

# PTZ Optics VL-ZCAM



**User Manual**

**V1.0**

**(English)**

Rev 1.0 10/15

## Preface

Thank you for using this HD Box Camera. This manual introduces the function, installation and operation of the HD camera. Prior to installation and usage, please read the manual thoroughly.

## Precautions

This product can only be used in the specified conditions in order to avoid any damage to the camera:

- Don't subject the camera to rain or moisture.
- Don't remove the cover. Removal of the cover may result in an electric shock. In case of abnormal operation, contact the manufacturer.
- Never operate outside of the specified operating temperature range, humidity, or with any other power supply than the one originally provided with the camera.
- Please use a soft dry cloth to clean the camera. If the camera is very dirty, clean it with diluted neutral detergent; do not use any type of solvents, which may damage the surface.

## Note

This is an FCC Class A Digital device. As such, unintentional electromagnetic radiation may affect the image quality of TV in a home environment.

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## Supplied Accessories

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

- Camera ..... 1
- AC Power Adaptor ..... 1
- Power Cord..... 1
- RS485 Adaptor..... 1
- This User Manual ..... 1

## Notes

### ● Electrical Safety

Installation and operation must be in accordance with national and local electric safety standards. Do not use any power supply other than the one originally supplied with this camera.

### ● Polarity of power supply

The power supply output for this product is 12VDC with a maximum current supply of 1A. Polarity of the power supply plug is critical and is as follows.



### ● Handling

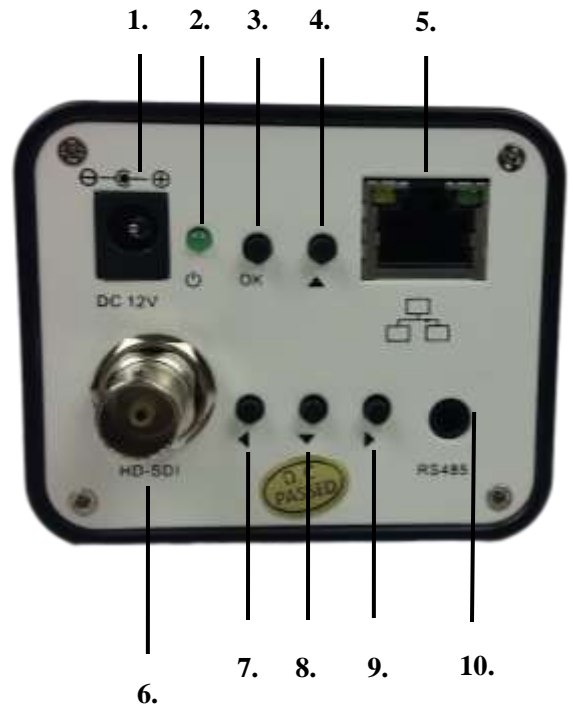
- Avoid any stress, vibration, or moisture during transportation, storage, installation and operation.
- Do not expose camera to any corrosive solid, liquid, or gas to avoid damage to the cover which is made of a plastic material.
- Never power camera on before installation is complete.
- **Do not dismantle the camera** - The manufacturer is not responsible for any unauthorized modification or dismantling.

## Features

1. Panasonic 1/2.7" inch HD CMOS Sensor
2. HD-SDI High Definition Video Output
3. H.264 IP Streaming Output (dual stream)
4. High performance in low illumination situations
5. Full 1920x1080p HD Resolutions up to 30 frames per second
6. 2D and 3D noise reduction with our latest "low noise CMOS sensor"
7. Button controls on back of camera
8. RS485 and ONVIF compatible IP remote camera control
9. Wide Dynamic Range
10. C/CS Type Lens Mount
11. Standard 1/4-20 female thread for camera mounting

## Product Specifications

<b>Model</b>	PTZ Optics VL-ZCAM	
<b>Type</b>	PTZ Optics HD 1080p Color Video Camera	
Video System	720P50, 720P60, 1080I50, 1080I60, 1080P25, 1080P30	
Sensor	Panasonic 1/2.7", CMOS, Total Pixels: 2.2M, Effective Pixels: 2.07M	
Scanning Mode	Progressive	
Lens Compatibility	Use C or CL Type for 1/ 2.7" imaging chip	
Included Lens	4x Optical Zoom f2.8mm-12mm, F1.4	
Minimal Illumination	0.05 Lux (F1.8, AGC ON)	
Shutter	1/30s - 1/10000s	
White Balance	Auto, Indoor, Outdoor, One-Push, Manual	
Backlight Compensation	Yes	
Digital Noise Reduction	2D & 3D Digital Noise Reduction	
Video S/N	≥55dB	
Included Lens	28° (tele) - 122° (wide)	
Included Lens	15.8° (tele) – 68.6° (wide)	
Ceiling Installation	Yes	
Image Mirroring	Yes	
Number of Presets	32	
Preset Accuracy	0.0° (No Error)	
HD Output	1x HD-SDI female	
Control Input / Output	1x RS-485: 3.5mm TRS Port (phoenix adaptor provided) Protocols: VISCA/Pelco-D/Pelco-P	
Power Connector	JEITA type (DC IN 12V)	
Input Voltage	12VDC (10.8 - 13.0V DC)	
Current Consumption	1.0A (Max)	
Operating Temperature	23°F - 104°F [-5°C - 40°C]	
Storage Temperature	-4°F - 140°F [-20°C - 60°C]	
Power Consumption	12W (Max)	
Dimensions	2.9"W x 2.4"H x 5.9"D [74mm x 61mm x 150mm]	8.5"D w/ included lens [215mm]
Weight	0.9 lbs. [0.41kg] (1lb w/ included lens) 0.5kg	



## Main Unit & Interface Description

1. Lens mounting position (only for C or CS type lens  
\*)

2. Aperture control interface (only applicable for  
DC automatic aperture)

\*Note To use a C mount camera lens, you need to use  
a special 5mm C/CS adapter ring.

1. Power interface:

Connect external adapter, 12V power supply.

2. Power Indicator Light

3. Menu OK key

4. Menu Up select key

5. Network interface

for 10/100 adaptive Ethernet interface

6. HD-SDI female connector

7. Menu Left select key

8. Menu Down select key

9. Menu Right select key

10. RS485 interface

**Operating tips:** Pressing "OK" button and then  
cycling power while holding down the "OK" button  
for 8 seconds, will restore the factory settings.



## Serial Communication Control

In default working mode, the camera is able to connect to a VISCA or Pelco controller with an RS485 serial interface.

### ➤ RS485 Communication Control

The camera can be controlled via RS485, Half-duplex mode, with support for VISCA, Pelco-D or Pelco-P protocol.

The parameters of RS485 are as follows:

Baud rate: 2400, 4800, 9600, 19200, 38400 bps.

Start bit: 1 bit.

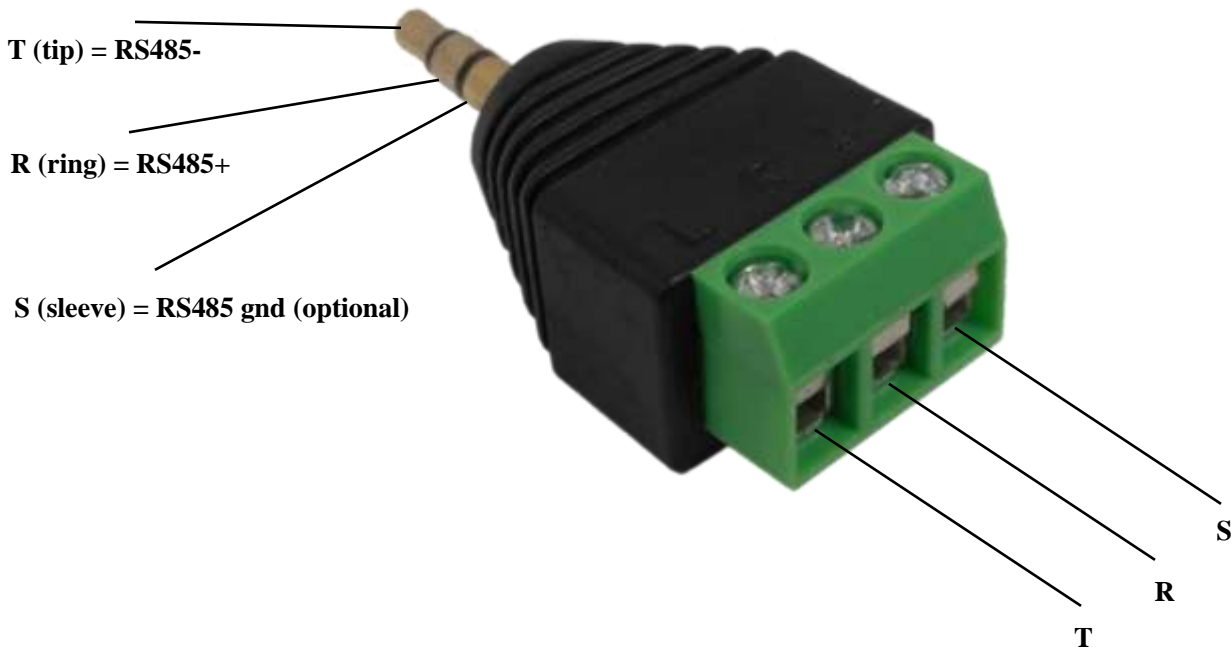
Data bit: 8 bits.

Stop bit: 1 bit.

Parity bit: none.

**Note:** EPTZ functionality must be turned on in the camera menu with a digital zoom limit set to a value greater than 1 for pan and tilt commands to function

## Serial Communication Control





## Basic RS485 Commands

Function	Command Packet	Notes
<b>UP</b>	8x 01 06 01 00 xx 03 01 FF	xx = Tilt Speed
<b>DOWN</b>	8x 01 06 01 00 xx 03 02 FF	Range of xx: 0 - 18
<b>LEFT</b>	8x 01 06 01 xx 00 01 03 FF	xx = Pan Speed
<b>RIGHT</b>	8x 01 06 01 xx 00 02 03 FF	Range of xx: 0 - 18
<b>PAN/TILT STOP</b>	8X 01 06 01 05 05 03 03 FF	
<b>ZOOM IN</b>	8x 01 04 2P 02 FF	P = Zoom Speed
<b>ZOOM OUT</b>	8x 01 04 3P 03 FF	Range of x: 0 - 7
<b>ZOOM STOP</b>	8X 01 04 07 00 FF	

## VISCA Command List

### Part 1: Camera-Issued Messages

ACK/Completion Message			
Command	Function	Command Packet	Comments
ACK/Completion Messages	ACK	z0 4y FF (y: Socket No.)	Returned when the command is accepted.
	Completion	z0 5y FF (y: Socket No.)	Returned when the command has been executed.

z = Camera Address + 8

Error Messages			
Command	Function	Command Packet	Comments
Error Messages	Syntax Error	z0 60 02 FF	Returned when the command format is different or when a command with illegal command parameters is accepted.
	Command Buffer Full	z0 60 03 FF	Indicates that two sockets are already being used (executing two commands) and the command could not be accepted when received.
	Command Canceled	z0 6y 04 FF (y: Socket No.)	Returned when a command which is being executed in a socket specified by the cancel command is canceled. The completion message for the command is not returned.
	No Socket	z0 6y 05 FF (y: Socket No.)	Returned when no command is executed in a socket specified by the cancel command, or when an invalid socket number is specified.
	Command Not Executable	z0 6y 41 FF (y: Execution command Socket No. Inquiry command: 0)	Returned when a command cannot be executed due to current conditions. For example, when commands controlling the focus manually are received during auto focus.

## Part 2: Camera Control Commands

Command	Function	Command Packet	Comments
AddressSet	Broadcast	88 30 01 FF	Address setting
IF_Clear	Broadcast	88 01 00 01 FF	I/F Clear
CAM_Power	On	8x 01 04 00 02 FF	Power ON/OFF
	Off	8x 01 04 00 03 FF	
CAM_Zoom	Stop	8x 01 04 07 00 FF	
	Tele(Standard)	8x 01 04 07 02 FF	
	Wide(Standard)	8x 01 04 07 03 FF	
	Tele(Variable)	8x 01 04 07 2p FF	p = 0(low) - 7(high)
	Wide(Variable)	8x 01 04 07 3p FF	
	Direct	8x 01 04 47 0p 0q 0r 0s FF	pqrs: Zoom Position
CAM_Focus	Stop	8x 01 04 08 00 FF	
	Far(Standard)	8x 01 04 08 02 FF	
	Near(Standard)	8x 01 04 08 03 FF	
	Far(Variable)	8x 01 04 08 2p FF	p = 0(low) - 7(high)
	Near(Variable)	8x 01 04 08 3p FF	
	Direct	8x 01 04 48 0p 0q 0r 0s FF	pqrs: Focus Position
	Auto Focus	8x 01 04 38 02 FF	AF On/Off
	Manual Focus	8x 01 04 38 03 FF	
Auto/Manual	8x 01 04 38 10 FF		
CAM_ZoomFocus	Direct	8x 01 04 47 0p 0q 0r 0s 0t 0u 0v 0w FF	pqrs: Zoom Position tuvw: Focus Position
CAM_WB	Auto	8x 01 04 35 00 FF	Normal Auto
	Indoor mode	8x 01 04 35 01 FF	Indoor mode
	Outdoor mode	8x 01 04 35 02 FF	Outdoor mode
	OnePush mode	8x 01 04 35 03 FF	One Push WB mode
	Manual	8x 01 04 35 05 FF	Manual Control mode
	OnePush trigger	8x 01 04 10 05 FF	One Push WB Trigger
CAM_RGain	Reset	8x 01 04 03 00 FF	Manual Control of R Gain
	Up	8x 01 04 03 02 FF	
	Down	8x 01 04 03 03 FF	
	Direct	8x 01 04 43 00 00 0p 0q FF	pq: R Gain
CAM_Bgain	Reset	8x 01 04 04 00 FF	Manual Control of B Gain
	Up	8x 01 04 04 02 FF	
	Down	8x 01 04 04 03 FF	
	Direct	8x 01 04 44 00 00 0p 0q FF	pq: B Gain

CAM_AE	Full Auto	8x 01 04 39 00 FF	Automatic Exposure mode
	Manual	8x 01 04 39 03 FF	Manual Control mode
	Shutter priority	8x 01 04 39 0A FF	Shutter Priority Automatic Exposure mode
	Iris priority	8x 01 04 39 0B FF	Iris Priority Automatic Exposure mode
	Bright	8x 01 04 39 0D FF	Bright Mode(Manual control)
CAM_SlowShutter	AutoSlowShutterLimit	8x 01 04 2A 0p 00 FF	
CAM_Iris	Reset	8x 01 04 0B 00 FF	Iris Setting
	Up	8x 01 04 0B 02 FF	
	Down	8x 01 04 0B 03 FF	
	Direct	8x 01 04 4B 00 00 0p 0q FF	pq: Iris Position
CAM_Gain	Reset	8x 01 04 0C 00 FF	Gain Setting
	Up	8x 01 04 0C 02 FF	
	Down	8x 01 04 0C 03 FF	
	Direct	8x 01 04 0C 00 00 0p 0q FF	pq: Gain Position
	Gain Limit	8x 01 04 2C 0p FF	p: Gain Position
CAM_Bright	Reset	8x 01 04 0D 00 FF	Bright Setting
	Up	8x 01 04 0D 02 FF	
	Down	8x 01 04 0D 03 FF	
	Direct	8x 01 04 0D 00 00 0p 0q FF	pq: Bright Position
CAM_ExpComp	On	8x 01 04 3E 02 FF	Exposure Compensation On/Off
	Off	8x 01 04 3E 03 FF	
	Reset	8x 01 04 0E 00 FF	Exposure Compensation Amount Setting
	Up	8x 01 04 0E 02 FF	
	Down	8x 01 04 0E 03 FF	
	Direct	8x 01 04 4E 00 00 0p 0q FF	
CAM_BackLight	On	8x 01 04 33 02 FF	Back Light Compensation On/Off
	Off	8x 01 04 33 03 FF	
CAM_NR(2D)Mode	Auto	8x 01 04 50 02 FF	ND2D Auto/Manual
	Manual	8x 01 04 50 03 FF	
CAM_NR(2D)Level	-	8x 01 04 53 0p FF	p: NR Setting (0: Off, level 1 to 5)
CAM_NR(3D)Level	-	8x 01 04 54 0p FF	p: NR Setting (0: Off, level 1 to 8)
CAM_Flicker	-	8x 01 04 23 0p FF	p: Flicker Settings (0: Off, 1: 50Hz, 2: 60Hz)
CAM_DHotPixel	-	8x 01 04 56 0p FF	p: Dynamic Hot Pixel Setting (0: Off, level 1 to 6)
CAM_ApertureMode( sharpness)	Auto	8x 01 04 05 02 FF	Sharpness Auto

	Manual	8x 01 04 05 02 FF	Sharpness Manual
CAM_Aperture(sharpness)	Reset	8x 01 04 02 00 FF	Aperture Control
	Up	8x 01 04 02 02 FF	
	Down	8x 01 04 02 03 FF	
	Direct	8x 01 04 42 00 00 0p 0q FF	pq: Aperture Gain
CAM_PictureEffect	Off	8x 01 04 63 00 FF	Picture Effect Setting
	B&W	8x 01 04 63 04 FF	
CAM_Memory	Reset	8x 01 04 3F 00 pp FF	pp: Memory Number(=0 to 127)
	Set	8x 01 04 3F 01 pp FF	
	Recall	8x 01 04 3F 02 pp FF	
CAM_LR_Reverse	On	8x 01 04 61 02 FF	Image Flip Horizontal On/Off
	Off	8x 01 04 61 03 FF	
CAM_PictureFlip	On	8x 01 04 66 02 FF	Image Flip Vertical On/Off
	Off	8x 01 04 66 03 FF	
CAM_RegisterValue	-	8x 01 04 24 mn 0p 0q FF	mm: Register No. (=00-7F) pp: Register Value (=00-7F)
CAM_ColorGain	Diret	8x 01 04 49 00 00 00 0p FF	p: Color Gain setting 0h (60%) to Eh (200%)
SYS_Menu	Off	8x 01 06 06 03 FF	Turns off the menu screen
Pan_tiltDrive	Up	8x 01 06 01 VV WW 03 01 FF	VV: Pan speed 0x01 (low speed) to 0x18 (high speed) WW: Tilt speed 0x01 (low speed) to 0x14 (high speed) YYYY: Pan Position ZZZZ: Tilt Position
	Down	8x 01 06 01 VV WW 03 02 FF	
	Left	8x 01 06 01 VV WW 01 03 FF	
	Right	8x 01 06 01 VV WW 02 03 FF	
	Upleft	8x 01 06 01 VV WW 01 01 FF	
	Upright	8x 01 06 01 VV WW 02 01 FF	
	DownLeft	8x 01 06 01 VV WW 01 02 FF	
	DownRight	8x 01 06 01 VV WW 02 02 FF	
	Stop	8x 01 06 01 VV WW 03 03 FF	
	AbsolutePosition	8x 01 06 02 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	
	RelativePosition	8x 01 06 03 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	
	Home	8x 01 06 04 FF	
	Reset	8x 01 06 05 FF	
Pan_tiltLimitSet	LimitSet	8x 01 06 07 00 0W 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF	W: 1 UpRight 0: DownLeft YYYY: Pan Limit Position ZZZZ: Tilt Position
	LimitClear	8x 01 06 07 01 0W 07 0F 0F 0F 07 0F 0F 0F FF	

CAM_AFSensitivity	High	8x 01 04 58 01 FF	AF Sensitivity High/Normal/Low
	Normal	8x 01 04 58 02 FF	
	Low	8x 01 04 58 03 FF	
CAM_SettingReset	Reset	8x 01 04 A0 10 FF	Reset Factory Setting
CAM_Brightness	Direct	8x 01 04 A1 00 00 0p 0q FF	pq: Brightness Position
CAM_Contrast	Direct	8x 01 04 A2 00 00 0p 0q FF	pq: Contrast Position
CAM_Flip	Off	8x 01 04 A4 00 FF	Single Command For Video Flip
	Flip-H	8x 01 04 A4 01 FF	
	Flip-V	8x 01 04 A4 02 FF	
	Flip-HV	8x 01 04 A4 03 FF	
CAM_SettingSave	Save	8x 01 04 A5 10 FF	Save Current Setting
CAM_Iridix	Direct	8x 01 04 A7 00 00 0p 0q FF	pq: Iridix Position
CAM_AWBSensitivity	High	8x 01 04 A9 00 FF	High
	Normal	8x 01 04 A9 01 FF	Normal
	Low	8x 01 04 A9 02 FF	Low
CAM_AFZone	Top	8x 01 04 AA 00 FF	AF Zone weight select
	Center	8x 01 04 AA 01 FF	
	Bottom	8x 01 04 AA 02 FF	
CAM_ColorHue	Direct	8x 01 04 4F 00 00 00 0p FF	p: Color Hue setting 0h (- 14 degrees) to Eh (+14 degrees)

### Part 3: Query Commands

Inquiry Command List			
Command	Command packed	Inquiry Packet	Comments
CAM_PowerInq	8x 09 04 00 FF	y0 50 02 FF	On
		y0 50 03 FF	Off(Standby)
		y0 50 04 FF	Internal power circuit error
CAM_ZoomPosInq	8x 09 04 47 FF	y0 50 0p 0q 0r 0s FF	pqrs: Zoom Position
CAM_FocusAFMode Inq	8x 09 04 38 FF	y0 50 02 FF	Auto Focus
		y0 50 03 FF	Manual Focus
CAM_FocusPosInq	8x 09 04 48 FF	y0 50 0p 0q 0r 0s FF	pqrs: Focus Position
CAM_WBModeInq	8x 09 04 35 FF	y0 50 00 FF	Auto
		y0 50 01 FF	Indoor mode
		y0 50 02 FF	Outdoor mode
		y0 50 03 FF	OnePush mode
		y0 50 05 FF	Manual
CAM_RGainInq	8x 09 04 43 FF	y0 50 00 00 0p 0q FF	pq: R Gain
CAM_BGainInq	8x 09 04 44 FF	y0 50 00 00 0p 0q FF	pq: B Gain
CAM_AEModeInq	8x 09 04 39 FF	y0 50 00 FF	Full Auto
		y0 50 03 FF	Manual
		y0 50 0A FF	Shutter priority
		y0 50 0B FF	Iris priority
		y0 50 0D FF	Bright
CAM_ShutterPosInq	8x 09 04 4A FF	y0 50 00 00 0p 0q FF	pq: Shutter Position
CAM_IrisPosInq	8x 09 04 4B FF	y0 50 00 00 0p 0q FF	pq: Iris Position
CAM_BrightPosInq	8x 09 04 4D FF	y0 50 00 00 0p 0q FF	pq: Bright Position
CAM_ExpCompModeInq	8x 09 04 3E FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_ExpCompPosInq	8x 09 04 4E FF	y0 50 00 00 0p 0q FF	pq: ExpComp Position
CAM_BacklightMode Inq	8x 09 04 33 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_Nosise2DMode Ing	8x 09 04 50 FF	y0 50 02 FF	Auto Noise 2D
		y0 50 03 FF	Manual Noise 3D
CAM_Nosise2DLevel	8x 09 04 53 FF	y0 50 0p FF	Noise Reduction (2D) p: 0 to 5
CAM_Noise3DLevel	8x 09 04 54 FF	y0 50 0p FF	Noise Reduction (3D) p: 0 to 8
CAM_FlickerModeInq	8x 09 04 55 FF	y0 50 0p FF	p: Flicker Settings(0: OFF, 1: 50Hz, 2: 60Hz)



CAM_ApertureModelInq(Sharpness)	8x 09 04 05 FF	y0 50 02 FF	Auto Sharpness
		y0 50 03 FF	Manual Sharpness
CAM_ApertureInq(Sharpness)	8x 09 04 42 FF	y0 50 00 00 0p 0q FF	pq: Aperture Gain
CAM_PictureEffectModeInq	8x 09 04 63 FF	y0 50 02 FF	Off
		y0 50 04 FF	B&W
CAM_MemoryInq	8x 09 04 3F FF	y0 50 0p FF	p: Memory number last operated.
SYS_MenuModeInq	8x 09 06 06 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_LR_ReverseInq	8x 09 04 61 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_PictureFlipInq	8x 09 04 66 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
CAM_RegisterValueInq	8x 09 04 24 mm FF	y0 50 0p 0p ff	mm: Register No. (00 to FF) pp: Register Value (00 to FF)
CAM_ColorGainInq	8x 09 04 49 FF	y0 50 00 00 00 0p FF	p: Color Gain setting 0h (60%) to Eh (200%)
CAM_IDInq	8x 09 04 22 FF	y0 50 0p 0q 0r 0s FF	pqrs: Camera ID
CAM_VersionInq	8x 09 00 02 FF	y0 50 ab cd mn pq rs tu vw FF	ab: Factory Code(00: VHD, 01:MR, 08:T) cd: Hardware Version mnpq: ARM Version rstu: FPGA Version vw: Camera model 01: C Type 02: M Type 03: S Type
VideoSystemInq	8x 09 06 23 FF	y0 50 00 FF	1920x1080i60
		y0 50 01 FF	1920x1080p30
		y0 50 02 FF	1280x720p60
		y0 50 04 FF	NTSC
		y0 50 05 FF	NTSC
		y0 50 06 FF	NTSC
		y0 50 07 FF	1920x1080p60
		y0 50 08 FF	1920x1080i50
		y0 50 09 FF	1920x1080p25
		y0 50 0A FF	1280x720p50

		y0 50 0C FF	PAL
		y0 50 0D FF	PAL
		y0 50 0E FF	PAL
IR_Receive	8x 09 06 08 FF	y0 50 02 FF	On
		y0 50 03 FF	Off
Pan-tiltMaxSpeedInq	8x 09 06 11 FF	y0 50 ww zz FF	ww: Pan Max Speed zz: Tilt Max Speed
Pan-tiltPosInq	8x 09 06 12 FF	y0 50 0w 0w 0w 0w 0z 0z 0z 0z FF	www: Pan Position zzz: Tilt Position
CAM_TypeInq	8x 09 00 03 FF	y0 50 01 FF	C Type
		y0 50 02 FF	M Type
		y0 50 03 FF	S Type
CAM_DateInq	8x 09 00 04 FF	y0 50 0r ss uu vv ww 0D FF	Version dater: Big Version Numbers: Little Version Numberuuuu: Yearvv: Monthww: Day
CAM_ModeInq	8x 09 04 A6 FF	y0 50 00 FF	Mode0
		y0 50 02 FF	Mode2
CAM_GainLimitInq	8x 09 04 2C FF	y0 50 0q FF	p: Gain Limit
CAM_DHotPixelInq	8x 09 04 56 FF	y0 50 0q FF	p: Dynamic Hot Pixel Setting (0: Off, level 1 to 6)
CAM_AFSensitivityInq	8x 09 04 58 FF	y0 50 01 FF	High
		y0 50 02 FF	Normal
		y0 50 03 FF	Low
CAM_BrightnessInq	8x 09 04 A1 FF	y0 50 00 00 0p 0q FF	pq: Brightness Position
CAM_ContrastInq	8x 09 04 A2 FF	y0 50 00 00 0p 0q FF	pq: Contrast Position
CAM_FlipInq	8x 09 04 A4 FF	y0 50 00 FF	Off
		y0 50 01 FF	Flip-H
		y0 50 02 FF	Flip-V
		y0 50 03 FF	Flip-HV
CAM_IridixInq	8x 09 04 A7 FF	y0 50 00 00 0p 0q FF	pq: Iridix Position
CAM_AFZone	8x 09 04 AA FF	y0 50 00 FF	Top
		y0 50 01 FF	Center
		y0 50 02 FF	Bottom
CAM_ColorHueInq	8x 09 04 4F FF	y0 50 00 00 00 0p FF	p: Color Hue setting 0h (- 14 degrees) to Eh (+14 degrees)
CAM_AWBSensitivityInq	8x 09 04 A9 FF	y0 50 00 FF	High
		y0 50 01 FF	Normal

		y0 50 02 FF	Low
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Block Inquiry Command List			
Command	Command packed	Inquiry Packet	Comments
CAM_LensBlockInq	8x 09 7E 7E 00 FF	y0 50 0u 0u 0u 0u 00 00 0v 0v 0v 0v 00 0w 00 FF	uuuu: Zoom Position vvvv: Focus Position w.bit0: Focus Mode 1: Auto 0: Manual
CAM_CameraBlockInq	8x 09 7E 7E 01 FF	y0 50 0p 0p 0q 0q 0r 0s tt 0u vv ww 00 xx 0z FF	pp: R_Gain qq: B_Gain r: WB Mode s: Aperture tt: AE Mode u.bit2: Back Light u.bit1: Exposure Comp. vv: Shutter Position ww: Iris Position xx: Bright Position z: Exposure Comp. Position
CAM_OtherBlockInq	8x 09 7E 7E 02 FF	y0 50 0p 0q 00 0r 00 00 00 00 00 00 00 00 00 FF	p.bit0: Power 1:On, 0:Off q.bit2: LR Reverse 1:On, 0:Off r.bit3~0: Picture Effect Mode
CAM_EnlargementBlockInq	8x 09 7E 7E 03 FF	y0 50 00 00 00 00 00 00 0p 0q rr 0s 0t 0u FF	p: AF sensitivity q.bit0: Picture flip(1:On, 0:Off) rr.bit6~3: Color Gain(0h(60%) to Eh(200%)) s: Flip(0: Off, 1:Flip-H, 2:Flip-V, 3:Flip-HV) t.bit2~0: NR2D Level u: Gain Limit

**Note:**

The [x] in the above table is the camera address, [y] = [x + 8].

### Pelco-D Protocol Command List

Function	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7
Up	0xFF	Address	0x00	0x08	Pan Speed	Tilt Speed	SUM
Down	0xFF	Address	0x00	0x10	Pan Speed	Tilt Speed	SUM
Left	0xFF	Address	0x00	0x04	Pan Speed	Tilt Speed	SUM
Right	0xFF	Address	0x00	0x02	Pan Speed	Tilt Speed	SUM
Zoom In	0xFF	Address	0x00	0x20	0x00	0x00	SUM
Zoom Out	0xFF	Address	0x00	0x40	0x00	0x00	SUM
Focus Far	0xFF	Address	0x00	0x80	0x00	0x00	SUM
Focus Near	0xFF	Address	0x01	0x00	0x00	0x00	SUM
Set Preset	0xFF	Address	0x00	0x03	0x00	Preset ID	SUM
Clear Preset	0xFF	Address	0x00	0x05	0x00	Preset ID	SUM
Call Preset	0xFF	Address	0x00	0x07	0x00	Preset ID	SUM
Auto Focus	0xFF	Address	0x00	0x2B	0x00	0x01	SUM
Manual Focus	0xFF	Address	0x00	0x2B	0x00	0x02	SUM
Query Pan Position	0xFF	Address	0x00	0x51	0x00	0x00	SUM
Query Pan Position Response	0xFF	Address	0x00	0x59	Value High Byte	Value Low Byte	SUM
Query Tilt Position	0xFF	Address	0x00	0x53	0x00	0x00	SUM
Query Tilt Position Response	0xFF	Address	0x00	0x5B	Value High Byte	Value Low Byte	SUM
Query Zoom Position	0xFF	Address	0x00	0x55	0x00	0x00	SUM
Query Zoom Position Response	0xFF	Address	0x00	0x5D	Value High Byte	Value Low Byte	SUM

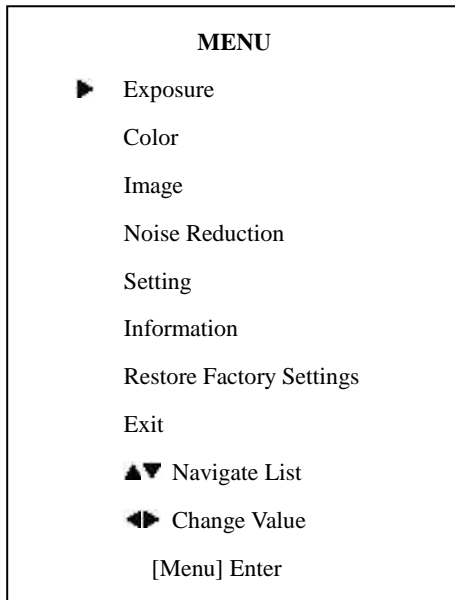
### Pelco-P Protocol Command List

Function	Byte1	Byte2	Byte3	Byte4	Byte5	Byte6	Byte7	Byte8
Up	0xA0	Address	0x00	0x08	Pan Speed	Tilt Speed	0xAF	XOR
Down	0xA0	Address	0x00	0x10	Pan Speed	Tilt Speed	0xAF	XOR
Left	0xA0	Address	0x00	0x04	Pan Speed	Tilt Speed	0xAF	XOR
Right	0xA0	Address	0x00	0x02	Pan Speed	Tilt Speed	0xAF	XOR
Zoom In	0xA0	Address	0x00	0x20	0x00	0x00	0xAF	XOR
Zoom Out	0xA0	Address	0x00	0x40	0x00	0x00	0xAF	XOR
Focus Far	0xA0	Address	0x00	0x80	0x00	0x00	0xAF	XOR
Focus Near	0xA0	Address	0x01	0x00	0x00	0x00	0xAF	XOR
Set Preset	0xA0	Address	0x00	0x03	0x00	Preset ID	0xAF	XOR
Clear Preset	0xA0	Address	0x00	0x05	0x00	Preset ID	0xAF	XOR
Call Preset	0xA0	Address	0x00	0x07	0x00	Preset ID	0xAF	XOR
Auto Focus	0xA0	Address	0x00	0x2B	0x00	0x01	0xAF	XOR
Manual Focus	0xA0	Address	0x00	0x2B	0x00	0x02	0xAF	XOR
Query Pan Position	0xA0	Address	0x00	0x51	0x00	0x00	0xAF	XOR
Query Pan Position Response	0xA0	Address	0x00	0x59	Value High Byte	Value Low Byte	0xAF	XOR
Query Tilt Position	0xA0	Address	0x00	0x53	0x00	0x00	0xAF	XOR
Query Tilt Position Response	0xA0	Address	0x00	0x5B	Value High Byte	Value Low Byte	0xAF	XOR
Query Zoom Position	0xA0	Address	0x00	0x55	0x00	0x00	0xAF	XOR
Query Zoom Position Response	0xA0	Address	0x00	0x5D	Value High Byte	Value Low Byte	0xAF	XOR

## Menu Settings

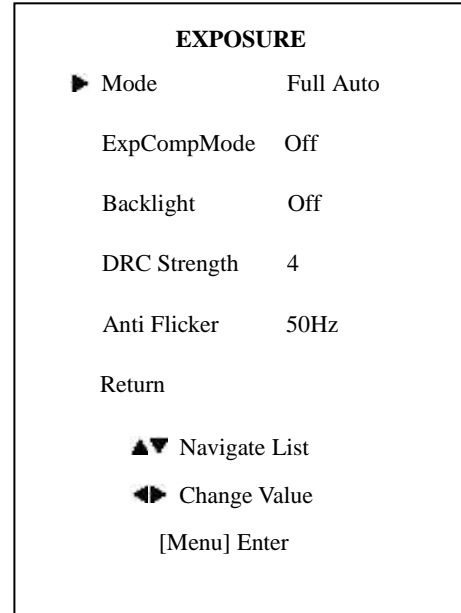
### 1. MENU OPERATION

Press the [OK] button to display the main menu on the screen. Use the up and down arrow buttons to move the cursor to the item to be set. Use the left and right arrow buttons to change the menu setting. Press the [OK] button to enter the corresponding sub-menu. Select “Return” to go to the previous menu.



### 2. EXPOSURE

Move the cursor to the Exposure item in the main menu and press [OK] button. The EXPOSURE menu appears, as shown in the following figure.



**Mode:** Set the camera exposure mode. Optional items: Full Auto, Bright, Shutter Priority.

**Shutter:** Set the Shutter values, only when Shutter Priority Mode is used. Optional items: 1/10000s, 1/6000s, 1/4000s, 1/3000s, 1/2000s, 1/1500s, 1/1000s, 1/725s, 1/500s, 1/350s, 1/250s, 1/200s, 1/125s, 1/100s, 1/90s, 1/60s, 1/30s.

**Bright:** Set the brightness values, only when Bright Mode is used. Optional items: 0 ~ 17.

**WDR:** Wide Dynamic Range, Optional items: 0 ~ 17.

**ExpCompMode:** Set the exposure compensation mode. Optional items: On, Off.

**ExpComp:** Set the exposure compensation value, only when ExpCompMode item is On. Optional items: -7 ~ 7.

**Backlight:** Set the backlight compensation. Optional items: On, Off.

**DRC Strength:** Dynamic Range Control strength. Optional items: 0 ~ 8.

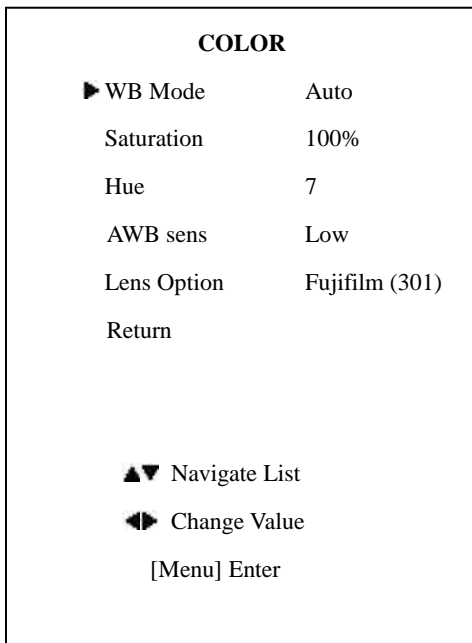
**Anti Flicker:** Anti flicker, Optional items: 50Hz, 60Hz,

Off.

**Return:** Return to previous menu

### 3. COLOR

Move the cursor to the Color item in the main menu and press [OK] button, COLOR menu appears, as shown in the following figure.



**WB Mode:** Set the camera white balance mode. Optional items: Auto, 3000K(Indoor), 4000K, 5000K(Outdoor), 6500K\_1, 6500K\_2, 6500K\_3, One Push WB(ok), Manual.

**R Gain:** Adjust the camera white balance red gain, only effective when the white balance mode is set to Manual.

Optional items: 0 ~ 255.

**B Gain:** Adjust the camera white balance blue gain, effective only when the white balance is set to Manual.

Optional items:

0 ~ 255.

**Saturation:** Color saturation adjustment, Optional items: 60% ~ 200%.

**Hue:** Chroma adjustment, Optional items: 0 ~ 14.

**AWB Sens:** White balance sensitivity. Optional items: Low, Middle, High.

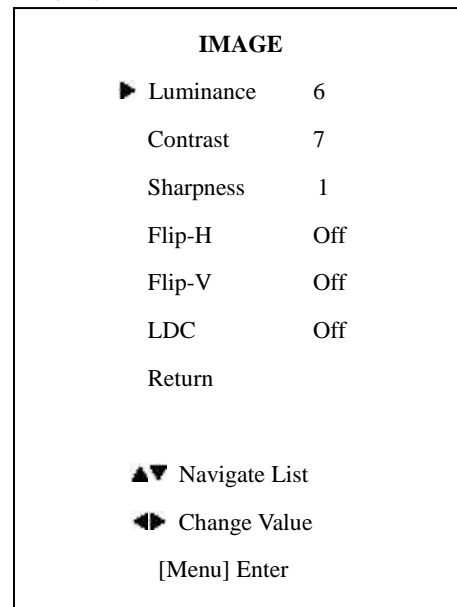
**Style:** Optional items: Ricom

Fujifilm(301), Fujifilm(300), Fujifilm(500), HE45.

**Return:** Return to previous menu

### 4. IMAGE

Move the cursor to the Image item in the main menu and press [OK] button, IMAGE menu appears, as shown in the following figure.



**Luminance:** Brightness adjustment. Optional items: 0 ~ 14

**Contrast:** Contrast adjustment. Optional items: 0 ~ 14

**Sharpness:** Sharpness adjustment. Optional items: Auto, 0 ~ 15

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

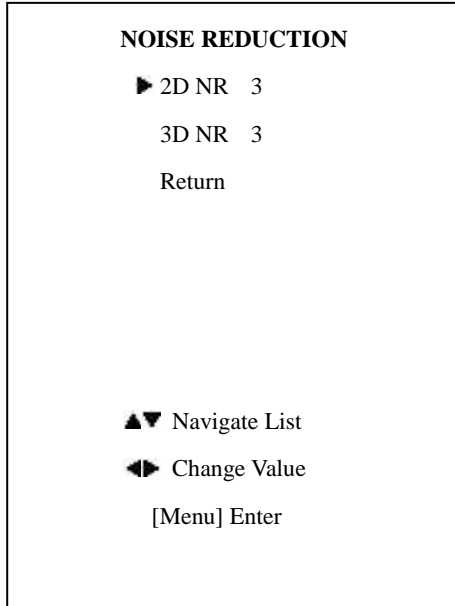
**Flip-V:** Image Flip Vertical. Optional items: On, Off

### 5. NOISE REDUCTION

Move the cursor to the Noise Reduction item in the main



menu and press [OK] button, NOISE REDUCTION menu appears, as shown in the following figure.

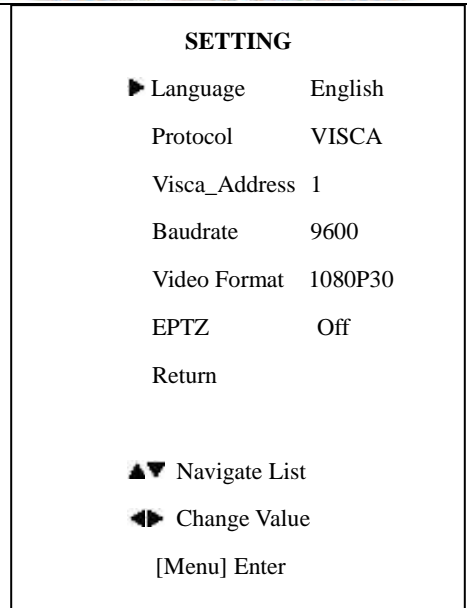


**2D NR:** 2D noise reduction. Optional items: Off, Auto, 1 ~ 5

**3D NR:** 3D noise reduction. Optional items: Off, 1 ~ 8

## 6. SETTING

Move the cursor to the Setup item in the main menu and press [OK] button, SETUP menu appears, as shown in the following figure.



**Language:** Menu language. Optional items: English, Chinese

**Protocol:** Control protocol type. Optional items: VISCA, PELCO-D, PELCO-P

**Visca\_Address:** VISCA address for camera. Optional items: 1 ~ 7

**Baudrate:** Serial port baud rate. Optional items: 2400, 4800, 9600, 19200, 38400

**Video Format:** Resolution and Framerate. Optional items: 720P50, 720P60, 1080I50, 1080I60, 1080P25, 1080P30

**EPTZ:** Electronic pan, tilt and zoom. Optional items: Off, On

## 7. INFORMATION

Move the cursor to the Restore Default item in the main menu and press [OK] button, INFORMATION menu appears, as shown in the following figure.

INFORMATION	
▶Version	1.27
Data	2015-08-14
IP	192.168.100.88
Gateway	192.168.100.1
Netmask	255.255.255.0
Return	
▲▼ Navigate List	
◀▶ Change Value	
[Menu] Enter	

RESTORE FACTORY SETTINGS	
▶ Yes	
No	
Return	
▲▼ Navigate List	
◀▶ Change Value	
[Menu] Enter	

### 8. RESTORE FACTORY SETTINGS

Move the cursor to the Restore Default item in the main menu and press [OK] button, RESTORE FACTORY SETTINGS

menu appears, as shown in the following figure.

**Restore:** Reset all settings to factory default settings.

Optional items: Yes, No

Note: Press [OK] button to confirm, All parameters are then restored to default values, including VISCA Addresses and Pelco addresses.

## Network Connection

### 1. Operating Environment

Operating System: Windows 2000/2003/XP/Vista/7/8.1

Network Protocol: TCP/IP

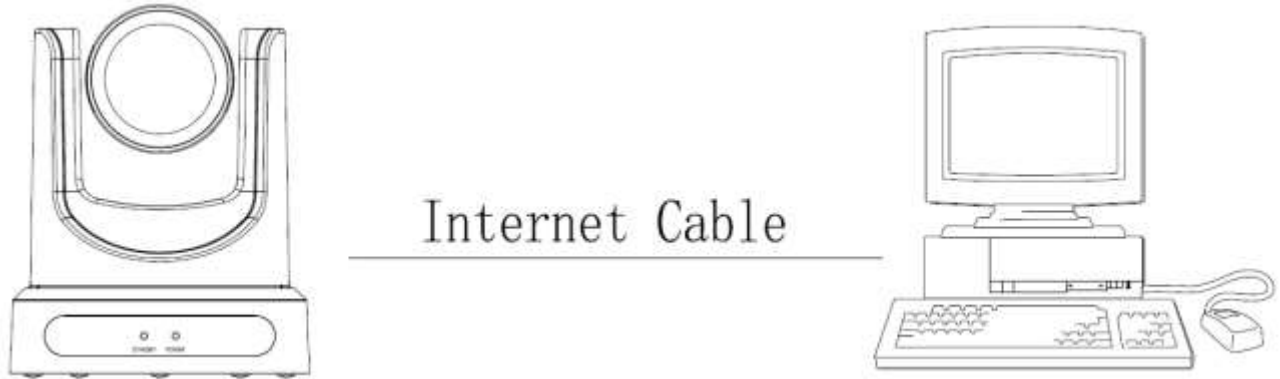
Client PC: P4/128M RAM/40G HD/ support for scaled graphics card, support for DirectX8.0 or more advanced version.

### 2. Equipment Installation

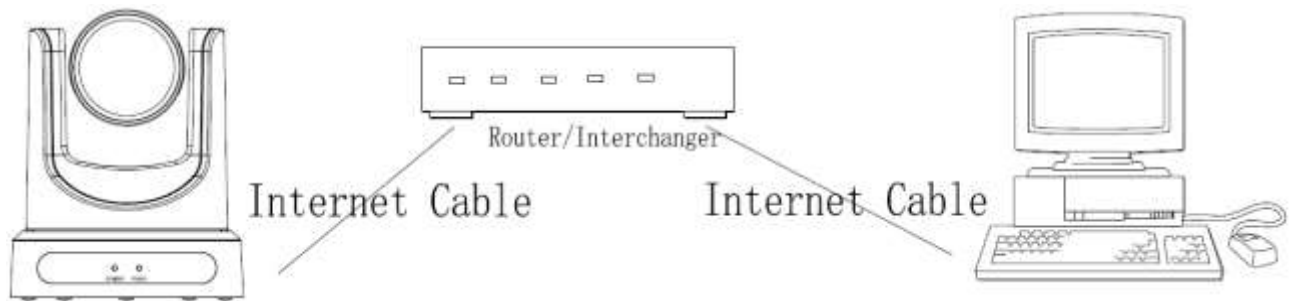
- 1) Connect camera to your network via a CAT5 or CAT6 patch cable or directly to your PC via a CAT5 or CAT6 crossover cable.
- 2) Turn on camera power.
- 3) If successful, the orange network light will illuminate and the green light will start flashing. If unsuccessful, the patch cable is bad, you are using the wrong cable (patch *aka* “*straight-thru*” cable for connection through a LAN; crossover for a direct PC connection) or you have connected to an inactive network jack.

### 3. Network Connection

Connection method between network camera and computer, as in pictures 1.1 and 1.2, below:



**Picture 1.1 Direct connections via “cross-over” network cable**

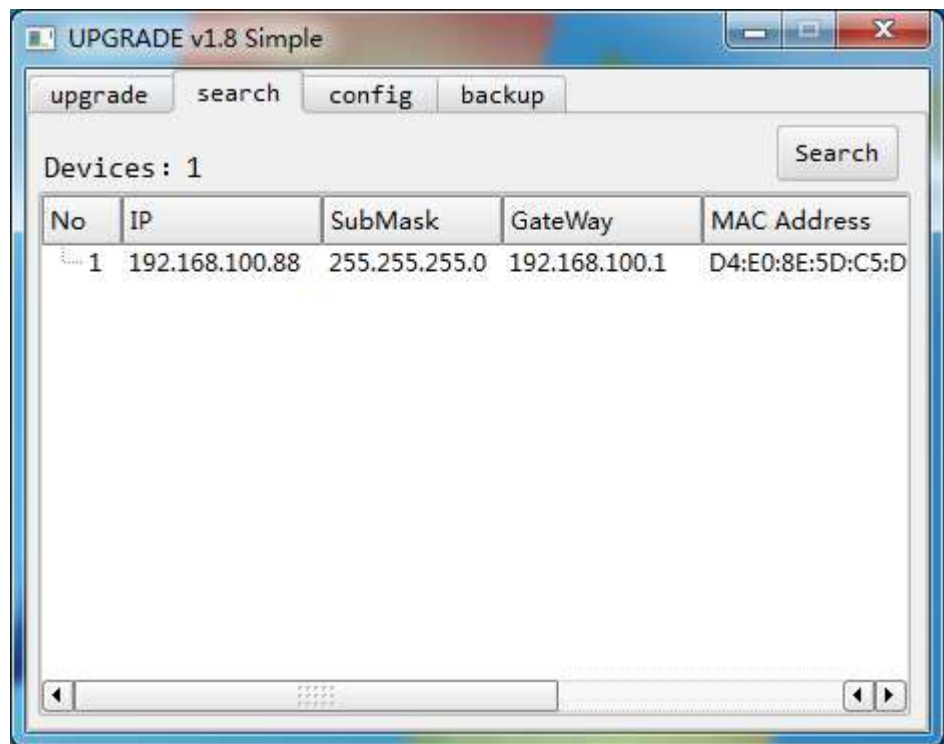


**Picture 1.2 Connections to LAN via patch cable to LAN wall jack or LAN switch**

## IP camera viewing and control via IP

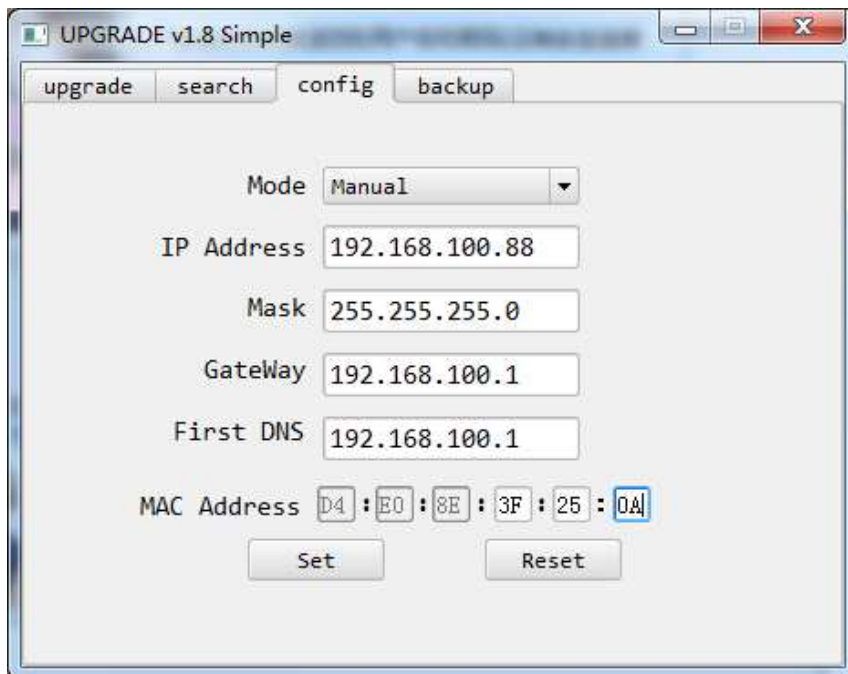
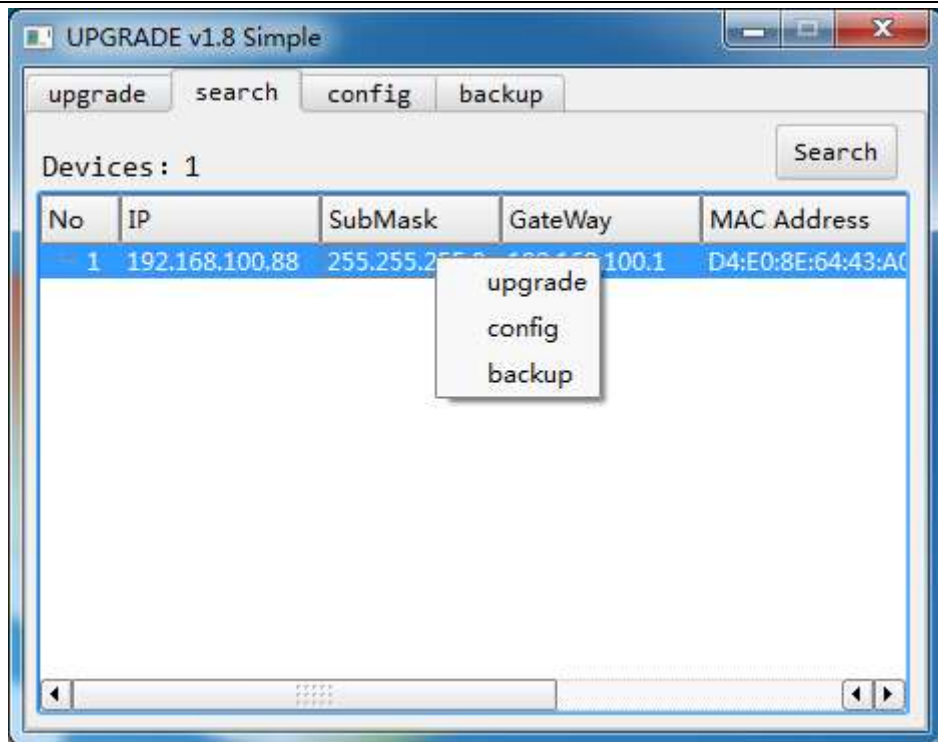
### 1 Setting up the camera's IP address:

1.1 Connect the Camera to the network (or PC). Turn on the camera power. The current IP address can be searched via the “Upgrade” software (software upgrading tool, named “upgrade\_En.exe” or “upgrade.exe” that can easily be downloaded from the <http://www.ptzoptics.com/downloads/> web site). Run “upgrade.exe”. Click the [Search] tab. Click the “Search” Button. The software will show the camera's IP address, subnet mask, network gateway and the camera's MAC address, as shown below:



If you have multiple cameras on the network, you can identify the camera you are working with by disconnecting and reconnecting the camera to see which MAC address belongs to that camera.

To set the IP address for the camera to work within your network environment, click the [config] tab or right click the listing in the [search] tab and select “config”.



Enter your new IP information as required and click the “Set” button. Note: In order to view or control the camera, the PC must be able to see this IP address, either by virtue of being in the same subnet or by appropriate routing settings in a router or network switch that connects these networks.



 **NOTE!**

**Camera's Factory Default IP Address and Login:**

**IP: 192.168.100.88**

**User name: admin**

**Password: admin**

**2 Accessing the IP Camera:**

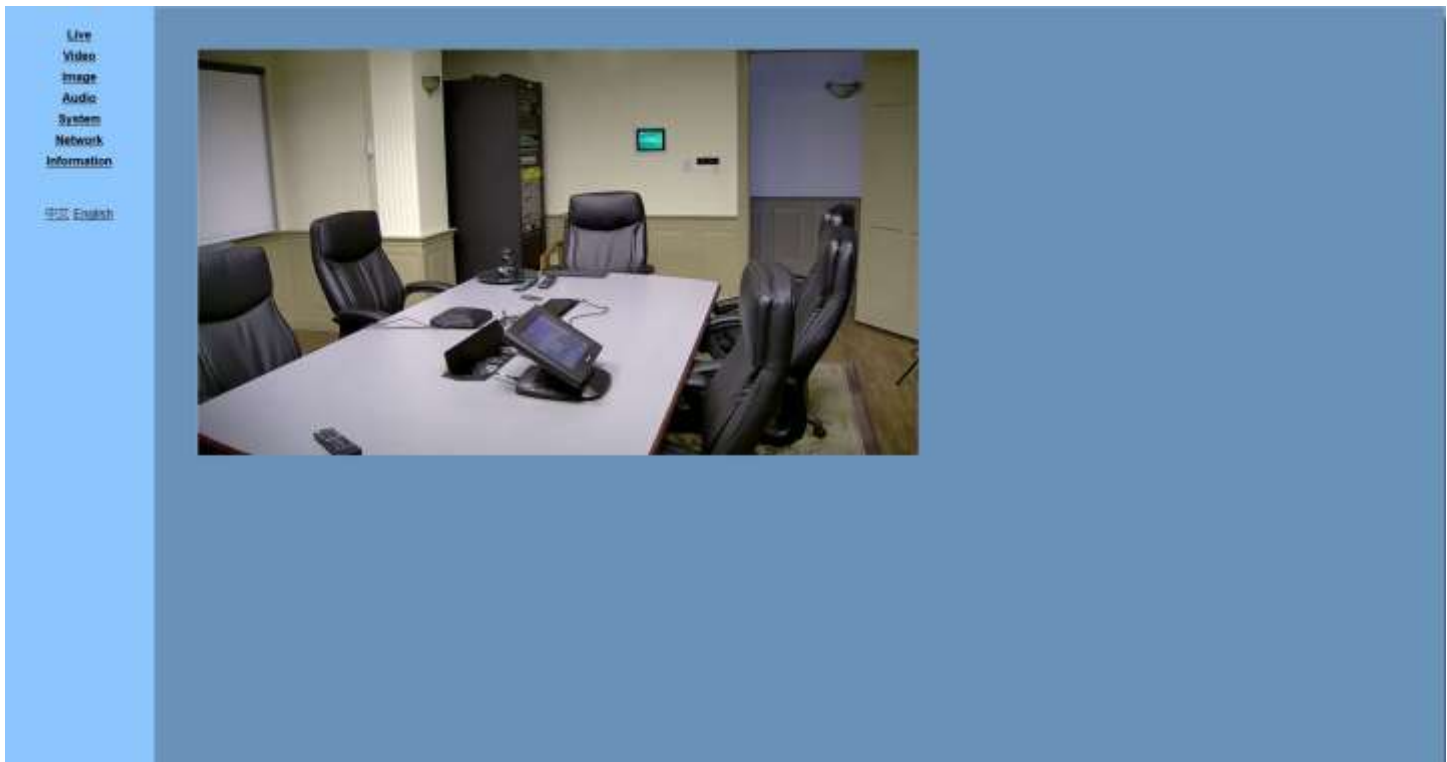
2.1 Input **http://[your IP address]**, (where *[your IP address]* is the IP address set for the camera) into the URL line of your browser. Results may be better with IE web browser; others may cause latency or fail to show a live image.

A login window will pop up, as shown below:



2.2 Input the User name and the Password and click "OK" to enter the web interface.





 **NOTE !**

If connecting to this type of camera for the first time, you may need to install the free VLC player software. Please go to <http://www.videolan.org/vlc/>. Click the download VLC button. If a download window appears, click “Save”. Then install the VLC player software by executing the file from your Downloads directory.



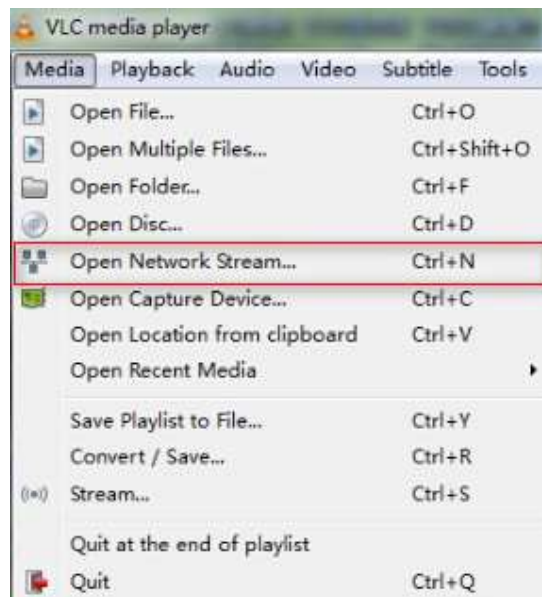
After installing the VLC player, log back into the camera’s IP interface:

## IP Camera accessed/controlled by WAN (internet)

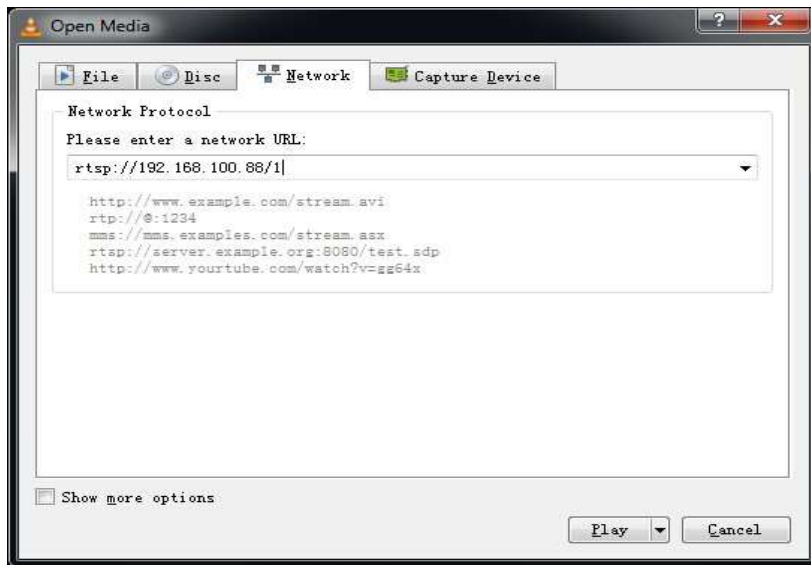
1. **Setup camera for IP** (see “setting up the camera’s IP” section above)
2. **Setup “Dynamic DNS” for your IP address**
  - 2.1. Select a Dynamic DNS provider and setup a host/domain name for your camera.
  - 2.2. Setup your network router for port forwarding, so that incoming requests to the Host/Domain Name are forwarded to your camera.

## VLC stream media player monitoring

1. **VLC media player procedure**
  - 1.1 Install the free VLC Media Player software (be sure to get appropriate version for your OS, Windows, MAC).  
<http://www.videolan.org/vlc/index.html>
  - 1.2 Open VLC media player, select the "Media" menu and click on “Open Network Steam”, or type "Ctrl+N".



- 1.3 Type in the URL address as follows: `rtsp://<Your Ip Address>:<your port number>/<desired stream number>` (1 for Main stream or 2 for sub stream). For example, you would type: `rtsp://192.168.100.88:554/1` Note: When the RTSP port number is the default value of 554 it may be omitted from the address as shown below.



## IP Camera Parameter Setup

### 1 Homepage introduction

#### 1.1 Home Page

All pages include 2 areas:

On the left is the menu

On the right is real time monitoring - displaying video image and the Parameter settings

#### 1.2 Video viewing window

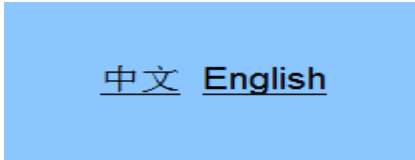
Click “**Live**” in the menu area. The video viewing window will be resized based upon video resolution, the higher the resolution is, the bigger the playing area is. Double click the viewing window and it will show in full-screen. Double click again and it will return to the initial size.

The Status bar in the viewing window is as shown below:



- 1) Video playback/pause button: controls real-time video. Pause to freeze the image, play to return to live video.
- 2) Audio control buttons: Mute and Volume controls for audio input on camera, if being used.
- 3) Full screen button will switch between Full Screen and Windowed view.

### 1.3 Language selection

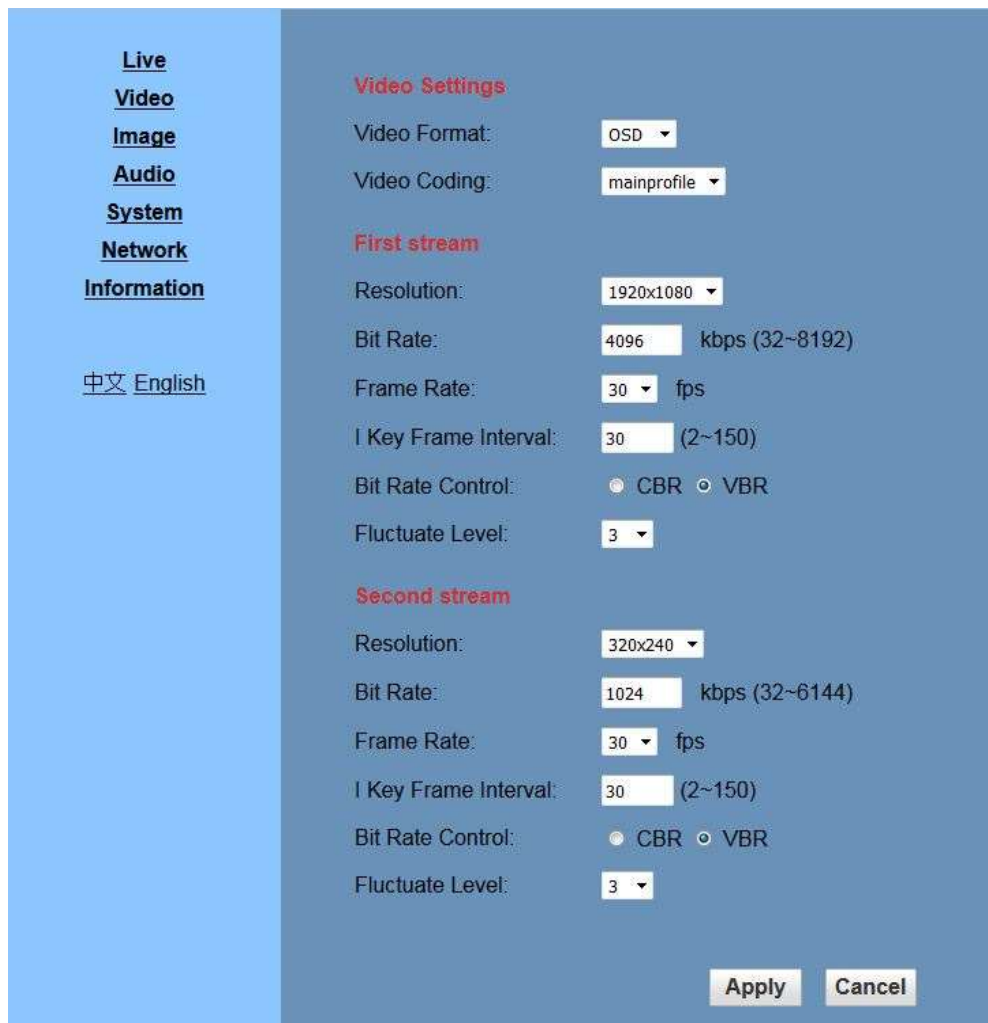


Click either “Chinese” or “English” to change the language of the menu.

## 1 Media

### 1.1 Video Setup

Click "Video". The streaming parameters may now be set in the right side area. The camera can send 2 simultaneous streams. For example, one in HD and one in SD so that both PCs and phones may have their own stream resolution.



1) **Video Settings**

**Video format**

Supports 50HZ, 60Hz and OSD (OSD = Format set by menu on camera OSD). Default: OSD

**Video Coding**

Support both “baseline” and “mainprofile” formats for H.264 video encoding.

Baseline is typically used for video conferencing.

2) **First Stream**

**Resolution**

Set the desired video stream resolution. The first stream allows 1920x1080 (1080p), 1280x720 (720p) or 1024x576. The second stream allows 720x576, 480x270 or 320x240. Higher resolutions will consume more bandwidth.

**Bit Rate**

Users can assign the bit rate of the stream (from 32 – 6144 kbps). Higher bit rates will provide for a higher quality image, if your network bandwidth is sufficient to support the rate.

**Frame rate:**

Users can specify the maximum frame rate (fps or frames per second). Higher frame rates provide smoother video but require higher bit rate settings.

**I key frame interval:**

Affects the quality of the video compression. This setting defines how many predicted frames will be used for each actual frame (from 2-150). Shorter intervals increase video quality at the cost of requiring higher bit rates in order to look good.

**Bit Rate Control method:**

Constant bit rate: video encoder will encode at a constant rate as set in bitrate setting

Variable bit rate: video encoder will encode at a variable rate with maximum as set in bit rate setting, allowing for low motion scenes to use less bandwidth.

**Fluctuate level**

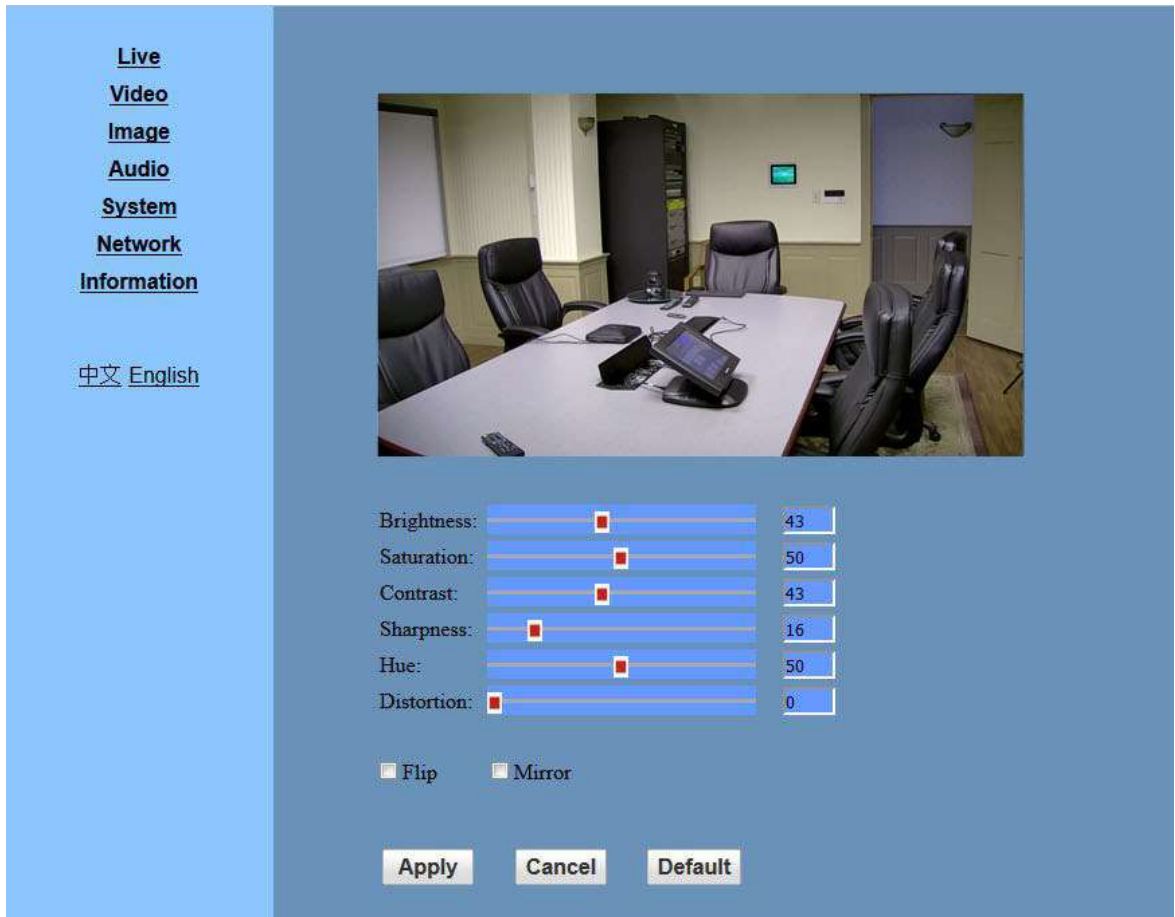
This setting affects how aggressive variable bit rate adjustments will be (1-6). Spikes that are too large may affect video quality. Low levels will not save on as much bandwidth.

3) **Second Stream** (See parameters for first stream).



## 1.2 Image Setup

Click “Image”. The image parameters may now be set in the right side area.



### Brightness

Image brightness 0-100. Use the slider control. The box on the right shows the corresponding numerical value. The Default setting is 43.

### Saturation

Color Saturation 0-100. Use the slider control. The box on the right shows the corresponding numerical value. The Default setting is 50.

### Contrast

Contrast 0-100. Use the slider control. The box on the right shows the corresponding numerical value. The Default setting is 43.

### Sharpness

Sharpness 0-100. Use the slider control. The box on the right shows the corresponding numerical value. The Default setting is 16.



**Hue**

Hue 0-100. Use the slider control. The box on the right shows the corresponding numerical value. The Default setting is 50.

**Distortion**

Adjusts the wide-angle-lens image distortion 0- 100. Use the slider control. The box on the right shows the corresponding numerical value. The Default setting is 0.

**Flip & Mirror**

Check the “Flip” box to invert the image vertically for a ceiling mount. Check the “Mirror” box to invert the image horizontally. The default setting is unchecked.

**Apply, Cancel and Default Buttons**

After adjusting the parameters, press the "Apply" button to save settings. Press the "Cancel" button to cancel the adjustment of the parameters. Press the "Default" button to return to the default value.

**1.3 Audio Setup** – Note: Audio capability is not active on this model.

**1.4 System Settings**

Click “System”. The system parameters may now be set in the right side area.



**1) Initialize**

**Work Mode:** RTSP (Real Time Streaming Protocol) is the only streaming protocol currently supported.

**Reboot:** Click the "Reboot" button to initiate a system restart. This is required after changing some settings.

**2) User**

**User and Password:** The user can modify the password (letters and Numbers only).

The default settings are UserName: **admin** and Password: **admin**

**Apply and Cancel Buttons**

After modifying the parameters, press the "Apply" button to save. Press the "Cancel" button to leave settings unchanged.

## 1.5 Network Settings

Click “Network”. The network parameters may now be set in the right side area.

**Live**  
**Video**  
**Image**  
**Audio**  
**System**  
**Network**  
**Information**

中文 English

**Lan Settings**  
 IP Configuration Type: Fixed IP Address  
 IP Address: 192.168.111.84  
 Subnet Mask: 255.255.255.0  
 Gateway: 192.168.111.1  
 DNS Address: 192.168.111.1  
 MAC Address: 04 E0 8E 00 20 49

**Port Settings**  
 HTTP Port number: 80 (80)  
 RTSP Port: 554 (554)

**RTMP Settings**  
 First stream:  On  Off  Video  Audio  
 MRL: rtmp://192.168.100.138/live/stream0  
 Second stream:  On  Off  Video  Audio  
 MRL: rtmp://192.168.100.138/live/stream1

**RTSP Settings**  
 RTSP Auth:  On  Off

**ONVIF Setting**  
 ONVIF:  On  Off  
 ONVIF Auth:  On  Off

**Multicast Settings**  
 Multicast:  On  Off  
 Address: 224.1.2.3  
 Port: 6688

Apply Cancel

### 1) LAN Settings

IP settings for the device can be set here. The Default the IP address of the camera is 192.168.100.88. The MAC address can be modified but should be left as set by the factory. Please note that after changing the IP settings for the camera, you may not be able to reconnect until your PC is set for and connected to the same subnet or visible via proper network routing.

### 2) Port Settings

While the IP address identifies the device, the camera uses multiple ports.

**HTTP Port:** This is the port for the web application (the default http port: 80)

**RTSP Port:** The camera supports the RTSP streaming protocol. The default port: 554.

**RTMP settings:** RTMP must stream to an RTMP server

- For first and second (optional) stream:
  - Set stream to On or Off (default)
  - Include Video and/or Audio in stream by checking box.
  - Type in the MRL (media resource locator – like a URL for media)

**RTSP settings:**

- RTSP Auth: Set to On or Off (Default)

**ONVIF Settings:** Note: ONVIF must be set to On and Digital Zoom Limit set to an amount greater than 1 for ONVIF PTZ control to function.

- ONVIF: Set to On or Off (Default)
- ONVIF Auth: Set to On or Off (Default)

**Multicast Settings:**

- Multicast: Set to On or Off (Default)
- Address: Enter the multicast address
- Port: Enter the multicast port

**Apply and Cancel Buttons**

After modifying the parameters, press the "Apply" button to save. Press the "Cancel" button to leave settings unchanged.

## 1.6 Device Information

Click “Information”

Shows the current device information, as shown below. You may change the device ID as required for your application.

**Live**  
**Video**  
**Image**  
**Audio**  
**System**  
**Network**  
**Information**

中文 [English](#)

**Information**

Device ID:

Software Version:

Webware Version:

## Maintenance and Troubleshooting

### Camera Maintenance

- Use a soft cloth or lotion-free tissue to clean the camera body.
- Use a soft dry lint-free cloth to clean the lens. If the camera is very dirty, clean it with a diluted neutral detergent. Do not use any type of solvent or harsh detergent, which may damage the surface.

### Unsupported Applications

- Do not shoot extremely bright objects for a long period of time, such as sunlight, ultra-bright light sources, etc...
- Do not operate in unstable lighting conditions, otherwise the image may flicker.
- Do not operate close to powerful electromagnetic radiation, such as TV or radio transmitters, etc...

### Troubleshooting

- No image
  1. Check whether the power cord is connected, voltage is OK, POWER lamp is lit.
  2. Check that the HD-SDI cable is connected correctly.
  3. Ensure that the destination device is switched to the HD-SDI port that you have plugged into.
- Abnormal display of image
  1. Be sure to use a resolution and refresh rate that is supported by your software.
- Image is shaky or vibrating.
  1. Check whether camera is mounted solidly or sitting on a steady horizontal and level surface.
  2. Check the building and any supporting furniture for vibration. Ceiling mounts are often affected by building vibration more than wall mounts.
  3. Any external vibration that is affecting the camera will be more apparent when in tele zoom (zoomed in) settings.

### Serial Control

1. Make sure the camera is on and functioning.
2. Verify that the RS485 cable is connected correctly and using the proper pinout.
3. Verify the communication settings of the control software or device (e.g. joystick).
4. Verify that the communication port on the controlling device is activated (e.g. Com port on PC).
5. Verify that all communication settings in the OSD Setup Menu correlate to the commands being used (e.g. VISCA address).

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