User Manual

MSW-H412AC-DS

4x2 18G HDMI 2.0 Matrix Switcher

with USB-C

Version: MSW-H412AC-DS_2023V1.3

Preface

Read this user manual carefully before using the product. Pictures shown in this manual are for reference only. Different models and specifications are subject to real product.

This manual is only for operation instruction, please contact the local distributor for maintenance assistance. The functions described in this version were updated till November, 2023. In the constant effort to improve the product, we reserve the right to make functions or parameters changes without notice or obligation. Please refer to the dealers for the latest details.

FCC Statement

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. It has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial installation.

Operation of this equipment in a residential area is likely to cause interference, in which case the user at their own expense will be required to take whatever measures may be necessary to correct the interference.

Any changes or modifications not expressly approved by the manufacture would void the user's authority to operate the equipment.

SAFETY PRECAUTIONS

To ensure the best from the product, please read all instructions carefully before using the device. Save this manual for further reference.

- Unpack the equipment carefully and save the original box and packing material for possible future shipment.
- Follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.
- Do not dismantle the housing or modify the module. It may result in electrical shock or burn.
- Using supplies or parts not meeting the specifications of product may cause damage, deterioration or malfunction.
- Refer all servicing to qualified service personnel.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.
- Do not put any heavy items on the extension cable in case of extrusion.
- Do not remove the housing of the device as opening or removing housing may expose you to dangerous voltage or other hazards.
- Install the device in a place with fine ventilation to avoid damage caused by overheat.
- Keep the module away from liquids.
- Spillage into the housing may result in fire, electrical shock, or equipment damage. If an object or liquid falls or spills on to the housing, unplug the module immediately.
- Do not twist or pull by force ends of the optical cable. It can cause malfunction.
- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.
- Unplug the power cord when left unused for a long period of time.
- Information on disposal for scrapped devices: do not burn or mix with general household waste, and please treat them as normal electrical wastes.

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1. Product Introduction

Thank you for selecting the TiGHT AV 18G 4x2 HDMI Matrix Switcher. This switcher is equipped with 3 HDMI inputs, 1 USB-C input, and 2 HDMI outputs. It fully supports HDMI 2.0b, 4Kx2K@60Hz 4:4:4, HDR 10, Dolby Vision, and HDCP2.3. Additionally, the USB-C port allows for external 60w charging, while the HDMI outputs support 4K auto downscaling to 1080p. The matrix also offers advanced auto switching that can be configurated individually for each output.

Furthermore, this switcher includes an independent audio matrix that can extract audio from any input or output. It provides various control options, including front panel buttons, an IR remote control, RS232 and TCP/IP commands, and via Web-UI.

1.1 Features

- Supports HDMI 2.0b, 4K@60Hz 4:4:4, HDR 10, Dolby Vision and HDCP 2.3.
- 3 x HDMI Inputs, 1 x USB-C Input, 2 x HDMI Outputs
- Provides up to 60w Power Delivery on USB-C input.
- Advanced auto switching configurable per output.
- Features an independent audio matrix.
- Supports 4K auto downscaling to 1080p on HDMI outputs.
- Extensive EDID management.
- Extensive HDCP management on input and output side.
- Supports CEC control for devices connected on inputs and outputs
- Various control options: Front panel, RS232, IR remote, TCP/IP and WEB UI.

1.2 Package List

- 1 x MSW-412AC-DS
- 2x Mounting Ears with 4 Mounting Screws
- 1 x DC 24V5A power adapter with EU and UK plug
- 1 x IR receiver (5V)
- 1 x IR Remote
- 4 x Rubber feet
- 1 x RS232 Cable (3-pin to DB9)
- 1x User Manual

Note: *Please contact your distributor immediately if any damage or defect in the components is found.*

1.3 Customer Service

We provide limited warranty for the product within **five** years counting from date of purchase (The purchase invoice shall prevail).

For more information see TiGHT AV general Warranty Statement at https://tightav.com/warranty-statement or just scan the QR-code below.

SCAN ME

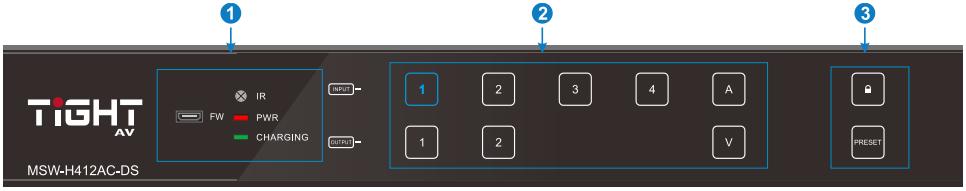
2. Technical Specification

Video	
Video Input	(3) HDMI, (1) USB-C
Input Connector	(3) Type-A female HDMI, (1) USB Type-C
HDMI Input Resolution	Up to 4K@60Hz 4:4:4 HDR10, Dolby Vision
USB-C Input Resolution	Up to 4K@60Hz 4:4:4
Video Output	(2) HDMI
Output Connector	(2) Type-A female HDMI
HDMI Output Resolution	Up to 4K@60Hz 4:4:4 HDR10, Dolby Vision Supports 4K to 1080p auto-downscaling.
HDMI Standard	Up to HDMI 2.0b
HDCP Version	HDCP 2.x/1.x
Audio	
HDMI Embedded Audio Format	LPCM 7.1 audio, Dolby Atmos®, Dolby® TrueHD, Dolby Digital® Plus, DTS:X™, and DTS-HD® Master Audio™ pass-through.
Audio Output Connector	(2) 5-pin terminal block (2) SPDIF
Analog L+R Audio Format	Supports PCM
Digital SPDIF Audio Format	Supports PCM, Dolby Digital, DTS, DTS-HD
Local Audio Sampling Rate	Supports 44.1KHz, 48KHz, 96KHz
Frequency Response	20Hz–20KHz, ±3dB
Max Output Level	**L+R**: 0.88 Vrms ± 0.5 dB. 2 V = 16 dB headroom above -10 dBV (316 mV) nominal consumer line level signal **SPDIF:** ±0.05dBFS
THD+N	< 0.05% (-80 dB), 20 Hz – 20 kHz bandwidth, 1 kHz sine at 0 dBFS level (or max level)
SNR	**L+R**: > 80dB, 20Hz-20 kHz bandwidth **SPDIF:** > 90dB, 20Hz-20 kHz bandwidth
Crosstalk Isolation	< -80 dB, 10 kHz sine at 0 dBFS level (or max level before clipping)
L-R Level Deviation	**L+R**: < 0.3 dB, 1 kHz sine at 0 dBFS level (or max level before clipping)
Output Load Capability	**L+R**: 1k ohm and higher (supports 10x paralleled 10k ohm loads)
Noise Level	>70dB @ 1 kHz
Control	
Control ports	(1) IR EYE, (1) RS232, (1) TCP/IP

General	
Operation Temperature	-5 - +55℃
Storage Temperature	-25 - +70℃
Relative Humidity	10% - 90%
External Power Supply	Input: AC 100-240V, 50/60Hz; Output: 24V DC 5A.
Power Consumption	76w (Max)
USB-C Power Charging	60w (Max)
Dimension (W*H*D)	315W * 44H * 165D mm
Net Weight	1450g
Safety Compliance	FCC, CE
Environmental Compliance	RoHS, WEEE

3. Panel Description

3.1 Front Panel



① **FW:** Micro USB port for firmware upgrade.

IR sensor: Built-in IR sensor, receives IR signal sent from IR remote.

PWR: The LED illuminates green when power is on, and it illuminates red when the unit is standby.

CHARGING: The LED illuminates green when charging external USB-C device.

② **INPUT:** Total 4 input touch-buttons with blue backlight, touch one of the buttons to select input channel.

OUTPUT: Total 2 Output touch-buttons with blue backlight, touch the buttons to select output channels.

"A": Touch-button with blue backlight, confirm the operation of the audio matrix switching.

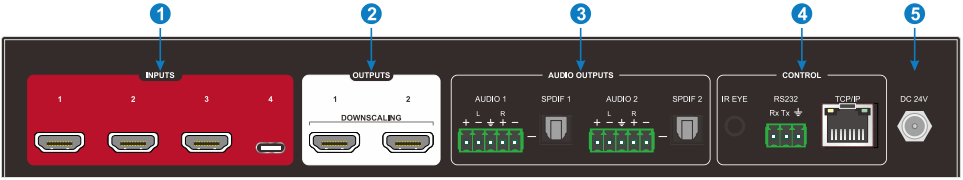
"V": Touch-button with blue backlight, confirm the operation of the video matrix switching.

③ **Lock:** Touch-button with blue backlight, press and hold for 3 seconds to lock/unlock all front buttons.

Preset: Touch-button with blue backlight, save or recall a preset.

Note: Please refer to section ***5. Front Panel Control*** for more details about switch operation.

3.2 Rear Panel



① **INPUTS:** 3 x Type-A HDMI input ports to connect HDMI source devices.

1 x USB-C input port to connect USB-C source devices.

② **OUTPUTS:** 2 x HDMI output ports to connect display devices.

③ **AUDIO OUTPUTS:** 2 x 5-pin terminal block and 2 x SPDIF port, audio de-embedding from any input sources.

④ **CONTROL:**

- **IR EYE:** Connect with external IR receiver for using the included IR remote to control the Matrix Switcher.
- **RS232:** 3-pin terminal block to connect the RS232 control device (e.g., PC) or a device to be controlled by RS232 commands.
- **TCP/IP:** RJ45 port to connect the control device (e.g., PC) to control the matrix by GUI or TCP/IP commands.

⑤ **DC 24V:** DC connector for power adapter connection.

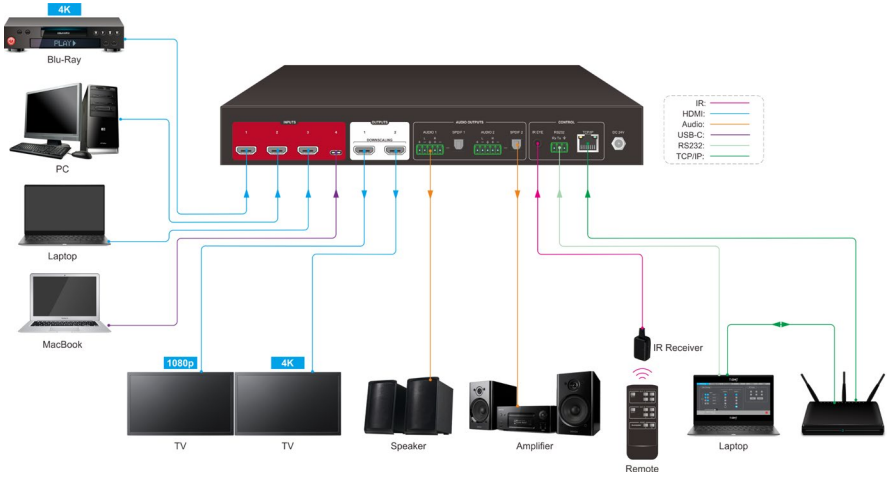
4. System Connection

4.1 Usage Precaution

- Make sure all components and accessories included before installation.
- System should be installed in a clean environment with proper temperature and humidity.
- All the power switches, plugs, sockets, and power cords should be insulated and safe.
- All devices should be connected before powering on the system.

4.2 System Diagram

The following diagram illustrates typical input and output connections that can be utilized with this matrix switcher:



5. Front Panel Control

The matrix switcher can be controlled by using the buttons on the front panel. In normal working state, all buttons illuminate white with backlight, and it will illuminate blue when it is clicked. If there is no operation within 30s, the front panel enters the dormant state, and all the button backlights are off. In the dormant state, touching any of the buttons or sending commands can activate the front panel.

5.1 Signal switching

- **Switch an input to an output**

  Operation: INPUT# + OUTPUT# + A (Audio) or V (Video) button

  Example: Switch Input 1 to Output 2:

  Press INPUT 1 

 ⟶ Press OUTPUT 2 

 ⟶ Press 

 or 

 to confirm switching.

- **Switch an input to several outputs**

  Operation: INPUT# + OUTPUT# + OUTPUT# +… + A (Audio) or V (Video) button

  Example: Switch Input 1 to Output 1 and 2.

  Press **INPUT 1** 

 ⟶ Press **OUTPUT 1**, **2** 

 ⟶ Press 

 or 

 to confirm.

5.2 Current routing status

Press 

 or 

 for Video or Audio ⟶ Press **OUTPUT 1**, **2** 

 to get the current input routed to the selected Video or Audio output.

5.3 Front Panel Lock/Unlock

Press and hold 
 at least three seconds to lock. ⟶ Press and hold 
 at least three seconds to unlock.

5.4 Preset Save/Recall Function

PRESET button can save the current video and audio routing and audio settings or load a saved layout preset.

- Save the current video and audio routing and audio settings to a preset
  Example: Save the current layout to preset 2.
  Press and hold 

at least 3 seconds and then press **INPUT 2** 

to select **Preset 2**.

- Recall a saved preset
  Example: Recall the saved preset 2.
  Press 

and then press **INPUT 2** 

to select **Preset 2**.

5.5 Switch IP Mode using Front Panel

To switch between Static IP mode and DHCP IP mode using front panel.

Press and hold 

and 

simultaneous for at least three seconds. If switching from Static to DHCP mode, please allow some time for the network to assign a new IP-address.

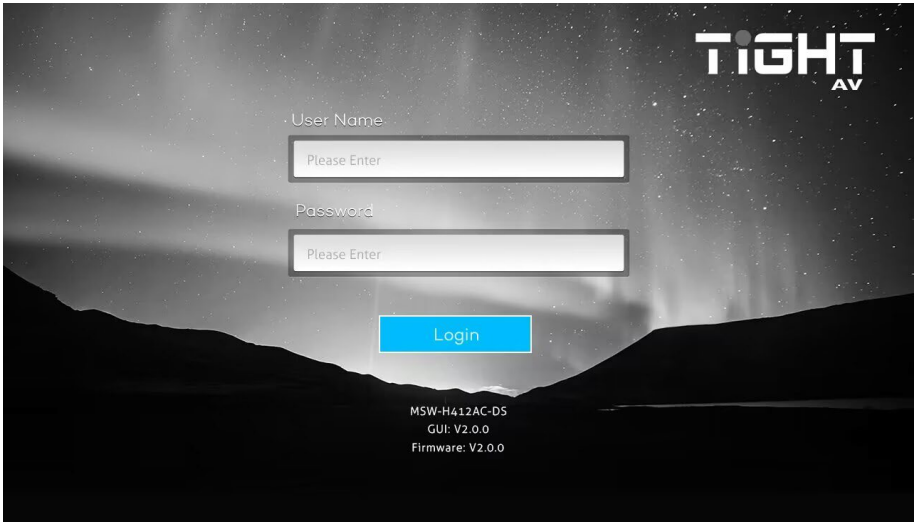
6. GUI Control

The switcher features a Web UI for configuration and control. The default IP settings are:

IP Address: 192.168.0.178

Subnet Mask: 255.255.255.0

Type 192.168.0.178 in the web browser, it will enter the below log-in webpage:



User Name: admin

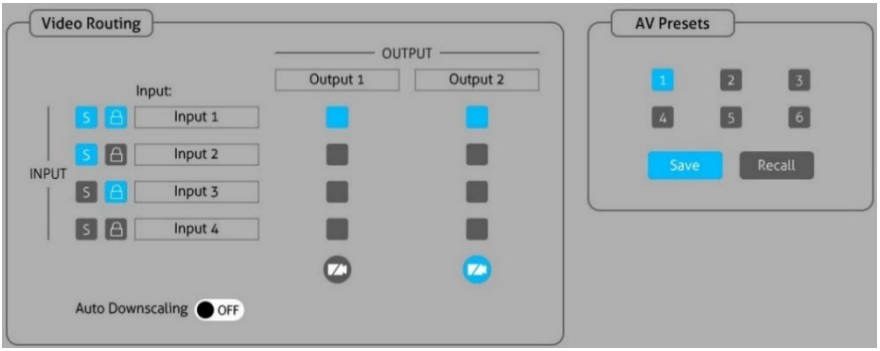
Password: admin

Type the user name and password, and then click Login to enter Web UI.

6.1 AV Routing

- **Video Routing**

  Use the 4x2 button grid on the page to set which inputs are directed to which outputs. For example, clicking the button on the Input 1 row and Output 1 column, directs input1 to output 1.



: INPUT Signal status.


: INPUT HDCP status.


: Mute Video. Sends out black video to keep connection to display.

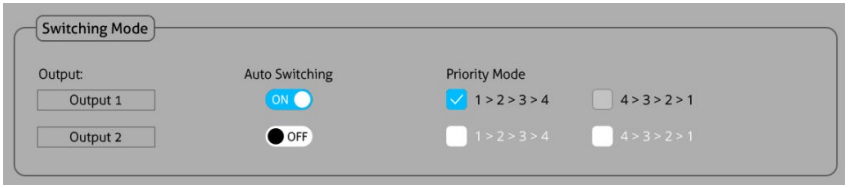
- **AV Presets**

  Use the 6 numbered buttons under AV Presets area to save and load layout presets. AV presets saves and recalls both Audio settings and Video settings.

  To save a given layout, first click one of the numbered buttons, then click the **Save** button.

  To load a previously saved layout, first click one of the numbered buttons, then click the **Recall** button.

- **Switching Mode**



To enable or disable the automatic output switching and choose the fallback priority mode, select either 1-2-3-4 or 4-3-2-1. Once the automatic switching is enabled on for a particular output, it will follow a set of rules for switching:

Last Connect auto-switching: Upon detecting a new input connection, the system will automatically select it as the active source. When a source is removed the unit will follow the configured fallback priority.

After reboot: Once the machine restarts, if the last selected signal source is still available, the signal will still be output, otherwise, the available source will be selected in order of priority.

One output auto-switching: One output is configured to auto-switching and the other is set to manual switching.

a) **New source connection:** When a new source is connected only the output set to auto-switching will present the new source video. The output set to manual doesn´t change. If yet another source is connected this will automatically take over following the “Last Connect” order. This is convenient when having a source like a room PC fixed on one display and only want BYOD devices to be presenting on the other display.

b) **Disconnecting source:** When removing a source, the output with auto-switching will use the configured fallback priority.

Two output auto-switching: Both outputs are configured to auto-switching.

a) **New source connection:**

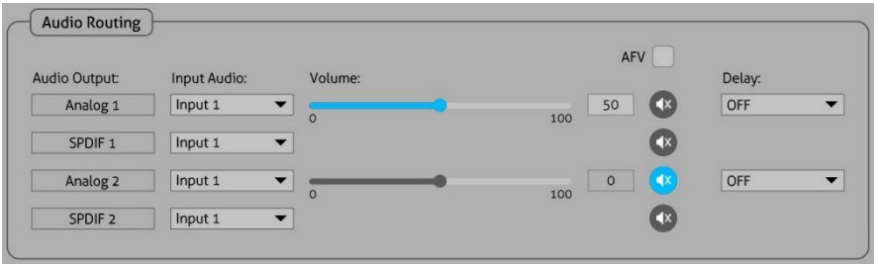
- First source that connects get displayed on output 1.
- Second source that connects get displayed on output 2.
- If a third source connects at a time when first and second still is presenting it takes over output 1, the fourth that connects takes over output 2 etc.
- If first source disconnect before the third source connects then third user gets displayed on output 1, forth that connects after that takes over output 2 etc.

b) **Disconnecting source:** When removing a source both outputs with auto-switching will use the configured fallback priority. This can be configured separately per output.

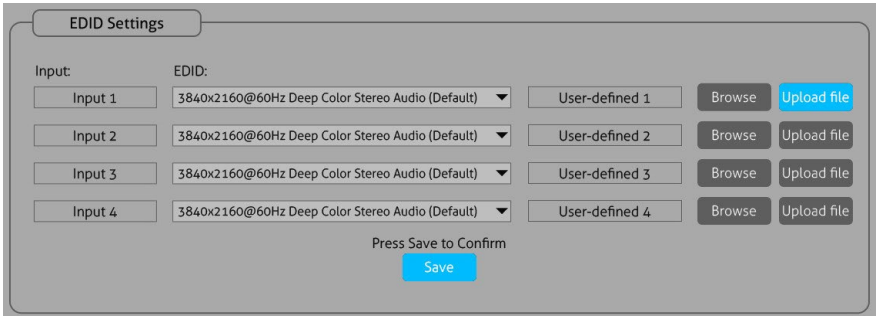
- **Audio Routing**

  Use the drop-list to select to de-embed audio from input or output source.

Audio Follow Video: The audio source is always de-embedded from the video input to the corresponding audio output. Example: Video input 1 is routed to video output 2 then the audio de-embedded from video input 1 is routed to audio output 2.



6.2 I/O Configuration



- **EDID Settings**

  Drop-down the EDID list to select EDID for input ports.

  How to upload user-defined EDID:

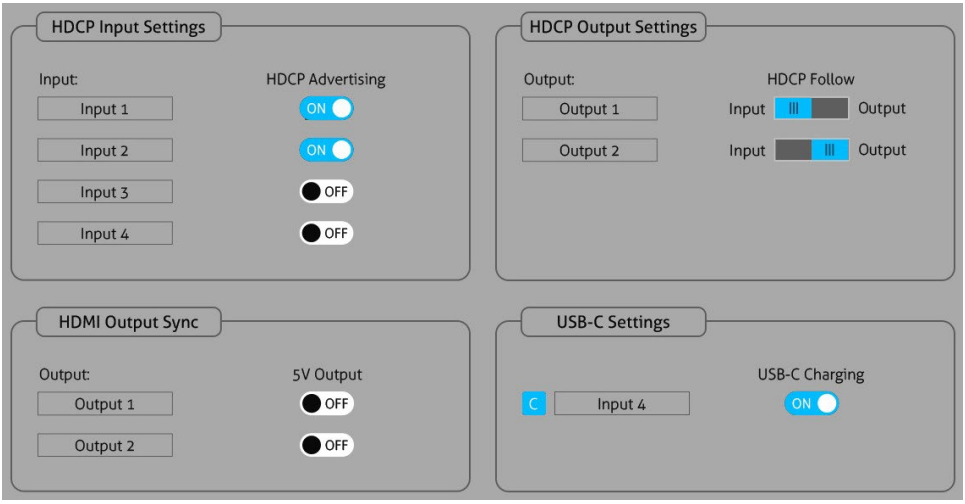
  1) Prepare the EDID file (.bin) on the control PC.

  2) Select **Browse** and then select the EDID file (.bin) accordingly.

  3) Click **Upload file.**

  4) Choose the User-defined EDID in the drop-down list, and then click **Save** to save setting.

  5) Set a user-friendly name under Device Setting section.



- **HDCP Input Settings:** HDCP Advertising ON/OFF. When ON the input presents itself as HDCP compatible. When OFF the input presents itself as non-HDCP compatible (to use in applications with for eg. Apple devices to prevent HDCP encryption for content that doesn´t require encryption)
- **HDCP Output Settings:**

  Follow Input: Follow the HDCP version of input source.

  Follow Output: Follow the HDCP version of the display.

  Note: only applies when input content is HDCP encrypted. If the input content is not HDCP encrypted the output is also not HDCP encrypted
- **HDMI Output Sync:**

  When there is no input signal routed to the current output, the output has two state options:

  1). Output without 5V (default) – OFF

  2). Only output 5V - ON
- **USB-C Settings:**

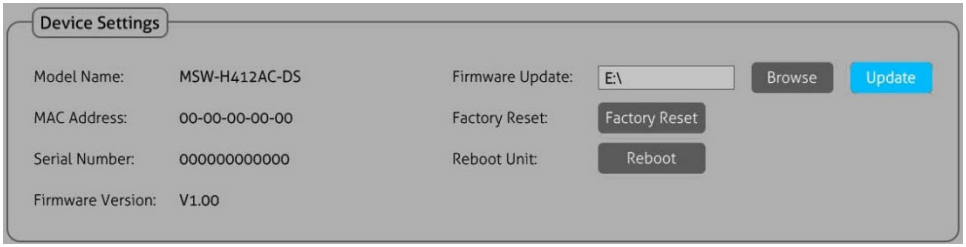
  

: USB-C connection status.

: USB-C external charging ON/OFF (default ON)

6.3 Device Settings



- **Device Settings**

  1) Display the model's name, mac address, serial number, firmware version.

  2) Firmware Update: Updates the MCU firmware.

  3) Factory Reset: Reset the unit to factory.

  4) Reboot Unit: Reboots the unit.

- **Network**

  1) Static IP or DHCP (Dynamic Host Configuration Protocol).

  2) Modify the static IP Address, Subnet Mask, and Gateway.

- **Access**

  1) Change Password for Web UI and web server access.

  2) Lock front panel to prevent pressing of the front panel buttons.

- **Input Name, Output Name, Audio Output Name, User-defined EDID Name, User-defined RS232 Name.**

6.4 CEC

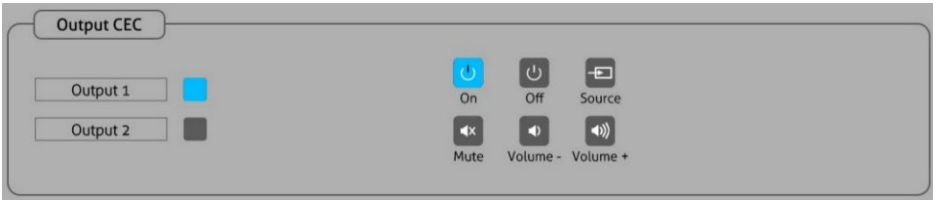
If the input source devices and local HDMI output devices support CEC, they can be controlled via the following CEC interface.

- **Input CEC**

  Select one or several HDMI input source devices to be controlled, and then press function buttons.

- **Output CEC**

  Select one or two HDMI output devices to be controlled, and then press function buttons.



6.5 Control

- **RS232**

  1) ASCII or HEX command format can be selected.

  2) Baud Rate: Supports 9600, 19200, 38400, 57600 or 115200.

  3) Command Ending: NULL, CR, LF or CR+LF can be chosen.

  4) User-defined Command: Type the command in this box to control the third-party device which is connected to the RS232 port of the switcher.

- **Unsolicited Status**

  The Unsolicited Status feature allows for automatically sending the full status report (see command getstatus in the **8.3 Command Protocol** section) to a user defined IP-Address, UDP Port and interval.

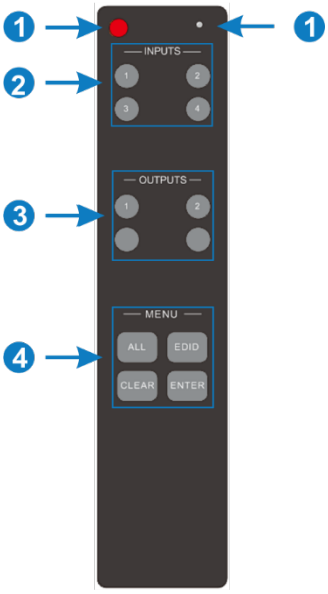
  1) Function switch: ON/OFF

  2) Send Status Port: User-defined UDP port

  3) Send Status IP Address: Send to the specified IP address

  4) Status Interval (1-3600 sec): Sending interval

7. Control



①. Enter/exit standby mode.

①. Blinking red when a button is pressed.

②. Video source selection buttons.

③. Output channel selection buttons.

④. Menu buttons:

- ALL: Select all inputs or all outputs.
- EDID: Enable one or several input sources to manually capture and learn the EDID data of output device.
- CLEAR: Cancel the current operation, if ENTER has not been pressed.
- ENTER: Confirm the desired operation.

8. Device Control

8.1 RS232

Connect the RS232 port to control device (e.g. PC) with RS232 cable. The switcher can be controlled by sending RS232 commands.
The list of command is used to control the switcher. The RS232 control software (e.g. docklight) needs to be installed on the control PC to send RS232 commands. After installing the RS232 control software, please set the parameters of COM number, bound rate, data bit, stop bit and the parity bit correctly, and then you are able to send command in command sending area.

Communication protocol: RS232 Communication Protocol
Baud rate: 9600 Data bit: 8 Stop bit: 1 Parity bit: none

8.2 TCP/IP Control

The system can be controlled over a network connection. A TCP/IP communication software (e.g. TCP&UDP) needs to be installed on the control PC. After installing the control software, create a connection according the below parameters:

Default IP-Address: 192.168.0.178
Default Subnet Mask: 255.255.255.0
Default Gateway: 192.168.0.1
TCP Port Number: 4001

Note:
Command ending symbol <CR>
Feedback ending with symbols <CR><LF>
Delimiter symbol "!"
Please type the command carefully due to case sensitivity.

8.3 Command Protocol

8.3.1 Device Settings

Command	Description	Command & Feedback Example
poweron	Exit standby mode	poweron ok
poweroff	Exit standby mode	poweroff ok
getstatus	Query system status and port status.	4x2 18g matrix switcher! msw-h412ac-ds! firmware:1.0.0! poweron! fplock:on! setbaudrate:6! ip:192.168.0.178! set,1,1!

		set,2,2! hdmisyncon,1! hdmisyncoff,2! downscaleon,1! downscaleoff,2! audiofollowon! seta,1:2! seta,2:2! analogdelay,1:200! analogdelay,2:200! spdifmute,1! spdifunmute,2! mute,1! unmute,2! lovol,1:25! lovol,2:50! in 1 2 3 4 link n n n n out 1 2 link n n edid,1:1 internal! edid,2:1 internal! edid,3:1 internal! edid,4:1 internal! out 1 follow display! out 2 follow input! out 1 on! out 2 off!
getfirmware	Query the firmware version	firmware:1.0.0
reset	Reset to factory default	reset ok
fplockon	Turn on the front panel lock	fplock:on ok
fplockoff	Turn off the front panel lock	fplock:off ok
setbaudrate:7	Set the serial port baud rate to 115200.	setbaudrate:7 ok
setbaudrate:6	Set the serial port baud rate to 57600.	setbaudrate:6 ok
setbaudrate:5	Set the serial port baud rate to 38400.	setbaudrate:5 ok
setbaudrate:4	Set the serial port baud rate to 19200.	setbaudrate:4 ok
setbaudrate:3	Set the serial port baud rate to 9600.	setbaudrate:3 ok
setip:xxx.xxx.xxx.xxx	Set IP of the device	setip:xxx.xxx.xxx.xxx ok

setipstatic	Set IP mode to Static	setipstatic ok
setipdhcp	Set IP mode to DHCP	setipdhcp ok
getip	Query IP of the device	ip:192.168.1.10

8.3.2 AV Routing

Command	Description	Command & Feedback Example
set,y:x	Switch video input [x] to output [y] x = 1 - 4 1 - input 1 2 - input 2 3 - input 3 4 - input 4 y= 0 - 2 0 - all outputs 1 - output 1 2 - output 2	set,y:x ok
getset	Query the video routing of all outputs	set,1:1! set,2:1! set,3:2! set 4:2!
getset,y	Query the input source of output port [y] x = 0 - 2 1 - output 1 2 - output 2	set,1:2! set,2:1!
seta,y:z	Set audio output y de-embedded from z z = 1 - 6 1 - input 1 2 - input 2 3 - input 3 4 - input 4 5 - output 1 6 - output 2 y = 0 - 2 0 - all audio outputs 1 - audio output 1 2 - audio output 2	seta,y:x ok

getseta	Query audio switching status.	audiofollowon! seta,1:2! seta,2:1!

8.3.3 Audio Settings

Command	Function	Command & Feedback Example
lovolinc:y **lovoldec:y** **mute:y** **unmute:y** **lovol,y:z**	y = 0 - 2 0 - all audio outputs 1 - audio output 1 2 - audio output 2 z= 0 - 100 (volume level) lovolinc: volume up for specified port lovoldec: volume down for specified port mute: mutes the specified port unmute: unmutes the specified port lovol: volume level for specified port	lovolinc:y lovol,y:z ok lovoldec:y lovol,y:z ok mute:y ok unmute:y ok lovol,2:75 ok
getaudiolevels	Query analog audio volume and mute status.	lovol,1:75! lovol,2:25! unmute,1! mute,2!
analogdelay,y:z	Set the delay time of analog audio output[y] y = 0 - 2 0 - all analog audio outputs 1 - analog audio output 1 2 - analog audio output 2 z = 0 - 250 : Set the delay time y is the output port (0 for all) z is delay time in ms (0 - 250 ms)	analogdelay,y:z ok
getanalogdelay,y	Query delay status of analog audio output [y] in ms. y= 1 - 2	analogdelay,1:250! analogdelay,2:250!
spdifmute,y **spdifunmute,y**	Mute or unmute of SPDIF output [y] y = 1 - 2 1 - output 1 2 - output 2	spdifmute,1 ok spdifunmute,1 ok
getspdif	Query digital audio mute status.	spdifmute,1! spdifunmute,2!
audiofollowon	Activate Audio Follow Video	audiofollowon ok

audiofollowoff	Deactivate Audio Follow Video	audiofollowoff ok

8.3.4 HDCP Management

Command	Description	Command & Feedback Example
hdcpadvertisingon,x	Enable HDCP advertising (HDCP compatibility mode) on input [x] x = 0 - 4 0 - all inputs 1 - input 1 2 - input 2 3 - input 3 4 - input 4	hdcpadvertisingon,x ok
hdcpadvertisingoff,x	Disable HDCP advertising (HDCP compatibility mode) on input [x] x = 0 - 4 0 - all inputs 1 - input 1 2 - input 2 3 - input 3 4 - input 4	hdcpadvertisingoff,x ok
gethdcpadvertising	Query HDCP advertising status (HDCP compatibility mode).	in 1 on! in 2 off! in 3 on! in 4 off!
hdcp,y:on	Enable HDCP always on for output [y] y = 0 - 2 0 - all outputs 1 - output 1 2 - output 2	hdcp,y:on ok
hdcpfollowdisplay,y	Output [y] HDCP mode follows the display y = 0 - 2 0 - all outputs 1 - output 1 2 - output 2	hdcpfollowdisplay,y ok
hdcpfollowinput,y	Output [y] HDCP mode follows the input source y = 0 - 2 0 - all outputs 1 - output 1 2 - output 2	hdcpfollowinput,y ok
gethdcpoutputs	Query the current HDCP mode for all output ports.	out 1 follow display! out 2 follow input! out 1 on! out 2 off!

8.3.5 EDID Management

Command	Description	Command & Feedback Example
resetedid	Reset to the default EDID	resetedid ok
setuseredid:xx	Upload user-defined EDID xx = 00 - 04 00 - all inputs 01 - input 1 02 - input 2 03 - input 3 04 - input 4 xx = U1 - U4 U1 - user-defined EDID 1 U2 - user-defined EDID 1 U3 - user-defined EDID 1 U4 - user-defined EDID 1	setuseredid:xx ok
setedid,x:zz	Set EDID zz for input [x] x = 0 - 4 0 - all inputs 1 - input 1 2 - input 2 3 - input 3 4 - input 4 zz = 01 - 12 01 - 1920x1080@60 8bit Stereo 02 - 1920x1080@60 8bit High Definition Audio 03 - 3840x2160@30Hz 8bit Stereo Audio 04 - 3840x2160@30Hz Deep Color High Definition Audio 05 - 3840x2160@60Hz 4:2:0 Deep Color Stereo Audio 06 - 3840x2160@60Hz Deep Color Stereo Audio (default) 07 - 3840x2160@60Hz Deep Color High Definition Audio 08 - 3840x2160@60Hz Deep Color HDR LPCM 6CH 09 - User-defined EDID 1 10 - User-defined EDID 2 11 - User-defined EDID 3 12 - User-defined EDID 4	setedid,x:zz ok
getedidout,y	Read the output [y] EDID and print it. y = 1 - 2	EDIDOUT, 2: ------

	1 - output 1 2 - output 2	
edidcopy,y,x	Copies EDID from output y and set to input [x] x = 0 - 4 0 - all inputs 1 - input 1 2 - input 2 3 - input 3 4 - input 4 y = 1 - 2 1 - output 1 2 - output 2	edidcopy,y,x ok
getedidin,x	Query EDID of input [x] x = 0 - 4 0 - all inputs 1 - input 1 2 - input 2 3 - input 3 4 - input 4	edid,1:1 internal! edid,2:1 internal! edid,3:1 internal! edid,4:1 internal!

8.3.6 Function Settings

Command	Description	Command & Feedback Example
autoswitchon,y	Enable auto-switching mode for output [y] y = 0 - 2 0 - all outputs 1 - output 1 only 2 - output 2 only	autoswitchon,1 autoswitchon,1 ok
autoswitchoff,y	Disable auto-switching mode for output [y] y = 0 - 2 0 - all outputs 1 - output 1 only 2 - output 2 only	autoswitchoff,1 autoswitchoff,1 ok
getautoswitch	Gets the autoswitch mode for outputs	autoswitchoff:1! autoswitchon:2!
fallbackmode,y:z	Sets fallback priority mode of auto-switching for output [y]. y = 0 - 2 0 - all outputs 1 - output 1 only 2 - output 2 only z=1-2 1 - mode 1: Priority 1-2-3-4 2 – mode 2 : Priority 4-3-2-1	fallbackmode,2:1 fallbackmode,2:1 ok

getfallbackmode	Gets fallback priority mode of auto-switching for outputs	fallbackmode,1:2! fallbackmode,2:2!
downscaleon,y	Enable auto-downscaling of output [y] y = 0 - 2 0 - all outputs 1 - output 1 2 - output 2	downscaleon,y ok
downscaleoff,y	Disable auto-downscaling of output [y] y = 0 - 2 0 - all outputs 1 - output 1 2 - output 2	downscaleoff,y ok
getdownscale	Query the downscaling status of the HDMI output ports	downscaleon,1! downscaleoff,2!
setusbcpoweroff	Turns off the charging on the USB-C input	setusbcpoweroff ok
setusbcpoweron	Turns on the charging on the USB-C input	setusbcpoweron ok
getusbcpower	Query the charging status for the USB-C port	usbcpoweron!
gethdmi5voltinputs	Query inputs 5V status.	IN 1 2 3 4 LINK N N N Y
gethpdoutputs	Query output port HPD (Hot Plug Detect) connection status.	OUT 1 2 LINK N N
savepreset:z	saves current settings to preset number z z = 0 - 9	savepreset:z ok
getpreset:z	Get information about preset number z z = 0 - 9	set,1:1! set,2:1! seta,3:2! seta,4:1! lovol,1:75! lovol,2:60! mute,1! unmute,2!
loadpreset:z	Recall the preset z and prints out the video and audio routing in the preset	loadpreset:z ok! set,1:1! set,2:1! seta,2:2! seta,4:1!
hdmisyncon,y	Turn on the HDMI Sync feature (5V) of output [y]. y= 0 - 2 0 - all outputs	hdmisyncon,y ok

	1 - output 1 2 - output 2	
hdmisyncoff,y	Turn off the HDMI Sync feature (5V) of output [y] y= 0 - 2 0 - all outputs 1 - output 1 2 - output 2	hdmisyncoff,y ok
gethdmisync	Query output HDMI Sync feature status.	hdmisyncon,1! hdmisyncoff,2!
cecin,x,[bb],[cc]:[dd] **cecout,y,[bb],[cc]:[dd]**	cecin is the command to send cec to an input port cecout is the commands to send cec to an output port bb, cc, dd are all hexadecimal data; x represents the input port, the input is 1-4, y represents the output port 1-2 (HDMI:01-02) FF represents all; bb: Represents device type (TV :40,20,80, Disc player 04,08, etc.); Example： #define CEC_ALL_DEVICE_TYPES_TV (0x80) #define CEC_ALL_DEVICE_TYPES_RECORDING_DEVICE (0x40) #define CEC_ALL_DEVICE_TYPES_TUNER (0x20) #define CEC_ALL_DEVICE_TYPES_PLAYBACK_DEVICE (0x10) #define CEC_ALL_DEVICE_TYPES_AUDIO_SYSTEM (0x08) #define CEC_ALL_DEVICE_TYPES_CEC_SWITCH (0x04)	cecin,x,[bb],[cc]:[dd] ok cecout,y,[bb],[cc]:[dd] ok

	cc: Represents CEC function category (e.g. 44 for remote function)
	eActiveSource =0x82, // follower:TV, switch --> Broadcst , Directly address
	eImageViewOn =0x04, // follower:TV, switch --> Broadcst
	eTextViewOn =0x0D, // follower:TV
	eStandBy =0x36, // follower:All --> Broadcst
	eUserControlPressed =0x44,// follower:All --> Broadcst//User control, equivalent to remote control
	
	dd: represents the specific data under the function (for example, 41, represents the volume of the remote control code plus). This can send two or three groups of combined data, or it can not send up to 9 groups according to the instructions.	

sendascii,x:zzz	Send the ascii command zzz on the local RS232 port using the specified baud rate x x = 1 - 7 1 - 2400 2 - 4800 3 - 9600 4 - 19200 5 - 38400 6 - 57600 7 - 115200	(No feedback for this command)
sendhex,x:zzzz	Send the hex command zzzz on the local RS232 port using the specified baud rate x x = 1 - 7 1 - 2400 2 - 4800 3 - 9600 4 - 19200 5 - 38400 6 - 57600 7 - 115200	(No feedback for this command)
sendasciipowon,x:zzz	Automatically send the ascii command zzz on the local RS232 using the specified baud rate x when entering poweron status. x = 1 - 7 1 - 2400 2 - 4800 3 - 9600	sendasciipowon,x:zzz ok

	4 - 19200 5 - 38400 6 - 57600 7 - 115200	
sendasciipowoff,x:zzz	Automatically send the ascii command zzz on the local RS232 using the specified baud rate x when entering poweroff status. x = 1 - 7 1 - 2400 2 - 4800 3 - 9600 4 - 19200 5 - 38400 6 - 57600 7 - 115200	sendasciipowoff,x:zzz ok
sendhexpowon,x:zzzz	Automatically send the hex command zzzz on the local RS232 using the specified baud rate x when entering poweron status. x = 1 - 7 1 - 2400 2 - 4800 3 - 9600 4 - 19200 5 - 38400 6 - 57600 7 - 115200	sendhexpowon,x:zzzz ok
sendhexpowoff,x:zzzz	Automatically send the hex command zzzz on the local RS232 using the specified baud rate x when entering poweroff status. x = 1 - 7 1 - 2400 2 - 4800 3 - 9600 4 - 19200 5 - 38400 6 - 57600 7 - 115200	sendhexpowoff,x:zzzz ok
sendusercommand,z	Sends the User Defined Commands that is defined in WEB UI. z = 1 - 3 1 - User Defined Command 1 2 - User Defined Command 2 3 - User Defined Command 3	sendusercommand,z ok

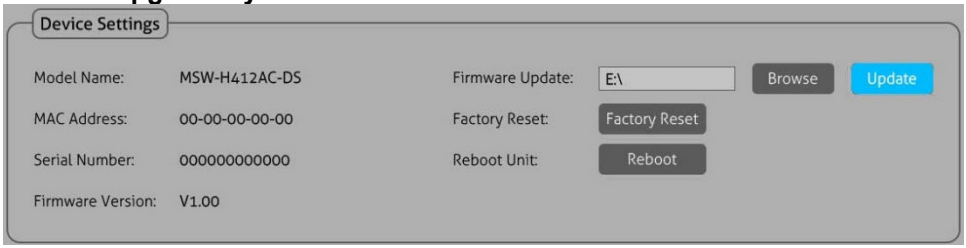
9. Firmware Upgrade

9.1 MCU upgrade by USB

Please follow the steps as below to upgrade firmware by the **FW** port on the front panel:

1) Prepare the latest upgrade file (.APP) and rename it as "**08010000.APP**" on PC.
2) Power off the switcher and connect the **FW** port of switcher to the PC with USB cable.
3) Power on the switcher, and then the PC will automatically detect a U-disk named of "BOOTDISK".
4) Double-click the U-disk, a file named of "READY.TXT" would be showed.
5) Directly copy the latest upgrade file (.bin) to the "BOOTDISK" U-disk.
6) Reopen the U-disk to check the filename "READY.TXT" whether automatically becomes "SUCCESS.TXT", if yes, the firmware was updated successfully, otherwise, the firmware updating is fail, the name of upgrade file (.bin) should be confirm again, and then follow the above steps to update again.
7) Remove the USB cable after firmware upgrade.
8) After firmware upgrade, the switcher should be restored to factory default by sending command.

9.2 MCU upgrade by Web UI

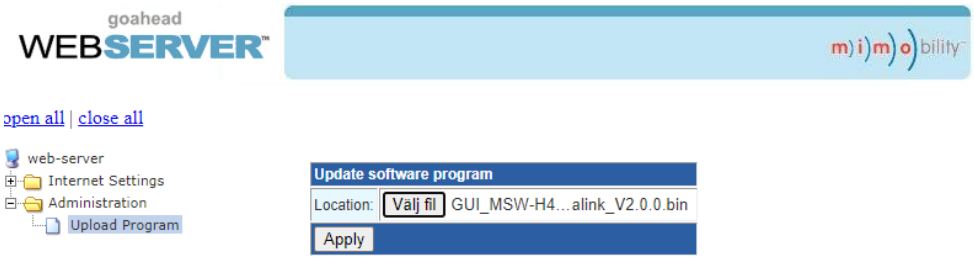


1) Open the Web UI as described in section 6. GUI Control and navigate to the tab **Device Settings**.
2) Click on **Browse** and select the MCU firmware file.
3) Click **Update**.
4) After firmware upgrade, the switcher should be restored to factory default by clicking **Factory Reset**.

9.3 GUI Upgrade

Please visit web server at the device IP-address and port number 100 for GUI online upgrade. Example using the default IP-address: http://192.168.0.178:100.

Type the username and password (the same as the GUI log-in, modified password will be available only after rebooting) to login the configuration interface. After that, click **Administration** in the source menu, and then click **Upload Program**, select the desired update file and press **Apply**, it will start the upgrading process.



10. Drawings and Dimensions