



Box Camera 20x Zoom IP White

AV-CM60-IPX-BOX

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Disclaimer and Contact

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Introduction

Purpose of This Manual

This Manual describes the safety precautions and the instructions for safe unpackaging, installation, operation, maintenance and disposal of the Avonic-IPX-BOX. In this Manual, the Avonic-IPX-BOX is referred to as the 'Product'.

Target Audience

This Manual is developed for installation technicians who install the Product at client sites, and for IT professionals who are responsible for operating the Product.

Document Structure

The Manual is subdivided into the following *Chapters*:

1. [Introduction](#)
2. [Safety](#)
3. [Package Contents](#)
4. [Product Overview](#)
5. [Installation](#)
6. [Operation](#)
7. [Maintenance](#)
8. [Troubleshooting](#)
9. [Contact](#)

Additionally, it contains the following:

- [VISCA camera and Command List](#)
- [VISCA camera Control Command List](#)
- [VISCA Query Command List](#)
- [PELCO-D Protocol Command List](#)
- [PELCO-P Protocol Command List](#)
- [Dimensions](#)

Safety

Important safety information

⚠ WARNING: Failure to follow these safety instructions could result in fire, electric shock, injury, or damage to this Product or other property. Read all the safety information below before using this Product.

⚠ WARNING: Before operating this product, please read the manual thoroughly and retain it for future reference. The manual can be downloaded on www.avonic.com.

Handling

Handle this Product with care. It is made of metal, glass, and plastic and has sensitive electronic components inside. this Product can be damaged if dropped, burned, punctured, or crushed, or if it comes in contact with liquid. If you suspect damage to this Product, discontinue use of this Product, as it may cause overheating or injury.

⚠ WARNING: Do not pick up and move the unit while a tripod is attached. The fitting may break under the weight of the tripod, which may result in injury.

Installation

Set up this Product on a hard, stable surface or mount it to a wall or ceiling. Only use an Avonic mount for mounting to a wall or ceiling. Ensure the mounting construction is capable of supporting four times the weight of the Product. (See 'General Specifications > Weight product' in the Product Datasheet for the exact weight.) Make sure to make use of a safety loop or drop protection that is capable of preventing the Product from falling if the mounting construction fails. Never install a product above persons to prevent any risk on injuries when it falls down.

⚠ WARNING: In order to maintain adequate ventilation, do not install or place this unit in a bookcase, built-in cabinet or any other confined space. To prevent risk of electric shock or fire hazard due to overheating, ensure that curtains and any other materials do not obstruct the ventilation.

⚠ WARNING: Check the installation at least once a year. An improper installation could cause the unit to fall.

Repairing

Don't open this Product and don't attempt to repair this Product yourself. Disassembling this Product may damage it or may cause injury to you. If this Product is damaged, malfunctions, or comes in contact with liquid, contact Avonic or an Avonic Authorized Service Provider. Repairs by service providers other than Avonic or an Avonic Authorized Service Provider may not involve the use of Avonic genuine parts and may affect the safety and functionality of the device. You can find more information about repairs and service at www.avonic.com.

Power

Power this Product with the included cable and power adapter. Other adapters may not meet applicable safety standards, and connecting with such adapters could pose a risk of death or injury.

⚠ WARNING: Using damaged cables, or using the Product when moisture is present, can cause fire, electric shock, injury, or damage to this Product or other property. When you power this Product, make sure the cable is fully inserted into the power adapter before you plug the adapter into a power outlet. It's important to keep this Product, the cable, and the power adapter in a well-ventilated area when in use.

Power adapter

To operate the Avonic power adapter safely and reduce the possibility of heat-related injury or damage, plug the power adapter directly into a power outlet. Don't use the power adapter in wet locations, and don't connect or disconnect the power adapter with wet hands. Stop using the power adapter and any cables if any of the following conditions exist:

- The power adapter plug or prongs are damaged.
- The cable becomes frayed or otherwise damaged.
- The power adapter is exposed to excessive moisture, or liquid is spilled into the power adapter.
- The power adapter has been dropped, and its enclosure is damaged.

Intended use

This Product shall not be used in the residential area and shall only be installed and operated by experienced technicians.

Not a medical device

This Product is not a medical device and should not be used as a substitute for professional medical judgment. It is not designed or intended for use in the diagnosis of disease or other conditions, or in the cure, mitigation, treatment, or prevention of any condition or disease. Please consult your healthcare provider prior to making any decisions related to your health.

Explosive and other atmospheric conditions

Using this Product in any area with a potentially explosive atmosphere, such as areas where the air contains high levels of flammable chemicals, vapours, or particles (such as grain, dust, or metal powders), may be hazardous. Exposing this Product to environments having high concentrations of industrial chemicals, including near evaporating liquified gasses such as helium, may damage or impair this Product functionality. Obey all signs and instructions.

High-consequence activities

This device is not intended for use where the failure of the device could lead to death, personal injury, or severe environmental damage.

Package contents

| Quantity | Description | Avonic SKU |
|----------|---------------------|--------------|
| 1 pc | PTZ Camera | CM60-IPX-BOX |
| 1 pc | Power Supply 12V/1A | CM-PSU-BOX |

Accessories



Wall Mount for CM60-IPX-BOX

Avonic SKU : CM-WMW-BOX

Product Overview

The Avonic CM-series cameras are designed for fixed installations. Without concessions on quality, these cameras are an affordable choice for many installations. The cameras are equipped with a Panasonic CMOS sensor combined with a glass high-quality glass lens with 12x /20x /30x optical zoom. Control these cameras over RS232/485 with the Avonic CM-CON100 PTZ controller or any third party controller that supports VISCA, Pelco-P/D protocols.

These high-quality conference video cameras, with resolutions up to 1080p/30 and H.265 encoded ultra-low bandwidth video streams, have adopted Panasonic's HD CMOS sensor, which produces high-quality images. The high SNR (55db) of the CMOS sensor combined with 2D and 3D noise reduction algorithms, effectively reduce the noise, even under low light conditions. Supports HDMI, SDI and CVBS output with high effective transmission distances. Using RS232/485 interface all the parameters of the camera can be remote-controlled.

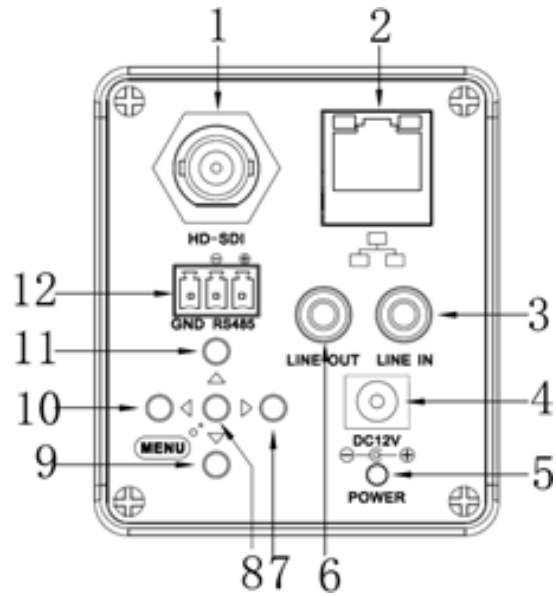
Features

- 20x Optical Zoom. TAMRON high quality super telephoto lens.
- H.264 and H.265 Support, enabling full HD 1080p/30fps video stream by ultra-low bandwidth, latency within 200ms.
- 1080P Full HD, Panasonic's 1/2.7 inch, 2.07 million effective pixels high quality HD CMOS sensor.
- Double Interface, 3G-SDI interface and IP streaming at the same time.
- AAC Audio Encoding, better sound quality and smaller bandwidth.
- Low-light, high SNR of CMOS sensor combined with 2D and 3D noise reduction algorithm, effectively reduce the noise, even under low illumination conditions.

Main Unit

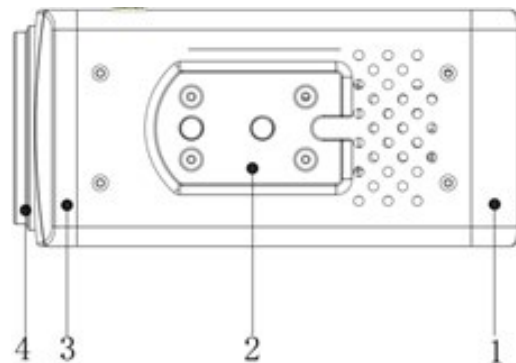
Input and Output Description

1. 3G-SDI interface
2. RJ45 interface
3. Audio Line in interface
4. DC 12V power interface
5. Power light (flashing red when on)
6. Audio Line out interface
7. Right key
8. MENU key
9. Down key
10. Left key
11. Up key
12. RS485 interface



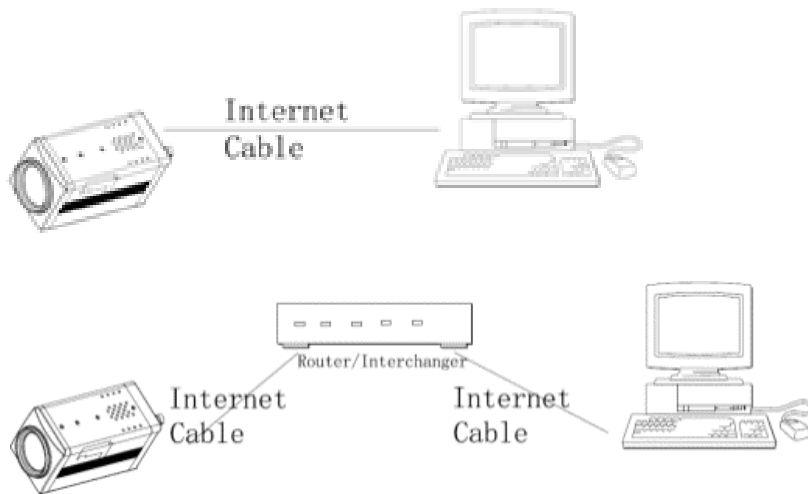
Bottom Parts

- 1 Camera Back Cover
- 2 Installation Positioning Track
- 3 Camera Front Cover
- 4 Lens Cap



Installation

Connection Diagram



Power adapter

This equipment is equipped with a 12V/1A DC power supply. Insert the power supply according to the requirements. The Power LED is flashing red when turned on.

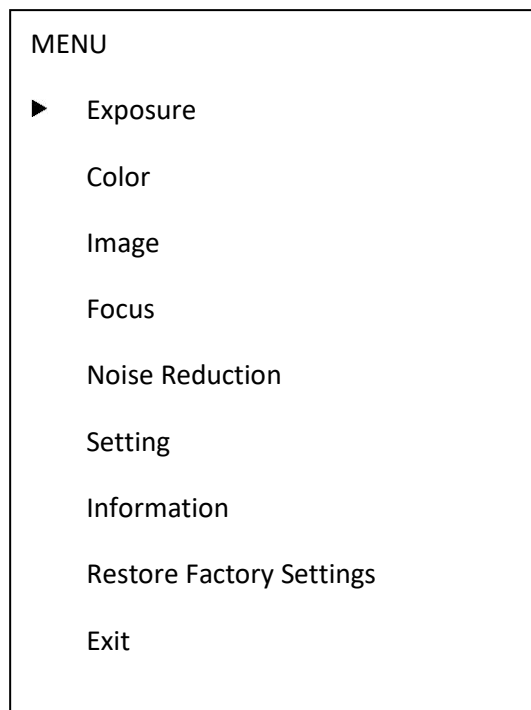
Operation

OSD Menu

Use the 5 keys on the back of the camera to control the OSD Menu.

MENU (Main Menu)

Directly press "MENU" button to enter the main menu.



Use the select key up and down. Choose a menu item, press **【MENU】** to enter submenu.

Choose[Exit] press **【MENU】** to exit menu.

EXPOSURE

| EXPOSURE | | |
|----------|--------------|------|
| ► | Mode | Auto |
| | ExpCompMod | On |
| | ExpComp | -1 |
| | GainLimit | 3 |
| | Backlight | Off |
| | DRC Strength | 3 |
| | Anti Flicker | 50Hz |
| | Return | |

- Mode: Set the camera exposure mode, Optional items: Auto, Bright, Iris Priority, Shutter Priority, Manual, WDR.
- Shutter: Set the Shutter values, only when the Mode for the Shutter Priority Mode and Manual Mode effective, 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.
- Iris: Set the Iris values, only when the Mode for the Iris Priority and Manual Mode effective, Optional items: F1.8,F2.0,F2.4,F2.8,F3.4,F4.0,F4.8,F5.6,F6.8,F8.0,F9.6,F11.0,Close
- GainLimit: Set the Gain value, Optional items: 0 ~ 15.
- Bright: Set the brightness values, only when the effective Mode for Bright Mode, Optional items: 0 ~ 17.
- ExpCompMode: Set the exposure compensation mode, can be installed: On, Off.
- ExpComp: Set the exposure compensation value, only when ExpCompMode item to On effective, Optional items: -7 ~ 7.
- Backlight: Set the backlight compensation, Optional items: On, Off.
- DRC Strength: Set up digital wide dynamic strength, can set up different levels of wide dynamic effect, Optional items: 0 ~ 8.

- Anti Flicker: Set the flashing function, Optional items: 50Hz, 60Hz, Off.
- DRC Strength: Set the DRC strength values, Optional items: 0 ~ 6.
- Return: get back

COLOR

| | | |
|-------|------------|------|
| COLOR | | |
| ▶ | WB Mode | Auto |
| | AWB Sens | Low |
| | RG Tuning | 2 |
| | BG Tuning | -1 |
| | Saturation | 100% |
| | Hue | 7 |
| | Return | |

- WB Mode: Set the camera white balance mode, Optional items: Auto, 3000K/Indoor, 4000K, 5000K/Outdoor, 6500K-1, 6500K-2, 6500K-3, One Push, Manual.
- RGTuning: Adjust the camera white balance mode of red tuning, are effective only when the white balance mode to Auto, Optional items: -10 ~ 10.
- BGTuning: Adjust the camera white balance mode of blue tuning, are effective only when the white balance mode to Auto, Optional items: -10 ~ 10.
- R Gain: Adjust the camera white balance mode of red gain, are effective only when the white balance mode to Manual, Optional items: 0 ~ 255.
- B Gain: Adjust the camera white balance mode of blue gain, are effective only when the white balance mode to Manual, Optional items: 0 ~ 255.
- Saturation: Color saturation adjustment, Optional items: 60% ~ 200%.
- Hue: Chroma adjustment, Optional items: 0 ~ 14.

- AWB sens: The white balance sensitivity, Optional items: Low, Middle, High.
- Return: get back.

IMAGE

| | | |
|-------|-----------|---------|
| IMAGE | | |
| ► | Luminance | 7 |
| | Contrast | 7 |
| | Sharpness | 2 |
| | Flip-H | Off |
| | Flip-V | Off |
| | Gamma | Default |
| | Style | Clarity |
| | Return | |

- 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.
- Gamma: Optional items: default, 0.45, 0.5, 0.56, 0.63.
- Style: Optional items: Norm, Clarity, Bright, Soft, 5S.
- Return: get back.

FOCUS

FOCUS

| | |
|----------------|------|
| ▶ D-Zoom Limit | x1 |
| AF Sensitivity | High |
| Auto Focus | On |

- Z-Doom Limit: Digital zoom camera settings, Optional items:x1.
- AF Sensitivity: Focus camera sensitivity, Optional items: Low, Middle, High.
- Auto Focus: Autofocus camera settings, Optional items: On, Off.
- Return: get back.

NOISE REDUCTION

NOISE REDUCTION

| | |
|---------|---|
| ▶ 2D NR | 3 |
| 3D NR | 3 |

- 2D NR:2D noise reduction, Optional items:1 ~ 5,Close,Auto.
- 3D NR:3D noise reduction, Optional items:1 ~ 8,Close.
- Return: get back.

SETTING

| SETTING | | |
|---------|---------------|---------|
| ► | Language | English |
| | Protocol | VISCA |
| | VISCA Address | 1 |
| | Baudrate | 9600 |
| | Video Format | 1080P30 |
| | Lens | Type2 |
| | Return | |

- Language: Language Settings, Optional items: English, Chinese.
- Protocol: Communication protocol Settings, Optional items: VISCA, PELCO-D, PELCO-P.
- VISCA Address: Address of the Visca Settings, Optional items: 0~7.
- P-D Address: P-D address settings, valid in PELCO-D mode, Optional items: 0~254.
- P-P Address: P-P address settings, valid in PELCO-P model, Optional items: 0~31.
- Baudrate: Camera baud rate settings, Optional items: 38400, 19200, 9600, 4800, 2400.
- SDI Video Format: Camera video format settings, Optional items: 1080P60, 1080I60, 1080P30, 720P60.
- Lens: Set lens type, Optional items: Type1, Type2.
- Return: get back.

INFORMATION

| | |
|-------------|----------------|
| Information | |
| ▶ Version | 7.2.01 |
| Data | 2016-08-10 |
| AF Version | 1.1.7 |
| IP | 192.168.100.99 |
| Gateway | 192.168.100.1 |
| Netmask | 255.255.255.0 |
| Return | |

RESTORE FACTORY SETTINGS

| | |
|--------------------------|--|
| RESTORE FACTORY SETTINGS | |
| ▶ Yes | |
| No | |

- Yes: verify, press **【MENU】** to restore factory Settings.
- No: cancel, press **【MENU】** to back to menu.
- Return: get back.

Serial Communication Control

COM port settings

RS485 Communication Control:

The camera can be controlled via RS485, Half-duplex mode:

- Baud rate: 2400/4800/9600 bit/s.
- Start bit: 1 bit.
- Data bit: 8 bits.
- Stop bit: 1bit.
- Parity bit: none.

Command List

The camera provides the following commands to control menu over RS-485:

| function | command packet | Notes |
|----------|--|---|
| UP | 8x 01 06 01 08 08 03 01 FF | Equivalent to the back four direction keys. |
| DOWN | 8x 01 06 01 08 08 03 02 FF | |
| LEFT | 8x 01 06 01 08 08 01 03 FF | |
| RIGHT | 8x 01 06 01 08 08 02 03 FF | |
| OK | 8x 01 04 0B 02 FF or 8x 01 04 0B 03 FF | Equivalent to the back 【MENU】 key. |

x:Camera VISCA address number.

For the complete VISCA command list, see Appendix A

IP camera control

IP camera default IP address is

192.168.100.99,

user "admin",

password "admin"

After modified, IP Camera be restarted

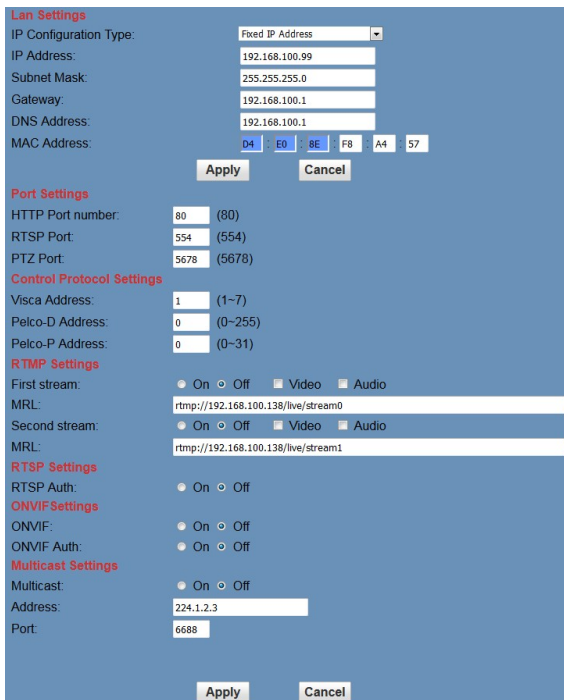
Unknown camera IP, view as below:

Method 1: connect camera to TV, press [menu] of the behind camera, select "Information", the camera IP will be show on screen.

Change IP address,2 methods as below:

Method 1: On web control page, find "Network"--->Change IP---->Click "Apply"

----> Restart camera



The screenshot displays the 'Lan Settings' section of the Avonic web control interface. It includes fields for IP Configuration Type (Fixed IP Address), IP Address (192.168.100.99), Subnet Mask (255.255.255.0), Gateway (192.168.100.1), DNS Address (192.168.100.1), and MAC Address (04 E0 8E F8 A4 57). Below these are 'Port Settings' for HTTP (80), RTSP (554), and PTZ (5678). The 'Control Protocol Settings' section includes Visca Address (1), Pelco-D Address (0), and Pelco-P Address (0). The 'RTMP Settings' section shows two streams with their respective MRLs. The 'RTSP Settings' section includes RTSP Auth (On). The 'ONVIF Settings' section includes ONVIF (On) and ONVIF Auth (On). The 'Multicast Settings' section includes Multicast (On) and Address (224.1.2.3). The 'Port' field is set to 6688. 'Apply' and 'Cancel' buttons are at the bottom.

TCP/UDP Control

The Avonic IP camera is implemented with a TCP server inside. The default TCP port number is 5678. This number can be changed in the WebGUI in the Network Menu. Once the connection between client and server is set up, the client will be able to send VISCA PTZ commands to the server. The server then parses and executes the VISCA PTZ command.

The Avonic IP Camera has also implemented an UDP server inside. The UDP port number is 1259. This number cannot be changed. Once the connection between client and server is set up, the client will

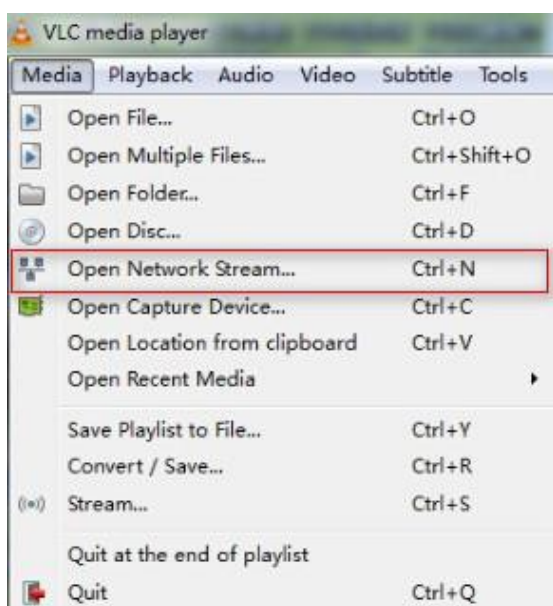
be able to send VISCA PTZ commands to the server. The server then parses and executes the VISCA PTZ command.

The PTZ Command Format is according to the definition of the VISCA protocol. Not all VISCA commands are implemented for TCP/UDP control. The camera address is default set to 1. This number can be changed in the WebGUI in the Network Menu. The commands are listed in Appendix A.

VLC stream media player monitoring

Visit VLC media server procedure

Open VLC media player, click "Media"-">"Open Network Steam ", or click "Ctrl+N"; as below:



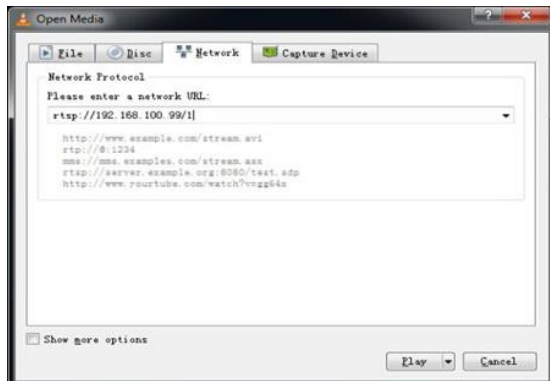
Input URL address:

rtsp://ip: port number/1 (First stream);

rtsp://ip: port number/2 (Second stream).

NOTE !

RTSP port number default value is 554.



Homepage introduction

Menu

All pages include 2 menu bars:

1. Real time monitoring: displaying video image
2. Parameter setup: with function buttons

Video viewing window

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

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

Language selection

Chinese/English/Russian

Media

Video Settings

Video Format: OSD

Encode Level: mainprofile

First stream

Encode Protocol: H264

Resolution: 1920x1080

Bit Rate: 4096 (32~20480) kbps

Frame Rate: 25 fps

I Key Frame Interval: 25 (2~150)

Bit Rate Control: ☒ CBR ☐ VBR

Fluctuate Level: 1

Second stream

Encode Protocol: H264

Resolution: 320x240

Bit Rate: 1024 (32~6144) kbps

Frame Rate: 25 fps

I Key Frame Interval: 25 (2~150)

Bit Rate Control: ☒ CBR ☐ VBR

Fluctuate Level: 1

Apply Cancel

1. Video format Support 50HZ and 60HZ and OSD three formats.
2. Encode Protocol
Support H.264 and H.265 and MJPEG three formats.
3. Encode Level Support baseline, main profile, high profile.
4. Resolution First Stream
1920x1080,1280x720, 1024x576,960x540,640x480,640x360
Resolution Second stream:
1280x720,1024x576, 720x480, 720x408, 640x360, 480x270, 320x240, 320x180
5. Bit Rate
First stream 32 ~ 20480 kbps
Second stream 32 ~ 6144 kbps

User can assign bit flow/stream, normally speaking, the bigger bit flow is, the clearer the image will be. The bit allocation must combine with network bandwidth, when the network bandwidth is too narrow and the allocated bit flow is too big, will cause video signal flow not to be transmitted normally, the video effect will be worse.

6. Frame rate

User can specify the size of the frame rate, generally, the frame rate greater, the image more smooth; Frame rate is smaller, the more you'll have the sense of a stuttering image.

First Stream: max. 30 fps

Second Stream: max. 30 fps

7. I key frame interval:

Set interval between 2 I frame, the bigger interval is, the response will be lower from viewing window.

8. Bit Rate control

Code stream control way:

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

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

9. Fluctuate level

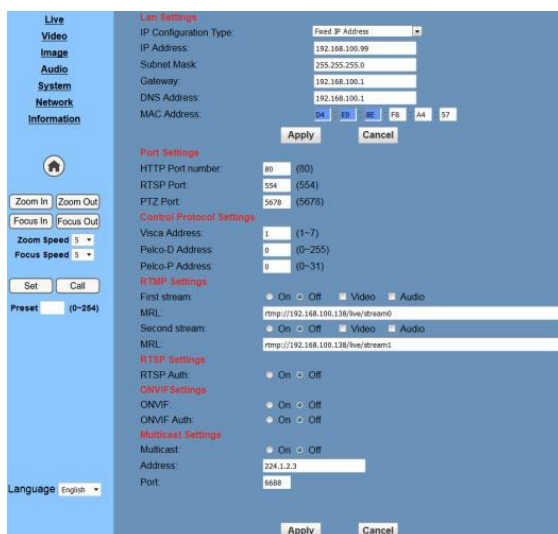
Restrain the fluctuation magnitude of variable rate, grade 1 ~ 6

System Setting



1. Work Mode
Work Mode RTSP
2. Reboot
Click the "Reboot" button, system restart.
3. User and password
The user can modify the password (letters and Numbers only)
4. Apply / Cancel
Modify password and click the "apply" button to the login page, press "cancel" button to cancel password change.

Network Setting



1. Lan Settings

Default the IP address is 192.168.100.99, The MAC address can be modified.

2. Port Settings

- a. HTTP Port IP address identifies the network device, the device can run multiple web applications, each network program using network port to transmit data, so data transmission to be carried out between the port and port. Port setting is to set up WEB SERVER program using which port to transmit. When port mapping, need to be consistent with the port number (default port: 80)
- b. RTSP Port Network camera support RTSP protocol, use the VLC tools broadcast.
- c. PTZ Port Support PTZ protocol, default port: 5678.

3. Control Protocol Setting

Setting camera control communication protocol, include Visca address, Pelco-D address, Pelco-P address.

4. RTMP Setting

Setting the camera stream, can set up two stream, in the two stream selection control code stream of "On", "Off", "Video", "Audio", etc.

5. RTSP Setting

Setting network camera RTSP protocol of "On", "Off".

6. ONVIF Setting

Setting the ONVIF protocol and ONVIF authorization "On", "Off".

7. Multicast Setting

Setting multicast "On", "Off", and multicast address(default address 224.1.2.3) and

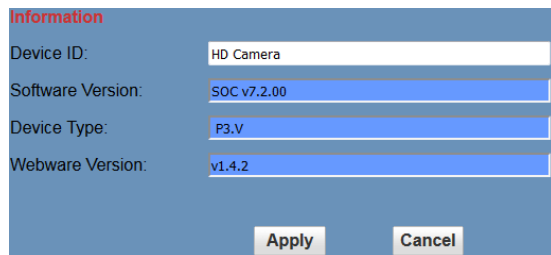
port(default 6688)

8. Apply / Cancel

Modify network parameters then press "Apply" button to modify network parameters, press "Cancel" button to cancel network parameters.

Information

Show the current device information, as shown to the right.



The screenshot shows a dialog box titled "Information" with a blue header. It contains four rows of information, each with a label on the left and a text field on the right. The text fields are highlighted with a blue selection bar. At the bottom of the dialog, there are two buttons: "Apply" and "Cancel".

| Label | Value |
|-------------------|-------------|
| Device ID: | HD Camera |
| Software Version: | SOC v7.2.00 |
| Device Type: | P3.V |
| Webware Version: | v1.4.2 |

Maintenance

Camera Maintenance

- If camera will not be used for a long time, disconnect AC power cord of AC adaptor to the outlet.
- Use soft cloth or tissue to clean the camera cover.
- Please use the soft dry cloth to clean the lens. If the camera is very dirty, clean it with diluted neuter detergent. Do not use any type of solvents, which may damages the surface.

Unqualified Application

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

Troubleshooting

Image

- No image
 1. Check whether the power cord is connected, voltage is OK, POWER lamp is flashing red.
 2. Check whether the camera can self-test after startup.
 3. Check the BOTTOM switch and make sure the two switches are both set OFF.
 4. Check video cable is connected correctly.
- Abnormal display of image

Check video cable is connected correctly.

- Image dithering even at widest zoom position

1. Check whether camera is fixed correctly.

2. Make sure if there are something like vibration machine or other things nearby.

Control

- Serial communication cannot control the camera

1. Check the camera working mode.

2. Check control cable is connected correctly.

Contact

For any questions or suggestions, contact the reseller or the local distributor of Avonic. Find the local distributor on the website of Avonic.

For the recent manual or datasheet, look at the Avonic website.

www.avonic.com

Appendix A

VISCA Camera Command List

x= Camera Address

y= Socket Number

z = Camera Address + 8

| Command | Function | Command Package | Note |
|-------------------|----------------|-------------------------------|----------------------|
| 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 | p = 0(low) - 7(high) |
| | Tele(Standard) | 8x 01 04 07 02 FF | |
| | Wide(Standard) | 8x 01 04 07 03 FF | |
| | Tele(Variable) | 8x 01 04 07 2p FF | |
| | Wide(Variable) | 8x 01 04 07 3p FF | |
| | Direct | 8x 01 04 47 0p 0q 0r 0s FF | pqrs: Zoom Position |

| Command | Function | Command Package | Note |
|-----------------------|----------|-----------------|--------------------------------------|
| ACK/Completion | ACK | z0 4y FF | Return when the command is accepted. |
| Messages | | (y: Socket No.) | |

| | | |
|------------|-----------------------------|--|
| Completion | z0 5y FF (y: Socket No.) | Return when the command has been executed. |
|------------|-----------------------------|--|

| Command | Function | Command Package | Note |
|-----------------------|------------------------|--|--|
| 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 specifild 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. |

VISCA Camera Control Command List

| Command | Function | Command Package | Notes |
|----------------------|-----------------|-------------------------------|---------------------------------------|
| 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 |
| | Manual Focus | 8x 01 04 38 03 FF | AF Off |
| | Auto/Manual | 8x 01 04 38 10 FF | AF Toggle On/Off |
| CAM_ZoomFocus | Direct | 8x 01 04 47 0p 0q 0r 0s | pqrs: Zoom Position |
| | | 0t 0u 0v 0w FF | p=0-4 qrs=0-F 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 |
| | Off | 8x 01 04 3E 03 FF | Compensation On/Off |
| | Reset | 8x 01 04 0E 00 FF | Exposure |
| | Up | 8x 01 04 0E 02 FF | Compensation Amount |
| | Down | 8x 01 04 0E 03 FF | Setting |
| | Direct | 8x 01 04 4E 00 00 0p 0q FF | pq: ExpComp Position |
| CAM_BackLight | On | 8x 01 04 33 02 FF | Back Light |
| | Off | 8x 01 04 33 03 FF | Compensation On/Off |
| 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 |
| | Reset | 8x 01 04 02 00 FF | Aperture Control |

| | | | |
|---------------------------------|--------|-------------------------------|---|
| CAM_Aperture (sharpness) | 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 |
| | Down | 8x 01 06 01 VV WW 03 02 FF | (high speed) |
| | Left | 8x 01 06 01 VV WW 01 03 FF | WW: Tilt speed 0x01 (low speed) to 0x14 |
| | Right | 8x 01 06 01 VV WW 02 03 FF | (high speed) |

| | | | |
|--------------------------|------------------|---|---|
| | Upleft | 8x 01 06 01 VV WW 01 01 FF | YYYY: Pan Position |
| | Upright | 8x 01 06 01 VV WW 02 01 FF | ZZZZ: Tilt Position |
| | 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 v0Y 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 |
| | LimitClear | 8x 01 06 07 01 0W 07 0F 0F 0F 07 0F 0F 0F FF | ZZZZ: Tilt Position |
| 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 | |
| | Flip-H | 8x 01 04 A4 01 FF | |
| | Flip-V | 8x 01 04 A4 02 FF | |
| | Flip-HV | 8x 01 04 A4 03 FF | Single Command For Video Flip |
| 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 dgrees) to Eh (+14 degrees |

VISCA Query Command List

| Command | Command Package | Return Package | Note |
|-----------------------|-----------------|----------------------|------------------------------|
| 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 | 8x 09 04 38 FF | y0 50 02 FF | Auto Focus |
| Inq | | y0 50 03 FF | Manual Focus |
| CAM_FocusPosInq | 8x 09 04 48 FF | y0 50 0p 0q 0r 0s FF | pqrs: Focus Position |
| CAM_WBModelInq | 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_ExpCompMod | 8x 09 04 3E FF | y0 50 02 FF | On |
| eInq | | y0 50 03 FF | Off |
| CAM_ExpCompPosInq | 8x 09 04 4E FF | y0 50 00 00 0p 0q FF | pq: ExpComp Position |
| CAM_BacklightMode | 8x 09 04 33 FF | y0 50 02 FF | On |
| Inq | | y0 50 03 FF | Off |
| CAM_Nosise2DMode | 8x 09 04 50 FF | y0 50 02 FF | Auto Noise 2D |
| Ing | | y0 50 03 FF | Manual Noise 3D |

| | | | |
|---------------------------------------|-------------------|----------------------|---|
| CAM_Noise2DLevel | 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_FlickerModelnq | 8x 09 04 55 FF | y0 50 0p FF | p: Flicker Settings(0: OFF, 1: 50Hz, 2: 60Hz) |
| CAM_ApertureModelnq(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_PictureEffectModelnq | 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_MenuModelnq | 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 cd: Hardware Version mnpq: ARM Version rstu: FPGA Version vw: Camera model 01: C Type 02: M Type 03: S Type |
| | | 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 |
| VideoSystemInq | 8x 09 06 23 FF | 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 |
| | | y0 50 02 FF | On |
| | | y0 50 03 FF | Off |
| | | y0 50 ww zz FF | ww: Pan Max Speed zz: Tilt Max Speed |
| Pan-tiltMaxSpeedInq | 8x 09 06 11 FF | y0 50 0w 0w 0w 0w 0z 0z 0z 0z FF | www: Pan Position zzz: Tilt Position |
| | | | |
| Pan-tiltPosInq | 8x 09 06 12 FF | | |
| | | | |

| | | | |
|-----------------------------|----------------|-------------------------------|--|
| 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 Numberss: Little Version Numberuuuu: Yearvv: Monthww: Day |
| CAM_ModelInq | 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 dgree) to Eh (+14 degrees |
| CAM_AWBSensitivit yInq | 8x 09 04 A9 FF | y0 50 00 FF | High |
| | | y0 50 01 FF | Normal |
| | | y0 50 02 FF | Low |

| Command | Command Package | Return Package | Note |
|---------------------------|-------------------|---|---|
| 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 uu: BackLight uu Exp Comp. vv: Shutter Position ww: Iris Position xx Bright Position z: Exp 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 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 |
|--------------------------------|-------------------|---|---|

Remark :

1. [x] in the above list refer to 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 |

VISCA over IP commands

The Avonic CM60-IP camera is implemented with a TCP server. The TCP port number is 5678 by default and can be altered in the WebGUI. Once the connection between client and server is set up, the client will be able to send PTZ commands to the server. The server then parses and executes the PTZ command.

The Avonic IP Camera has also implemented a UDP server. The UDP port number is fixed on 1259. Once the connection between client and server is set up, the client will be able to send PTZ commands to the server. The server then parses and executes the PTZ command.

The VISCA over IP command list is based on the VISCA protocol. Not all VISCA commands are implemented.

The PTZ Command format is according to the definition of the VISCA protocol. The VISCA address of the camera is set to 1 by default and can be changed in the WebGUI. As all cameras are uniquely identified by their IP address, all VISCA addresses of the cameras that are controlled over IP do not necessarily have to be unique.

Default settings:

| | |
|---------------|------|
| TCP port | 5678 |
| UDP port | 1259 |
| VISCA address | 1 |

The commands are as follow:

Camera return commands

x= Camera Address

y= Socket Number

z = Camera Address + 8

All parameter values are in HEX

| Return/complete Command | | | |
|-------------------------|------------|-----------------------------|--|
| Command | Function | Command Packet | Comments |
| ACK/Completion Messages | ACK | 90 4y FF (y: Socket No.) | Return when the command is accepted. |
| | Completion | 90 5y FF (y: Socket No.) | Return when the command has been executed. |

| Error command | | | |
|----------------|---------------------|--------------------------------|--|
| Command | Function | Command Packet | Comments |
| Error Messages | Syntax Error | 90 60 02 FF | Returned when the command format is different or when a command with illegal command parameters is accepted. |
| | Command Buffer Full | 90 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 | 90 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 | 90 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 | 90 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. | |

Camera control commands

x= Camera Address

y= Socket Number

z = Camera Address + 8

All parameter values are in HEX

| Command | Function | Command Packet | Comments |
|------------|----------------------|----------------------------|----------------------------------|
| AddressSet | Broadcast | 88 30 01 FF | Address setting |
| CAM_Zoom | Stop | 81 01 04 07 00 FF | |
| | Tele(Standard speed) | 81 01 04 07 02 FF | |
| | Wide(Standard speed) | 81 01 04 07 03 FF | |
| | Tele(Variable speed) | 81 01 04 07 2p FF | p = 0(low speed) - F(high speed) |
| | Wide(Variable speed) | 81 01 04 07 3p FF | |
| | Direct | 81 01 04 47 0p 0q 0r 0s FF | pqrs(0-F): Zoom Position |
| CAM_Focus | Stop | 81 01 04 08 00 FF | |

| | | | |
|-----------|-----------------------|----------------------------|--|
| | Far(Standard speed) | 81 01 04 08 02 FF | |
| | Near(Standard speed) | 81 01 04 08 03 FF | |
| | Far(Variable speed) | 81 01 04 08 2p FF | p = 0(low) - F(high) |
| | Near(Variable speed) | 81 01 04 08 3p FF | |
| | Direct Focus Position | 81 01 04 48 0p 0q 0r 0s FF | min p = 0, q = 0, r = 0, s = 0 max p = 0, q = 6, r = E, s = A |
| | Auto Focus | 81 01 04 38 02 FF | AF On/Off |
| | Manual Focus | 81 01 04 38 03 FF | |
| | Auto/Manual | 81 01 04 38 10 FF | |
| CAM_WB | Auto | 81 01 04 35 00 FF | Normal Auto |
| | Indoor mode | 81 01 04 35 01 FF | Indoor mode |
| | Outdoor mode | 81 01 04 35 02 FF | Outdoor mode |
| | OnePush mode | 81 01 04 35 03 FF | One Push WB mode |
| | Manual | 81 01 04 35 05 FF | Manual Control mode |
| | OnePush trigger | 81 01 04 10 05 FF | One Push WB Trigger |
| CAM_RGain | Reset | 81 01 04 03 00 FF | Manual Control of R Gain |
| | Up | 81 01 04 03 02 FF | |
| | Down | 81 01 04 03 03 FF | |
| | Direct | 81 01 04 43 00 00 0p 0q FF | pq: R Gain |
| CAM_Bgain | Reset | 81 01 04 04 00 FF | Manual Control of B Gain |
| | Up | 81 01 04 04 02 FF | |
| | Down | 81 01 04 04 03 FF | |
| | Direct | 81 01 04 44 00 00 0p 0q FF | pq: B Gain |

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|-------------|----------------------|----------------------------|---|
| CAM_AE | Full Auto | 81 01 04 39 00 FF | Automatic Exposure mode |
| | Manual | 81 01 04 39 03 FF | Manual Control mode |
| | Shutter priority | 81 01 04 39 0A FF | Shutter Priority Automatic Exposure mode |
| | Iris priority | 81 01 04 39 0B FF | Iris Priority Automatic Exposure mode |
| | Bright | 81 01 04 39 0D FF | Bright Mode(Manual control) |
| CAM_Iris | Reset | 81 01 04 0B 00 FF | Iris Setting (CAM_AE is set to Iris Priority) |
| | Up | 81 01 04 0B 02 FF | |
| | Down | 81 01 04 0B 03 FF | |
| | Direct Iris Position | 81 01 04 4B 00 00 0p 0q FF | min p = 0 q = 0 max p = 0, q = C |
| CAM_Gain | Reset | 81 01 04 0C 00 FF | Gain Setting |
| | Up | 81 01 04 0C 02 FF | |
| | Down | 81 01 04 0C 03 FF | |
| | Direct | 81 01 04 0C 00 00 0p 0q FF | pq: Gain Position |
| | Gain Limit | 81 01 04 2C 0p FF | p: Gain Position |
| CAM_Bright | Reset | 81 01 04 0D 00 FF | Bright Setting |
| | Up | 81 01 04 0D 02 FF | |
| | Down | 81 01 04 0D 03 FF | |
| | Direct | 81 01 04 0D 00 00 0p 0q FF | pq: Bright Position |
| CAM_ExpComp | On | 81 01 04 3E 02 FF | Exposure Compensation On/Off |
| | Off | 81 01 04 3E 03 FF | |
| | Reset | 81 01 04 0E 00 FF | Exposure Compensation Amount Setting |
| | Up | 81 01 04 0E 02 FF | |
| | Down | 81 01 04 0E 03 FF | |

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|-----------------------------|--------|-------------------------------|---|
| | Direct | 81 01 04 4E 00 00 0p 0q FF | pq: ExpComp Position |
| CAM_BackLight | On | 81 01 04 33 02 FF | Back Light Compensation On/Off |
| | Off | 81 01 04 33 03 FF | |
| CAM_NR(2D)Mode | Auto | 81 01 04 50 02 FF | ND2D Auto/Manual |
| | Manual | 81 01 04 50 03 FF | |
| CAM_NR(2D)Level | - | 81 01 04 53 0p FF | p: NR Setting (0: Off, level 1 to 5) |
| CAM_NR(3D)Level | - | 81 01 04 54 0p FF | p: NR Setting (0: Off, level 1 to 8) |
| CAM_Flicker | - | 81 01 04 23 0p FF | p: Flicker Settings (0: Off, 1: 50Hz, 2: 60Hz) |
| CAM_DHotPixel | - | 81 01 04 56 0p FF | p: Dynamic Hot Pixel Setting (0: Off, level 1 to 6) |
| CAM_ApertureMode(sharpness) | Auto | 81 01 04 05 02 FF | Sharpness Auto |
| | Manual | 81 01 04 05 02 FF | Sharpness Manual |
| CAM_Aperture(sharpness) | Reset | 81 01 04 02 00 FF | Aperture Control |
| | Up | 81 01 04 02 02 FF | |
| | Down | 81 01 04 02 03 FF | |
| | Direct | 81 01 04 42 00 00 0p 0q FF | pq: Aperture Gain |
| CAM_PictureEffect | Off | 81 01 04 63 00 FF | Picture Effect Setting |
| | B&W | 81 01 04 63 04 FF | |
| CAM_Memory | Reset | 81 01 04 3F 00 pp FF | pp: Memory Number(=0 to 127) |
| | Set | 81 01 04 3F 01 pp FF | |
| | Recall | 81 01 04 3F 02 pp FF | |
| CAM_LR_Reverse | On | 81 01 04 61 02 FF | Image Flip Horizontal On/Off |
| | Off | 81 01 04 61 03 FF | |

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| CAM_PictureFlip | On | 81 01 04 66 02 FF | Image Flip Vertical On/Off |
| | Off | 81 01 04 66 03 FF | |
| CAM_ColorGain | Diret | 81 01 04 49 00 00 00 0p FF | p: Color Gain setting 0h (60%) to Eh (200%) |
| SYS_Menu | Off | 81 01 06 06 03 FF | Turns on/off the menu screen |
| | On | 81 01 06 06 02 FF | |
| Pan_tiltDrive | Up | 81 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 | 81 01 06 01 VV WW 03 02 FF | |
| | Left | 81 01 06 01 VV WW 01 03 FF | |
| | Right | 81 01 06 01 VV WW 02 03 FF | |
| | Upleft | 81 01 06 01 VV WW 01 01 FF | |
| | Upright | 81 01 06 01 VV WW 02 01 FF | |
| | DownLeft | 81 01 06 01 VV WW 01 02 FF | |
| | DownRight | 81 01 06 01 VV WW 02 02 FF | |
| | Stop | 81 01 06 01 VV WW 03 03 FF | |
| | AbsolutePosition | 81 01 06 02 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF | |
| | RelativePosition | 81 01 06 03 VV WW 0Y 0Y 0Y 0Y 0Z 0Z 0Z 0Z FF | |
| | Home | 81 01 06 04 FF | |
| | Reset | 81 01 06 05 FF | |

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|--------------------|------------|---|---|
| Pan_tiltLimitSet | LimitSet | 81 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 | 81 01 06 07 01 0W 07 0F 0F 0F 07 0F 0F 0F FF | |
| CAM_AFSensitivity | High | 81 01 04 58 01 FF | AF Sensitivity High/Normal/Low |
| | Normal | 81 01 04 58 02 FF | |
| | Low | 81 01 04 58 03 FF | |
| CAM_SettingReset | Reset | 81 01 04 A0 10 FF | Reset Factory Setting |
| CAM_Brightness | Direct | 81 01 04 A1 00 00 0p 0q FF | pq: Brightness Position |
| CAM_Contrast | Direct | 81 01 04 A2 00 00 0p 0q FF | pq: Contrast Position |
| CAM_Flip | Off | 81 01 04 A4 00 FF | Single Command For Video Flip |
| | Flip-H | 81 01 04 A4 01 FF | |
| | Flip-V | 81 01 04 A4 02 FF | |
| | Flip-HV | 81 01 04 A4 03 FF | |
| CAM_SettingSave | Save | 81 01 04 A5 10 FF | Save Current Setting |
| CAM_Iridix | Direct | 81 01 04 A7 00 00 0p 0q FF | pq: Iridix Position |
| CAM_AWBSensitivity | High | 81 01 04 A9 00 FF | High |
| | Normal | 81 01 04 A9 01 FF | Normal |
| | Low | 81 01 04 A9 02 FF | Low |
| CAM_AFZone | Top | 81 01 04 AA 00 FF | AF Zone weight select |
| | Center | 81 01 04 AA 01 FF | |
| | Bottom | 81 01 04 AA 02 FF | |
| CAM_ColorHue | Direct | 81 01 04 4F 00 00 00 0p FF | p: Color Hue setting 0h (– 14 degrees) to Eh (+14 degrees) |

Inquiry Commands

x= Camera Address

y= Socket Number

z = Camera Address + 8

All parameter values are in HEX

| Inquiry Command | | | |
|------------------------|----------------|----------------------|----------------------|
| Command | Command Packet | Packet | Comments |
| CAM_ZoomPosIn q | 81 09 04 47 FF | 90 50 0p 0q 0r 0s FF | pqrs: Zoom Position |
| CAM_FocusAFMo delnq | 81 09 04 38 FF | 90 50 02 FF | Auto Focus |
| | | 90 50 03 FF | Manual Focus |
| CAM_FocusPosIn q | 81 09 04 48 FF | 90 50 0p 0q 0r 0s FF | pqrs: Focus Position |
| CAM_WBModeln q | 81 09 04 35 FF | 90 50 00 FF | Auto |
| | | 90 50 01 FF | Indoor mode |
| | | 90 50 02 FF | Outdoor mode |
| | | 90 50 03 FF | OnePush mode |
| | | 90 50 05 FF | Manual |
| CAM_RGainInq | 81 09 04 43 FF | 90 50 00 00 0p 0q FF | pq: R Gain |
| CAM_BGainInq | 81 09 04 44 FF | 90 50 00 00 0p 0q FF | pq: B Gain |
| CAM_AEModelnq | 81 09 04 39 FF | 90 50 00 FF | Full Auto |
| | | 90 50 03 FF | Manual |
| | | 90 50 0A FF | Shutter priority |
| | | 90 50 0B FF | Iris priority |
| | | 90 50 0D FF | Bright |

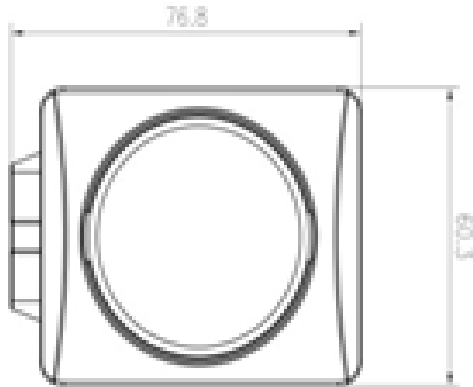
| | | | |
|---------------------------------|----------------|----------------------|---|
| CAM_ShutterPosInq | 81 09 04 4A FF | 90 50 00 00 0p 0q FF | pq: Shutter Position |
| CAM_IrisPosInq | 81 09 04 4B FF | 90 50 00 00 0p 0q FF | pq: Iris Position |
| CAM_BrightPosInq | 81 09 04 4D FF | 90 50 00 00 0p 0q FF | pq: Bright Position |
| CAM_ExpCompModelInq | 81 09 04 3E FF | 90 50 02 FF | On |
| | | 90 50 03 FF | Off |
| CAM_ExpCompPosInq | 81 09 04 4E FF | 90 50 00 00 0p 0q FF | pq: ExpComp Position |
| CAM_BacklightModelInq | 81 09 04 33 FF | 90 50 02 FF | On |
| | | 90 50 03 FF | Off |
| CAM_Noise2DModelInq | 81 09 04 50 FF | 90 50 02 FF | Auto Noise 2D |
| | | 90 50 03 FF | Manual Noise 3D |
| CAM_Noise2DLevel | 81 09 04 53 FF | 90 50 0p FF | Noise Reduction (2D) p: 0 to 5 |
| CAM_Noise3DLevel | 81 09 04 54 FF | 90 50 0p FF | Noise Reduction (3D) p: 0 to 8 |
| CAM_FlickerModelInq | 81 09 04 55 FF | 90 50 0p FF | p: Flicker Settings(0: OFF, 1: 50Hz, 2: 60Hz) |
| CAM_ApertureModelInq(Sharpness) | 81 09 04 05 FF | 90 50 02 FF | Auto Sharpness |
| | | 90 50 03 FF | Manual Sharpness |
| CAM_ApertureInq(Sharpness) | 81 09 04 42 FF | 90 50 00 00 0p 0q FF | pq: Aperture Gain |
| CAM_PictureEffectModelInq | 81 09 04 63 FF | 90 50 02 FF | Off |
| | | 90 50 04 FF | B&W |
| CAM_MemoryInq | 81 09 04 3F FF | 90 50 0p FF | p: Memory number last operated. |
| SYS_MenuModelInq | 81 09 06 06 FF | 90 50 02 FF | On |
| | | 90 50 03 FF | Off |

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|---------------------|----------------|-------------------------------------|---|
| CAM_LR_Reverselnq | 81 09 04 61 FF | 90 50 02 FF | On |
| | | 90 50 03 FF | Off |
| CAM_PictureFliplnq | 81 09 04 66 FF | 90 50 02 FF | On |
| | | 90 50 03 FF | Off |
| CAM_ColorGainInq | 81 09 04 49 FF | 90 50 00 00 00 0p FF | p: Color Gain setting 0h (60%) to Eh (200%) |
| VideoSystemInq | 81 09 06 23 FF | 90 50 00 FF | 1920x1080i60 |
| | | 90 50 01 FF | 1920x1080p30 |
| | | 90 50 02 FF | 1280x720p60 |
| | | 90 50 04 FF | NTSC |
| | | 90 50 05 FF | NTSC |
| | | 90 50 06 FF | NTSC |
| | | 90 50 07 FF | 1920x1080p60 |
| | | 90 50 08 FF | 1920x1080i50 |
| | | 90 50 09 FF | 1920x1080p25 |
| | | 90 50 0A FF | 1280x720p50 |
| | | 90 50 0C FF | PAL |
| | | 90 50 0D FF | PAL |
| | | 90 50 0E FF | PAL |
| Pan-tiltMaxSpeedInq | 81 09 06 11 FF | 90 50 ww zz FF | ww: Pan Max Speed zz: Tilt Max Speed |
| Pan-tiltPosInq | 81 09 06 12 FF | 90 50 0w 0w 0w 0w 0z 0z 0z 0z FF | www: Pan Position zzzz: Tilt Position |
| CAM_GainLimitInq | 81 09 04 2C FF | 90 50 0q FF | p: Gain Limit |
| CAM_DHotPixelInq | 81 09 04 56 FF | 90 50 0q FF | p: Dynamic Hot Pixel Setting (0: Off, level 1 to 6) |
| | 81 09 04 58 FF | 90 50 01 FF | High |

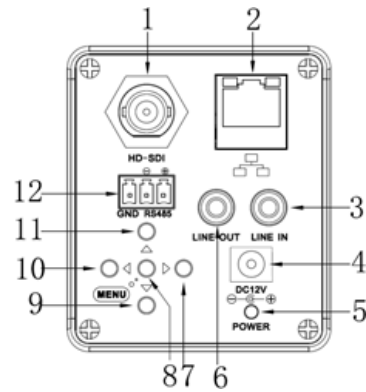
| | | | |
|-----------------------|----------------|----------------------|---|
| CAM_AFSensitivityInq | | 90 50 02 FF | Normal |
| | | 90 50 03 FF | Low |
| CAM_BrightnessInq | 81 09 04 A1 FF | 90 50 00 00 0p 0q FF | pq: Brightness Position |
| CAM_ContrastInq | 81 09 04 A2 FF | 90 50 00 00 0p 0q FF | pq: Contrast Position |
| CAM_FlipInq | 81 09 04 A4 FF | 90 50 00 FF | Off |
| | | 90 50 01 FF | Flip-H |
| | | 90 50 02 FF | Flip-V |
| | | 90 50 03 FF | Flip-HV |
| CAM_IridixInq | 81 09 04 A7 FF | 90 50 00 00 0p 0q FF | pq: Iridix Position |
| CAM_AFZone | 81 09 04 AA FF | 90 50 00 FF | Top |
| | | 90 50 01 FF | Center |
| | | 90 50 02 FF | Bottom |
| CAM_ColorHueInq | 81 09 04 4F FF | 90 50 00 00 00 0p FF | p: Color Hue setting 0h (– 14 degrees) to Eh (+14 degrees) |
| CAM_AWBSensitivityInq | 81 09 04 A9 FF | 90 50 00 FF | High |
| | | 90 50 01 FF | Normal |
| | | 90 50 02 FF | Low |

Appendix B Dimensions

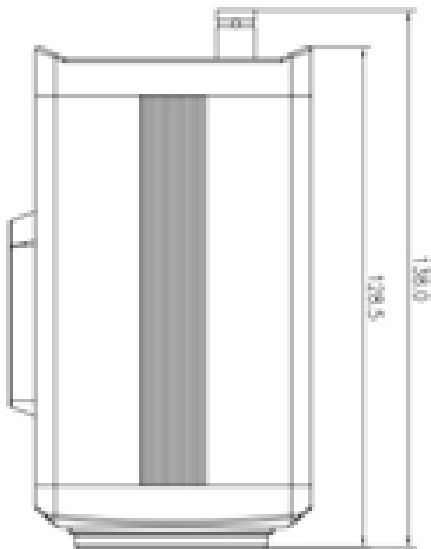
Front



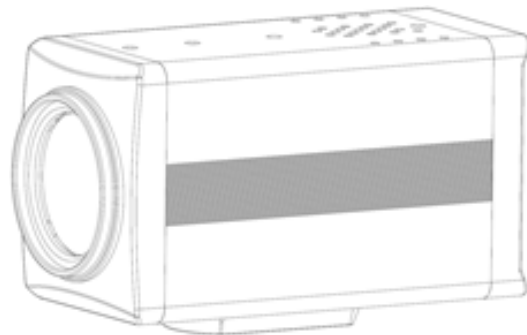
Rear



Top



Side



Bottom

All sizes are in mm

Weight: 0.85 kg