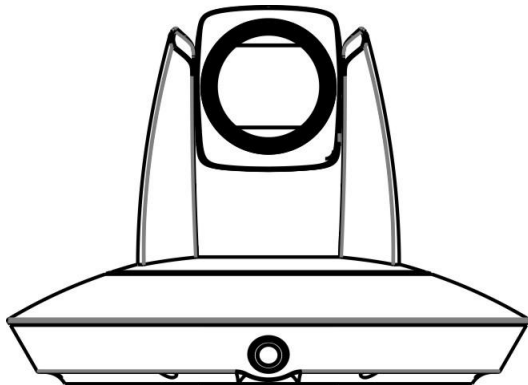


Lecturer Tracking System V2

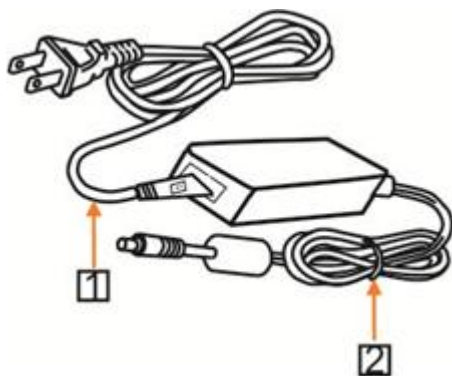
User Manual V1.0



SAFETY NOTICE-IMPORTANT!!!

The following important notes must be followed carefully to run the camera and respective accessories in total safety. The camera and relative accessories are called video system in this section.

- Before installing the camera, please read this manual carefully. Please follow installation instructions indicated in this manual during installation. Please keep this manual for future use.
- The installation should be performed by qualified service personnel or system installers in accordance with all local rules.
- Before powering on the camera, please check the power voltage carefully. Make sure that you are using the correct power source.
- Please put the power cable, video cable and control cable in safe place.
- Do not operate the camera beyond the specified temperature and humidity. Working temperature range of the camera is between 0°C and +40°C. The ambient humidity range is less than 90 % .
- During transporting, avoid violent shake or force to the camera.
- To prevent electric shock, do not remove screws or housing of the camera. There are no self-serviceable parts inside. Refer to qualified service personnel for servicing.
- Video cable and RS485/RS232 cable should be kept far away from other cables. Shielded and independent wiring is necessary for video and control cables.
- When cleaning the camera, please use soft cloth. If the camera is very dirty, wipe it off gently with a soft cloth moistened with a weak solution of water and a neutral kitchen detergent. Wring all liquid from the cloth before wiping the camera, then wipe off all remaining dirt with a soft, dry cloth. Use lens cleaning paper to clean the lens.



⚠ Warnings

If you need to extend the power cable, please extend the power cable from the part 1 on below picture (220V/110V), do not extend from part 2 on below picture (DC12V), otherwise it will cause unexpected damage to the device.

CONTENTS

SAFETY NOTICE-IMPORTANT!!!	3
CONTENTS	5
ABOUT THE PRODUCT	1
QUICK GUIDE	1
FEATURES	2
CHARACTERISTICS & FUNCTIONS	2
LIST OF PARTS	3
ACCESSORIES	3
MAIN PARTS & INTERFACES	4
DIMENSIONS	6
INSTALLATION INSTRUCTIONS	7
SETTING	8
SOFTWARE CONNECTION	8
LECTURER TRACKING CAMERA	9
BLACKBOARD WRITING SENSOR	16
ISMART CMS APPLICATION SOFTWARE GUIDE	19
NETWORK CONNECTION	19
CLIENT SOFTWARE INSTRUCTION	22
MENU SETTINGS	33
MENU CONFIGURATION	33
MENU EXPLANATION	37
VIDEO	38

EXPOSURE -----	38
COLOR-----	39
PAN/TILT/ZOOM-----	40
SYSTEM-----	40
STATUS -----	41
RESTORE DEFAULTS -----	41
ANNEX 1 TECHNICAL SPECIFICATIONS-----	42
ANNEX 2 SIZE AND DIMENSION -----	45
TROUBLESHOOTING -----	46

ABOUT THE PRODUCT

Quick Guide

The camera can be accessed and controlled via the following ways:

- Client software iSmartCMS: tracking setting, camera search and control, network setting.
- VLC: view of main stream and sub video stream;
- IE: camera image preview, camera control, network setting;
- SDK: provide secondary development kits for the connecting and controlling of camera;
- Onvif: version 2.1 supported

Name: admin

Password: 123456

- Network transmission: recommended connection mode with lecture recording device.

iSmartCMS

Refer to detailed instructions from this user manual.

rtsp

- 1 Make sure PC and the camera are in the same LAN.
- 2 Four channel stream url: `rtsp://IP/chx`,
x=1,2,3,4.

1&3 stream tracking camera image, 2&4 stream full view camera image.

- 3 IP address is acquirable through iSmartCMS, default rtsp port is 554.

IE

- 1 Make sure PC and the camera are in the same LAN;
- 2 Input IP address+ port number 88 (default port is 88) in the IE address bar:

`http://IP:88`, such as
`http://192.168.18.229:88`
- 3 Install plug-in's;
- 4 Name: admin Password: Null;
- 5.Support Windows 7 or above operation system, whereas Windows XP is not supported.

SDK

Disk comes with camera includes:
SDK_Demo: SDK development sequence;
SDK_Doc: instruction of SDK connection;
SDK_Lib: SDK Library. SDK only provides image acquiring, PTZ controlling and etc, tracking configuration is not included.

Network transmission

On the tracking parameters setting page, the IP address, port and connection protocol (TCP/UDP) of the lecturer recording device can be configured. After connected, the camera can be controlled by the standard

VISCA protocol. Lecture recording device can achieve audio & video of the camera through rtsp or rtmp.

Features

Lecturer tracking system consists of a lecturer tracking camera and optional blackboard writing sensor.

Lecturer tracking camera is very suitable for lecture recording, corporate training applications, its built-in high speed processor adopts the most advanced face detection and image analysis algorithm of behaviors to follow lecturer precisely; there is no need to wear any sensor on tracked object, it is very easy to use.

The optional blackboard writing sensor has built-in image algorithm of detecting writing action on the board, it is easy for installation, it can achieve excellent accuracy and reliability.

Controllable through Ethernet or RS232 / RS485.

Both network video and SDI video can be achieved simultaneously.

Characteristics & Functions

Lecturer Tracking Camera

Featured Advantages

- Integrated with HD full view camera and HD tracking camera. Both HD videos can be outputted up to 1080P60 simultaneously;
- No geometric distortion of full-view camera;
- Tracking camera and full-view camera have the same color and brightness;
- The camera can adjust automatically as per the height of lecturer. The camera can track lecturer all around the classroom, even if lecturer walks into students area;
- Excellent locking and anti-interference performance: the camera keeps tracking on the object even the object stands still for a long period. Other moving objects and video from projectors do not interfere the tracking performance;
- Support several tracking modes;

Intelligent Tracking

- Smooth tracking performance: the tracked object moves in small range or minor gestures will not affect the

tracking effect, tracking sensitivity is adjustable.;

- Always output clear image when tracking horizontally or vertically, there is no focus issue;
- Auto zoom capability during tracking;
- Suits all kinds of classroom with different size, shape and type;

IP (Network)

- H.265/H.264 video compression;
- Support four streams to output both full view and tracking image, videos streamed through Ethernet can be with different resolutions.

Simple Configuration

- Priority zone and blocking zones can be easily set through control software installed on PC;
- User-friendly interface, simple parameter settings, easy installation and use;

Blackboard Writing Sensor

- Built-in image algorithm to detect wiring actions on blackboard, easy installation, but provides excellent accuracy and reliability;
- Avoid shadow disturbance, only detects board writing actions;

- Direct rectangular setting of detection and blocking areas via mouse from the network video;

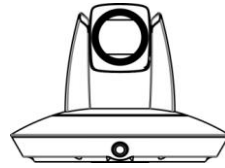
List of Parts

Accessories

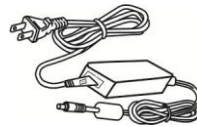
When you open the box, check all accessories according to the packing list.

Lecturer Camera

Camera (1)



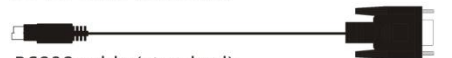
Power Adapter (1)



Cable Package (2)



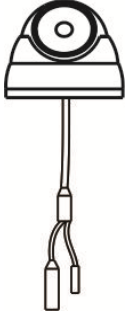
RS485 cable (standard)



RS232 cable (standard)

Optional Blackboard Writing Sensor

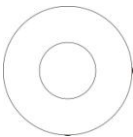
Blackboard Writing Sensor(1)



Power Adapter (1)



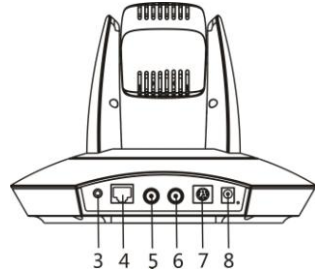
CD(1)



1 Tracking Camera

2 Full-View Camera

Rear View



3 Audio Input

4 Ethernet

5 HD-SDI 1 Interface (Tracking Camera)

6 HD-SDI 2 Interface (Full-view Camera)

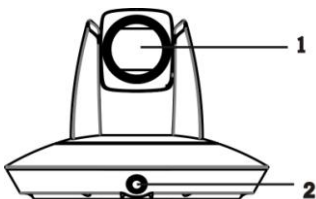
7 Control Interfaces (RS-485/RS-232)

8 Power Input (DC12V)

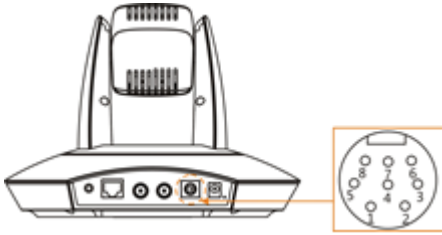
Main Parts & Interfaces

Lecturer Tracking Camera

Front View

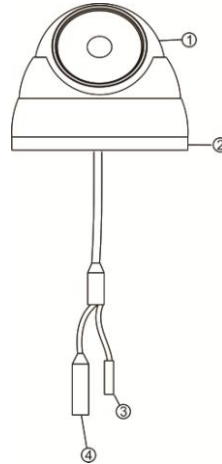


Pin Definition of Control Port



Pin Definition of Control Port	
No	Definition
1	/
2	/
3	232-TX
4	GND
5	232-RX
6	GND
7	485+
8	485-

Blackboard Writing Sensor

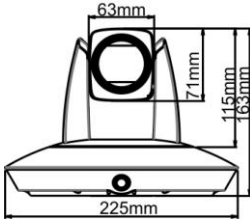


- 1.Camera head
- 2.Adjusting ring
- 3.Power
- 4.POE module (RJ45)

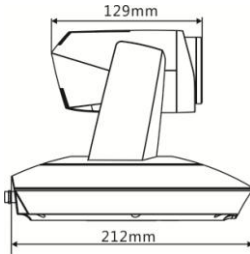
Dimensions

Lecturer Tracking Camera

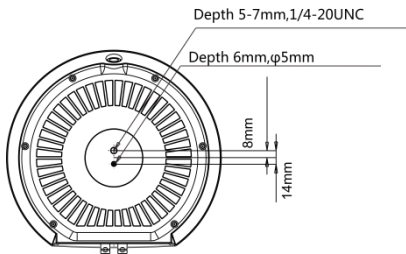
Front View



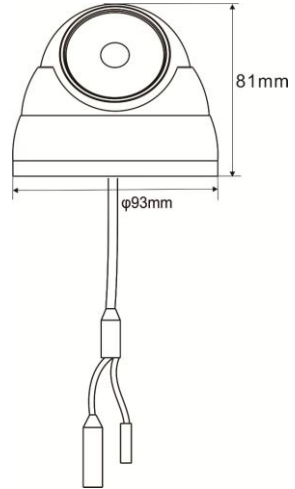
Side View



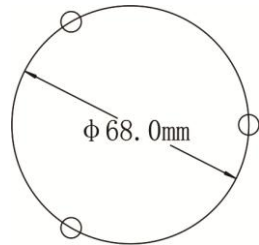
Bottom View



Blackboard Writing Sensor



Installation hole



INSTALLATION

INSTRUCTIONS

For Camera

Suggested height from the camera to floor is 2.4 meters; Suggested distance from the camera to the platform is 8 meters, and the installation position should be close to the central axis to get the best tracking result

The camera can track the students in a classroom with size of 15 meters in length and 8 meters in width.

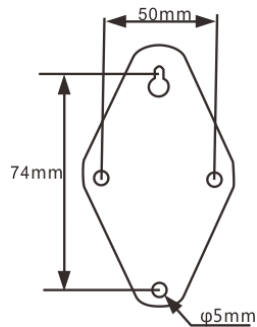
For Blackboard Writing Sensor

The sensor shall be installed at the ceiling right above the blackboard, with a distance of 80~110cm to the blackboard. The FOV is 90°. Use the client software to capture video and adjust angle to make sure the camera view fully covers the blackboard and the black board covers the half upper image, shown as follows.

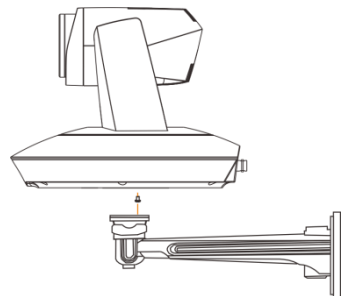


Wall Mounts (Optional)

1. According to diameter and position of the 4 installation holes (as shown below) on the bracket, fix the bracket onto the installation position.

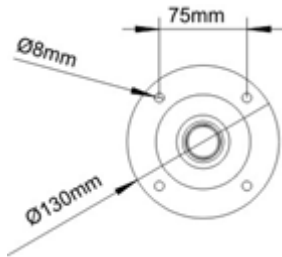


2. Use inch screws to fix the camera on the bracket, fix the limit screw according to actual requirement, and make sure the camera is tightly fixed onto the bracket before you let go of the camera.

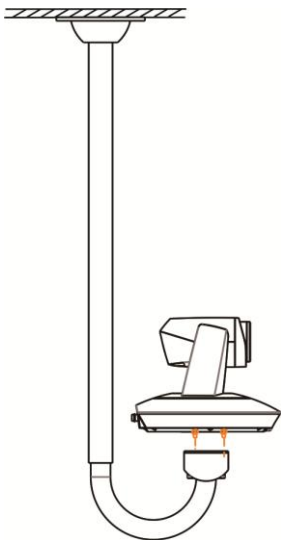


Pendant Mount (Optional)

1. According to diameter and position of the 4 holes on the pole (as shown below), Fix the pole brackets onto ceiling with 4 screws



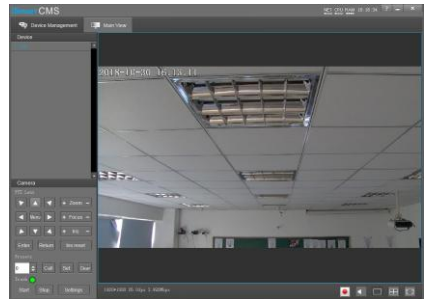
2. Use screws to fix camera on the pole. Make sure the camera is tightly fixed onto the bracket before you let go of the camera.



Setting

Software Connection

Take out Disc comes with the camera package, install "iSmart CMS" from the disc on your PC, turn on "iSmart CMS", connect and add camera to the management device list, and enter into the main interface. Select one of a camera to do the following tracking settings:



Tracking Settings



Start: turn on tracking, using controller or software to call preset 80 can also turn on tracking.

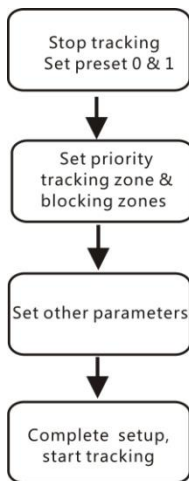
Stop: turn off tracking, using controller or software to call preset 81 can also turn off tracking.

Settings: Click this button to get into detailed tracking parameters for configuration.

Once this button is clicked, main stream will automatically switch from tracking camera to full view camera. Once configuration is completed, main stream will return to tracking camera again.

Lecturer Tracking Camera

Setting Process



Preset 1: Preset 1 is the position where tracking starts, preferred to be set at Podium; to configure it, move the camera's Pan/Tilt/Zoom to put the lecturer in the appropriate size and position in the image, then set it as preset 1. In some other cases, the preset 1 is also useful: after camera finishes calibration, it will sit at preset 1; once tracking object gets lost, the camera can be configured to move to preset 1; when the camera starts auto zooming, its

zooming times is also based on preset 1's zooming times.

Preset 0: It is a position that can be configured to have the camera move to once tracked object gets lost, recommended to set at a full view image of the lecturing area. See basic parameter settings for details.

Preset 2: this is the position that camera moves to after blackboard writing sensor detects writing action.

Tracking Setting

Settings

Basic1 Basic2 Senior1 Senior2

Basic params

Video format 1080p25

Baud rate 9600bps

Protocols VISCA

Device addr 01

Pos correct ▲

Face hight ◀ OK ▶

Debug ● ▼

Zone settings

Lecturer

Blocking zone

1 2 3 4

5 6 7 8

Refresh Save Exit

Basic1 Basic2 Senior1 Senior2

Tracking setting

Tilt motion Permanent track

Auto zoom Outside platform

Tracking params Reset

Track Sens. 4

Pan speed 4

Tilt speed 3

Zoom limit 3

Lost timeout 1

In/Out podium 3

Target lost action

No. 1 preset

Blackboard close-up

Close

Video auto switch

Close

Boot default state

Track

Refresh Save Exit

Basic1 Basic2 Senior1 Senior2

U/D podium
Detect

Platform area
Detect single-obj

Track model
Normal

Send type
Once

Director rules
Outside director

Target appear 11

Target miss 22

In podium 33

Out podium 44

Refresh Save Exit

Basic1 Basic2 Senior1 Senior2

Mode
Serial port

Connect protocol
TCP

As
Client

Director ip
0.0.0.0

Director port
0

Connect test
 Network test

Refresh Save Exit

Basic parameters setting

Basic

The factory default setting of the camera is 1 (address), 9600bps, VISCA protocol, 1080p25 for tracking camera and full-view camera.

Position Calibration



Adjust the lecturer's position in the video when he/she is not in the center of image.

Warning: The position has been adjusted to the best value before leaving the factory, do not change it until it is necessary.

Adjust Head Height

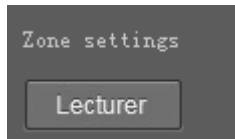


User can adjust the head height in the view.

Debug

Enable and disable display current status of face detection of tracking camera and motion detection of full-view camera.

Zone Setting

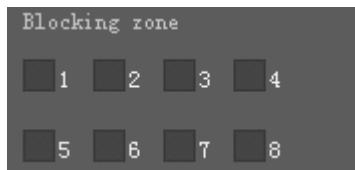
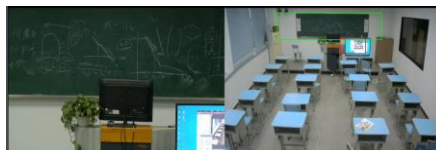


Recommended to set the platform or podium as priority zone, the camera will detect object from this zone to start tracking accordingly.

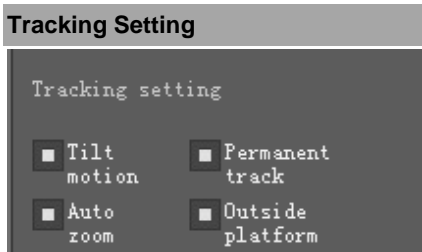
Set other interference sources (like projector, digital whiteboard, TV screen and etc) near the platform or podium as blocking zones so the camera will not track these sources. The blocking zones must be inside the priority zone; otherwise, they will not be blocked.

The camera's tracking range can cover the whole classroom, so the platform zone is defined as a priority tracking zone.

Usually set the top edge of the blackboard as the top boundary of the platform zone (at least higher than the lecturer's head), and the bottom boundary is higher than students' head sitting in the first row.



Blocking zones: There are 8 blocking zones shown in green rectangle, they can be configured independently. The moving objects inside the blocking zones of the full-view camera will not be detected and tracked while the tracking camera still tracks the lecturer.



Tilt Motion: when it's enabled, the camera will automatically adjust tilt angle during tracking. When it's disabled, the camera will track as per the tilt angle of preset 1.

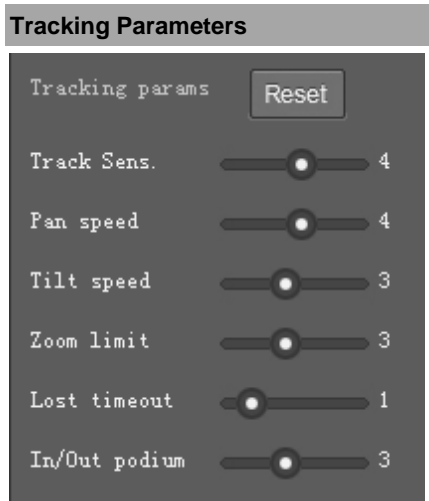
If the lecturer does not walk into the student area, it's suggested to disable auto zoom and tilt motion.

Permanent Tracking: when it's enabled, tracking will be activated all the time even when the lecturer walks into the student area. To avoid an extreme low tilt angle, it's suggested to disable permanent tracking, and the camera will not track at an extreme low tilt angle.

Auto zoom: when it's enabled, during tracking, the camera will auto zoom in or out. When it's disabled, the zoom during tracking will be according to preset 1.

Keep tracking outside tracking zone:

When it's enabled, the camera will still track if the object is outside the tracking zone.



Track Sens: Set sensitivity of tracking based on speed of movement. High sensitivity will track at small movement.

Pan Speed: Set pan speed for tracking;

Tilt Speed: Set tilt speed for tracking;

Zoom Limit: Higher value enables more zoom times.

Lost Timeout: Set the interval before Object Lost Action will be performed, (go to preset 1 or 0). Default is 5 seconds.

In/Out podium: This is used to define the detecting sensitivity when lecturer moves out of the lower part of the Priority Zone, if you want the camera to detect sensitively when the lecturer moves out of the lower

part of the Priority Zone, set the sensitivity as high; otherwise, set it as low.



Target Lost Action: Used to define the action to be performed if the camera loses the tracked object for a period of time

Blackboard Close-up: Used to define the action to be performed when Blackboard writing sensor is triggered. When Preset 2 is selected, the camera will go to preset 2. When Lecturer Tracking is selected, the camera will move to preset 2 and starts tracking there.

Video Auto Switch: camera supports to automatically switch between video's, when auto is selected as "full view camera" / "tracking camera" channel and the movement of step onto / walk down the podium was selected as not detecting, the network stream will automatically switch & output between full view camera video and tracking camera video according to object's showing up or disappearing. When the

movement of step onto / walk down the podium was selected as detecting, network stream will auto switch & output between the full view camera video and tracking camera video based on the object's movement of step onto / walk down podium. Select "off", network stream always outputs non switchable fixed view video.

Boot default state: The action to be performed when the camera is powered on.

Senior Parameters Setting



U/D podium: Decide whether to detect the action of step on / step down the podium;

Platform area: Decide whether to detect only single object or multi-object on the platform;

Tracking mode: "Normal lock tracking mode" means that the tracking camera always follows the object, and does not

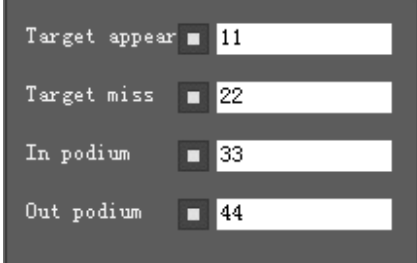
send code during tracking; "PTZ motion /switching code at res mode" means that the tracking camera always follows the target, but in the process of following, it will send code once the camera moves or stops, which is convenient for the recorder to switch to wide angle image when the camera is moving, and when the camera is stationary, it switches to close-up image; "The speed of PTZ movement fast / slow switching code" means that the camera always follow the object, but in the process of following, once the camera speed becomes faster or slower, it will send code, which is convenient for the recorder to switch to the wide angle image when the camera moves fast, and switch to close-up images when the camera moves slowly.

Send type: two options of returning codes: "send only once" and "always send".

Director rules: camera has built-in switching rules, the blackboard writing sensor does not send out switching code, then when internal switching rule is selected, it will do internal communication, finally lecturer tracking camera sends out codes according to internally switched sequence.

In the internal switching regulation, the blackboard has the highest priority level, followed by the lecturer tracking camera images.

When the internal switching rules is not applied, the blackboard writing sensor, and the lecturer tracking camera send returning codes respectively according to the customized switching code, every video can be switched according to its own priorities; first select the "target appear", "target miss", "In podium" and "Out podium" options, and then set the following switching code, each switching code includes maximum 8 bytes. Each byte is represented by a hexadecimal number and separated by a space.



Target appear	11
Target miss	22
In podium	33
Out podium	44

Mode
 Serial port

Connect protocol
 TCP

As
 Client

Director ip
 0.0.0.0

Director port
 0

Connect test
 Network test

Blackboard Writing Sensor

After it is installed, please capture the camera view and adjust the installation position till the camera view is fully covered the whole blackboard, shown as follows:



(Code Send) Mode: choose to send codes via network or serial port;

Connect Protocol: once “Network” is chosen as “Mode”, choose TCP or UDP as communication protocol.

(Lecturer Tracking Camera) As: once “Network” is chosen as “Mode”, choose “Client” to actively communicate with recorder, choose “Server” to await to be communicated from recorder.

Director IP and Port: once “Network” is chosen as “Mode”, configure recorder’s IP address and Port at these two frames.

Basic

Basic

Blackboard Zone

Blocking Zone

Basic Settings

Interval Before Action:
Short Long 1

Detecting Sensitivity:
Low High 1

Lecturer Tracking Camera IP Address:

Basic Parameters

Blackboard Zone

Blocking Zone

Blackboard Zone: define effective zone for the sensor. The zone is displayed as a blue rectangle. Generally it covers the whole blackboard. The bottom is in parallel with the bottom line of blackboard. To avoid

incorrect detection, make sure body (including head) of the lecturer does not enter the area when he is not writing on blackboard.

Blocking zones: There are 8 blocking zones available in red rectangle to avoid interference to trigger, they can be configured independently. The moving objects inside the blocking zones of the full-view camera will not be detected and tracked while the tracking camera still tracks the lecturer head.

Basic Settings

Interval Before Action:
Short Long 1

Detecting Sensitivity:
Low High 5

Interval Before Action: Used to define the interval that the sensor confirms writing action is completed after no one writes on the board. For example, if it is set as 3, then after on one writes on the board for 3 seconds, the sensor will consider writing is completed.

Detecting Sensitivity: 0-6 levels.

Suggested to set at 0-5, if set at the highest value 6, the sensor may detect shadow on the board.

Lecturer Tracking Camera IP Address:

Lecturer Tracking Camera IP Address:

To set lecturer tracking camera's IP address, then after the sensor detects writing action on the board, it will command the tracking camera to move to pre-defined position.

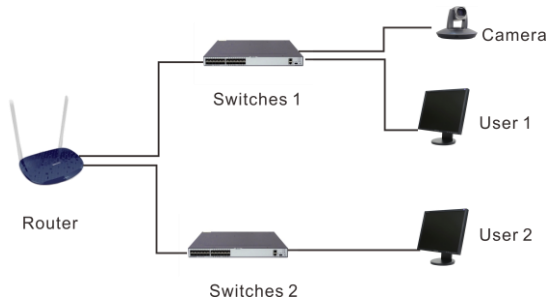
Network Test: to test if the blackboard writing sensor and the lecturer tracking camera is connected in the network.

iSmart CMS Application Software Guide

Network Connection

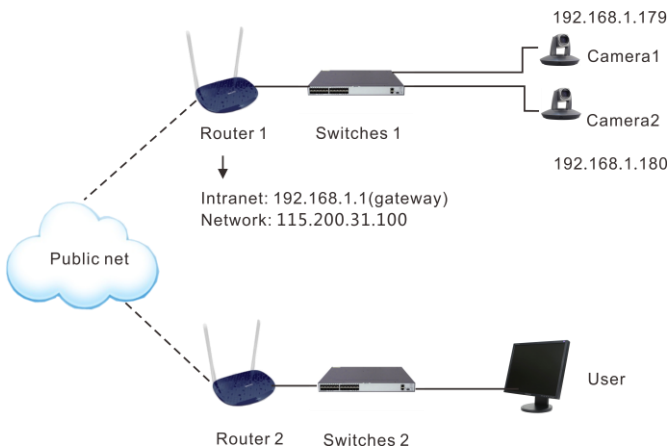
Connect the camera to network with an Ethernet cable, power on the camera.

LAN Connection



Please refer to the above diagram, user1 and user 2 are in the same router, they are considered as in the same LAN, connect the camera to the same LAN as where the PC is, and refer to below instructions as how to use the application software, then the camera can be found and connected from the online device list.

WAN Connection



Please refer to the above diagram, user and the camera are in different routers, they are considered as in a WAN; in this condition, application software iSmartCMS can not search and find the camera automatically. User can still connect after below conditions are satisfied: (1) Set camera's IP address as static IP address (2) Router of the LAN where camera is connected supports Port Mapping. (3) Router of the LAN where camera is connected has fixed public IP address. Follow below steps to connect:

Step One

Set camera's IP address in LAN: connect user PC to the LAN (Router 1) where the camera is connected according to LAN connection instructions, use application software iSmartCMS to search and find the camera, then add it to manage; then set camera's IP address in the same network segment as the router 1. Camera's gateway is usually set at Router 1's LAN IP address, for example, 192.168.1.1, then camera's IP address can be set as for example 192.168.1.179 or 192.168.1.180 as long as they are in the same network segment.

Steps Two

Route Mapping: User PC logs into router configuration menu, gets into "Port Mapping" (router management authorization may be required); refer to below picture, DO NOT tick "Do not apply this rule", from first frame under "External port", input any number from 1-65535, but preferred to be set at more than 10000 like 10200 so there will be less port conflict possibility. From "Internal IP", input the camera1's IP address 192.168.1.179, from first frame of "Internal Port", input 3478, (all cameras use this same port number). "Protocol" and "Mapping Line" can be default, from "Note", input "Camera 1's mapping port" or something to understand.

Port mapping

List of rules

Not applied	<input type="checkbox"/> Do not apply this rule If you disable this rule, the following configuration will only be saved but will not applied.
External port	<input type="text"/> <input type="text"/> You can input an external port or an external port segment to be mapped to an open port or port segment of an internal host. If you leave it blank, the external port or port segment is identical to the internal port or port segment. The range is between 1 and 65535.
Internal IP	<input type="text"/> The IP address of the internal host that provides external service. For example: <i>192.168.0.50</i>
Internal port	<input type="text"/> <input type="text"/> The open port or port segment of the internal host that provides external services. The range is between 1 and 65535.
Protocol	TCP ▾ The protocol used for port mapping can be TCP, UDP or both.
Mapping line	Any ▾ The line used for port mapping can be single WAN or multi WAN.
Note	<input type="text"/> You can write a short note to describe this mapping rule. For example: <i>The WEB server for Marketing Department.</i>

Save

Back

Help

Port mapping function can map the service port of the intranet server host to extranet, so external network users can access the services offered by the intranet server through the external IP address and port of the router.

Notice:

· Port mapping works only if "Block extranet requests" on the Attack defense page is disabled.

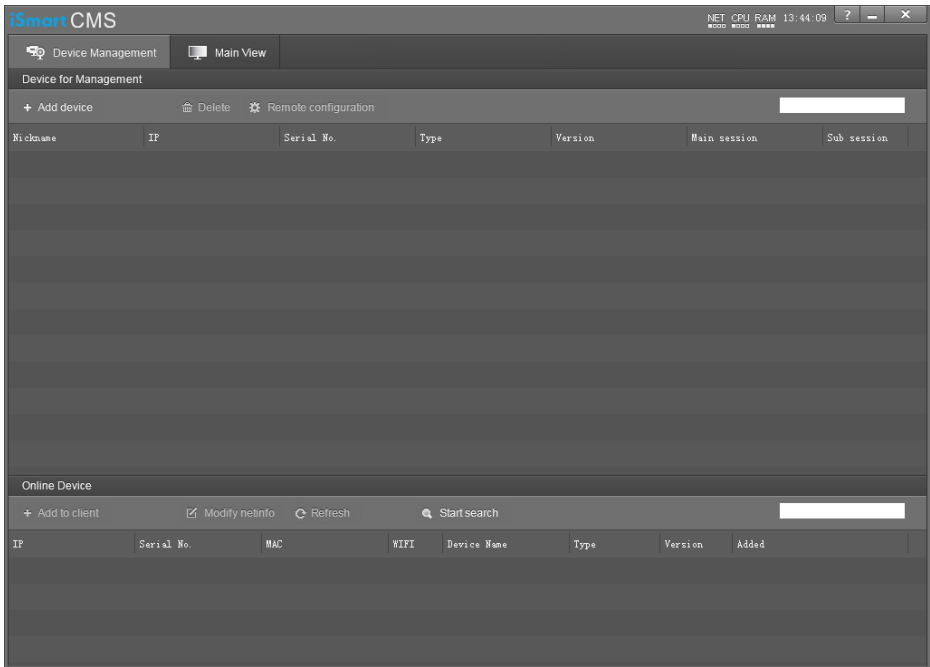
Step Three

Access from external network: Router 1's public IP address is 115.200.31.100, for example, go through the above steps one and two, WAN users under router 2 can access camera 1 through IP address 115.200.31.100 + port 10200. Then, in WAN, the mapping of camera 1 and (IP 115.200.31.100 + port 10200) is established. Camera 2 can use another external port such as 10320, so mapping of camera 2 with (IP 115.200.31.100 + port 10320) is established. In the "Managed Device" of the client software iSmart CMS, click "+ Add", enter the IP address 115.200.31.100 and port 10200 and other information, then the camera 1 can be accessed and controlled.

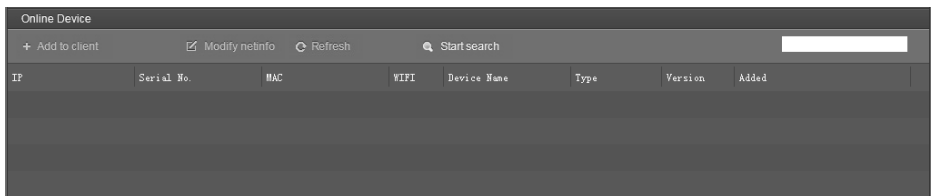
Client Software instruction

Search and list the camera

Install and open the client software in PC, enter the main interface:



If the camera and PC are in the same LAN, click “Start Search”, then searching starts and all online devices will be listed, as the picture shown below:



To modify the device IP address, input the IP address, mask, gateway in the “Modify Network” column.

✕

Modify Network Parameter

Ethernet

Device information:

CameraName:

Mac:

SN:

Network information:

ConnType:

IP:

Mask:

GateWay:

DNS1:

DNS2:

Modify

To control and preview a camera, first choose the device, modify its IP address as the IP address of the same LAN, then click “Add to Client” as the picture shown below.

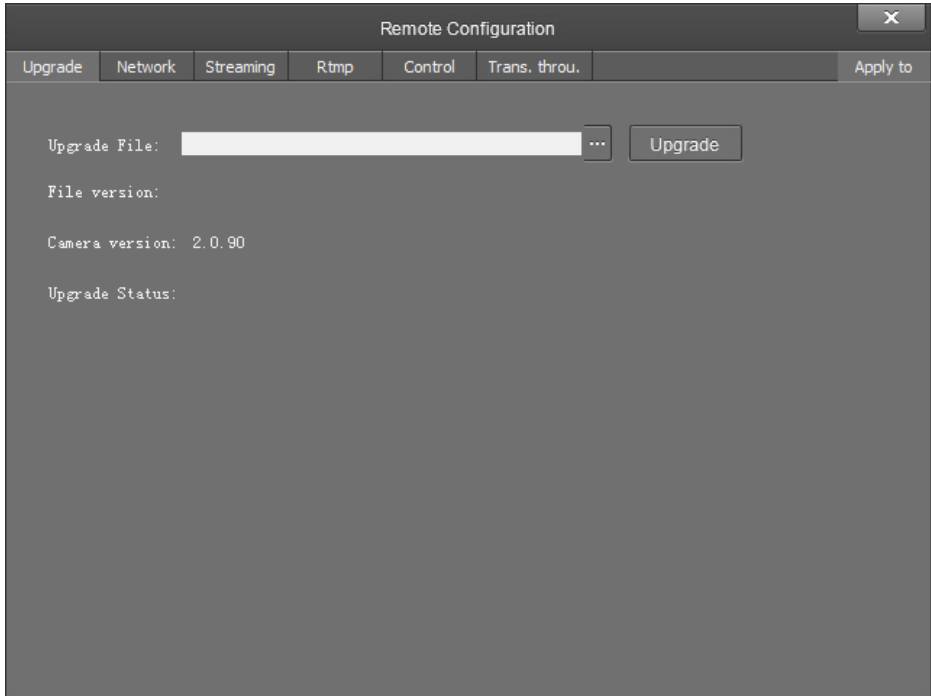
Online Device							
+ Add to client ✕ Modify netinfo ↻ Refresh 🔍 Stop search							
IP	Serial No.	MAC	WiFi	Device Name	Type	Version	Added
10.0.3.128	L6D3V3H2B9OUQUK4G224	00:04:05:01:88:89	No	av200_4K	LZC5-F79H	1.0.00	
10.0.3.212	8288653H2BYOUQW4515K2	00:04:05:01:88:7E	No	av200t-8tst	E200T	2.0.00	
10.0.3.240	S00705R2BYOSQUR241W0	00:04:05:01:88:36	No	S00705R2BYOSQUR241W0	LTC	5.0.04	

Please check that all IP addresses are in the same LAN.

Remote Configuration

Choose the camera in the device list, click “Remote Configuration” in the column to upgrade or configure IP address of the camera.

Upgrade:



Click "Upgrade" menu to enter the main interface, as the picture shown above.

Click to search and load the updating firmware, then click "Upgrade" to start upgrading, do not power off the camera during upgrading ,after upgrading is completed, camera will reboot.

Network:

The screenshot shows a 'Remote Configuration' dialog box with a dark grey background. At the top, there is a title bar with a close button (X) on the right. Below the title bar is a horizontal menu with tabs: 'Upgrade', 'Network', 'Streaming', 'Rtmp', 'Control', 'Trans. throu.', and 'Apply to'. The 'Network' tab is selected. The main area contains several configuration fields:

Connect with	Static IP	rtsp port	554
IP Address	10.0.3.146	app port	5000
Mask	255.255.255.0		
Gateway	10.0.3.1		
DNS 1	10.0.0.1		
DNS 2	0.0.0.0		

At the bottom right of the dialog box, there is a 'Save' button.

- Connect with: please choose from Static IP or dynamic IP address;
- IP address: input IP address for the device;
- Mask: input mask address for the device;
- Gateway: input gateway address for the device;
- DNS 1 server-prior, input DNS address for the device;
- DNS 1 server- spare, it will be used in case DNS1 server is not working;
- Port: streaming port(RTSP) and application port(SDK connection) can be configured. The range of stream ports is 3479~7999 and 554, default is 554. The range of application ports is 3479~7999, default is 5002;
- Click the "Save" button after setting is completed;
- Camera will connect to internet after above-mentioned operations;

Streaming:

Remote Configuration ✕

Upgrade Network Streaming Rtmp Control Trans. throu. Apply to

Stream type	<input type="text" value="Main stream"/>		Channels	<input type="text" value="MORO"/>
Resolution	<input type="text" value="1080P"/>		Encode type	<input type="text" value="AAC"/>
Video rate type	<input type="text" value="CBR"/>		Sample rate	<input type="text" value="16KHz"/>
Max rate (Kbps)	<input type="text" value="4096"/>		Audio rate	<input type="text" value="64Kbps"/>
Frame rate	<input type="text" value="fullfps"/>		Input pin	<input type="text" value="LineIn"/>
Key frame interval	<input type="text" value="25"/>		Volume	<input type="range" value="50"/>
Video coding type	<input type="text" value="H264"/>		<input type="button" value="Save"/>	
Encode Level	<input type="text" value="High"/>		<input type="button" value="Save"/>	

- Stream type: set the parameters of main stream, sub stream, third stream, fourth stream.
- Resolution: set among 4K(3840*2160), 1080P(1920*1080),720P(1280*720) .D1&QVGA(320*240), choose resolutions based on actual requirements and capability of device. The higher the resolution is, the better network requirements will be needed.
- Max.rate: configure max stream rate or adjustable stream rate.
- Frame rate: choose from different frame per second
- Key frame interval: configure the number of frames between the two key frames. The larger the key frame interval is, the smaller the fluctuation of the byte will be, but the image quality is relatively poor. Vice versa, the larger the fluctuation of the byte will be, the higher the image quality will be.
- Video coding type: choose from H.264 and H.265.
- Encode level: choose from BaseProfile、MainProfil and HighProfile.

RTMP:

The screenshot shows a 'Remote Configuration' window with a tabbed interface. The 'Rtmp' tab is selected. The window contains four rows of RTMP stream configurations, each with a checkbox, a dropdown menu for stream type, and a text input field for the URL. A 'Save' button is located at the bottom left.

RTMP ID	Stream Type	URL
RTMP 1	Main stre:	rtmp://10.0.3.6:31935/live/lrc5
RTMP 2	Sub strear	rtmp://10.0.3.6:31935/live/lrc6
RTMP 3	Main stre:	qulubo://dev.opensight.cn:5000/?c=JG0001812120
RTMP 4	Sub strear	rtmp://10.0.3.6:31935/live/lrc6

In RTMP1 and RTMP2, main stream, sub stream, third stream, fourth stream can be chosen to stream.

Control:

- Password setting: if password is used, it is only after correct password is put that the camera can be accessed.
- Reboot: reboot the camera.

Remote Configuration

Upgrade Network Streaming Rtmp **Control** Trans. throu. Apply to

Old password	<input type="password"/>	Local Time	2018-11-07 09:57:45	<input type="button" value="s tm val"/>
New password	<input type="password"/>			
Confirm	<input type="password"/>	Show Time		
<input type="button" value="Save"/>		Time Format	YYYY-MM-DD HH:mm:ss	<input type="button" value="s tm fmt"/>
Reboot	<input type="button" value="Reboot"/>	Refresh NTP		
Device name	LTC-A2001NV2	TimeZone	+08:00	
<input type="button" value="save name"/>		NTP Server	ntp1.aliyun.com	<input type="button" value="s ntp"/>

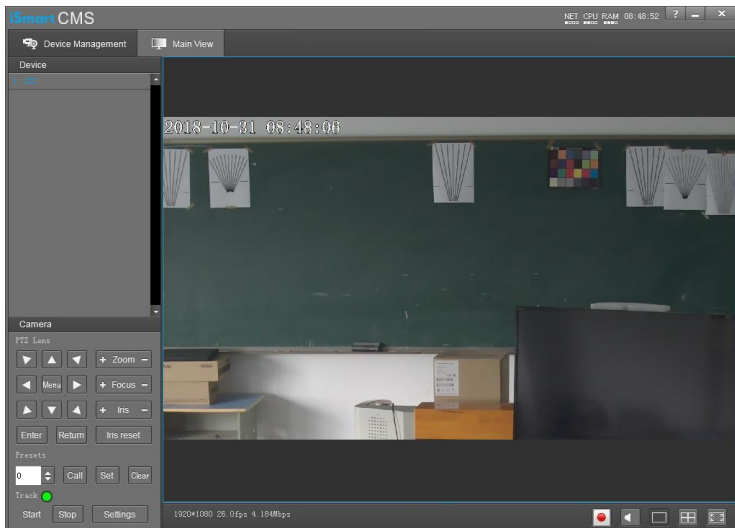
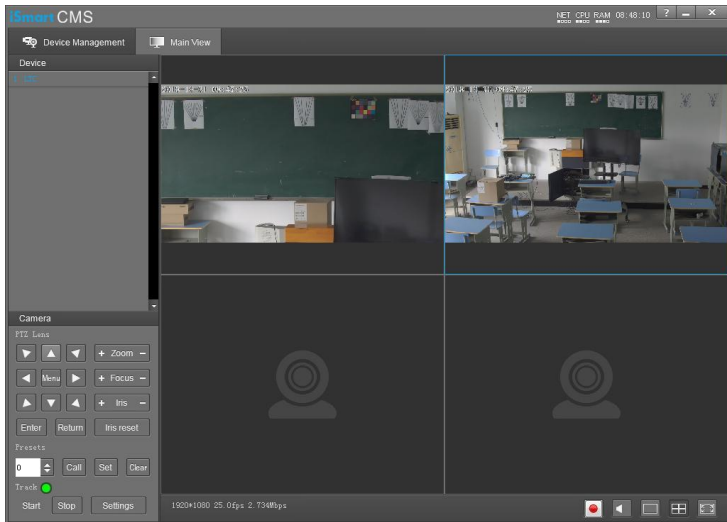
Transparent Transmission:

The image shows a 'Remote Configuration' dialog box with a close button (X) in the top right corner. The dialog has a tabbed interface with the following tabs: Upgrade, Network, Streaming, Rtmp, Control, Trans. throu., and Apply to. The 'Trans. throu.' tab is currently selected. Inside the dialog, there are five configuration fields: 'Enable' is a dropdown menu set to 'Disable'; 'Protocol' is a dropdown menu set to 'TCP'; 'Camera as' is a dropdown menu set to 'Client'; 'IP' is a text input field containing '0.0.0.0'; and 'Port' is a text input field containing '0'. A 'Save' button is located below these fields.

- Enable / Disable: enable / disable this feature;
- Protocol: choose from TCP / UDP protocols;
- Camera as: choose from Client or Server;
- IP: if set camera as Client, the IP address of the transmitted device should be inputted; if set camera as Server, there is no need to set IP address;
- Port: choose from 1-65535 as transparent transmission port.

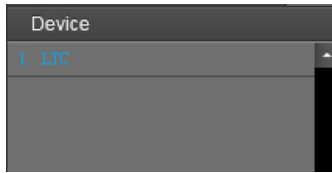
Preview

Click “Main View” to get into camera control and preview part as below.

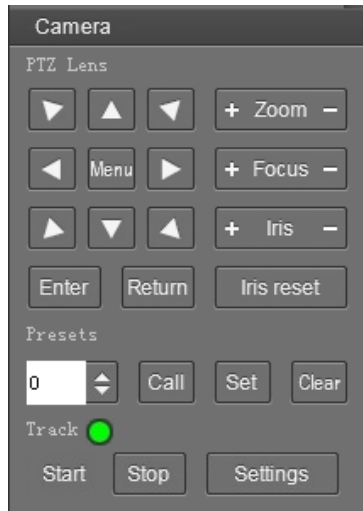


This interface includes three main parts: Device List, Device Control, Video Preview

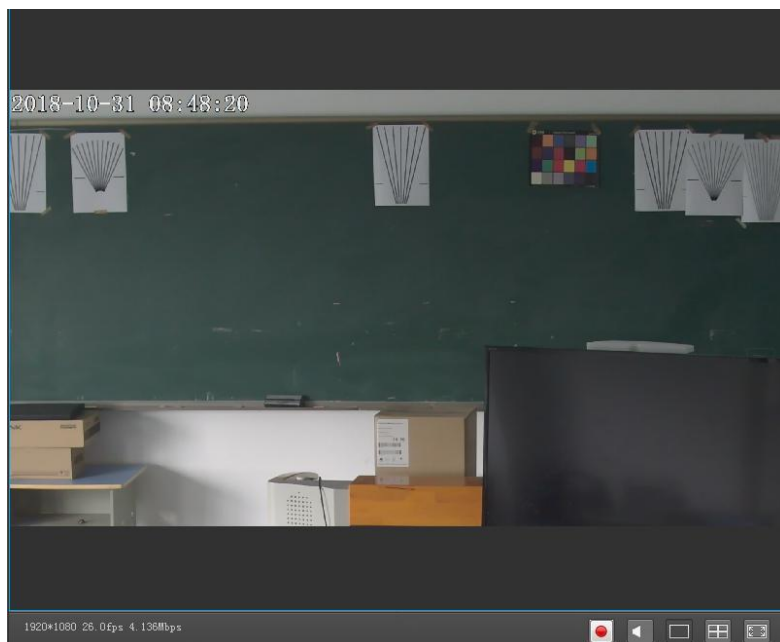
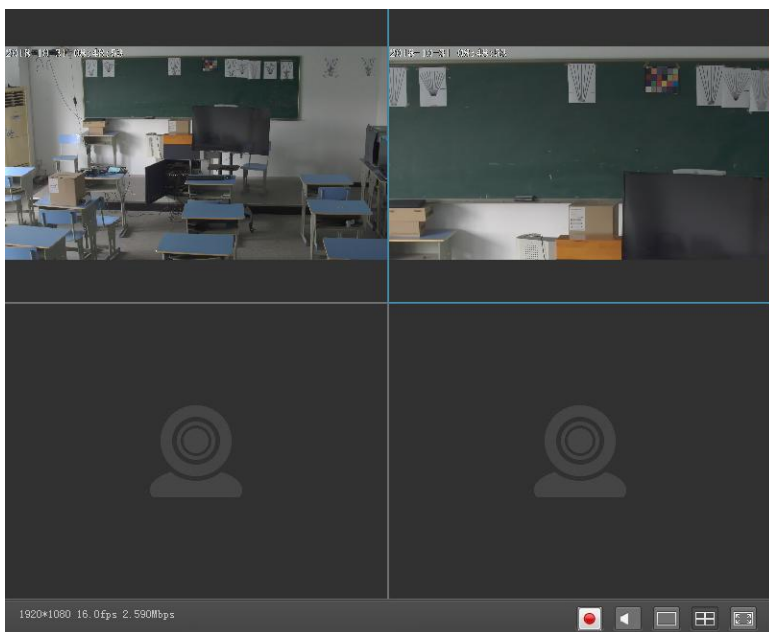
- Device: It displays all online cameras added to “Device Management”.



- Device Control: get control of the selected camera (camera name in blue).



- Video Preview: double click the camera in the list, main camera stream will be displayed in the preview frame; or right click the selected camera from the left column to get its main or substream video. Video preview mode can be single video or four video's, when in four video's mode, select one of the four video's then choose the bottom right icon to enlarge this selected video to a big single frame.

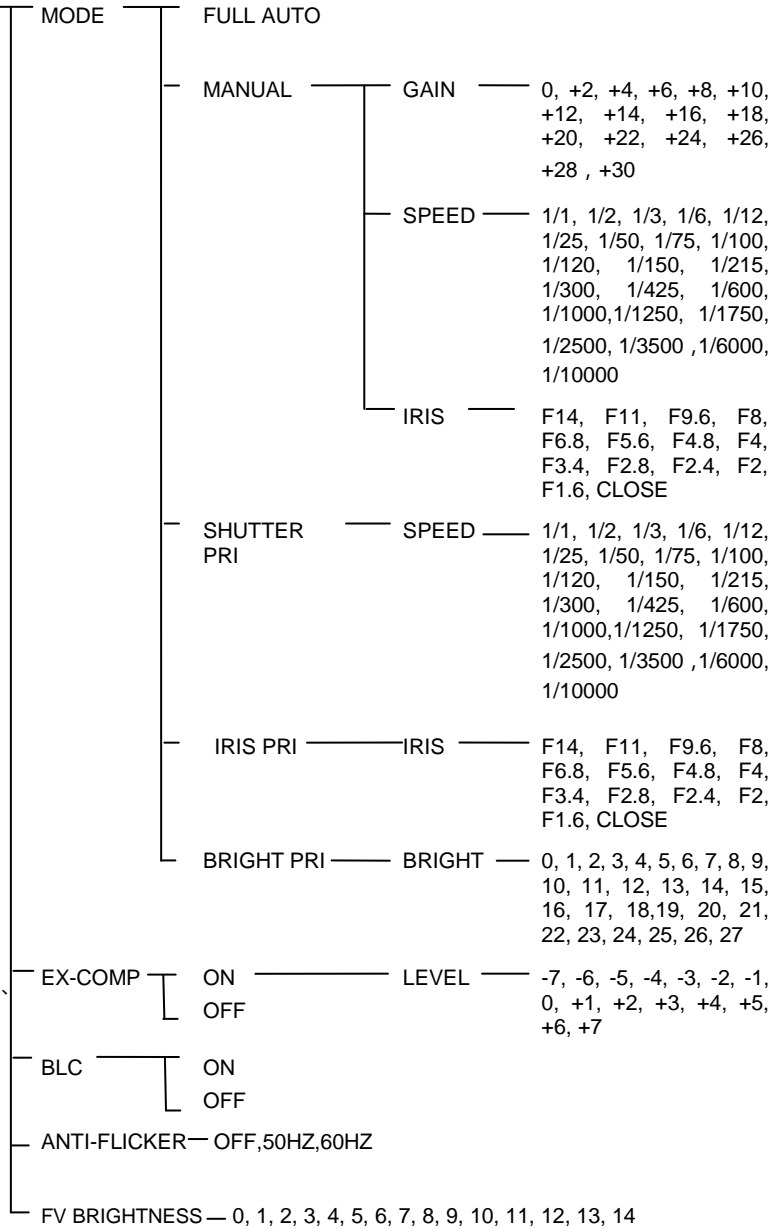


MENU SETTINGS

Menu Configuration

<VIDEO>	SHARPNESS	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15
Refer to Page 38	BRIGHTNESS	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
	CONTRAST	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
	GAMMA MODE	0, 1, 2, 3, 4
	2DNR LEVEL	1, 2, 3, 4, 5, OFF
	3DNR LEVEL	1, 2, 3, 4, 5, OFF
	WIDE DYNAMIC	1, 2, 3, 4, 5, OFF

<EXPOSURE>
Refer to Page
38



<COLOR> Refer to Page 39	WB MODE	—	AUTO, ATW, ONE PUSH, INDOOR, OUTDOOR, MANUAL, SODIUM LAMP, FLUO LAMP
	SATURATION	—	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
	HUE	—	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14

<PAN TILT ZOOM> Refer to Page 40	PAN/TILT SPEED	—————	1, 2, 3, 4, 5, 6, 7, 8
	PTZ TRIG AF	—————	ON, OFF
	RATIO SPEED	—————	ON , OFF
	POWER UP ACTION	—————	PRESET 1, PRESET 2, PRESET 3, PRESET 4, PRESET 5, PRESET 6, PRESET 7, PRESET 8, PRESET 9, HOME

< SYSTEM >

Refer to Page
40

ADDRESS	1, 2, 3, 4, 5, 6, 7
PROTOCOL	VISCA, PELCO-P, PELCO-D
BAUDRATE	2400, 4800, 9600, 38400
VIDEO FORMAT	1080P60, 1080P50, 1080I60, 1080I50, 1080P30, 1080P25, 720P60, 720P50
MOUNT MODE	STAND , CEILING
RS485 PORT	HALF-DUPLEX-1 , HALF-DUPLEX-2
DISPLAY INFO	ON , OFF
LANGUAGE	ENGLISH

<STATUS>

Refer to Page
41

ADDRESS	1
PROTOCOL	VISCA
BAUDRATE	9600
VIDEO FORMAT	1080P25
MOUNT MODE	STAND
IMAGE VER	V6629
FIRMWARE VER	V1.0.0

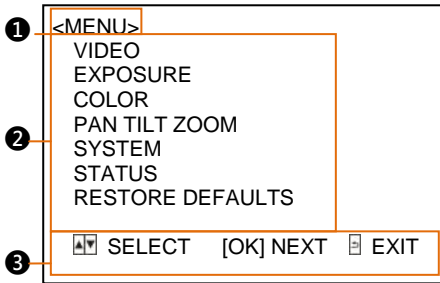
<RESTORE DEFAULTS>

Refer to Page41

Menu Explanation

Main Menu

Press **[MENU]** button to enter / exit menu.



1 Menu Hint

It displays currently selected menu option.

2 Menu Options

It displays options under current menu hint.

Press **▲** or **▼** button to select among menu options, once font of options turned from white color to yellow color, it indicates the menu has been elected, press OK button to get into this menu.

3 Prompt Message

"**▲▼ SELECT**" indicates it is possible to press **▲** or **▼** button to select menu options.

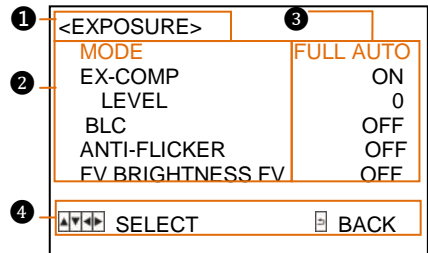
"**[OK]NEXT**" indicates it is possible to press **[OK]** button to enter next level menu.

"**[OK] EXIT**" indicates it is possible to press **[OK]** button to exit menu.

Submenus

From main menu, navigate to select

<EXPOSURE> menu, press **[OK]** to enter.



1 Menu Hint

It displays currently selected menu option.

2 Menu Options

It displays options under current menu hint.

Press **▲** or **▼** button to select among menu options, once font of options turned from white color to yellow color, it indicates the menu has been elected, press **[OK]** button to get into this menu.

3 Manual Exposure

Press **◀** or **▶** button to change value.




4 Prompt Message

"**▲▼ SELECT**" indicates it is possible to press **▲** or **▼** to select menu options, press **◀** or **▶** to change value

"**▶ BACK**" indicates it is possible to press **[▶]** to return to previous menu.

Video

VIDEO menu is used to change video value.

<VIDEO>	
SHARPNESS	8
BRIGHTNESS	7
CONTRAST	2
GAMMA MODE	0
2DNR LEVEL	OFF
3DNR LEVEL	OFF
WIDE DYNAMIC	OFF
  SELECT	 BACK

Available Options:

SHARPNESS: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15.

BRIGHTNESS: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14.

CONTRAST: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14.

GAMMA MODE: 0, 1, 2, 3, 4.




2DNR LEVEL: 1, 2, 3, 4, 5, OFF

3DNR LEVEL: 1, 2, 3, 4, 5, OFF.

WIDE DYNAMIC: 1, 2, 3, 4, 5, OFF.

Exposure

EXPOSURE menu is used to adjust exposure value.

<EXPOSURE>	
MODE	FULL AUTO
EXP-COMP	ON
LEVEL	0
BLC	ON
ANTI-FLICKER	OFF
FV BRIGHTNESS FV	OFF
  SELECT	 BACK

MODE:

FULL AUTO: Gain, Shutter Speed and Iris value are adjusted automatically according to working environment.

MANUAL: manually adjust Gain, Shutter Speed and Iris

GAIN: 0, +2, +4, +6, +8, +10, +12, +14, +16, +18, +20, +22, +24, +26, +28, +29, +30.

SPEED: 1/1, 1/2, 1/3, 1/6, 1/12, 1/25, 1/50, 1/75, 1/100, 1/120, 1/150, 1/215, 1/300, 1/425, 1/600, 1/1000, 1/1250, 1/1750, 1/2500, 1/3500, 1/6000, 1/10000s

IRIS: F14, F11, F9.6, F8, F6.8, F5.6, F4.8, F4, F3.4, F2.8, F2.4, F2, F1.6, CLOSE.

SHUTTER PRI: Gain and Iris value are adjusted automatically according to working environment; shutter speed value is adjustable manually.

SPEED: 1/1, 1/2, 1/3, 1/6, 1/12, 1/25, 1/50, 1/75, 1/100, 1/120, 1/150, 1/215, 1/300, 1/425, 1/600, 1/1000, 1/1250, 1/1750, 1/2500, 1/3500, 1/6000, 1/10000s.

IRIS PRI: Gain and shutter speed value are adjusted automatically according to working environment; Iris value is adjustable manually.

IRIS: F14, F11, F9.6, F8, F6.8, F5.6, F4.8, F4, F3.4, F2.8, F2.4, F2, F1.6, CLOSE.

BRIGHT PRI: Manually adjust the video brightness.

BRIGHT: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27.

EXP-COMP: Once EXP-COMP is set as On, below level options become available -7, -6, -5, -4, -3, -2, -1, 0, +1, +2, +3, +4, +5, +6, +7 +7 is the maximum compensation value for bright, -7 is the maximum compensation value for dark.

BLC: ON, OFF.

Backlight compensation (BLC) is video gain done automatically to correct the exposure of subjects that are in front of a bright light source.

ANTI-FLICKER (OFF, 50Hz, 60Hz): To avoid video flicker at power systems of different frequency.

FV BRIGHTNESS: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14.

COLOR

COLOR menu is used to adjust color related values. Available options:

< COLOR >	
WB MODE	MANUAL
R.GAIN	7
B.GAIN	7
SATURATION	7
HUE	7
SELECT	BACK

WB MODE: AUTO, ATW (auto tracking), ONE PUSH, INDOOR, OUTDOOR, MANUAL, SODIUM LAMP, FLUO LAMP

“ONE PUSH”: In “ONE PUSH TRIGGER” mode, aim the camera at a pure white object (say a white paper), then press OK button.

“AUTO” mode: R.GAIN, G.GAIN and B.Gain can be chosen from -7~+7.

“MANUAL” mode: R.GAIN and B. GAIN value can be chosen from 0~255.

SATURATION: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14.

HUE: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14.

Pan/Tilt/Zoom

PAN/TILT/ZOOM is used to change pan/tilt/zoom value, available options:

<PAN TILT ZOOM>	
PAN/TILT SPEED	8
D-ZOOM LIMIT	X1
PTZ TRIG AF	ON
RATIO SPEED	ON
POWER UP ACTION	HOME
SELECT	BACK

PAN/TILT SPEED: 1, 2, 3, 4, 5, 6, 7, 8 the bigger the number is, the faster the speed is.

D-ZOOM LIMIT: X1, X2, X3, X4, X5, X6, X7, X8, X9, X10, X11, X12.

PTZ TRIG AF: Turn ON / OFF the auto focus when the camera pans / tilts / zooms.

RATIO SPEED (ON, OFF): Set the relation of PT speed as per zoom time. When it's on, PTZ speed will be faster when zoom time is bigger.

POWER UP ACTION: PRESET 1, PRESET 2, PRESET 3, PRESET 4, PRESET 5, PRESET 6, PRESET 7, PRESET 8, PRESET 9, HOME.

System

<SYSTEM>	
ADDRESS	1
PROTOCOL	VISCA
BAUD RATE	9600
IR ADDRESS	1
VIDEO FORMAT	1080I50
MOUNT MODE	STAND
RS485 PORT	HALF-DUPLEX-1
LANGUAGE	ENGLISH
SELECT	BACK

ADDRESS: 1, 2, 3, 4, 5, 6, 7.

PROTOCOL: VISCA, PELCO-D, PELCO-P;

BAUD RATE: 2400, 4800, 9600, 38400;

IR ADDRESS: 1,2,3,4, set camera address to be controlled by remote controller.

VIDEO FORMAT: 1080P60, 1080P50, 1080P30, 1080P25, 1080I60, 1080I50, 720P60, 720P50;

MOUNT MODE: STAND, CEILING;

RS485 PORT:

HALF-DUPLEX-1: the camera will not return ACK/FINISH/FAULT msg.

HALF-DUPLEX-2: the camera will return ACK/FINISH/FAULT msg.

LANGUAGE: ENGLISH

STATUS

< STATUS >	
ADDRESS	1
PROTOCOL	VISCA
BAUD RATE	9600
IR ADDRESS	1
VIDEO FORMAT	1080P50
MOUNT MODE	STAND
FIRMWARE VER	V3.0.00
BACK	

Display information (address, protocol, baud rate, IR address, video format, mount mode, image version and firmware version) of the current camera.

Restore Defaults

< RESTORE DEFAULTS >	
PRESS OK	CONFIRM
PRESS BACK	CANCEL
BACK	

RESTORE DEFAULTS option is used to reset all menus to default value.

Press **OK** to confirm or press **BACK** to cancel and return to previous menu.

ANNEX 1 TECHNICAL SPECIFICATIONS

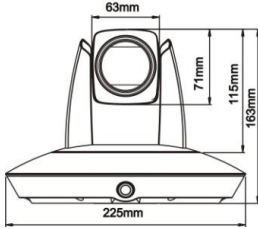
LENS	
Tracking Camera	
Image Sensor	1/2.8" CMOS, 2.14MP
Lens	4.7mm-94mm
Iris	F1.6-F3.5
Optical Zoom	20X
Digital Zoom	12X
Angle of view	59.5°-2.9°
Focus	Auto/Manual/ One push trigger
Min. Illumination	0.5 Lux (30FPS), 0.1Lux (60FPS)
Shutter	1/1 ~ 1/10,000 sec
Gain	Auto/ Manual
White Balance	Auto, Indoor, Outdoor, One push, Manual
Exposure	Auto, Manual, Shutter Priority, Iris Priority
S/N Ratio	≥50dB
Full-view Camera	
Image Sensor	1/2.8" CMOS
Effective Pixels	2.14MP
White Balance	Auto
Exposure	Auto
Focus	Manual
Focal Length	3.4mm
Angle of view	Horizontal: 72°, Vertical: 40°
Network	
Resolution	Max Support 1920*1080@60fps
Video Compression	H.265/ H.264
Audio Compression	AAC
Network Protocol	ONVIF, RTSP,HTTP, TCP,UDP,RTMP
IE access	Support
Multi-stream	4 streams: 2 for tracking camera, 2 for wide angle camera

PTZ	
Pan Range	-170°~+170°
Tilt Range	-30°~+90°
Pan Speed	0.1°~120°/s
Tilt Speed	0.1°~90°/s
Preset Number	256
Comm. Port	RS-485, RS-232
WIFI interface	2.4G/ 5G WIFI (optional)
Debug / upgrade interface	100M RJ45, POE optional
Protocol	PELCO-D, VISCA
SDI Video	
Video Output	HD-SDI (2 Channels)
Video Format	1080p60, 1080p50, 1080p30, 1080p25, 1080i60 ,
General	
OSD	Yes
Power Input	DC12V
Power Consumption	<20W
Working Temp	0°C~+40°C
Storage Temp	-20°C~+60°C
Dimensions	225mm×163mm×212mm
Weight	1.96KG
Color	Grey
Blackboard Writing Sensor	
Sensor	1/3"CMOS
Effective Pixel	400 mega pixel
Min Illumination	1Lux
S/N Ratio	> 50dB
Gain Control	Auto
E-Shutter	1/30-1/10000
White Balance	Auto
Focal Length	2.4mm
FOV	Horizontal: 90°; Vertical: 50°
IRIS	F2.0
Video Compression	H.264

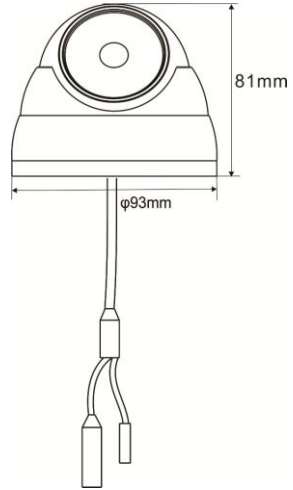
Bit Rate	32Kbps-8Mbps
Video Resolution	720p30,1080p30
Network Interface	10/100M Ethernet, POE (optional)
Power Supply	DC12V, POE
Power Consumption	< 5W
Working Temperature	0-40℃
Working Humidity	≤95%
Dimensions	φ93mm*81mm
Net Weight	0.33KG

ANNEX 2 SIZE AND DIMENSION

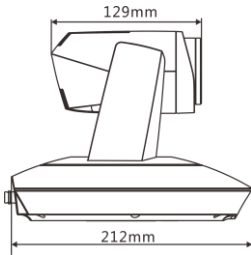
Front



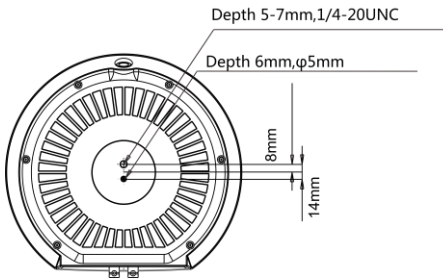
Blackboard Writing Sensor (supplied separately)



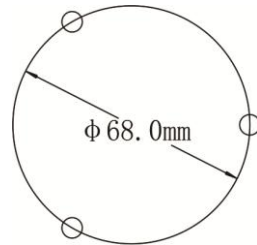
Side



Bottom



Mounting Hole



TROUBLESHOOTING

Problem	Possible Cause	Solution
No action or image after powered on	Power supply failure	Check power supply
	Power adapter damaged	Replace power adapter
	Power cable connection got loosen	Check & reconnect
No self-testing after powered on, or with motor noise	Not enough power supply	Check & reconnect power cable connection
	Mechanical failure	Repair
Not controllable from remote controller	Low battery of remote controller	Change battery for remote controller
	Exceed remote control distance	Control within distance of 8M
After power on, self-test successfully, but not controllable	Wrong address / protocol / baud rate	Check & set again
	Wrong connection or short circuit of RS-485/RS422 or RS-232 cable	Check & reconnect
Video loss when pans / tilts / zooms	Not enough power supply	Check & reconnect power cable
	Video cable not properly connected	Replace with a good video cable
Video captured after connected to digital video interface of a capture device is not good as the video captured after connected directly analog video interface of the capture device	Different video capture devices have different video capturing performance, image quality maybe worse after it has been converted from analog to digital	Consult video capture device supplier for more information

This user manual is only for reference, it is subject to change; please ask for the latest version from your supplier.

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