series.)
- **All Output:** A Hot Key for you to set the same value to all output channels.
- **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. For HDMI-E8 is useful from 1 to 8 values upon 8 output ports and HDMI-E16 is useful from 1 to 8 values upon 8 output ports.
- **Previous and Next:** If the connections of your Matrix Switcher are over to 8 devices, you can click “**Previous**” or “**Next**” to view the console list by paging.

7.3.1 Audio Configuration (Not Support for DA)

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

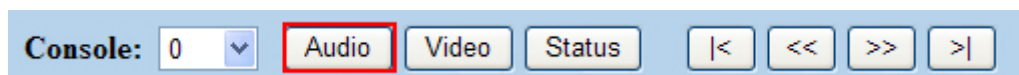


Figure 7-14 Audio Configuration

In “**Audio Settings**” window, you can select output port from the drop-down list. If you want to mute the volume, please select the **Mute** check box. You can also adjust the **Subwoofer**, **Bass**, **Treble** or **Lip-sync** value here.

If the device does not support audio function, it will appear “---”.

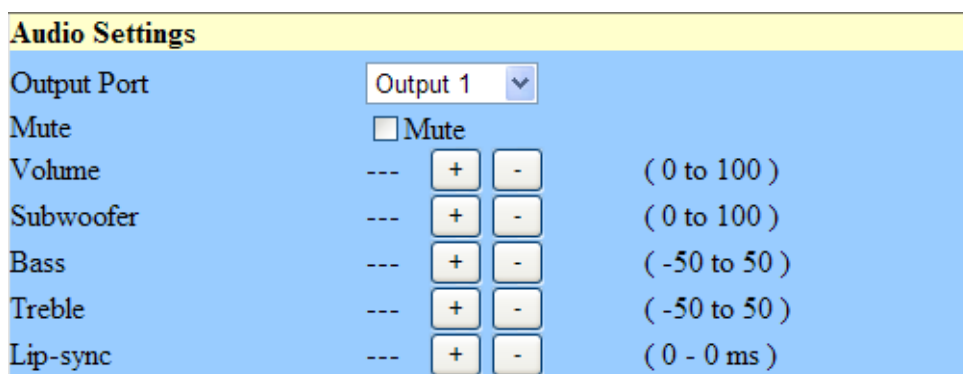


Figure 7-15 Audio Settings

7.3.2 Video Configuration (Not Support for DA)

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

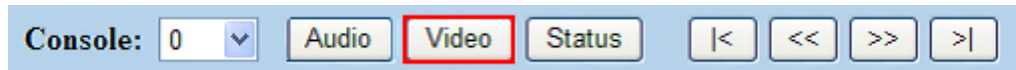


Figure 7-16 Video Operation

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

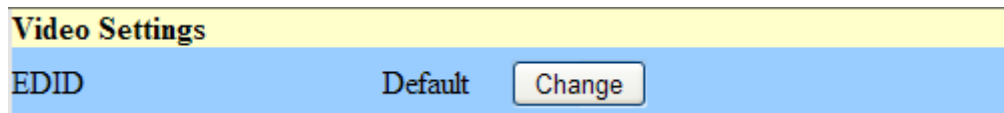


Figure 7-17 Video Configuration – Default Port Used

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

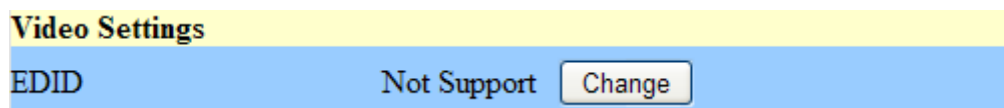


Figure 7-18 Video Configuration – Not Support

7.3.3 Device Status Information

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

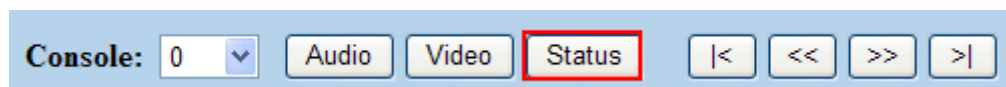


Figure 7-19 Device Status

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.

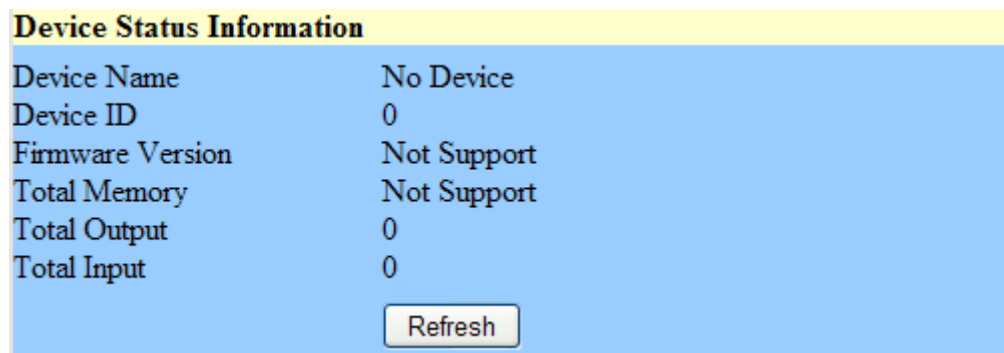






Figure 7-20 Device Status Information

7.3.4 Device Output View

When your Distribution Amplifier (DA) supports more than 8 output ports, the output configuration view of browser application will over one page. Click  to go to the first page of output configurations,  to go to last page,  to go to prior one and  to go to next one as below:

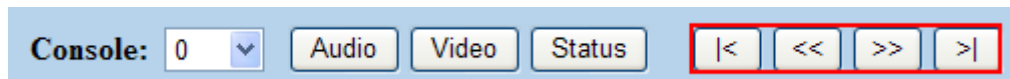


Figure 7-21 Output View

7.3.5 LAN Main Operation

Refer to the main configuration window, for the basic operation is described as below:

Example: Now there is a Distribution Amplifier (DA) having all the input/output ports properly connected to the equipment. If you want to set OUT2, 3 and 4 ports connect to IN1 port.

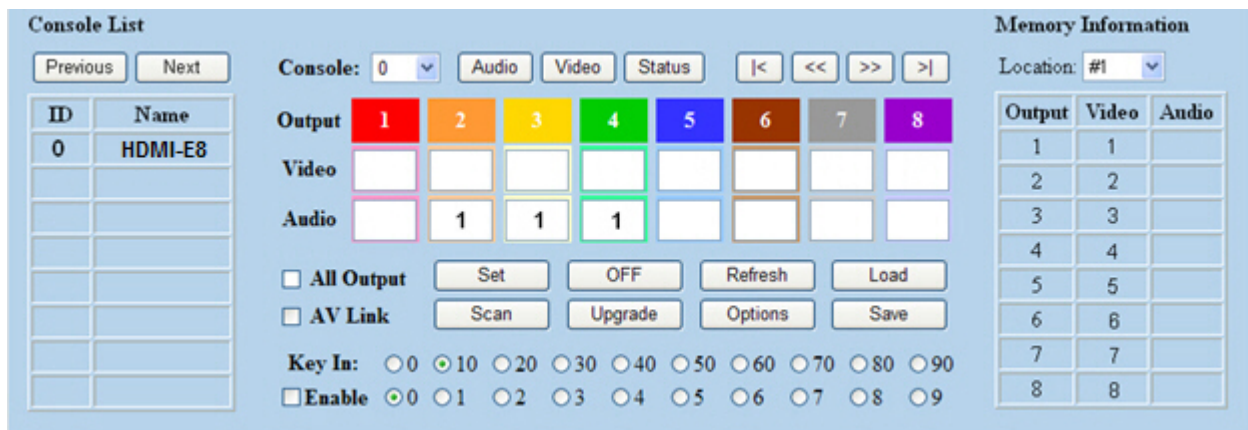


Figure 7-22 AV Matrix Control (for HDMI-E8 Reference)

Step 1: For channel 2, 3, 4 Output, please key in the value “1” in the **Audio** fields.

Step 2: Click “Set” button.

Upon completion of the above 3 steps, you have actually completed the switching operation of having IN1 to OUT2, 3 and 4 successfully.

7.3.6 LAN Memory Function (Not Support for DA)

Function Description: To store and retrieve the settings.

Store Function Description (STO/Save): The **Store Function** saves all the present input/output switching relations to any Locations from #1 to #8 you desired.

A specific example of the Store Function is described below:

Store the present input/output switching relations to Location #2. First, select Location #2, as shown in the figure below. Then click the **Save** button to save the present input/output switching relations to Location #2.

Retrieve Function Description (RCL/Load): To retrieve the saved input/output switching relations.

A specific example of the Retrieve Function is described below:

To retrieve the input/output corresponding relations saved in Location #1. Select the Location #1 as shown in the figure below. The input/output corresponding relations stored in Location #1 will be showed directly.

Memory Information

Location: #1

| Output | Audio |
|--------|-------|
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |

Memory Information

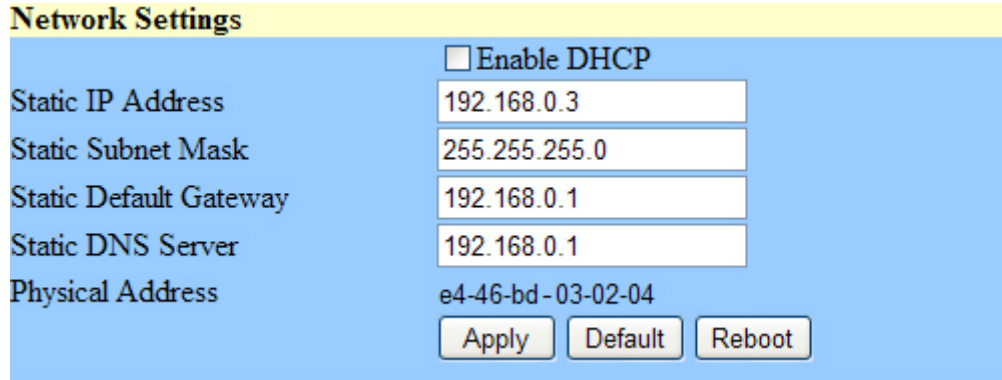
Location: #1

| Output | Video | Audio |
|--------|-------|-------|
| 1 | | 1 |
| 2 | | 2 |
| 3 | | 3 |
| 4 | | 4 |
| 5 | | 5 |
| 6 | | 6 |
| 7 | | 7 |
| 8 | | 8 |

Figure 7-23 Memory Information

7.3.7 LAN IP Function

In the main configuration menu, select **Options** button to prop-up the **Browser** ex. “**Windows Internet Explorer**” dialog box, click “**OK**” to show the IP configuration window.



| Network Settings | |
|---|--------------------------------------|
| | <input type="checkbox"/> Enable DHCP |
| Static IP Address | 192.168.0.3 |
| Static Subnet Mask | 255.255.255.0 |
| Static Default Gateway | 192.168.0.1 |
| Static DNS Server | 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 7-24 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.

8. Troubleshooting

1. What to do if the serial port (usually refer to the computer serial port) fails to control the Distribution Amplifier (DA)?

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 [6.6.6 Device ID Settings](#) and [6.6.5 DIP Switcher 2 Pins](#).

2. What to do if the corresponding audio signal fails to output during configurations?

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.

3. 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.

4. What to do if the 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.

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

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

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

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

7. What to do if IR function failure occurred?

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

Appendix A Remote Controller (Optional)

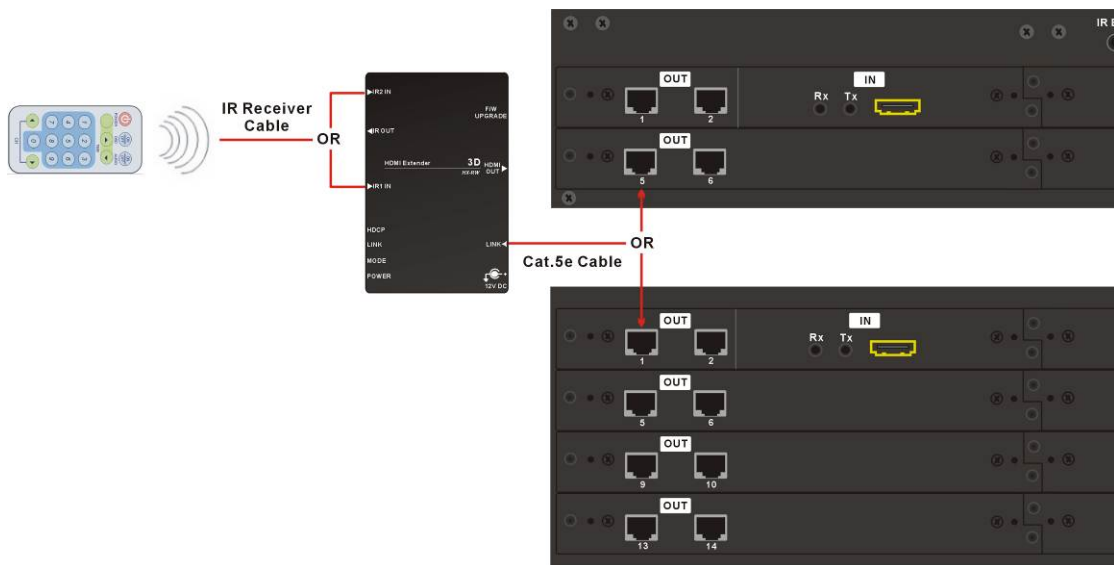
The device supports a remote control interface allows you to control the channels and video features switch of device through remote controller. For the switching, you can press **OUT** key, then press **IN** key.



- **OUT 0 - OUT 9** and **ALL** keys are used for output configurations.
- **IN 0**, **IN 1** and **OFF** keys are used for input configurations.
- Other keys are useless.

Appendix B IR Mini-Controller (Optional)

The Distribution Amplifier (DA) supports an IR Mini-Controller to allow you to select input channel through infrared sensor upon an extended connection – HDMI Extender (HX-RW). The signal for IR Mini-Controller is only available to the IR Receiver connected to the IR1 IN or IR2 IN port of HDMI Extender (HX-RW). If there are over 2 IR Receivers receive the signal, all of them will be switched to the same selected input simultaneously. In order to avoid the event occurs described above, you can configure the positions of your IR Receivers based on different environments.



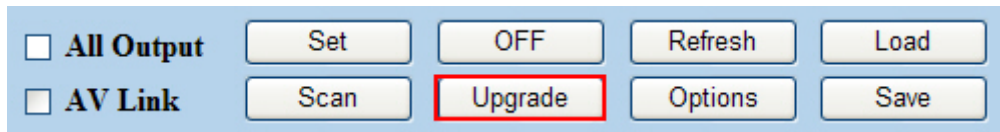
- **0** and **1** keys are used for select channel.
- Press **Power** key to switch to “**0**” (**OFF**).
- Other keys are useless.

Appendix C Firmware Upgrade

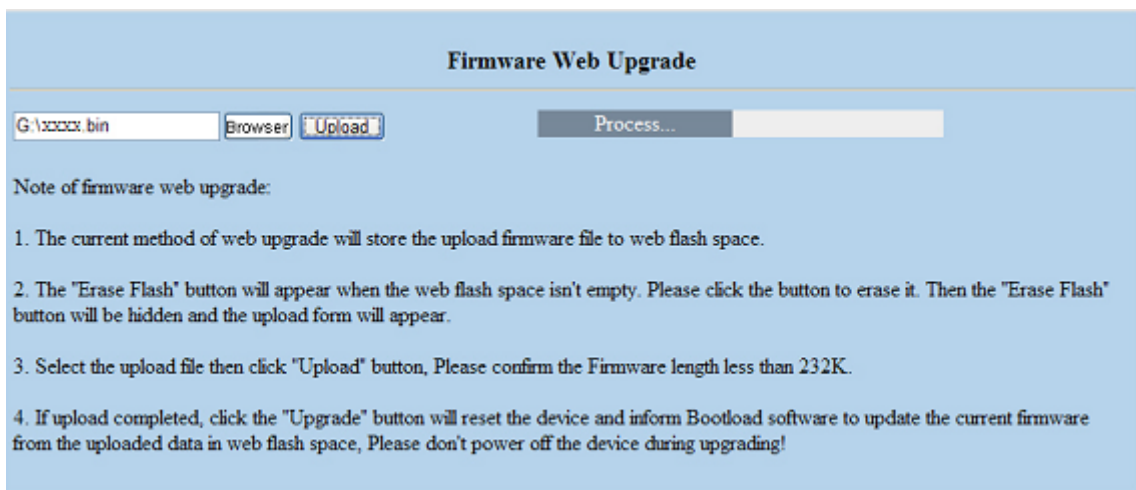
This Chapter will introduce you how to upgrade firmware on your web browser. For firmware upgrade, you have to upload the firmware file to your web server and then upload it to your device from web server.

Follow the steps as below to upgrade the firmware:

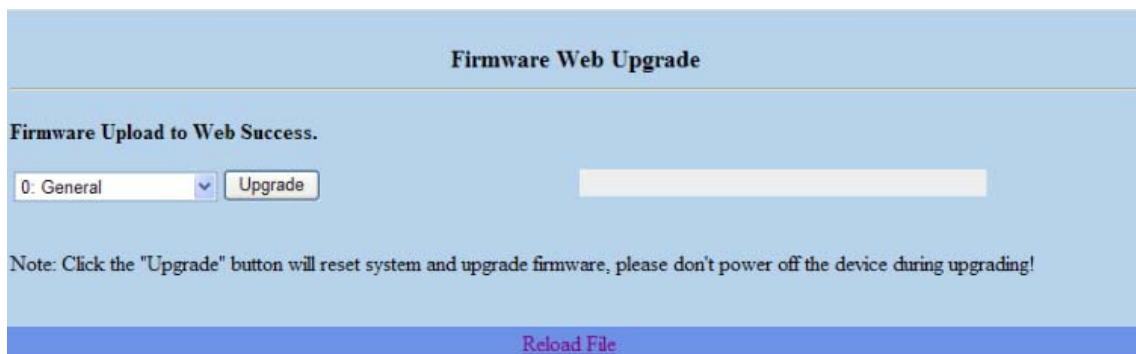
1. Open the **Browser** on your PC, key in the default IP address: <http://192.168.0.3> to login the AV MA TRIX Control configuration. Click **“Upgrade”** to begin firmware upgrade.



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



3. Select **“0: General”** form 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.

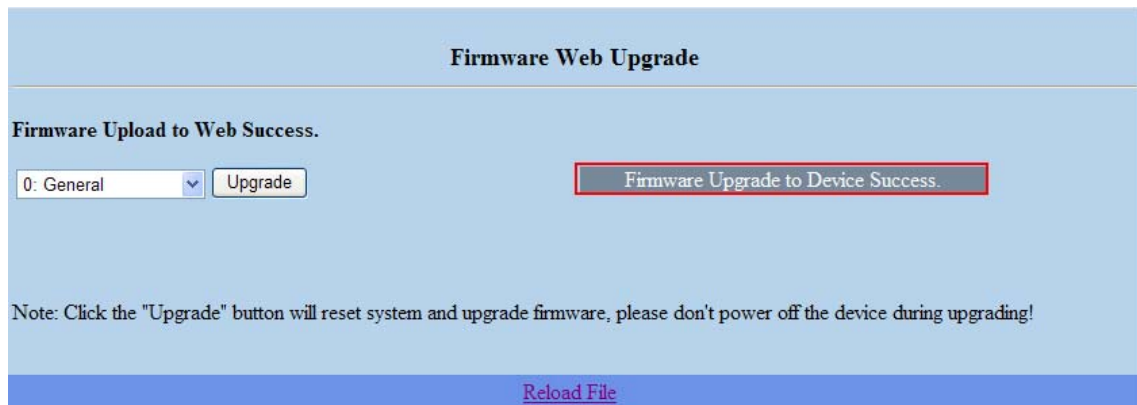
The screenshot shows the 'Firmware Web Upgrade' page. At the top, it says 'Firmware Upload to Web Success.' Below this, there is a dropdown menu labeled '1: Matrix Device'. Underneath, there is a 'Device ID:' label followed by a dropdown menu showing '0'. An 'Upgrade' button is located below the Device ID dropdown. At the bottom of the page, there is a note: 'Note: Click the "Upgrade" button will reset system and upgrade firmware, please don't power off the device during upgrading!' and a 'Reload File' link.

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 image shows two side-by-side screenshots of the 'Firmware Web Upgrade' page for '2: Matrix I/O Module', separated by a large grey arrow pointing from left to right. Both screenshots show the 'Firmware Upload to Web Success.' header. The left screenshot shows the 'Device ID:' dropdown set to '0' and the 'I/O Module:' dropdown set to '1'. The right screenshot shows the 'Device ID:' dropdown set to '0' and the 'I/O Module:' dropdown set to '1'. Both screenshots have an 'Upgrade' button and a note at the bottom: 'Note: Click the "Upgrade" button will reset system and upgrade firmware, please don't power off the device during upgrading!'.

- ☞ The **Distribution Amplifier (DA)** supports modules for upgrading; you have to upgrade each module individually. You can select **IO Module 5** for HDMI-E8 or **IO Module 9** for HDMI-E16 to upgrade all IO modules.

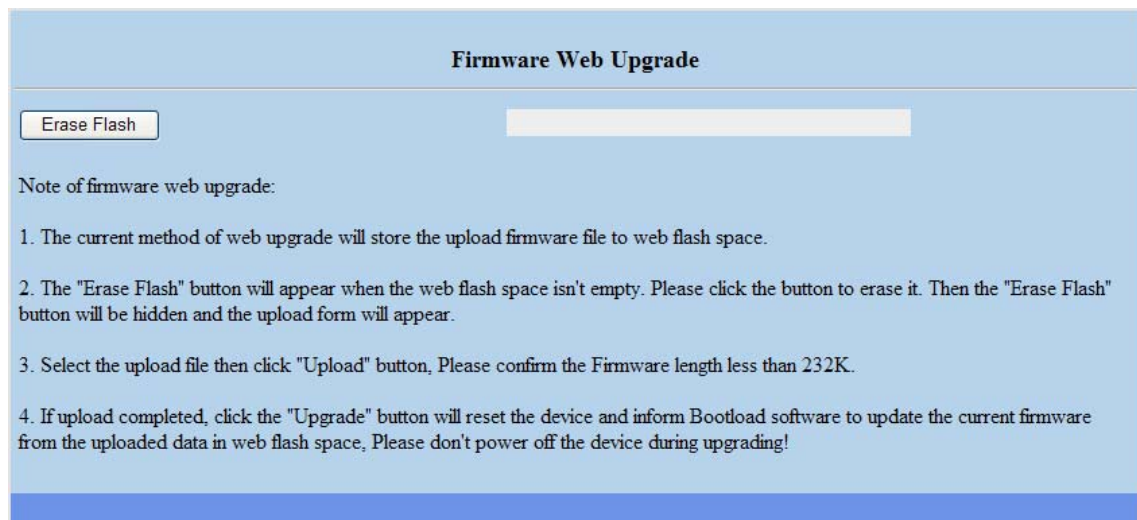
6. After finishing firmware upgrade successfully, **“Firmware Upgrade to Device Success”** information will appear as below.



The screenshot shows a web interface titled "Firmware Web Upgrade". Below the title, it says "Firmware Upload to Web Success." There is a dropdown menu set to "0: General" and an "Upgrade" button. A red-bordered box contains the text "Firmware Upgrade to Device Success." Below this, a note states: "Note: Click the 'Upgrade' button will reset system and upgrade firmware, please don't power off the device during upgrading!" At the bottom, there is a link labeled "Reload File".

Besides, the firmware upgrade will not stop even though the web connection is fail suddenly.

7. If there is a firmware already exists 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.



The screenshot shows a web interface titled "Firmware Web Upgrade". Below the title, there is an "Erase Flash" button and a progress bar. Below the button, it says "Note of firmware web upgrade:". There are four numbered instructions: 1. The current method of web upgrade will store the upload firmware file to web flash space. 2. The "Erase Flash" button will appear when the web flash space isn't empty. Please click the button to erase it. Then the "Erase Flash" button will be hidden and the upload form will appear. 3. Select the upload file then click "Upload" button, Please confirm the Firmware length less than 232K. 4. If upload completed, click the "Upgrade" button will reset the device and inform Bootload software to update the current firmware from the uploaded data in web flash space, Please don't power off the device during upgrading!

Appendix D 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 this device. The computer can control the device 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.

D-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.

D-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)

D-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 |
| Switch Tools | | | | | |
| 0x01 | Switch Video Output Channel | Output | Input | A | 2 |
| 0x02 | Switch 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 | |
| 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 | |
| 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.
5. Request 0x01, 0x07, 0x09, 0x0B, 0x30, 0x31 and 0x3F are only supported by HDMI-E8 / HDMI-E16.

D-1.3 Index Byte

Index Byte (IB)

| <i>Name</i> | <i>Bit 7</i> | <i>Bit 6</i> | <i>Bit 5</i> | <i>Bit 4</i> | <i>Bit 3</i> | <i>Bit 2</i> | <i>Bit 1</i> | <i>Bit 0</i> |
|-------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 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. (1: Input port for Distribution Amplifier (DA)) |
| Setting | The setting type that will be selected. 0: All Settings 1: Switch Settings only 2: Video/Audio Settings only |
| - | Don't care |

D-1.4 Value Byte

Value Byte (VB)

| <i>Name</i> | <i>Bit 7</i> | <i>Bit 6</i> | <i>Bit 5</i> | <i>Bit 4</i> | <i>Bit 3</i> | <i>Bit 2</i> | <i>Bit 1</i> | <i>Bit 0</i> |
|-------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| 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) 1: Input Port 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 |

D-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: switch output 6 to the input 3.

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

Byte 2 (RB) is 0x01 – Request: Switch 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

D-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 |

D-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.

D-2.2 ACK Type B

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

| <i>Name</i> | <i>Bit 7</i> | <i>Bit 6</i> | <i>Bit 5</i> | <i>Bit 4</i> | <i>Bit 3</i> | <i>Bit 2</i> | <i>Bit 1</i> | <i>Bit 0</i> |
|-------------|---|--------------|--------------|--------------------|--------------|--------------|--------------|--------------|
| 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 | | |
| 0x1D | Request Audio Output Delay Low | | Delay1 |
| 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**”.

D-2.3 ACK Type C

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

| <i>Name</i> | <i>Bit 7</i> | <i>Bit 6</i> | <i>Bit 5</i> | <i>Bit 4</i> | <i>Bit 3</i> | <i>Bit 2</i> | <i>Bit 1</i> | <i>Bit 0</i> |
|-------------|---|--------------|--------------|--------------------|--------------|--------------|--------------|--------------|
| 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

D-2.4 ACK Type D

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

| <i>Name</i> | <i>Bit 7</i> | <i>Bit 6</i> | <i>Bit 5</i> | <i>Bit 4</i> | <i>Bit 3</i> | <i>Bit 2</i> | <i>Bit 1</i> | <i>Bit 0</i> |
|-------------|---|--------------|--------------|--------------------|--------------------------------|--------------|--------------|--------------|
| 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 switch tools request. (Request 0x02, 0x04, 0x06 and 0x08)

0 - Not support Audio switch tools request.

Bit 6: 1 - Support Video switch tools request. (Request 0x01, 0x03, 0x05 and 0x07)

0 - Not support Video switch 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)

D-2.5 ACK Type E

ACK Byte + LB + EXTI + VIDI + 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

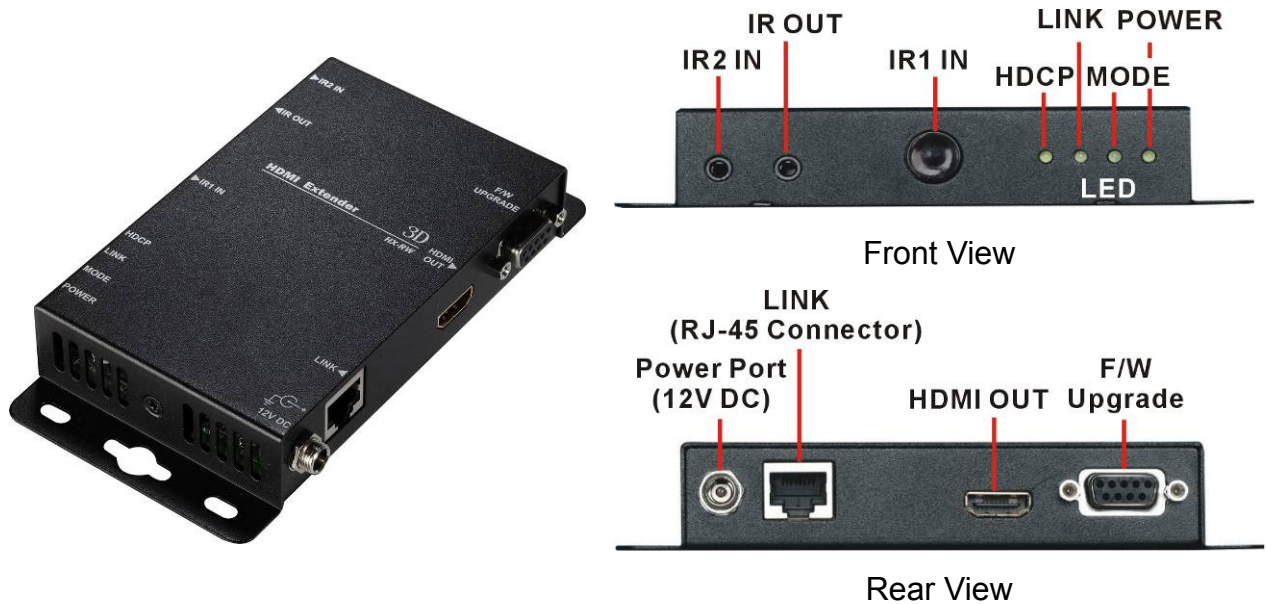
DTMAX: defines audio maximum delay time. (Unit: 100 ms)

Appendix E HDMI Extender (HX-RW)

The extension of HDMI video signal device supports up to 100 meter away by using an HDMI Extender and Cat.5e cable.

HDMI Extender is ideal for:

- Test bench facilities
- Data Center
- Help desks



LED Indicators (Green):

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

Features

- Through the HDMI Extender (HX-RW), you can use the output of HDMI-E8 or HDMI-E16 to display identical image and extension of HDMI signal up to 100 meter on HDTV
- HDCP Compliant
- Support 3D pass-through
- Support all frequency band IR pass-through
- One Cat.5e cable extension
- Support resolution up to 4K x 2K
- HDBaseT technology
- Use Cat.5e cable to install easily

Specifications

| Function | HX-RW |
|----------------------|--------------------|
| HDMI OUT | HDMI A-Type Female |
| LINK | RJ45 Connector |
| IR OUT | 3.5ψ Stereo Jack |
| IR2 IN | 3.5ψ Stereo Jack |
| F/W UPGRADE | DB9 Female |
| Max. Resolution | 4K x 2K |
| Cable Distance | 100 m |
| Power Adapter (Min.) | DC 12V with Lock |
| Housing | Metal |
| Weight | 308g |
| Dimensions (LxWxH) | 150x80x25 mm |

Installation

1. Turn off the HDTV.
2. Connect the HDMI cable between the HDTV and the “**HDMI OUT**” port of HDMI Extender (HX-RW).
3. Connect the Cat.5e cables between Matrix Output port and the “**LINK**” port of HDMI Extender (HX-RW).
4. Connect the power cord and turn on the extender.
5. Turn on the HDTV.

IR Receiver Cable Directions

Put IR Receiver Cable into the HDMI Extender (HX-RW) “**IR2 IN**” port and place the IR Receiver Cable, so that you can point to it easily with your IR remote controller.

IR Receiver Cable:



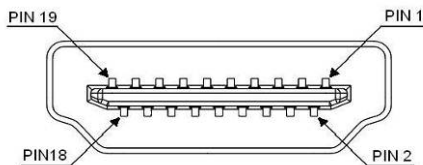
IR Blaster Cable Directions

Plug IR Blaster Cable into HDMI Extender (HX-RW) “**IR OUT**” port located on the front-panel.

IR Blaster Cable:

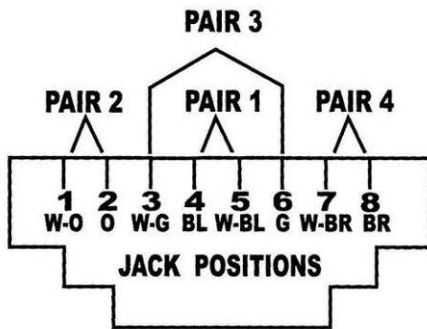


HDMI Output Connector



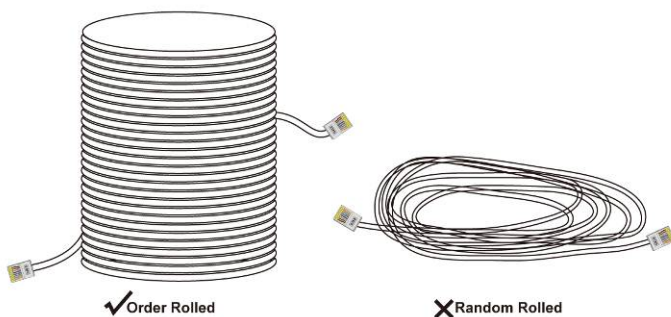
| Pin # | Signal | Pin # | Signal |
|-------|--------------------|-------|------------------------|
| 1 | TMDS Data 2+ | 11 | TMDS Clock Shield |
| 2 | TMDS Data 2 Shield | 12 | TMDS Clock - |
| 3 | TMDS Data 2- | 13 | CEC |
| 4 | TMDS Data 1+ | 14 | Utility (NC on device) |
| 5 | TMDS Data 1 Shield | 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 | RJ45 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 |

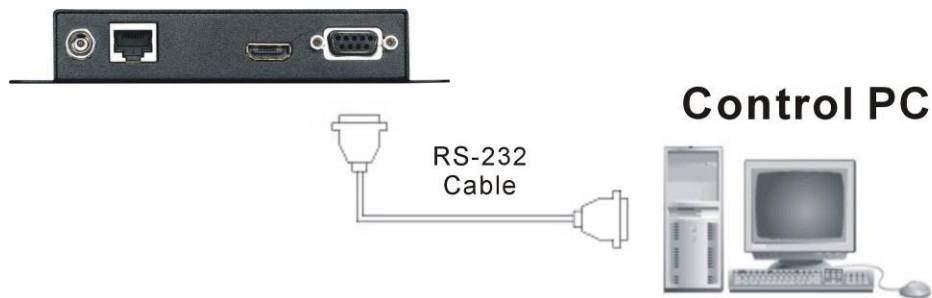
- ☞ However sometimes, especially in demonstrations or in a lab environment, the cable is rolled randomly in small turns for convenience. The randomly rolled UTP cable suffers additional signal impairments (compared to a straight cable) and therefore the maximal operating reach might be reduced. Rolling a Cat.5e cable around a 70 cm fixed diameter plastic drum has just a minor effect on the FEXT (Far End Cross Talk) when compared to a fully stretched cable.



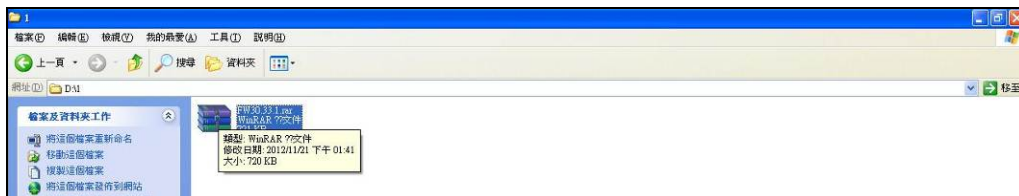
Firmware Upgrade

Before upgrading firmware, you have to receive a Firmware burn package containing all software needed for burning. Follow the steps as below to upgrade the HDMI Extender (HX-RW) firmware:

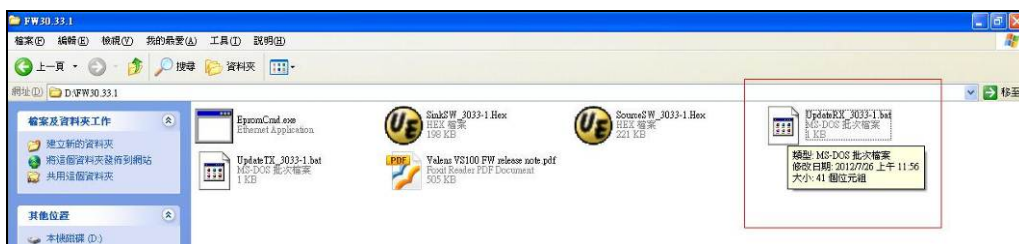
1. Connect the power cord to the power port on the panel of HDMI Extender (HX-RW). The other end of the power cord connected to a suitable power source.
2. Connect the control PC and HDMI Extender (HX-RW) with a RS-232 cable.



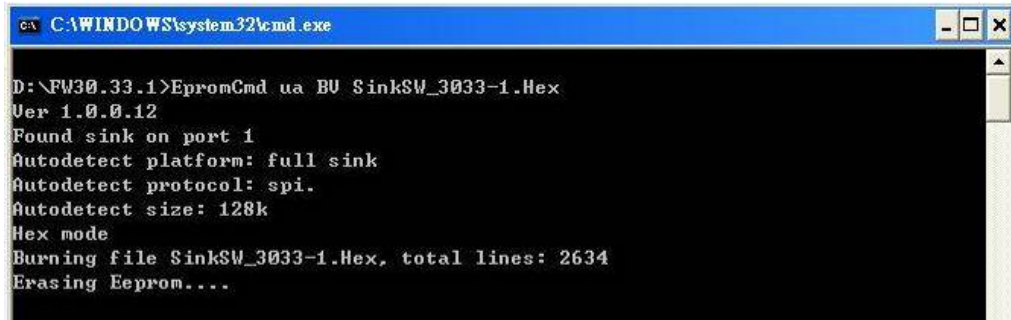
3. On the control PC, decompress the Firmware burn package file.



4. Process the UpdateRX_XXXX.bat file to upgrade HDMI Extender (HX-RW) firmware. (XXXX is specified for firmware version)



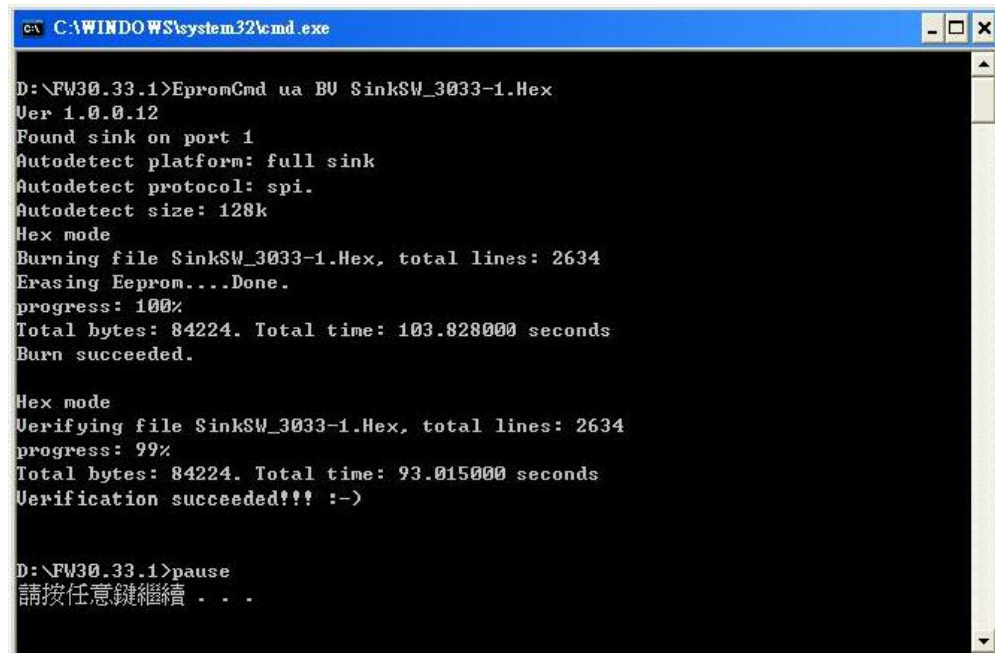
5. The burning windows will pop-up and begin to upgrade.



```
C:\WINDOWS\system32\cmd.exe

D:\FW30.33.1>EepromCmd ua BU SinkSW_3033-1.Hex
Ver 1.0.0.12
Found sink on port 1
Autodetect platform: full sink
Autodetect protocol: spi.
Autodetect size: 128k
Hex mode
Burning file SinkSW_3033-1.Hex, total lines: 2634
Erasing Eeprom....
```

6. Final, the burning is finish as below.



```
C:\WINDOWS\system32\cmd.exe

D:\FW30.33.1>EepromCmd ua BU SinkSW_3033-1.Hex
Ver 1.0.0.12
Found sink on port 1
Autodetect platform: full sink
Autodetect protocol: spi.
Autodetect size: 128k
Hex mode
Burning file SinkSW_3033-1.Hex, total lines: 2634
Erasing Eeprom....Done.
progress: 100%
Total bytes: 84224. Total time: 103.828000 seconds
Burn succeeded.

Hex mode
Verifying file SinkSW_3033-1.Hex, total lines: 2634
progress: 99%
Total bytes: 84224. Total time: 93.015000 seconds
Verification succeeded!!! :->

D:\FW30.33.1>pause
請按任意鍵繼續 . . .
```