AVLINK™

User Manual

Matrix Switcher
4x4 / 6x2
HX-2544 / HX-2562

V.2016HX-254462.00

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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 if necessary.

- Make sure all equipments installed on the rack including power strips and other electrical connectors are properly grounded.

- Only use the power cord supported with the device.

- Do not use liquid or aerosol cleaners to clean the device.

- Always unplug the power to the device before cleaning.

- Unplug the power cord during lightning or after a prolonged period of non-use to avoid damage to the equipment.

- Do not stand on any device while installing the device to the rack.

- Do not attempt to maintain the device by yourself, any faults, please contact your vendor.

- Save this manual properly for future reference.

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CHAPTER 1 OVERVIEW

1.1 Introduction

The HX-2544/2562 Matrix switcher is a high performance HDMI switching equipment combining with video and audio. It is used for input/output cross switching of image signals. It can also transmit images input separately to each multi-output equipments, thereby minimizing signal attenuation and ensuring high definition, integrating high fidelity graphics and audio signal output.

The HX-2544/2562 is used mainly in TV broadcasting projects, multi-media conference halls, and large display projects, TV teaching and command control centers. It boasts features of power interruption protection during power surge, LCD display and synchronous and integrate audio/visual switching functions. HX-2544/2562 supports 4 to 4/6 to 2 HDMI Type A for input and output connectors. Beside it also supports RS-232 and LAN communication ports enable convenient communication with remote control equipment to switch the image signals.

Figure 1-1 HX-2544

Figure 1-2 HX-2562

1.2 Packing

Or	HDMI Matrix Switcher x 1 (HX-2544 or HX-2562)
	Power Adapter x 1 - HX-2544: 12V/5A - HX-2562: 12V/1.25A
	RS-232 Communication Connected Cable x 1
	LAN Line x 1
	HDMI Cable x 1
	IR Receiver Cable x 1
	IR Blaster Cable x 1
	Matrix Switcher Remote Controller x 1
	AAA Battery x 2
	User Manual x 1
	Rack-Mount Bracket x 2
	Screws (for Brackets) x 6

CHAPTER 2 FEATURES

- Support 4x4 or 6x2 fixed I/O interfaces
- Mixed use HDMI cables for input and output connections
- HDCP Compliant
- Support HDR
- EDID management (Copy from OUT port 1)
- Memory control can up to 4 sets
- Support resolution up to 4K x 2K@60Hz (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)
- Fast response time for channel switch
- IR pass-through supports all IN and OUT ports
- IR pass-through supports all kinds of IR frequency band
- IR pass-through supports duplex transmission between IN and OUT ports
- IR pass-through switch is based on HDMI switched by controller
- Support IR remote control
- Support IR Mini-Controller to select the input channel through Output configuration
- Support RS-232 remote control
- Support Ethernet remote control
- 1U rack

CHAPTER 3 SPECIFICATIONS

Hardware	
Input Connector	HX-2544: HDMI Type A x 4 HX-2562: HDMI Type A x 6
Output Connector	HX-2544: HDMI Type A x 4 HX-2562: HDMI Type A x 2
RS-232 Connector	DB9 Female
LAN Connector	RJ45
8 Pins Dip Switcher	1
LCD Module	1
Power	HX-2544: DC 12V/5A HX-2562: DC 12V/1.25A
3.5 Jack	16
Housing	Black Aluminum
Mounting	1U Rack mountable
Weight	HX-2544: 2520g HX-2562: 2420g
Dimensions (LxWxH)	440x185x42mm
Multimedia	
Max. Resolution	4K x 2k@60Hz (8-bit)
Highest TMDS Frequency	600MHz
Control Information	
HDMI Cable Distance	At least 10 meter
Baud Rate	9600 bps; 8 data bits, 1 stop bit, no parity
Ethernet Protocol	Telnet, HTTP, DHCP, TCP/IP, ICMP (ping)
Control Sequence	Matrix
Remote Control	IR Receiver, IR Blaster
Web Server	LAN, RJ45

CHAPTER 4 INSTALLATION

The Matrix Switcher has a black metallic housing. It can be placed on a sturdy desk directly or installed on a 19-in bracket. You can also use the rubber feet pasted on the bottom of the chassis to protect your device when you want to place the device on a working desk.

Figure 4-1 HX-2544 with 1U Rack-Mount

Figure 4-2 HX-2562 with 1U Rack-Mount

Use the screws provided with the rack and a screw driver to firmly tighten the device in the rack to prevent working lose due to vibration on the rack.
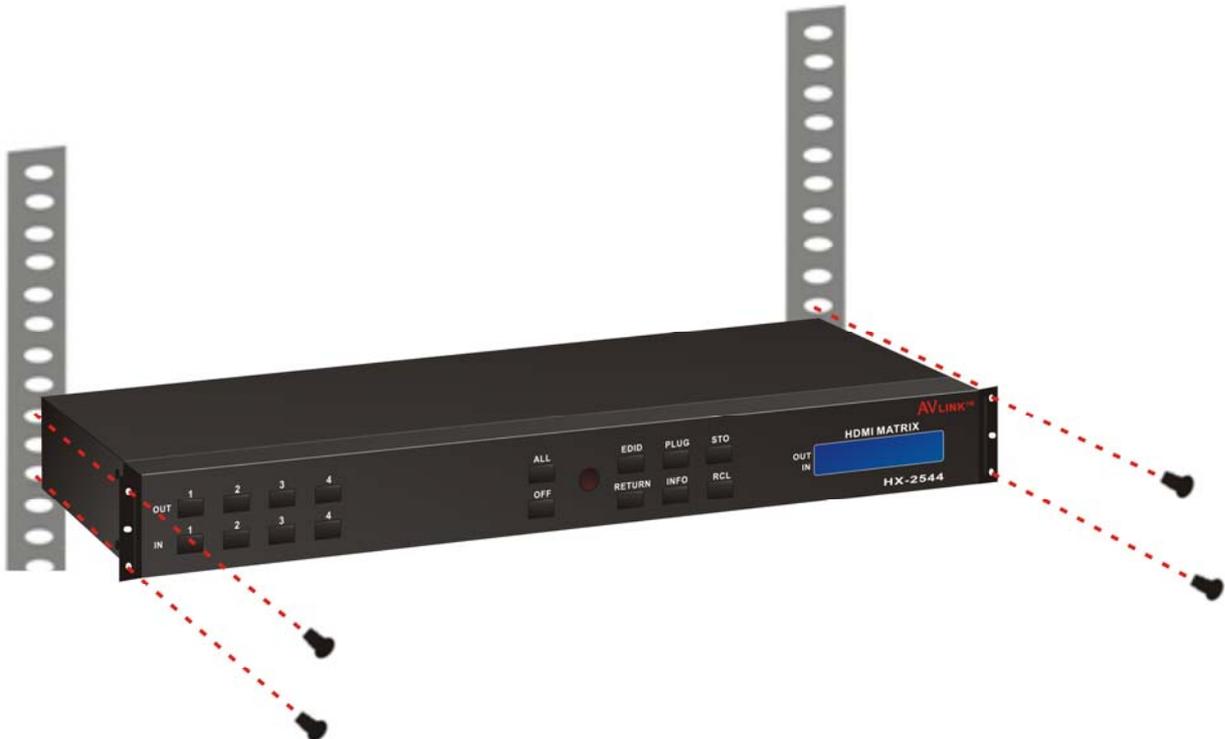
Figure 4-3 Mount the Device in the Rack

CHAPTER 5 FRONT/REAR PANELS

5.1 Front Panel

HX-2544 supports up to 4 Input and 4 Output switching keys on the Front Panel allowing you to switch signal quickly.

Figure 5-1 HX-2544 Front Panel

HX-2562 supports up to 6 Input and 2 Output switching keys on the Front Panel allowing you to switch signal quickly. Also refer to *Chapter 8 Operation Examples* about below descriptions.

Figure 5-2 HX-2562 Front Panel

- **OUT keys** (output channel)**:** Specify the Channel for HDMI signal output. These keys configure the status or access the settings; you can also use these keys to switch output channels.

- **IN keys** (input channel)**:** Specify the Channel for HDMI signal input. Use these keys to switch the connected input channels or use them to instead of number keys upon memory selections.

- **ALL:** This key allows user to set single input channel to all output channels. The usage of **"ALL"** key is the same as output key.
    - Press the **"ALL"** key.
    - Select the one of the IN keys.
    - The selected **IN x** key will transfer the input signal to all output channels.
    - You can also press the **"ALL"** key and then press the **"OFF"** key to disable all the displayed switching settings.

- **OFF:** Disable the entire output channels. Press one of the **OUT x** keys that want to be disabled for the output channel, then press the **"OFF"** key. Likewise, press the

"**ALL**" key and then press the "**OFF**" key to disable all the displayed switching settings. In addition to switching port menu, press "**OFF**" key can return to the main screen during implementing in other menu.

- **EDID: FHD** (fix mode) and **OUT1** (access the first output channel) selection key.
    - **FHD Mode:** The Matrix Switcher supplies a set of fixed **EDID** values to support up to only 1080P high performance TV.
    - **OUT1 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.
    - **4K30 Mode:** Set the output resolution to 4K30.
    - **4K60 Mode:** Set the output resolution to 4K60.

- **RETURN:** Press this key to go back to main screen.

- **PLUG:** Press this key to show you the status of all HDMI IN/OUT Type A jacks on the rear panel. If the HDMI IN/OUT jack is connected, it will appear "**O**" on the screen. Alternatively, it will appear "**X**" specified the HDMI IN/OUT jack is unused.

- **INFO:** This key can show you the ID, IP address and In/Out port information.

☞ Press **PLUG** and **INFO** keys simultaneously to show you the firmware versions of modules.

- **STO:** The "**Store Key**" saves all current output/input corresponding relations up to 4 sets for a memory control.
    - Press the "**STO**" key firstly.
    - Arrange the Output and Input channel combinations.
    - The relations among all settings will be saved in the memory permanently.

- **RCL:** The "**Retriever Key**" retrieves all settings that are saved in the memory.
    - Press the "**RCL**" key firstly.
    - Then press the previously saved output channel key
    - The system will retrieve the saved all status and implement current status switching if the previously saving channel is selected.

☞ Press and hold **STO** and **RCL** keys simultaneously at least 1 sec. to restore to factory default values.

- **IR Receiver:** Infrared receiver can receive signals from the Matrix Switcher Remote Controller.

- **LCD:** LCD display shows current Matrix Switcher status and operation status.

5.2 Rear Panel

HX-2544 supports up to 4 input and 4 output HDMI Type A jacks on the rear panel, each female terminals form the signal input/output jacks. The HX-2544 signal input/output terminal channels are numbered as IN1~4/OUT1~4 channels.

Figure 5-3 HX-2544 Rear Panel

The HX-2562 supports up to 6 input and 2 output HDMI Type A jacks on the rear panel, each female terminals form the signal input/output jacks. The HX-2562 signal input/output terminal channels are numbered as IN1~6/OUT1~2 channels. The input terminal channels supply you to connect to different equipment including Blu-ray/DVD players, graphics workstations, and number displays. The output jacks allow you to connect to projectors, video recorders, displays and multiplexers and so on.

Figure 5-4 HX-2562 Rear Panel

- **Power Port:** The Power Port is applicable for DC12V connected to the outlet of power source. Refer to *6.5 Power Connection*.

- **RS-232:** Use a 9-pin **RS-232** cable to connect both computer serial port (COM1 or COM2) and Matrix Switcher **RS-232** communication port, refer to *6.2.1 RS-232*. The computer then can be deployed to control the Matrix Switcher after installing of application software. Refer to *Appendix C RS-232 Communication Protocol* for an individual configuration.

- **LAN Port:** Use the RJ45 connection cable to connect the Internet and the Matrix Switcher. The entire PCs at the same network can control the Matrix Switcher through the LAN port. Refer to *6.2.2 RJ45 LAN Port.*

- **Switchers:** Matrix Switcher supports 8 pins DIP for connected configurations. For more information, refer to *6.6 DIP Switcher*

▪ **IR EXT:** This is used to connect the IR Receiver Cable for the Matrix Switcher Remote Controller. Refer to *6.4 IR EXT Connection*.

▪ **IN1~4 (HX-2544) or 1~6 (HX-2562):** Matrix Switcher Input jacks are connected to the Blu-ray players, DVD players, STBs or other source devices.

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+		

▪ **OUT1~4 (HX-2544) or 1~2 (HX-2562):** Matrix Switcher Output jacks are connected to HDTVs, projectors or other sink devices connection.

▪ **IR TX 1~8 Ports:** Used to connect to the IR Blaster Cable for IR pass-through.

IR Blaster Pin Definitions:
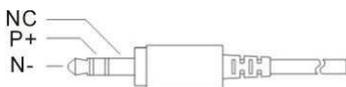
▪ **IR RX 1~8 Ports**: Used to connect to the IR Receiver Cable for IR pass-through.

IR Receiver Pin Definitions:
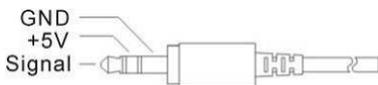
CHAPTER 6 CONNECTIONS
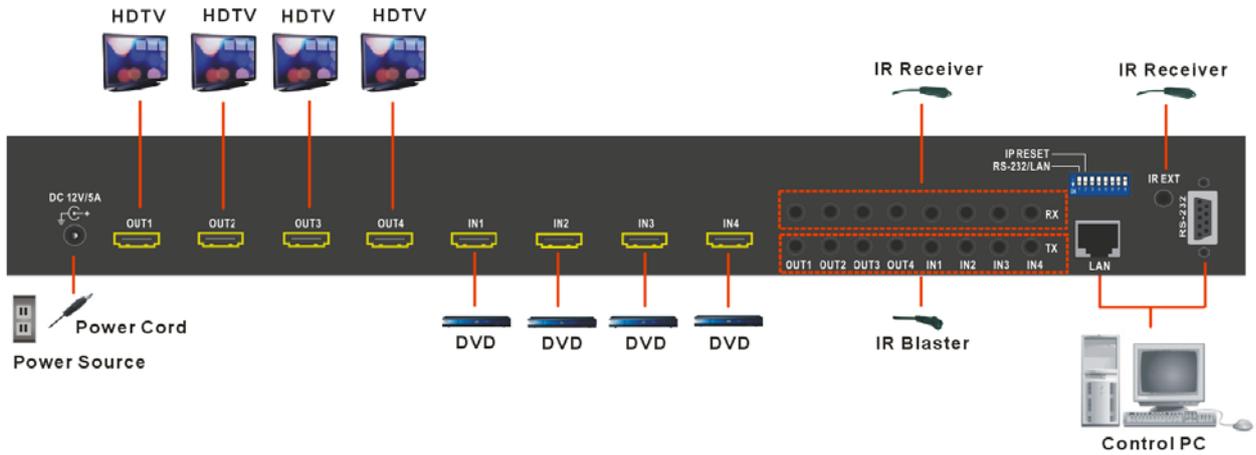
Figure 6-1 HX-2544 Connections
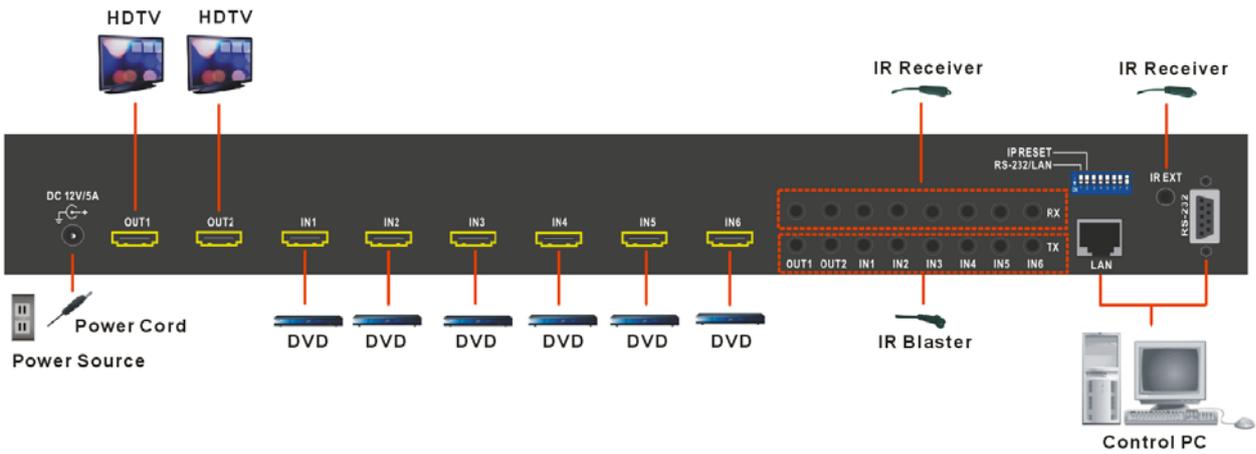
Figure 6-2 HX-2562 Connections

6.1 Input/Output Connections

Use the HDMI connecting cable to connect the Input/Output serial jack (IN1 ~ IN4 or 6) to the HDMI jack of the Blu-ray/DVD player/graphics workstations/number displays.
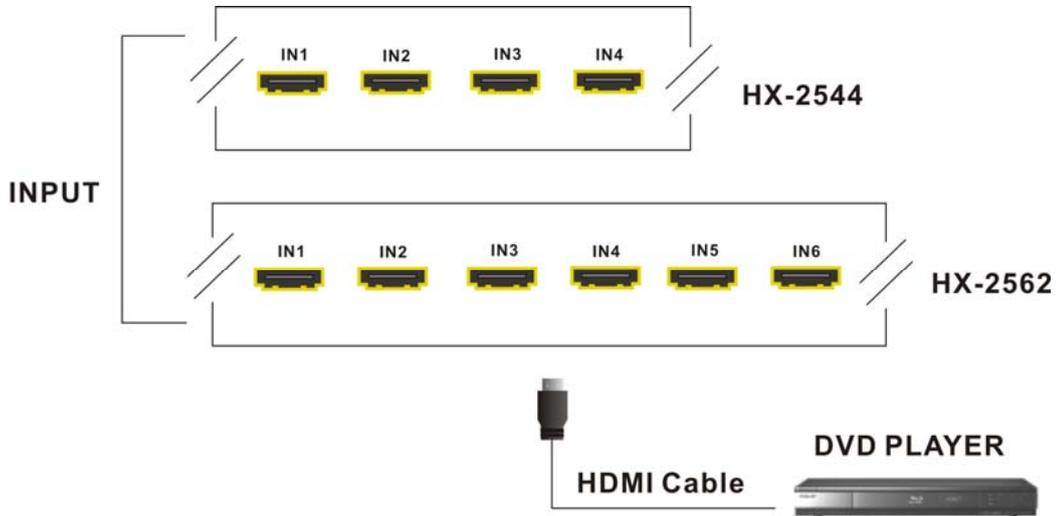
Figure 6-3 Input Connections
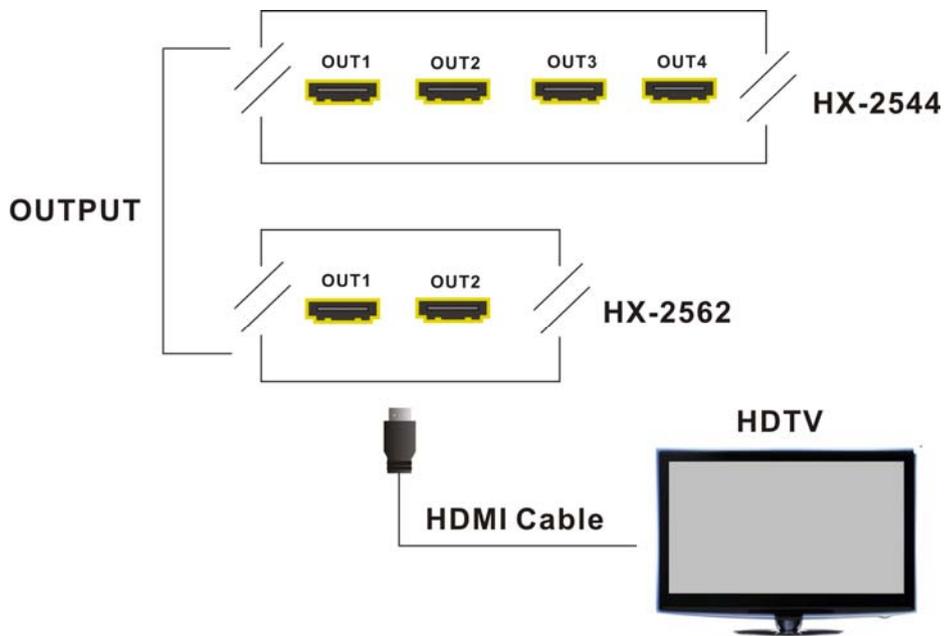
Figure 6-4 Output Connections

6.2 Matrix Switcher Remote Control

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

6.2.1 RS-232

Use the RS-232 connecting cable to connect the computer serial communication port (COM1 or COM2) to the RS-232 communication port of the Matrix Switcher. The computer can then be used to control the Matrix Switcher after installing of application software. Aside from using the front panel keys for switching operation, you are also permitted to use the RS-232 connection port for remote operation.
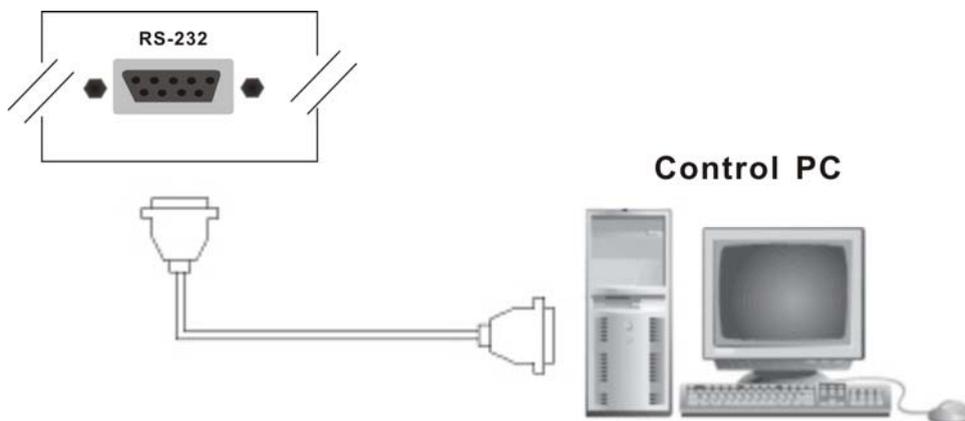
Figure 6-5 RS-232 and Control PC Connection

The RS-232 Pin functions are described as below:

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

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

Female DB9(From PC)
Pin4 Connected to Pin6
Pins 1,7,8 Connected together
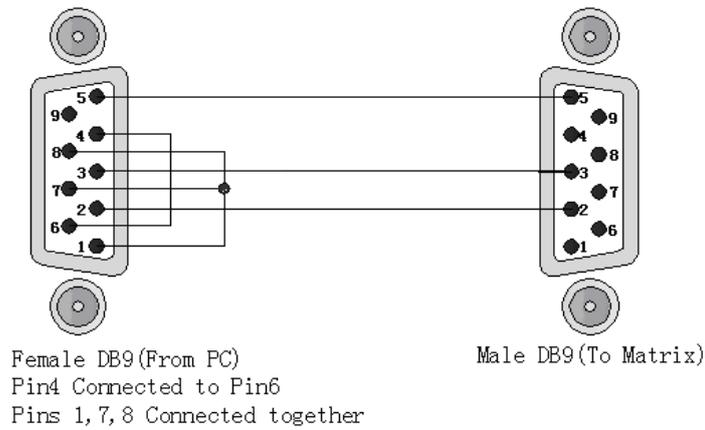
Male DB9(To Matrix)

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

Note:Flow control=None

Female DB9(From PC)
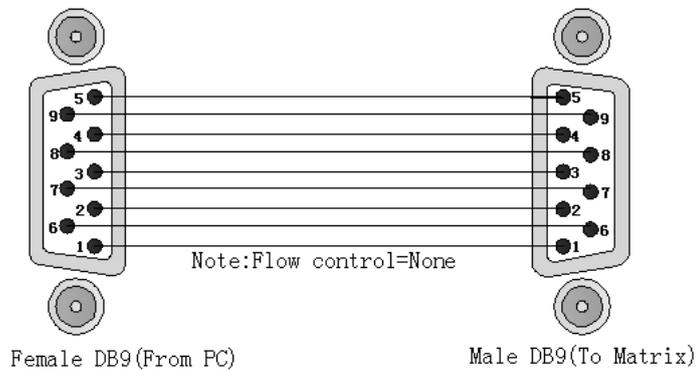
Male DB9(To Matrix)

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

Female DB25(From PC)
Pin20 Connected to Pin6
Pins 4,5,8 Connected together
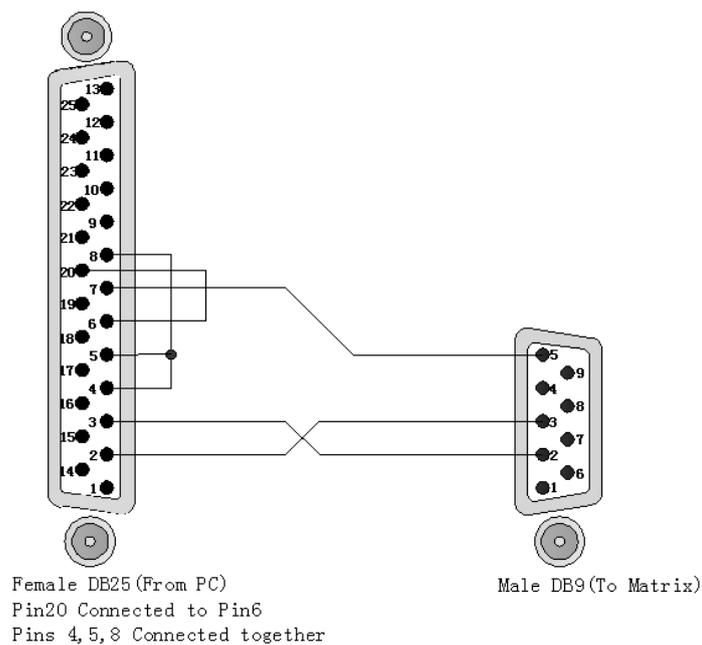
Male DB9(To Matrix)

Figure 6-7 RS-232 – From Female DB25 (PC) to Male DB9 (Matrix)

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6.2.2 RJ45 LAN Port

This Matrix 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.) That allowing you to control all series connected devices through PC Browser.
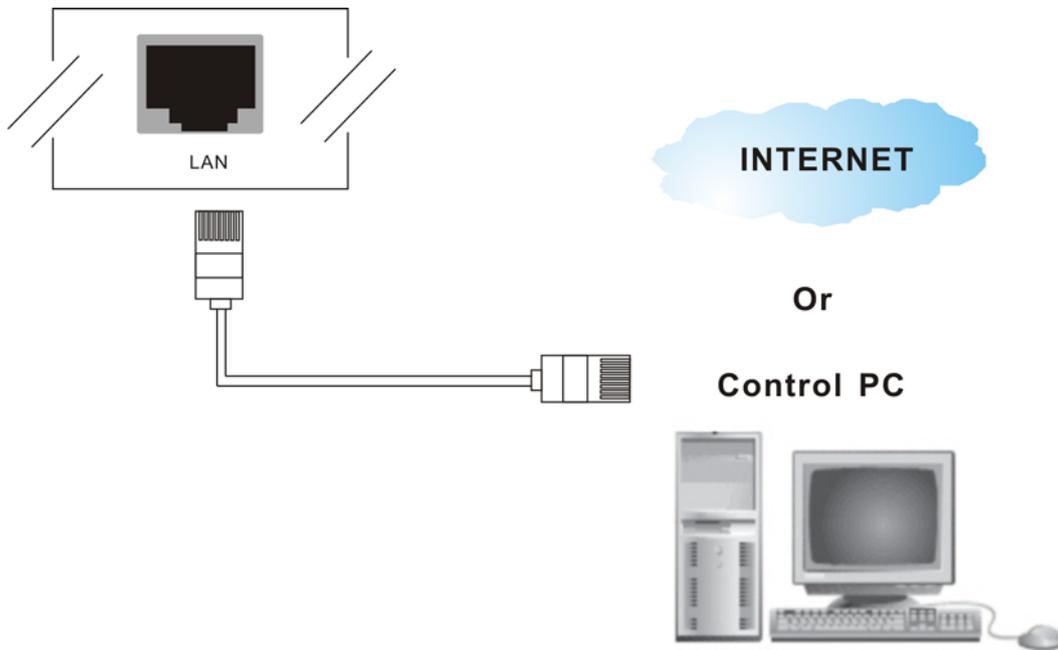
Figure 6-8 LAN Port Connection

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

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
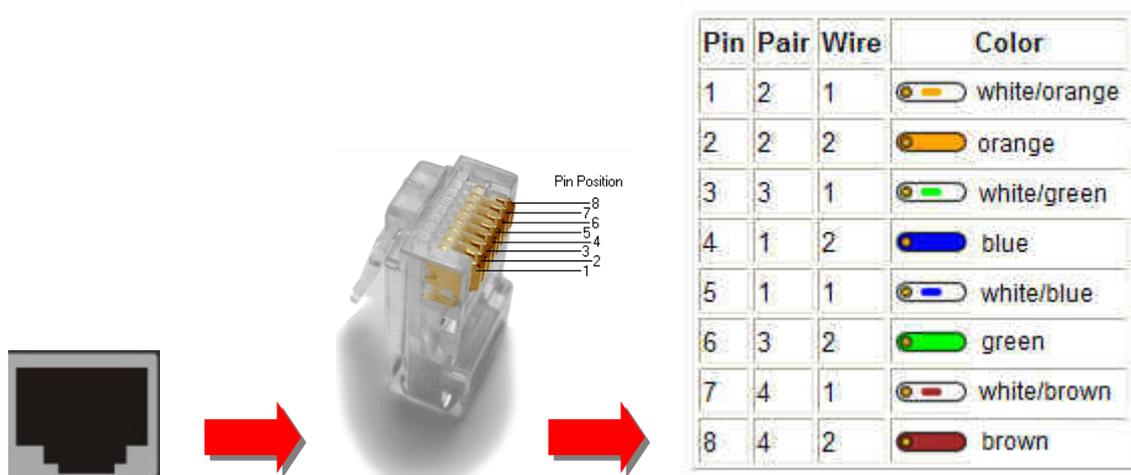
Figure 6-9 RJ45 Connector

6.3 IR Pass-Through Connection

The Matrix Switcher provides an IR Receiver Cable and IR Blaster Cable accessories for IR pass-through. IR Receiver Cable can be connected to IR Rx ports or IR EXT on the rear panel. On the other hand, IR Blaster Cable can be connected to IR Tx ports 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
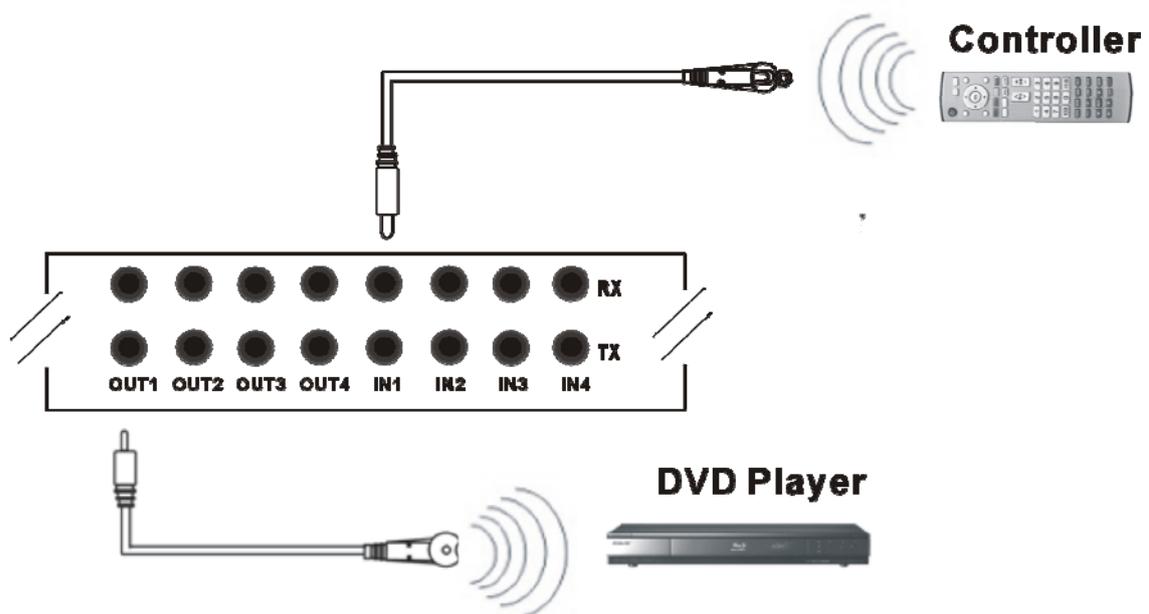
Figure 6-10 IR Extended Aiming – Multimedia

☞ TX/RX ports are designed on the IR extender. TX OUT1~OUT4 are configured to RX IN1~IN4 for matrix connection, but TX IN1~IN4 are only configured to RX OUT1~OUT4 individually, and cannot be used as matrix connection.

6.4 IR EXT Connection

The Matrix Switcher provides an IR Receiver Cable for more convenient to react to the Matrix Switcher Remote Controller. If it is difficult for you to aim at IR Receiver on the front panel due to the location of Matrix switcher, please connect IR Receiver Cable to the IR EXT port located on the rear panel for optional position.
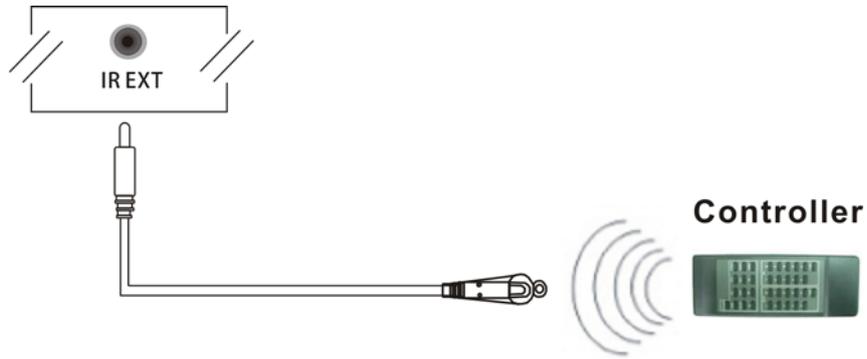
Figure 6-11 IR EXT Connection

6.5 Power Connection

Use the included power cord to connect the power port on the rear panel of Matrix Switcher to the outlet.
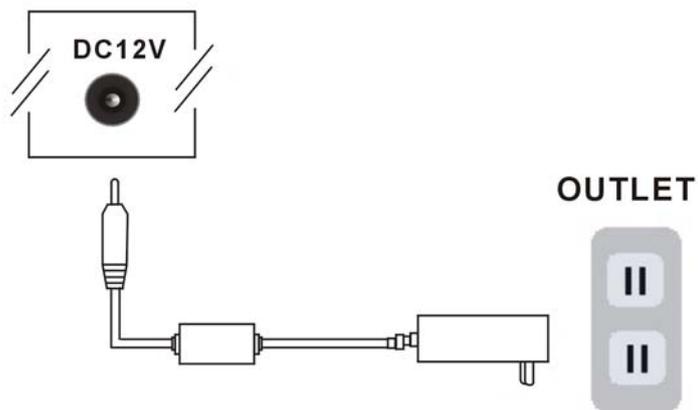
Figure 6-12 Power Connection

6.6 DIP Switcher
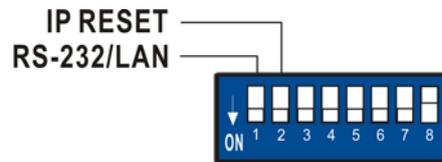
Figure 6-13 DIP Switcher

A. DIP Switcher Pin 1: Switch between RS-232 port and LAN port connection.

   ON: RS-232

   OFF: LAN

B. DIP Switcher Pin 2: Reset the web server IP address to the factory default value.

The steps are as below:

   1. Please adjust the Pin2 to ON and re-start the Matrix Switcher.

   2. After the Matrix Switcher re-starts about 10 seconds, shut down it.

   3. For a normal operation, please adjust the Pin2 to OFF, then power on the Matrix Switcher again. The IP address will be restored to the default value: **192.168.0.3**

C. DIP Switcher Pin 3 to 8: Not used.

CHAPTER 7 REMOTE CONFIGURATIONS

7.1 Telnet Commands

You can operate and configure the Switcher via a remote terminal session using Telnet. Follow the steps as below to log into the Switcher by means of a Telnet session:

1. Connect the Switcher to LAN port of your network with RJ45 cable.

2. Power on both Switcher and control PC.

3. Open a terminal session (command line) on your control PC.

4. At the prompt, key in the Switcher's IP address as below:

TELNET [IP Address]:**192.168.0.3**

5. Press **Enter**

☞ Please switch the DIP Switcher PIN 1 to DOWN for LAN configuration. The command examples for this chapter are for HX-2544 reference.

7.1.1 Command List and Reboot

Once the connection with Switcher is established, the Telnet prompt screen will appear, type **help** [Enter] to show the command list.
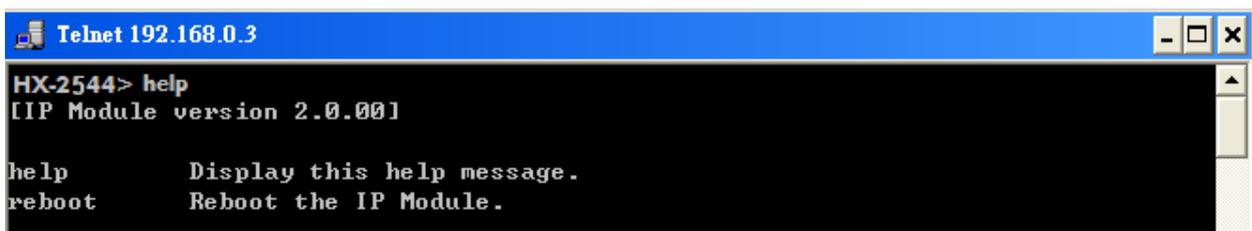
Figure 7-1 Help Command

- **Display the command list.**
  HX-2544> help   [Enter]

- **Reboot the IP Module.**
  HX-2544> reboot   [Enter]

7.1.2 IP/Telnet Configuration
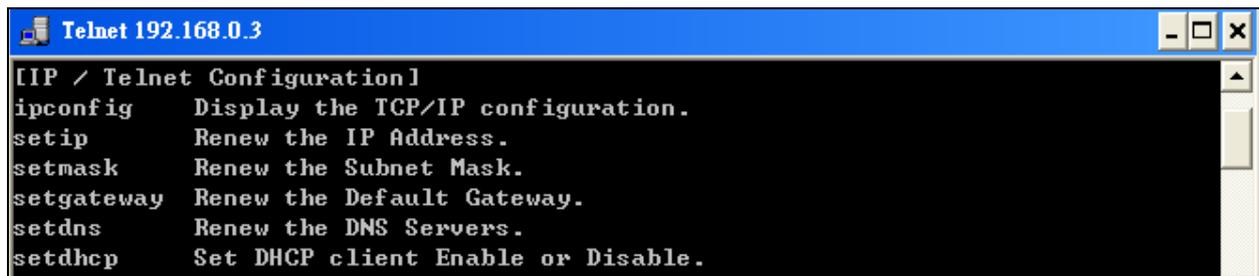
Figure 7-2 IP/Telnet Configuration

- **Display the TCP/IP configuration**
  HX-2544> ipconfig   [Enter]
  Current IP: 192.168.0.3
  Current IP Mask: 255.255.255.0
  Current Gateway: 192.168.0.1

- **Renew the IP Address**

  HX-2544> setip [ip addr]   [Enter]

  [ip addr]: xxx.xxx.xxx.xxx

  Example:
  Set IP address: 192.168.0.2

      HX-2544> setip 192.168.0.2   [Enter]
      HX-2544> setip IP address: 192.168.0.2

- **Renew the Subnet Mask**

  HX-2544> setmask [netmask]   [Enter]

  [netmask]: xxx.xxx.xxx.xxx

  Example:
  Set subnet mask address: 255.255.255.0

      HX-2544> setmask 255.255.255.0   [Enter]
      HX-2544> setmask Subnet Mask: 255.255.255.0

- **Renew the Default Gateway**

  HX-2544> setgateway [ip addr]   [Enter]

  [ip addr]: xxx.xxx.xxx.xxx

Example:
Set gateway address: 192.168.0.1

    HX-2544> setgateway 192.168.0.1   [Enter]
    HX-2544> setgateway Gateway: 192.168.0.1

- **Renew the DNS Servers**

  HX-2544> setdns [ip addr]   [Enter]

[ip addr]: xxx.xxx.xxx.xxx

Example:
Set DNS IP address: 192.168.0.1

    HX-2544> setdns 8.8.8.8   [Enter]
    HX-2544> setdns DNS IP:8.8.8.8

- **Set DHCP Enable or Disable**

  HX-2544> sethdcp [status]   [Enter]

[status]: 0: Disable 1: Enable

Example:
Set DHCP to disable.

    HX-2544> setdhcp 0   [Enter]
    HX-2544> setdhcp DHCP Client: Disable

☞ Please reboot to make the new values take effect.

7.1.3 Device Configuration

Figure 7-3 Device Configuration

- **Display current route status**
  HX-2544Z> route   [Enter]
  Output 01: Input = 01
  Output 02: Input = 02
  Output 03: Input = 03
  Output 04: Input = 04

- **Route configurations**
  HX-2544> route [xx] [yy]   [Enter]

  xx – select output port, 0: select all outputs
  yy – select input port, 0: disconnect

  Example:
  1. Set the output 3 and input 1.

  HX-2544> route 3 1   [Enter]
  Output 03: Input = 01

  Display reset route status.

  HX-2544> route   [Enter]
  Output 01: Input = 01
  Output 02: Input = 02
  Output 03: Input = 01

  2. Set all outputs to accept signals come from input 1.

  HX-2544> route 0 1   [Enter] or HX-2544>route 1 [Enter]
  Output 01: Input = 01
  Output 02: Input = 01
  Output 03: Input = 01
  Output 04: Input = 01

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3. Disconnect the input signal to output 1.

    HX-2544> route 1 0   [Enter]
    Output 01: Input = 00

    Display reset route status.
    HX-2544> route   [Enter]
    Output 01: Input = 00
    Output 02: Input = 01
    Output 03: Input = 01

HX-2544> route [xx][yy0][yy1]…[yyn]   [Enter]

Route outputs sequentially to the specified input.
Route the output to the specified input yy0.
Route the next 1 output to the specified input yy1.
Route the next n output to the specified input yyn, n<=4.

Example:
Set output port sequentially to the corresponding input 3 and 4.

HX-2544> route 1 3 4   [Enter]
Output 01: Input = 03
Output 02: Input = 04

- **Display the input and output link status**
    HX-2544> link   [Enter]
    Output 01: Connected
    Output 02: Connected
    Output 03: Connected
    Output 04: Connected
    Input 01: Not Connected
    Input 02: Not Connected
    Input 03: Not Connected
    Input 04: Not Connected

☞ This command is used for HDMI HPD (hot plug detect), when an HDMI signals is detected, the resulting hot-plug detection instantiates a start-up communication sequence. Output is for remote output (HDBT)

- **Display EDID status**
    HX-2544> edid   [Enter]
    Input 01: EDID = 00
    Input 02: EDID = 00
    Input 03: EDID = 00
    Input 04: EDID = 00

- **EDID management**

  HX-2544Z> edid <edid>   [Enter]

  <edid>: select edid source, 0: default 1080P, 1: copy port1, 2: 4K30, 3: 4K60

  Example:
  HX-2544> edid 1   [Enter]
  Input 01: EDID = 01
  Input 02: EDID = 01
  Input 03: EDID = 01
  Input 04: EDID = 01

- **Reset the device to factory default settings**

  HX-2544> default   [Enter]
  Reset the device to factory default settings.

- **Display device information**

  HX-2544> info   [Enter]
  Device Name: HX-2544
  Output Total: 4
  Input Total: 4
  Memory Total: 4
  Support Link Status: Output
  Support EDID management

- **Display version information**

  HX-2544> ver   [Enter]
  IP Module version 2.0.00
  AV Matrix Protocol <API> version 2.40
  Device Firmware version 1.0.00

7.1.4 AV Matrix Protocol Command
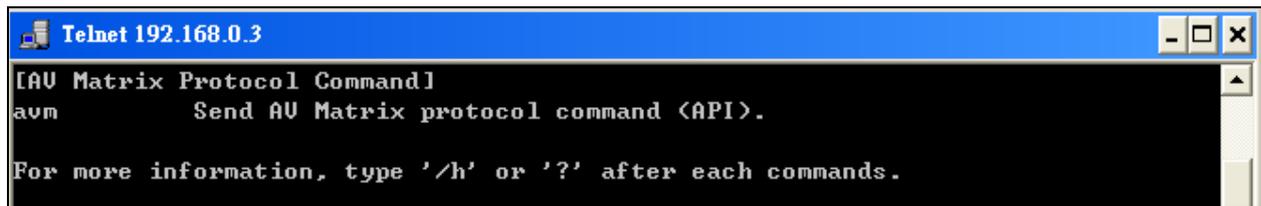
Figure 7-4 AV Matrix Protocol Command

- **Send AV Matrix protocol command <API>**
  HX-2544> avm <instruction> <index> <value>   [Enter]

  <instruction>: AVM Protocol Byte 2
  <index>: AVM Protocol Byte 3
  <value>: AVM Protocol Byte 4

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7.2 RS-232 Commands

You can also operate and configure the Switcher via a remote terminal session using RS-232. Follow the steps as below to log into the Switcher by means of a RS-232 session (the example as below is for Hyper Terminal):

1. Connect the Switcher to your control PC with RS-232 cable.

2. Power on both Switcher and control PC.

3. Open the Hyper Terminal by clicking **Start │ Programs │ Accessories │ Communications │ Hyper Terminal** on your control PC.

4. The **New Connection – Hyper Terminal** screen will appear. Input the connection name and select a representative icon. Then click **OK**.

5. Select the connecting port that you want to use, click **OK**. Default port is **COM1**.

6. Set the Bits per second to **9600**, Data Bits to **8** (Default), Parity to **None** (Default), Stop bits to **1** (Default) and flow control to **None** from the drop-down list, click **OK**.

☞ Please switch the DIP Switcher PIN 1 to ON for RS-232 configuration.

7.2.1 Commands List and Status

Once the connection with Switcher is established, type **help** in the Hyper Terminal screen to show the command list.

- **Show the command list**

```
================================
Welcome to HX-2544 Console
F/W Version 0.0.01
================================
HX-2544> help

-----------------------------------------------------------------
--                      Console Help                           --
-----------------------------------------------------------------
--  HX-2544            F/W Version : 0.0.01                     --
--                                                             --
-- help    : Show Help Information                              --
-- status  : Show Global System Status                         --
--                                                             --
-- HDMI Output Setup Command                                   --
-- route x y : Set Output x to Input y                         --
--   x = [0-4] (0: ALL), y = [0-4] (0: OFF)                    --
--                                                             --
-- EDID Setup Command                                          --
-- edid x  : Select HDMI Input EDID Mode                       --
--   x = [0-3] 0: 1080P                                        --
--             1: Copy from Output 1                           --
--             2: 4K30                                         --
--             3: 4K60                                         --
--                                                             --
-- Restore Default Command                                     --
-- default : Restore to factory default settings               --
-----------------------------------------------------------------
```

Figure 7-5 Command List

- **Show the Status of Your Switcher**

```
HX-2544 >status
HX-2544 F/W Version 1.0.00

Output 01 : Input = 00, Not Connected
Output 02 : Input = 00, Not Connected
Output 03 : Input = 00, Not Connected
Output 04 : Input = 00, Not Connected
```

Figure 7-6 Switcher Status

7.2.2 HDMI Command

- **HDMI Output Setup Command**

```
-- HDMI Output Setup Command                                --
--   x = [0-4] (0: ALL), y = [0-4] (0: OFF)                  --
-- route x y   : Set Output x to Input y                     --
```

Figure 7-7 HDMI Output Setup Command

Example:

Set output 1 signal comes from input 5.

```
HX- 2544 > route 1 4
Output 01 : Input = 04

HX- 2544 > status
HX- 2544  F/W Version 1.0.00

Output 01 : Input = 04
Output 02 : Input = 00, Not Connected
Output 03 : Input = 00, Not Connected
Output 04 : Input = 00, Not Connected
```

Figure 7-8 HDMI Output Setup Command - Example

7.2.3 EDID Command

- **EDID Setup Command**

```
-- EDID Setup Command                                        --
--   x = [0-1], (0: 1080P, 1: Copy from OUT 1)               --
-- edid x : HDMI Input Copy EDID from Output x               --
```

Figure 7-9 EDID Setup Command

Example:

Set resolution copied from EDID output 2. For EDID value configurations, please refer to *7.1.3 Device Configuration.*

```
HX-2544 > edid 0
HDMI Input : EDID = 0, Default EDID 1080P
HX-2544 > edid 1
HDMI Input : EDID = 1, Copy from OUT 1
```

Figure 7-10 EDID Setup Command - Example

7.2.4 HDMI Output Resolution Commands

```
-- HDMI Output Setup Command                                    --
-- route x y : Set Output x to Input y                          --
--   x = [0-4] (0: ALL), y = [0-4] (0: OFF)                     --
--                                                              --
-- EDID Setup Command                                           --
-- edid x  : Select HDMI Input EDID Mode                        --
--   x = [0-3] 0: 1080P                                         --
--             1: Copy from Output 1                            --
--             2: 4K30                                          --
--             3: 4K60                                          --
```

Figure 7-11 HDMI Output Resolution Setup Command

Example:

```
HX-2544 > res 1 1
Output 01 : Resolution = 01
```

Figure 7-12 Resolution Setup Command - Example

7.2.5 Restore Default Command

- **Restore to Factory Default Settings**

```
HX-2544 > default
Reset the device to factory default settings.

HX-2544 > status
HX-2544  F/W Version 1.0.00

Output 01 : Input =00 , Not Connected
Output 02 : Input =00 , Not Connected
Output 03 : Input =00 , Not Connected
Output 04 : Input =00 , Not Connected
```

Figure 7-13 Restore Default Command

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CHAPTER 8 OPERATION EXAMPLES

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

Key	LCD Display	Operation
OUT 1 2 3 4 / IN 1 2 3 4 (OUT 2 black) OUT 1 2 / IN 1 2 3 4 5 6 (OUT 2 black)	**HX-2544** OUT 1 2 3 4 EDID IN 0 0 0 0 OUT1 **HX-2562** OUT 1 2 EDID IN 0 0 OUT1	1. Press the NO.2 key of the output channel for 2 seconds, then the input channels will begin to flicker.
OUT 1 2 3 4 / IN 1 2 3 4 (OUT 2 gray, IN 1 black) OUT 1 2 / IN 1 2 3 4 5 6 (OUT 2 gray, IN 1 black)	**HX-2544** OUT 1 2 3 4 EDID IN 0 1 0 0 OUT1 **HX-2562** OUT 1 2 EDID IN 0 1 OUT1	2. Press the NO.1 key of the Input channel for 2 seconds.

Example 2: Switch the NO.1 and NO.2 input signals to NO.1 and NO.2 output channels.
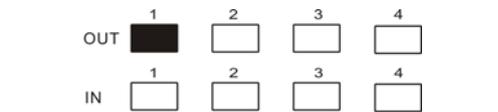
Key	LCD Display	Operation
	HX-2544 OUT 1 2 3 4 EDID IN 0 0 0 0 OUT1	1. Press the NO.1 key of the output channel, then the input channel will begin to flicker.
	HX-2562 OUT 1 2 EDID IN 0 0 OUT1	
	HX-2544 OUT 1 2 3 4 EDID IN 1 0 0 0 OUT1	2. Press the NO.1 key of the Input channel.
	HX-2562 OUT 1 2 EDID IN 1 0 OUT1	
	HX-2544 OUT 1 2 3 4 EDID IN 1 0 0 0 OUT1	3. Press the NO.2 key of the output channel, then the input channel will begin to flicker.
	HX-2562 OUT 1 2 EDID IN 1 0 OUT1	
	HX-2544 OUT 1 2 3 4 EDID IN 1 2 0 0 OUT1	4. Press the NO.2 key of the Input channel.
	HX-2562 OUT 1 2 EDID IN 1 2 OUT1	
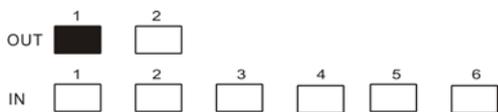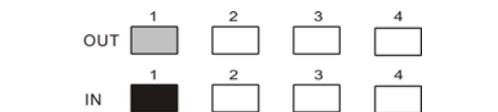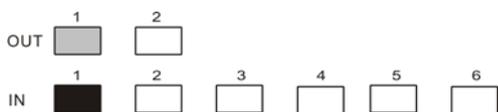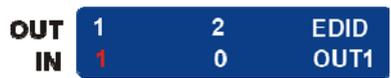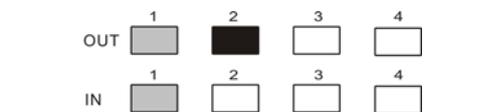
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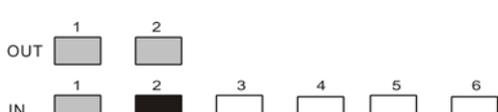
Example 3: "All" settings.

Key	LCD Display	Operation
ALL → OFF	**HX-2544** OUT 1 2 3 4 EDID / IN 1 2 0 0 OUT1 OUT 1 2 3 4 EDID / IN 0 0 0 0 OUT1 **HX-2562** OUT 1 2 EDID / IN 1 2 OUT1 OUT 1 2 EDID / IN 0 0 OUT1	1. Press the **ALL** key on the front panel, and then press the **OFF** key to cancel all the settings.
ALL ; OUT 1 2 3 4 ; IN 1 2 3 4 (IN 4 selected)	**HX-2544** OUT 1 2 3 4 EDID / IN 0 0 0 0 OUT1 OUT 1 2 3 4 EDID / IN 4 4 4 4 OUT1	2. Press **ALL** key then select input 4 that indicate all outputs will switch to selected inputs. **E.g.** Input is 4.
ALL ; OUT 1 2 ; IN 1 2 3 4 5 6 (IN 4 selected)	**HX-2562** OUT 1 2 EDID / IN 0 0 OUT1 OUT 1 2 EDID / IN 4 4 OUT1	

Example 4: "STO" and **"RCL"** functions.

Key	LCD Display	Operation
STO ■	HX-2544 OUT IN Store to Memory: 1 2 3 4 HX-2562 OUT IN Store to Memory: 1 2 3 4	1. Press the **STO** key on the front panel. The **Store to Memory** begins to flicker about 8 seconds.
(OUT/IN diagram)	HX-2544 OUT IN Store to Memory: Save to 1	2. Press the IN1 key or OUT1 key to save the setting in the NO.1 memory location.
(OUT/IN diagram)	HX-2562 OUT IN Store to Memory: Save to 1	
RCL ■	HX-2544 OUT IN Recall from Memory: 1 2 3 4 HX-2562 OUT IN Recall from Memory: 1 2 3 4	3. Press the **RCL** key on the front panel, The **Recall from Memory** begins to flicker about 8 seconds.

Key	LCD Display	Operation
OUT 1 2 3 4 / IN 1■ 2 3 4 OR OUT 1■ 2 3 4 / IN 1 2 3 4	HX-2544 OUT **Recall from Memory:** IN Load from 1	4. Press the IN1 key or OUT1 key to Load the previously saving.
OUT 1 2 / IN 1■ 2 3 4 5 6 OR OUT 1■ 2 / IN 1 2 3 4 5 6	HX-2562 OUT **Recall from Memory:** IN Load from 1	

Example 5: "STO" and **"RCL"** combinations – restore to factory default values.

Key	LCD Display	Operation
STO + RCL ■ + ■	HX-2544 OUT **Reset Configuration** IN Press<STO> to reset. HX-2562 OUT **Reset Configuration** IN Press<STO> to reset.	1. Press and hold the **STO** and **RCL** keys about 2~3 seconds simultaneously on the front panel to restore all settings to factory default values. Follow the screen information, press **"STO"** key to begin resetting.
	HX-2544 OUT 1 2 3 4 EDID IN 1 2 3 4 OUT1 HX-2562 OUT 1 2 EDID IN 1 2 OUT1	2. After finish resetting, All of settings will restore to the factory default values.

Example 6: "EDID" functions.

Key	LCD Display	Operation
EDID	HX-2544 OUT 1 2 3 4 EDID IN 1 2 3 4 OUT1 OUT 1 2 3 4 EDID IN 1 2 3 4 FHD OUT 1 2 3 4 EDID IN 1 2 3 4 4K30 OUT 1 2 3 4 EDID IN 1 2 3 4 4K60 HX-2562 OUT 1 2 EDID IN 1 2 OUT1 OUT 1 2 EDID IN 1 2 FHD OUT 1 2 EDID IN 1 2 4K30 OUT 1 2 EDID IN 1 2 4K60	Press the **EDID** key to switch OUT1, FHD, 4K30 and 4K60, refer to *EDID*.

Example 7: "PLUG" functions.

Key	LCD Display	Operation
PLUG	HX-2544 OUT O X X X OUT IN O X X X IN HX-2562 OUT O X OUT IN O X X X X X IN	Press the **PLUG** key individually to show you the status of I/O jack. **"O"** is specified for the I/O jack is used and **"X"** is specified for unused.

Example 8: "INFO" function.

Key	LCD Display	Operation
INFO	HX-2544 OUT **ID: 0 Master: Telnet** IN **IP: 192.168.0.3** **OR** OUT **ID: 0 MASTER: RS232** IN **IP: 192.168.0.3** HX-2562 OUT **ID: 0 Master: Telnet** IN **IP: 192.168.0.3** **OR** OUT **ID: 0 MASTER: RS232** IN **IP: 192.168.0.3**	Press the **INFO** key to show you the device information.

CHAPTER 9 TROUBLESHOOTING

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

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

2. What to do if the HDMI Matrix front panel keys switching not responsive?

Answer: The HDMI Matrix 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 Matrix?

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.

4. What to do if the corresponding audio signal fails to output during HDMI Matrix 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 Matrix panel keys and communication ports are out of order?

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

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

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

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

Answer: Place the equipment in a ventilate location. If it is still not to be improved, please check with the 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 MATRIX SWITCHER REMOTE CONTROLLER

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

Figure A-1 Matrix Switcher Remote Controller

- **POWER, OSD, SCAN, ▲, ▼, AUDIO, VIDEO** and **+10** keys are useless.
- **ID** key is the same as **"INFO"** function on the front panel.

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APPENDIX B FIRMWARE UPGRADE

This Chapter will brief 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. In order to avoid the error during upgrading, we suggest that it is better to contact your local agency for helping.

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 **"F/W Upgrade"** to begin firmware upgrade.

Figure B-1 Update Switcher's Firmware

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 milliseconds, and byte to byte timeout is 30 ms.

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

C-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.

C-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)

C-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 (Not Applicable in HX-2384Z/331608Z)					
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	
EDID Control					
0x20	Select Input EDID Type	0	EDID	A	2
0x21	Request Input EDID Type	1	0	B	
Video Control					
0x24	Set Output Resolution Mode	Output	Res	A	
0x25	Get Output Resolution Mode	Output	0	B	
0x26	Set Output Aspect Ratio	Output	Aspect	A	
0x27	Get Output Aspect Ratio	Output	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.

C-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

C-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

C-1.5 Byte 5 – Check Byte

Check 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.

Example: 20 01 05 03 93 --- Device ID 0, Switch Video 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 is 0x93

CRC Calculation

CRC 0 = 0 (initial value)

CRC 1 = Crc8(CRC 0 ^ **Byte 1**) = Crc8(0x20) = 0x23

CRC 2 = Crc8(CRC 1 ^ **Byte 2**) = Crc8(0x23 ^ 0x01) = Crc8(0x22) = 0x9F

CRC 3 = Crc8(CRC 2 ^ **Byte 3**) = Crc8(0x9F ^ 0x06) = Crc8(0x99) = 0x8D

CRC 4 = Crc8(CRC 3 ^ **Byte 4**) = Crc8(0x8D ^ 0x03) = Crc8(0x8E) = 0x93

Use the algebraic representations of the polynomials is the **CRC-8-Dallas/Maxim**

Polynomial: $x^8 + x^5 + x^4 + 1$ (0x31 or 0x8C)

For "^" (XOR)

XOR Truth Table

Input		Output
A	B	
0	0	0
0	1	1
1	0	1
1	1	0

Example:

```
        BYTE  BIT  7  6  5  4  3  2  1  0
A       0x23        0  0  1  0  0  0  1  1
B       0x01        0  0  0  0  0  0  0  1
-----------------------------------------------------------------
A ^ B   0x22        0  0  1  0  0  0  1  0
```

A ^ B = 0x23 ^ 0x01 = 0x22

CRC calculation for C Language

```
command[0] = 0x20;   // Byte 1 : Target
command[1] = 0x01;   // Byte 2 : Instruction
command[2] = 0x06;   // Byte 3 : Index
command[3] = 0x03;   // Byte 4 : Value


crc = 0;   // initial value


for (i = 0; i < length; i++) {          // length = 4, Byte 1 to Byte 4

  crc ^= command[i];

  for (j = 0; j < 8; j++) {
    if (crc & 0x01) {
      crc = ((crc >> 1) ^ 0x8C);
    } else {
      crc = (crc >> 1);
    }
  }
}


command[4] = crc;            // Byte 5 : CRC Value
```

C-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

C-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.

C-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"**.

C-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

C-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)

C-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

☞ PLUG is not applicable in HX-2384Z/331608Z.

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

User Manual
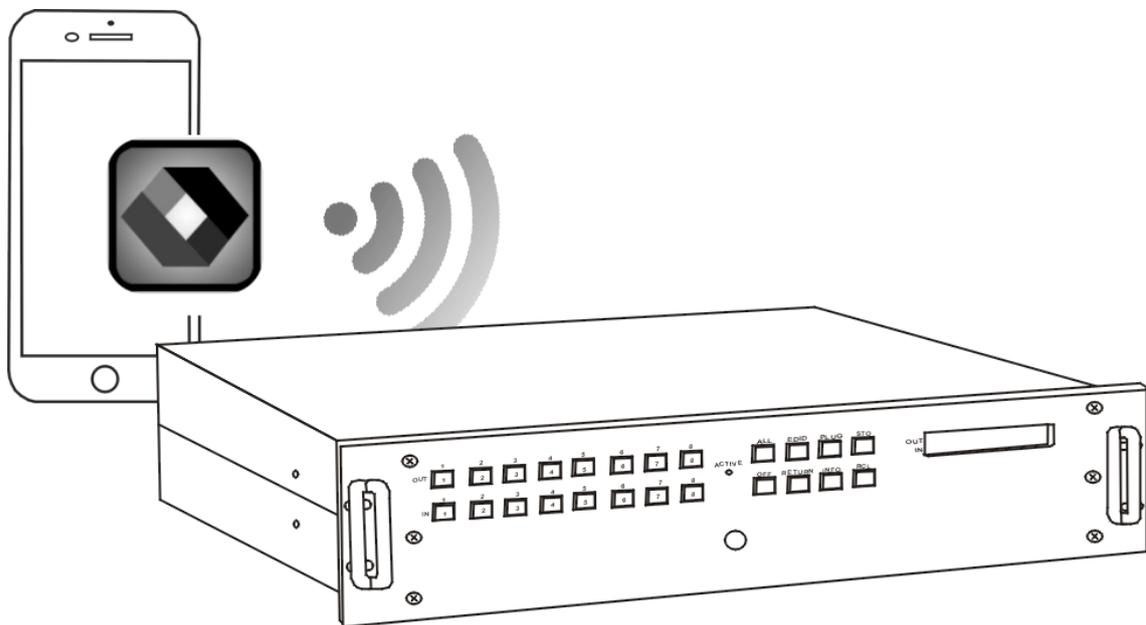
Switch System APP
HX-2544/2562
MX-3UB/4UB/7UB

V.2018APP-HXMX01.00

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TABLE OF CONTENTS

CHAPTER 1 INTRODUCTION

The Switch System mobile APP, available for the HX-2544/2562 and MX-3UB/4UB/7UB, gives you the freedom to control your Switcher with your mobile device anywhere you have a Wi-Fi connection. To use this feature, you have to first download and install the Switch System APP to your mobile device.
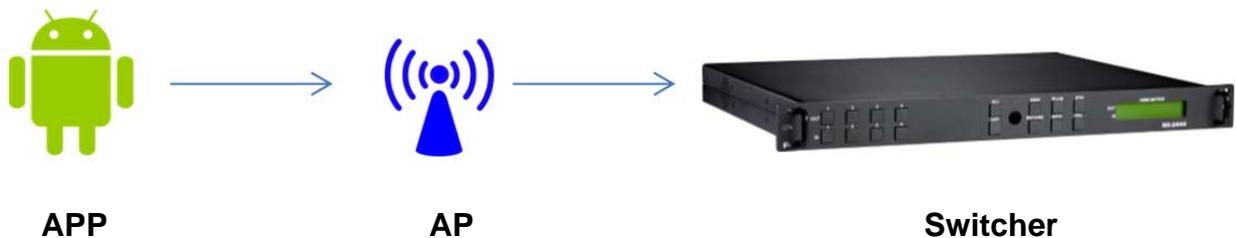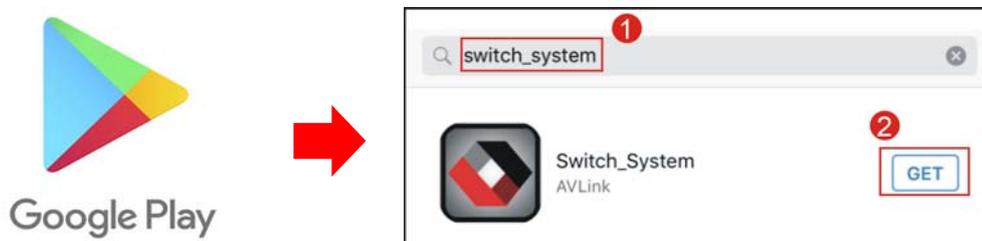

| **APP** | **AP** | **Switcher** |

☞ *The pictures in this manual are for HX-2544 references. Other models having this APP are similar the pictures in this manual.*

1.1 Download APP

Before managing the Switcher via your mobile device, you have to install **Switch System APP** firstly. Follow the steps as below to download the **Switch System APP**:

1. Launch the **Google Play Store** ▶ **(Android)/APP Store** 🅰 **(iOS)** on your mobile device.

2. Enter **switch_system** to search the available application.

3. Tap **GET** to download the application on your mobile device.

4. After installing successfully, the **switch_system** APP icon 🔲 will appear on your mobile device.

☞ *Before beginning the connection between your mobile device and switcher, the RS-232 feature on DIP Switcher locating on the rear panel of connected switcher have to be enabled.*

ON: RS-232
OFF: LAN
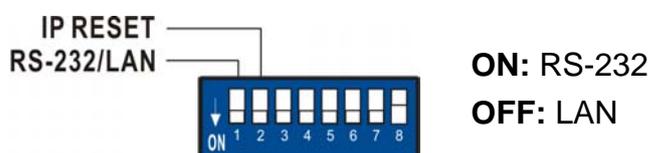
1.2 Switcher Connection

Tap **switch_system** APP icon on your Mobile Device. The picture as below will appear:
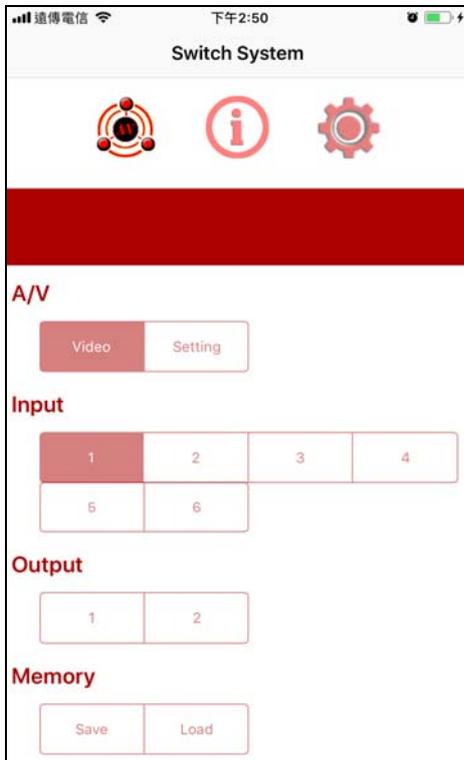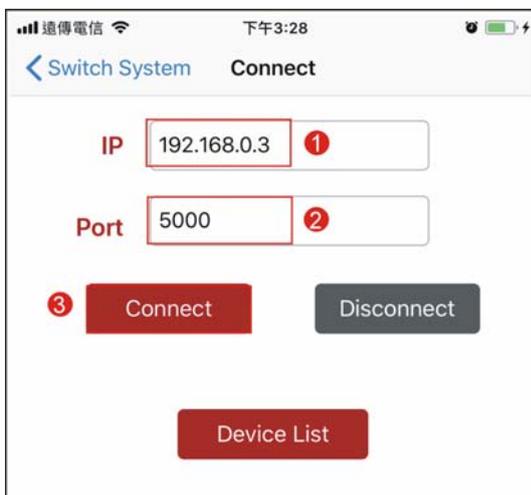

Connection Successfully

☞ *When the switcher is connected successfully, the ⓘ and ⚙ items can be clicked. Otherwise, only ⦿ item can be clicked.*
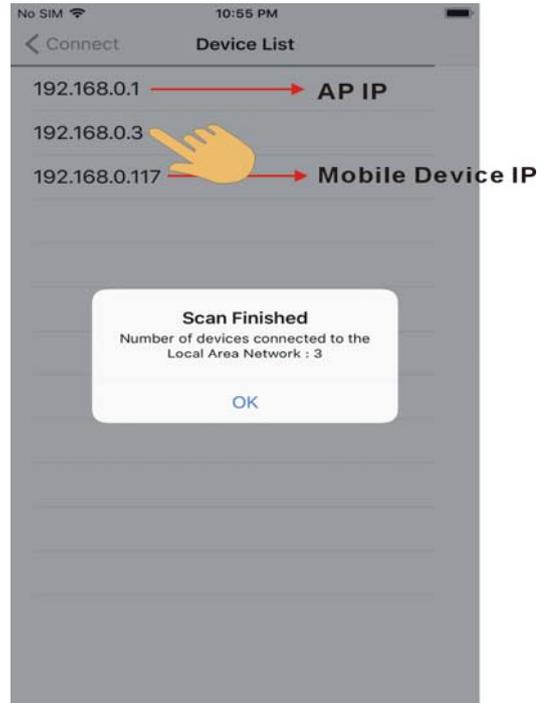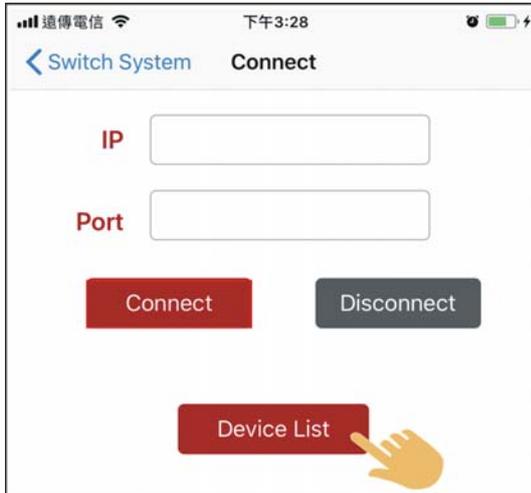
There are two methods to connect the switcher to your mobile device.

- Tap ⦿ item, enter the switcher IP and port connected, tap **Connect** button to connect to the switcher.


4
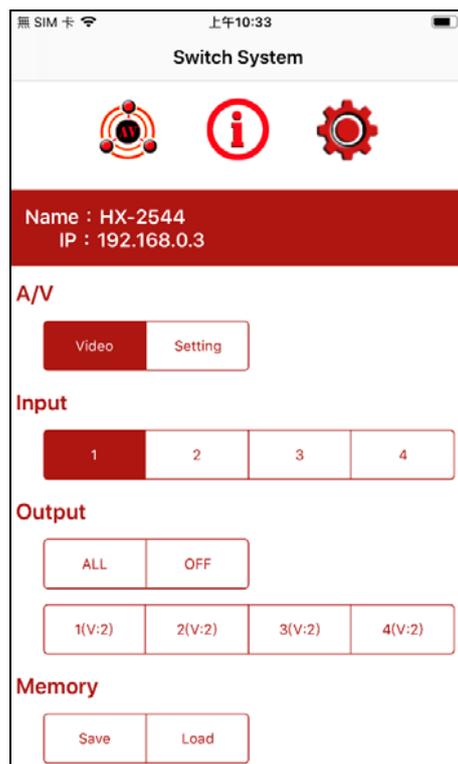
- Tap 🔴 item, select **Device List** button to see what switchers are detected currently and tap the IP address to connect to the switcher.

CHAPTER 2 USING SWITCH SYSTEM APP

2.1 Main Page

For the Main Page, switch_system APP allows you to switch Input and output. Tap 2th Input item and tap 1th Output item, the switcher would switch 2th Input to 1th Output and Main page would show the value "1(V:2)".
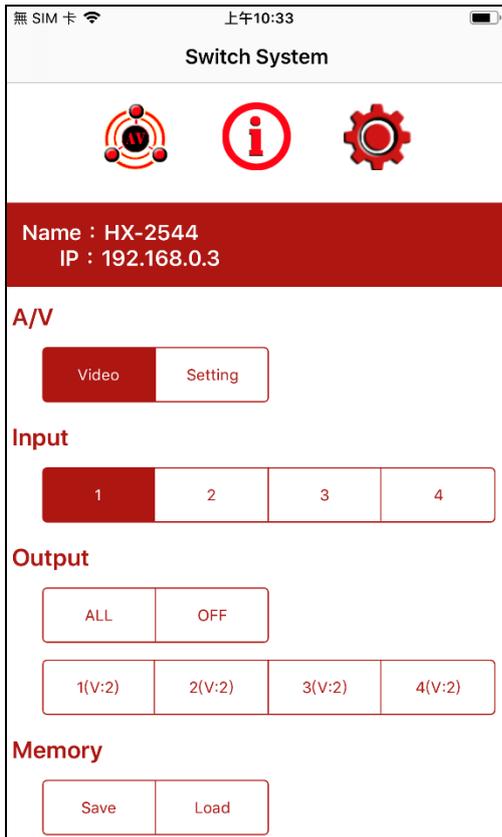
☞ *The Input value is always 1th Input if you back to main page from other page.*

☞ *You have to tap 2th Input item and tap ALL item if you want to switch all outputs to the 2th Input. You have to tap OFF item if you want to cancel all outputs settings.*

2.2 Information

Tap ⓘ item to show you the connected switcher information including Switcher's Name, ID, Audio, Video, EDID Type, Total Memory/Output/Input quantities, Protocol Version and Firmware Version.
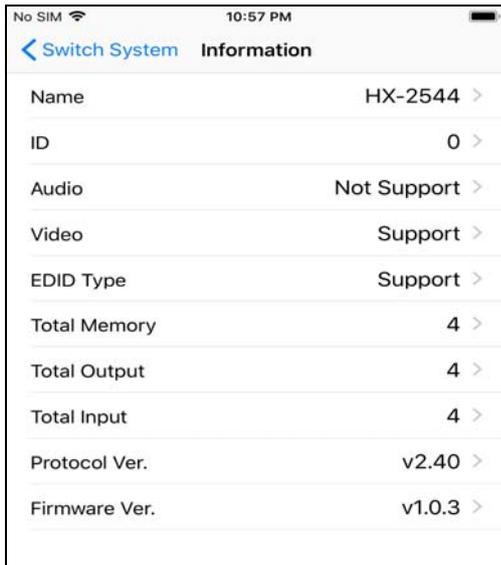
2.3 Setting Configurations

Switch_system APP allows you to freedom change connected switcher IP address, Input and Output port's name.

- Change IP address: Tap **Save & Reboot** to make the modified values take effect.
- Change Input/Output port's name: Tap **Modify** to make the modified values take effect.
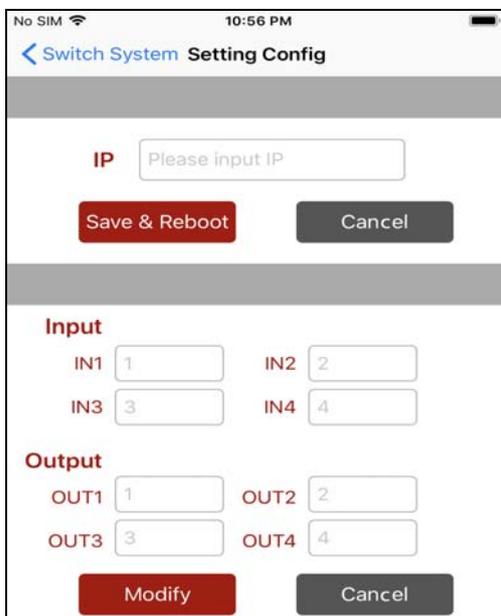
☞ *The Default IP address is 192.168.0.3. You have to change the IP address if you want to control many Swichers from the same AP.*

☞ *Once the IP address, Input/Output port's name are changed, the related information on the APP main page will also be changed synchronously.*

2.4 Video Settings

For the Video Settings, switch_system APP allows you to remote set the output resolution depending on the connected switcher model; various video settings are provided as below:

- **FHD Mode:** The Switcher supplies a set of fixed **EDID** values to support FHD (1080P/8bit) high performance TV.
- **OUT1 Mode:** The 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 correct resolution to all the HDTV.
- **4K30 Mode:** The Switcher supplies a set of fixed **EDID** values to support 4K30 high performance TV.
- **4K60 Mode:** The Switcher supplies a set of fixed **EDID** values to support 4K60 high performance TV.
- **720P Mode:** The Switcher supplies a set of fixed **EDID** values to support 720P high performance TV. (For MX-3UB/4UB/7UB)
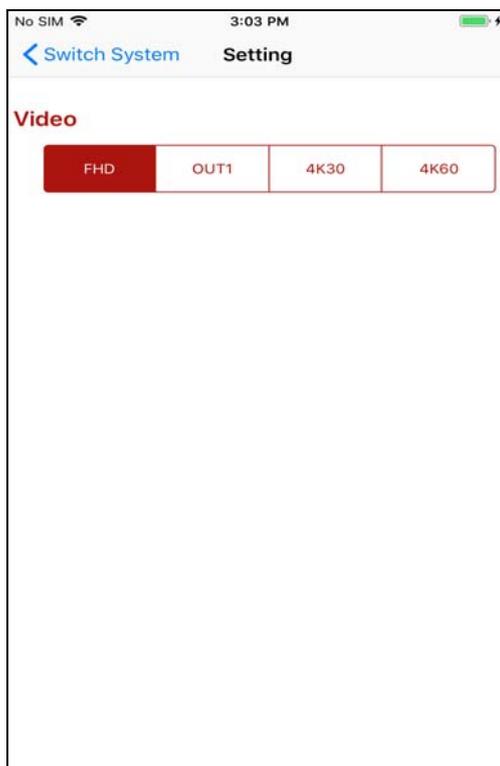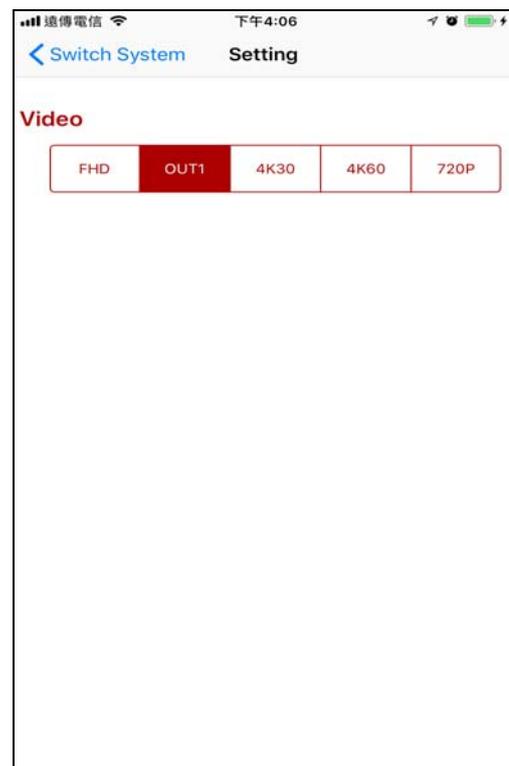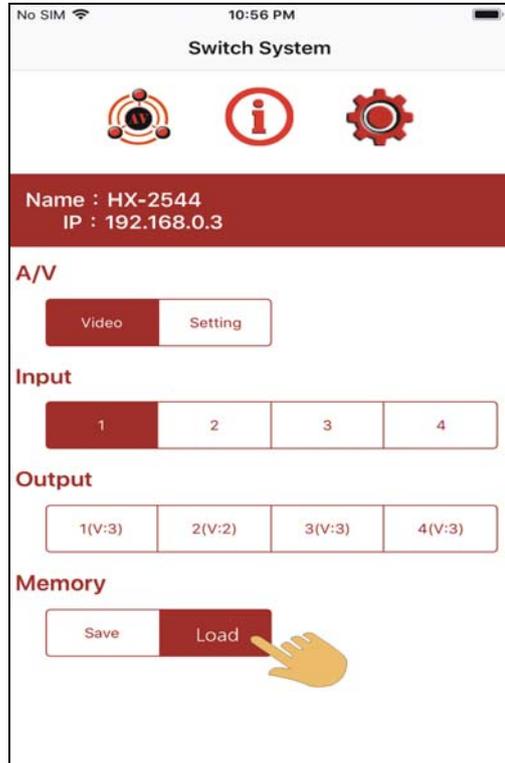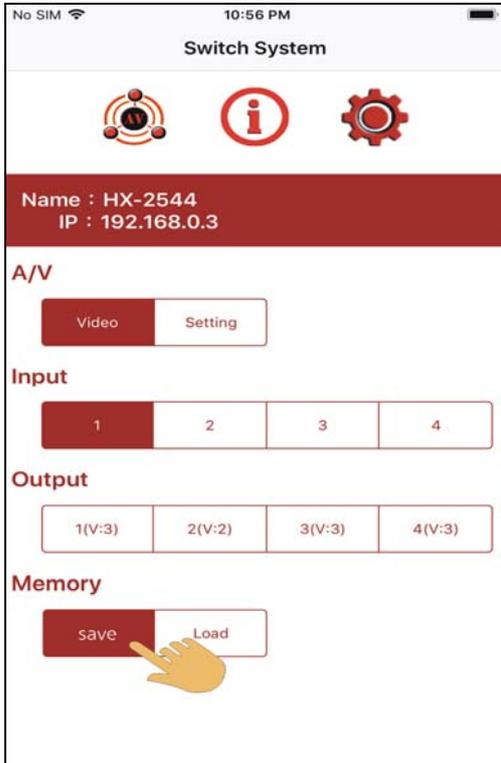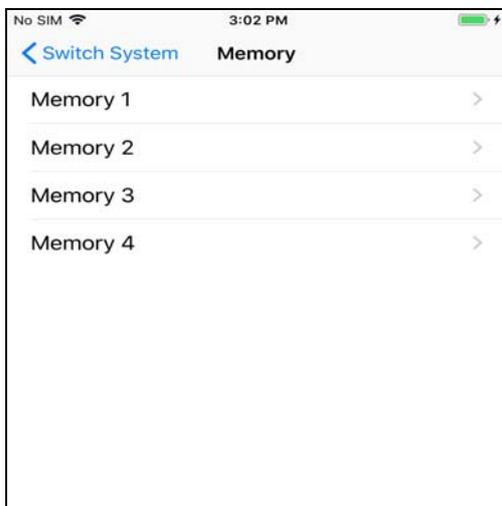
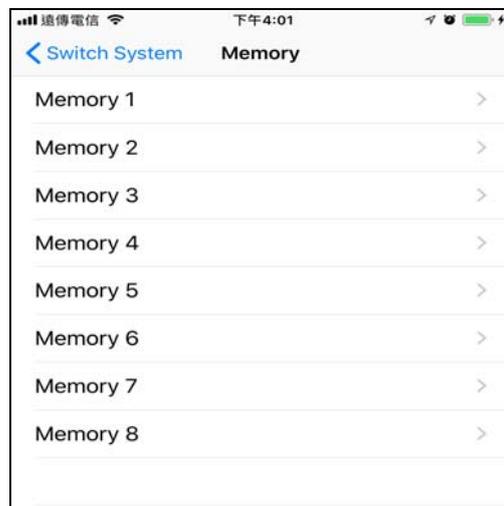| HX-2544/2562 | MX-3UB/4UB/7UB |

2.5 Memory Configurations

HX-2544/2562 and MX-3UB/4UB/7UB switcher provide memory storage function; you can configure the memory through switch_system APP, store and retrieve the switcher configuration. For the memory item, tap **Save** to save the configurations or tap **Load** to retrieve the saved configurations.

- **HX-2544/2562 switcher:** Support up to 4 sets memory control.
- **MX-3UB/4UB/7UB:** Support up to 8 sets memory control.

| HX-2544/2562 | MX-3UB/4UB/7UB |