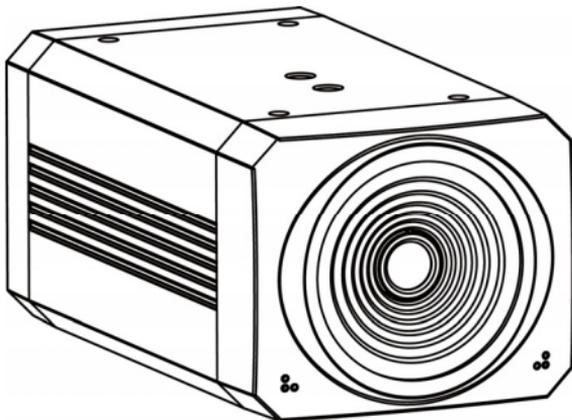


# HD Color Box Camera



## User Manual English (V1.2)

### Copyright and Disclaimer

All contents of this manual, whose copyright belongs to our Corporation cannot be cloned, copied or translated without the permission of the company. Product specifications and information which were referred to in this document are for reference only. We may change, delete, or update any content at any time and without prior notice.



Warning

This is class A production. Electromagnetic radiation at specific frequencies may affect the image quality of TV in home environment.

## Catalogue

1	Note .....	1
2	Supplied Accessories.....	1
3	About Product.....	1
	3.1 Features.....	1
	3.2 Product Specification .....	2
	3.3 Interface and Button.....	4
	3.4 Dimension .....	4
4	Menu Settings.....	5
	4.1 MENU.....	5
	4.2 EXPOSURE .....	5
	4.3 COLOR .....	5
	4.4 IMAGE.....	6
	4.5 FOCUS.....	6
	4.6 NOISE REDUCTION .....	7
	4.7 SETTING.....	7
	4.8 INFORMATION .....	7
	4.9 RESTORE DEFAULT.....	8
5	Network Function.....	8
	5.1 Operating Environment.....	8
	5.2 Equipment Installation.....	8
	5.3 Internet Connection.....	8
	5.4 IP Camera controlled by LAN .....	8
	5.5 Camera Controlled by WAN.....	10
	5.6 IP Camera Parameter Setup.....	11
	5.7 Download Upgrade Program .....	16
6	Product Installation .....	17
7	Image Tracking Configuration .....	19
	7.1 Network Function .....	19
	7.2 Configuration Process.....	20
	7.3 Teacher Configuration.....	21
	7.4 Student Configuration .....	24

7.5	Director Configuration .....	27
7.6	FAQ .....	29
8	Maintenance and Troubleshooting.....	29

## 1 Note

- **Electric Safety**

Installation and operation must accord with electric safety standard.

- **Use Caution to Transport**

Avoid stress, vibration or soakage in transport, storage and installation.

- **Polarity of Power Supply**

The power supply of this product is +12V, the max electrical current is 2A. Polarity of the power supply plug drawing shows as below.



- **Installation Precautions**

Do not use in corrosive liquid, gas or solid environment to avoid any cover (plastic material) damage. Make sure there is no obstacle within rotation range.

Never power on before installation is completed.

- **Do not Dismantle the Camera**

We are not responsible for any unauthorized modification or dismantling.



Warning

Specific frequencies of electromagnetic field may affect the image of the camera!

## 2 Supplied Accessories

When you unpack, check that all the supplied accessories are included:

Name	Quantity
Camera	1
Power Adapter	1
User Manual	1

## 3 About Product

### 3.1 Features

- **HD EPTZ**

Configure 4K Sensor and 4K lens to achieve high-definition electronic pan-tilt effect.

- **Intelligent Teaching Tracking**

Built-in leading image recognition and tracking algorithm, you can achieve smooth and natural tracking without any auxiliary positioning camera or tracking host.

It supports teacher tracking mode and student tracking mode.

- **AF Lens**

The 42° lens of the teacher camera supports auto focus, the horizontal angle of the student camera can reach 95°, the small lens, the big vision. At the same time, EPTZ is supported, and the brake is not moved, and it is enlarged and seen more clearly.

### ● Low Light

The application of 2D and 3D noise reduction algorithm greatly reduces the image noise. Even under the condition of ultra-low illumination, it still keeps the picture clean and clear, and the SNR of image is as high as 55dB.

### ● Dual Interface Output

It supports SDI interface, effective transmission distance up to 150 meters (1080P25). SDI and network can output at the same time.

### ● PoC & PoE

It supports PoC (Power over Cable) and PoE (Power over Ethernet) one-wire function, power, video, audio, control three-wire in one.

### ● Interleaving Mode

It can realize a single camera single SDI interface to simultaneously output panoramic and close-up signals.

## 3.2 Product Specification

<b>Name</b>	HD Color Box Camera
<b>Camera</b>	
Sensor	1/2.8", CMOS, Effective Pixel: 8.46M
Scanning Mode	Progressive
Lens Mount	M12
Lens 1 (teacher)	Focus: f=7.2mm, FOV: 42°

Lens 2 (student)	Focus: f=2.8mm, FOV: 95°
Auto Focus	Teacher Camera Support
Minimal Illumination	0.5 Lux @ (F1.8, AGC ON)
Shutter	1/30s ~ 1/10000s
White Balance	Auto, Indoor, Outdoor, One Push, Manual, VAR
Digital Noise Reduction	2D & 3D Digital Noise Reduction
Backlight Compensation	Support
EPTZ	Support
Digital Zoom	8x
PoE	Support
PoC	Support
Auto Tracking	Teacher/Student Mode

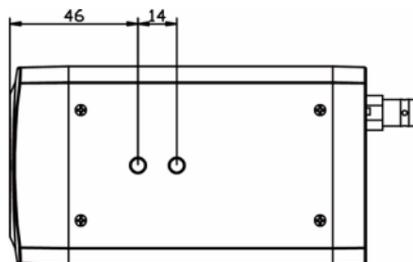
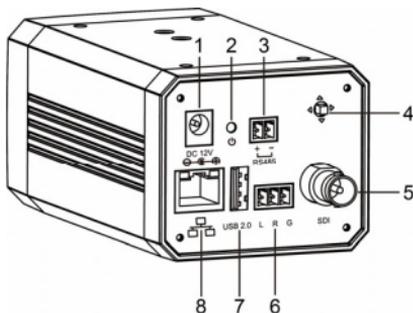
### Network Features

Encode Protocol	H.264/MJPEG
Video Stream	First/Second/Third/ Four Stream
First Stream Resolution	1920x1080, 1280x720, 1024x576, 960x540, 640x480, 640x360, 352x288

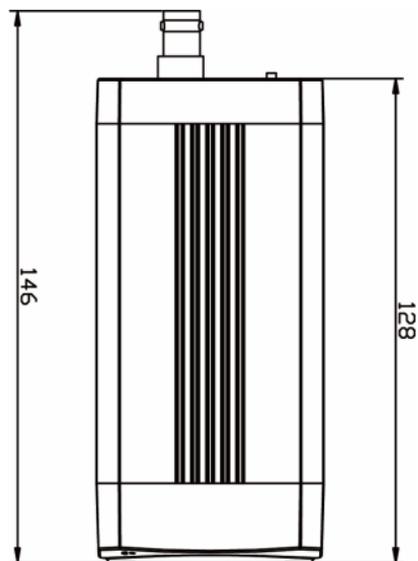
Second Stream Resolution	3840x2160, 1920x1080, 1280x720, 1024x576, 720x576(50Hz), 720x480(Dial Priority), 720x408, 640x360, 480x272, 320x240, 320x180
Third Stream Resolution	1920x1080, 1280x720, 1024x576, 960x540, 720x576(50Hz), 720x480(Dial Priority), 720x408, 640x480, 640x360, 480x272, 320x240
Four Stream Resolution	1920x1080, 1280x720, 1024x576, 960x540, 720x576(50Hz), 720x480(Dial Priority), 720x408, 640x480, 640x360, 480x272, 320x240
Video Bit Rate	32Kbps ~ 16384Kbps
Bit Rate Control	Variable Rate, Fixed Rate
Frame Rate	1fps ~ 25fps
Audio Compression	AAC/G711A
Audio Bit Rate	96Kbps, 128Kbps
Protocols	TCP/IP, HTTP, RTSP, RTMP, ONVIF, DHCP etc.

Input/Output Interface	
Network Interface	1 x RJ45: 10M/100M Adaptive Ethernet Port, (Support POE)
SDI Interface	1 x SDI: BNC type, 800mVp-p, 75Ω. Along to SMPTE 424M standard (Support POC)
Audio Interface	1 x Line In: 3pin (Phoenix Interface)
USB Interface	1 x USB 2.0: Type A, female
Control Interface	1 x RS485: 2pin, Max Distance: 1200m, Protocol: VISCA / Pelco-D / Pelco-P
Power Interface	DC 12V
Physical Parameter	
Input Voltage	DC 12V / PoE (IEEE 802.3af) / PoC
Current Consumption	0.5A
Operating Temperature	-10°C ~ 40°C
Storage Temperature	-40°C ~ 60°C
Power Consumption	6W
Size	72 x 60 x 128mm (without bracket)
Net Weight	0.37Kg

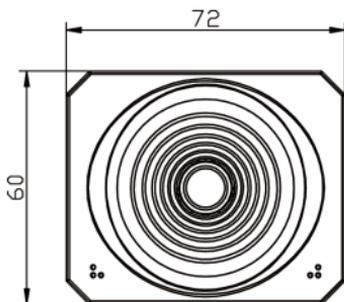
### 3.3 Interface and Button



Item	Name
1	DC 12V Interface
2	Power Indicator
3	RS485 Interface
4	Menu Button
5	SDI Interface
6	LINE IN Interface
7	USB 2.0 Interface
8	Network Interface



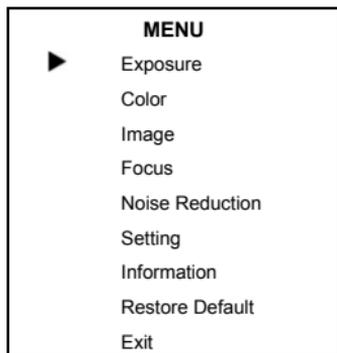
### 3.4 Dimension



## 4 Menu Settings

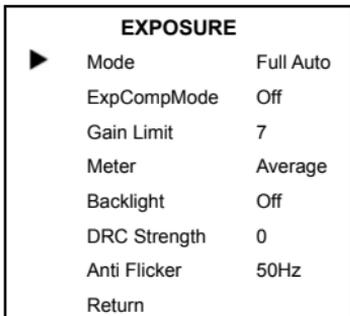
### 4.1 MENU

Press [MENU] button to display the main menu on the normal screen, using arrow button to move the cursor to the item to be set. Press the [HOME] button to enter the corresponding sub-menu.



### 4.2 EXPOSURE

Move the main menu cursor to [EXPOSURE], and press [HOME] key enter the exposure page, as shown in the following figure.



Mode: Exposure mode, optional items:

Full Auto, Manual, Shutter Priority, Bright, Smart.

ExpCompMode: Exposure compensation mode, optional items: On, Off (Effective only in Full Auto mode).

ExpComp: Exposure compensation value, optional items: -7 ~ 7 (Effective only in ExpCompMode item to On).

Gain Limit: Maximum gain limit, optional items: 0 ~ 15 (Effective only in Full Auto, Bright mode).

Meter: Optional items: Top, Average, Center, Bottom.

Backlight: Set the backlight compensation, optional items: On, Off (Effective only in Full Auto mode).

DRC Strength: Optional items: 0 ~ 8.

Anti-Flicker: Anti-flicker, optional items: Off, 50Hz, 60Hz (Effective only in Full Auto, Bright mode).

Bright: Intensity control, optional items: 0 ~ 17 (Effective only in Bright mode).

Shutter: Shutter value, optional items: 1/30s, 1/60s, 1/90s, 1/100s, 1/125s, 1/200s, 1/250s, 1/350s, 1/500s, 1/725s, 1/1000s, 1/1500s, 1/2000s, 1/3000s, 1/4000s, 1/6000s, 1/10000s (Effective only in Manual, SAE mode).

### 4.3 COLOR

Move the main menu cursor to [COLOR], and press [HOME] key enter the color page, as shown in the following figure.

COLOR		
▶	WB Mode	Auto
	AWB Sens	High
	RG Tuning	0
	BG Tuning	0
	Saturation	100%
	Hue	7
	Return	

WB-Mode: White balance mode, optional items: Auto, Indoor, Outdoor, One Push, Manual, VAR.

AWB Sens: The white balance sensitivity, optional items: Low, Middle, High.

R Gain: Red gain, optional items: 0~255 (Effective only in Manual mode).

B Gain: Blue gain, optional items: 0~255 (Effective only in Manual mode).

Color Temp: Optional items: 2500K ~ 8000K (Effective only in VAR mode).

RG Tuning: Red gain fine-tuning, optional items: -10 ~ +10 (Effective only in Auto, One Push, VAR mode).

BG Tuning: Blue gain fine-tuning, optional items: -10 ~ +10 (Effective only in Auto, One Push, VAR mode).

Saturation: Optional items: 60% ~ 200%.

Hue: Optional items: 0 ~ 14.

#### 4.4 IMAGE

Move the main menu cursor to [IMAGE], and press [HOME] key enter the image page, as shown in the following figure.

IMAGE		
▶	Luminance	7
	Contrast	7
	Sharpness	4
	Flip-H	Off
	Flip-V	Off
	Gamma	EXT
	Style	Default
	LDC	Off
	Return	

Luminance: Brightness adjustment, optional items: 0 ~ 14.

Contrast: Contrast adjustment, optional items: 0 ~ 14.

Sharpness: Sharpness adjustment, optional items: 0 ~ 14.

Flip-H: Image flipped horizontally, optional items: On, Off.

Flip-V: Image Flip Vertical, optional items: On, Off.

Gamma: Optional items: Default, 0.45, 0.5, 0.56, 0.63.

Style: Optional items: Default, Norm, Clarity, Bright, PC, Clarity (LED).

LDC: Optional items: -10 ~ 10, Off.

#### 4.5 FOCUS

Move the main menu cursor to [FOCUS], and press [HOME] key enter the noise reduction page, as shown in the following figure.

FOCUS		
▶	AF Sense	Low
	Focus Mode	One-Shot
	Focus Area	Middle Area
	Return	

AF Sense: Optional items: Low, Medium, High.

Focus Mode: Optional items: Auto, Manual, One-Shot.

Focus Area: Optional items: Middle Area, Bottom Half, All, Upper Half.

## 4.6 NOISE REDUCTION

Move the main menu cursor to [NOISE REDUCTION], and press [HOME] key enter the noise reduction page, as shown in the following figure.

NOISE REDUCTION		
▶	2D NR	Auto
	3D NR	2
	Return	

2D NR: 2D noise reduction, optional items: Close, Auto, 1 ~ 5.

3D NR: 3D noise reduction, optional items: Close, 1 ~ 8.

## 4.7 SETTING

Move the main menu cursor to [SETTING], and press [HOME] key enter the setting page, as shown in the following figure.

SETTING		
▶	Language	English
	Protocol	VISCA
	Visca Addr	1
	EPTZ	On
	Zoom Limit	1x ~ 8x
	HD-VLC	Off
	SDI View	Close-Up
	Video Format	1080P25
	Return	

Language: Optional items: English, Chinese.

Protocol: Optional items: VISCA, PELCO-D, PELCO-P.

Visca Addr: Optional items: 1 ~ 7 (Effective only in VISCA Protocol).

P-D Addr: Optional items: 0 ~ 254 (Effective only in PELCO-D Protocol).

P-P Addr: Optional items: 0 ~ 31 (Effective only in PELCO-P Protocol).

EPTZ: Optional items: On, Off.

Zoom Limit: Optional items: 1x ~ 8x, 2x ~ 4x, 2x ~ 8x, 3x ~ 8x, 1x ~ 3x, 1x ~ 4x.

HD-VLC: Optional items: On, Off.

SDI View: Optional items: Close-Up, MixedP60, MixedP50, Auto, Panoramic.

Video Format: Optional items: 1080P30, 1080P25.

## 4.8 INFORMATION

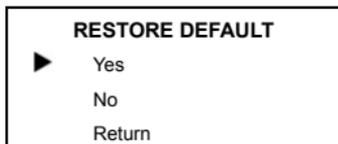
Move the main menu cursor to [INFORMATION], and press [HOME] key enter the information page, as shown in the following figure.

**INFORMATION**

Version	8.2.60
Model	O44.THW
Date	2021-05-24
IP	192.168.100.82
Gateway	192.168.100.1
Netmask	255.255.255.0
▶ Return	

**4.9 RESTORE DEFAULT**

Move the main menu cursor to [RESTORE DEFAULT], and press [HOME] key enter the restore default page, as shown in the following figure.



Yes: Confirm restore factory settings.

No: Cancel restore factory settings.

**5 Network Function****5.1 Operating Environment**

Operating System: Windows 2000/2003/XP/vista/7/8/10

Network Protocol: TCP/IP

Client PC: P4/128M RAM/40GHD/support scaled graphics card, support DirectX 8.0 or more advanced version.

**5.2 Equipment Installation**

1) Connect internet camera to your internet or to your PC directly via internet cable.

- 2) Turn on DC 12V power.
- 3) If the network connection is normal, the connection light (green) at the network interface will light up within 5 seconds, and the data indicator (orange) will flash, indicating that the physical connection of the camera has been completed.

**5.3 Internet Connection**

There are two main ways to connect network camera.



Connect by Network Cable



Connect by Switch/Router

**5.4 IP Camera controlled by LAN****5.4.1 Setup IP Address**

The teacher camera IP address:

192.168.100.82; the student camera IP address: 192.168.100.92. If you don't know the camera IP, please view as below:

Method 1: Use the remote control to transfer out the OSD menu, and go to the information page to see the IP address.

Method 2: connect camera to PC with network cable, use "upgrade\_En.exe" to search for IP address.



upgrade

Change IP address, two methods as below:

Method 1: Login the web page, select "Network > Lan Settings", change IP address, subnet mask and gateway. Click "Submit" and restart the camera.

**Lan Settings**

IP Configuration Type: Fixed IP Address

IP Address: 192.168.100.82

Subnet Mask: 255.255.255.0

Gateway: 192.168.100.1

DNS Address: 8.8.8.8

MAC Address: DA ED 8E CD 82 6E

Submit Cancel

**Port Settings**

HTTP Port: 80

RTSP Port: 554

TCP Port: 6000

UDP Port: 1239

**RTSP Settings**

First Stream: On Off Video Audio

MRL: rtsp://192.168.100.136/live/stream0

Second Stream: On Off Video Audio

MRL: rtsp://192.168.100.136/live/stream1

Third stream: On Off Video Audio

MRL: rtsp://192.168.100.136/live/stream2

Fourth stream: On Off Video Audio

MRL: rtsp://192.168.100.136/live/stream3

**RTSP Settings**

RTSP Auth: On Off

**ONVIF Settings**

ONVIF: On Off

ONVIF Auth: On Off

**Multicast Settings**

Multicast: On Off

Address: 224.1.2.3

Port: 6566

**SDK Settings**

Active Connection: On Off

Address: 192.168.100.136

Port: 1234

**STP Settings**

NTP time sync: On Off

Time Zone: (GMT+08:00) Beijing, Chi

Server address: cn.np.org.cn

Time interval(mh): 1440

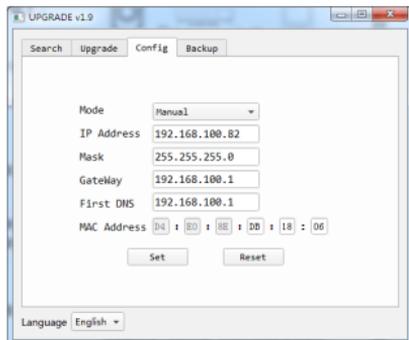
Main time show: On Off

Position: X 0 Y 0

Sub-time show: On Off

Position: X 0 Y 0

Method 2: Open "upgrade\_En.exe", change IP and click "Set". After modified, IP Camera will be restart.



### Change IP Address:

- Step 1 Search the IP address of camera.
- Step 2 Select the camera IP of you want to change.
- Step 3 Select config dialog of upgrade applets.
- Step 4 Change the IP address, netmask and gateway, then click "Set".
- Step 5 Finish.

### 5.4.2 Visit/Access IP Camera

Input `http://192.168.100.82` to web browser, the login window pop up, input user name: admin, password: admin, shown as below:



After login, shown as below:



Tips

IE browser does not support H5, you need to use VLC plug-in to view videos. Please visit VLC website (<http://www.videolan.org/vlc>) download and install the 32-bit VLC media player, after it installed, visit video conference camera will have normal image display. Other mainstream browsers already support H5 and do not need to install the VLC plug-in.

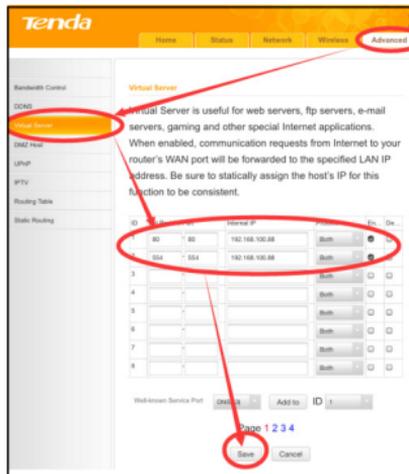
## 5.5 Camera Controlled by WAN

### 5.5.1 Setup IPC Controlled by Dynamic DNS

Two dynamic DNS available: Dyndns.org, 3322.org

#### Router Port Mapping:

Take Tenda router for example, enter Router Home Page (interface page), select "Advanced" - "Virtual Server", add a new port number in "Ext Port", add a new port number in "Int port", put camera IP address to "Internal IP", then select "Save", shown as below:



### 5.5.2 Dynamic DNS Visit Camera

Set domain name to camera, setup the parameter, then dynamic DNS can access camera. Access link: `http://hostname: port number`. For example, setup host computer name: `youdomain.f3322.org`, camera port number: 89. Access link should be: <http://youdomain.3322.org:89>.



Tips

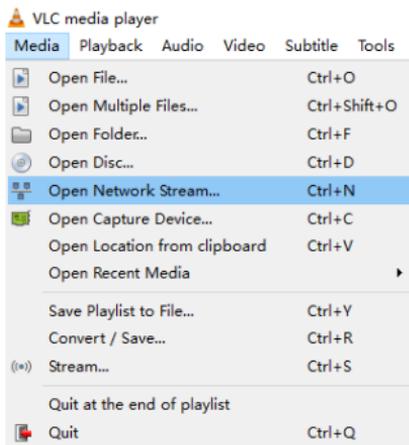
If camera port default as 80, then unnecessary to input port number, use host name can access camera directly.

### 5.5.3 VLC Stream Media Player

#### Visit VLC Media Server Procedure

**Step 1** Open VLC media player.

**Step 2** Click “Media > Open Network Stream”, or click “Ctrl + N”:



**Step 3** Input URL address:

First Stream:

rtsp://ip: port number/1

Second Stream:

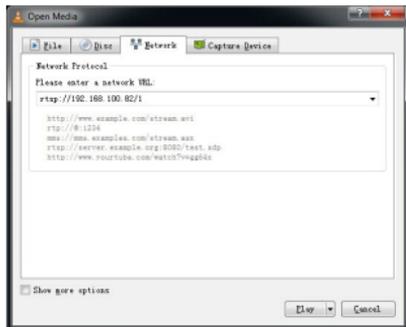
rtsp://ip: port number/2

**Step 4** Finish.



Tips

RTSP port number default 554. If the camera port default is 80, then unnecessary to input port number of URL address.



## 5.6 IP Camera Parameter Setup

### 5.6.1 Homepage Introduction

#### A. Video Viewing Window

Video viewing window must be same as video resolution, the bigger the resolution is, the bigger the playing area is. Double click viewing window, will show full-screen, double click again, will return to initialized size.

Status bar in viewing window shown as below:



- 1) Video playback pause button: control real-time video pause, stop the last picture, click recoverable video again.
- 2) Audio control buttons: can adjust the volume or set silent mode.
- 3) Full screen switch button.

## B. Lens Control Settings



### 1) Lens Control

Up, Down, Left and Right arrows and the home button allow you to manually drive the camera to the desired position.

### 2) Zoom

Zoom In and Zoom Out buttons allow for wide or narrow view of the space.

### 3) Focus

Focus In and Focus Out buttons allow for fine manual focus adjustment if the camera has any problems auto focusing on the difficult object.

### 4) Zoom & Focus Speed

Zoom and Focus speeds can be set at any rate between 0 ~ 7.

### 5) Set Up Preset

After manually setting up a shot that you would like to return to later, you can save presets for quick recall of these positions. Type a number between 0 and 254 into the Preset box. Click the "Set" button to save the current location with that preset number. Click the "Call" button to cause the camera to return to that position. This enables smooth, quick and convenient control without the need to manually drive the camera.

You can set up preset that user want as below.

Method: Type a number into the Preset box.



Preset: Optional items: 0 ~ 254.

### 6) Menu

Click the "Menu", OSD option will open the on-screen display menu of the camera giving you control from within the IP interface.

## C. Language Selection

Language

Chinese/English/Russian

## 5.6.2 Video Settings

**Video Settings**

hdvlc: Off (only mixed format)

Video Format: Dial Priority

Encode Level: mainprofile

**First stream**

Encode Protocol: H264

Resolution: 1920x1080

Bit Rate: 4096

Frame Rate: 25 fps

I Key Frame Interval: 25

Bit Rate Control: CBR

**Second stream**

Encode Protocol: H264

Resolution: 1920x1080

Bit Rate: 3000

Frame Rate: 25 fps

I Key Frame Interval: 25

Bit Rate Control: CBR

**third stream**

Encode Protocol: H264

Resolution: 640x360

Bit Rate: 1024

Frame Rate: 25 fps

I Key Frame Interval: 25

Bit Rate Control: CBR

**fourth stream**

Encode Protocol: H264

Resolution: 1920x1080

Bit Rate: 3000

Frame Rate: 25 fps

I Key Frame Interval: 25

Bit Rate Control: CBR

### 1) hdvlc

Turn On/Off hdvlc.

### 2) Video Format

Support 50Hz and Dial Priority two formats.

### 3) Encode Level

Support baseline, mainprofile, highprofile and svc-t four levels.

### 4) Encode Protocol

Support H.264/MJPEG protocol.

### 5) Resolution

First stream support 1920x1080, 1280x720, 1024x576, 960x540, 640x480, 640x360, 352x288; Second stream support 3840x2160, 1920x1080, 1280x720, 1024x576, 720x576 (50Hz), 720x480 (Dial Priority), 720x408, 640x360, 480x272, 320x240, 320x180; Third stream and four stream supports 1920x1080, 1280x720, 1024x576, 960x540, 720x576 (50Hz), 720x480 (Dial Priority), 720x408, 640x480, 640x360, 480x272, 320x240; The bigger resolution is, the clearer the image will be, more network bandwidth will be taken.

### 6) Bit Rate

The user can specify the bit rate. Generally speaking, the larger of the bit rate, the clearer of the image. However, the configuration of the bit rate needs to be combined with the network bandwidth. When the network bandwidth is narrow and the bit rate is configured larger, the video stream cannot be transmitted normally, and the visual effect is worse.

### 7) Frame Rate

User can specify the size of the frame rate, generally, the frame rate greater, the image will more smooth; Frame rate is smaller, the more sense of beating.

### 8) I Key Frame Interval

Set interval between three I frame, the bigger interval is the response will be lower from viewing window.

## 9) Bit Rate Control

Code stream control way:

Constant bit rate: video coder will be coding according to preset speed.

Variable bit rate: video coder will adjust the speed based on preset speed to gain the best image quality.

### 5.6.3 Image Settings



#### 1) Brightness

Image bright 0~14, slider control, on the right shows the corresponding numerical.

Default value is 7.

#### 2) Saturation

Saturation 0~14, slider control, on the right shows the corresponding numerical.

Default value is 4.

#### 3) Contrast

Contrast 0~14, slider control, on the right shows the corresponding numerical.

Default value is 7.

#### 4) Sharpness

Sharpness 0~14, slider control, on the right shows the corresponding numerical.

Default value is 4.

#### 5) Hue

Hue 0~14, slider control, on the right shows the corresponding numerical.

Default value is 7.

#### 6) Flip & Mirror

Tick Flip to realize image upside down, tick mirror to realize image around the mirror.

Default value is not tick.

### 5.6.4 Audio Settings



#### 1) Audio Switch

Turn On/Off audio switch.

#### 2) Audio Type

Audio type AAC.

#### 3) Sample Rate

Optional items: 44.1K, 48K.

#### 4) Bit Rate

Optional items: 96K, 128K, 256K.

#### 5) Input Type

Input type LINE IN.

## 6) Input Vol L

The volume of the left channel.

## 7) Input Vol R

The volume of the right channel.

## 8) ADTS Options

Optional items: On, Off.

## 5.6.5 System Settings

**Initialize**

Reboot

Factory Default

**Log Download**

**User**

UserName

Password

Guest

Guest Password

### 1) Reboot

Click the "Reboot" button, system restart.

### 2) Factory Default

Click the "Factory Default" button, system can be restore factory default.

### 3) Log Download

Access Log and Upgrade Log.

### 4) Username and Password

The user can modify the password (letters and numbers only).

## 5.6.6 Network Settings

**Lan Settings**

IP Configuration Type

IP Address

Subnet Mask

Gateway

DNS Address

MAC Address

**Port Settings**

HTTP Port

RTSP Port

TCP Port

UDP Port

**RTMP(S) Settings**

First Stream  On  Off  Video  Audio

MRL

Second Stream  On  Off  Video  Audio

MRL

Third stream  On  Off  Video  Audio

MRL

Fourth stream  On  Off  Video  Audio

MRL

**RTSP Settings**

RTSP Auth  On  Off

**ONVIF Settings**

ONVIF  On  Off

ONVIF Auth  On  Off

**Multicast Settings**

Multicast  On  Off

Address

Port

**SDK Settings**

Active Connection  On  Off

Address

Port

**NTP Settings**

NTP time sync  On  Off

Time Zone

Server address

Time interval(min)

Main time show  On  Off

Position

Sub time show  On  Off

Position

### 1) Lan Settings

Default the teacher camera IP address: 192.168.100.82; the student camera IP address: 192.168.100.92.

The MAC address can not be modified.

### 2) Port Settings

#### A. HTTP Port

IP address identifies the network device, the device can run multiple web applications, each network program using network port to transmit data, so data transmission to be carried out between the port and port. Port setting is to set up WEB SERVER program using which port to transmit.

When port mapping, need to be consistent with the port number (default port: 80).

#### B. RTSP Port

Network camera support RTSP protocol, use the VLC tools broadcast, default port: 554.

#### C. TCP Port

Support TCP protocol, default port: 6000.

#### D. UDP Port

Support UDP protocol, default port: 1259.

### 3) RTMP(S) Settings

Setting the MRL of RTMP, select enable or disable video and audio. You can select control code stream of "On", "Off", "Video", "Audio" between in the four streams.

### 4) RTSP Settings

Turn On/Off RTSP auth.

### 5) ONVIF Settings

Turn On/Off ONVIF and ONVIF auth.

### 6) Multicast Settings

Turn On/Off multicast. Setting multicast address (default value is 224.1.2.3) and port (default value is 6688, then 6688 is the multicast port of the first stream; 6690 is the multicast port of the second stream).

### 7) SDK Settings

Turn On/Off active connection. Setting SDK address (default value is 192.168.100.138) and port (default value is 1234).

### 8) NTP Settings

Turn On/Off NTP time sync, main time show and sub time show. Setting NTP server address, time interval, main stream position and sub stream position.

## 5.6.7 Device Information

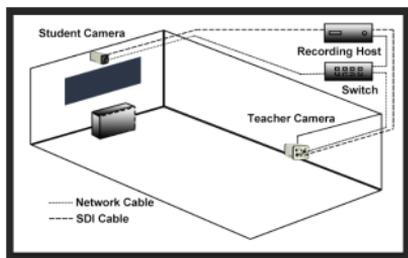
Show the current device information, as shown below.

Information	
Device ID	HD Camera
Device Type	O44.T1
Software Version	SOC 8.2.41
Webware Version	v1.5.5
<input type="button" value="Submit"/> <input type="button" value="Cancel"/>	

## 5.7 Download Upgrade Program

If you need the camera upgrade program, please contact the manufacturer.

## 6 Product Installation



Installation Diagram

### Teacher HD Color Box Camera

(Focus:  $f=7.2\text{mm}$ , FOV:  $42^\circ$ )

Installation height: 2.2M~2.4M

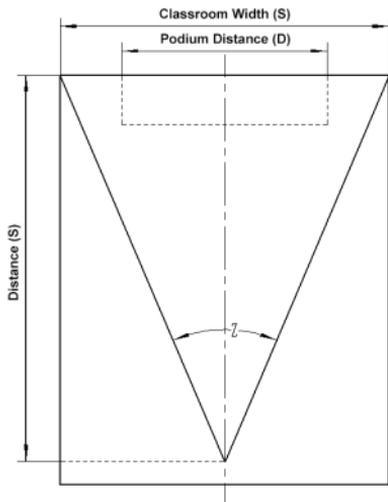
Installation position: horizontally centered installation. The position longitudinally away from the blackboard wall is calculated with the following formula:

The distance between the teacher machine and the blackboard wall  $S=(W/2)/\tan(Z/2)$ , where  $W$  is the width of the wall where the blackboard is located, and  $Z$  ( $42^\circ$ ) is the horizontal field of view of the teacher machine lens.

Take a standard 10 x 8 meter classroom as an example, if the width of the wall where the blackboard is located is 8 meters, then  $L=10$  meters.

The smaller  $S$  is the closer the teacher's computer is to the blackboard, the better the effect of the teacher's close-up.

For a standard 10 x 8 meter classroom,  $S$  recommends 10 meters. For a standard 8 x 6 meter classroom,  $S$  recommends 8 meters.



Installation method: It is best to install with a boom to ensure the distance between the teacher's computer and the blackboard.

Taking a standard 10 x 8 meter classroom as an example, if it is installed on the back wall of the classroom ( $S=10$  meters), the distance may be too large. The horizontal range of the image taken exceeds the width of the wall where the blackboard is located. The doors and windows on both side walls will be Intake. The sharpness will be insufficient when the teacher closes up the picture.

### Wiring Reservation:

Scene 1 (when using a POE switch):

1. One SDI line is connected to the SDI 1 input port of the recording and broadcasting host, and the teacher's close-up video input.
2. A network cable (at least Category 5),

connected to a POE switch, providing power supply, control, and panoramic network video input for teachers.

Scene 2 (when using a non-POE switch):

1. One SDI cable is connected to the SDI 1 input port of the recording and broadcasting host.
2. One network cable (at least Category 5), connected to the switch, to provide control and panoramic network video input for teachers.
3. The AC 220V AC dual-hole socket interface is connected to the camera's standard power supply, and the standard power supply DC 12V power connector is connected to the camera, which is used for camera power supply.

#### Student HD Color Box Camera

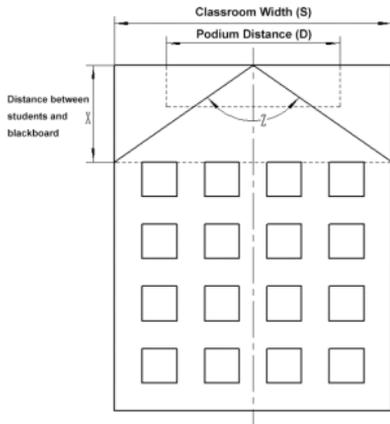
(Focus:  $f=2.8\text{mm}$ , FOV:  $95^\circ$ )

Installation height: 2.2M~2.4M

Installation method: wall-mounted

#### Installation Location

1. Front installation: The best installation position is the middle of the blackboard wall, and the student area is taken from the front.
2. Side installation: In order to solve the problem that the first row of students are too close to the podium and the shooting is not enough to cover the area of the first row of students in the formal installation, consider adjusting the camera installation position and install it on the side.



Calculate the closest distance X between the first row of students and the formal camera.

$$X^2 = (W / 2 * \tan(Z / 2))^2 - H^2$$

Where W is the width of the wall where the blackboard is located or the width of the first row of students' shots. Z ( $95^\circ$ ) is the horizontal field of view of the student camera lens, and H is the installation height of the camera.

Taking a standard 10 x 8 meter classroom as an example, the width of the wall where the blackboard is located is 8 meters, the installation height of the camera is 2.2 meters, and X is calculated to be 2.8 meters.

#### Wiring reservation:

Scene 1 (when using a POE switch):

1. One SDI line is connected to the SDI 1 input port of the recording and broadcasting host, and the teacher's close-up video input.

2. A network cable (at least Category 5), connected to a POE switch, providing power supply, control, and panoramic network video input for teachers.

Scene 2 (when using a non-POE switch):

1. One SDI line is connected to the SDI1 input port of the recording and broadcasting host.

2. One network cable (at least Category 5), connected to the switch, providing control and panoramic network video input for teachers.

3. The AC 220V AC dual-hole socket interface is connected to the camera's standard power supply, and the standard power supply DC 12V power connector is connected to the camera, which is used for camera power supply.

## 7 Image Tracking Configuration

### 7.1 Network Function

This description mainly introduces the close-up camera network, and the panoramic camera network description does not introduce it.

#### 7.1.1 Enter the Web Interface

- View Camera IP

The network cable is connected to the computer, and the IP of the machine can be searched with our dedicated camera upgrade software. (If you need software, please contact the manufacturer to obtain)

Enter the camera IP in the browser, fill in the user name: admin, password: admin, you can enter the network interface.

- There are two ways to change the camera IP:

Method 1: Click the webpage [Network Settings] with the mouse to enter the interface and make changes, click "Submit", and then restart the camera.

**LAN Settings**

IP Configuration Type: Fixed IP Address

IP Address: 192.168.100.82

Subnet Mask: 255.255.255.0

Gateway: 192.168.100.1

DNS Address: 8.8.8.8

MAC Address: D4 ED BE C0 B2 6E

Submit Cancel

**Port Settings**

HTTP Port: 80

RTSP Port: 554

TCP Port: 8000

UDP Port: 1279

**RTSP (S) Settings**

First Stream:  On  Off Video  Audio

MRL: rtsp://192.168.100.130/live/streams1

Second Stream:  On  Off Video  Audio

MRL: rtsp://192.168.100.130/live/streams1

Third stream:  On  Off Video  Audio

MRL: rtsp://192.168.100.130/live/streams2

Fourth stream:  On  Off Video  Audio

MRL: rtsp://192.168.100.130/live/streams3

**RTSP Settings**

RTSP Auth:  On  Off

**ONVIF Settings**

ONVIF:  On  Off

ONVIF Auth:  On  Off

**Multicast Settings**

Multicast:  On  Off

Address: 224.1.2.3

Port: 6000

**JDE Settings**

Active Connection:  On  Off

Address: 192.168.100.130

Port: 1234

**NTP Settings**

NTP time sync:  On  Off

Time Zone: (GMT+08:00) Beijing, Chn

Server address: cn.ntp.org.cn

Time Interval(min): 1440

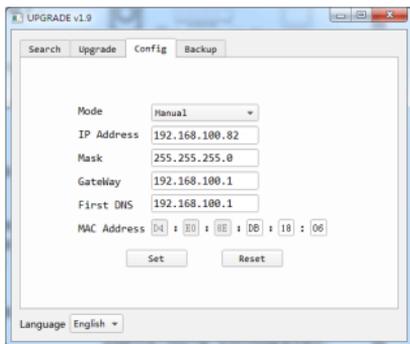
Main time show:  On  Off

Position: X 0 Y 0

Sub time show:  On  Off

Position: X 0 Y 0

Method 2: Modify the configuration items in the camera-specific upgrade software, and then click Settings.



- The camera needs to be restarted after changing the camera IP. The method is as follows:

Method 1: Manually power off and restart

Method 2: Click Restart in the web page system configuration item (applicable to remote)

- View software version information

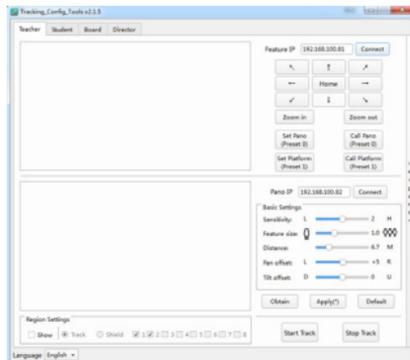


Tips

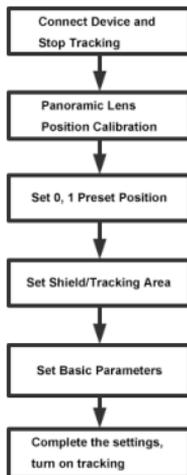
- teacher camera IP address:  
192.168.100.82
- student camera IP address:  
192.168.100.92

## 7.2 Configuration Process

Configure through the software "Tracking Config Tools" provided by our company. The config tool interface is as follows:



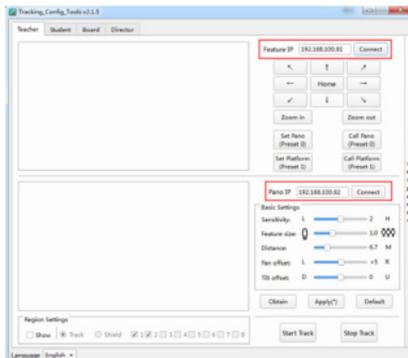
The setting process of teacher/student camera is as follows:



## 7.3 Teacher Configuration

### 7.3.1 Connect the Device

Connect the IP of the feature camera and the IP of the pano camera on the teacher's camera, and click [Stop Track] to enter the debugging state, as shown below:



### 7.3.2 Set Preset Position

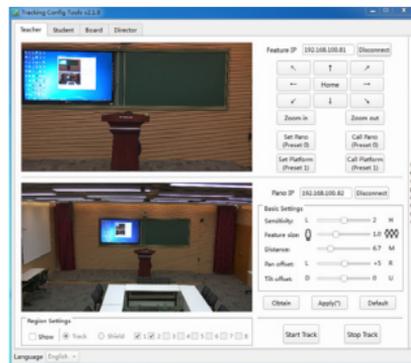
Set panoramic position, set podium position, available [↑] [↓] [←] [→] [Zoom in] [Zoom out] to adjust the position of the close-up lens; call the panoramic position, call the podium position, and verify whether the panoramic position and the podium position are valid, as shown below:

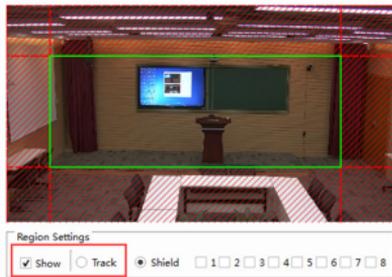


### 7.3.3 Set Shielding/Tracking Area

- Tracking Area Setting

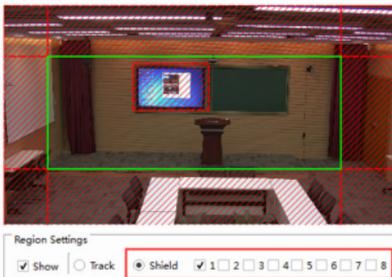
Check [Show], select the tracking area, click the starting point of the tracking area to be set with the left mouse button, hold down the left mouse button and drag to draw a rectangular tracking area.





#### ● Block Area Settings

Shield the large screen and other interference sources in the tracking area, support 8 shielding areas; check [Show], select the shielding area, click the starting point of the shielding area to be set with the left mouse button, hold down the left mouse button and drag to draw a rectangular shielding area, part of the tracking area should be reserved under the shielding area, and shielding areas cannot be set on the left and right borders of the tracking area, as shown in the following figure:



### 7.3.4 Configure Basic Parameters

- Configure basic parameters and click [Apply] to take effect;
- Sensitivity: Set the range of action and tracking response speed that triggers teacher tracking, the optional range is 0~4, and the default value is 2.
- Feature size: Set the viewing angle range of the close-up camera's tracking screen, the setting range: 0.5~2.0, the default value is 1.0.
- Distance: the horizontal distance between the teacher's camera and the podium, the setting range: 3.0~20.0, the default value is 6 meters.
- Pan offset: optional range: -200~+200 (steps), 0.069°/step; negative numbers are calibrated to the left, positive numbers are calibrated to the right, default: +5;
- Tilt offset: Optional range: -200~+200 (steps), 0.069°/step; negative numbers are calibrated down, positive numbers are calibrated up, default: 0;

Pano IP

Basic Settings

Sensitivity: L  H

Feature size:

Distance:  M

Pan offset: L  R

Tilt offset: D  U

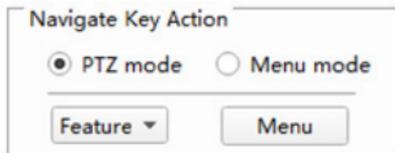
### 7.3.5 Advanced Parameter

#### Configuration

Set advanced parameters, click [click to expand] to set advanced parameters.

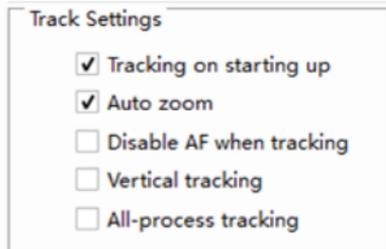
- Navigate Key Action

You can choose PTZ mode or menu mode. In the menu mode, select [Feature] or [Pano], and click the [Menu] button to set the camera's OSD menu. In PTZ mode, you can manually control the [Feature] PTZ.



- Track Settings

Set the working mode of the tracking camera, you can choose: Tracking on starting up, Auto zoom, Disable AF when tracking, Vertical tracking, All-process tracking five working modes; check "✓" to take effect.



- Target Action

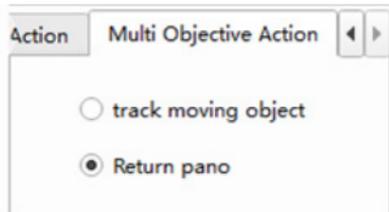
**Target Lost Action:** Set [Feature Camera] the action after losing the target, you can choose: None action, Pano (Preset 0),

Platform (Preset 1).

Timeout: Indicates that after the target is lost, the [Target Lost Action] will be executed after the timeout period has elapsed. Value range: 0-15s, default: 3s.

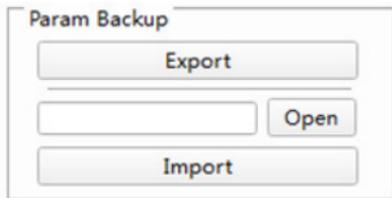


**Multi Objective Action:** Set the tracking status when the teacher is tracking multiple targets in the tracking area. You can choose: track moving targets and return to the panorama; when the number of teachers' targets changes from multiple targets to single targets, a 5s delay is required to track a single target, as shown below.



- Param Backup

**Param Backup:** Used to import and export the configuration parameters of the feature camera to simplify the configuration tasks of the same scene, as shown in the figure below.



**Export:** When you stop tracking, click [Export] to back up the tracking parameters, click [Open], and you can see the file path;  
**Import:** When stopping tracking, click [Open] to select the tracking parameters to be imported, and click [Import] to wait for completion;

**Version Info:** display the version information of the feature camera and the pano camera.



### 7.3.6 Start Track

After completing the parameter configuration, click [Apply] to ensure that the configuration parameters take effect, and then click [Start Track] to enter the automatic tracking mode.

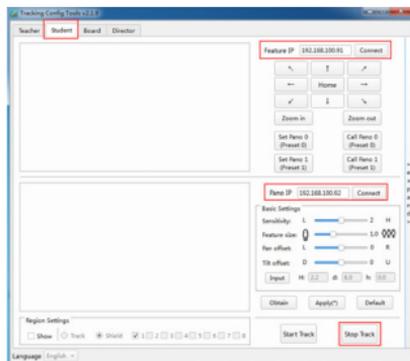


## 7.4 Student Configuration

### 7.4.1 Connect the Device

Connect the IP of the feature camera and the IP of the pano camera on the student's

camera, and click [Stop Track] to enter the debugging state, as shown below:

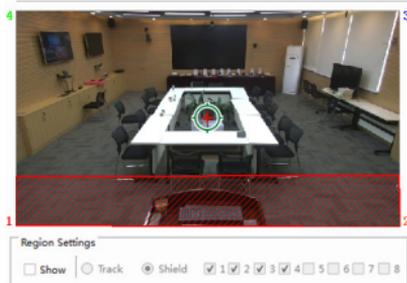


### 7.4.2 Set PTZ Mode

There are two modes of pan/tilt: [electronic pan/tilt] and [cutout]. When you select [Electronic PTZ], the close-up picture will be given in the form of analog PTZ, and when you select [Mutout], it will be given the close-up picture in the form of straight cut.

### 7.4.3 Set Shielding Area

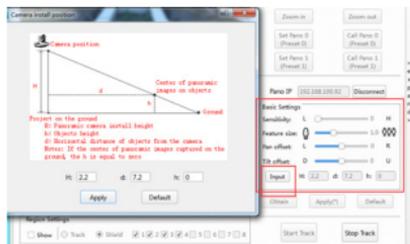
Shielding area setting: check [Show], check the "√" to set the number of the shielding area, such as shielding area 1, use the mouse to click the left edge of the shielding area 1, and drag the mouse to the neighboring or separating border in a counterclockwise direction. as shown in the figure below.



#### 7.4.4 Configure Basic Parameters

- Configure basic parameters and click [Apply] to take effect;
- Sensitivity: To match different tracking targets, use 3 or 4 for elementary and middle school students, use 2 for high school students, and use 0 or 1 for college students. The default value is 2;
- Feature size: Set the viewing angle range of the close-up camera tracking picture, the setting range: 0.5~2.0, the default value is 1.0;
- Pan offset: Optional range: -200~+200 (steps), 0.069°/step; negative numbers are calibrated to the left, positive numbers are calibrated to the right, default: 0;
- Tilt offset: Optional range: -200~+200 (steps), 0.069°/step; negative numbers are calibrated down, positive numbers are calibrated up, default: 0;
- Input height and length: the installation height of the student computer and the horizontal distance between the projection point of the center of the

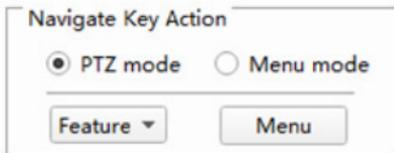
panoramic screen of the student computer on the ground and the student computer;



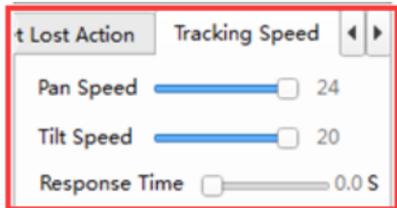
#### 7.4.5 Advanced Parameter Configuration

Set advanced parameters, click [click to expand] to enable advanced parameter settings.

- Navigate Key Action  
You can choose PTZ mode or menu mode. In the menu mode, select [Feature], and click the [Menu] button to set the camera's OSD menu. In PTZ mode, you can manually control the [Feature] PTZ.

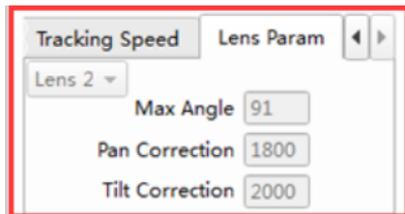


- Tracking Speed  
Tracking speed: Set the horizontal speed of the close-up machine tracking; Stand-up response time: The shortest time to respond to the tracking after the student is detected to stand up, the default value: 1.0s.



- Lens Param

Lens Param: Set the lens parameters of the panoramic camera, lens 1 means 3.6mm small distortion, lens 2 means 3mm non-distortion lens, and lens 1 is standard.



- Tracking Configuration

Tracking settings: Set the working mode of the tracking machine, you can choose: boot tracking, panoramic switch, face detection; check "✓" to take effect.

**Power-on Tracking:** Tracking is started when the camera is turned on.

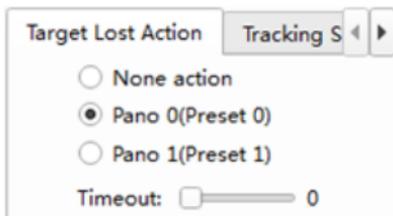
**Panorama Switch:** After turning on [Panorama Switch], the recording screen will first switch to the student's panorama and then to the student's close-up. After it is closed, the student's feature article will be cut directly;

**Face Detection:** After turning on [Face Detection], the camera will use face detection to determine whether the tracking target needs a close-up picture;

- Target Action

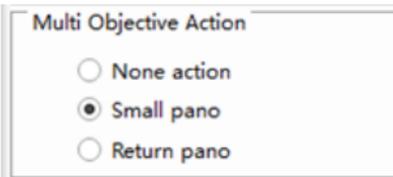
Target Lost Action: Set [Feature Camera] the action after losing the target, you can choose: None action, Pano (Preset 0), Platform (Preset 1).

Timeout: Indicates that after the target is lost, the [Target Lost Action] will be executed after the timeout period has elapsed. Value range: 0-15s, default: 0s.



Multi Objective Action: Set up tracking actions for multiple student targets after standing up, optional: None action, Small pano, Return pano.

Default: Small pano.

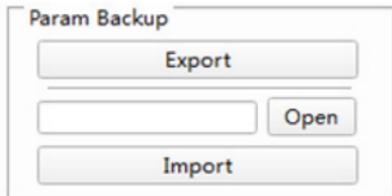


- Param Backup

Param Backup: Used to import and export the configuration parameters of the feature camera, simplifying the configuration tasks of the same scene.

Export: When you stop tracking, click [Export] to back up the tracking parameters,

click [Open], and you can see the file path;  
 Import: When stopping tracking, click [Open]  
 to select the tracking parameters to be  
 imported, and click [Import] to wait for  
 completion;



- Version Info



### 7.4.6 Start Track

After completing the parameter  
 configuration, click [Apply] to ensure that  
 the configuration parameters take effect,  
 and then click [Start Track] to enter the  
 automatic tracking mode.



## 7.5 Director Configuration

The director terminal is used to configure  
 the communication parameters between the  
 teacher and student camera, blackboard  
 machine and the director host.

It is necessary to fill in the director host IP  
 and the port number for receiving the  
 director command, and the communication

between the teacher and student camera,  
 blackboard machine and the director host

### 7.5.1 Communication Settings

Port: When UDP is selected as the  
 communication protocol, the port number  
 for receiving control commands from the  
 director host, the default value: 8791.

Baud Rate: The serial port baud rate is  
 9600 Kbps.

Communication Protocol:

The communication mode between the  
 camera and the recording host can be serial  
 port or network. You need to select one of  
 UDP, TCP and serial port.

The default protocol: UDP.

Command Type: The communication  
 command type between the camera and  
 the director host supports the selection of  
 HEX or ASCII type, and all status codes can  
 be set freely. Default command type: HEX.



### 7.5.2 Director Mode

Select the director mode, fill in the director  
 switch command, the default is: internal  
 director.

**Switch Auto:** After the camera receives the  
 instruction of [switch auto], the tracking  
 mode is switched to auto, the default value:  
 ff 00 00 00 00 01, which can be modified.

**Switch Manual:** After the camera receives  
 the instruction of [switch manual], the

tracking mode is switched to manual, the default value: ff 00 00 00 00 02, which can be modified.

### 7.5.3 Director Strategy

Director Strategy: External Director and Interior Director.

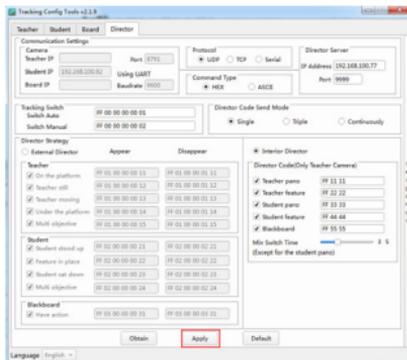
**External Director:** The three cameras of the blackboard machine, the student machine and the teacher machine send the current status codes to the recording and broadcasting host separately. For example, the blackboard machine has two states (with action and no action), and the student machine has four states (student stands up, close-up in place, Students sit down, multi-target), the teacher machine has five states (upper stage, static, moving, off stage, multi-target).

The recording and broadcasting host needs to direct the broadcast according to the status of the three cameras received, for example, when the teacher is on the stage Switch to the teacher's feature article screen when the teacher is off the stage, switch to the student panoramic screen when the teacher is off the stage; switch to the student feature article screen when the student feature article is in place, switch to the student panoramic screen when the student has multiple goals.

**Interior Director:** The teacher's camera will receive the current status of the blackboard, students, and teacher, and send the switching code to the recording and broadcasting host according to the priority from high to low. After receiving the switching code, the recording and broadcasting host can directly perform the screen guidance according to the instructions. The recording host does not need to judge the current status. That is, firstly when there is an action on the blackboard, the switching code of the blackboard is sent, and when there is no action on the blackboard, it is judged whether there is an action in the student area, and finally the teacher action is judged. For example, when the teacher is not in the podium area or walking, send the teacher panoramic switch code, when the teacher is in the podium area and is still, send the teacher close-up code, if the student stands up, first send the student panoramic switch code, when the student feature camera is in place, send the student feature article switch code, the student will return to the teacher screen after sitting down or standing up for a timeout (30s-60s).

### 7.5.4 Configuration Effective

After completing the director configuration, click [Apply], and the director configuration will take effect.



## 7.6 FAQ

**Q:** After setting the parameters, click "Apply", and the application failed.

- A:** 1: Wrong version/no tracking  
 2: The firewall is not turned off  
 3: Multiple configuration tools opened  
 4: Tracking program hung up  
 5: Computer IP conflict  
 6: The camera version is an old version

**Q:** Teacher/student camera does not track

**A:** Confirm whether the tracking has been turned on; whether the panoramic position and feature position (teacher camera) have been set; whether the teacher camera draws the tracking area; whether the three parameters of the student camera are measured accurately.



**Q:** High tracking false tracking rate

**A:** 1: Teacher Camera: draw the shielding area on the surrounding part with light source.

2: Student Camera: draw the shielding area on the surrounding part with light source; turn on face detection (if you need to turn on interlace mode, do not turn on face detection).

**Q:** The version information of the feature camera in the lower right corner of the tracking configuration tool is 0.0.00.

**A:** 1: The protocol/address of the feature camera and the pano camera are different.

2: The tracking program is abnormal and needs to be upgraded again.

3: There is some problems with the serial port connected between the pano camera and feature camera, so please return to the factory for repair.

**Q:** The movement of people will be blurred or smeared during the tracking of the teacher camera.

**A:** Enter the menu, select exposure, change the exposure mode to shutter priority, and change the shutter speed to 1/100s.

**Q:** The configuration tool prompts that the connection type does not match.

**A:** Make sure the student terminal is connected to the student camera, and the teacher terminal is connected to the teacher camera.

## 8 Maintenance and Troubleshooting

### Camera Maintains

- If camera will not be used for a long time, please turn off the power switch,

disconnect AC power cord of AC adaptor to the outlet.

- Use soft cloth or tissue to clean the camera cover.
- Please use the soft dry cloth to clean the lens. If the camera is very dirty, clean it with diluted neuter detergent. Do not use any type of solvents, which may damage the surface.

#### Unqualified Application

- No shooting extreme bright object for a long period of time, such as sunlight, light sources, etc.
- No operating in unstable lighting conditions, otherwise image will be flickering.
- No operating close to powerful electromagnetic radiation, such as TV or radio transmitters, etc.

#### Troubleshooting

##### Image

- Image have jitter when the camera lens at max multiple.
- 1) Check whether the camera installed position be stabled.
  - 2) Check whether have vibrating machinery or object near the camera.
- There is no video image in Browser  
IE browser does not support H5, you need to use VLC plug-in to view videos. Please visit VLC website (<http://www.videolan.org/vlc>) download and install the 32-bit VLC media player, after it installed, visit video conference camera will have normal image

display. Other mainstream browsers already support H5 and do not need to install the VLC plug-in.

- Unable to access camera through Browser
- 1) Test whether the PC to access the network can work properly, first of all, the network fault caused by the PC virus can be eliminated, until the PC and IP Camera can communicate with each other Ping.
  - 2) Disconnect the network, connect IP Camera and PC separately, and reset the IP address of PC.
  - 3) Check IP address, subnet mask, and gateway settings for IP Camera.
  - 4) Check whether the MAC address is conflicts.
  - 5) Check whether the Web port is occupied by another device.
- Forget the IP address or login password

The teacher camera IP address:

192.168.100.82; the student camera IP address: 192.168.100.92

Default user name: admin;

Default password: admin.

##### Control

Serial port cannot control

- 1) Check whether the camera protocol, address such is the same.
- 2) Check whether the control line is connected well.