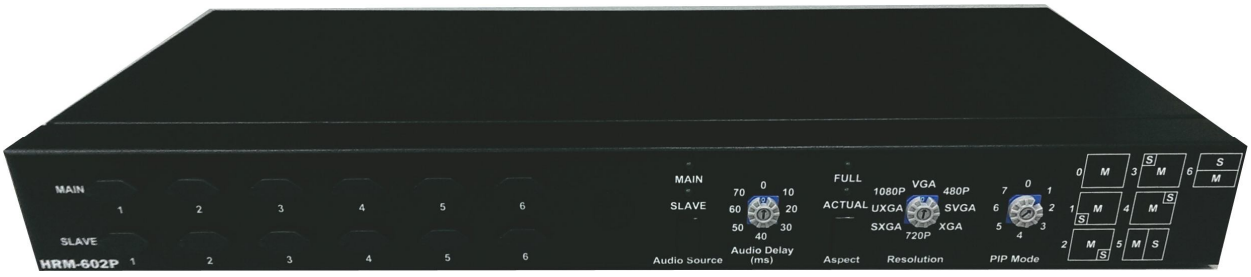
User Manual



Seamless HDMI Switch Scaler

with PIP and Audio Delay Functionality

6x2

HRM-602P

V.2013HRM-602P.00

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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.

TABLE OF CONTENTS

CHAPTER 1 SWITCHER SYSTEM OVERVIEW

1.1 Introduction

The HRM-602P Switcher is a high performance switching equipment with 6x2 HDMI connectors. Through 6 HDMI connectors, the multimedia signals come from the HDMI sources that you can transmit them simultaneously to the VGA and HDMI output display, thereby minimizing signals attenuation and ensuring high definition, integrating high fidelity graphics and multimedia signal output.

The HRM-602P Switcher 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, LCD display and synchronous and integrate audio/visual switching functions. Beside it also supports a RS-232 or LAN communication port enables convenient communication with remote control equipment to switch the multimedia signals. Through a standard TCP/IP connection with seamless integration in any existing network for easy remote access.

With easy operation, the HRM-602P allows you to use both pushbuttons and IR remote control to operate the device.

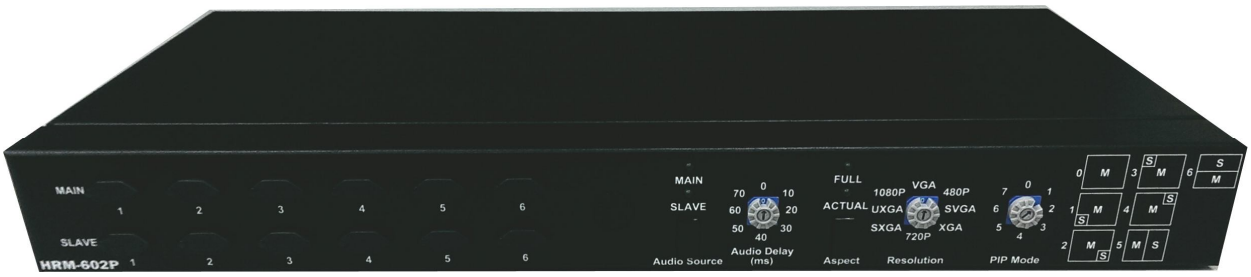


Figure 1-1 HRM-602P Switcher

1.2 Packing

	HRM-602P Switcher *1
	RS-232 Communication Connected Cable *1
	Power Cord *1
	Adapter *1
	HDMI Cable *1
	Rack-Mount Bracket *2
	Screws (for Brackets) *6
	IR Remote Controller *1
	Software CD *1 (Includes “AV Matrix Control Software” and “User Manual”)

CHAPTER 2 FEATURES

- Up/down/cross converter equipped with HDMI input/output.

  - 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.
- Compliant with the specification of HDMI.
- Supports 7 * display mode. (1* Normal mode, 4* PIP mode, 2* PBP mode).

  - On the display mode 0 (only display one channel each time.) You can switch between input channels to an output display directly without any idle time.

- Supports adjustable audio delay time for lip-sync (up to 70 ms).
- Supports 2 * aspect ratio modes.

  - **"Actual"(1:1)** Aspect ratio mode: This mode keeps the output image have the horizontal and vertical ratio as same as the input image comes from the video. That makes the output image has no distortion.

  - **"Full"** Aspect ratio mode: This mode modifies the original input image comes from the video to fit the aspect ratio of your output display. Sometimes the image will be cut or distorted so that it can fit in with the screen of your output display.

- Supports 8 * output resolution: VGA, 480P, SVGA, XGA, 720P, SXGA, UXGA, 1080P.
- Supports **"Audio Delay"** adjustment to allow the sync-processing images and audio signals without latency.
- Supports both HDMI and VGA output.
- Supports RS-232 control.
- Supports Ethernet control.
- Remote controller for operation.
- Hot pluggable and 1U rack design.
- EDID management (Copy from OUT port).
- Auto skips over the power-off and unplugged cable.

CHAPTER 3 SPECIFICATIONS

Hardware	
Input Connector	6 x HDMI Type A Female
Output Connector	1 x HDMI Type A Female, 1 x VGA HD15 Female
RS-232 Connector	1 x DB9 Female
LAN Connector	1 x RJ-45
Audio Port	1 x Audio Out Port
8 pins Dip Switcher	1
LED Indicators	16 x LED indicators specified for the connection is **"Selected"**.
Adapter	INPUT: 100VAC~240VAC, 50/60Hz, 1.5A OUTPUT: 12V, 5A
Housing	Metal
Mounting	Rack mountable (1U-rack-mount kit)
Weight	1.8kg
Dimensions (LxWxH)	384x173x45 mm
Multimedia	
Max. Resolution	1080P
Max Pixel Clocks	225MHz
Control Information	
HDMI Cable Distance	At least 10 meters
Ethernet Protocol	HTTP, DHCP, TCP/IP, ICMP (ping)
Program Control	Web Server, AVM Application
Serial Control Port	RS-232, 9Pin Female D Type Connector
Remote Control	Remote Controller, IR Receiver
Web Server	LAN (RJ-45)

CHAPTER 4 DEVICE INSTALLATION

The Switcher 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 the Device on a Standard Bracket with 1U Rack-mount

CHAPTER 5 FRONT/REAR PANELS

5.1 Front Panel

Figure 5-1 HRM-602P Switcher Front Panel

The HRM-602P Switcher supports up to 12 switching keys on the Front Panel for indicating the connection status of the Main or Slave window that allows you to switch each screen quickly.

- **MAIN 1~6 keys** (Main window)**:** Specifies the one of input HDMI1~ HDMI6 channel to a Main window output. These keys configure the signal sources of HDMI1~HDMI6 channels upon the Main window. You can also use these keys to switch input channels.
- **SLAVE 1~6 keys** (Slave window)**:** Specifies the one of input HDMI1~ HDMI6 channel to a Slave window output. These keys configure the signal sources of HDMI1~HDMI6 channels upon the Slave window. You can also use these keys to switch input channels.
- **Audio Source key:** Press this key to switch the audio source comes from the main window or slave window.
    - **MAIN LED indicator:** When the input channel for the Main window is selected as the audio source, the MAIN LED indicator will become solid green.

- **SLAVE LED indicator:** When the input channel for the Slave window is selected as the audio source, the SLAVE LED indicator will become solid green.

☞ Only one of input channel can be configured as output source.

- **Audio Delay:** The HRM-602P Switcher supports you 0, 10, 20, 30, 40, 50, 70 and 70 ms audio delay settings. Usually, when you process the video images, at times, it can take longer than processing the audio signal. The longer processing time is called latency. Audio Delay feature is designed to correct for this latency so that the signals between audio and video can be transmitted synchronously
- **Aspect:** The HRM-602P Switcher allows you to configure the Aspect ratio of the output image including Full and Actual aspect.

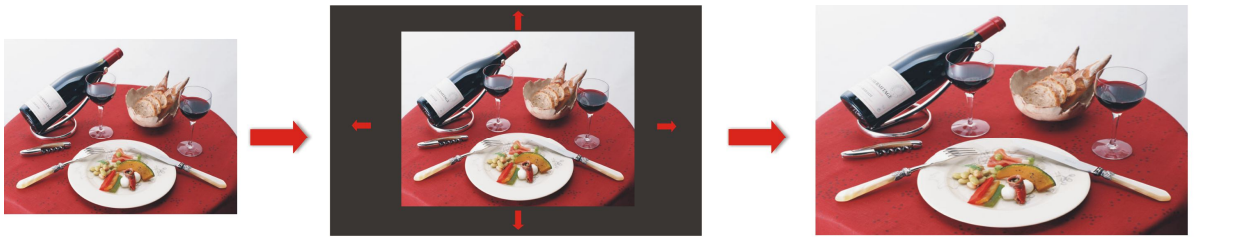
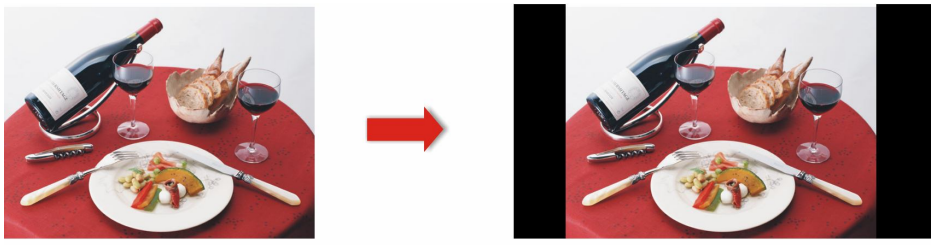


Figure 5-2 Full Aspect

☞ When the Full aspect for the output image is configured, the FULL LED indicator will become solid green.



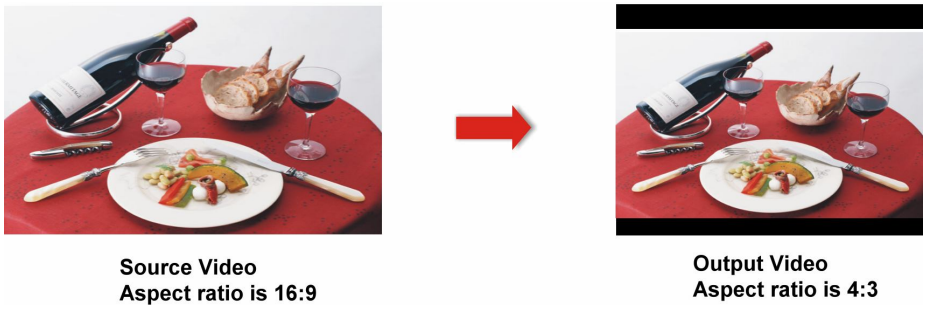


Figure 5-3 Actual Aspect

☞ When the Actual aspect for the output image is configured, the ACTUAL LED indicator will become solid green.

- **Resolution:** The HRM-602P Switcher supports you VGA, 480P, SVGA, XGA, 720P, SXGA, UXGA and 1080P output resolutions. It can transform the input source to available output resolution.
- **PIP Mode:** PIP (picture-in-picture) is a feature that allows the screen to display more than one image. Depending on this feature, you can watch one channel and another input source using PIP feature, one in the main screen and the other in the slave window.
- The HRM-602P Switcher supports you up to 7 display modes as below:
- **6 display modes for the full aspect:** (for reference)

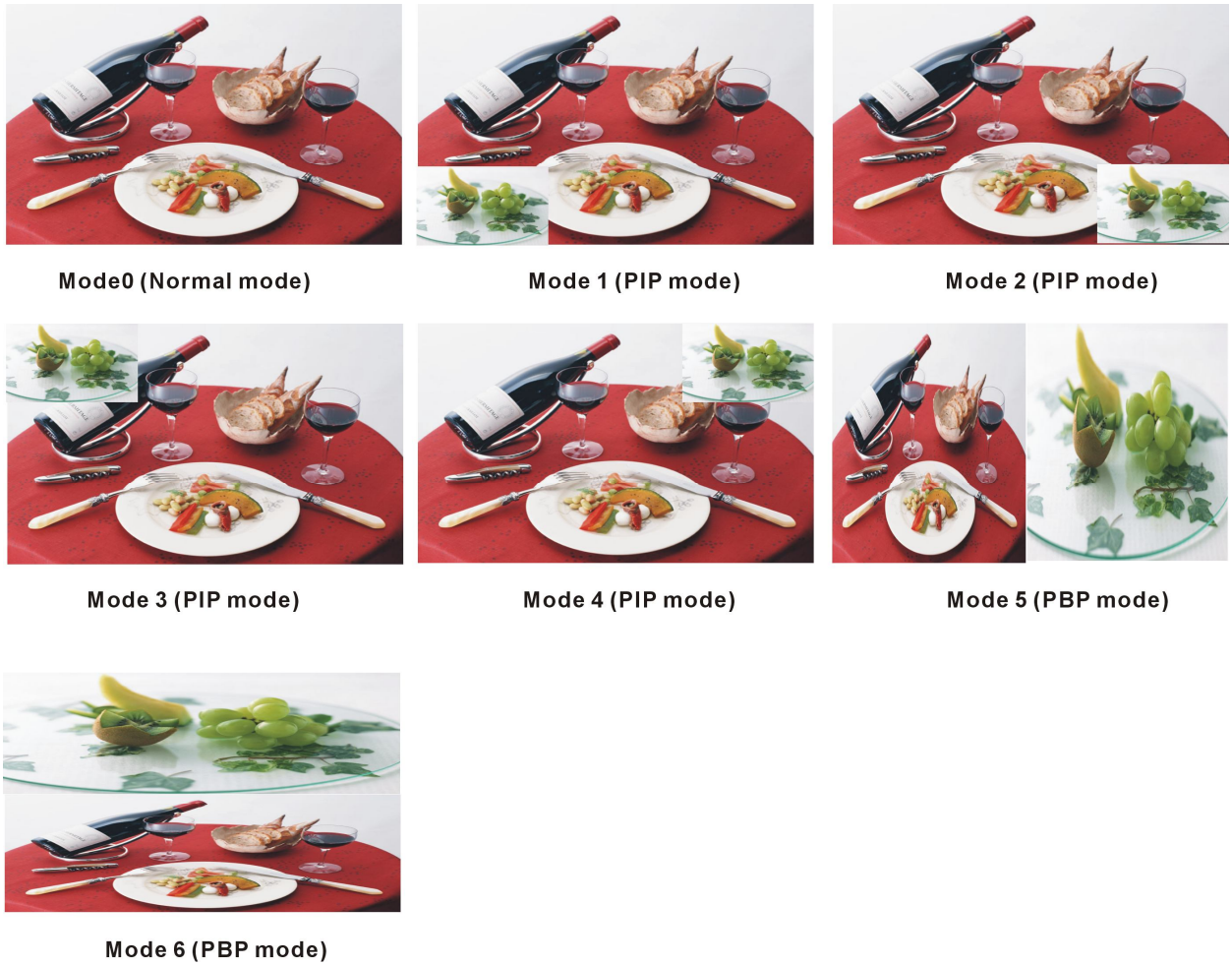


Figure 5-4 Display Modes for Full Aspect

▪ **6 display modes for the actual aspect:** (for reference)

Figure 5-5 Display Modes for Actual Aspect(4:3 video output to 16:9)

- **Normal Mode:** Only the main channel will be displayed – No PIP displays.
- **PIP Mode:** Shows you two channels simultaneously. Each of them is assigned to Main or Slave window individually.
- **PBP Mode:** The PBP Mode is split the screen into two equal pictures. The picture on the left side of your screen is the Main window (main channel) and the picture on the right side of the screen is the Slave window (slave channel). Or the picture on the top side of your screen is the Slave window (slave channel) and the picture on the bottom of your screen is the Main window (main channel).

☞ For PBP Mode, you have to adjust the PIP Mode located on the front panel of HRM-602P Switcher to No. 5 or 6/7. The PIP Mode No.7 is the same as No.6.

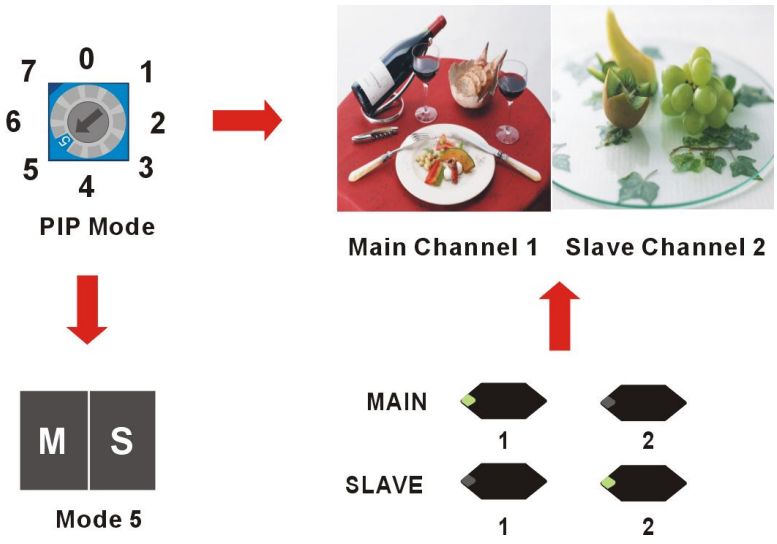


Figure 5-6 PIP Display for PBP Mode 5

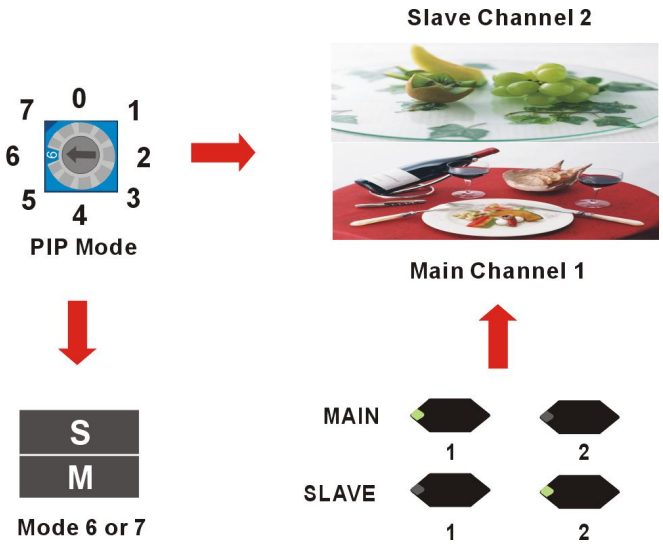


Figure 5-7 PIP Display for PBP Mode 6/7

- **IR:** Infrared receiver for the HRM-602P Switcher. The longest distance of your IR remote controller to receive the signals is about 12 meters.

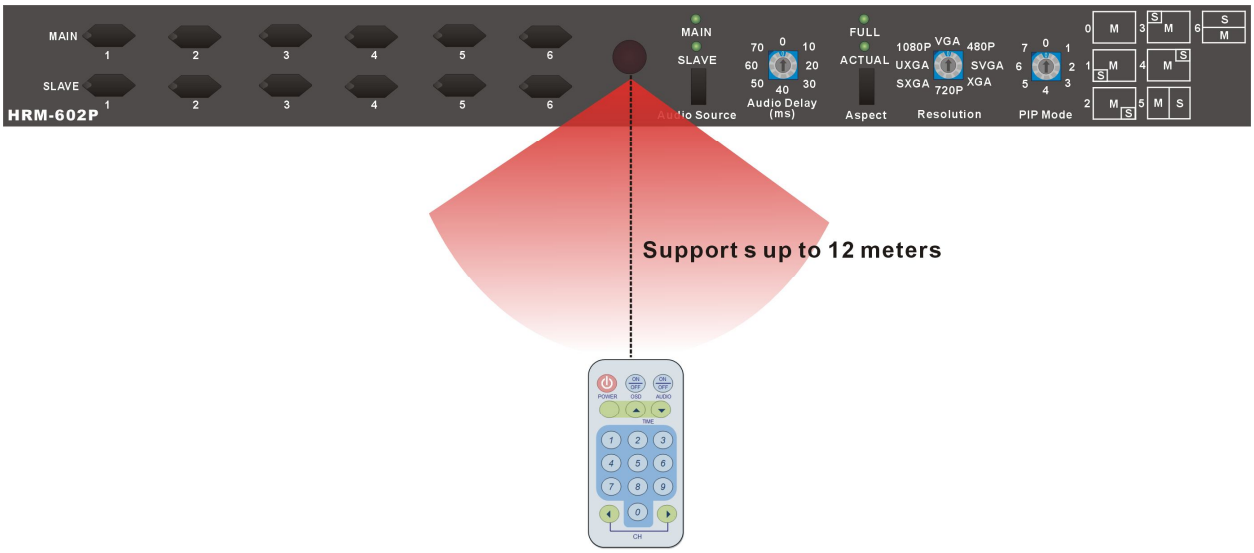


Figure 5-8 IR Receiving Distance

5.2 IR Remote Controller

Figure 5-9 IR Remote Controller

Main Channel Port selection:

Press the Number#1~6 button to select the channel to the Main channel.

Example: Press the “5” button on the Remote controller specified the input signal of the Main channel comes from the channel#5.

Slave Channel Port selection:

Press the “0” + Number#1~6 button to select the channel to the Slave channel.

Example: Press the “0” button on the Remote controller first, then press the “3” button to select the channel#3 input signal to the Slave channel. (Only available with PIP mode 1~7).

5.3 Rear Panel

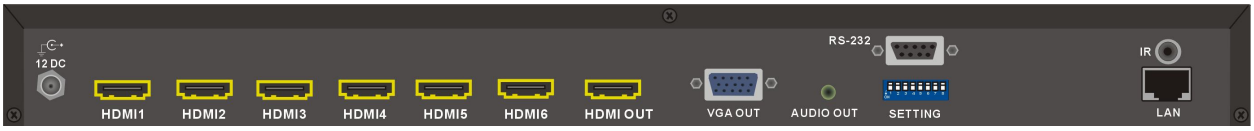


Figure 5-10 HRM-602P Switcher Rear Panel

The HRM-602P Switcher supports up to 6 input and 1 output jacks (HDMI Type A) on the rear panel, each female terminals separately form the signal input and output jacks. The signal input connector are numbered as “HDMI1~6” for signal input. The input terminals supply you to connect to different equipments including CD/DVD players, Blue Ray player, PS3, Video Camera, STB and so on. The output terminal with HDMI and VGA interface can be connected to projectors, video recorders, multiplexers and other displayers.

- **12 DC 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*.
- **HDMI1~6 connectors:** The HRM-602P Switcher Input connectors are connected to the DVDs, CD players, PS3 or other input sources.
- **HDMI OUT connector:** The HRM-602P Switcher Output connector is connected to the A/V, HDTVs or other output devices.

HDMI Type A Connector pin definition:

Pin #	Signal	Pin #	Signal
1	TMDS Data2+	11	TMDS Clock Shield
2	TMDS Data2 Shield	12	TMDS Clock-
3	TMDS Data2-	13	NC
4	TMDS Data1+	14	NC
5	TMDS Data1 Shield	15	DDC-SCL

6	TMDS Data1-
7	TMDS Data0+
8	TMDS Data0 Shield
9	TMDS Data0-
10	TMDS Clock+

16	DDC-SDA
17	DDC-Ground
18	+5V Power
19	Hot Plug Detect

- **VGA OUT connector:** The VGA OUT connector is connected to the Monitor, HDTVs or other output devices through a VGA cable.
- **AUDIO OUT port:** This port is connected to the speaker, microphone or other audio output devices
- **RS-232 connector:** Use a 9-pin RS-232 cable to connect both computer serial port (COM1 or COM2) and the HRM-602P's RS-232 communication connector, refer to *6.5.1 RS-232.* The computer can then be deployed to control the HRM-602P after installing of application software. Refer to *7.1 Software Introduction* for a software control or *Appendix C RS-232 Communication Protocol* for an individual configuration.
- **SETTING switcher:** Supports an eight pins DIP switcher for Switcher connection configurations. For more information, refer to *6.5 Ports and Switchers.*
  - Pin 1: IP Reset
  - Pin 2~3: RS-232/LAN
  - Pin 6~Pin8: ID
- **IR port:** This is used for connecting the IR Receiver. Refer to *6.3 IR EXT Connection.*

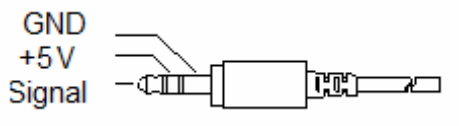


Figure 5-11 IR Receiver Pin Definition

- **LAN Port:** Use the RJ-45 connection cable to connect the Internet and the HRM-602P Switcher. The entire PC at the same network can control the HRM-602P Switcher through the LAN port. Refer to *6.5.2 LAN Port.*

CHAPTER 6 CONNECTIONS

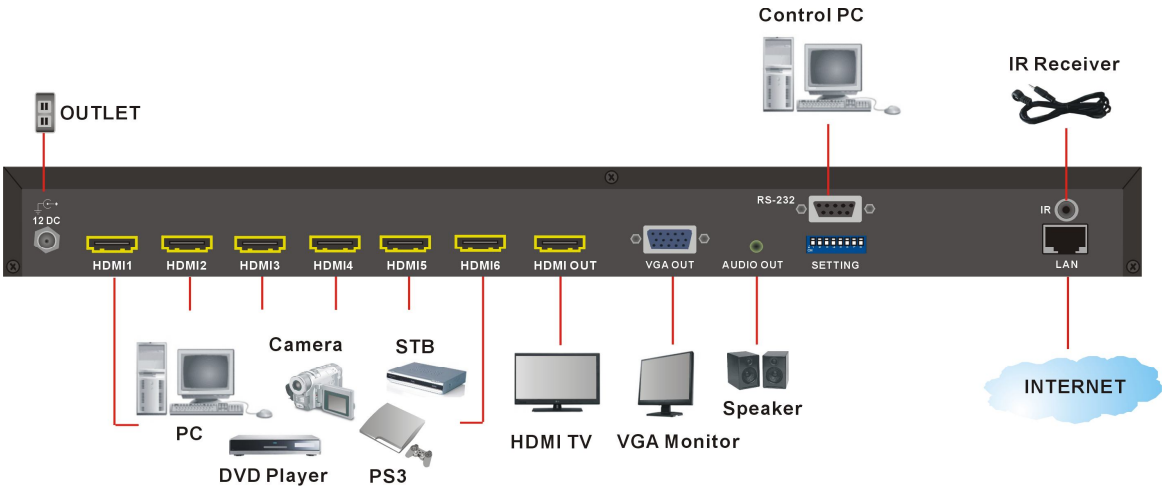


Figure 6-1 HRM-602P Connections

6.1 Input/Output Connections

Use the HDMI connecting cable to connect the Input HDMI connector (HDMI 1 ~ HDMI 6) to the HDMI connector of the CD/DVD player/Camera/PS3/STB/PC and output connector (HDMI OUT) to the HDMI connector of the HDMI TV, displays, multiplexers and so on.

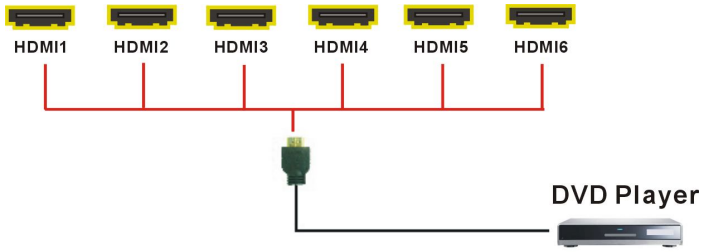


Figure 6-2 Input Connections

Figure 6-3 Output Connection

6.2 HDMI Switcher System 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 HRM-602P Switcher. The computer can then be used to control the HRM-602P Switcher after installing of application software. Aside from using the front panel keys for switching operation, you are also permitted to use the RS-232 connection port for a remote operation.

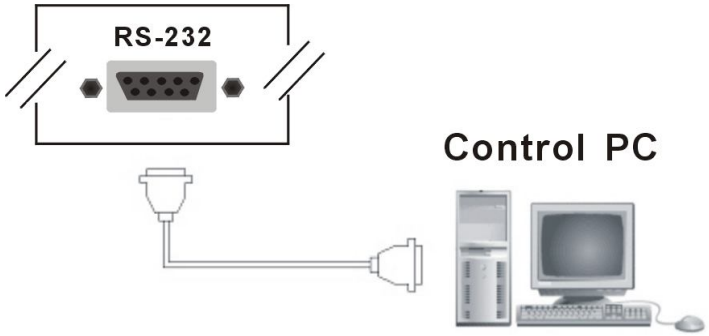


Figure 6-4 RS-232 and Control PC connection

The HRM-602P Switcher also supports a LAN port allows you to control all the series connection devices through PC Browser.

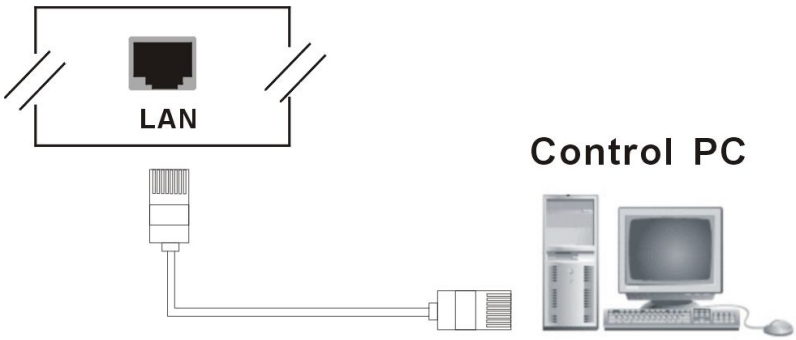


Figure 6-5 LAN port and Control PC Connection

☞ The HRM-602P Switcher supports RS-232 and LAN ports on the rear panel for a remote control and allows you to operate settings via the keys located on the front panel.

6.3 IR EXT Connection

The HRM-602P Switcher provides you an IR receiver for more convenient to react to the controller. If it is difficult for you to aim at IR receiver on the front panel due to the location of Switcher, please connect it to the IR EXT port located on the rear panel for optional position.

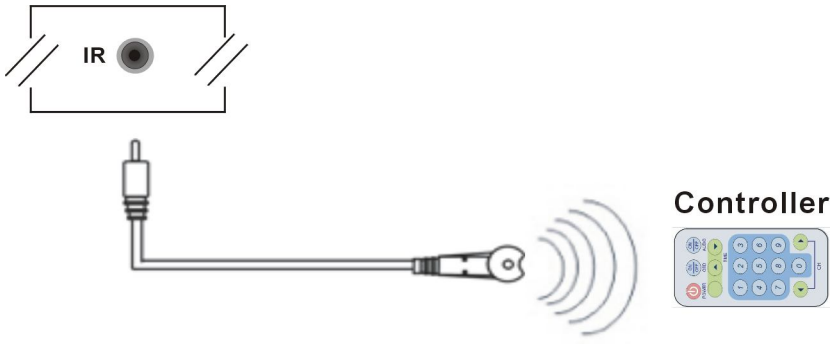


Figure 6-6 IR Extended Aiming

6.4 Power Connection

Use the included power cord to connect from the power port on the rear panel of the HRM-602P Switcher to the outlet.

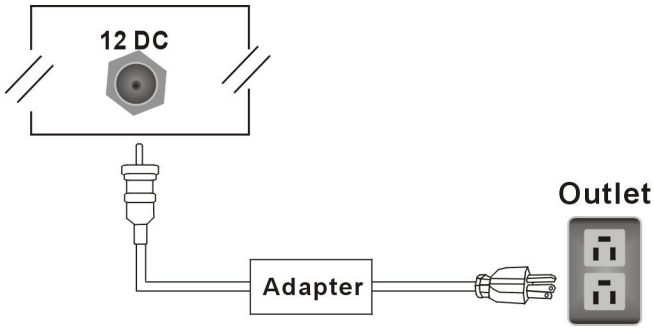


Figure 6-7 Power Connection

6.5 Ports and Switchers

The HRM-602P Switcher provides standard RS-232 serial communication port. Beside the front panel for key switching operation, you can also use the RS-232 serial communication port to carry out remote operation.

6.5.1 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

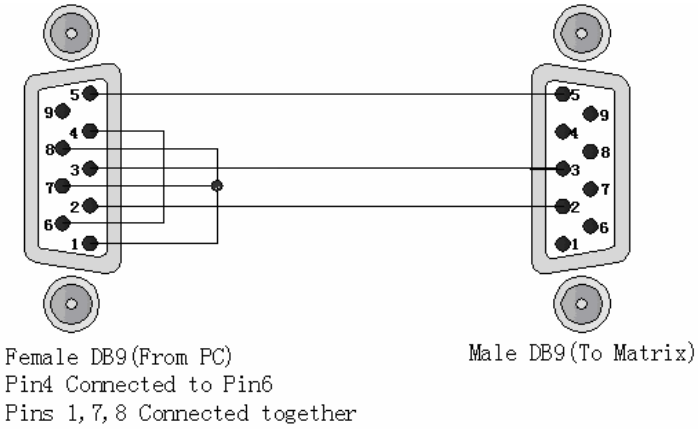


Figure 6-8 (a)

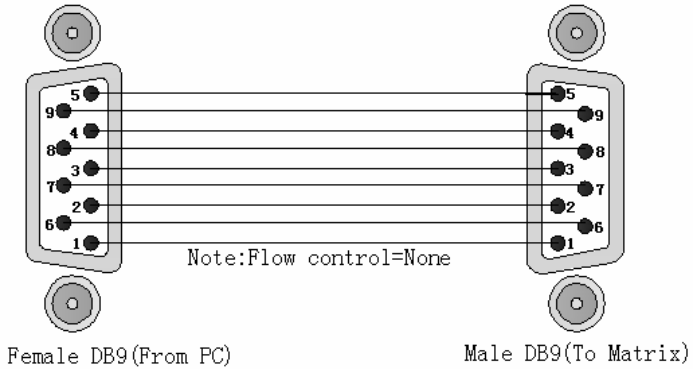


Figure 6-8 (b)

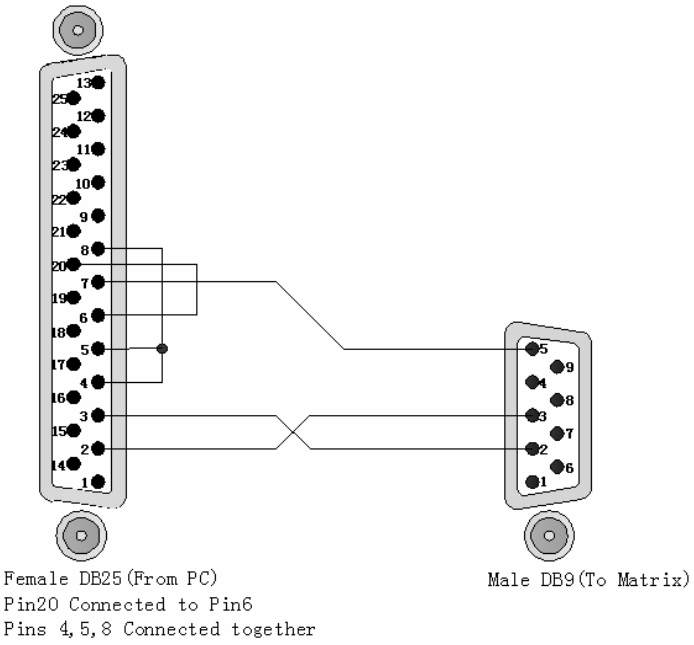
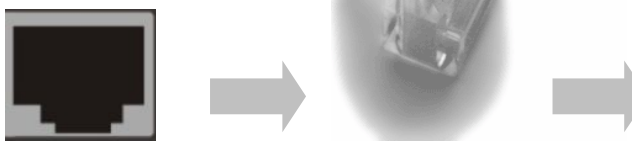


Figure 6-9

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

6.5.2 LAN Port

The HRM-602P Switcher 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.)



Pin	Pair	Wire	Color
1	2	1	white/orange
2	2	2	orange
3	3	1	white/green
4	1	2	blue
5	1	1	white/blue
6	3	2	green
7	4	1	white/brown
8	4	2	brown

Figure 6-10 LAN Port

6.5.3 DIP Switcher 8 Pins

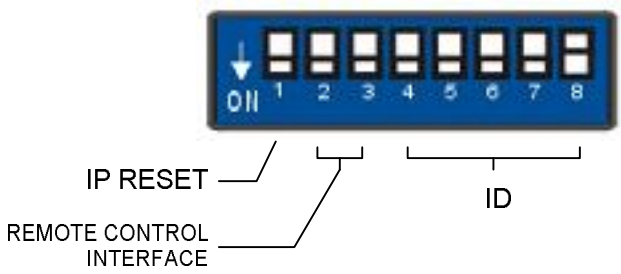


Figure 6-11 DIP Switch

A. DIP Switcher Pin 1: Reset the web server IP address to **192.168.0.3**

The steps are as below:

1. Please adjust the pin1 to ON and re-start the HRM-602P Switcher
2. After the HRM-602P Switcher re-starts about 10 seconds, shut down your equipment.
3. For a normal operation, please adjust the pin1 to OFF, then power on the HRM-602P Switcher again. The IP address will be restored to the default value: **192.168.0.3**

B. DIP Switcher Pin 2 to 3: Switch between RS-232 port and LAN port connection.

	SW3	SW2
LAN	ON	ON
RS-232	ON	OFF

C. DIP Switcher Pin 4 to 8: Switch to down (ON) is specified for “0”, on the other hand to up (OFF) is specified for “1”.

6.5.4 Device ID Settings

Device ID Settings

The Device ID determines the position of a Selector system. When multiple Selector products are connected to one PC or when the Selector products are serially connected, the Device ID decides which Selector 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:

Number Setting Table

ID Address (Decimal)	ID Address (Hexadecimal)	ID Address (Binary)	ON/OFF Switching Positions				
			SW8	SW7	SW6	SW5	SW4
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
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:

- Window98/2000/NT/XP operating systems
- 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 HRM-602P and PC

You must power off the HRM-602P 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 *6.5.1 RS-232*)

7.2 Switcher Configuration

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

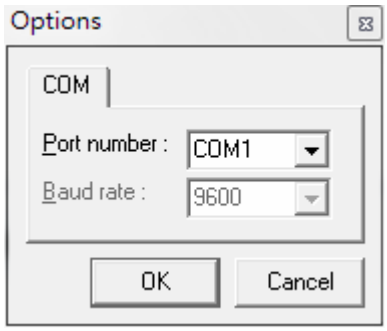


Figure 7-2 AV Matrix Options Window

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:

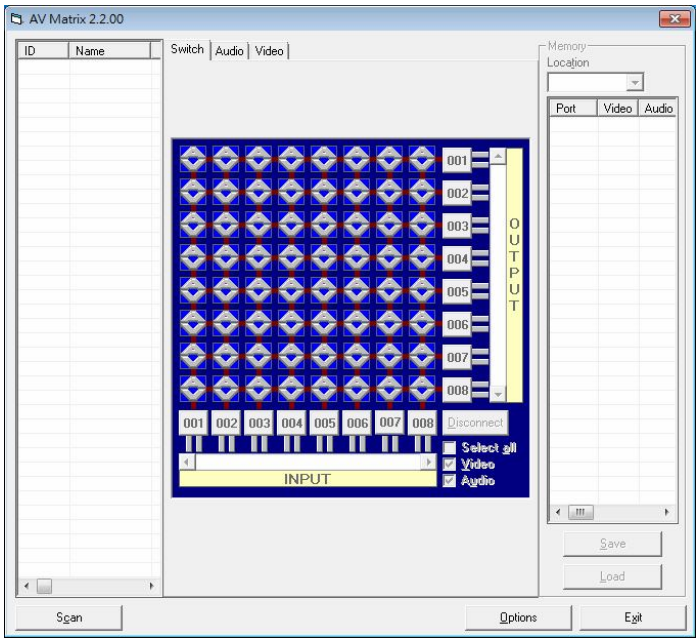


Figure 7-3《AV Matrix》Software Application Main Window

☞ 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 Switcher switching device.

Name: The name of Switcher switching device.

A/V: Specify the character of audio or video. Or both of audio and video are supported will show **"Video"**.

I/O: 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 selecting switching functions:

Example: Now there is an HRM-602P Switcher having all the input/output ports properly connected to the equipment. If you want to set channel 1 input to channel 2, 3 and 4 output; channel 3 inputs to channel 1 output. There are 2 ways to implement the switching. 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:

Step 1: First 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 **"Input"** 001 and **"Output"** 002, 003 and 004 switching.

Step 2: First select the **"Output"** number key 001 to the right of the blue configuration area, and select the **"Input"** number key 003 to the bottom. Then, press the previously selected **"Output"** number key 001. This way, you have selected Input 03 and Output 001 switching.

Upon completion of the above steps, you have actually completed the switching operation of having channel 1 input to channel 2, 3 and 4 outputs while at the same time successfully switched from channel 3 input to channel 1 output.

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

Switch Tab: Click **"Switch"** tab to show the main configuration window.

Video Tab: Click the **"Video"** tab to show the video related configuration window. For more information.

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 001~016.

Video check box: Used for video 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 (a) below:

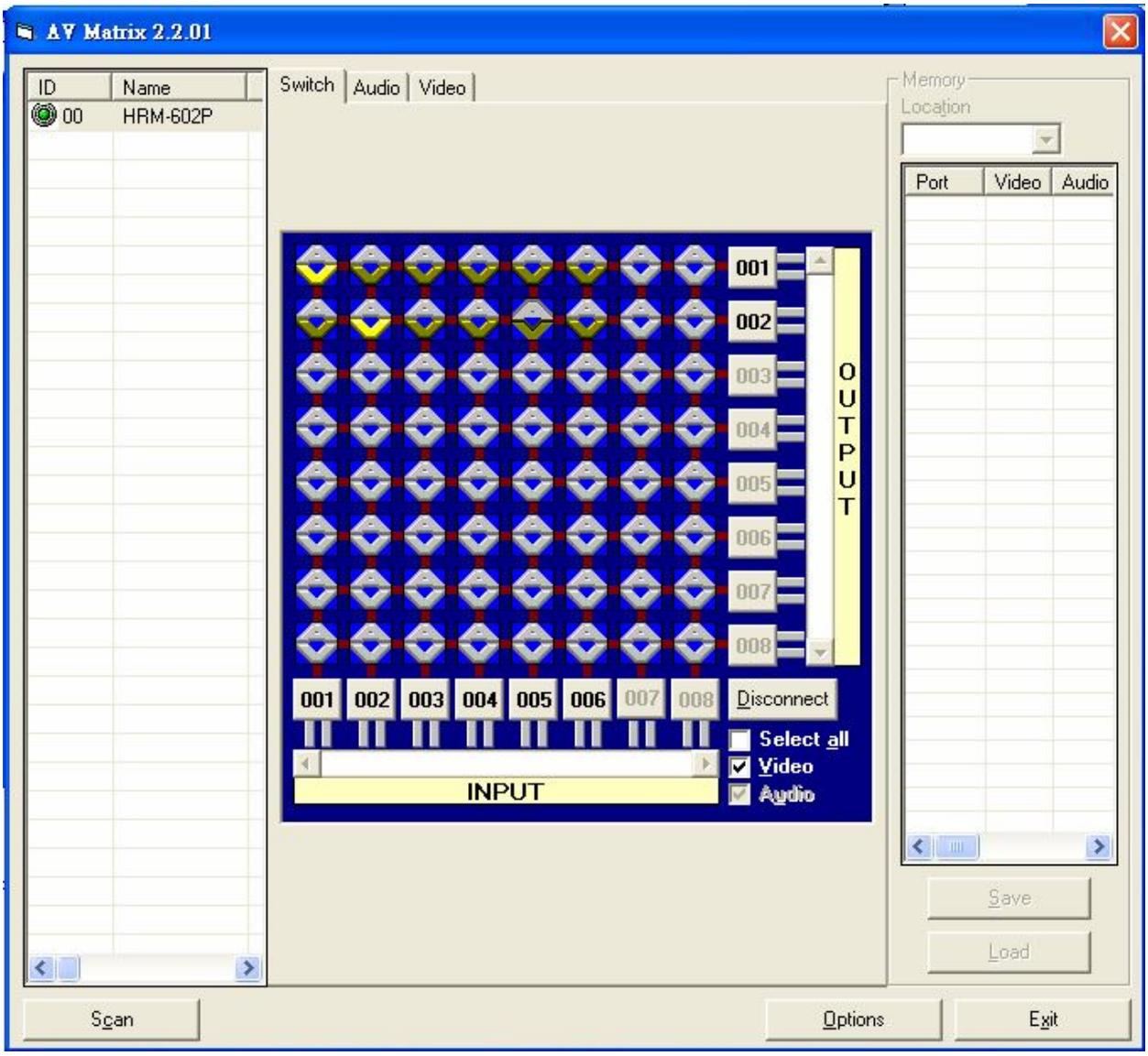
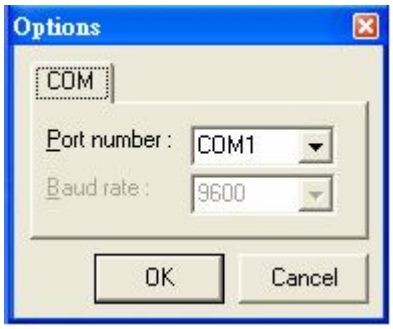


Figure 7-4 Disconnect Function Key (a)

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）



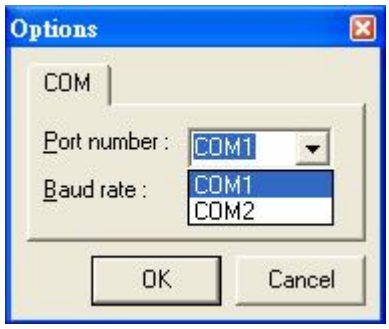


Figure 7-5 Options（a） **Figure 7-5 Options（b）**

Function Description:

Linking Methods: In **"Port number"** select one of the COM ports as shown in Figure 7-5（b）for a 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 C 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:

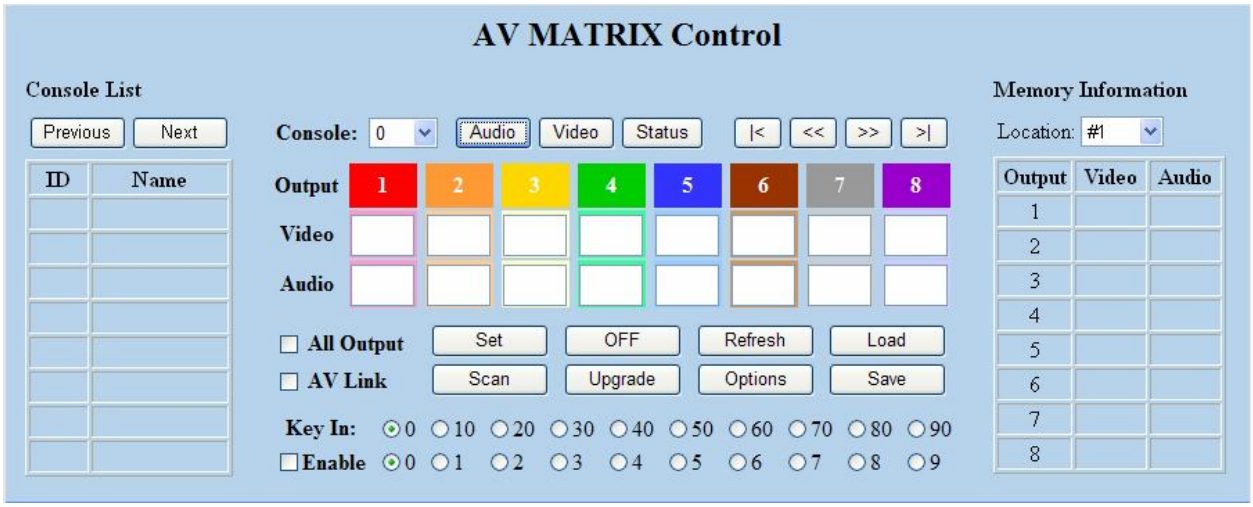


Figure 7-6 LAN Web Configuration Window

☞ HRM-602P Switcher is integrated HDMI switching equipment. You can only key in the Output Channel No. into the **Video** field for configuration.

☞ HRM-602 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 HRM-602P 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 the connections of your Switching device 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 B 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.

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 **"5"** value in the channel 1 output. Click anywhere on the window, the all channels output will become **"5"** 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. For HRM-602P Switcher is useful from 1 to 16 values upon 16 output ports.

Previous and Next: If the connections of your Switching devices are over to 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.

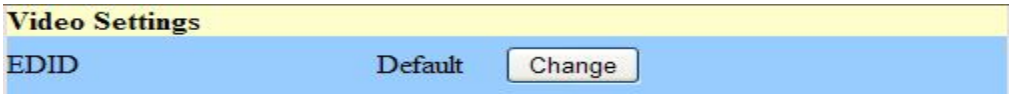


Figure 7-9 Video Configurations – Default port used

☞ 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.

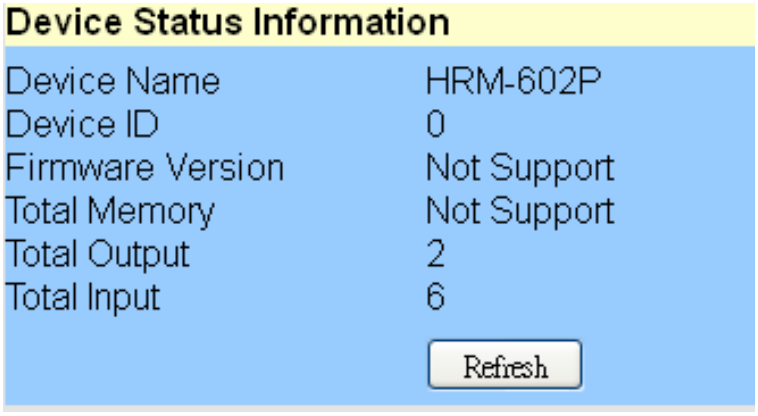


Figure 7-12 Device Status Information

7.3.2 LAN Main Operation

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

In PIP mode 0, only output 1 is available.

Switch channel In PIP mode 1~6:

- **Output 1 is Main channel of the HRM-602P.**
- **Output 2 is Slave channel of the HRM-602P.**

Example: Now there is an HRM-602P Switcher having all the input/output ports properly connected to the equipment. If you want to set channel 4 input to output 1; channel 3 inputs to output 2.

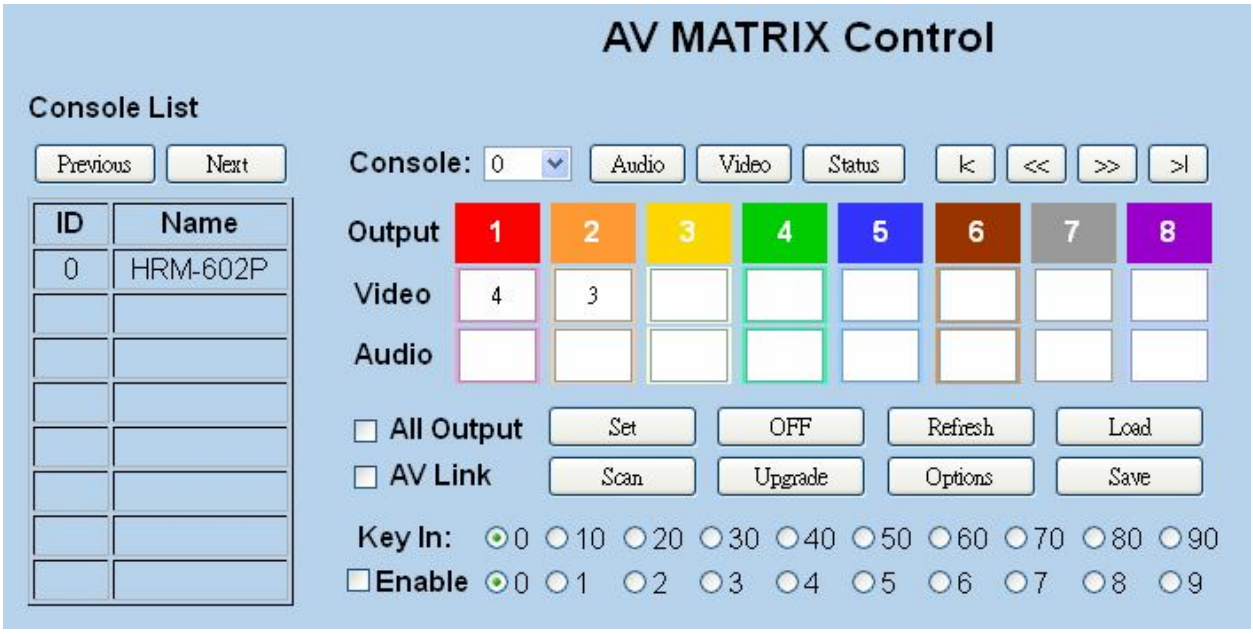


Figure 7-13 AV Matrix Control

Step 1: For channel 1 Output, please key in the value **"4"** in the **Video** fields.

Step 2: For channel 2 Output, please key in the value **"3"** in the **Vide** fields.

Step 3: Click **"Set"** button.

Upon completion of the above 3 steps, you have actually completed the switching operation of having channel 4 input to channel 1 output while at the same time successfully switched from channel 3 input to channel 2 output.

7.3.4 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 as shown in Figure 7-14

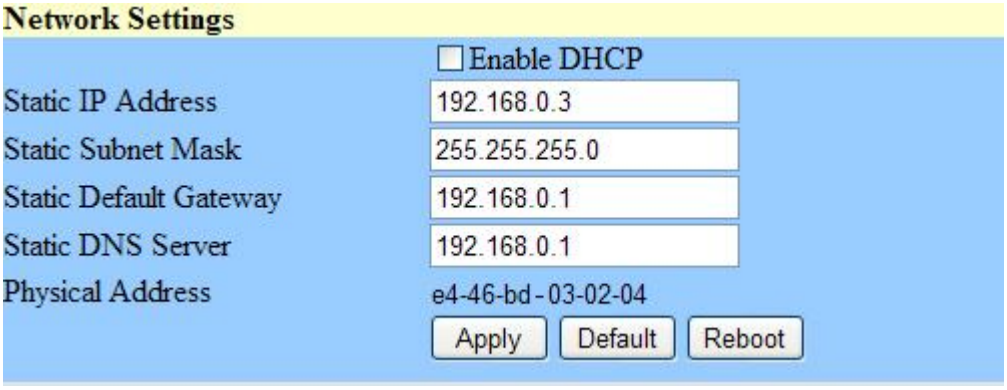


Figure 7-14 Network Settings

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.

7.3.5 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 7-15. 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: HRM-602P 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.

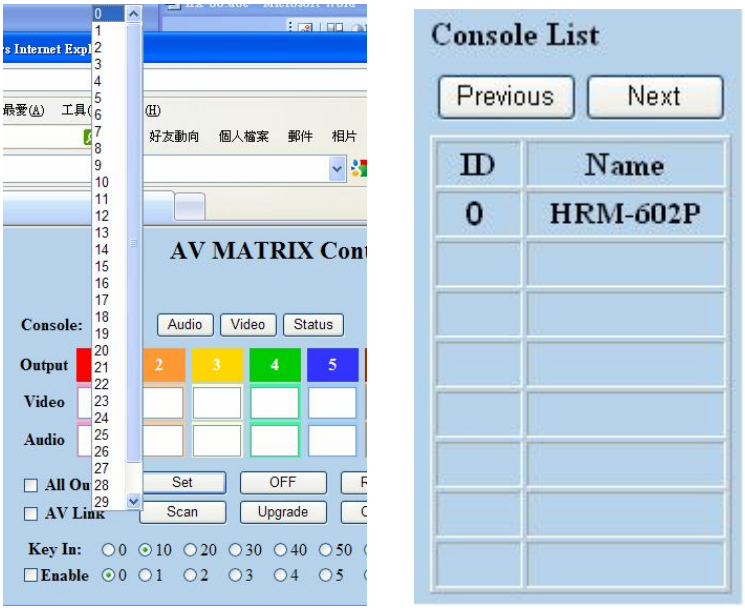


Figure 7-15 Other Application

CHAPTER 8 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 HDMI Switcher front panel keys switching not responsive?

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

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

Answer: **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 6.5.4 Device ID Settings.

4. What to do if the corresponding audio signal fails to output during HDMI Switcher switching?

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 HDMI 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 Switcher 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?

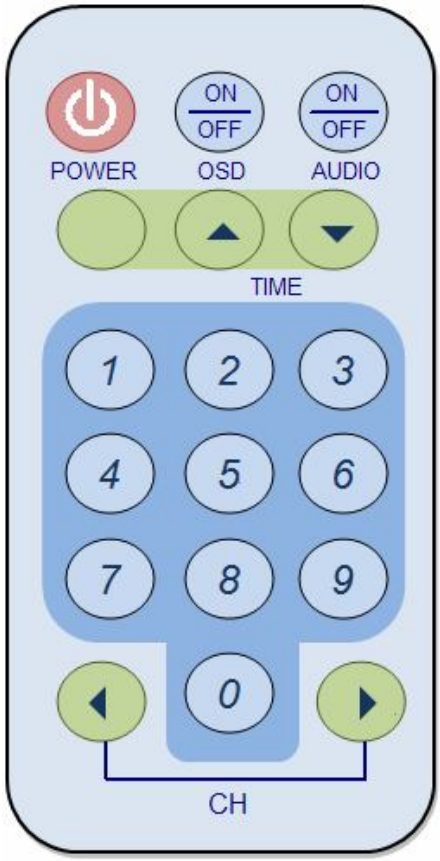
Answer: Place the equipment in a ventilate location. If it is still not to be improved, please check with the build-in fan whether is damaged. Or contact your agency for helping.

9. What to do if IR function failure occurred?

Answer: Check the remote controller is 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 IR CONTROLLER

The HRM-602P Switcher supports a remote controller allows you to remote switch which Input signal by passing through to current output with an extended connection - IR receiver/transmitter. The signal for controller is only available to the IR receiver connected to the IR hole located on the rear panel.



Main Channel Port selection:

Press the Number#1~6 button to select the channel to the Main channel.

Example: Press the “5” button on the Remote controller specified the input signal of the Main channel comes from the channel#5.

Slave Channel Port selection:

Press the “0” + Number#1~6 button to select the channel to the Slave channel.

Example: Press the “0” button on the Remote controller first, then press the “3” button to select the channel#3 input signal to the Slave channel. (Only available with PIP mode 1~7).

APPENDIX B FIRMWARE UPGRADE

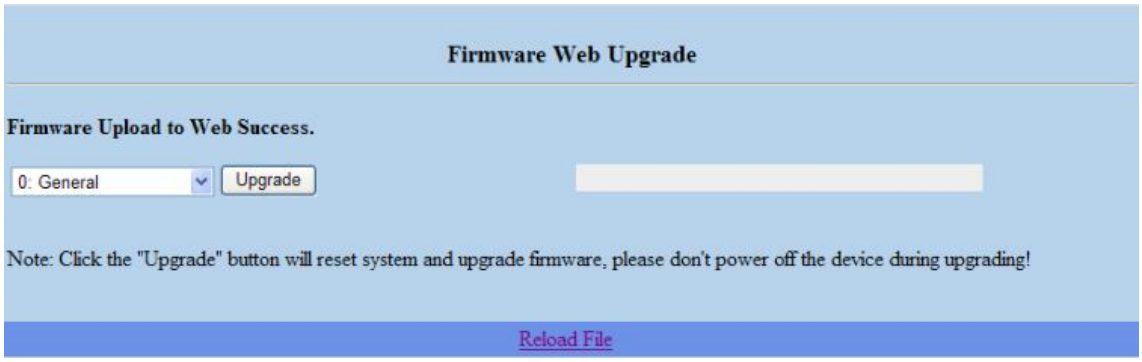
This Chapter will introduce you how to upgrade firmware on your web browser. For firmware upgrade, you have to upload the firmware file to your web server and then upload it to your device from web server.

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.

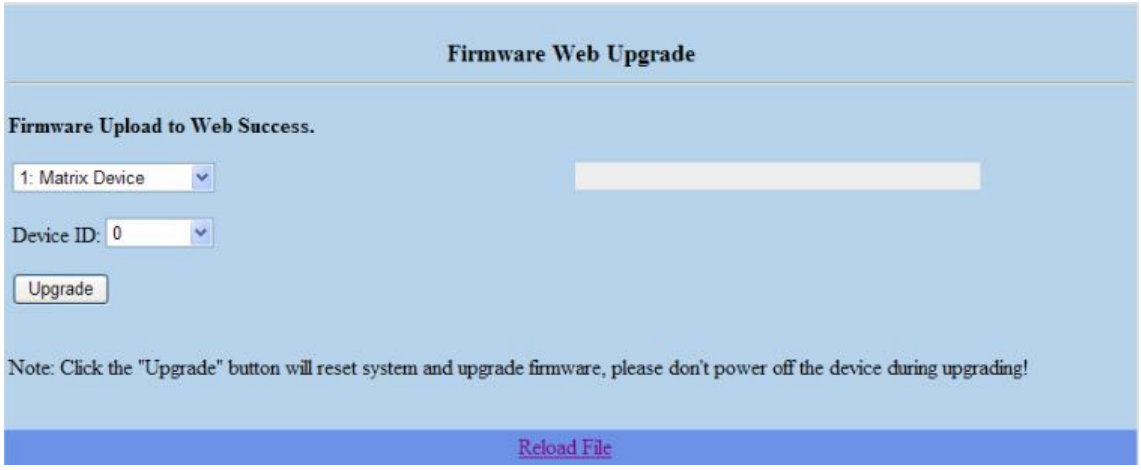
2. Click **"Browser"** to select upgraded .bin firmware, then click **"Upload"** to upload the firmware to web server.

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

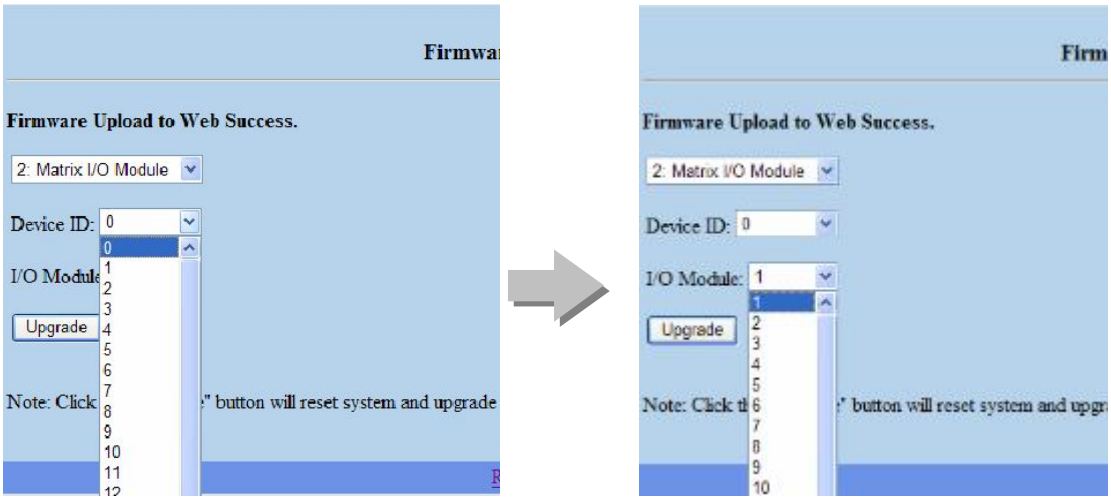


☞ For **0: General** selecting, you have to adjust the switcher ID on the real panel to **"0"** that means the device with ID **"0"** will be upgraded.

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



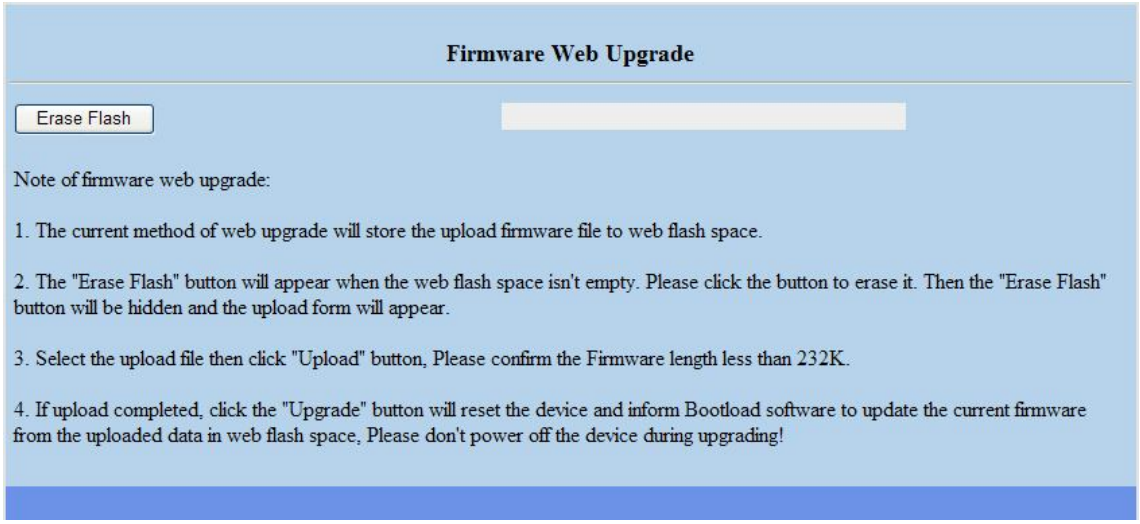
5. Select **"2: Switcher I/O Module"** will allow you to upgrade I/O modules. You have to decide which device you want to configure, and then select the suitable Device ID and I/O Module from the drop-down menu. Click **"Update"** to upgrade.



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 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.



APPENDIX C 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 ms, and byte to byte timeout is 30ms.

Use the RS-232 connecting cable to connect the computer serial port to the RS-232 communication port of the Switcher device. The computer can control the Switcher 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 – x is allowed to be stored.
4. Use 0x3F to confirm the device connected is properly and supported commands.

D-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: Switch Settings only 2: Video/Audio Settings only
-	Don’t care

D-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

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

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		
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)

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

D-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 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)