DVDO

DVDO-USBC-HDMI-PS-42

4x2 Presentation Switcher with USB-C & HDMI Inputs

User Manual

Version v1.4

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1 Product Introduction

DVDO-USBC-HDMI-PS-42 is an all-in-one presentation switcher with HDMI, USB-C & USB connectivity for video conferencing applications.

It acts as a 4x2 HDMI2.0 matrix switcher, featuring USB-C connectivity for a simplified transmission of 4K video, audio, control signals and power providing meeting participants with easy host switching, utilizing data speeds of up to 5 Gbps under the USB 3.2 Gen1 providing video resolution capabilities up to 4K@60Hz at 4:4:4.

For the USB-C input ports, one provides up to 65W charging, the other provides external 5V 2A charging for mobile phones.

Easy control, it supports TCP/IP(GUI), RS232 and front buttons controlling.

1.1 Features

- Multiple USB 3.2 Gen 1 connectivity for any type of USB devices (Camera, speakerphone, touch monitor, USB-HID devices etc.…)
- Separate USB 3.2 Host switching layer for multiple USB hosts and USB devices
- Supports HDMI2.0, 4K@60 4:4:4 up to 18Gbps
- HDCP2.2 and backward compliant.
- Supports USB-C up to 4K@30 4:2:0 with 65W charging (only for the first port).
- One USB3.2 (5Gbps) KVM console HUB and control up to 4 directly connected computers
- USB-C supports DP1.2 MST function.
- Supports 4K to 1080p down-scaling without frame rate change.
- CEC and display control & EDID management
- Controllable via front panel, RS232, TCP/IP (GUI) and Auto-switching.
- Firmware upgraded by TCP/IP (GUI)

1.2 Package Contents

- 1 x DVDO-USBC-HDMI-PS-42
- 2 x Mounting Ears with 4 Screws
- 4 x Rubber feet
- 1 x RS232 Cable (3-pin to DB9)
- 1 x 5-pin phoenix connector
- 1 x 100Watt USB-C Power Supply (20V 5A)
- 1 x User Manual

2 Specifications

<table>
<tr><th colspan="6">Video Input</th></tr>
<tr><td colspan="2">Video Input</td><td colspan="4">2 x HDMI, 2 x USB-C</td></tr>
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<tr><td colspan="2" rowspan="2">Video input Video Resolution</td><td colspan="4">HDMI: Up to 4K@60Hz 4:4:4 8bit</td></tr>
<tr><td colspan="4">USB-C: Up to 4K@30Hz, DP1.2 MST function</td></tr>
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<tr><td colspan="2">Video Output</td><td colspan="4">2 x HDMI</td></tr>
<tr><td colspan="2">Video Output Connector</td><td colspan="4">Type-A Female HDMI</td></tr>
<tr><td colspan="2">Video output Video Resolution</td><td colspan="4">HDMI: Up to 4K@60Hz 4:4:4, supports 4K to 1080P down-scaling</td></tr>
<tr><td colspan="2">HDMI Version</td><td colspan="4">Up to 2.0</td></tr>
<tr><td colspan="2">HDCP Version</td><td colspan="4">Up to 2.2</td></tr>
<tr><th colspan="6">Downscaling Capability</th></tr>
<tr><td colspan="3">Input</td><td colspan="3">Output</td></tr>
<tr><td>Resolution</td><td>Refresh rate</td><td>Color Space</td><td>Resolution</td><td>Refresh rate</td><td>Color Space</td></tr>
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<tr><td>4K</td><td>50Hz</td><td>4:4:4</td><td rowspan="2">1080p</td><td rowspan="2">50Hz</td><td rowspan="2">4:4:4</td></tr>
<tr><td>4K</td><td>50Hz</td><td>4:2:0</td></tr>
<tr><td>4K</td><td>30Hz</td><td>4:4:4</td><td rowspan="2">1080p</td><td rowspan="2">30Hz</td><td rowspan="2">4:4:4</td></tr>
<tr><td>4K</td><td>30Hz</td><td>4:2:0</td></tr>
<tr><td>4K</td><td>25Hz</td><td>4:4:4</td><td rowspan="2">1080p</td><td rowspan="2">25Hz</td><td rowspan="2">4:4:4</td></tr>
<tr><td>4K</td><td>25Hz</td><td>4:2:0</td></tr>
<tr><td>4K</td><td>24Hz</td><td>4:4:4</td><td rowspan="2">1080p</td><td rowspan="2">24Hz</td><td rowspan="2">4:4:4</td></tr>
<tr><td>4K</td><td>24Hz</td><td>4:2:0</td></tr>
<tr><th colspan="6">Audio</th></tr>
<tr><td colspan="2">Audio formats for pass-through</td><td colspan="4">LPCM 7.1, Dolby® TrueHD, Dolby Digital® Plus, and DTS-HD® Master Audio™.</td></tr>
<tr><td colspan="2">Audio formats for de-embedding</td><td colspan="4">PCM 2.0 on 5-pin terminal block</td></tr>
<tr><th colspan="6">Control</th></tr>
</table>

USB	2x USB Type C with charging function (one for 65Watt, the other for 10Watt)
	2x USB Type B for user application
	4x USB Type A for peripherals
RS-232	1 x 3-pin terminal block
Ethernet	1x 100Base-T on RJ45 port
General	
Operation Temperature	-5°C ~ +55°C
Storage Temperature	-25°C ~ +70°C
Relative Humidity	10%-90%
External Power Supply	Input: AC 100~240V, 50/60Hz; Output: 20V DC 5.0A, 100Watt
Power Consumption	85W (Max)
Dimension (W*H*D)	260 mm x 25mm x 155mm
Net Weight	0.95 KG
Gross Weight	1.75 KG

3 Panel Description

3.1 Rear Panel

Name & Description	Remark
INPUT	2 x Type-A HDMI 2.0 ports to connect HDMI sources. 2 x USB-B supports USB3.2. 2 x Type-C ports to connect USB-C sources.
OUTPUT	2 x Type-A HDMI2.0 ports to connect HDMI displays. 1 x 5-pin balanced de-embedded audio.
RS232	1 x 3-pin terminal block for RS232 control
TCP/IP	1 x RJ45 connector for TCP/IP control.
Type-C (PD)	Connects to 100W USB-C power supply, PD100W

3.2 Front Panel

Name & Description	**Remark**
USB DEVICE	4 x USB-A, supports USB3.2
Power LED indicator	1 x Power LED, the LED illuminates green when it is powered on.
OUTPUT 1	**1-4**: Four input LEDs, one of which illuminates blue to indicate which source is selected for output 1 **Auto LED**: Illuminates blue in auto switching mode. **Manual Toggle**: Press the button repeatedly to cycle through the four video inputs.
OUTPUT 2	**1-4**: Four input LEDs, one of which illuminates blue to indicate which source is selected for output 2. **Auto LED**: Illuminates blue in auto switching mode. **Manual Toggle**: Press the button repeatedly to cycle through the four video inputs.

4 System Connection

4.1 Usage Precaution

- Make sure all components and accessories are included before installation.
- The 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 power on.

4.2 System Diagram

The following diagram illustrates the typical input and output connection of the switcher:

5 Button Control

5.1 Manual Switching

When the switcher is in manual switching mode, the AUTO button LED goes out. Please follow the below steps to switch input source to output channel.

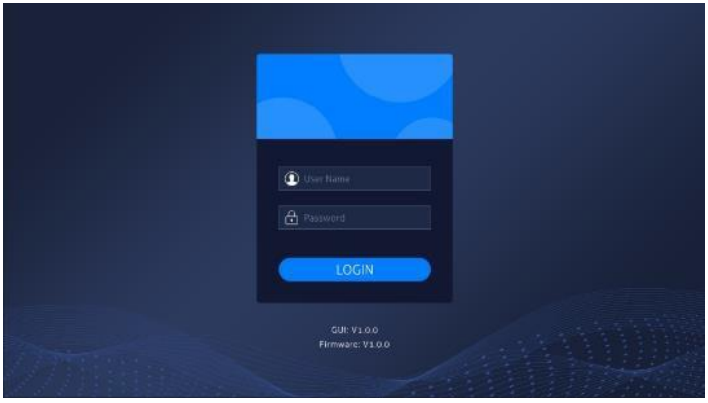
- Press the “Manual Toggle” button to select input source, and the corresponding button LED turns blue.
- It will be switched from USB-C 1, USB-C 2, HDMI 3 to HDMI4 respectively.

6 GUI Control

The switcher can be controlled via TCP/IP. The default IP settings are:

IP Address:	192.168.1.239
Subnet Mask:	255.255.255.0

Type ***192.168.1.239*** in the internet browser, it will enter the below log-in webpage:

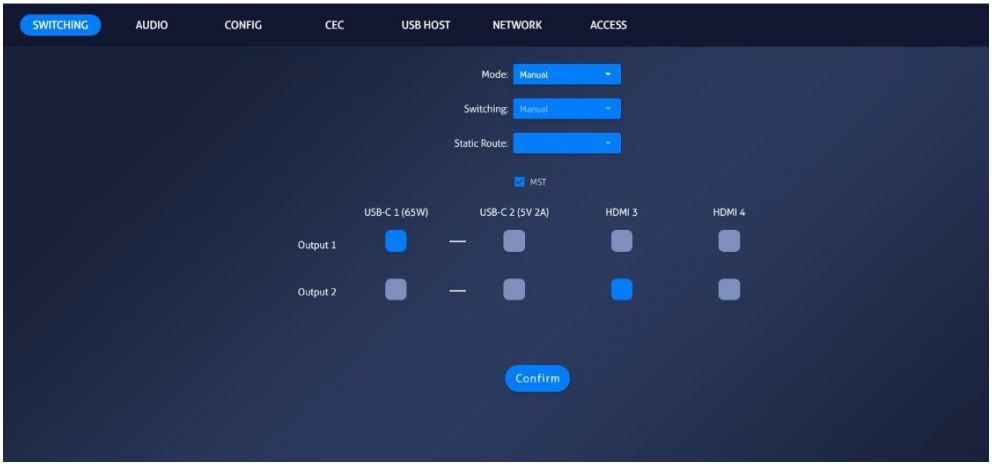


Username: admin
Password: admin

Type the user name and password, and then click **LOGIN** to enter the section for video switching.

6.1 Video Switching Setting

6.1.1 Conference Mode



Auto

- HDMI Inputs will have one screen each
- USB-C have extended desktop and priority above the HDMI inputs.

HDMI1 & HDMI2 are allocated to each output, when USB-C Connects it uses MST to take over both outputs, working as a BOYD solution for two screens.

Typical usage is a **Windows MTR** solution with 2 screen outputs. They will always be on screen, with access to all USB Devices. When a

BYOD client connects to USB-C, it will get access to 2 external screens with up to 4K30 resolution and all USB peripherals.

Please note:

Configuration and resolution available to USB-C host will depend on the computer's specifications. Please refer to the user manual of the computer to check if HBR2 or HBR3 is supported. With HBR2 you will get 2x1080p, while with HBR3 2x4K@30.

Static Route

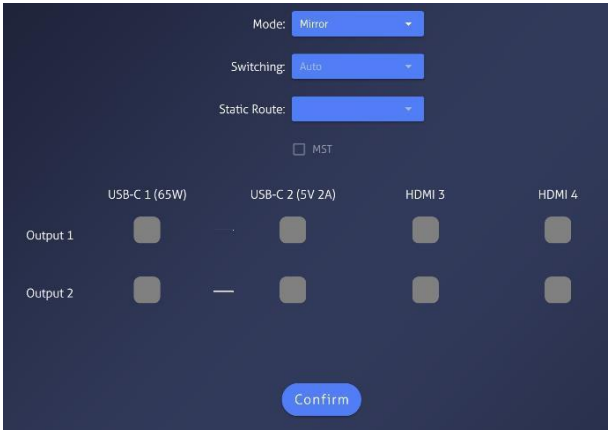
An optional setting where the systems is changed from a 4x2 Matrix to a 3x1 AutoSwitcher + a 1 to 1 connection for a preferred input.

6.1.2 Manual Mode

- MST is optional
- No auto switching

The correct setting to use when you have a 3rd party control system. All major systems can control DVDO-USBC-HDMI-PS-42 via LAN or RS232.

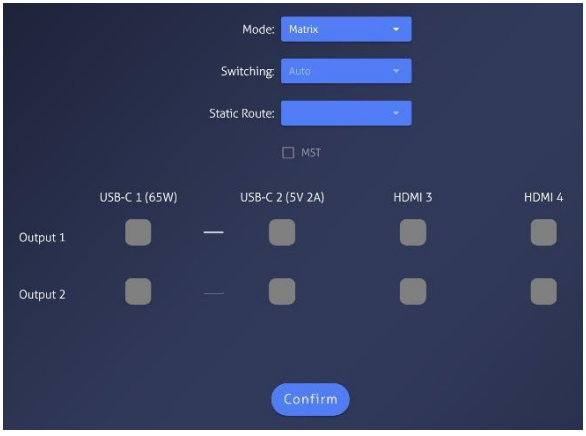
6.1.3 Mirror Mode



The latest source connected will be routed to both outputs.

MST is deactivated as this setting is the one to choose when using it as an Auto Switcher with only 1 output active, or you have 1 screen in use + either a projector, recorder, streaming-device etc.

6.1.4 Matrix Mode

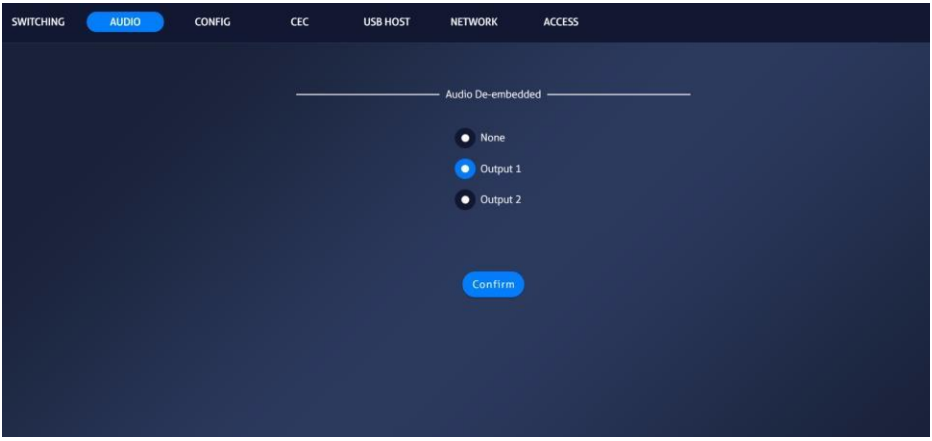


- 1 source – Duplicate
- 2 sources - Matrix

To use the switcher with 4 inputs that has equal priority towards the 2

displays. When only 1 source is connected it will be duplicated to both screens to prevent having black screens when the system is in use. When a 2nd source connects the two sources will have a screen each. For a 3rd connected source the one source that connected first will be disconnected.

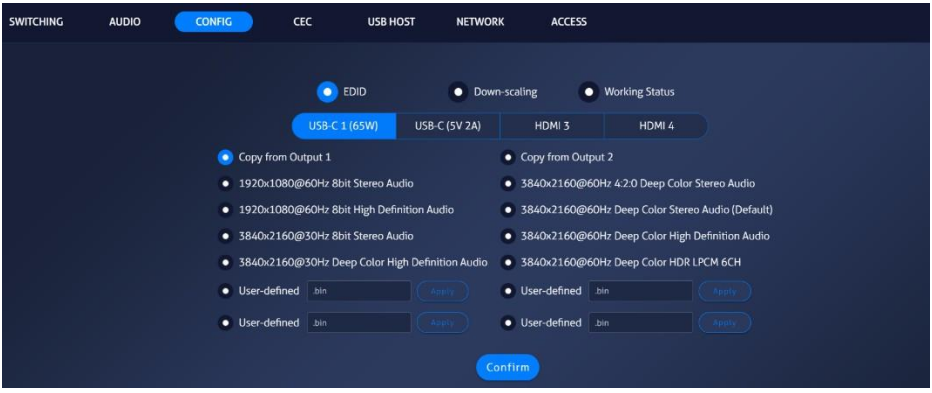
6.2 Audio Control Setting



- Set the de-embedded audio output from output1 or output2 or none.

6.3 Configuration

6.3.1 EDID Setting



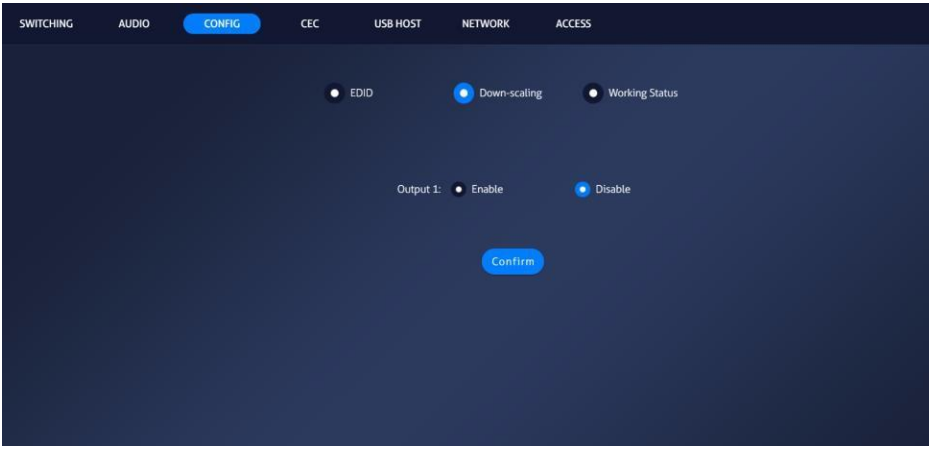
- Copy the EDID from Output 1 or Output 2 or select built-in 8 EDID for the selected input source.
- Upload user-defined EDID by the below steps:

  Step 1: Prepare the EDID file (.bin) on the control PC. Step 2: Select the **User-defined**.

  Step 3: Click the box .bin , and then select the EDID file (.bin) according to the tooltip.

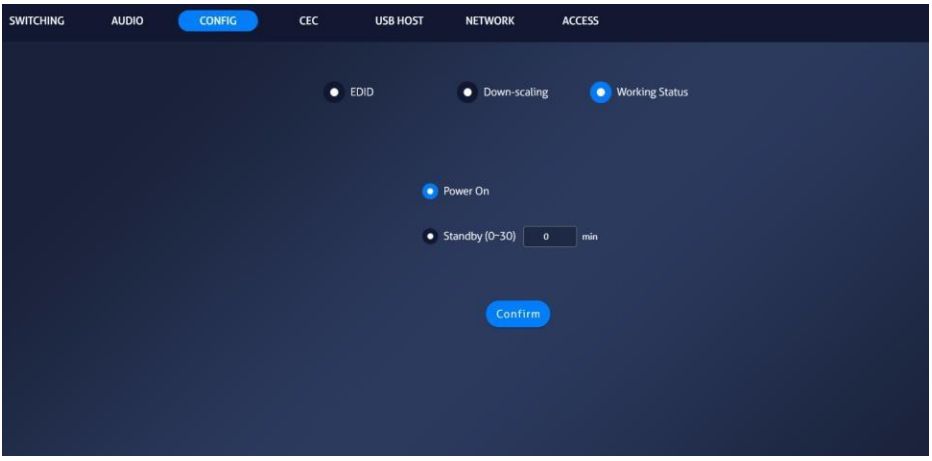
  Step 4: Click **Confirm** to upload the user-defined EDID.

6.3.2 Down-scaling Setting



- To enable or disable the down-scaling function on output 1.

6.3.3 Working Status Setting

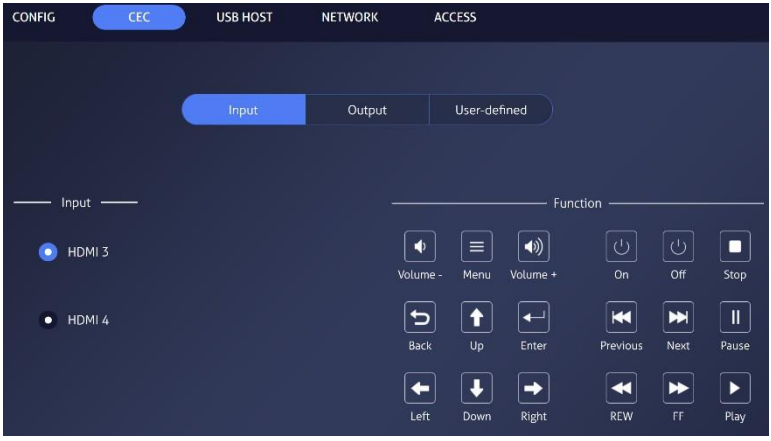


- Power on the device
- Set the device at “Standby” mode at a selected time, from 0-30 minutes

6.4 CEC Control Setting

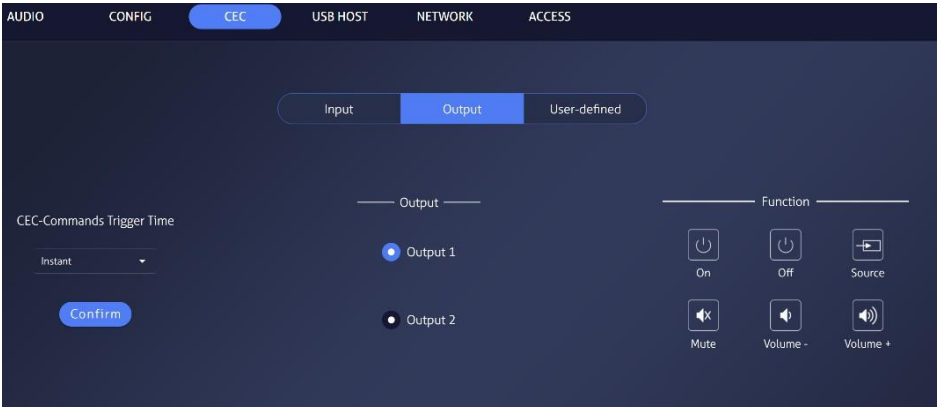
If the input source devices and display devices support CEC, they can be controlled by the below control button.

6.4.1 Source Control



- Select the input source which needs to be controlled, and then press the Function buttons.

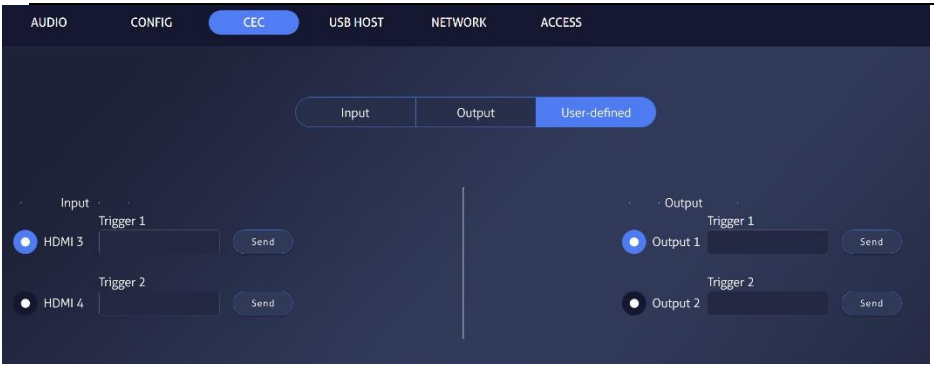
6.4.2 Display Control



- Select the output display which needs to be controlled, and then press function buttons
- CEC commands triggered time setting, it will send out the CEC command automatically at a setting time, from one minute to 30 minutes.

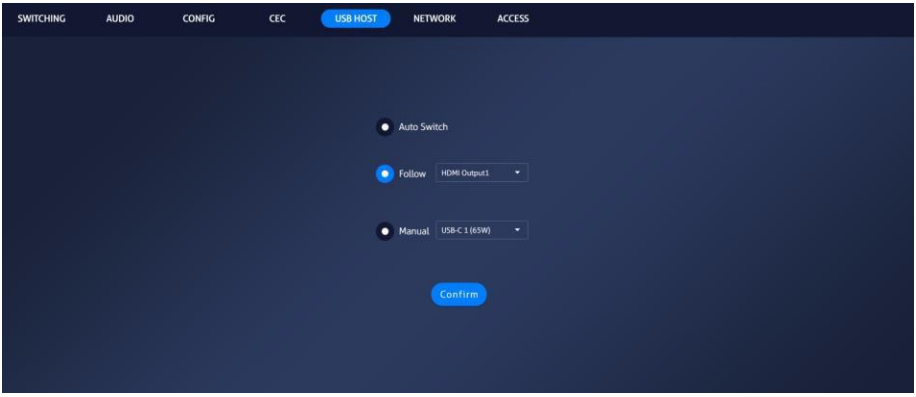
6.4.3 User-defined

The switcher also provides user-defined CEC functions, the CEC command can be edited and saved in the Trigger box.



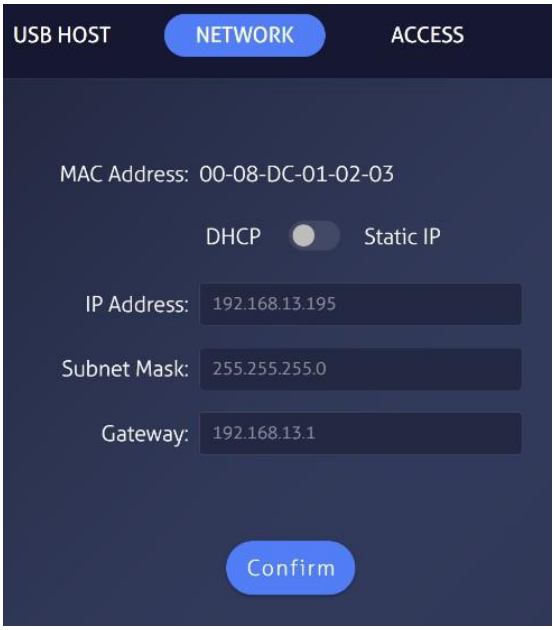
- Select the input source, and then type CEC command in the **Trigger 1** or **Trigger 2** box to control the selected source.
- Select the output display, and then type CEC command in the **Trigger 1** or **Trigger 2** box to control the selected display.

6.5 USB HOST Setting



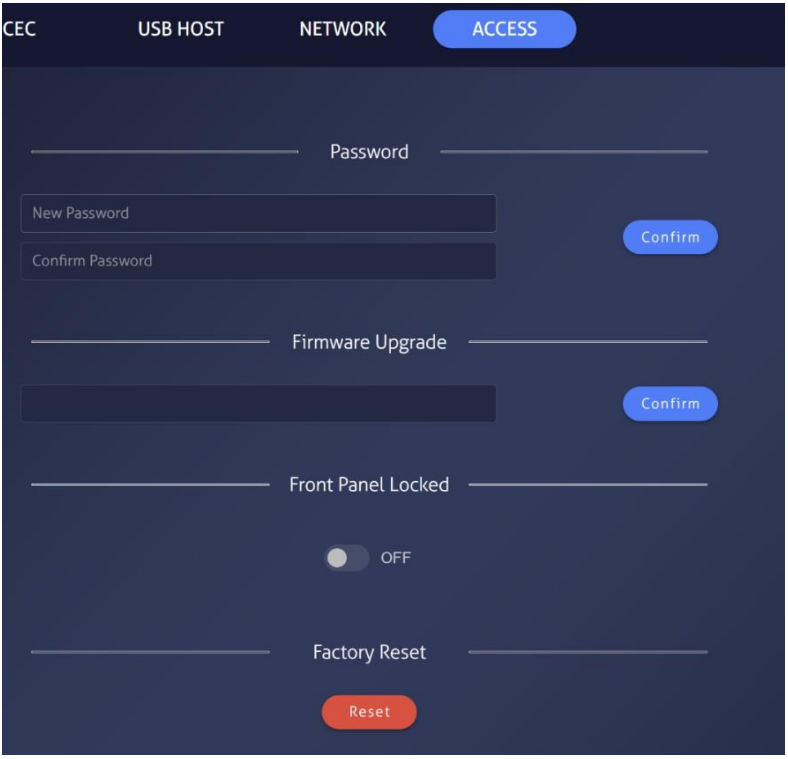
- Set the USB HOST for “Auto Switch”, “Follow the outputs” or “Manual” status.

6.6 Network Setting



- Static IP or Dynamic Host Configuration Protocol (DHCP).
- Modify the static IP Address, Subnet Mask, and Gateway.

6.7 Access Setting



- Change the password
- Firmware upgrade (check the details on Page 28)

7 RS232 Command

Communication protocol: RS232 Communication Protocol

Baud rate: 9600 Data bit: 8 Stop bit: 1 Parity bit: none

Note: All commands need to be ended with <CR> <LF> / 0A 0D

7.1 System Command

Command	Description
#HELP	Print Help Information
#GET_SYSINFO	Query all status and settings
#GET_FIRMWARE_VERSION	Query firmware version
#GET_MATRIX_NAME	Get matrix name
#FACTORY_RESET	Reset to factory default setting
#SET_POWER [x]	Power on/power off, [x]=0~1: 0 - OFF, 1 - ON
#SET_STANDBY XX	Power standby state, XX= 0~30 minutes XX=01, 02…30
#SET_KEYPAD_LOCK [x]	Unlock/Lock front keypad, [x]=0~1: 0 - Unlock, 1 - Lock
#STA_KEYPAD_LOCK	Query status of KEYPAD_LOCK
#SET_GUI_DHCP [x]	Set GUI DHCP On/Off, [x]=0~1: 0 - OFF, 1 - ON
#SET_GUI_IP:XXX.XXX.XXX.XXX	Set GUI IP
#SET_GUI_NMK:XXX.XXX.XXX.XXX	Set GUI Subnet Mask
#SET_GUI_RIP:XXX.XXX.XXX.XXX	Set GUI Gateway
#SET_GUI_RESET	Reset GUI to default setting
#GET_GUI_DHCP	Query GUI DHCP
#GET_GUI_IP	Query GUI IP
#GET_GUI_NMK	Query GUI Subnet Mask
#GET_GUI_RIP	Query GUI Gateway

7.2 Query Command

Command	Description
#STA_VIDEO	Query video switching setting
#STA_AUDIO	Query status of audio outputs
#STA_MODE	Query status of system work mode
#STA_MAN_MST	Query status of MST when system work in manual mode
#STA_CONF	Query status of switch mode when system work in conference mode
#STA_SR	Query static route setting
#STA_DS	Query down-scaling state of HDMI outputs
#STA_USB	Query status of USB HOST
#STA_IN	Query HDMI input connection (5V)
#STA_OUT	Query HDMI output connection (HPD)
#EDIDSTA[xx]	Query The HDMI Inputs EDID Setting [xx]=H1,H2,H3,H4,HA (All inputs) Note: 1) If user defined EDID is empty, then use it will show the default EDID 2) If EDID from '#EDIDUpgrade' will show 'user define EDID'

7.3 Setting Command

Command	Description
#SET [XX] [YY]	Switch HDMI input [XX] to output [YY] [XX]=H1,H2,H3,H4 [YY]=O1,O2,OA (all outputs)
#SET AUDIO [XX] [YY]	Select audio source [XX] for Deembedded audio output [YY] [XX]=O1,O2 [YY]=A1
#[XX] VOLUME [YY]	Mute & Unmute [XX]= A1,represents analog audio output 1

	[YY]==MU Mute [YY]==UM Unmute
#SET MODE [XX]	System work in [XX] mode [XX]=01~04 01 Conference 02 Matrix 03 Mirror 04 Manual
#SET MAN_MST ON/OFF	Set MST function ON/OFF on USB-C when System is working in Manual mode
#SET CONF [XX]	Set switch mode work in [XX] when System is working in Conference Mode [XX]=AT, Auto [XX]=SR, Static Route
#SET SR [XX]	Set Switch HDMI input [XX] to Static Route [XX]=H1,H2,H3,H4
#SET [XX] DS ON	Enable the down-scaling function of HDMI output [XX] [XX]=O1(HDMI Output 1)
#SET [XX] DS OFF	Disable the down-scaling function of HDMI output [XX] [XX]=O1(HDMI Output 1)
#SET USB [XX]	Select USB source [XX] for USB HOST [XX]=O1,O2,represents follow HDMI output1~2 [XX]=AT, represents auto switch [XX]=C1,C2,represents USB-C 1~2 [XX]=H3,H4,represents Host 3~4

7.4 EDID Command

Command	Description
#EDIDUpgrade [XX][YY]	[XX][YY] Upgrade the User Define EDID [YY] Data of the Input Port [XX] [XX]=H1,H2,H3,H4 [XX]=HA, represents all inputs [XX]=H1~H4, represents HDMI input 1~4 [YY]=UD1~UD4, upload a user-defined EDID 1~4 The EDID can be saved for invoking at any time, When the command applied system prompts to upload the EDID file (.bin),Operation will be cancelled in 10 seconds
#EDID [XX] [YY]	The input [XX] recall the embedded EDID [YY] [XX]=H1, H2, H3, H4, HA. The 'HA' represents all inputs [YY]=01~09. EDID 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 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

#EDIDM [XX] [YY]	Copy the EDID data of output [XX] to input [YY] [XX]=O1, O2 [YY]=H1,H2,H3,H4,HA (All Inputs)

7.5 CEC Command

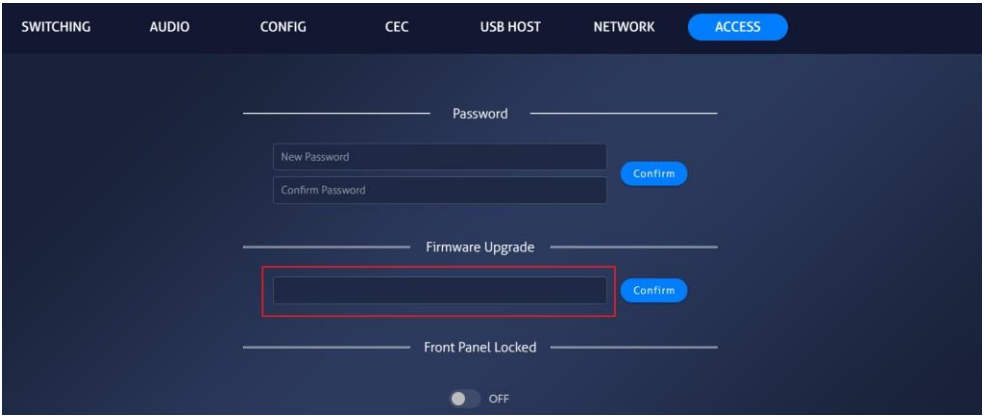
Command	Description
#CEC [XX] [BB] [CC] [DD]	CEC Command sending [XX]=H3,H4,HA (All inputs) [XX]=O1,O2,OA (All outputs) [BB]: Device type (e.g. TV: 40/20/80; Blu-ray DVD: 04/08) [CC]: CEC function type (e.g. '44': Remote control) [DD]: The specific command (e.g. '41': Volume up) (e.g. '#CEC O2 80 44 43': TV Volume Mute)
#SET CEC TRIG [XX]	Configure CEC-commands trig automatically time intervals [XX]= Time Intervals 00 Instant 01 10s 02 30s 03 1min 04 5min 05 10min 06 30min
#STA_CEC_TRIG	Query status of CEC-commands trig time intervals

8 Firmware Upgrade

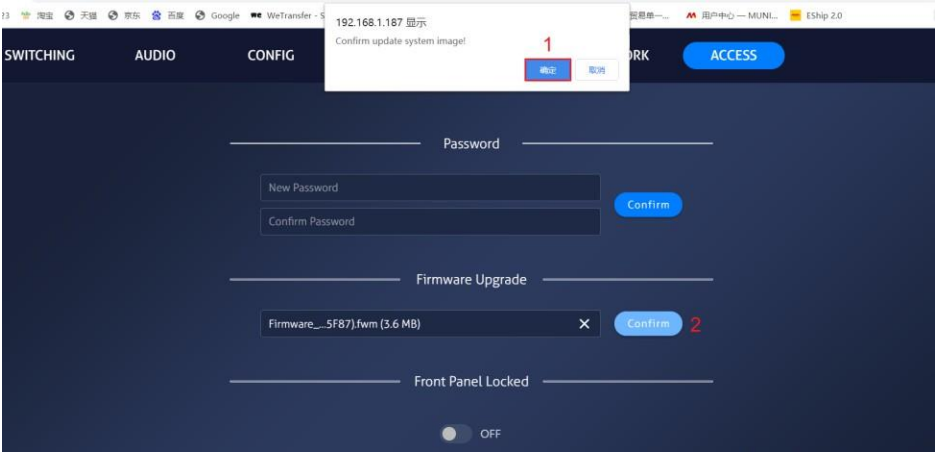
Please follow the steps below to upgrade firmware by GUI.

1) Prepare the latest upgrade file (.fwn) on PC.

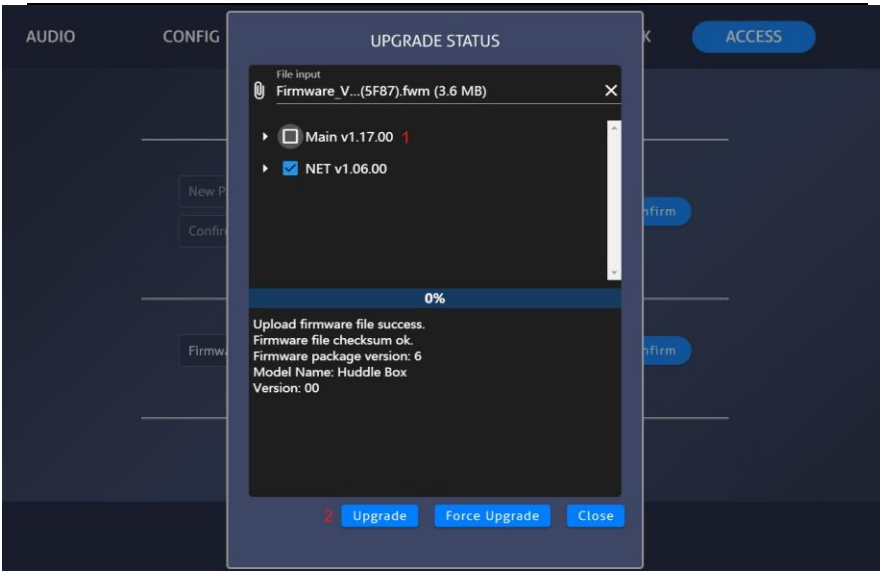
2) Click the RED circle to upload the file.



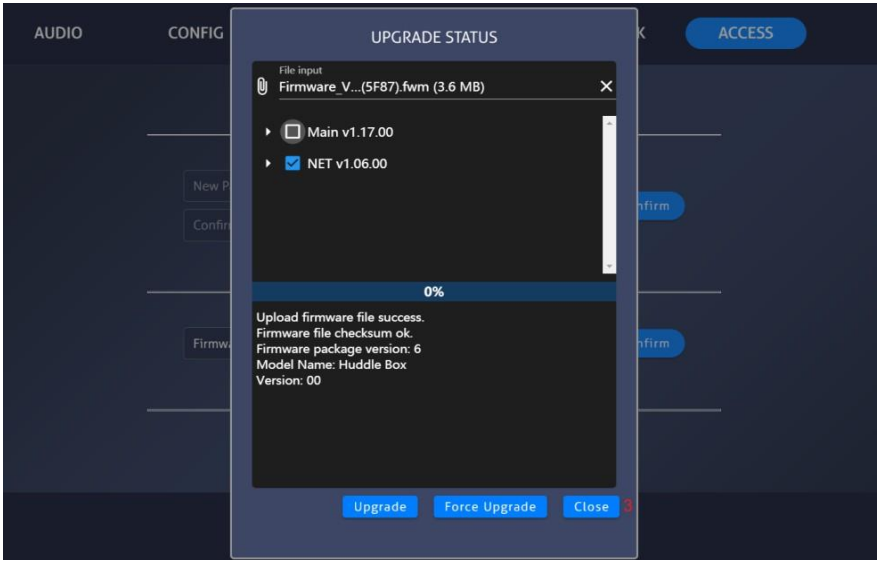
3) Click step 1 and step 2 for the procedure.



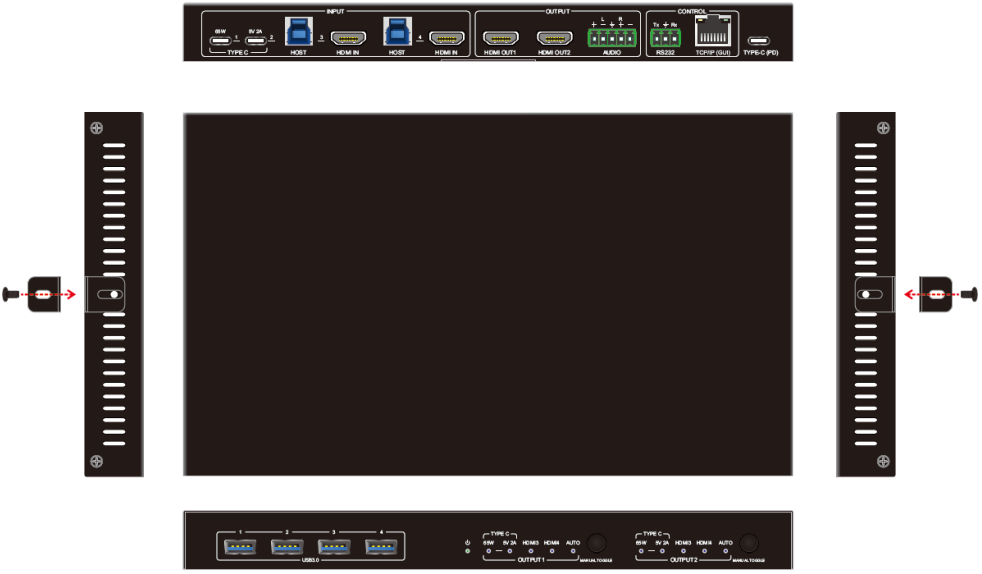
4) Continue to click Step 1 and step 2.



5) After upgrading successfully, then click the close button.



9 Panel Drawing



10 Troubleshooting and Maintenance

Problems	Potential Causes	Solutions
Output image with white noise.	Bad quality of the connecting cable.	Try another high-quality cable.

	Fail or loose connection.	Make sure the connection is good.
No output image when switching	No signal at the input / output end.	Check with oscilloscope or multimeter if there is any signal at the input/ output end.
	Fail or loose connection.	Make sure the connection is good.
	The switcher is broken.	Send it to authorized dealer for repairing.
POWER indicator doesn't work or no respond to any operation	Fail connection of power cord.	Make sure the power cord connection is good.
Cannot control the device by control device (e.g., a PC) through RS232 port	Wrong RS232 communication parameters	Type in correct RS232 communication parameters.
	Broken RS232 port	Send it to authorized dealer for checking.

Note: *If your problem persists after following the above troubleshooting steps, seek further help from authorized dealer or our technical support.*

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