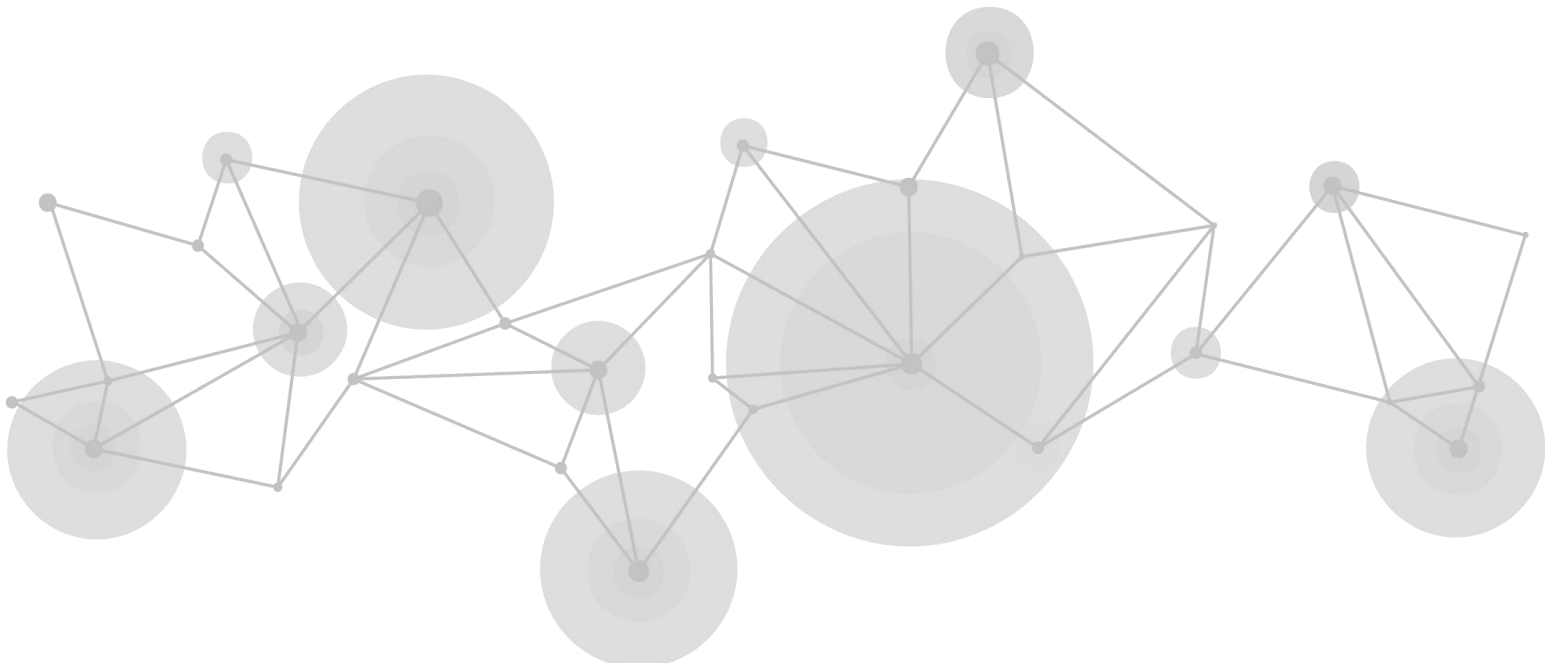




# User Manual



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Thank you for choosing our product!

This User Manual is designed to show you how to use this product quickly and make use of all the features. Please read all directions and instructions carefully before using this product.

## Declarations

### FCC/Warranty

#### Federal Communications Commission (FCC) Statement

This equipment 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 when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area may cause harmful interference, in which case the user will be responsible for correcting any interference.

#### Guarantee and Compensation

RGBlink provides a guarantee relating to perfect manufacturing as part of the legally stipulated terms of guarantee. On receipt, the purchaser must immediately inspect all delivered goods for damage incurred during transport, as well as for material and manufacturing faults. RGBlink must be informed immediately in writing of any complains.

The period of guarantee begins on the date of transfer of risks, in the case of special systems and software on the date of commissioning, at latest 30 days after the transfer of risks. In the event of justified notice of compliant, RGBlink can repair the fault or provide a replacement at its own discretion within an appropriate period. If this measure proves to be impossible or unsuccessful, the purchaser can demand a reduction in the purchase price or cancellation of the contract. All other claims, in particular those relating to compensation for direct or indirect damage, and also damage attributed to the operation of software as well as to other service provided by RGBlink, being a component of the system or independent service, will be deemed invalid provided the damage is not proven to be attributed to the absence of properties guaranteed in writing or due to the intent or gross negligence or part of RGBlink.

If the purchaser or a third party carries out modifications or repairs on goods delivered by RGBlink, or if the goods are handled incorrectly, in particular if the systems are commissioned operated incorrectly or if, after the transfer of risks, the goods are subject to influences not agreed upon in the contract, all guarantee claims of the purchaser will be rendered invalid. Not included in the guarantee coverage are system failures which are attributed to programs or special electronic circuitry provided by the purchaser, e.g. interfaces. Normal wear as well as normal maintenance are not subject to the guarantee provided by RGBlink either.

The environmental conditions as well as the servicing and maintenance regulations specified in this manual must be complied with by the customer.

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# Operators Safety Summary

The general safety information in this summary is for operating personnel.

## Do Not Remove Covers or Panels

There are no user-serviceable parts within the unit. Removal of the top cover will expose dangerous voltages. To avoid personal injury, do not remove the top cover. Do not operate the unit without the cover installed.

## Power Source

This product is intended to operate from a power source that will not apply more than 230 volts rms between the supply conductors or between both supply conductor and ground. A protective ground connection by way of grounding conductor in the power cord is essential for safe operation.

## Grounding the Product

This product is grounded through the grounding conductor of the power cord. To avoid electrical shock, plug the power cord into a properly wired receptacle before connecting to the product input or output terminals. A protective-ground connection by way of the grounding conductor in the power cord is essential for safe operation.

## Use the Proper Power Cord

Use only the power cord and connector specified for your product. Use only a power cord that is in good condition. Refer cord and connector changes to qualified service personnel.

## Use the Proper Fuse

To avoid fire hazard, use only the fuse having identical type, voltage rating, and current rating characteristics. Refer fuse replacement to qualified service personnel.

## Do Not Operate in Explosive Atmospheres

To avoid explosion, do not operate this product in an explosive atmosphere.

# Installation Safety Summary

## Safety Precautions

For all product installation procedures, please observe the following important safety and handling rules to avoid damage to yourself and the equipment.

To protect users from electric shock, ensure that the chassis connects to earth via the ground wire provided in the AC power Cord.

The AC Socket-outlet should be installed near the equipment and be easily accessible.

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## Unpacking and Inspection

Before opening product shipping box, inspect it for damage. If you find any damage, notify the shipping carrier immediately for all claims adjustments. As you open the box, compare its contents against the packing slip. If you find any shortages, contact your sales representative.

Once you have removed all the components from their packaging and checked that all the listed components are present, visually inspect the system to ensure there was no damage during shipping. If there is damage, notify the shipping carrier immediately for all claims adjustments.

## Site Preparation

The environment in which you install your product should be clean, properly lit, free from static, and have adequate power, ventilation, and space for all components.

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# Chapter 1 Your Product

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## 1.1 In the Box

**Power Adapter**



**Type-C Cable**



**USB3.0 Cable**



**Audio Cable**



**Note:**

For computers/phones/pads without HDMI port but with Type C interface, you can convert Type C to HDMI. Be sure that the Type C interface shall meet the USB 3.1 standard.



## 1.2 Product Overview

The dual channel video switcher mixer for the streaming generation, mini-pro features four resolution independent inputs - connect 2K or 4K signals up to 4K60 to take advantage of native high-performance sources, whether cameras or laptops, without compromise.

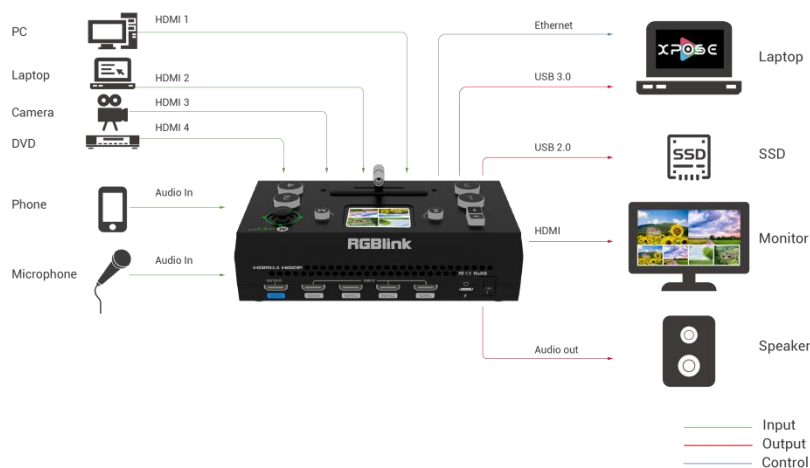
While presets for PIP and PBP are provided, mini-pro includes full pixel-to-pixel scaling capabilities for both the PIP and background video layers – truly unique in a streaming mixer of this size – features usually found only on larger professional video mixers.

Audio for output is selectable from embedded sources or an external source. Both Line and Mic level audio is supported on board with variable delay controls to bring audio into sync if needed.

In addition to HDMI and USB3.0 streaming outputs, mini-pro includes a dedicated USB recording port. Simply connect a portable drive and record directly from mini-pro.

The exclusive integral display not only shows video preview, but is touch enabled for natural operation of features and settings. Remote control is available via free companion apps for laptops and mobile devices too.

mini-pro is packed with features including dynamic output control, preview multi-view, picture in picture, Chroma Key, video transitions, on board PTZ camera controls and more.

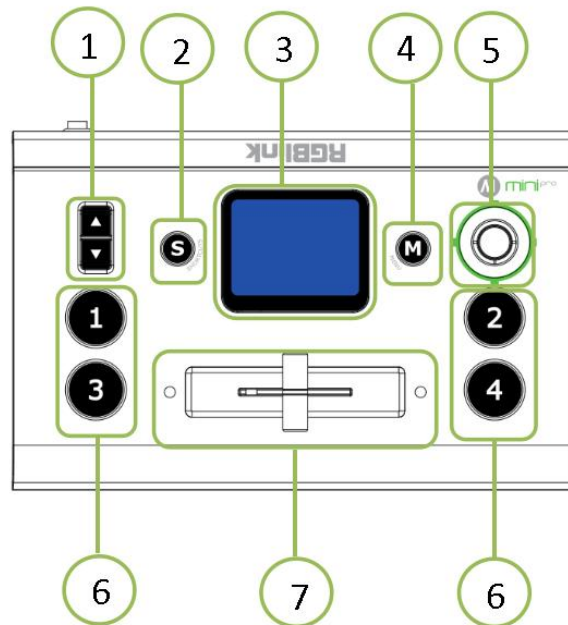


### Key Features

- mini switcher convenient to carry
- Built-in LCD for video previews
- Joystick Camera Control
- T-Bar switch and 14 transition effects
- 4K HDMI inputs
- Support live streaming via USB 3.0
- Support recording via USB 2.0
- Embedded & Insert Audio with Sync

- Mix audio from multiple inputs
- Chroma Key
- Configurable PIP video overlay

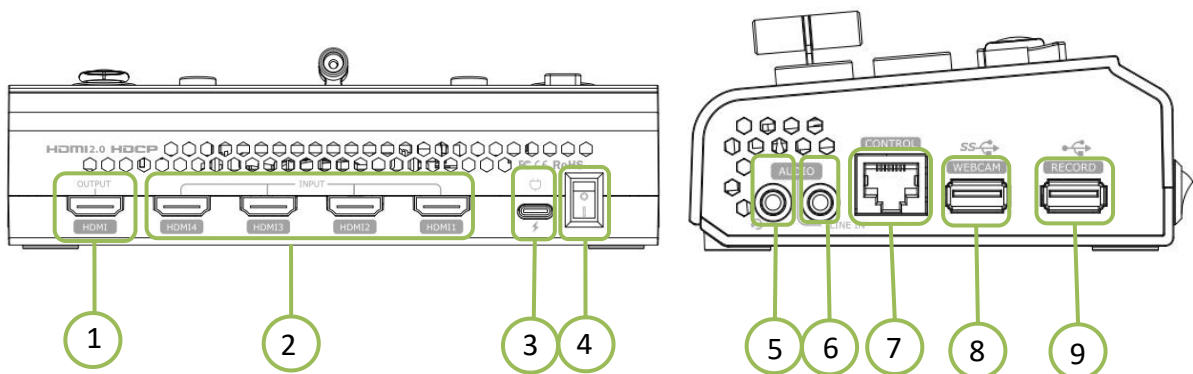
## Front Panel



1	Up/Down	<ol style="list-style-type: none"> <li>1. Adjust volume of PGM when it is under Main menu</li> <li>2. Proportionally adjust size of sub-picture when it is under position and scale adjustment</li> <li>3. Zoom in/out when PTZ control is enabled</li> </ol>
2	S	Shortcut button, push it and touch screen enter quick operation interface which includes 4 Preset to load, Audio,Record on/off,Mute on/off,Chroma Key on/off
3	2" Touch Screen	<ol style="list-style-type: none"> <li>1. Operate mini-pro menu by tapping it and monitor 4 inputs in real time</li> <li>2. Monitor the screen of the currently controlled camera in real time under PTZ control, and save the currently set screen by tapping it, and a call button can be formed on the screen</li> </ol>
4	M(menu)	Main menu button, push it and touch screen back to main menu interface and push it again touch screen display 4 inputs
5	5-Direction Joystick	<ol style="list-style-type: none"> <li>1. left-right-up- down 4 directions to choose icons on menu and middle to confirm entering next level</li> <li>2. Move the sub-picture when it is under position adjustment</li> <li>3. Control left right up and down movement when PTZ control is enabled.</li> </ol>

<b>6</b>	①②③④	4 inputs, red: on air (PGM) static green: signal is standing by flashing green: ready to be switched No light: input source is not supported or no input source
<b>7</b>	<b>T-Bar</b>	Manual switch, push to left end or right end to switch signal to PGM. T-Bar is not at end position input switch will fail

## Interface Panel

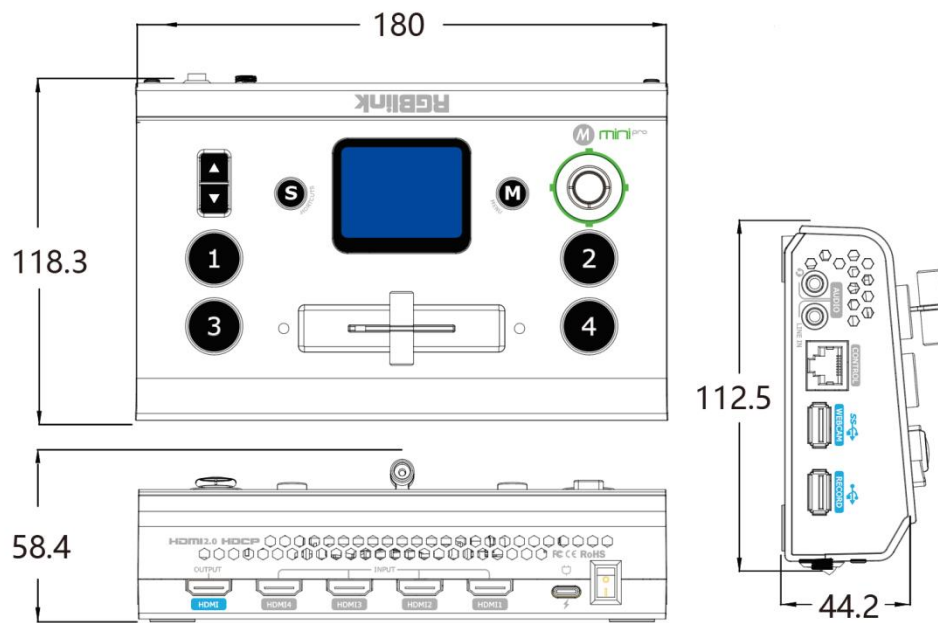


<b>1</b>	<b>HDMI OUT</b>	1 HDMI Output port, connect to display to show Preview (6 pictures) or PGM.
<b>2</b>	<b>HDMI IN</b>	4 HDMI 4K Inputs, connect to input source from 4K or HD camera or PC
<b>3</b>	<b>Type C</b>	1 Type C Jack for power input, connect to PD power adapter
<b>4</b>	<b>Power</b>	Switch on to power on mini-pro
<b>5</b>	<b>MIC IN &amp; AUDIO OUT</b>	MIC IN & AUDIO OUT, support one passive MIC input and one audio output via 2 in 1 audio split cable
<b>6</b>	<b>LINE IN</b>	LINE IN, active audio input, connect to mobile phone, computer or audio console
<b>7</b>	<b>CONTROL</b>	Communication port to link dedicated software for control
<b>8</b>	<b>WEBCAM</b>	USB output, capture signal via third party streaming software and push to live broadcasting websites, support access to smart phones for mobile pushing stream
<b>9</b>	<b>RECORD</b>	Connect to SSD to record audio and video from PGM

## Dimension

Following is the dimension of mini-pro for your reference:

180mm × 118.3mm × 58.4mm



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# Chapter 2 Install Your Product

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## 2.1 Plug in Power

RGBlink mini-pro is packaged with a 12V power link cable and Type C power Adapter.

When linking the power supply, please check the power supply standard used in your country/region.



Connect mini-pro to power plug by the link cable



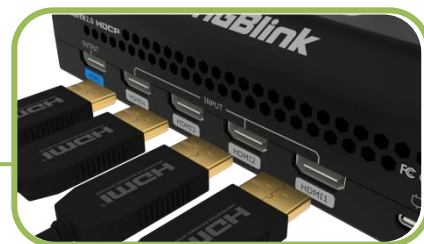
### Note:

The Power Supply included with mini-pro is the recommended power supply for use with the device. In the event the power supply is mislaid or otherwise not available, a USB-C power supply may be used provided that the power supply :

1. meets the USB Power Delivery (PD3.0) specification
2. has a "Fast Charge" capability
3. is rated for a minimum of 20W and if a replacement USB-C cable is also needed,
4. only a certified PD aware USB cable should be used

## 2.2 Input HDMI Signal Source

You can use any camera, computer or other HDMI device as the input source of the mini-pro. It supports up to 4 sources of different formats and resolutions at the same time via 4 HDMI ports, and 4 HDMI inputs support up to 4K@60Hz. If you are using interlaced signal, mini-pro supports de-interlacement through HDMI 1 automatically. You can see the resolution of the input signal on the mini-pro screen when there is active signal plug in.



### Note:

The HDMI cable is not included in the mini-pro package and needs to be purchased separately. Some camcorders use a mini HDMI port, you need to buy a mini HDMI-HDMI cable separately when you use these camcorders.

## 2.3 Connecting HDMI Output

You can use an HDMI cable to connect the HDMI output to a monitor with an HDMI input interface, so that you can monitor the input, output and audio display in real time.



The default output of HDMI output is multi-screen PVW (Preview) monitoring screen, so you can see the audio and video conditions of all input signal sources, you can see the current status of each function of mini-pro, and you can also see the PST (Preset) and current PGM (program) output.



In addition to supporting multi-screen monitoring, HDMI output also supports single screen display of any one of the four inputs. You can switch between PVW and PGM In 【Video Output】 menu. HDMI output supports resolution setting . After pressing the 【M】 button, tap the OUTPUT setting on the menu to select the output resolution format. HDMI output supports resolution up to 1080p60.

## 2.4 Connecting Microphone and External Monitoring Devices

On the right panel of mini-pro, there is a 3.5mm standard microphone interface which can be directly connect to the microphone or wireless MIC, or LINE output from the external audio console to do audio mixing of multiple external audio inputs.

The mini-pro supports 3.5mm analog audio and 4-channel HDMI digital audio for multi-channel simultaneous mix in to make sure sound of the computer and the sound of the MIC can be output at the same time.

You can use external speakers or headphones to monitor the main output audio signal in real time.



### Note:

For general camera, there usually is a certain delay due to the processing of light-to-electricity conversion during the filming process but the processing of MIC is relatively simple, so there will be video picture failing to keep up with MIC audio, which is synchronization problem. Therefore, it is necessary to do audio delay setting for the MIC audio to ensure the synchronization of the picture and the sound, which will be explained in the introduction of "Audio Control" later.

## 2.5 Connect USB and Webcam

Connect the USB 3.0 port on mini-pro to computer by USB 3.0 cable (blue) and computer will capture mini-pro USB output as a webcam source which can be pushed to Facebook, YouTube, Zoom, Twitter and other streaming media platform.



### Note:

If your computer only has a Type-C port, you can use a USB-A to Type-C cable to transmit the webcam signal. Please note that the Type-C cable you choose needs to support data transmission. The signal is recognized in Windows and MAC system as 「RGBlink USB 3.0 Capture」.

## 2.6 Connect Computer

Software control: connect computer and mini-pro with CAT6 cable

Record and Stream: connect mini-pro's USB-A and mini-pro's USB 3.0 port with USB3.0 cable  
(Note: the color of USB3.0 port is blue)

### Minimum System Requirements for macOS

- macOS 11.0 Big Sur or later
- macOS 10.15 Catalina

### Minimum System Requirements for Windows

- Microsoft Windows 10 64-bit



**Note:**

The IP address of the mini-pro must be in the same LAN segment as the computer. Refer to 5.1 for IP address manually changing IP address.

## 2.7 Turn on Your mini-pro

After mini-pro is connected to power supply, push the Power button on the rear panel, the device will enter to the boot interface and enter operation interface within 10S.





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## Chapter 3 Use Your Product

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After system connection of mini-pro to power supply, input source devices(computer, MIC(camera) and output to HDMI display and USB 3.0 streaming which is recognized as webcam source on computer.

### 3.1 Touch Screen Operation

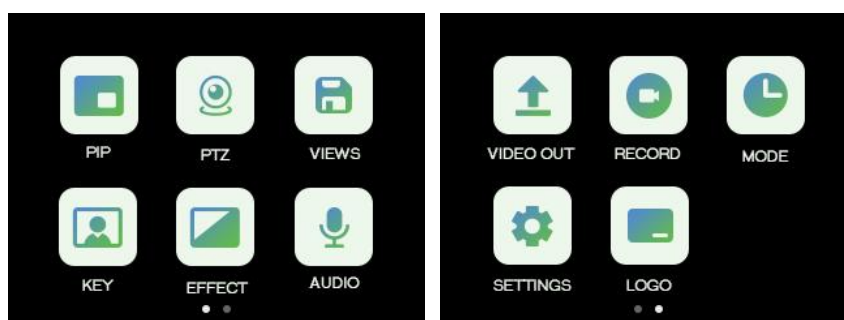
#### Touch Screen Introduction

There is a 2" touch screen on mini-pro operation board, through which most operation can be done, so let's introduce this touch screen first.

Before introducing the operation of the touch screen, we need to introduce the button **【M】**, the MENU and back key. Push the button and the 2-inch LCD screen will quickly return to the main menu interface.



As shown in the figure below, the UI style on the touch screen is similar to current smart phone operating interface. The first-level menu is in icon. You can quickly enter the corresponding function management interface by tapping the corresponding icon.



#### Swipe Shortcut

Similarly, the mini-pro's touch screen also has some simple **swipe shortcut** functions:

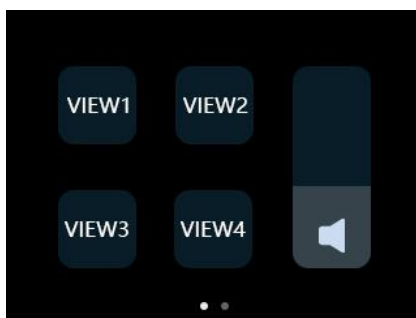


- (1) you can quickly return to the main menu by swiping from bottom to top (same as the 【M】 key);
- (2) back to last menu by swiping from left to right;
- (3) enter the preset Load menu by swiping from top to bottom (same as the 【S】 key);
- (4) enter more settings of current function by swiping from right to left.

When entering an operation item, such as adjusting the transition time, you can adjust it by sliding the time bar on the screen, or by pushing the up and down keys on the left of the operation board.

## Preset Menu

In the preset menu (by pressing the【S】button or swiping from the top to the bottom of the screen), the icons on the LCD screen default to the dark off state. Tap the icon to turn to the bright color to get it selected and open preset (View), Chroma Key switch, Black switch, Record switch, Mute switch, volume adjustment switch, etc.



The function of the icon button in the shortcut menu can be customized according to user's needs.

## 3.2 Switch Source

The buttons ①②③④ on the operation board corresponds to the 4 HDMI inputs one-to-one. When four signal source plug in, the lights on the signal source buttons will appear in four states:

**Steady green:** The signal is recognized and no operation is performed;

**Flashing green:** The currently selected signal is ready to be switched;

**Steady red:** The current signal is in PGM output;

**Unlit:** No signal source is connected or the resolution of the signal source connected is not accepted.

## Switch Effect Setting

mini-pro is default 0.5S Fast Fade mode, by pushing ①②③④ signal buttons, 4 input signals can

be switched in fast fade mode.



If you want to use more transition effects, tap **【EFFECT】** icon on the touch screen.

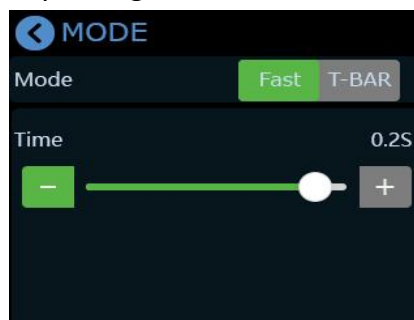


You can enter the **【Effects】** selection interface, where fade in, fade out and various other transition effects can be selected. The inside icons on the menu can be dragged and sorted according to your preferences. When the selection is completed, the root directory icon will be replaced with the last selected icon.



## Switch Mode Setting

Tap the icon **【MODE】** to customized by sliding the time bar.

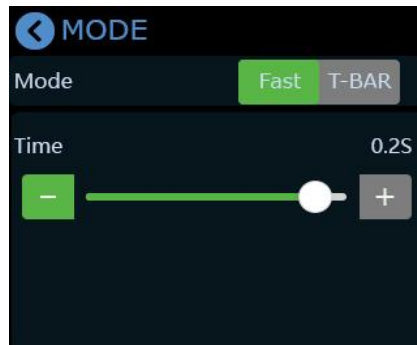


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## 3.3 T-Bar Switch and Multi-screen Preview

mini-pro defaults to **Fast Switching Mode**, but on some important occasions, you may need to preview and preset the next scene to ensure the accuracy and stability of the screen. mini-pro provides T-Bar mode to allow switch after editing and confirmation.

Return to the main menu interface by pushing the button【M】, find the【MODE】icon by swiping the screen left right, and then tap the icon to enter the menu and you can see 【Mode】 in which there options of Fast and T-Bar mode, as follows



When T-Bar is enabled, all operation could be checked on PST window. Slide T-Bar to switch between PST and PGM.

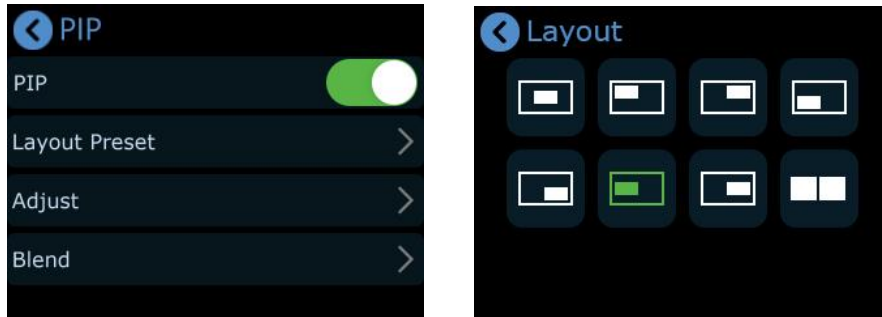
## 3.4 PIP

mini-pro defaults to single-screen switching. If you need to use PIP, push button【M】to return to the main menu, then find 【PIP】 , and tap the icon to enter the PIP setting interface.



### PIP Layout Setting

Layout offers 8 layout options for picture-in-picture. Click the arrow on the right to enter layout interface and choose the layout needed.




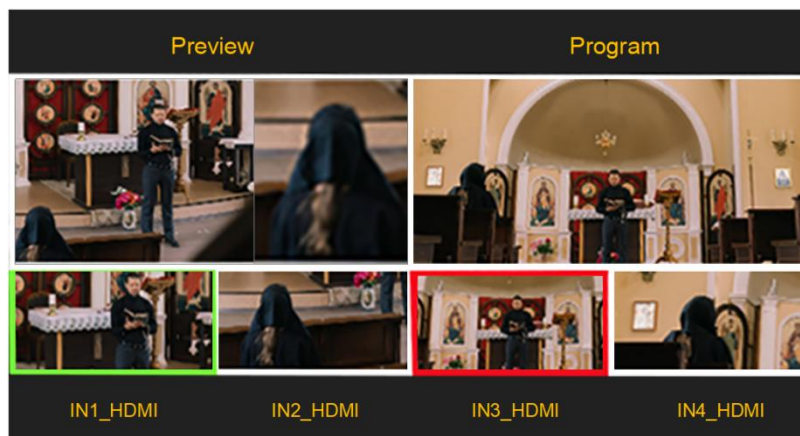
## PIP Layer Setting

If detailed adjustment is required, return to PIP 【Picture】 menu, adjust the size and position via the up/down/left/right keys, as shown below.



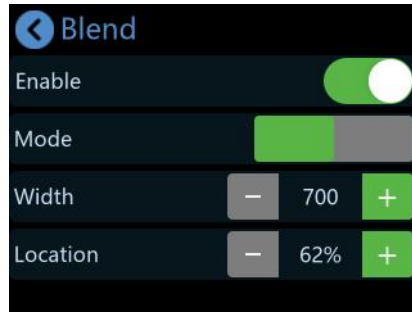
In addition to adjustment by moving the slide rail, you can also use the toggle to quickly adjust the size of the sub-picture, and use the joystick to quickly adjust the position of the sub screen. If you need to quickly switch to the PGM, you can press the joystick.

If you select the layout , then press the toggle to adjust the picture ratio and get a better view.





## Blend Function Setting

If you want to achieve such an effect that images of two input signals can be blended with a softening effect around their edges, it is recommended to use **Blend** in mini-pro. Click 【Blend】 in PIP menu to enter the following interface.



You can choose to enable the function and then configure parameters. S button can be used to shift options between Enable, Mode, Width and Location.

You can choose Left or Right Blend Mode. Tap   icon or push Up/Down button on the front panel to adjust width and location as required.

The default Width value is 700. The larger the width value is set, the softer the edge, and the better the blending effect.

The Location is used to control the blending range. The larger the location value, the wider the blending area.



Save the above settings to the View 1~8 to realize quick call.

## 3.5 Views

mini-pro save preset to View in real time. If you want to quickly load current preset next time, just save it to corresponding View. The View will save all the currently set parameters including PIP layout, Chroma Key setting, PTZ presets, therefore when you need to load any preset, just push corresponding View button in Shortcut interface.

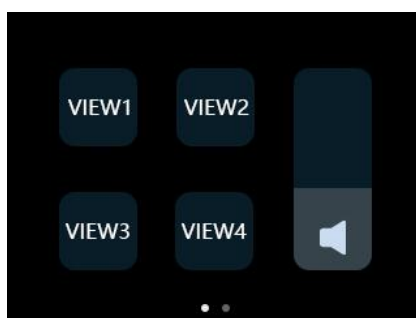
(1) After setting the effect, please tap the button **【M】** and find the VIEWS.



(2) By tapping the icon VIEW , you can save the preset to the corresponding View 1-8. Yellow icon indicates the view that being used,green one is saved views,gray one in the blank view.



(3) Push button【S】to enter the Shortcut menu where there are buttons of View 1~4 which can loaded directly.



(4) After loading View, if PIP layout needs to change, users can select main screen or sub screen by pushing the middle button on joystick which default selects sub screen. After selecting sub screen or main screen, select input source for them by pushing the signal source button, adjust sub screen size by pushing button Up/Down and position by joystick. All the setting is saved to in real time to make sure it can be used next time the device is turned on.

(5) If you want the modified preset to be loaded from the View, you need to re-save it to the current View or a new View. Please repeat the above save operation.

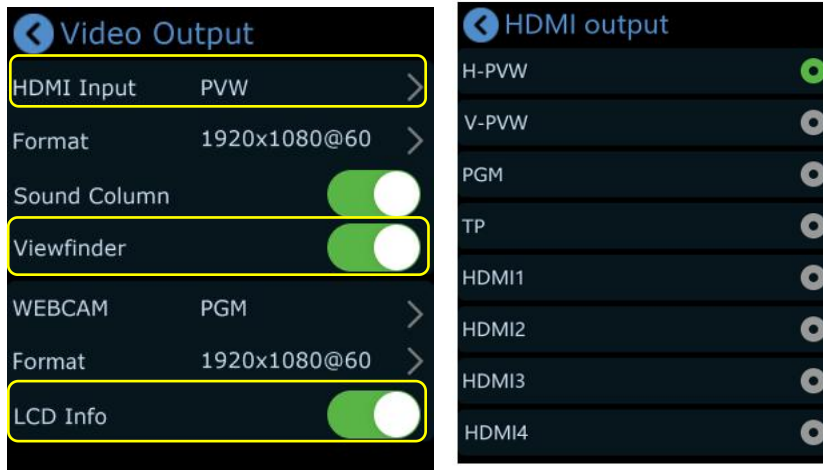
## 3.6 Video Output

mini-pro offers output through HDMI and USB.

### HDMI Output

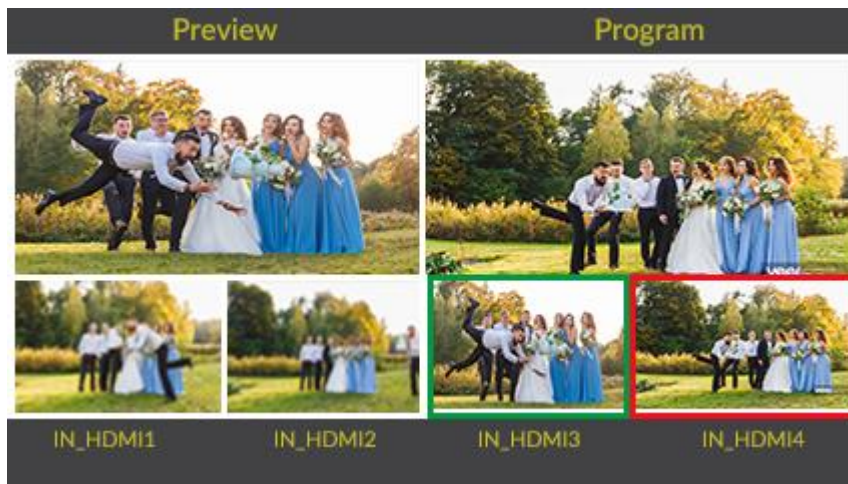
HDMI output defaults multi-screen preview,which can be switched to PGM or the 4 input content in field application.

Push button 【M】 to return to main menu and find 【Video Output】 to set parameters for the HDMI output.



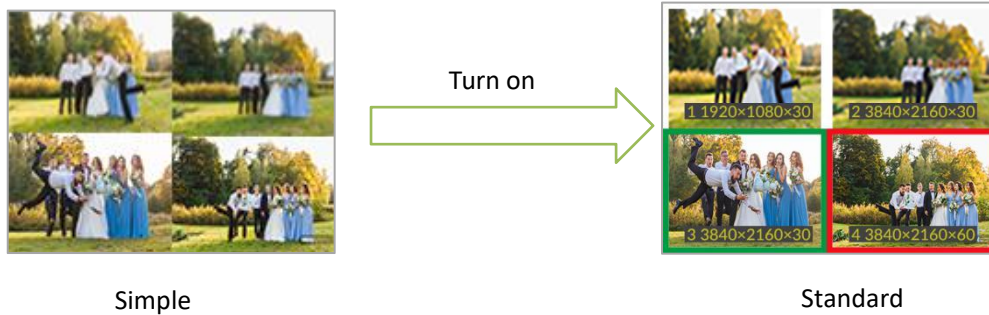
Push button **【 M 】** again when the touch screen is in main menu interface and touch screen will enter 4-screen input source preview.

Turn on **【 Viewfinder 】** , you can see a white rectangle in the PVW as shown in the picture, helping users frame the camera view.



The **【 LCD Info 】** is LCD display setting, which controls whether the 2x2 video preview is **【 simple 】** or as **【 standard (PVW) 】** ,turn on **【 LCD Info 】** to check the resolution of four inputs as shown in the picture below:





Simple

Standard

## USB 3.0 Output

USB 3.0 output recognized as WEBCAM on computer defaults to be PGM which can be changed to multi-screen PST or TP (Test Pattern).

Push button **【M】** to return main menu and find **【Output】** to do **WEBCAM** setting.



It is default to be PGM and tap “>” on the right to change to PST or TP. Choose format for the output setting by tapping “>” on the right.



## 3.7 Audio

mini-pro supports mixed output of multiple channels, and also supports audio delay.

Tap the button **【M】** to return to the main menu, find and tap **【Audio】** to enter the sound setting interface.



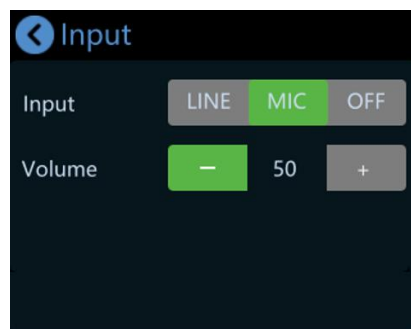
The audio output can be turned on or off, and the volume can be adjusted by sliding the bar. mini-pro also supports to turn on/off or adjust volume for each audio of HDMI 1, HDMI 2, HDMI 3, HDMI 4, MIC and LINE independently.



## MIC

mini-pro features two MIC inputs, which allow users to connect it with a microphone or a line-level device.

Users can also click **Input** to enter **LINE** / **MIC** interface to turn on or off LINE/MIC, adjust the audio volume level.



- LINE/MIC: ON/OFF
- Volume: 0~100 with 10 increment

## MIX

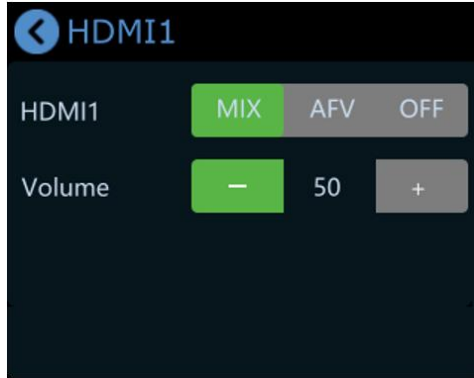
There is total 6 audios as the audio source, which include 2 HDMI embedded audios, 1 MIC audio

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input and 1 LINE audio input.

The four HDMI input ports all support embedded audio. Turn on the MIX and the audio will be permanently mixed into the PGM output.

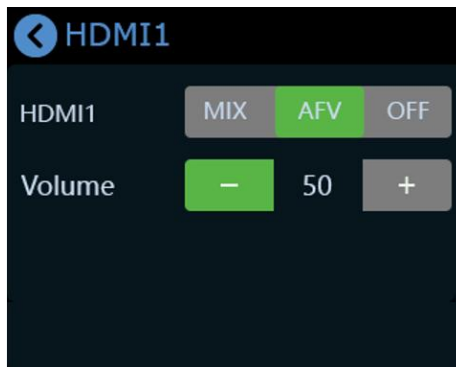
In **【Audio】** interface, you can select a specific input to configure and set by clicking on HDMI 1, HDMI 2, HDMI 3, or HDMI 4.



In **【MIX】** , you can adjust the audio volume level.

## AFV

Each channel of the 4 HDMI embedded audios can be set to AFV (Audio-Follow-Video) mode. Turn on AFV, the audio follows the video switch to perform a soft gradual transition when video is switched, that is, when one HDMI audio is set to AFV, then the audio will be turned on only when PGM switch to this channel video source.



When the touch screen is in the main interface or preview interface (4-screen of the 4 inputs) or Shortcut interface, the PGM audio volume can be adjusted by the toggle.



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## 3.8 Chroma Key

mini-pro supports matting, the Chroma Key in the menu, removing the pure color background and overlaying it on another signal to realize the application of virtual reality. Matting can be done on XPOSE mini or simple settings and adjustments can be made on the Chroma Key in the menu.

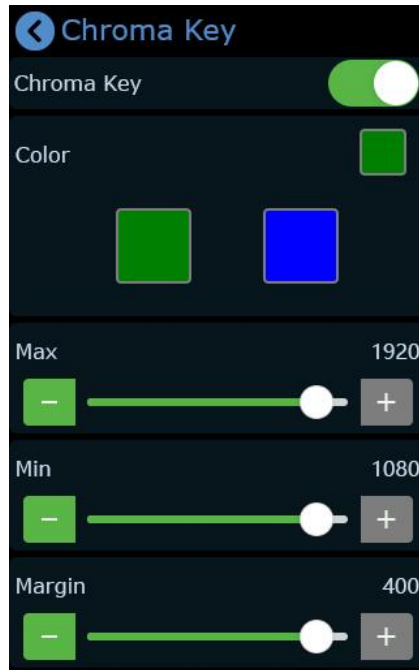
(1) Push button **【M】** to return to the main menu interface, find **【Chroma Key】**, tap this icon to enter the setting menu.



(2) You can choose on or off to enable/disable the function. The sub-screen defaults to input 4, and the main screen defaults to input 1, which can both be changed to other source according to field application.



(3) Select the background color which is default in green to be removed and make adjustments. S button can be used to shift options between Max, Min and Margin. Similar to PIP, the size, position and cropping of the main/sub-screen can be set via UP/Down button or touch screen.



(4) After loading the Chroma Key preset, you can use the joystick or touch screen to switch the selection of the main/sub-screen, push the signal source to switch between different signals, adjust the size of the screen through the toggle, adjust the position of the screen through the joystick, and all the re-adjusted settings will be Saved to the current View in real time.

(5) After the Chroma Key is set, the parameters can be saved directly on the device. Next time when the the device is on no matter on the dominant software XPOSE mini or the touch screen itself, users can directly load the preset. And the layer selection stays at main screen, that is, directly press the signal key, the main screen is switched.

## 3.9 PTZ

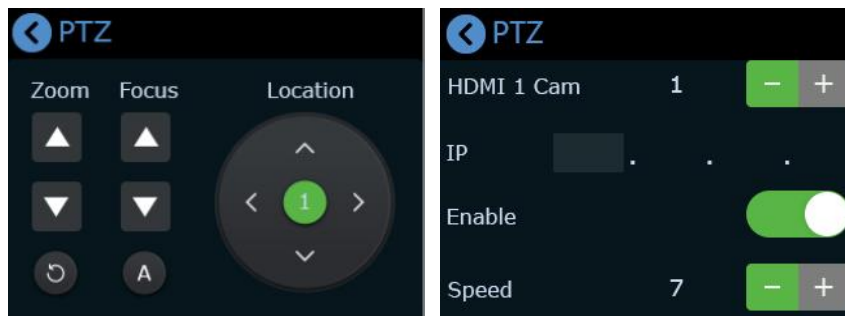
mini-pro can control cameras supporting VISCA protocol. mini-pro can control the camera's lens moving horizontally and vertically, focus and zoom. Not only that, the mini-pro can also save the position and zoom information of the camera, so that you can quickly retrieve it the next time you use it.

The PTZ preset of mini-pro not only saves the parameters of the PTZ, but also includes calling the camera, that is, when the View of the PTZ is loaded, the input is switched to the camera signal source at the same time.

Tap the button **【M】** to return to the main menu, find the **【PTZ】** icon and tap the icon to enter the menu.



When you want to control PTZ camera, **the IP address of mini-pro and camera should be in the same network segment**. You can adjust the IP address in the menu below. Use S Button to choose 4 segment one-by-one and then adjust IP address via Up/Down Button on the front panel.



When setting PTZ, use the signal key ①②③④ to select the corresponding PTZ camera signal to preview.

On the PTZ menu interface, when the PTZ function is enabled, the rotation angle of the PTZ can be adjusted by the joystick, and the focal length adjusted by the toggle. Using joystick to adjust speed. Pushing signal keys can switch the signal source between different PTZ cameras.



### Note:

For specific settings of PTZ, please refer to: <https://rgblink-web.azurewebsites.net/uppic/file/202305190644174992.pdf>

## 3.10 Record

The mini-pro supports recording streaming media content to an external SSD or USB storage through the USB2.0 interface. The SSD storage can reach up to 2T, and the USB storage can support up to 64G. The supported formats include exFAT. The supported SSD can reach up to 2T and USB storage 64G and recording format is in exFAT.

Before recording, format the SSD or U-disk first. The steps of format as below:

1. Connect the SSD or U-disk to your computer
2. Open "my computer"
3. Right-click your computer and select "format"
4. Set the file system to exFAT and the size of allocation unit to 128kb
5. Select "quick format" and start

Insert the SSD or USB storage into the USB2.0 interface RECORD.

**Note:** If the SSD could not be recognized when inserting into mini-pro, then use a dual USB cable to power the SSD.

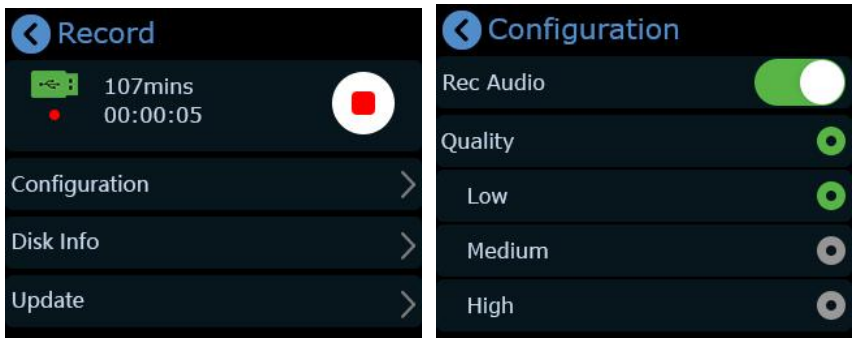


mini-pro will automatically recognize the hard disk or U disk and display the relevant information on the recording window of multi-screen PVW .

After inserting the SSD or USB storage, push button **【M】** to return to the main menu, and then tap **【Record】** to enter the interface to switch on Record and view the status of the SSD.

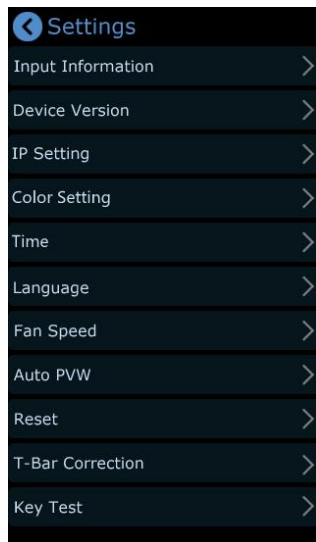


Press the button to start/stop record and turn ON/OFF to record audio and set the quality.



### 3.11 Settings

Click **【Settings】** to enter the menu below. As shown in the figure, the Settings menu includes 11 modules: Input Information, Device Version, IP Setting, Color Setting, Time, Language, Fan Speed, Auto PVW, Reset, T-Bar Correction and Key Test.



## Input Information

Click **Input Information** to enter the following interface.



In this interface, users can check information of 4 HDMI inputs. If there is no HDMI input, the interface displays "No Input"; If there is an active HDMI input, the interface displays the resolution.

## Device Version

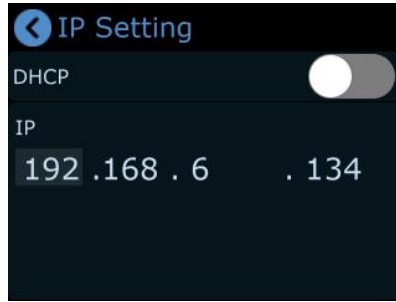
Click **Device Version** to check Serial Number, MAC Address, MCU Version and Video Version.



## IP Setting

Click **IP Setting** to enter the following interface.

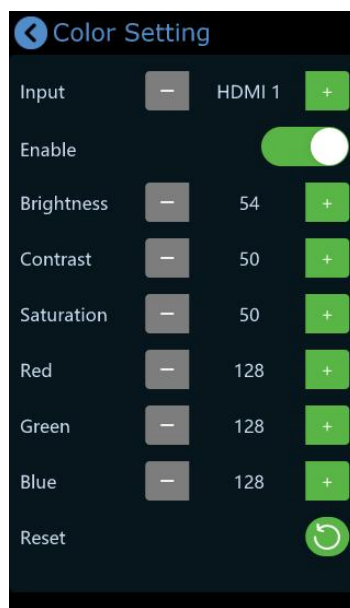







Turn on DHCP and mini-mx can automatically capture the IP address. If DHCP is turned off, users can manually set the IP address, net mask and gateway.

## Color Setting

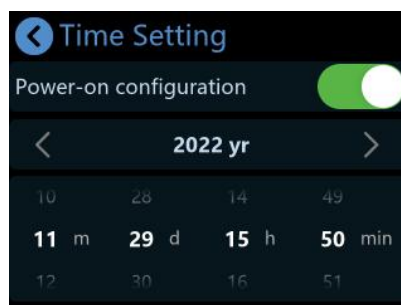
Click **Color Setting** to enter the following interface for parameter settings of 1-4 HDMI inputs.



The Enable switch is ON by default. Use S button on the front panel to switch different options. Select different HDMI inputs and then adjust Brightness, Contrast, Saturation and other parameters by pushing Up/Down button on the front panel or clicking   icons. Restore to the default parameters by clicking  icon.

## Time

Click **Time** to enter the following interface for date setting of recorded file.



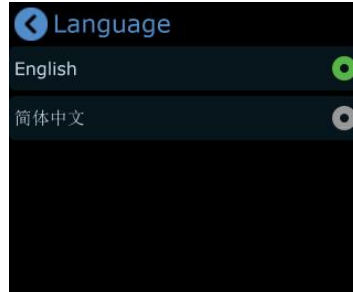
Turn on power-on configuration, mini-pro will automatically pop up the interface above to remind

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user to set the time. The set time will be restored to the default value after powered off.

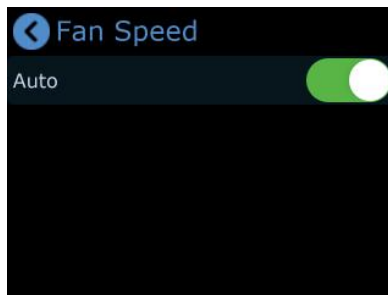
## Language

Click **Language** to enter the following interface. English and Chinese is optional.



## Fan Speed

Click **Fan Speed** to enter fan control interface for speed adjustment.





Four gears available, and users can also turn on **Auto** to achieve automatic adjustment of the fan speed.

## Auto PVW

Click **Auto PVW** to enter the following interface.



Set the time (default to be 15s) for automatic return to the default interface. Adjust automatic PVW time by pressing   or the Up/Down Button on the front panel. Increase or reduce 15s each time.

## Reset

Click **Reset** to enter the following interface.




Click **YES** to restore to the previous settings.  
Please reboot the device after reset.



## T-Bar Correction

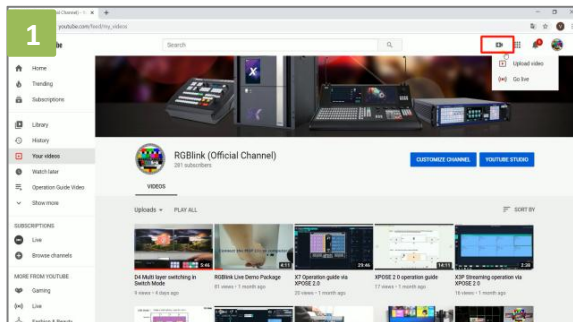
Click **T-Bar Correction** to enter the following interface.



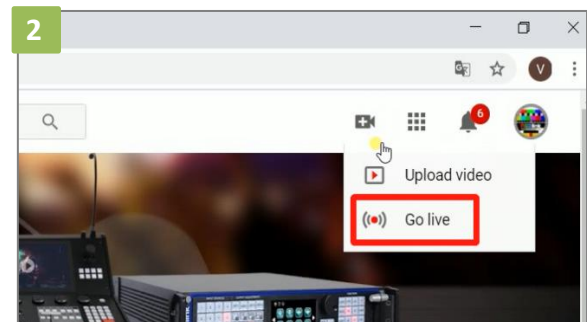
Follow above steps to complete T-Bar calibration: Push T-Bar to right, turn on the calibration switch; push T-Bar to left, click this icon  to turn on the calibration switch.

# Chapter 4 Streaming

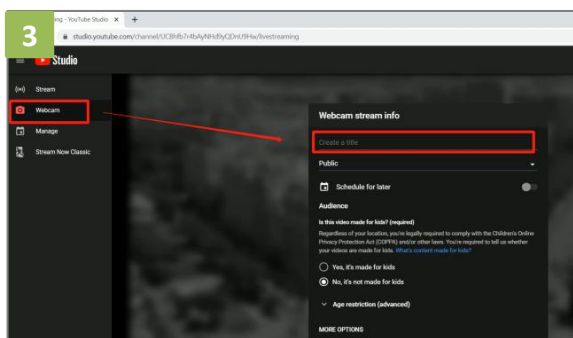
## 4.1 YouTube Streaming



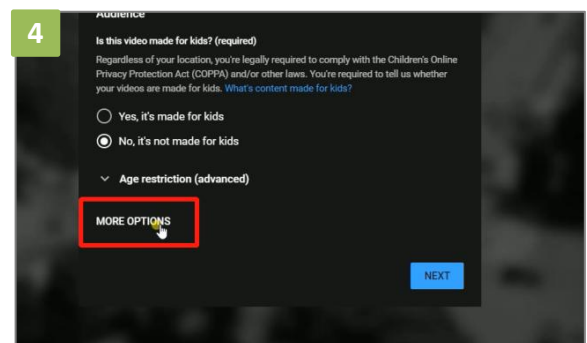
1. Create a video or post.



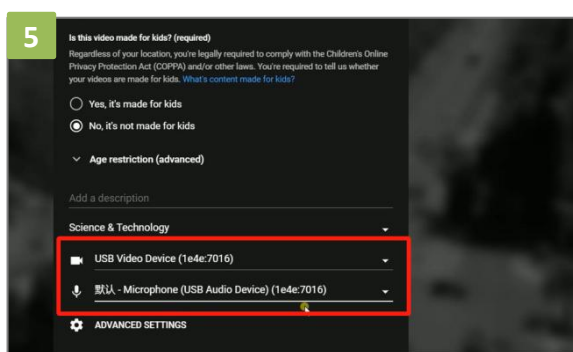
2. Then click "Go live".



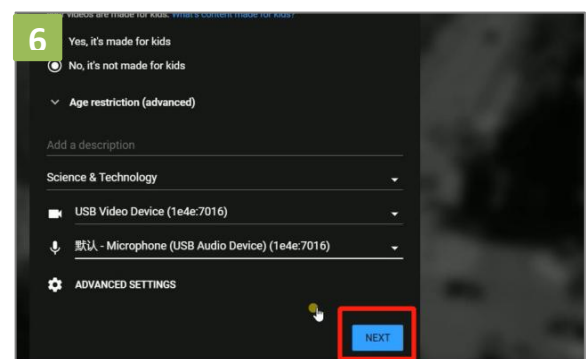
3. Enter Live streaming interface. And then create a title.



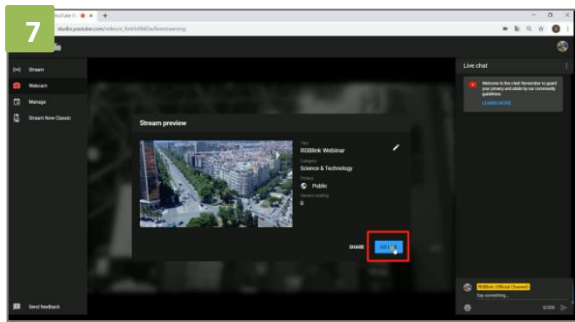
4. Click "More option".



5. Set video and audio as USB 3.0 Video/Audio device.

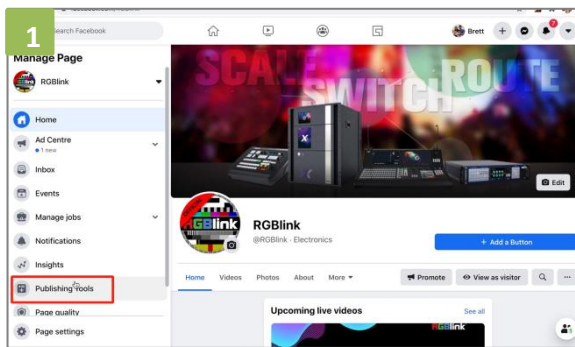


6. After finished all setting, click "NEXT".

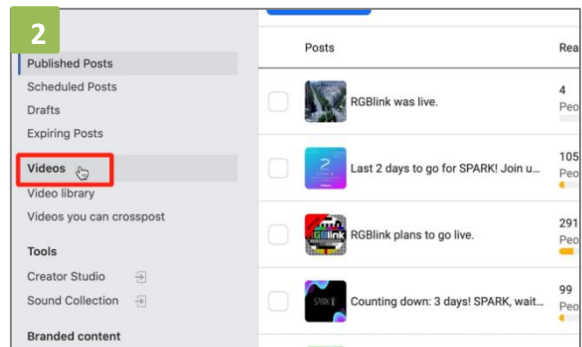


7. Go live.

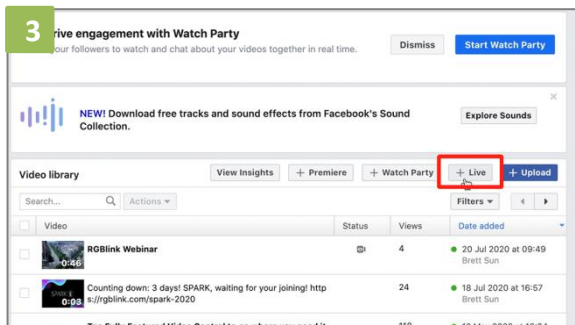
## 4.2 Facebook Streaming



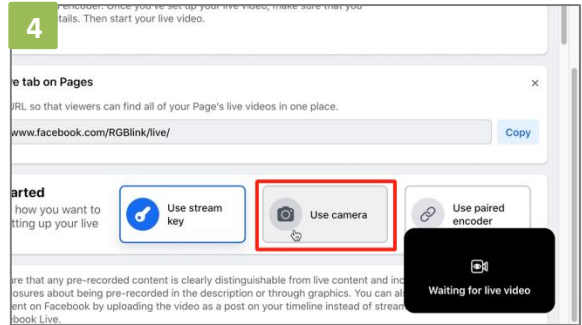
1. Enter "Publishing Tools".



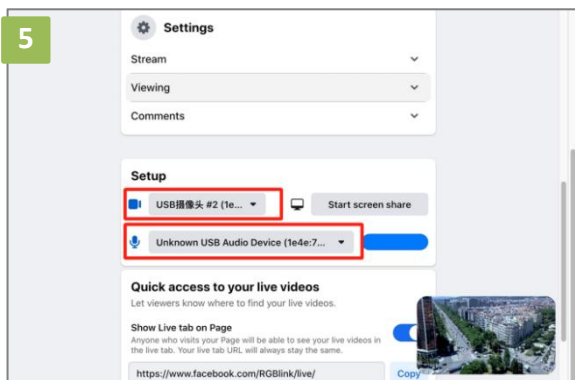
2. Click "Video"



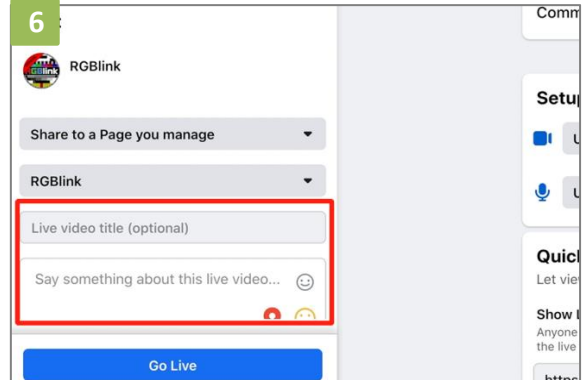
3. Click "+Live"



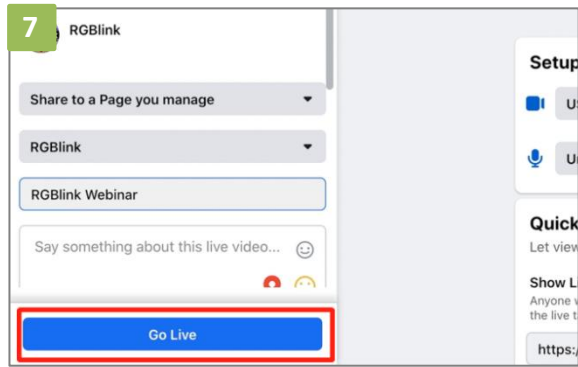
4. Choose "Use Camera"



5. Set video and audio as USB 3.0 Video/Audio device.

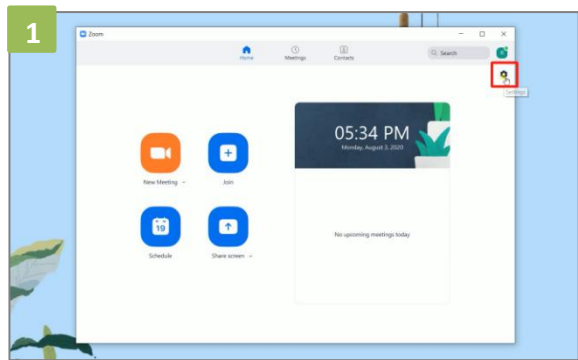


6. Add a title and description.

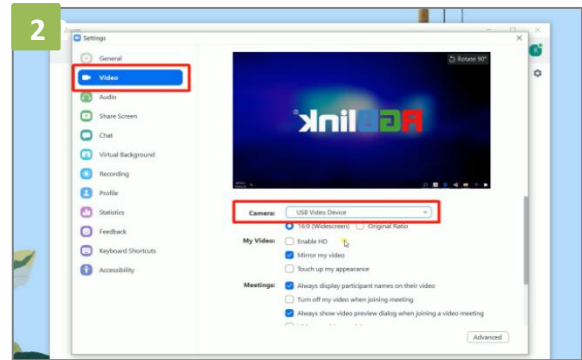


7. Go Live.

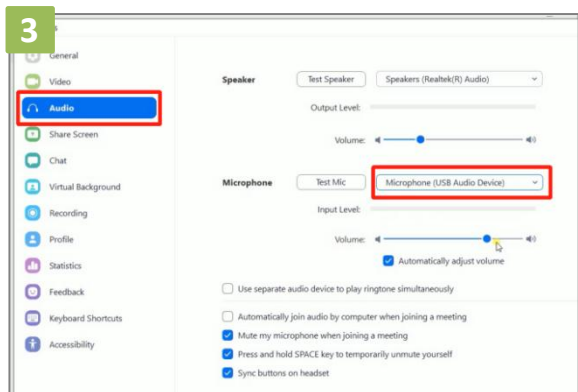
## 4.3 Zoom Streaming



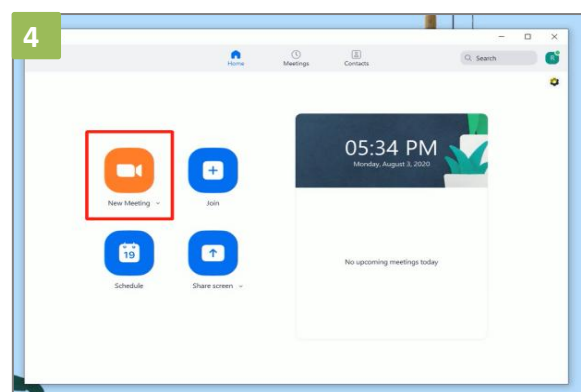
1. Enter Zoom, click "Setting" icon.



2. Click "Video", set Camera as "USB Video Device".



3. Click "Audio", set Microphone as "USB Audio Device".



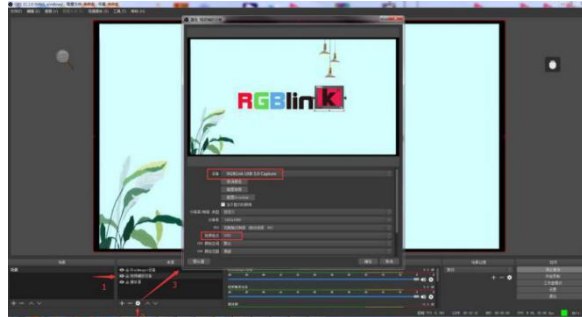
4. Finished all setting, Start meeting/Live.

## 4.4 OBS Streaming

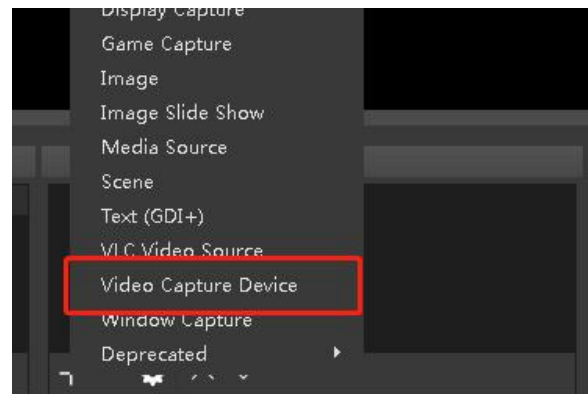
### Video Capture

mini-pro is compatible with many third party steaming software, we recommend OBS, which is available to download on <https://obsproject.com/download>. Download the software and update to the latest version.

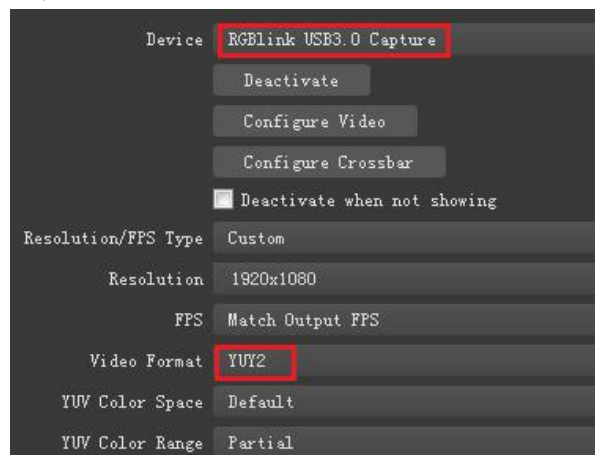
1. Click "+" icon



2. choose video capture device



3. Choose :RGBlink USB 3.0 Capture and Choose Video Format YUY2



### Note:

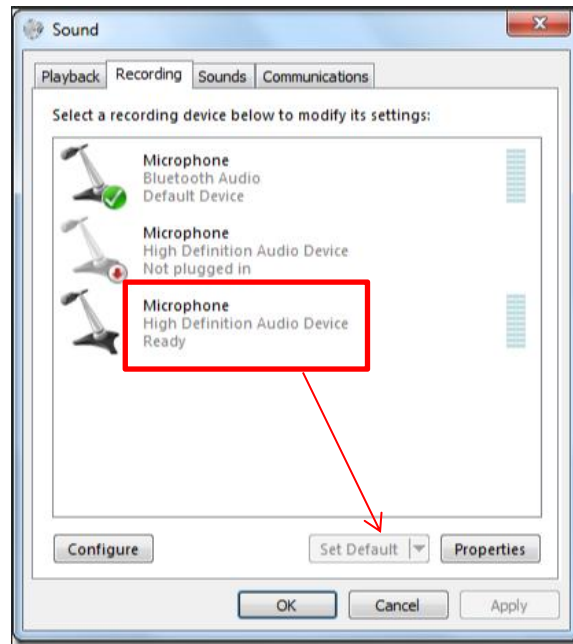
If there is no video format YUY 2 after setting above, check the USB 3.0 port connection. Make sure it is linked to USB 3.0 port on PC by USB 3.0 cable. (USB 3.0 cable or port is standard in blue while USB 2.0 is in black).If the captured , change the video format to YUY2.

## Audio Setting

When there is no audio playing first check the video source see if the it is set in default value and then check the audio setting on OBS.

1. Set Default for the audio source.
2. Audio setting on OBS.

Choose Audio, click Setting and choose audio device (Mic/Auxiliary Audio Device)

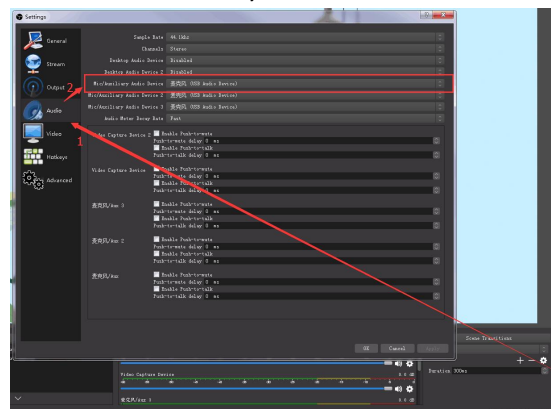


## Synchronize Video with External Audio

When the video itself doesn't have embedded audio and need insert external audio. Here are the steps.

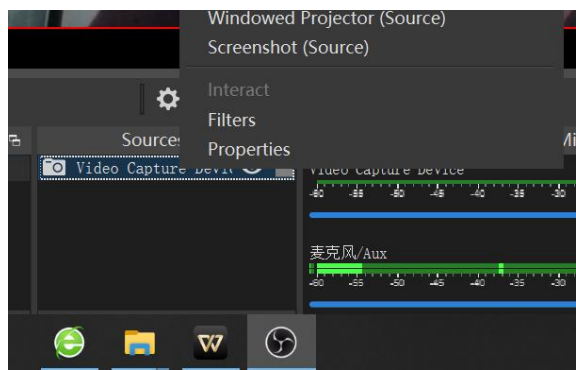


1. Set the audio source: Setting→Audio→Mic/Auxiliary Audio Devices

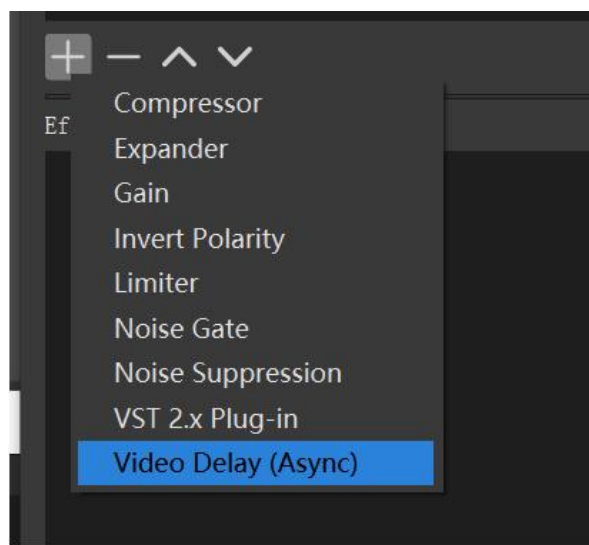




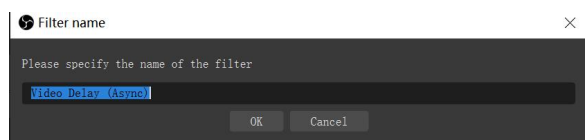
2.Right click the Video Capture Device in Source and choose Filter



3. Click “+”under Audio/Video Filters and choose Video Delay (Async)



4.You can custom the filter name in the pop-up window. Click OK to confirm the filter name.



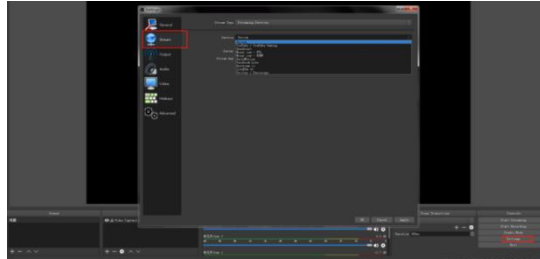
5.Input delay value in ms, the value need to adjusted until the video and audio is synchronous.



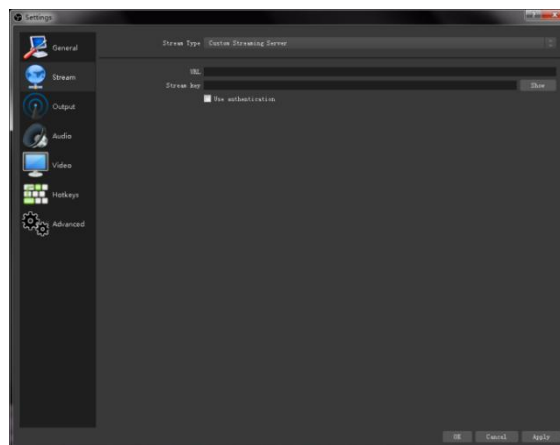
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## Streaming Setting

1. Find the RTMP URL and Stream Key provided by streaming broadcast website.
2. Copy URL and Stream Key
3. Back to OBS, click Setting in the lower right corner and click "Stream". Choose Stream Type as "Streaming Service" or "Custom Streaming Server" . If choose "Streaming Service", there is a list of streaming service name available in the drop down list of Service. If the streaming service is in the list, choose it from the list. If choose Custom Service, just fill in URL and Stream Key.

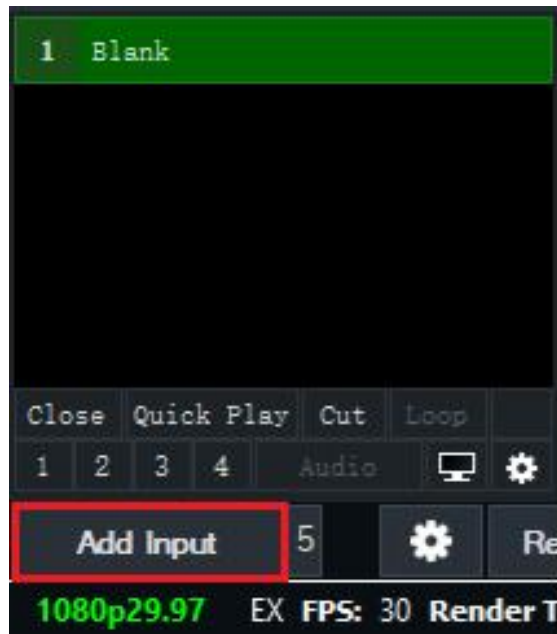


4. Paste the RTMP URL to Server or URL and Stream Key to Stream Key.
5. Click "Start Streaming".
6. Go back to live broadcast website and check the broadcasting.

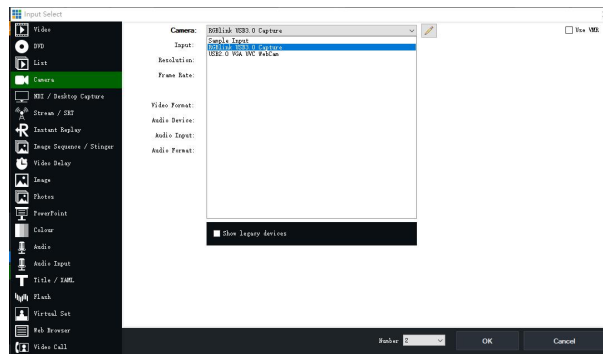


## 4.5 vMix Streaming

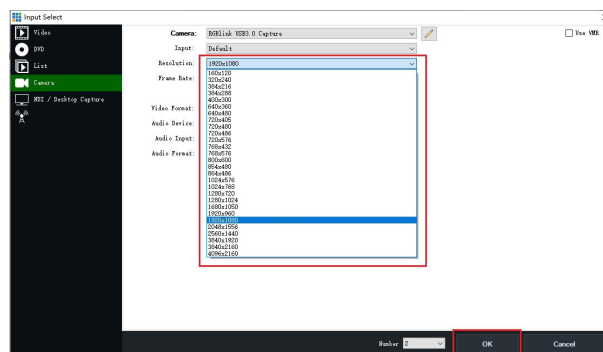
1. Click a new blank, then click the “Add Input” button.



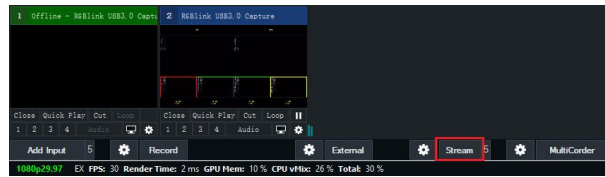
2. Select Camera-Camera-RGBlink USB3.0 Capture.



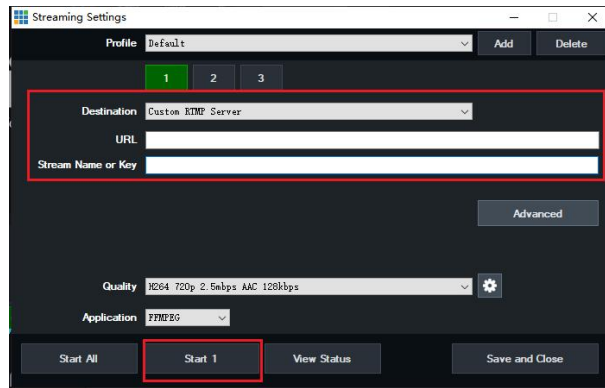
3. Select the same resolution as the mini output. Then click “OK”.



4. Click Stream setting button.



5. Complete the URL and Key information. Click “Start 1”,vMix will begin streaming.



**Note:**

vMix does not support automatic recognition of the output resolution of mini-pro. Every time the output resolution of mini-pro is modified, the picture on vMix will pause. The user needs to re-select RGBlink USB3.0 Capture and manually input the current output resolution of mini-pro.

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# Chapter 5 XPOSE mini Operation

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XPOSE mini is a software that allows you to control your mini-pro, RGBlink is available for all platforms including Android, iOS, MacOS, Windows.

## Minimum System Requirements for macOS

### Windows:

- CPU: i5 and above
- Memory: 8 GB or more
- Operating System: Windows 10 64 bit processor or above
- Graphics: Support Direct X9 128M or above (open AERO effect)
- Hard disk space: Above 16G (primary partitions, NTFS format)
- Connector: USB 3.0 or type c
- Others: do not run multiple video capture or editing software simultaneously

### MAC:

- CPU: i5 and above
- Connector: USB 3.0 or type c
- Operating System: macOS 11.0 Big Sur or later  
macOS 10.15 Catalina
- Others: do not run multiple video capture or editing software simultaneously

You can either connect the mini-pro directly to your computer via the LAN port provided by the mini-pro, or link the mini-pro to your router and the computer to the Wi-Fi emitted by your wireless router.



### Note:

The IP address of the mini-pro must be in the same WLAN segment as the computer or the mobile control device you choose.

## 5.1 Connect mini-pro and computer

### Direct Link via a Network Cable

#### (1) Modify mini-pro's IP Address

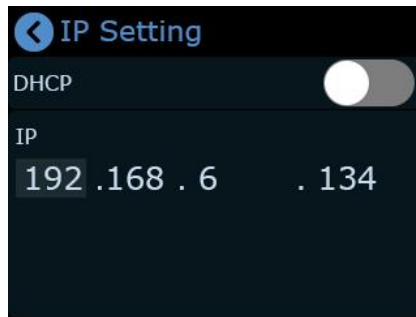
The mini-pro is connected to a computer via TCP/IP protocol for data transfer. Therefore, you need to keep the mini-pro on the same IP network segment as your PC or mobile device. If the mini-pro is connected directly to a computer, you need to change the mini-pro's IP manually to avoid IP conflicts on the same network segment.

#### Steps to modify mini-pro's IP address:

1. Push **【M】** button,enter **【Settings】** -- **【IP Setting】** menu;



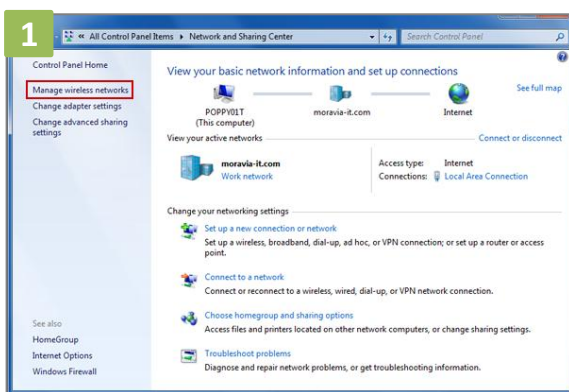
2. Change value of IP via touch screen and toggle



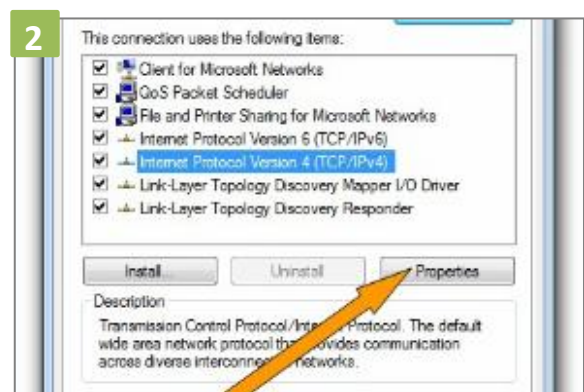
## (2) Change the PC's IP Address

To ensure that the mini-pro and the PC can communicate smoothly, the IP address of the computer needs to be verified.

### Steps to modify the IP address of the Ethernet port (windows).



1. Open the Network Sharing Center;  
Click on "Ethernet";



2. Access to Properties may require administrator privileges;  
Under "This connection uses the following items", find "Internet Protocol version 4 (TCP/IPv4)";

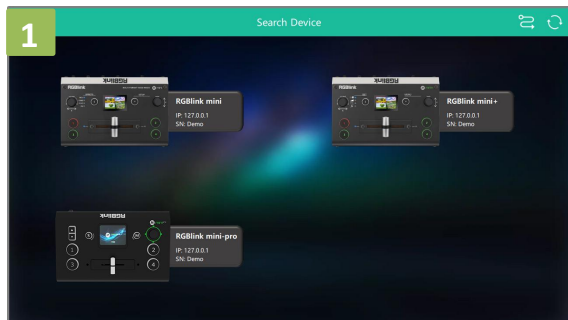
<b>3</b>	IP Address	192 . 168 . 0 . 101
	Subnet Mask	255 . 255 . 255 . 0
	Default Gateway	192 . 168 . 0 . 1


3. Select "Use the following IP address" and change the IP address to the same network segment as mini-pro

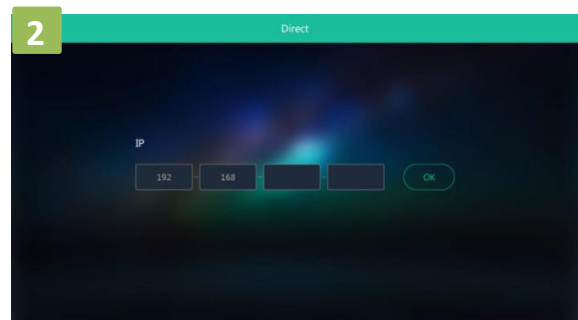
eg: mini-pro's IP address is 192.168.0.99, then the computer's IP address can be set to 192.168.0.1-255. Please make sure that the IP addresses do not conflict.

### Static Direct Connection

To ensure that XPOSE mini can connect in different classes of subnet masks, if you find that you cannot connect to the mini series by searching, please try to use the direct connection method. The direct connection feature was added after XPOSE mini was updated to version V1.0.0.9.



1. Open XPOSE mini and click on the icon in the upper right corner .



2. Enter the IP address of the currently connected mini-pro.

### Connect Wirelessly with Your Router

The mini-pro provides wireless control, so you can control it from a greater distance when the mini-pro is not in your immediate vicinity. A wireless router is required to use this feature. The computer receives the WIFI signal from the wireless router you connect the mini-pro to.

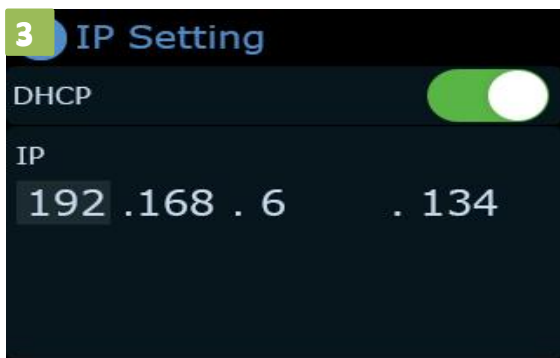
## Steps of wireless connection:



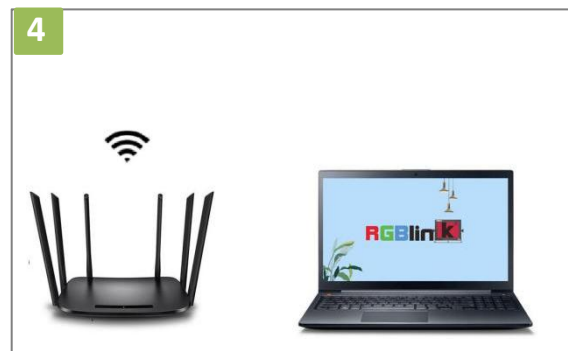
1. Connect the mini-pro to the router's LAN port.



2. Press the **【M】** button to enter **【Settings】**  
-- **【IP Setting】** menu.



3. Turn on the DHCP switch.



4. Computer connects to Wi-Fi from the router, and then Open XPOSE mini search



### Note:

The Android and IOS versions can only connect wirelessly. Regardless of whether you are using wireless or wired, you need to make sure that the IP addresses are on the same network segment and that they do not conflict.

## 5.2 Using XPOSE mini

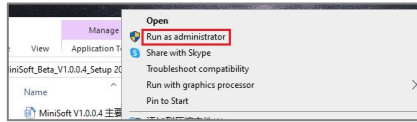
XPOSE mini simulates the mini-pro's real world appearance and the operations you can control with XPOSE mini are very similar to those you can do with the mini-pro's hardware. XPOSE mini has put all the functions in the "M" button. You can use this button for functions that are not possible with the mini-pro hardware.


Install dedicated software named XPOSE to control mini-pro.

Right click the setup exe file .

Choose **Run as administrator** to open the exe and install the software.





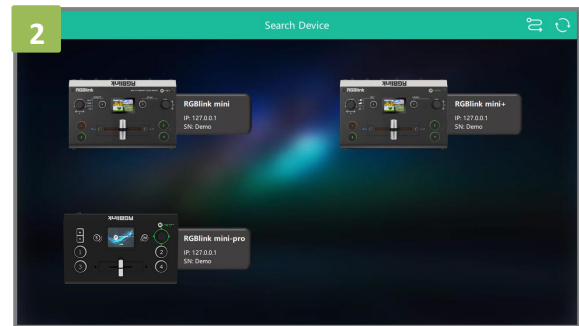
After software is installed, click the icon  XPOSE and login the software



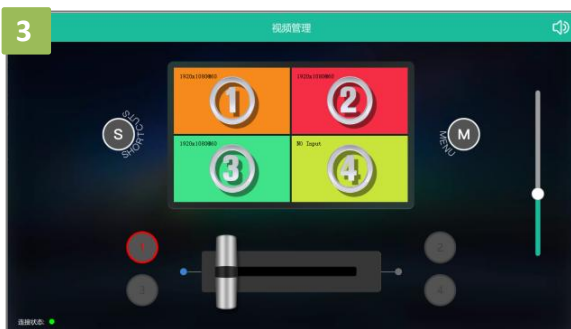
## Search Device



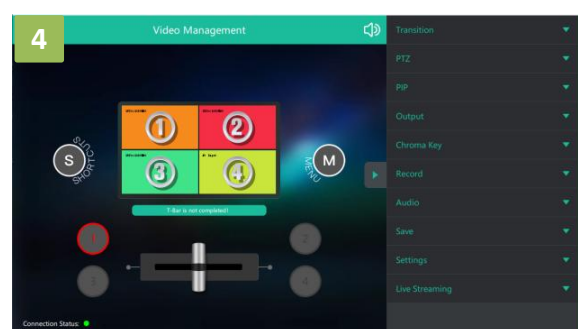
1. Click Search to search mini-pro device.



2. After searching, all available mini-pro devices in the sub-net can be found, up to 128 devices can be found if there are.



3. Select the desired device by SN and IP and enter the management interface.



4. The software interface is a simulation of operation panel on real mini-pro device.



### Note:

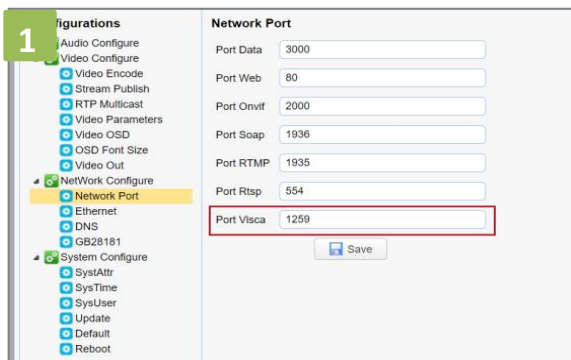
If it is the first time for you to use XPOSE mini, we suggest you watch our User Guide video.

Following sections are dedicated to the additional features of XPOSE mini.



## PTZ Camera Setting

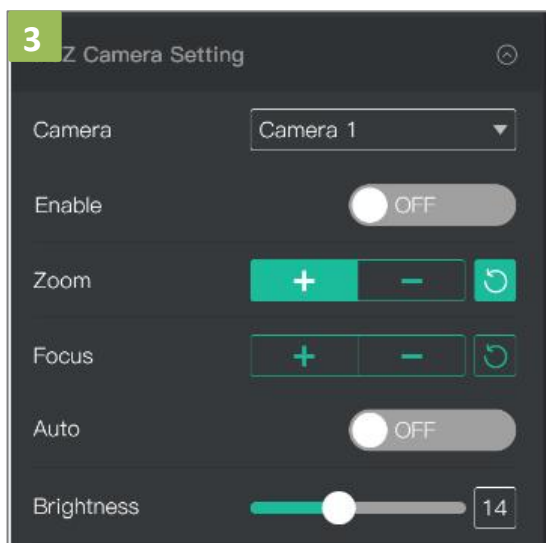
When controlling the PTZ camera, the computer, mini-pro and PTZ camera should be in the same network segment.



1. Set the corresponding communication port on the PTZ camera, such as VISCA or UDP port 1259.



2. Set both old IP and new IP to the camera IP address you want to control, the corresponding communication port to 1259 on mini-pro, configuration path: M(Menu) → FX → PTZ Camera Setting Port on the control software of mini-pro.

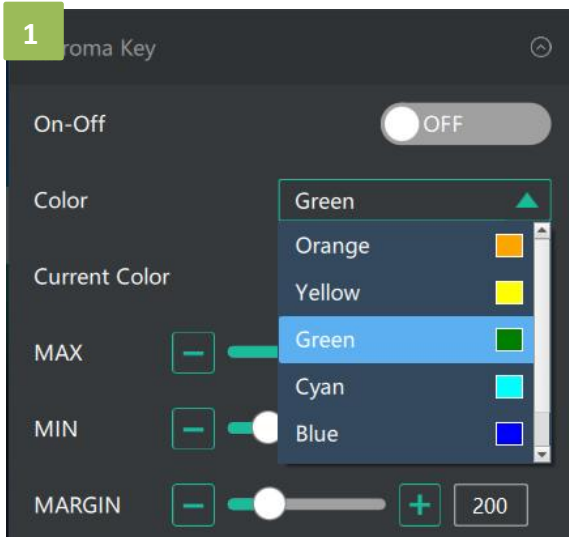


3. After IP address setting, turn on "Enable" and you can control PTZ camera.

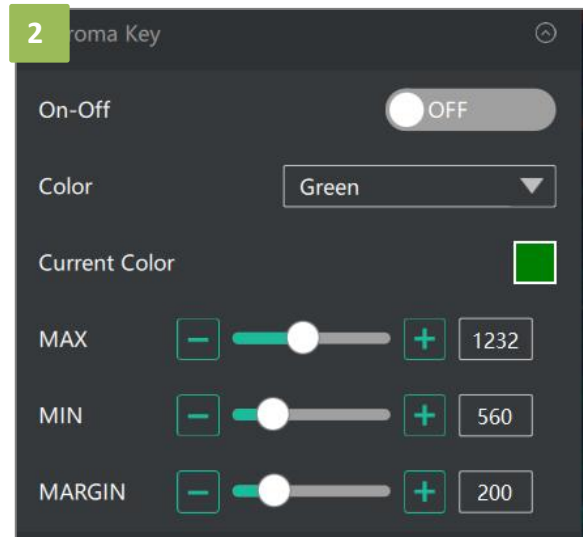
## Chroma Key

mini-pro also provides chroma key of sub-screens. Sub-screen keying is possible with PIP turned on, which helps you to combine characters with the virtual background.

Make sure to use XPOSE mini V1.0.0.9 or higher before using the latest program, and make sure to use mini-pro V1.23 and higher.



1. Select the base color you want to remove, there are 6 kinds of colors you can select: orange, yellow, green, cyan, blue and purple.



2. You can click in the MAX MIN MARGIN data input box to achieve a more precise keying effect.



### Note:

When using chroma key, make sure that the layer you want to edit is on the top layer, which is the B layer in the PIP setting, otherwise you may not see the chromakey effect.

## Live Streaming

**Device Capture:** choose RGBlink USB3.0 Capture

**H.265:** When it is ON, users can watch 4 inputs streaming back on XPOSE software.

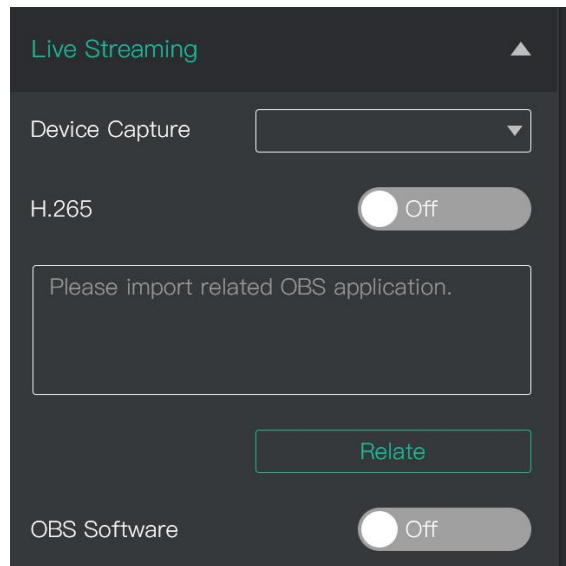
Import the related OBS application if users need to do live streaming, click Relate to confirm.

**OBS:** slide ON to start streaming.



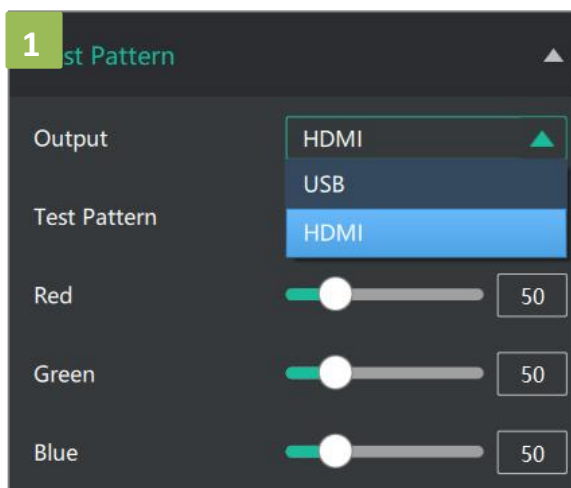
### Note:

H.265 and OBS cannot work at the same time. User choose either H.265 or OBS, not both.

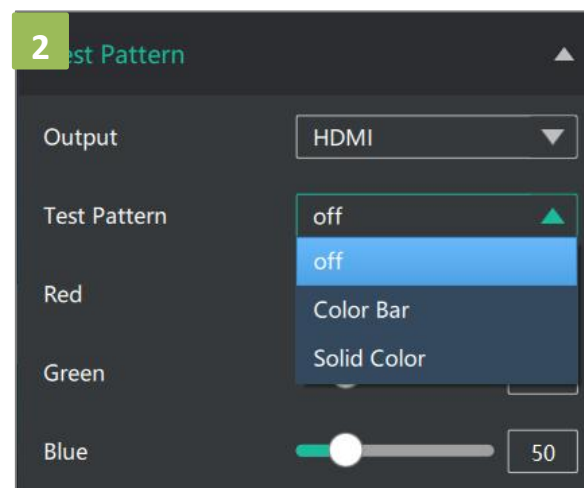


## Test Pattern

To facilitate troubleshooting, XPOSE mini provides a test signal output, which can be used to troubleshoot the USB or HDMI output interface when there is no output signal from USB or HDMI.



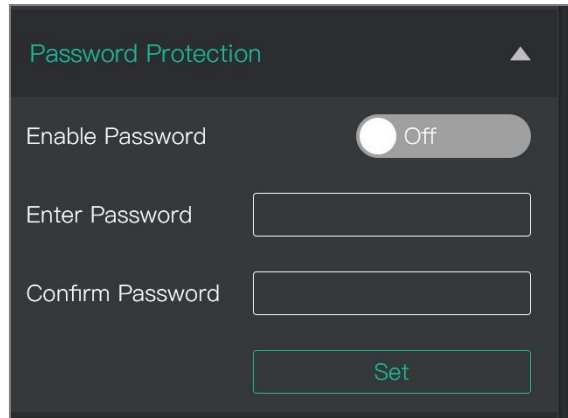
1. Select the USB/HDMI interface to be tested.



2. Select the mode of the test pattern.

## Password Protection

In order to solve the problem of control conflicts caused by different devices controlling the same mini-pro in the same LAN, XPOSE mini provides a password protection function, as an administrator, you can set a password for the device controlling XPOSE mini, and when you control the interface again, you need to enter the password to control it.



### Note:

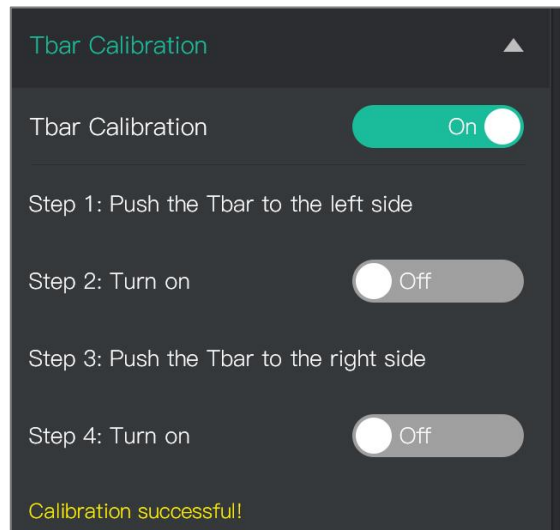
If you have forgotten your password, please restore the factory settings on the mini-pro.

## T-Bar Calibration

If the T-Bar is not in the correct position, no other operation is possible. t-Bar correction is available in XPOSE mini.

### The steps are as follow:

1. Turn on the T-Bar Calibration switch.
2. Push the T-Bar to the **far right** on the mini-pro.
3. Turn on the "On" switch
4. Push the T-Bar to the **far left** on the mini-pro.
5. Turn on the "On" switch



## 5.3 Upgrade

### 1.Tools:

- Firmware ZIP upgrade package
- XTOOL (V1.0.1.10 or higher) -packaged in the ZIP
- Computer with network connection

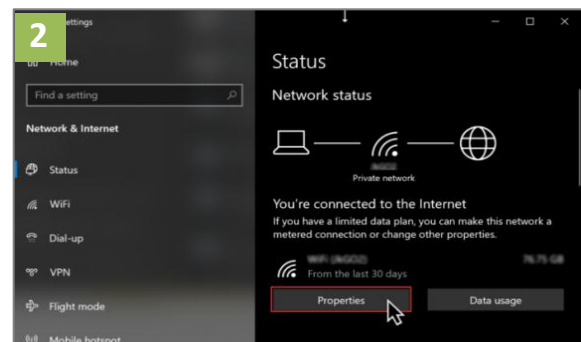
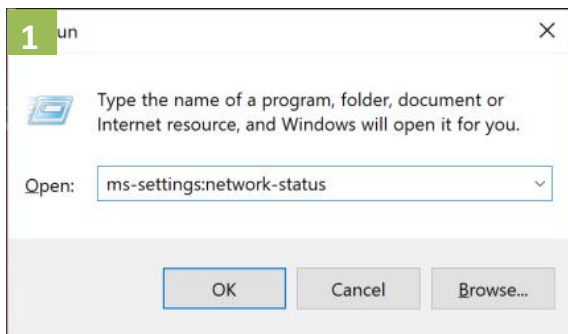
- Windows (minimum Win 7, Win 10 recommended)
- macOS (minimum 10.13 High Sierra)

## 2. Upgrade

2.1 Power on the device and connect LAN ports between PC and device by Cat6 cable;

2.2 Ensure that your computer is on the same network as the mini-pro. The default IP address of mini-pro is 192.168.0.99, in which case your computers IP address should be in the range 192.168.0.xxx (xxx cannot be the same as mini-pro or other device on the network) to enable connection between the mini-pro and your computer.

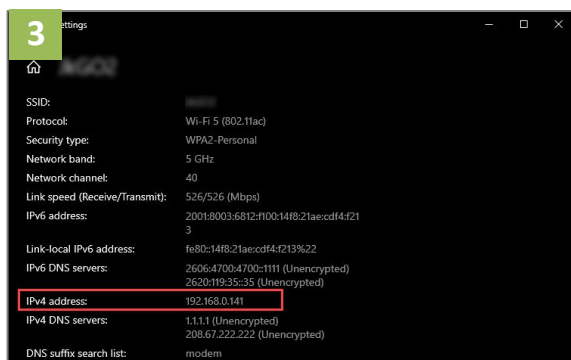
### Check IP of PC:



1. Press  +  keys together

to open the Command Prompt; In the dialog type: ms-settings:network-status

2. Click on the “Properties” button



3. Scroll down to find your IP address

If the IP address is not in the same section, manual change of IP address is required. Here are the steps:

- Step 1. Click Start menu, click “Setting”
- Step 2. Open **Network and Internet > Network and Sharing Center**.
- Step 3. On the left pane of the new window, click **Change adapter settings**.
- Step 4. You will be displayed with **Network Connections** of the PC.

- **Important note:** Right click on “Ethernet” or “Local Area Connection” if you want to change IP of any physical connection. And right click on “WLAN” in case you wish to change IP of any wireless connections.
  - Step 5. Choose **Properties** after right clicking on the network name.
  - Step 6. Select the **Internet Protocol Version 4 (TCP/IPv4)**, then click **Properties**.
  - Step 7. **Obtain an IP Address automatically** should be selected by default, but please choose the **Use the Following IP Address**.
- Step 8. Now put your desired IP Address according to your wish its correct format. Change **Subnet mask and default gateway** if you want to.

### Install XTOOL App

Step 1. Extract the Firmware ZIP package into a folder

Step 2. Navigate to the **/Upgrade Tool/XTOOL** folder

Step 3. Right mouse-click the XTOOL Soft Setup and *Run as Administrator* [Windows]

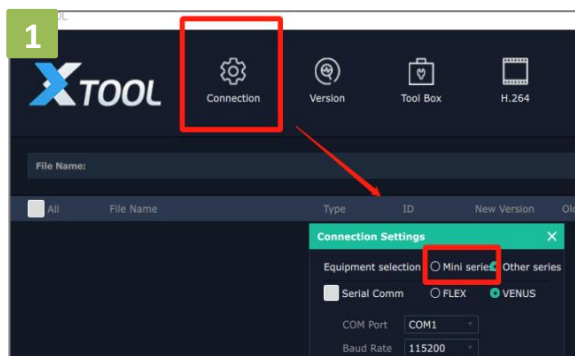
Step 3. Follow the Setup Wizard to install all the components. There will be multiple Dialog windows pop-up for installing the necessary components (*refer XTOOL Installation Guide*)

If the XTOOL app has been installed previously, use the **Modify** option to complete the setup.

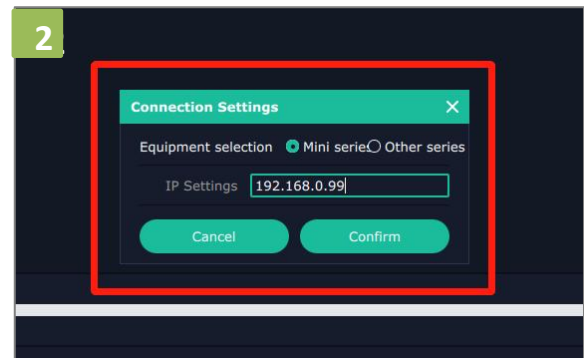
XTOOL is a universal updater application for RGBlink products, as such has a number of features in support of the full range of RGBlink devices that are not utilized for mini-pro updates in this guide.

#### 1. Upgrade

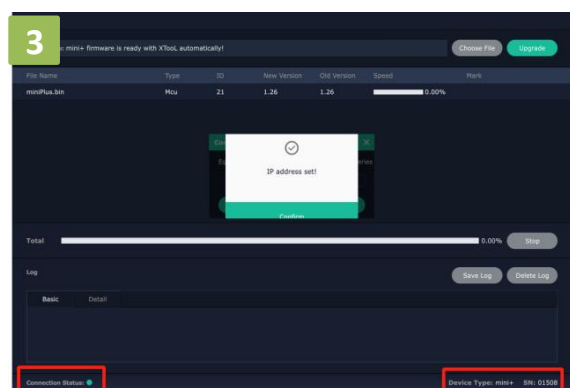
Open the XTOOL app with *Run as Administrator* [Windows]



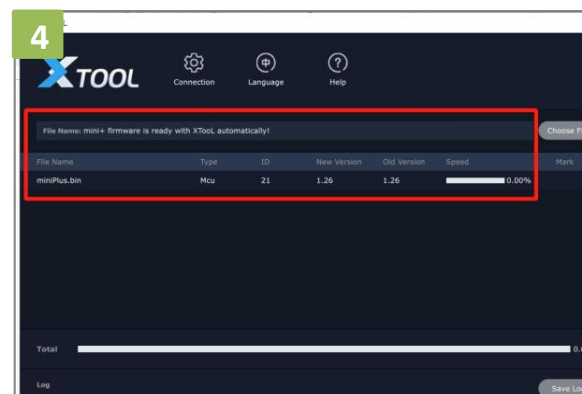
1. Click “Connection” and select “mini series”



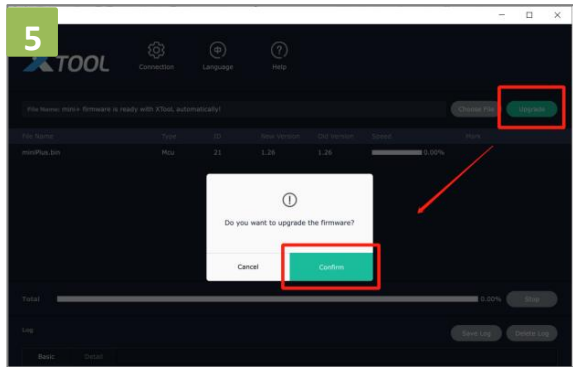
2. Fill in the IP Address of the mini-pro (as example above, default mini-pro IP is 192.168.0.99), and click “Confirm”.



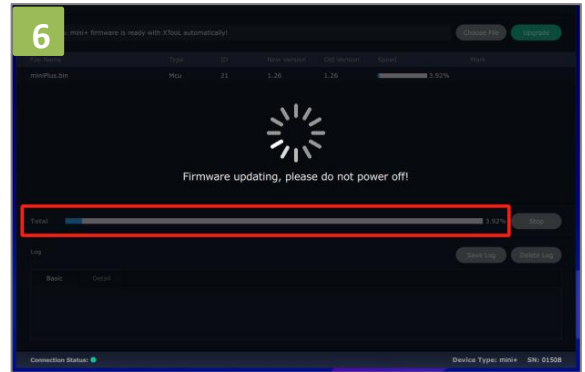
3. Review Connection Status at bottom left, to confirm indicator light is green and there is device information showing at bottom right.



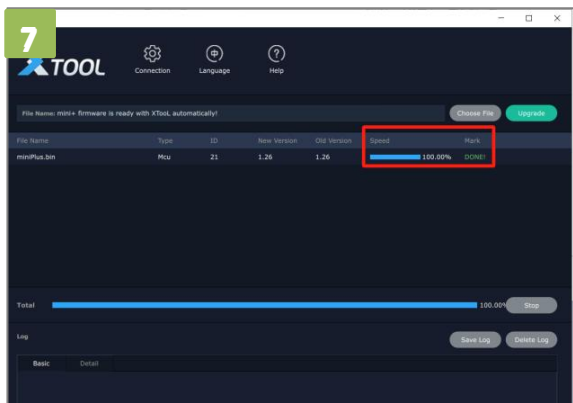
4. The firmware package will be ready with XTOOL automatically.



5. Click "Upgrade" and click "Confirm" in the pop-up windows.



6. Firmware is upgrading and you can monitor the progress. Please do not power off while upgrading.



7. mini-pro is now upgraded and ready to use.



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# Chapter 6 Ordering Codes

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## 6.1 Product Code

230-0003-02-0

mini-pro

# Chapter 7 Appendix

## 7.1 Specification

Connectors	Input	HDMI 4K	4×HDMI-A	
	Output	HDMI 2K	1×HDMI-A	
		Streaming	1×USB Type-A	
		Recording	1×USB Type-A	
	Audio	In	2×3.5mm Stereo Jack	
		Out	1×3.5mm Stereo Jack	
	Communication	LAN	1×RJ45	
	Power		1×PD Type-C	
Performance	Input Resolutions	HDMI SMPTE VESA	720p@50/60   1080i@50   1080p@24/30/50/60   2160p@60 1024×768@60   1280×720@60   1280×768@60   1280×800@60   1280×1024@60   1360×768@60   1366×768@60   1440×900@60   1600×1200@60   1680×1050@60   1920×1080@60   1920×1200@60   3840×2160@60   4096×2160@60	
	Output Resolutions	HDMI SMPTE VESA USB	720p@50/60   1080p@24/25/30/50/60 1024×768@60   1280×720@50/60   1280×768@60   1280×1024@60   1360×768@60   1920×1080@24/25/30/50/60 1024×768@60   1280×720@50/60   1280×768@60   1280×1024@60   1360×768@60   1920×1080@24/25/30/50/60	
	Supported Standards	HDMI	2.0	
		USB	2.0	
		H.265	ITU-T H.265/ ISO/IEC 23008-2	
	Supported Protocol	PTZ	VISCA	
	Streaming Formats	ITU-T H.265   ISO/IEC 23008-2		
	Video	Video Formats	HDMI 2.0   HDCP 2.2	
		Video Sampling	4:4:4 YUV	
		Video Latency	<4 frames	
	Audio	Line In Delay	up to 8 frames	
Audio Formats		LPCM/2ch/24bit/16bit/48kHZ		

		Color Space	RGB 8bit
	Record/Storage	Disk Formats	FAT32(≤32 GB)   exFAT(64GB~2T)
		Recording Formats	MP4   WAV
Power	Input Voltage	PD 12V/1.5A(via plug pack supplied)	
	Contact Power	13.2W	
	Max Power	20W	

Environment	Temperature	0°C~60°C		
	Humidity	10%~85%		
Physical	Weight	Net	0.42kg	
		Package	1.20kg	
	Dimension	Net	180mm×118.3mm×58.4mm	
		Package	255mm×145mm×85mm	

## 7.2 FAQ

### 1. When there is a problem with mini-pro.

A: We recommend you to upgrade to the latest version of firmware first, then reset and restart the device.

### 2. If there is a power supply problem with the mini-pro.

A: Please try to change the power adapter (support 20W).

### 3. mini-pro upgrade notes.

A: Please disable the other adapters(except mini-pro LAN adapter) on Network and Internet, turn off the DHCP on setting of mini-pro, after upgrading successfully, remember to reset and restart the device.

### 4. mini-pro cannot control PTZ.

A: Please make sure that the IP address of mini-pro and PTZ are in the same network segment. For example, the IP address of PTZ is 192.168.5.163. Please also set the IP address of mini-pro to 192.168.5.X ( 2~254) except163 Outside), confirm on mini XPOSE whether the Visca port number in the PTZ settings is the corresponding port number, for example, the Visca port number of the PTZ of RGBlink is 1259.

### 5. mini-pro USB2.0 RECORD cannot recognize U disk.

A: Please format the U disk (exFAT, FAT32).

### 6. mini-pro USB3.0 WEBCAM cannot be recognized/recognized without picture(black picture).

---

A: Please confirm whether the computer configuration meets the following conditions, if not, please select one of the following methods 6.1)-6.5) for testing:

Windows:

CPU:i5 and above

Memory:8 GB or more

Operating System: Windows 10 64 bit processor or above

Graphics: Support Direct X9 128M or above (open AERO effect)

Hard disk space: Above 16G (primary partitions, NTFS format)

Connector: USB 3.0 or type c

Others: do not run multiple video capture or editing software simultaneously

MAC:

CPU: i5 and above

Connector: USB 3.0 or type c

Operating System: macOS 11.0 Big Sur or later macOS 10.15 Catalina

Others: do not run multiple video capture or editing software simultaneously

6.1)Or use typeC to USB3.0 hub to connect the computer and mini-pro

6.2)Or use USB software->ProcessControl\_1.0.0.2 to improve performance of computer(in the attachment)

6.3)Lower the output resolution

6.4)Unplug and plug the USB3.0 cable and re-enter the streaming software.

6.5)Change the USB2.0 cable to do streaming (note that the picture quality is lower than the USB3.0 cable, and the USB2.0 cable is not recommended to use the PVW output)

## **7. Does mini-pro support HDCP?**

A: The HDMI input supports the HDCP protocol, HDMI input 1 port supports HDCP2.X, the other input ports support HDCP1.X, and the output does not support HDCP protocol encryption

## **8. mini-pro HDMI input what kind of YUV.**

A: mini-pro supports 4:4:4, not supports 4:2:0.

## **9. When mini-pro input is i format signal will be half-screened or cut with the P format signal, the height of the P format will be cut.**

A: At present, the latest program can automatically determine the i/P signal source and automatically adjust the cropping value.

## **10. Can mini-pro be controlled by mobile phone?**

A: At present, the Android version has been uploaded on the official website, the IOS version is still being uploaded, and the version in the APP Store does not control the mini-pro.

## **11. When the mini-pro switch is turned on and power on, plug in the USB cable to USB2.0 RECORD port, and the LCD screen will sometimes flicker.**

---

A: Hardware repair has been done, if this situation occurs, please try to turn off the switch, unplug the power, and power on again.

**12. Can mini-pro recording be paused, If you stop recording and then start recording again, will it be saved in a new file?**

A: Currently there is no pause function. Restarting recording will save a new file.

**13. Can mini-pro control PTZ of Pelco protocol?**

A: Currently, the PTZ controlling this protocol is not supported, mini-pro supports to control Visca protocol PTZ.

## 7.3 Terms & Definitions

●**RCA:** Connector used primarily in consumer AV equipment for both audio and video. The RCA connector was developed by the Radio Corporation of America.

●**BNC:** Stands for Bayonet Neill-Concelman. A cable connector used extensively in television (named for its inventors). A cylindrical bayonet connector that operates with a twist-locking motion .

●**CVBS:** CVBS or Composite video, is an analog video signal without audio. Most commonly CVBS is used for transmission of standard definition signals. In consumer applications the connector is typically RCA type, while in professional applications the connector is BNC type.

●**YPbPr:** Used to describe the colour space for progressive-scan. Otherwise known as component video.

●**VGA:** Video Graphics Array. VGA is an analog signal typically used on earlier computers. The signal is non-interlaced in modes 1, 2, and 3 and interlaced when using in mode.

●**DVI:** Digital Visual Interface. The digital video connectivity standard that was developed by DDWG (Digital Display Work Group). This connection standard offers two different connectors: one with 24 pins that handles digital video signals only, and one with 29 pins that handles both digital and analog video.

●**SDI:** Serial Digital Interface. Standard definition video is carried on this 270 Mbps data transfer rate. Video pixels are characterized with a 10-bit depth and 4:2:2 color quantization. Ancillary data is included on this interface and typically includes audio or other metadata. Up to sixteen audio channels can be transmitted. Audio is organised into blocks of 4 stereo pairs. Connector is BNC.

●**HD-SDI:** High-definition serial digital interface (HD-SDI), is standardized in SMPTE 292M this provides a nominal data rate of 1.485 Gbit/s.

●**3G-SDI:** Standardized in SMPTE 424M, consists of a single 2.970 Gbit/s serial link that allows replacing dual link HD-SDI.

- 
- **6G-SDI:** Standardized in SMPTE ST-2081 released in 2015, 6Gbit/s bitrate and able to support 2160p@30.
  - **12G-SDI:** Standardized in SMPTE ST-2082 released in 2015, 12Gbit/s bitrate and able to support 2160p@60.
  - **U-SDI:** Technology for transmitting large-volume 8K signals over a single cable. a signal interface called the ultra high definition signal/data interface (U-SDI) for transmitting 4K and 8K signals using a single optical cable. The interface was standardized as the SMPTE ST 2036-4.
  - **HDMI:** High Definition Multimedia Interface: An interface used for the transmission of uncompressed high definition video, up to 8 channels of audio, and control signals, over a single cable.
  - **HDMI 1.3:** Released on June 22 2006, and increased the maximum TMDS clock to 340 MHz (10.2 Gbit/s). Support resolution 1920 × 1080 at 120 Hz or 2560 × 1440 at 60 Hz). It added support for 10 bpc, 12 bpc, and 16 bpc color depth (30, 36, and 48 bit/px), called deep color.
  - **HDMI 1.4:** Released on June 5, 2009, added support for 4096 × 2160 at 24 Hz, 3840 × 2160 at 24, 25, and 30 Hz, and 1920 × 1080 at 120 Hz. Compared to HDMI 1.3, 3 more features added which are HDMI Ethernet Channel (HEC) , audio return channel (ARC),3D Over HDMI, a new Micro HDMI Connector, an expanded set of color spaces.
  - **HDMI 2.0:** Released on September 4, 2013 increases the maximum bandwidth to 18.0 Gbit/s. Other features of HDMI 2.0 include up to 32 audio channels, up to 1536 kHz audio sample frequency, the HE-AAC and DRA audio standards, improved 3D capability, and additional CEC functions.
  - **HDMI 2.0a:** Was released on April 8, 2015, and added support for High Dynamic Range (HDR) video with static metadata.
  - **HDMI 2.0b:** Was released March, 2016, support for HDR Video transport and extends the static metadata signaling to include Hybrid Log-Gamma (HLG).
  - **HDMI 2.1:** Released on November 28, 2017. It adds support for higher resolutions and higher refresh rates, Dynamic HDR including 4K 120 Hz and 8K 120 Hz.
  - **DisplayPort:** A VESA standard interface primarily for video, but also for audio, USB and other data. DisplayPort (orDP) is backwards compatible with HDMI, DVI and VGA.
  - **DP 1.1:** Was ratified on 2 April 2007, and version 1.1a was ratified on 11 January 2008. DisplayPort 1.1 allow a maximum bandwidth of 10.8 Gbit/s (8.64 Gbit/s data rate) over a standard 4-lane main link, enough to support 1920x1080@60Hz
  - **DP 1.2:** Introduced on 7 January 2010, effective bandwidth to 17.28 Gbit/s support increased resolutions, higher refresh rates, and greater color depth, maximum resolution 3840 × 2160@60Hz
  - **DP 1.4:** Publish on 1 Mar, 2016. overall transmission bandwidth 32.4 Gbit/s ,DisplayPort 1.4 adds support for Display Stream Compression 1.2 (DSC), DSC is a "visually lossless" encoding technique with up to a 3:1 compression ratio. Using DSC with HBR3 transmission rates, DisplayPort 1.4 can support 8K UHD (7680 × 4320) at 60 Hz or 4K UHD (3840 × 2160) at 120 Hz with 30 bit/px RGB color and HDR. 4K at 60 Hz 30 bit/px RGB/HDR can be achieved without the need for DSC.
  - **Multi-mode Fiber:** Fibers that support many propagation paths or transverse modes are called multi-mode fibers,

generally have a wider core diameter and are used for short-distance communication links and for applications where high power must be transmitted.

●**Single-mode Fiber:** Fiber that support a single mode are called single-mode fibers. Single-mode fibers are used for most communication links longer than 1,000 meters (3,300 ft).

●**SFP:** Small form-factor pluggable , is a compact, hot-pluggable network interface module used for both telecommunication and data communications applications.

●**Optical Fiber Connector:** Terminates the end of an optical fiber, and enables quicker connection and disconnection than splicing. The connectors mechanically couple and align the cores of fibers so light can pass. 4 most common types of optical fiber connectors are SC, FC, LC,ST.

●**SC:** (Subscriber Connector), also known as the square connector was also created by the Japanese company – Nippon Telegraph and Telephone. SC is a push-pull coupling type of connector and has a 2.5mm diameter. Nowadays, it is used mostly in single mode fiber optic patch cords, analog, GBIC, and CATV. SC is one of the most popular options, as its simplicity in design comes along with great durability and affordable prices.

●**LC:** (Lucent Connector) is a small factor connector (uses only a 1.25mm ferrule diameter) that has a snap coupling mechanism. Because of its small dimensions, it is the perfect fit for high-density connections, XFP, SFP, and SFP+ transceivers.

●**FC:** (Ferrule Connector) is a screw type connector with a 2.5mm ferrule. FC is a round shaped threaded fiber optic connector,mostly used on Datacom, telecom, measurement equipment, single-mode laser.

●**ST:** (Straight Tip) was invented by AT&T and uses a bayonet mount along with a long spring-loaded ferrule to support the fiber.

●**USB:** Universal Serial Bus is a standard that was developed in the mid-1990s that defines cables, connectors and communication protocols. This technology is designed to allow a connection, communication and power supply for peripheral devices and computers.










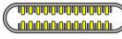
●**USB 1.1:** Full-Bandwidth USB, specification was the first release to be widely adopted by the consumer market. This specification allowed for a maximum bandwidth of 12Mbps.

●**USB 2.0:** or Hi-Speed USB, specification made many improvements over USB 1.1. The main improvement was an increase in bandwidth to a maximum of 480Mbps.

● **USB 3.2:** Super Speed USB with 3 varieties of 3.2 Gen 1(original name USB 3.0), 3.2Gen 2(original name USB 3.1), 3.2 Gen 2x2 (original name USB 3.2) with speed up to 5Gbps,10Gbps,20Gbps respectively.

USB version and connectors figure:

	Type A	Type B	Mini A	Mini B	Micro-A	Micro-B	Type C
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USB 2.0							
USB 3.0							
USB 3.1&3.2							

- NTSC:** The colour video standard used in North America and some other parts of the world created by the National Television Standards Committee in the 1950s. NTSC utilizes an interlaced video signals.

- PAL:** Phase Alternate Line. A television standard in which the phase of the colour carrier is alternated from line to line. It takes four full images (8 fields) for the colour-to-horizontal images (8 fields) for the colour-to-horizontal phase relationship to return to the reference point. This alternation helps cancel out phase errors. For this reason, the hue control is not needed on a PAL TV set. PAL, is widely used in Western Europe, Australia, Africa, the Middle East, and Micronesia. PAL uses 625-line, 50-field (25 fps) composite colour transmission system.

- SMPTE:** Society of Motion image and Television Engineers. A global organization, based in the United States, that sets standards for baseband visual communications. This includes film as well as video and television standards.

- VESA:** Video Electronics Standards Association. An organization facilitating computer graphics through standards.

- HDCP:** High-bandwidth Digital Content Protection (HDCP) was developed by Intel Corporation and is in wide use for protection of video during transmission between devices.

- HDBaseT:** A video standard for the transmission of uncompressed video (HDMI signals) and related features using Cat 5e/Cat6 cabling infrastructure.

- ST2110:** A SMPTE developed standard, ST2110 describes how to send digital video over and IP networks. Video is transmitted uncompressed with audio and other data in a separate streams.

SMPTE2110 is intended principally for broadcast production and distribution facilities where quality and flexibility are more important.

- SDVoE:** Software Defined Video over Ethernet (SDVoE) is a method for transmission, distribution and management AV signals using a TCP/IP Ethernet infrastructure for transport with low latency. SDVoE is commonly used in integration applications.

- Dante AV:** The Dante protocol was developed for and widely adopted in audio systems for the transmission of uncompressed digital audio on IP based networks. The more recent Dante AV specification includes support for digital video.



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- **NDI:** Network Device interface (NDI) is a software standard developed by NewTek to enable video-compatible products to communicate, deliver, and receive broadcast quality video in a high quality, low latency manner that is frame-accurate and suitable for switching in a live production environment over TCP (UDP) Ethernet based networks. NDI is commonly found in broadcast applications.
  - **RTMP:** Real-Time Messaging Protocol (RTMP) was initially a proprietary protocol developed by Macromedia (now Adobe) for streaming audio, video and data over the Internet, between a Flash player and a server.
  - **RTSP:** The Real Time Streaming Protocol (RTSP) is a network control protocol designed for use in entertainment and communications systems to control streaming media servers. The protocol is used for establishing and controlling media sessions between end points.
  - **MPEG:** Moving Picture Experts Group is a working group formed from ISO and IEC developing standards that allow audio/video digital compression and Transmission.
  - **H.264:** Also known as AVC (Advanced Video Coding) or MPEG-4i is a common video compression standard. H.264 was standardized by the ITU-T Video Coding Experts Group (VCEG) together with the ISO/IEC JTC1 Moving Picture Experts Group (MPEG).
  - **H.265:** Also known as **HEVC** (High Efficiency Video Coding) H.265 is the successor to the widely used H.264/AVC digital video coding standard. Developed under the auspices of ITU, resolutions up to 8192x4320 may be compressed.
  - **API:** An Application Programming Interface (API) provides a predefined function which allows access capabilities and features or routines via a software or hardware, without accessing source code or understanding the details of inner working mechanism. An API call may execute a function and/or provide data feedback/report.
  - **DMX512:** The communication standard developed by USITT for entertainment and digital lighting systems. The wide adoption of the Digital Multiplex (DMX) protocol has seen the protocol used for a wide range of other devices including video controllers. DMX512 is delivered over cable of 2 twisted pairs with 5pin XLR cables for connection.
  - **ArtNet:** An ethernet protocol based on TCP/IP protocol stack, mainly used in entertainment/events applications. Built on the DMX512 data format, ArtNet enables multiple “universes” of DMX512 to be transmitted using ethernet networks for transport.
  - **MIDI:** MIDI is the abbreviation of Musical Instrument Digital Interface. As the name indicates the protocol was developed for communication between electrical musical instruments and latterly computers. MIDI instructions are triggers or commands sent over twisted pair cables, typically using 5pin DIN connectors.
  - **OSC:** The principle of Open Sound Control (OSC) protocol is for networking sound synthesizers, computers, and multimedia devices for musical performance or show control. As with XML and JSON, the OSC protocol allows sharing data. OSC is transported via UDP packets between devices connected on an Ethernet.
  - **Brightness:** Usually refers to the amount or intensity of video light produced on a screen without regard to colour. Sometimes called black level.

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● **Contrast Ratio:** The ratio of the high light output level divided by the low light output level. In theory, the contrast ratio of the television system should be at least 100:1, if not 300:1. In reality, there are several limitations. Well-controlled viewing conditions should yield a practical contrast ratio of 30:1 to 50:1.

● **Colour Temperature:** The colour quality, expressed in degrees Kelvin (K), of a light source. The higher the colour temperature, the bluer the light. The lower the temperature, the redder the light. Benchmark colour temperature for the A/V industry include 5000°K, 6500°K, and 9000°K.

● **Saturation:** Chroma, Chroma gain. The intensity of the colour, or the extent to which a given colour in any image is free from white. The less white in a colour, the truer the colour or the greater its saturation. Saturation is the amount of pigment in a colour, and not the intensity.

● **Gamma:** The light output of a CRT is not linear with respect to the voltage input. The difference between what you should have and what is actually output is known as gamma.

● **Frame:** In interlaced video, a frame is one complete image. A video frame is made up of two fields, or two sets of interlaced lines. In a film, a frame is one still image of a series that makes up a motion image.

● **Genlock:** Allows synchronisation of otherwise video devices. A signal generator provides a signal pulses which connected devices can reference. Also see Black Burst and Color Burst.

● **Blackburst:** The video waveform without the video elements. It includes the vertical sync, horizontal sync, and the Chroma burst information. Blackburst is used to synchronize video equipment to align the video output.

● **Colour Burst:** In colour TV systems, a burst of subcarrier frequency located on the back part of the composite video signal. This serves as a colour synchronizing signal to establish a frequency and phase reference for the Chroma signal. Colour burst is 3.58 MHz for NTSC and 4.43 MHz for PAL.

● **Colour Bars:** A standard test pattern of several basic colours (white, yellow, cyan, green, magenta, red, blue, and black) as a reference for system alignment and testing. In NTSC video, the most commonly used colour bars are the SMPTE standard colour bars. In PAL video, the most commonly used colour bars are eight full field bars. On computer monitors the most commonly used colour bars are two rows of reversed colour bars

● **Seamless Switching:** A feature found on many video switchers. This feature causes the switcher to wait until the vertical interval to switch. This avoids a glitch (temporary scrambling) which often is seen when switching between sources.

● **Scaling:** A conversion of a video or computer graphic signal from a starting resolution to a new resolution. Scaling from one resolution to another is typically done to optimize the signal for input to an image processor, transmission path or to improve its quality when presented on a particular display.

● **PIP:** Picture-In-Picture. A small image within a larger image created by scaling down one of image to make it smaller. Other forms of PIP displays include Picture-By-Picture (PBP) and Picture- With-Picture (PWP), which are commonly used with 16:9 aspect display devices. PBP and PWP image formats require a separate scaler for each video window .

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●**HDR:** is a high dynamic range (HDR) technique used in imaging and photography to reproduce a greater dynamic range of luminosity than what is possible with standard digital imaging or photographic techniques. The aim is to present a similar range of luminance to that experienced through the human visual system.

●**UHD:** Standing for Ultra High Definition and comprising 4K and 8K television standards with a 16:9 ratio, UHD follows the 2K HDTV standard. A UHD 4K display has a physical resolution of 3840x2160 which is four times the area and twice both the width and height of a HDTV/FullHD (1920x1080) video signal.

●**EDID:** Extended Display Identification Data. EDID is a data structure used to communicate video display information, including native resolution and vertical interval refresh rate requirements, to a source device. The source device will then output the provided EDID data, ensuring proper video image quality.

## 7.4 Revision History

The table below lists the changes to the User Manual.

Format	Time	ECO#	Description	Principal
V1.0	2022-08-29	0000#	Release	Aster
V1.1	2023-04-25	0001#	Add audio parameters Add Settings	Aster
V1.2	2023-09-08	0002#	Add Blend Function in PIP menu	Aster
V1.3	2023-12-06	0003#	Update Audio Setting	Aster
V1.4	2024-06-13	0004#	Update Product Code	Aster

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# Chapter 8 Support

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