User Manual

Milestone PRO

MP-IP500E & MP-IP500D & MP-IP500C1

18G HDMI over 1G IP Encoder & Decoder

Version: MP-IP500_2023V1.0

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 July 13, 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 A 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 performance 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 products' specifications 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, please treat them as normal electrical wastes.

Table of Contents

1. Product Introduction

The MP-IP500 is a network AV extender with HDMI encoder and decoder up to resolution 4K@60Hz 4:4:4, HDR. It is designed for HDMI transmission over IP network with control signals at distance up to 100m over CATx cable. It works with one control PC (Wake on IP control box) and one 1GbE Switch to control a variety of functions.

The MP-IP500 provides one of the most advanced IP Streaming solutions on the market utilizing Aspeed technology, which synergizes various IP/AV standards to work together as one.

The MP-IP500 features 4K video with 1 frame latency from encoder to decoder, Video wall, 1G Ethernet, IR, RS232, etc. It can be controlled by the Web-UI.

Compares with traditional HDBaseT matrix AV Switching, MP-IP500 features low cost, easy installation, more interoperability and flexibility. It is ideal for distributing AV over 1 Gigabit Ethernet in enterprises and other large-scale installations.

1.1 Features

- Streams 4K video with 1 frame latency.
- Supports HDMI video resolution up to 4K@60Hz 4:4:4 8bit.
- Transports RS232 and IR signal to any units.
- Supports Video Wall mode up to 9x9 screens.
- Selectable output resolutions up to 4K scaling ability.
- Additional 3-pin terminal block for audio embedding.
- IP control box for TCP/IP control.

1.2 Package List

For each unit, they have different package, sold separately.

1x MP-IP500E	**1x MP-IP500D**	**MP-IP500C1**
● 2x Mounting Kit	● 2x Mounting Kit	● 2x Mounting Kit
● 4x Rubber feet	● 4x Rubber feet	● 4x Rubber feet
● 1x 3-pin Terminal Block	● 1x 5-pin Terminal Block	● 1x 3-pin Terminal Block
● 1x 5-pin Terminal Block	● 1x User Manual	● 1x 5V1A adapter
● 1x User Manual		● 1x User Manual

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

2. Specification

2.1 Encoder

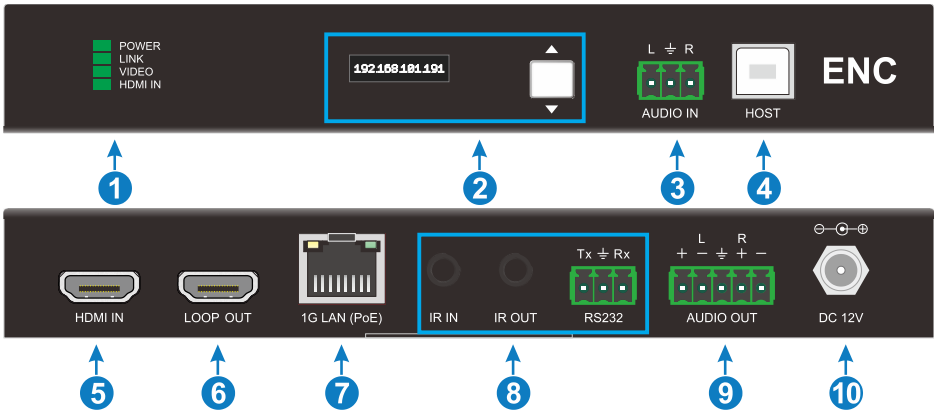
Input	
Video Input	(1) HDMI
Video Input Connector	(1) Type-A female HDMI
HDMI Input Resolution	Up to 4K@60Hz 4:4:4 8bit
Audio Input	(1) Analog Audio In
Audio Input Connector	(1) 3-Pin terminal block
Output	
Video Output	(1) IP Stream (1) HDMI
Video Output Connector	(1) RJ45, (1) Type-A female HDMI
HDMI Output Resolution	Up to 4K@60Hz 4:4:4 8bit
Audio Output	(1) IP Stream (1) De-embedding Output
Audio Output Connector	(1) RJ45, (1) 5-Pin terminal block
General	
Control	(1) IR IN, (1) IR OUT, (1) RS232, (1) host
Control Connector	(2) 3.5mm jack, (1) 3-pin terminal block (1) USB-B
Operation Temperature	-10℃ ~ +55℃
Storage Temperature	-25℃ ~ +70℃
Relative Humidity	10%-90%
Power Consumption	7.8W (Max)
Dimension (W*H*D)	180 x 142.7 x 25 mm
Net Weight	570g

2.2 Decoder

Input	
Video Input	(1) IP Stream
Video Input Connector	(1) RJ45
Output	
Video Output	(1) HDMI
Video Output Connector	(1) Type-A female HDMI
HDMI Output Resolution	Up to 4K@60Hz 4:4:4 8bit
Audio Output	(1) Analog audio output
Audio Output Connector	(1) 5-Pin terminal block
Audio Sample Rate	Support 48 kHz, 96 kHz, 192 kHz
THD+N	< 0.05% (-80dB), 20Hz – 20KHz bandwidth, 1KHz sine at 0dBFS level (or max level).
Frequency Response	20Hz – 20KHz, ±1dB
SNR	> 90 dB, 20Hz - 20KHz bandwidth.
Crosstalk Isolation	< - 80 dB, 10KHz sine at 0dBFS level (or max level before clipping).
Noise Level	< - 80 dBu
General	
Control	(1) IR IN, (1) IR OUT, (1) RS232
Control Connector	(2) 3.5mm jack, (1) 3-pin terminal block
Operation Temperature	-10℃ ~ +55℃
Storage Temperature	-25℃ ~ +70℃
Relative Humidity	10%-90%
Power Consumption	11.52W (Max);
Dimension (W*H*D)	180 x 142.7 x 25 mm
Net Weight	570g

3. Panel Description

3.1 MP-IP500 Encoder



1. **POWER LED:** The LED illuminates green when power is supplied.

   LINK LED: The LED indicates green if 1G LAN port is connected.

   VIDEO LED: The LED illuminates green when the stable video signal is detected.

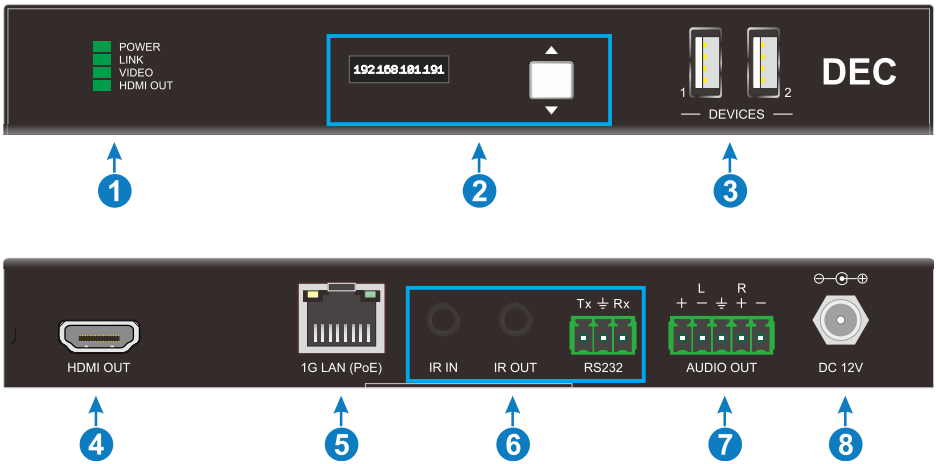
   HDMI IN: The LED illuminates green when 5V signal is detected.

2. **OLED Screen:** Show the unit information of IP address, firmware version and MCU version.

   Button: Recycle switch the information show in OLED screen.

3. **AUDIO IN:** 1x 3-pin terminal block, embedding the analog audio in the source.
4. **HOST:** 1x USB-B 2.0, connect the PC
5. **HDMI IN:** 1x HDMI Type-A female port, connecting to the video source.
6. **LOOP OUT:** 1x HDMI output port for the video loop out.
7. **1G LAN(PoE):** 1x RJ45 port, connecting to the IP Network for the IP stream output. The port also supports IEEE 802.3af-2003 PoE to power for the unit.
8. **Control:** IR input, IR output and RS232 support unicast and multicast communicate between encoder and decoder.
9. **AUDIO OUT:** 1x 5-pin terminal block for the audio de-embedding.
10. **DC 12V:** Connect to the DC12V1A power adapter.

3.2 MP-IP500 Decoder



1. **POWER LED:** The LED illuminates green when power is supplied.

   LINK LED: The LED indicates green if 1G LAN port is connected.

   VIDEO LED: The LED illuminates green when the stable video signal is detected.

   HDMI OUT: The LED illuminates green when 5V signal is detected.

2. **OLED Screen:** Show the unit information of ENC IP address, DEC IP address, Firmware version and MCU version.

   Button: Recycle switch the information show in OLED screen.

3. **DEVICES:** 2x USB-A 2.0 connect to the USB devices.

4. **HDMI OUT:** 1x HDMI output port for the video out.

5. **1G LAN(PoE):** 1x RJ45 port, connecting to the IP Network for the IP stream input. The port also supports IEEE 802.3af-2003 PoE to power for the unit.

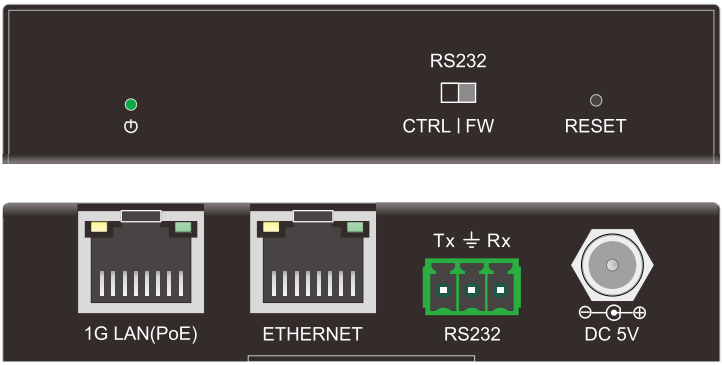
6. **Control:** IR input, IR output and RS232 support unicast and multicast communicate between encoder and decoder.

7. **AUDIO OUT:** 1x 5-pin terminal block for the audio de-embedding.

8. **DC 12V:** Connect to the DC12V1A power adapter.

3.3 IP Control Box

The MP-IP500C1 control box allows third party control of the multicast system use TCP/IP, RS232.



1. **Power LED:** Illuminates green when power on.
2. **DIP Switch:** Select the RS232 mode, controlling or firmware upgrade.
3. **Reset:** Long press 3s for factory reset.
4. **1G LAN(PoE):** Connect to the IP Network for the control. The port also supports IEEE 802.3af-2003 PoE to power for the unit.
5. **ETHERNET:** Connect to the network where the control system existing.
6. **RS232:** Connect to the PC for the RS232 control.
7. **DC5V:** Connect to the DC5V1A power adapter.

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 of the power switches, plugs, sockets, and power cords should be insulated and safe.
- All devices should be connected before being powered on.

4.2 Connection Type

There are three types of possible applications:

Extender (Point-to-Point)

In a point-to-point configuration, there is no need for a switch. Distribute full, transfer 4K@60Hz 4:4:4 resolution up to 100m.

Splitter (One-to-Many)

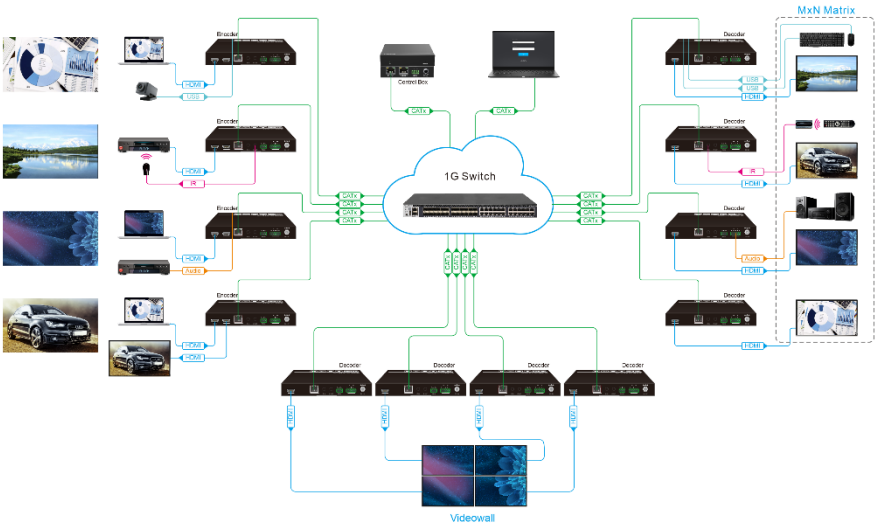
With only one MP-IP500 as transmitter and one 1G Ethernet Switch, any A/V signal can instantly distributed to a near limitless number of receivers and screens, any number of times.

Matrix Switcher (Many-to-One, Many-to-Many)

The combination of switching and splitting enables a completely scalable matrix system. Independently route video, audio and control signal from any source to any endpoint.

4.3 System Diagram

The following diagram illustrates typical input and output connections that can be utilized with the MP-IP500:



Matrix System

4.4 Hardware Setup

Please follow the steps below to complete the system installation:

1) Connect the power supply (12V DC) to the power connectors (or powered by the switch via PoE).
2) Connect the video/graphics source device to the HDMI input connector on each Encoder unit.
3) Connect the video display device to the HDMI output connector on each DECODER unit.
4) (Optional) Connect RS232 devices as needed if you want to test RS232 serial extension between Encoder and DECODER units.
5) (Optional) Connect GbE compatible Ethernet devices as needed for testing the 1 Gig Ethernet ports of any Encoder or DECODER units.
6) (Optional) Connect compatible IR emitter modules to the IR output connectors of any Encoder or DECODER.
7) (Optional) Connect compatible IR receiver modules to the IR input connectors of any Encoder or DECODER.
8) Connect a 1G Ethernet cable from the 1GbE port each Encoder and DECODER unit to any available 1GBaseT port.
9) Connect one IP Control Box to the network.
10) Connect the control PC to the ETHERNET port of one IP control box or one of the 1GbE switch (except the management/console port of the switch).
11) The hardware setup is now completed.

5. Operation of TCP/IP

5.1 General Information

After connecting a control box in the Local Area Network, we can login in the GUI to control the units.

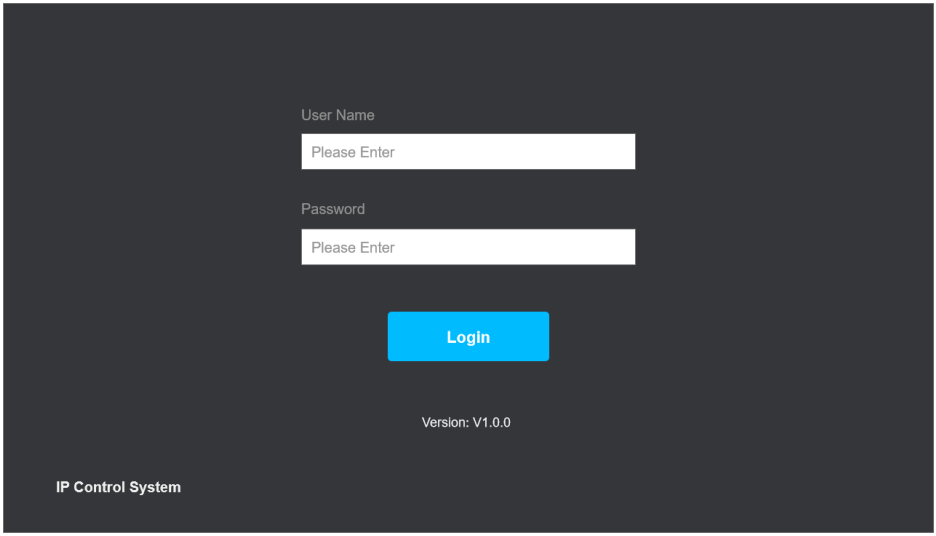
IP Address: 192.168.0.178

Subnet Mask:255.255.255.0

Username: admin

Password: admin

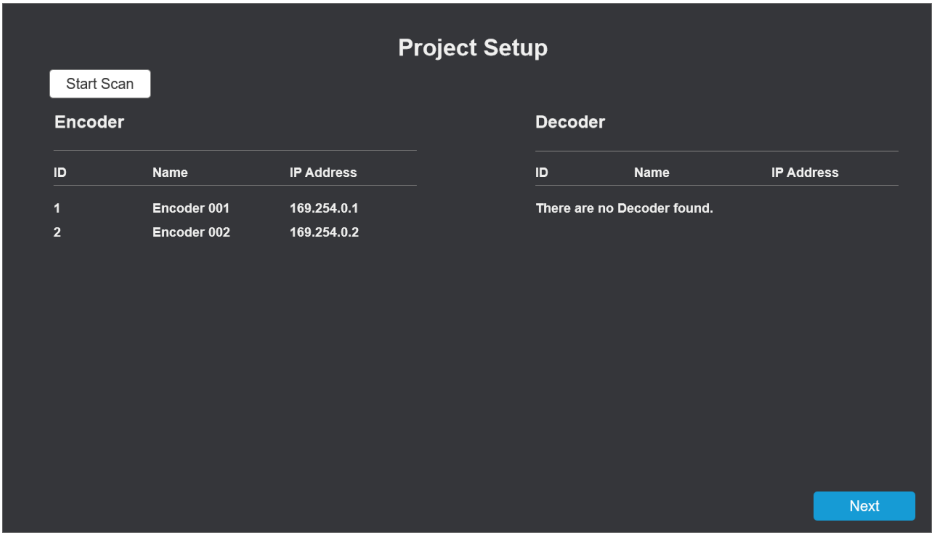
Type 192.168.0.178 in the internet browser, it will enter the login webpage



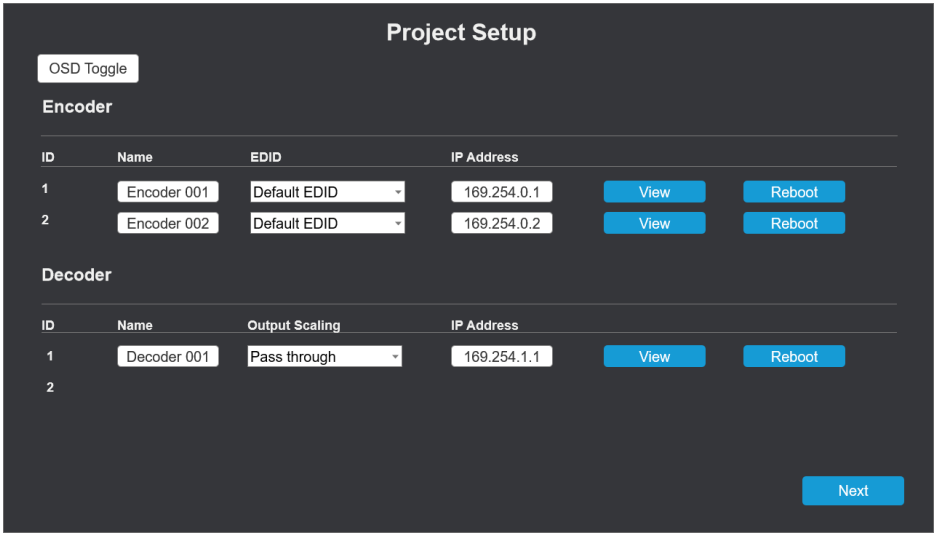
Please type the username and password, and then click **Login**.

5.2 Project Setting

In the first login in, it will require to setting a project, scan the unit and find the encoder and decoder.



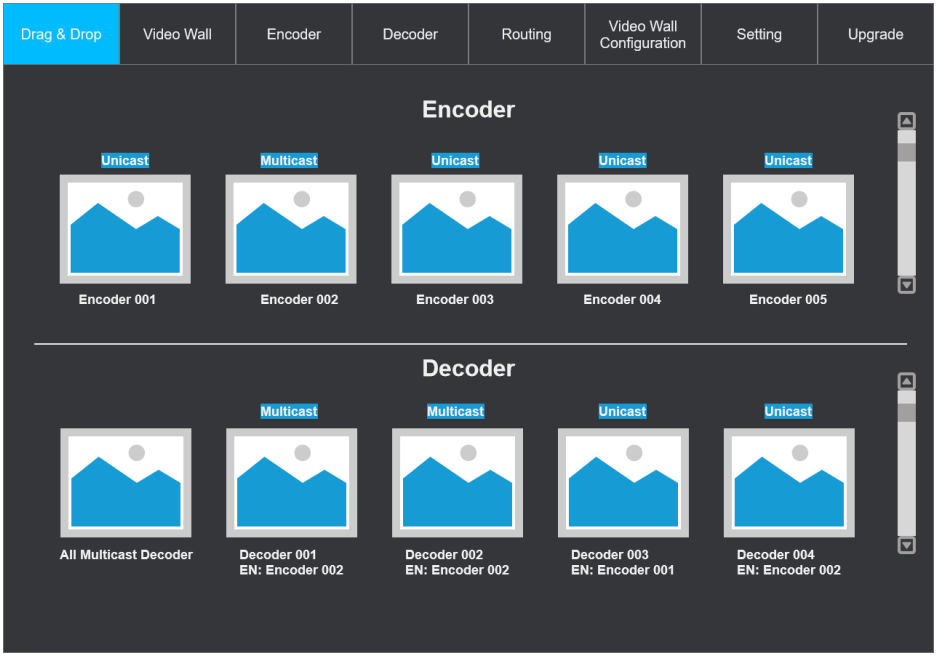
Click Next for more setting.



Modify the devices name of each unit. And setting the EDID, IP Address.

View button is for open a preview image. Reboot button is use for restart the unit.

5.3 Drag and Drop

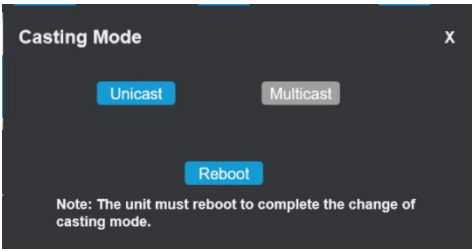


In this page, you can build the connect between the encoders and decoders.

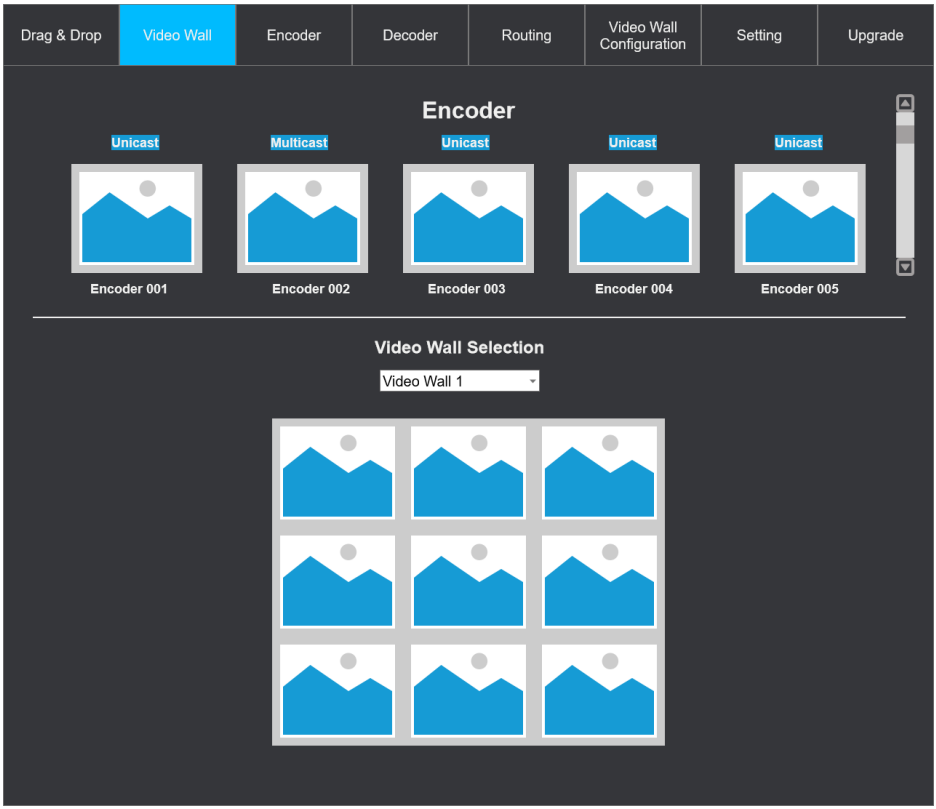
In unicast mode, it only supports point to point link.

In multicast mode, it supports matrix switch.

Click the button to switch the unicast/multicast mode of units.

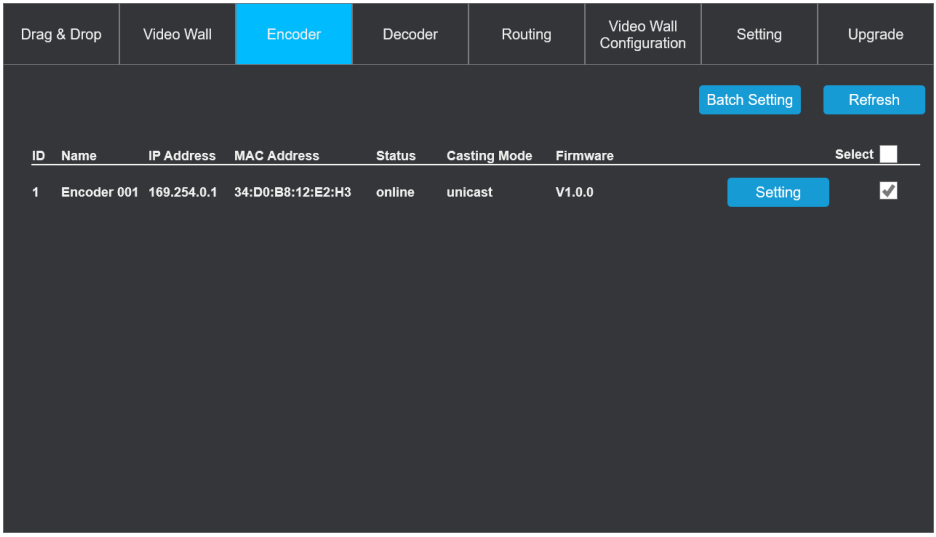


5.4 Video Wall



After configuration of the video wall (see the section 5.8), we can switch the video wall source in this page.

5.5 Encoder

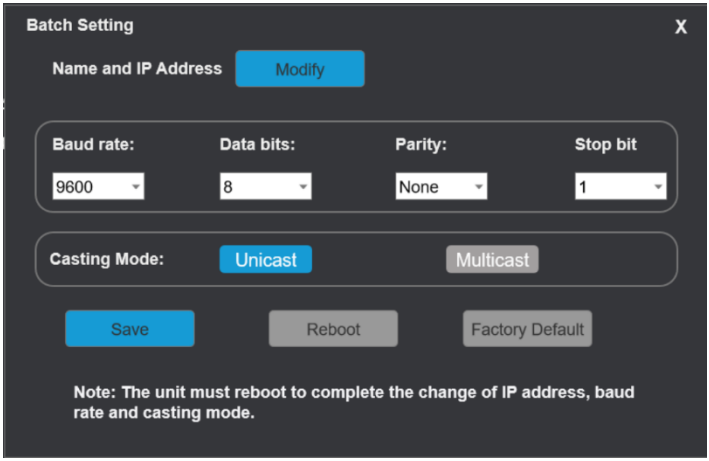


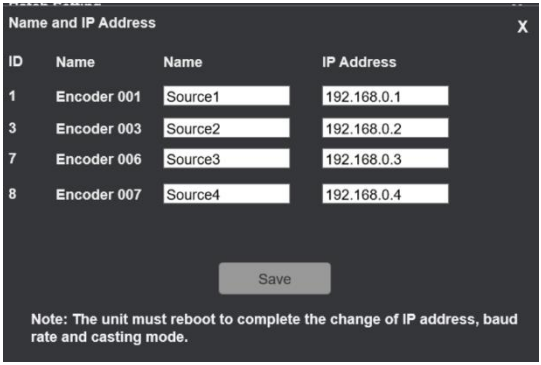
In this page, we can see all the encoder in this project.

We can set each unit or batch setting.

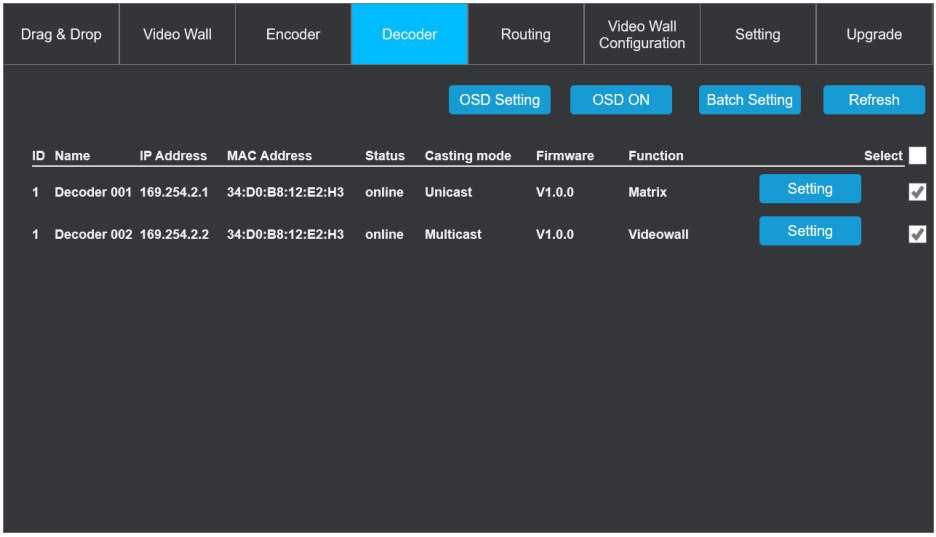
- Modify the device name, IP address.
- Select the audio source: HDMI or Analog input.
- Turn on/off CEC passthrough.
- Turn on/off audio de-embedding.
- Setting EDID: select on the list or user defined.
- RS232 setting.
- Casting mode select.
- Remove the unit from the project.
- Reboot the unit.
- Factory reset the unit.

For the batch setting, we can setting the Devices name, IP address, RS232 and casting mode.



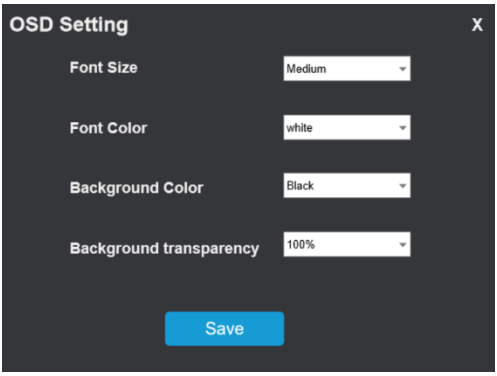


5.6 Decoder



We can find all the decoder and setting each unit in this page.

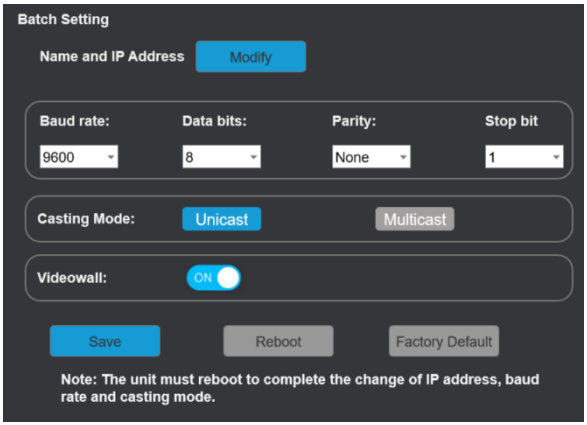
For the OSD, we can set the font size, font color, back ground color and background transparency.



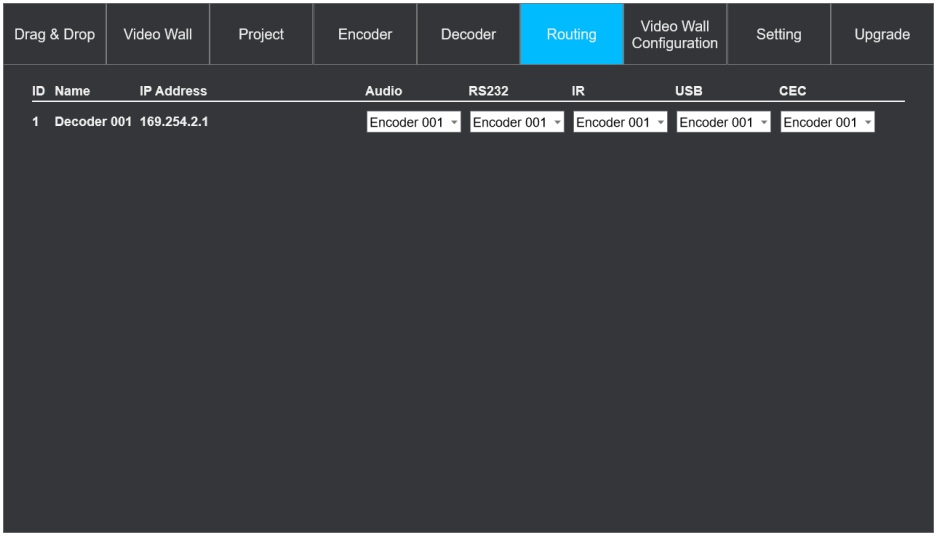
Click the setting button to turn on the setting page.

- Modify the device name, IP address.
- Turn on/off videowall mode.
- Require for the USB device connect.
- Turn on/off CEC passthrough.
- Turn on/off audio de-embedding.
- Select the output resolution.
- Setting EDID: select on the list or user defined.
- RS232 setting.
- Casting mode select.
- Remove the unit from the project.
- Reboot the unit.
- Factory reset the unit.

For the batch setting, we can modify the device name, IP address, RS232, select casting mode and turn on/off videowall mode.

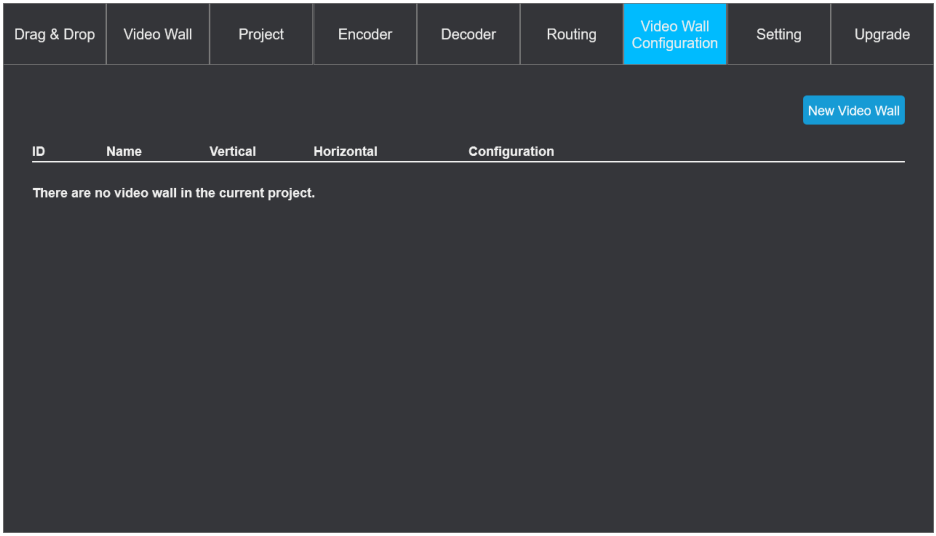


5.7 Rounting



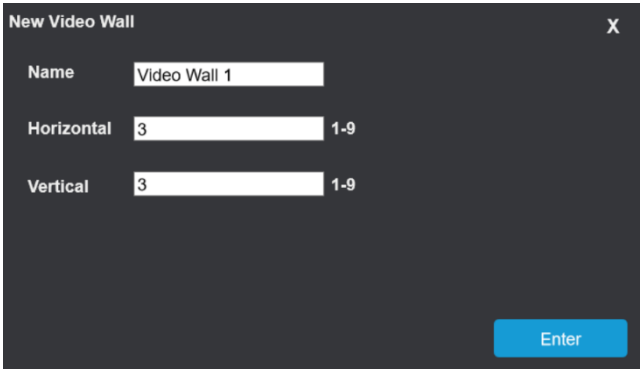
In this page, we can select the audio, RS232, IR, USB, CEC of the decoder routing to which encoder.

5.8 Video Wall

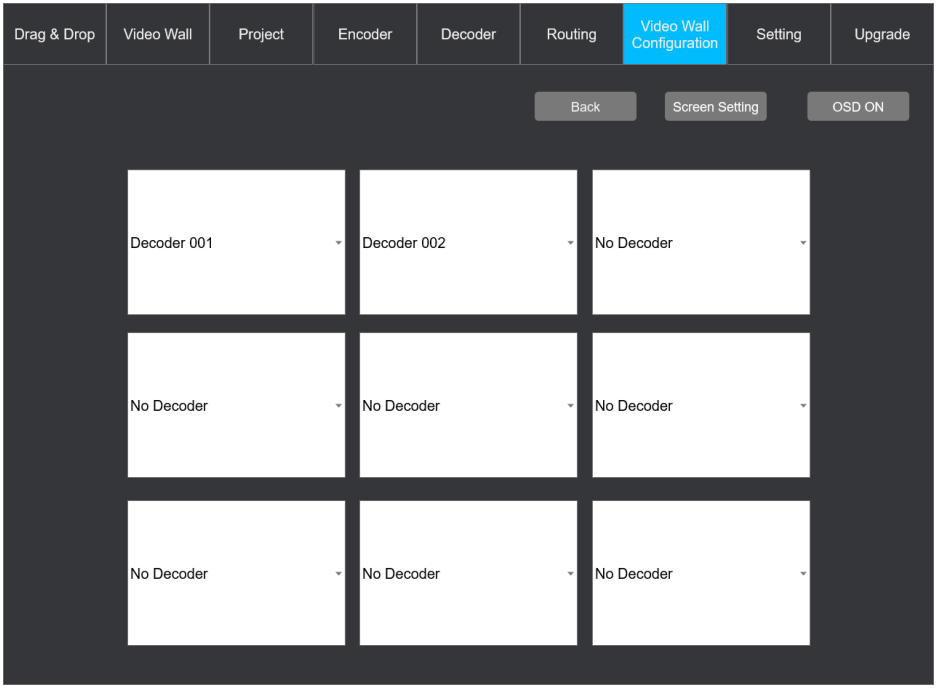


For the video wall configuration page, we can build several video wall for the application requirements.

Click New Video Wall button to setting:

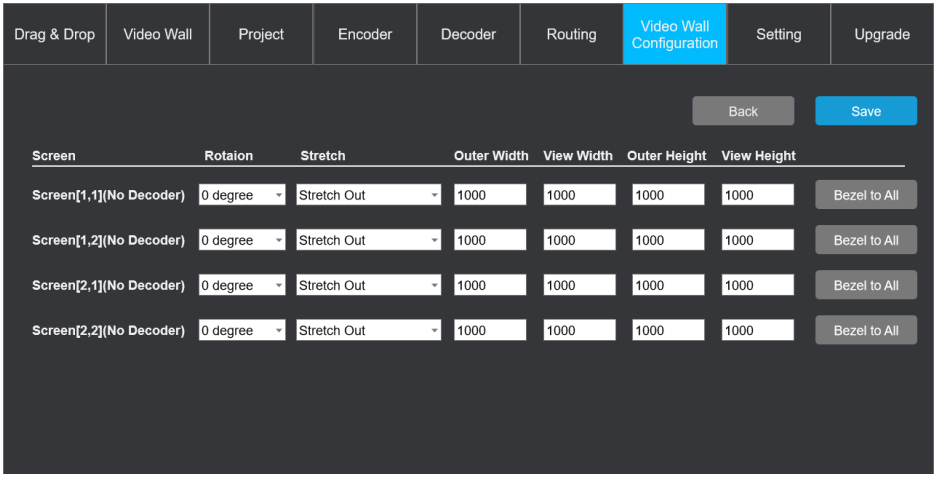


After choosing the video wall size, click enter button.

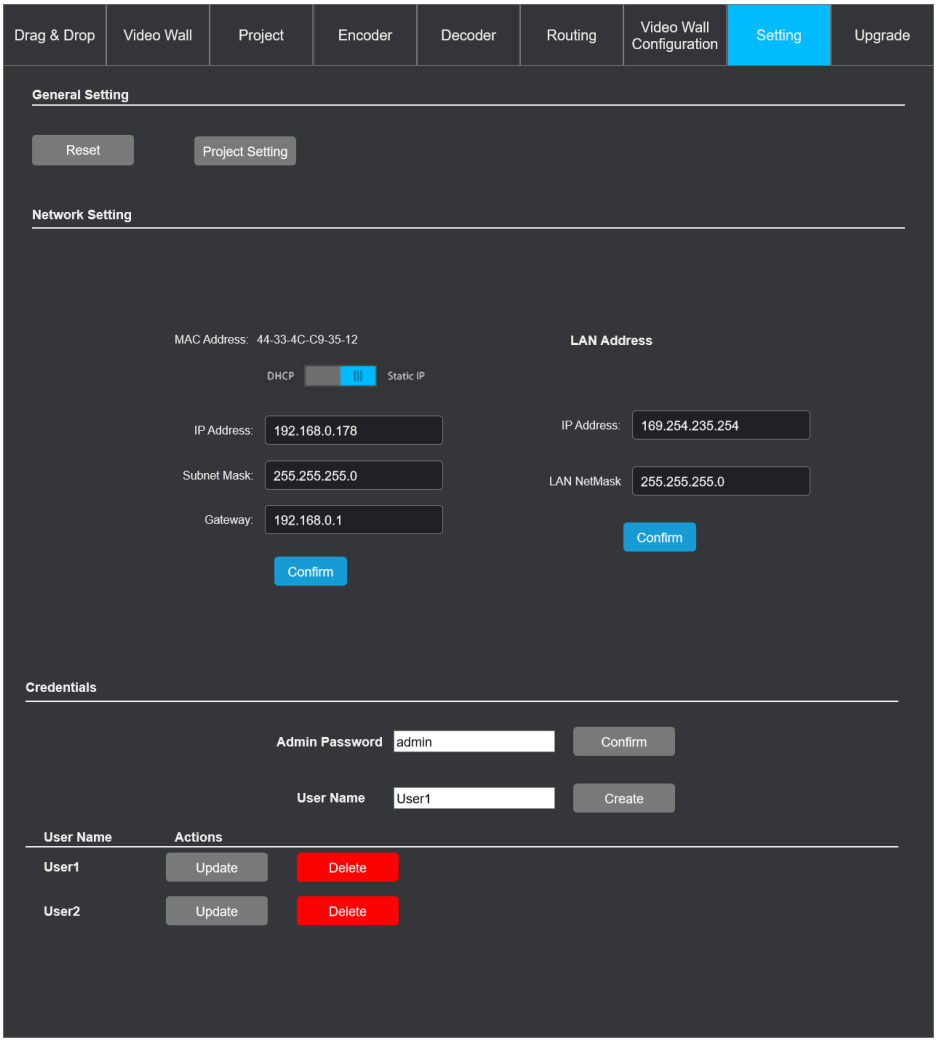


In this page, we can select the decoder for all the screen.

Click Screen Setting button for more setting:



5.9 Setting

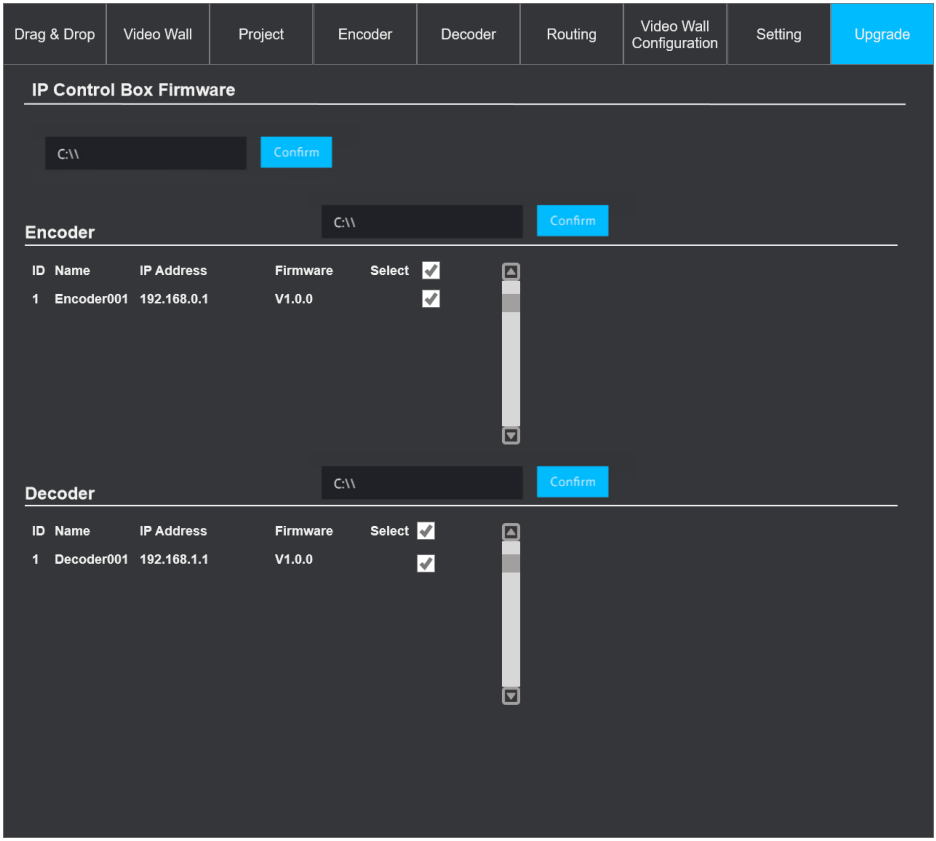


For the general setting, we can reset the control box or setting the project.

For the network setting, we can setting the GUI login IP address and the LAN address.

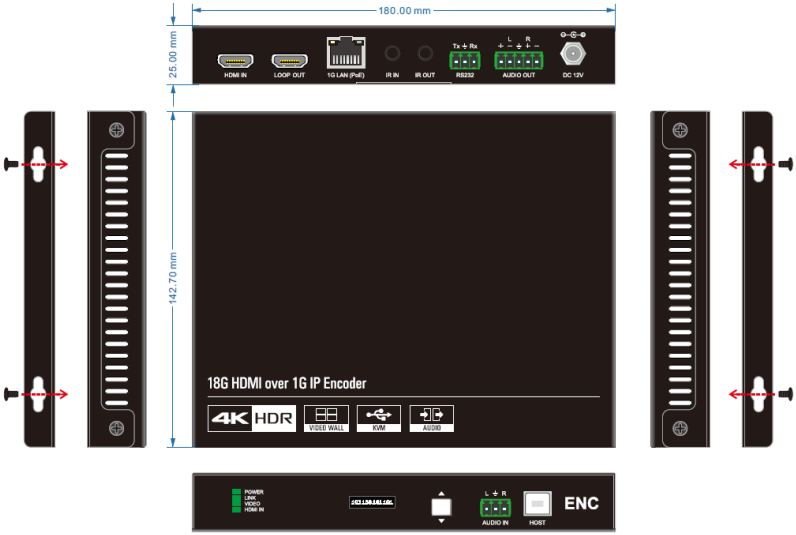
In this page, we can also setting password of the admin and user.

5.10 Upgrade

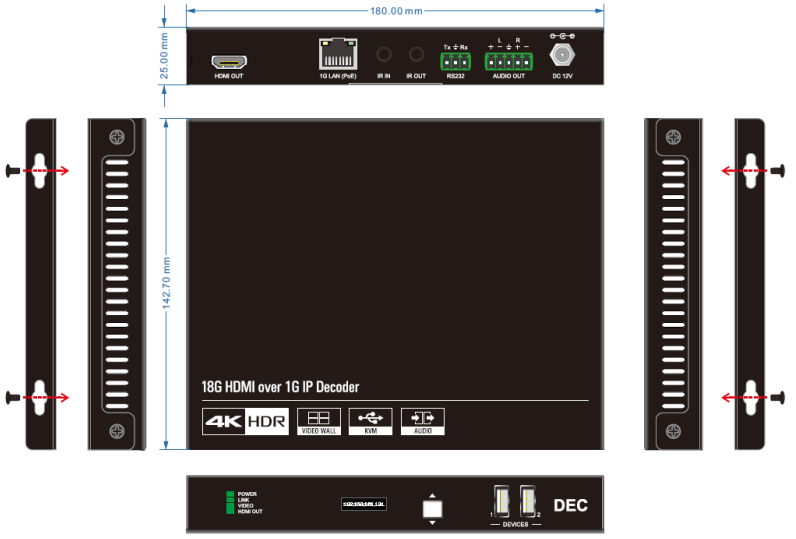


In this page, we can upgrade the firmware of control box and each encoder or decoder unit. It also support batch upgrade.

6. Panel Drawing



MP-IP500E



MP-IP500D

7. Troubleshooting & Maintenance

1) If the IPA Manager does not detect any Transmitters/Receivers, please make sure:

- Whether the IP address is configured correctly. Please ensure the IP of the connected control PC is set to the same network segment as the Encoder / DECODER.
- Whether there is an IP address conflict with another device in the same network. Please make sure, each device has a different IP address in the same LAN.
- Power supply is normal and as specified.
- The connection cables are of high-quality and the link has been established successfully.

2) If the IPA Manager detects the connected Encoder/DECODER units correctly, please confirm whether the video source is selected correctly and that the connection cable functions as specified.

Note: *If your problem still remains after following the troubleshooting steps above, please contact your local dealer or distributor for further assistance.*

8. Customer Service

The return of a product to our Customer Service implies the full agreement of the terms and conditions hereinafter. There terms and conditions may be changed without prior notice.

1) Warranty

The limited warranty period of the product is fixed three years.

2) Scope

These terms and conditions of Customer Service apply to the customer service provided for the products or any other items sold by authorized distributor only.

3) Warranty Exclusion

- Warranty expiration.
- Factory applied serial number has been altered or removed from the product.
- Damage, deterioration or malfunction caused by:
  - ✓ Normal wear and tear.
  - ✓ Use of supplies or parts not meeting our specifications.
  - ✓ No certificate or invoice as the proof of warranty.
  - ✓ The product model showed on the warranty card does not match with the model of the product for repairing or had been altered.
  - ✓ Damage caused by force majeure.
  - ✓ Servicing not authorized by distributor.
  - ✓ Any other causes which does not relate to a product defect.
- Shipping fees, installation or labor charges for installation or setup of the product.

4) Documentation:

Customer Service will accept defective product(s) in the scope of warranty coverage at the sole condition that the defeat has been clearly defined, and upon reception of the documents or copy of invoice, indicating the date of purchase, the type of product, the serial number, and the name of distributor.

Remarks: Please contact your local distributor for further assistance or solutions.