



Avonic PTZ Camera 30/20x/12x zoom

CM70-IP/CM71-IP/CM73-IP

www.avonic.com | User Manual | Version 1.2

Disclaimer, Contact, IP Rating and CE Marking

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IP Rating

The IP Rating (ingress protection) for this Product is IP30. This means that the Product has an intrusion protection against solid objects over 2.5mm, e.g. tools & wires and has no moisture protection.

CE Marking

The Product has a CE Marking. The CE labels are placed at the bottom of the Product and on the packaging. See the respective figures below:



Figure 1: CE Marking (Product)



Figure 2: CE Marking (Packaging)

EU Declaration of Conformity

The Avonic Declaration of Conformity is in accordance with EN ISO/IEC 17050-1 and generated using the ProductIP compliance platform.

Table 1: EU Declaration of Conformity

| | | |
|---|--|--|
| Declaration number: | DOCIP 819694 |  |
| Name and address of manufacturer / EU-AR: | Avonic Exportweg 11a 2645ED Delfgauw Netherlands | |
| THIS DECLARATION OF CONFORMITY IS ISSUED UNDER THE SOLE RESPONSIBILITY OF: | | |
| Name and address of manufacturer: | Avonic Exportweg 11a 2645ED Delfgauw Netherlands |  |
| Product identification: | PTZ Camera 12x/20x/30x Zoom White AV-CM7x | |
| THE PRODUCTS MENTIONED IN THIS DECLARATION ARE IN CONFORMITY WITH: | | |
| EU Community Legislation | Restriction of Hazardous Substances (RoHS) Directive 2011/65/EU [OJEU L174/88-110, 01.07.2011] Electromagnetic Compatibility (EMC) Directive 2014/30/ EU [OJEU L96/79-106, 29.03.2014] Ecodesign energy-related products Directive 2009/125/EC [OJEU L285/10-35, 31.10.2009] Low Voltage Directive (LVD) 2014/35/ EU [OJEU L96/357-374, 29.03.2014] | |
| Harmonised standards | Safety of electrical equipment EN 60065:2014 + AC:2016 + AC:2017 + AC:2017 + AC:2018 Electromagnetic Compatibility (EMC) EN 55020:2007 + A11:2011 + A12:2016 EN 55032:2015 + AC:2016 EN 55035:2017 EN 61000-3-2:2014 EN 61000-3-3:2013 Restricted substances in electrical products EN 50581:2012 EN IEC 63000:2018 Ecodesign Regulation (EC) 278/2009 - Ecodesign of external power supplies (EPS) | |
| Other specifications: | | |
| Notified Body: | | |
| Additional Information: | | |
| SIGNED FOR AND ON BEHALF OF: | | |
| Place and date of issue: | Delfgauw, 24 October 2019 | |
| Signature: |  | |
| Name, function: | Walter Harrewijn, CEO | |
| Company name: | Avonic | |

Important Information

Liability

Avonic will NOT be held responsible for any damage or injury caused by unqualified persons carrying out these tasks, or by not following the instructions in this Manual.

Intended Use and Non-Intended Use

Installation



The following applies to the *installation* of the camera:

- The installation activities described in this Manual should ONLY be executed by experienced technicians.
- The installation activities should NOT be executed by minors, mentally disabled persons or other persons not qualified to perform these tasks.





Operation





The following applies to the *operation* of the camera:





- The operational activities described in this Manual should ONLY be executed by people with enough technical knowledge to perform the activities in a safe manner.
- This Product is specifically developed for video conferencing / streaming via internet by companies, institutes and universities. It is NOT meant for private use in the residential area.
- This Product should ONLY be used indoors.
- 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.

Important Precautions

| | |
|---|--|
|  | This Product is NOT intended for use where failure of the device could lead to death, personal injury, or severe environmental damage. |
|  | Be sure that you have COMPLETELY READ and UNDERSTOOD ALL information in this Manual before unpacking, installing and using this Product. Keep the Manual in a safe place for future reference or download it from www.avonic.com . |
|  | Failure to follow the SAFETY NOTES as described in this chapter could result in fire, electric shock, injury, or damage to this Product or other property. |
|  | Power this Product ONLY with the included cable and power adapter. Other adapters may not meet applicable safety standards, and could pose a risk of death or injury when connected. |

Symbols Used in This Manual

| Symbol | Meaning | Description |
|---|------------------|--|
|  | Danger | Not following the instructions associated with this symbol may lead to personal injury and / or serious damage to the Product. |
|  | Electrical Shock | Not following the instructions associated with this symbol may lead to life-threatening situations and / or serious damage to the Product. |

| Symbol | Meaning | Description |
|---|-------------|--|
|  | Important | The information associated with this symbol requires special attention. |
|  | Information | The information associated with symbol refers to a general remark or a reference to other documentation. |
|  | Instruction | This symbol refers to one or more user instructions. |
|  | Recycling | Specific parts of the Product can be re-used. |

Acronyms

The following acronyms are used in this Manual:

| | |
|--------------|---|
| AAE | Aperture Auto Exposure |
| AWB | Aperture White Balance |
| BLC | Black Light Control |
| CCM | Customizable Color Matrix |
| CMOS | Complementary Metal Oxide Semiconductor |
| DRC | Dynamic Range Compression |
| EV | Exposure Value |
| HD | High Definition |
| HDMI | High-Definition Multimedia Interface |
| IP | Internet Protocol |
| MJPEG | Motion-JPEG |
| NR | Noise Reduction |
| OSD | On-Screen Display |
| PoE | Power over Ethernet |
| PTZ | Pan / Tilt / Zoom |
| RTMP | Real-Time Messaging Protocol |
| RTSP | Real-Time Streaming Protocol |
| SAE | Shutter Auto Exposure |
| SDI | Serial Digital Interface |
| SKU | Stock Keeping Unit |
| SNR | Signal to Noise Ratio |
| SRT | Secure Reliable Transport |
| UDP | User Datagram Protocol |

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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 CM70-IP, CM71-IP and CM73-IP cameras.



In this Manual, the Avonic CM70-IP, CM71-IP and CM73-IP cameras are 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. *Product Overview*
4. *Unpacking*
5. *Mounting and Installation*
6. *Operation*
7. *Maintenance*
8. *Transport and Storage*
9. *Disposal and Recycling*
10. *Troubleshooting*





Additionally, it contains the following

- *Appendix A - VISCA Settings and Command List*
- *Appendix B - Dimensions*
- *Appendix C - HTTP API*
- *Appendix D - CMOS Image Sensor Characteristics*

Safety Instructions

This chapter contains important safety information regarding the unpacking, installation and use of the camera.

Important Precautions

| | |
|---|--|
|  | This Product is NOT intended for use where failure of the device could lead to death, personal injury, or severe environmental damage. |
|  | Be sure that you have COMPLETELY READ and UNDERSTOOD ALL information in this Manual before unpacking, installing and using this Product. Keep the Manual in a safe place for future reference or download it from www.avonic.com . |
|  | Failure to follow the SAFETY NOTES as described in this chapter could result in fire, electric shock, injury, or damage to this Product or other property. |
|  | Power this Product ONLY with the included cable and power adapter. Other adapters may not meet applicable safety standards, and could pose a risk of death or injury when connected. |

Intended Use



See section *Intended Use and Non-Intended Use* on page iv for details.

Handling



To prevent the risk of injury, take the following precautions when handling this Product:

- Handle the Product with care. It is made of metal, glass, and plastic and has sensitive electronic components inside.
- The Product can be damaged if dropped, burned, punctured or crushed, or if it comes into contact with liquid.
- Do not pick up and move the Product unit while a tripod is attached. The fitting may break under the weight of the tripod, which may result in injury.
- If you suspect any damage to the Product, discontinue its use, as it may cause overheating or injury.

Mounting



To prevent the Product from falling down which may cause injuries:

- 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.)
- Use a safety loop or drop protection that prevents the Product from falling if the mounting construction fails.
- During installation, NEVER install a Product above a person.
- Check the installation at least once a year. An improper mounting could cause the unit to fall off, resulting in personal injury.

Ventilation



To prevent the risk of life-threatening injury or damage to the Product or other property, caused by electric shock or fire hazard due to overheating:

- Maintain adequate ventilation by NOT installing or placing the Product unit in a bookcase, built-in cabinet or any other confined space.
- Ensure that curtains or any other material does NOT obstruct the ventilation.

Repair



Take the following precautions if the Product should be repaired:

- Don't open this Product and don't attempt to repair it yourself. Disassembling the Product may damage it or may cause injury to you.
- If this Product is damaged, malfunctioning, or if it comes into 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 and Adapter



To prevent the risk of life-threatening injury or damage to the Product or other property, caused by electric shock or fire hazard:

- Power this Product ONLY with the included cable and power adapter. Other adapters may not meet the applicable safety standards. They could pose a risk of death or injury when connected.
- Do NOT use damaged cables.
- Do NOT power the Product in a moist / wet environment.
- Before you power the Product, ensure the cable is fully inserted into the power adapter.
- Plug the power adapter directly into a power outlet.
- Do NOT use the power adapter at a moist / wet location.
- Do NOT connector disconnect the power adapter with wet hands.
- Keep the Product, cable, and power adapter in a dry and well-ventilated area when in use.
- 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 it.
 - The power adapter has been dropped, and its enclosure is damaged.

Atmospheric Conditions



To prevent the risk of injury or damage to the Product or other property caused by a potentially explosive atmosphere:

- Do NOT use this Product in an area with a potentially explosive atmosphere, such as areas where the air contains high levels of flammable chemicals, vapors, 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.

Product Overview

Description

The cameras in the Avonic CM70-IP / CM71-IP / CM73-IP series comprise a high-quality PTZ camera line with simultaneous HDMI, 3G-SDI, USB 2.0 and IP-stream Ethernet outputs. The cameras of this line are designed for fixed, indoor installations. The cameras include a rich feature set, that is usually found on broadcast-grade cameras. For example: a user-adjustable Color Matrix and SRT streaming (licensed premium functions). The cameras have the ability to deliver outstanding quality under low light conditions, thanks to its high-quality SNR CMOS sensor. The sensor delivers Full HD 1080p60 video. Each camera can be accessed remotely through a WebGUI, in which the user can set up and operate a specific camera. Each camera is provided with an On-Screen Display (OSD) menu, an integrated on-screen menu that can be accessed within the camera to change specific functions that effect how the camera processes an image. The OSD Menu is visible on the HDMI, SDI, and IP outputs.



Features

Each camera in the Avonic CM70-IP / CM71-IP / CM73-IP series has the following features:

- 20x/12x/30x Optical Zoom glass lens.
- High SNR CMOS combined with Digital Noise Reduction (DNR) for a clear picture, even under very low light conditions.
- Full HD 1920 x 1080p60 resolution and Pristine image quality.
- The camera can be powered using Ethernet port with PoE (802.3af) functionality, accessed via WebGUI and controlled by VISCA over IP / Onvif for video streaming.
- H265, H264, optional SRT and MJPEG compression at a bitrate up to 40Mbit, thus enabling Full HD video stream by ultra-low latency over RTSP, RTMP, UDP, Unicast, Multicast support.
- 3G-SDI, HDMI, USB 2.0 (1080p30) and IP.
- Camera control using common protocols: VISCA, Pelco-D / P via RS-232, RS-485, IP (VISCA), Onvif or IR.
- Remote control included.
- Supports up to 255 presets with 0.1° accuracy and High-Speed Pan-Tilt function.
- Balanced audio input with embedding into IP stream, SDI and HDMI outputs.
- Configurable audio offset.
- Optional premium features: SRT streaming, Tally light, configurable Color Matrix. License AV-LC70-1 (sold separately).

Unpacking

This describes the contents of a complete Product package, and instructions for safe unpacking and (if necessary) Product return.

It is subdivided into the following sections:

1. Package Contents
2. Handling Precautions
3. Unpacking the Camera
4. Return Procedure

Package Contents

The following tables contains an overview of the package contents of the Product.

| No. | Quantity | Description | Avonic SKU |
|-----|----------|--|----------------------|
| 1 | 1 pc | PTZ Camera | AV-CM70/71/73-IP-B/W |
| 2 | 1 pc | Remote Control | AV-CM40-RC |
| 3 | 1 pc | USB cable type A to type A | AV-USB20-AA |
| 4 | 1 pc | Power Supply 12V/A | AV-CM40-PSU |
| 5 | 1 pc | RS-232 9-pin D-Sub female to DIN -8 male | AV-CM-RS-232 |
| 6 | 1 pc | 5-way Phoenix Balanced audio con. (CTBP92HE/5) | AV-PHNX-5 |
| 7 | 1 pc | 2-way Phoenix RS-485 connector | AV-PHNX-2 |

Each item is visualized below and referenced by the associated number in the table above:



Figure 3: Package Contents

Handling Precautions



Always take the camera by its base and do *not* move the position of the lens manually. See below.

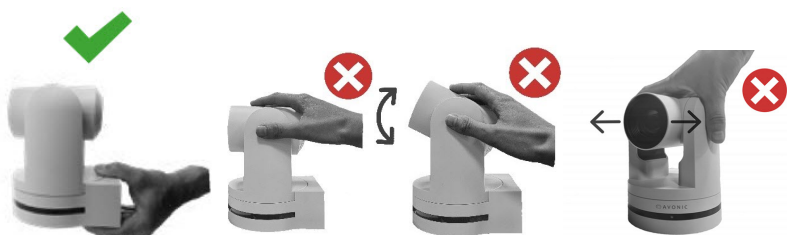


Figure 4: Handling Precautions

Unpacking the Camera



Execute the following steps to unpack the camera and associated components:

1. Open the box.
2. Verify that the contents of the box exactly matches the items as described in [Package Contents](#) on page 13. If this is NOT the case, contact Avonic and stop here.

The camera should be in its protective foam as follows:



Figure 5: Camera in Foam

3. Verify that the plastic camera bag is sealed. If this is NOT the case, contact Avonic and stop here.
4. Break the seal of the sealed camera bag.
5. Take the camera out of the bag. Be sure to follow the [Handling Precautions](#) on page 13 while doing so.
6. Install the camera following the steps as described in the chapter [Mounting and Installation](#) on page 15

Return Procedure



If, for any reason, you have to return the camera to Avonic, Execute the following steps:

1. Place the camera back in its protective foam. *Verify that the lens is in HORIZONTAL position!*
2. Place the camera with *all* of its components in the box.
3. Verify that the contents of the box *exactly* matches the items as described in [Package Contents](#).
4. Contact [Avonic](#) for the Return Procedure.

Mounting and Installation

This chapter describes the steps you have to perform to mount and install the Product in a correct and safe manner.

These steps are subdivided into the following groups, each of which is described in a separate section:

1. Mounting on Wall or Ceiling
2. Connecting the Components to the Camera
3. Connecting a Controller to a Camera
4. Connecting the camera to a local network



Take the following precautions to prevent the Product from falling down which may cause injuries:

- 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.)
- Use a safety loop or drop protection that prevents the Product from falling if the mounting construction fails.
- During mounting and installation, NEVER install a Product above a person.
- Check the installation at least once a year. An improper mounting could cause the unit to fall off, resulting in personal injury.

Mounting on Wall or Ceiling

The following accessories (AV-MT200 and AV-MT250) are separately available if the client wants to mount the camera to the wall or ceiling. Contact your Avonic reseller or local distributor for purchasing details.



Wall and Ceiling mount (AV-MT200)

SKU white: AV-MT200-W

SKU black: AV-MT200-B



Ceiling mount (AV-MT250)

SKU white: AV-MT250-W

SKU black: AV-MT250-B



Visit www.avonic.com to download instructions for mounting the camera to the wall or ceiling using the accessories AV-MT200 or AV-MT250.

Connecting the Components to the Camera



Execute the following steps to connect the components to the camera:

1. Connect all provided components (see [Package Contents](#)) to the ports at the rear of the camera. The figure below shows the applicable ports.



Figure 6: Camera Ports

1. Kensington Lock
2. Balanced Audio Line in 5-pin Phoenix connector
3. RS-485 two-wire serial communication with 2-pin Phoenix connector
4. System Selector (see Using the Select Switch on page 51)
5. RS-232 mini-DIN-8 IN (connect the supplied RS-232 cable)
6. RS-232 mini-DIN-8 OUT for daisy chaining RS-232 connection
7. BNC 3G-SDI output, SMPTE 425M level A.
8. HDMI Type A
9. USB2.0 Type A, UVC video output and control
10. RJ45 Ethernet connection, with PoE
11. DC12V power with locking screw (connect the supplied DC PSU)
12. Power ON/OFF
13. Fall protection eye

2. If you have connected the power cable to the camera, set the power switch at the back of the camera to the 'ON' position. If you use a PoE Ethernet connection, ensure that the Power switch is always 'ON'.

After empowering the camera, it starts initializing by first rotating the Pan-Tilt to the maximum top right position and then to the center.



If position preset '0' has been stored, this is the position that will be called after initialization.

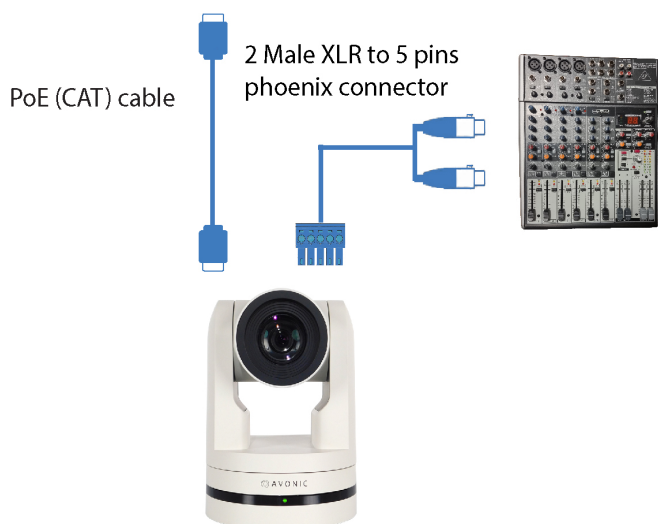
The current IR-channel setting and IP Address of the camera are displayed on the [OSD Menu](#). From this point onwards, the user can start controlling the camera.

Balanced Audio Connection



To connect balanced audio to the camera, you need the following:

- Double Male XLR cable with the possibility to connect it to a 5 pins phoenix connector (CTBP92HE/5: see [package contents](#)).
- Audio input device with multiple XLR input/ outputs, such as a mixer.
- PoE (CAT) cable for streaming. See below:





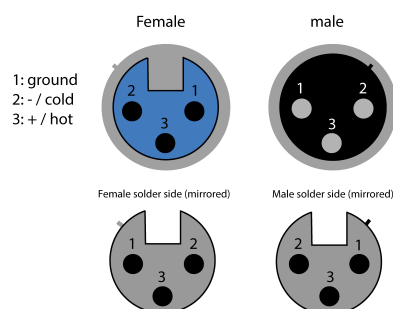
Follow the instructions below to connect the audio cable to the phoenix and the XLR connectors.

1. Connect the wires of the audio cable as is shown in picture 1 to both XLR connectors. Note that the pictures of the connector's back are **mirrored**!
2. Connect the wires of the other side of the audio cable as is shown in picture 2.

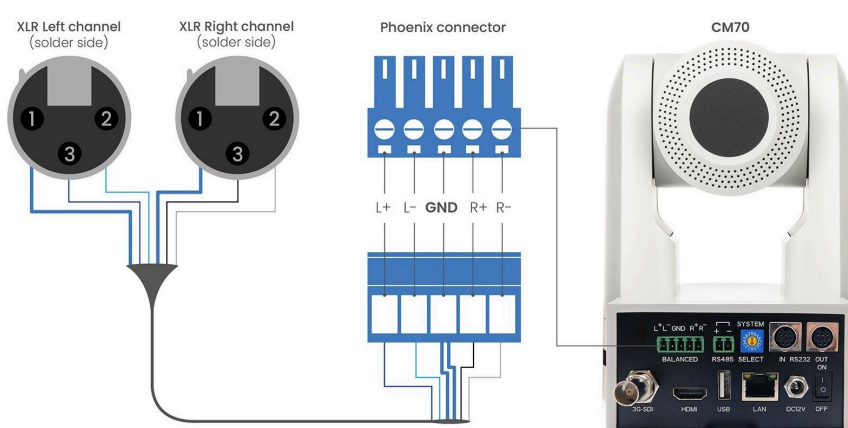


Take note that the colors of the wires could be different in your audio cable according to the pictures (XLR and Phoenix connector) below. You need to know which one are the right and left channels and which one is the GND (ground).

Picture 1: XLR connector



Picture 2: Phoenix connector



Connecting a Controller to a Camera

You can connect one or more cameras to an VISCA IP controller.



See <https://avonic.com/en/product-categorie/controllers/> for an overview of the available controllers.

A controller gives you direct control over the most important camera settings (e.g., Pan, Tilt, Zoom, Focus, White Balance). You can access all other settings through the [OSD Menu](#) of the camera using the controller.

Connecting the camera to a local network

The camera(s) can be connected via a serial connection to USB, HDMI, SDI, RS-232, RS-485, or via a LAN Ethernet connection. Each of these options is described below.

Connecting via USB, HDMI or SDI



Execute the following steps to connect the camera to a desktop or a (computer) monitor via USB, HDMI or SDI:

1. Connect the camera to the desktop or monitor via the USB, HDMI or SDI port (see figure above).
2. Open the Windows Camera app or a third-party camera app.
3. Open the Settings.
4. Select the camera you just connected, or click on the option / icon to change the camera to the camera you just connected.
5. Press the [MENU](#) button on the provided IR Remote Control to open the [OSD Menu](#).



See [Using the Remote Control](#) for more information on how to use the Remote Control.

Serial Connecting via RS-232 or RS-485

COM Port Settings

In default working mode, the camera can connect to a VISCA controller via an RS-232 or RS-485 serial interface. The applicable COM port settings are (where '*' stands for 'Default value'):

RS-232

- Baud rate: 2400/4800/9600*/115200
- Start bit: 1 bit
- Data bit: 8 bits
- Stop bit: 1 bit

RS-485 (half-duplex mode)

- Baud rate: 2400/4800/9600*
- Start bit: 1 bit
- Data bit: 8 bits
- Stop bit: 1 bit



See [Appendix A - VISCA Settings and Command List](#) on page 61 for the command list.

RS-232 Interface



Connect the controller to the back of the camera via the RS-232 cables as shown in the figures below:



| No. | Function |
|-----|----------|
| 1. | DTR |
| 2. | DSR |
| 3. | TXD |
| 4. | GND |
| 5. | RXD |
| 6. | GND |
| 7. | IR OUT |
| 8. | NC |

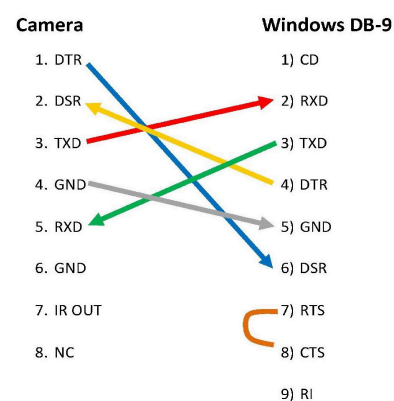
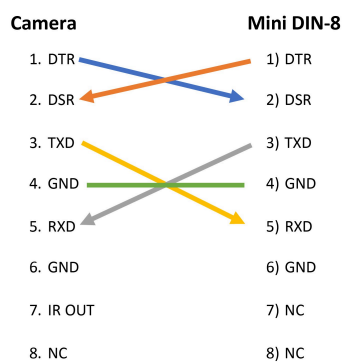


Figure 7: RS-232 Interface (Mini DIN-8)

Figure 8: RS-232 Cable and Interface Connection (Mini DIN-8 and Windows DB-9)

RS-232 Network Connection



Execute the following steps to connect the controller to the back of the camera(s) via RS-232:

1. Make the connection using *daisy chaining* network architecture.
2. Keep in mind that the maximum cable length for RS-232 is 10-15m.

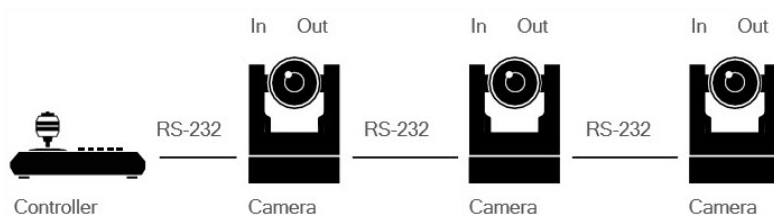


Figure 9: RS-232 Network Connection Diagram

RS-485 Interface



Connect the controller to the + and - at the back of the camera via the RS-485 cables, as shown in the figure below. Note that the color of the connecting cables (red and black in the figure) may vary.

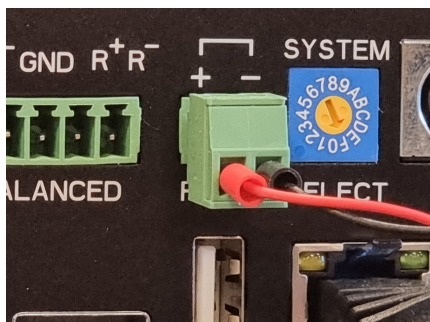


Figure 10: RS-485 Interface

RS-485 Network Connection



Execute the following steps to connect multiple cameras to RS-485:

1. Attach the cameras to a 2-wire twisted pair bus (maximum length 1200m) that is terminated at both ends with a 120Ω-impedance resistor.
2. Ensure that the maximum distance from the bus to the camera or controller is 5m. If you use only ONE camera, the impedance resistor is not needed.

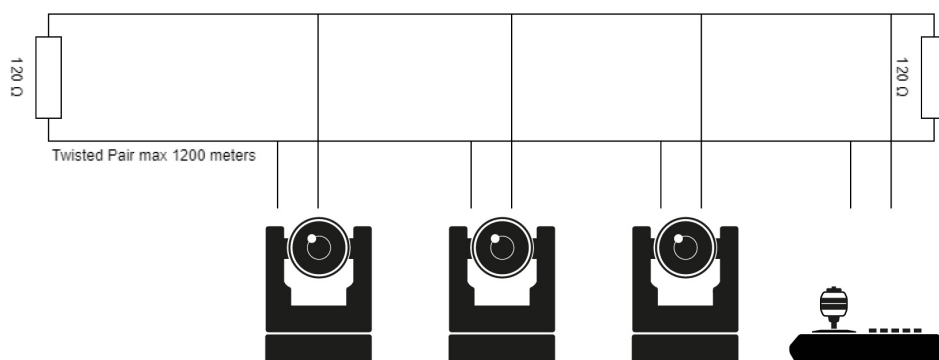


Figure 11: RS-485 Network Connection Diagram

Connecting via LAN

Avonic IP cameras can be controlled by any device using the Visca over IP protocol (see the command list in [Appendix A - VISCA Settings and Command List](#)).

Settings

By default, the IP address of the camera is "192.168.5.163" with "admin" for both the username and password.

The control parameters for the CM7x-IP cameras are as follows:

- IP Address: 192.168.5.163
- Username: admin
- Password: admin
- TCP or UDP port: 1259

IP (Network) Connection



Execute the following steps an Avonic PoE camera to a LAN:

1. Use a standard (PoE) switch. If the unit is simultaneously connected to both PoE and its own power supply, the power supply will take priority. If the power supply is disconnected when PoE is present, the camera will remain operational without interruption.
2. Ensure that addressing is done via IP. When using VISCA over IP, the 'x' in all the '8x' addresses is always '1', where the Visca address in a Visca over IP environment is always 1. (See [Appendix A - VISCA Settings and Command List](#) for more information.)

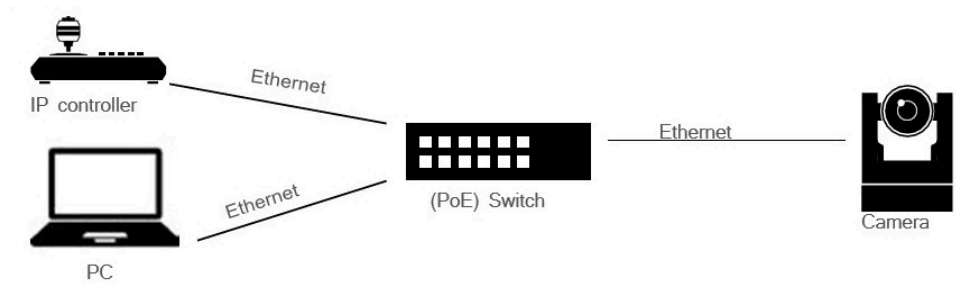


Figure 12: IP Network Connection Diagram

Operation

1. WebGUI
2. Using the Remote Control
3. Other Key Combinations
4. OSD Menu
5. Using the Select Switch

WebGUI

You can access the REC200 through a WebGUI where you can set up the REC200.

Login

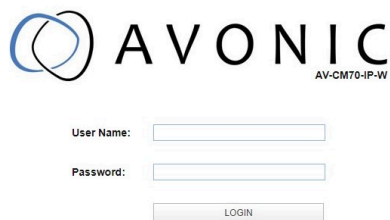


Figure 13: WebGUI > Login



Execute the following steps to log on to the WebGUI:

1. Open your web browser. Enter the default IP address "192.168.5.163". The *Login* screen appears.
2. Enter "admin" for both the *User Name* and *Password* and Click **LOGIN** to continue.



If **DHCP** is enabled and no **DHCP** server is available, the camera will automatically appoint an IPv4 link-local address between **169.254.0.0** and **169.254.255.255**. The IP address is shown on the screen at start-up.

After a successful logon, the WebGUI is displayed. Here, you can select various tabs that are described below.

LOCAL

In this tab, you can see a preview of the camera IP video output. For example:

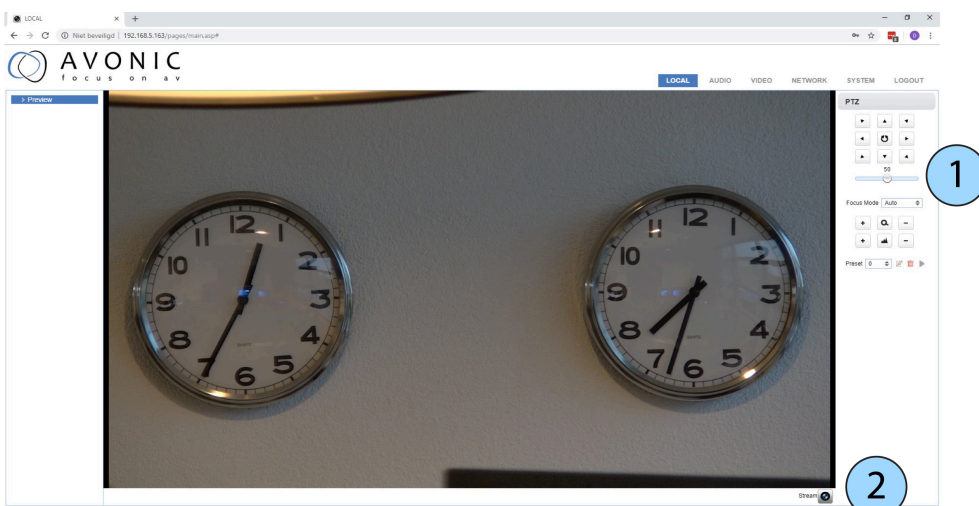


Figure 14: WebGUI > Preview



Execute the following steps to see a preview of the camera IP video output:

1. Use the options on the right to adjust the PTZ control, speed by zoom slider, focus and zoom functionalities.
2. Click on the camera icon below the screen to switch the preview between main stream and sub stream.



The Preview feature **ONLY** works if the main or sub stream is set to 'H264' (see [VIDEO - Camera Settings](#)).

AUDIO



Connect first an audio cable with XLR connectors to the 5 pins Phoenix connector and connect the cable to the camera. See [Balanced Audio Connection](#) on page 16

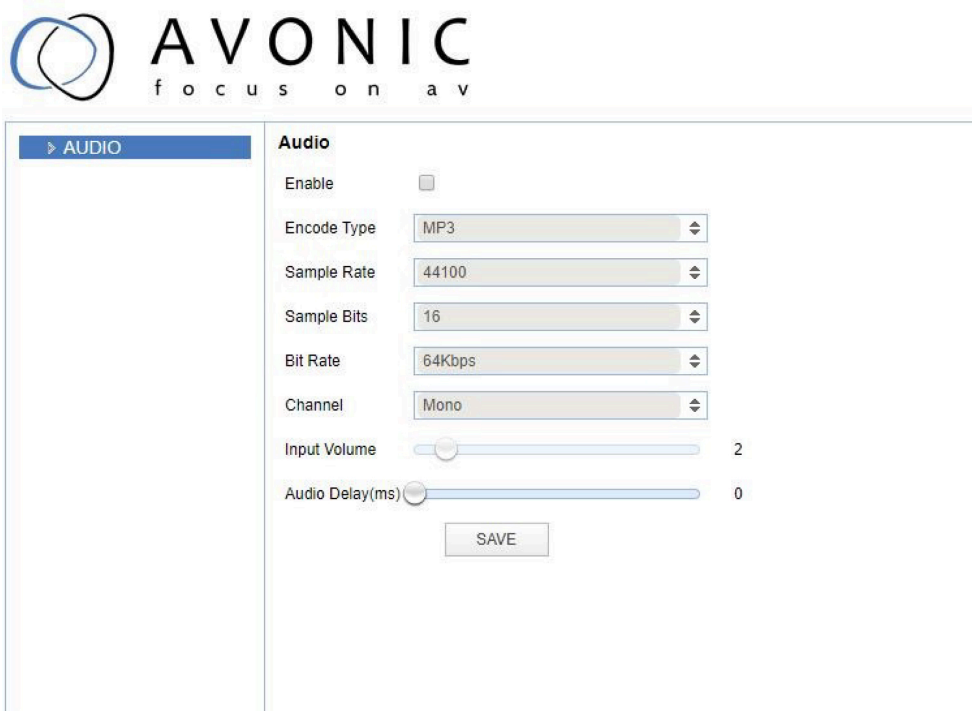


Figure 15: WebGUI > Audio

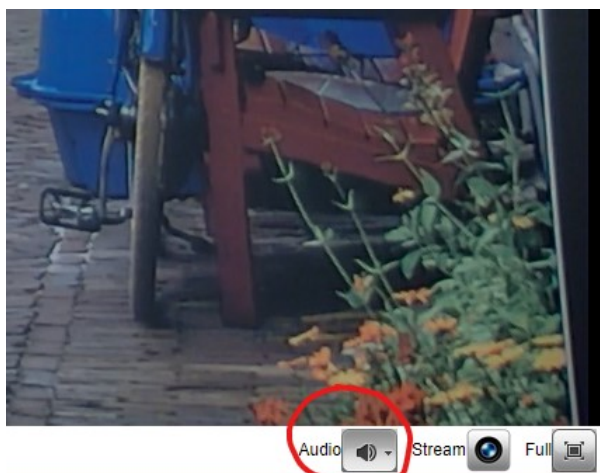


Make your settings as follows:

1. Enable (checked) or disable (blank) embedding of audio input (camera rear).
2. Select the encoding type: mp3, AAC or G.711A.
3. Select the sample rate: 16000, 32000, 44100 or 48000.
4. Set the sample bits always to 16.
5. Select the Bitrate: 32, 48, 64, 96 or 128 Kbps.
6. Select the Channel: Mono or Stereo.
7. Set the Input Volume: 1 ~ 10.
8. Set the Audio Delay (ms): 0 ~ 200.
9. Click **SAVE** to apply your settings. A small confirmation dialogue appears in the bottom right corner.



Make sure to **enable audio** and to click at the **audio** button on the bottom of the *Preview page* of the WebGUI.



VIDEO

You can use the VIDEO tabs (described below) to define your settings for the video output, including the main settings of the camera's OSD.

VIDEO - Video Encoder



Video Encoder

Streaming Video

Multicast Streaming

Camera Settings

OSD

Output Format

SRT

Video Encoder

| Stream | Main Stream | Sub Stream |
|-------------------|-------------|------------|
| Compressed Format | H.264 | H.264 |
| Profile | BP | HP |
| Image Size | 1920*1080 | 320*180 |
| Rate Control | CBR | CBR |
| Image Quality | Best | Good |
| Bit Rate(Kb/S) | 4096 | 512 |
| Frame Rate(F/S) | 60 | 25 |
| I Frame Interval | 300 | 75 |
| I Frame Min QP | 30 | 20 |
| QFactor | 50 | 40 |
| Stream Name | live/av0 | live/av1 |

SAVE

RTP Package

RTP Package Size Small Package

SAVE

Figure 16: WebGUI > VIDEO > Video Encoder

The Video Encoder settings are listed below.

| Video Encoder Option | Main Stream | Sub Stream |
|--------------------------|--|--|
| Compressed Format | MJPEG/ H.264/ H265 | MJPEG/ H.264/ H265 |
| Profile | BP/ MP/HP | BP/ MP/HP |
| Image Size | 1920*1080/1280*720 | 1920*1080/1280*720/ 320*180/ 320*240/ 640*360 |
| Rate Control | CBR (constant bit rate) / VBR (variable bit rate) depending on format | |
| Image quality | Fixed at 'best' | Fixed at 'good' |
| Bit Rate(Kb/s) | 64-40960 | 64-40960 |
| Frame Rate (F/s) | 5-60 frames per second | 5-30 frames per second |
| I FrameInterval | 1-300 | 1-150 |
| I Framemin. QP | 10-51 | 10-51 |
| Streamname | live/av0 | live/av1 |
| RTSP Link | rtsp://<ip-address>/live/av0 | rtsp://<ip-address>/live/av1 |
| RTP Package | Small Package (standard MTU size, 1500 bytes) Big Package (approx. 60kb MTU size) | |



NDI uses the **Main Stream** of the camera. Execute the following steps to save your settings:

1. Click **SAVE** to apply your settings. A small confirmation dialogue appears in the bottom right corner.
2. Reboot the camera if you changed RTP package.



Read this [article](#) from Youtube and the [article](#) from Facebook for setting up a correct stream, if you want to stream via Youtube or Facebook.

VIDEO - Streaming Video

Video Encoder

Streaming Video

Multicast Streaming

Camera Settings

OSD

Output Format

SRT

Streaming Video

Stream

Main Stream

Sub Stream

Enable

☐
☐

Protocol Type

RTMP

RTMP

Host Address

192.168.5.11

192.168.5.11

Host Port

1935

1935

Stream Name

live/av0

live/av1

User Name

Password

Password for stream encryption

Crypto key length in bytes

0

0

SAVE

Figure 17: WebGUI > VIDEO > Streaming Video

The recommended Streaming Video settings are listed below.

| Stream Option | Main Stream | Sub Stream |
|--|--------------------------|--------------------------|
| Enable | Mark checkbox to enable | Mark checkbox to enable |
| Protocol Type | RTMP, SRT | RTMP, SRT |
| Host Address | 192.168.5.11 | 192.168.5.11 |
| Host Port | 1935 | 1935 |
| Stream Name | live/av0 | live/av1 |
| User Name | Empty is default setting | Empty is default setting |
| Password | Empty is default setting | Empty is default setting |
| Password for stream encryption* | Empty is default setting | Empty is default setting |
| Crypto Key Length in bytes | 0, 16, 24, 32 | 0, 16, 24, 32 |



Execute the following steps to save your settings:

1. (* in the table) Enter a value for *Password for stream encryption* if the selected *Protocol Type* is "SRT".
2. Click **SAVE** to apply your settings. A small confirmation dialogue appears in the bottom right corner.
3. Start an video streaming application like VLC mediaplayer, Daum Potplayer etc. to stream the video of the camera to that application.

VIDEO - Multicast Streaming

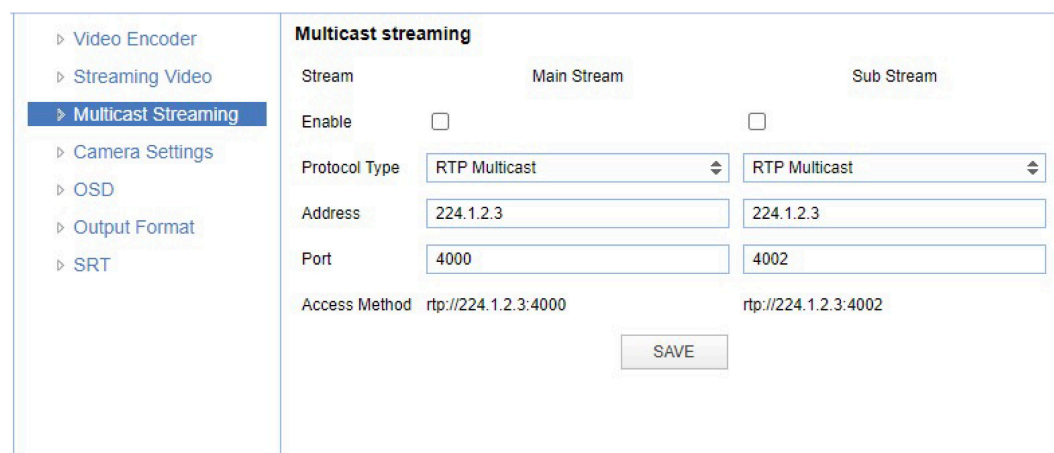


Figure 18: WebGUI > VIDEO > Multicast Streaming

The recommended Multicast Streaming settings are listed below.

| Stream Option | Main Stream | Sub Stream |
|----------------------------|---|----------------------------------|
| Enable | Mark checkbox to enable/ disable | Mark checkbox to enable/ disable |
| Protocol Type | RTP/ TS Multicast/ TS Unicast | RTP/ TS Multicast/ TS Unicast |
| Address (multicast) | 224.0.0.0~ 239.255.255.255 | 224.0.0.0~ 239.255.255.255 |
| Address (unicast) | Specify the IP address to which you want the Unicast stream pushed. | |
| Port | 4000 (default) | 4002 (default) |
| Access Method | rtp://224.1.2.3:4000 | rtp://224.1.2.3:4002 |



Click **SAVE** to apply your settings. A small confirmation dialogue appears in the bottom right corner.

VIDEO - Camera Settings

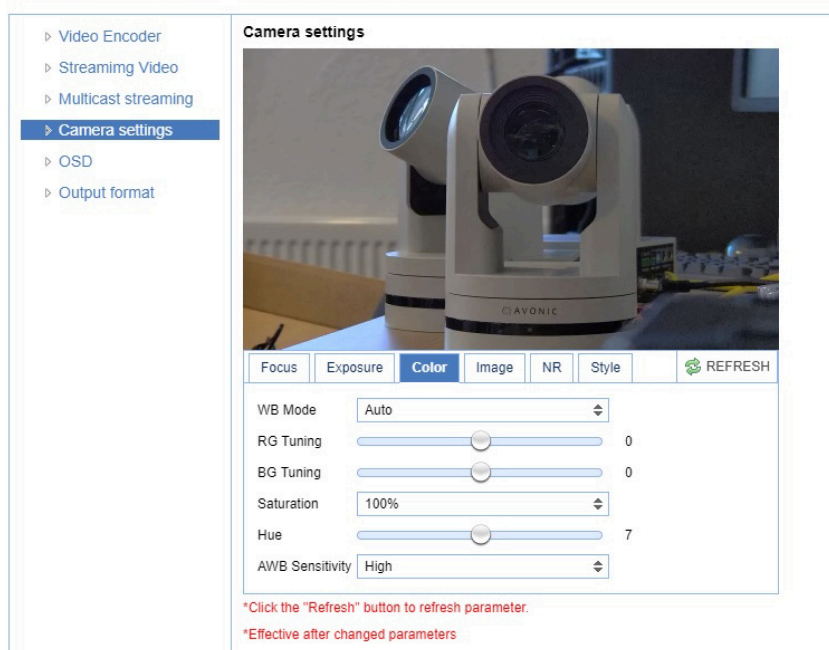


Figure 19: WebGUI > VIDEO > Camera Settings



Execute the following steps to define your camera settings:

1. Use the **Camera Settings** tabs (described below) to change the OSD settings as if you are using the remote control.
2. If you have changed a value with the remote control, update the WebGUI using the **REFRESH** button.



A picture is shown **ONLY** if the main video stream is set to H264.

Focus

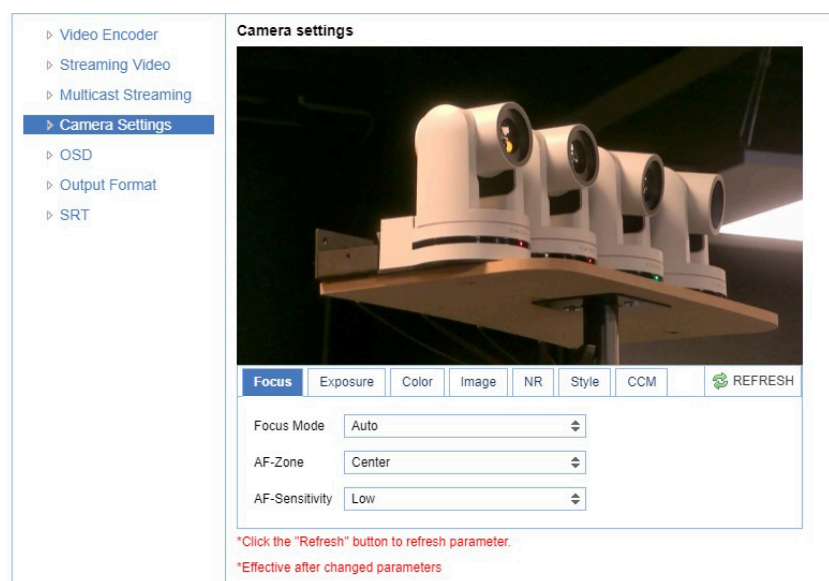


Figure 20: WebGUI > VIDEO > Camera Settings > Focus

The three Focus settings are explained below.

Focus Mode

- Auto** The camera determines the focus position by itself and will adjust to the contents of the filmed object.
- Manual** The user is able to set a fixed focus position manually. This can be useful when the contents of the filmed object are not clear towards the background and the autofocus has difficulty finding the correct focusing.
- One-push** The camera will focus once and will keep the focus in that position until another focus command is sent.

AF-Zone

This setting defines the area where the autofocus is aimed at.

AF-sensitivity

Sets the level of speed with which the autofocus responds. This can be useful if you have people walking through the picture. If the setting is 'High', the camera will respond immediately. If the setting is 'Low' or 'Medium', the camera will not react to sudden and short changes in the picture.



Note that in some cases the autofocus will have some difficulties to focus. We strongly recommend to focus manually to avoid autofocus issues. See also the [Troubleshooting/ Image](#) in this manual.

Exposure

If you click in the field after the option 'mode', you will see that you have the following Exposure options: Auto, Manual, SAE, AAE and Bright. These options are described below.

Auto Exposure Mode

In Automatic exposure mode, the camera determines the iris and shutter settings. See the settings below:

EV (Exposure Value): ON/OFF and Level

If the light conditions require this, you can create a quick adjustment to your current exposure settings without actually changing the fundamental values like iris and shutter.



Take care to not 'overdo' the settings or the picture will become washed out bright or too dark.

BLC (Back Light Compensation): ON/OFF

Compensation for having to film against bright light directly into the lens. See the pictures below:

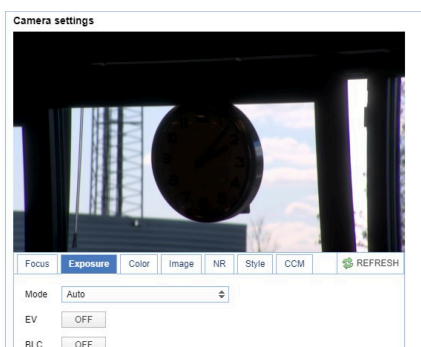


Figure 21: Camera Settings > Auto Expo (BLC OFF)

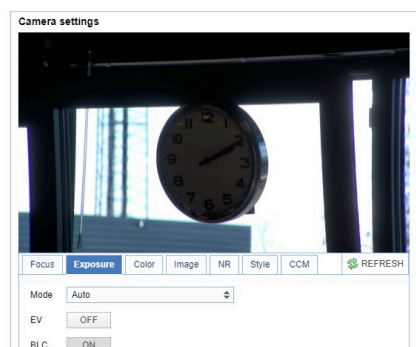


Figure 22: Camera Settings > Auto Expo (BLC ON)

Flicker

This setting handles the flickering of artificial lighting in its operating space. Options are 50Hz, 60Hz and OFF.

G.Limit

Gain limit is the maximum level of artificial brightness and contrast that the camera can automatically add to the image. This setting will make a significant difference to the overall picture.



Within reason this setting add noise to the picture in dark areas and produce a washed out, greyish picture.

DRC

Dynamic Range Compression has a similar effect on the picture as the above mentioned gain limit. The DRC works by compressing the natural dynamic range of the image by taking out the darkest and lightest parts. This can be a particular helpful setting when the light conditions are challenging. The differences should be clearly visible in dark parts of the image, as they will become lighter/more grey as the level of DRC increases.

Manual Exposure Mode

| | | | | | | | |
|---------|-----------------|-------|-------|----|-------|-----|---------|
| Focus | Exposure | Color | Image | NR | Style | CCM | REFRESH |
| Mode | Manual | | | | | | |
| Shutter | 1/100 | | | | | | |
| Iris | F1.8 | | | | | | |
| DRC | 7 | | | | | | |

Figure 23: WebGUI > VIDEO > Camera Settings > Manual Exposure Mode

In Manual exposure mode, you can manually set the shutter, Iris and DRC options.

Shutter

The shutter setting determines the amount of time per second that the sensor is exposed. The range of the shutter speed setting is 1/25th of a second (40 milliseconds) to 1/10000th of a second (0.1 milliseconds). If you shoot a video with a shutter time of 1/25th of a second, you can imagine that the video becomes blurry and overexposed. The faster the shutter is set to open and close, the sharper your filmed object will become. However, the amount of light that falls onto the sensor is also diminished.



If you are inexperienced or if the light conditions change a lot, it's best practice to keep the camera on the automatic exposure setting.

Iris

The Iris is a part of a lens that regulates the amount of light that passes through the lens and onto the sensor, by altering the diameter of the hole through which the light enters. The diameter of the hole is measured in *F-stop* value. A higher value lets in less light, while a lower setting lets in more light.

This setting affects the length of the depth of field. The higher F-stop you use, the deeper your depth of field. Reason: the smaller the aperture, the more focused the light beams will be, resulting in a more focused image.

DRC

Dynamic Range Compression has a similar effect on the picture as the above mentioned gain limit. The DRC works by compressing the natural dynamic range of the image by taking out the darkest and lightest parts. This can be a particular helpful setting when the light conditions are challenging. The differences should be clearly visible in dark parts of the image, as they will become lighter/more grey as the level of DRC increases.

SAE Mode (Shutter Auto Exposure)

In this mode, the shutter speed is user-adjustable. The camera automatically decides the best Iris F-stop value for an optimal exposure setting.



Keep in mind that the shutter speed is the amount of time that each frame of the sensor has been exposed to light.

To compensate for poor lighting conditions, it is possible to adjust the **DRC (Dynamic Range Compression)**. The DRC works by compressing the natural dynamic range of the image, by taking out the darkest and lightest parts. This can be a particular helpful setting when the light conditions are challenging. The differences should be clearly visible in dark parts, as they will become lighter / more grey as the level of DRC increases.

AAE Mode (Aperture Auto Exposure)

The camera will automatically set the shutter speed based on the Iris F-stop value (aperture) set by the user. As the camera determines the preferable shutter speed, it is possible to turn the anti flicker setting to the required 50Hz or 60Hz to eliminate the effects of a shutter functioning at 1/50th of a second, for example. In this mode, both the Gain limit and DRC are available to compensate for challenging light conditions.

Bright Mode

This mode is to try and create a decent image when the light conditions are exceptionally poor.

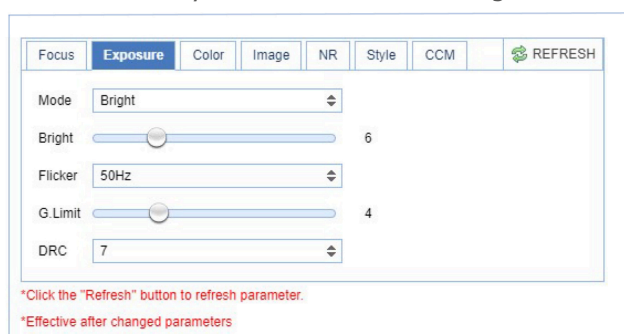


Figure 24: WebGUI > VIDEO > Camera Settings > Bright Exposure Mode

In this mode, you should keep the Bright level, Gain limit and DRC as low as possibly acceptable to avoid getting too much noise in the picture. If the level of noise in the image becomes unacceptable, you can use noise reduction to smooth the picture over.

Color

The color modes inside the camera are designed in such a way that the video output of the camera can match the current light conditions to produce accurate colors. There are several automatic preset modes and a manual mode to set the colors to the preference of the user.

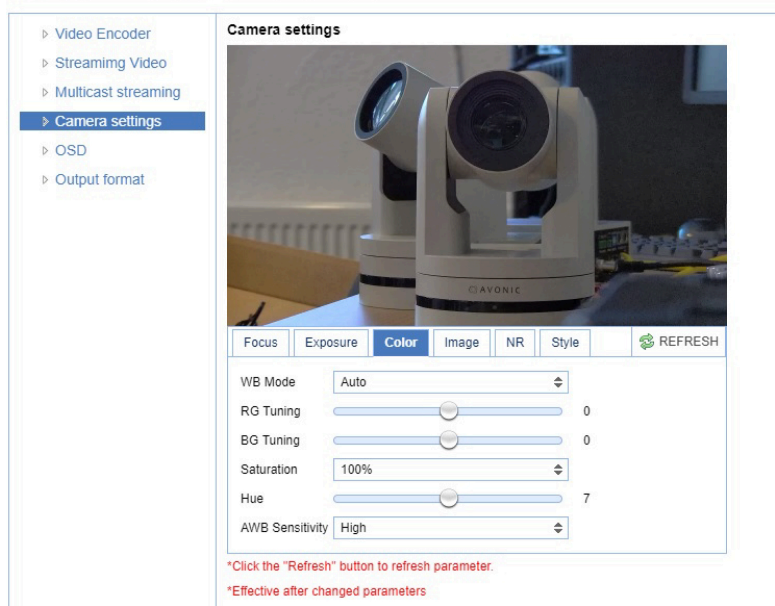
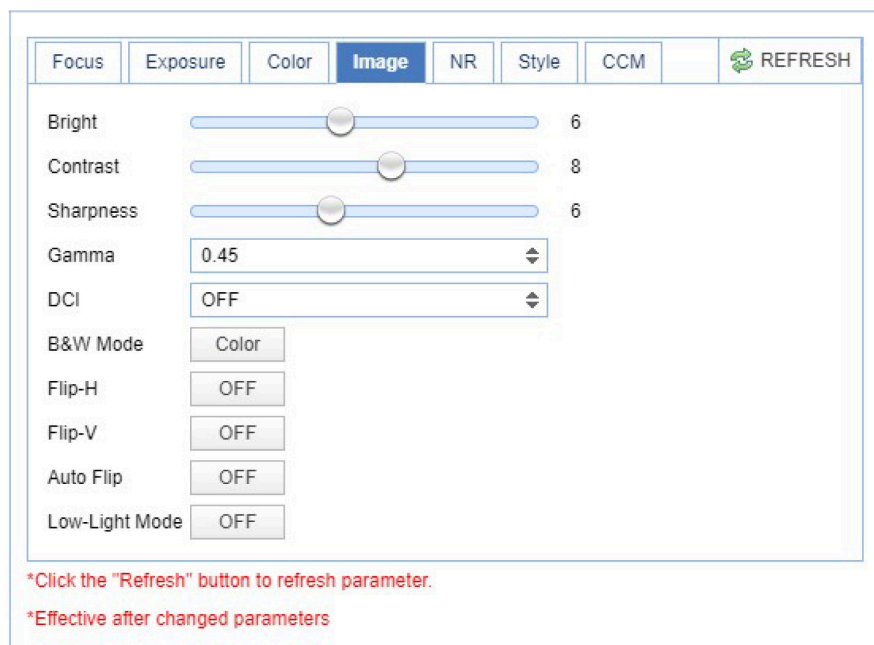


Figure 25: WebGUI > VIDEO > Camera Settings > Color

The settings are listed below.

| | |
|------------------------|--|
| WB mode auto | The camera continuously measures and defines the light conditions and acts accordingly. In this mode, there are some adjustments that can be made to tune the image to the preference of the user. |
| RG Tuning | Red Gain Tuning, increase or decrease red. |
| BG Tuning | Blue Gain Tuning, increase or decrease blue. |
| Saturation | How saturated the image's colors are. 0% would produce a black and white image. |
| Hue or tint | The balance between green and red. 0 is green, 14 is red. |
| AWB Sensitivity | This setting indicates how quickly the camera responds to changing light settings. |

Image



*Click the "Refresh" button to refresh parameter.

*Effective after changed parameters

Figure 26: WebGUI > VIDEO > Camera Settings > Image

These are settings that have an effect on the image post-processing. Basically, these settings are all artificial: they don't affect the optical parts of the camera itself.

The settings are listed below.

| | |
|----------------------------------|---|
| Bright | The amount of detail that is visible in darker areas of the image. <i>Be careful not to set this setting too high, as you will see that the image becomes 'milky-white'.</i> |
| Contrast | The amount of detail that is visible in lighter areas of the image. |
| Sharpness | Artificial contrast, be careful no to set this too high as it will create a sort of 'halo' around sharp edges of filmed objects. The setting of sharpness coincides with the setting of noise reduction. |
| Gamma | The gamma curve selection has to do with the perception of the human eye to lighter and darker. If you select a higher rate of gamma, you will see that the picture become darker, but you get also more detail. |
| DCI | The Dynamic Contrast affects the contrast of the picture. The higher the number, the more contrast you will get. |
| B&W Mode | Black and White Mode makes the picture black and white. |
| Flip-H, Flip-V, Auto flip | The Flip-H mode turns the picture horizontally, while the Flip-V mode turns it vertically by 180 degrees. When Auto Flip is on, the camera will automatically flip the picture horizontal and vertical. |
| Low-Light Mode | The Low-Light mode is present to be able to film when the environment in which the camera sits is almost completely dark. The frame rate will drop to 10 frames per second, to catch as much light on the sensor as possible. If this mode is needed to produce a picture, add more light to the scene to get better results. |

NR (Noise Reduction)

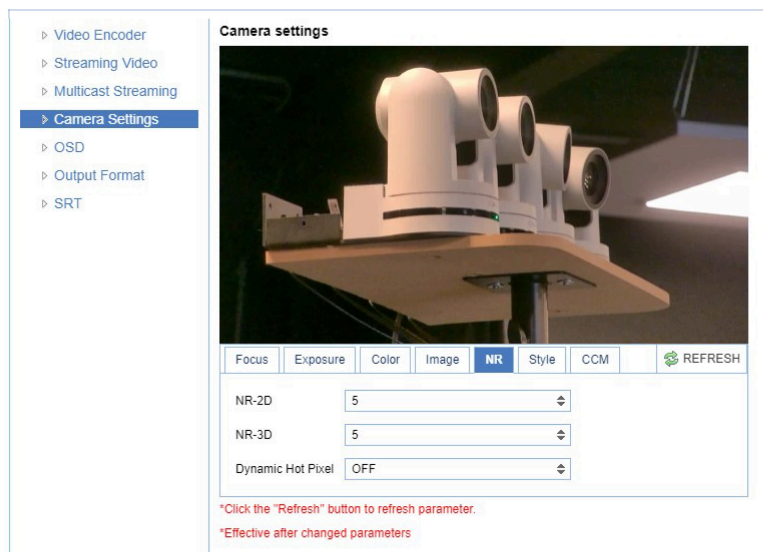


Figure 27: WebGUI > VIDEO > Camera Settings > NR

Noise reduction can be used to soften the image when noise is present due to poor lighting conditions. The higher the amount of noise reduction, the softer the image will get, ultimately resulting in loss of details. Be careful when adjusting the noise reduction, as it can take away the natural 'crispness' of the image. You will lose the natural 'crispness' of the image, if you set the dynamic contrast and gain too high (this will cause more noise). Better practice is to add light to the filmed object.

The settings are as follows:

| | |
|--------------------------|--|
| NR-2D | Used for still-standing objects. |
| NR-3D | Used for moving objects. |
| Dynamic Hot Pixel | A dynamic hot pixel is a defective pixel which look much brighter than they should and will sometimes become visible due to long exposure shots of the camera at a higher rate of light sensitivity. This is often visible as sparkles in the picture. The Dynamic Hot Pixels mode corrects the pixel so that the pixel will appear as normal on the filmed picture. |

Style

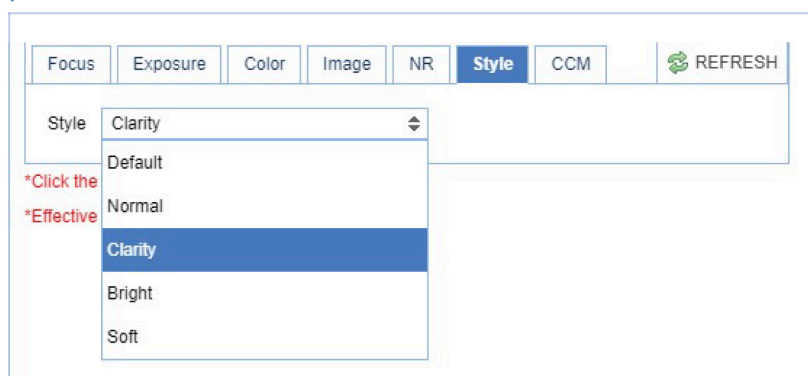


Figure 28: WebGUI > VIDEO > Camera Settings > Style

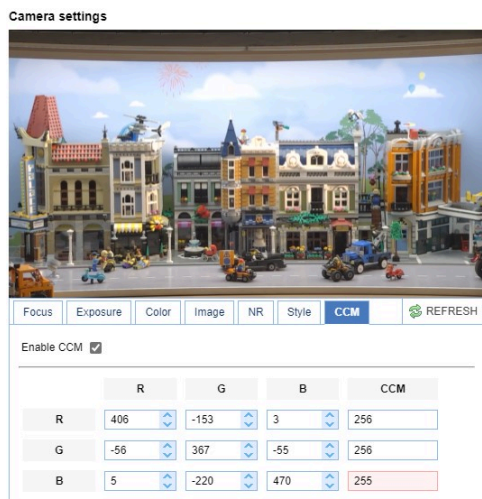
Here, you can choose the style you want, such as **Default** (standard setting), **Normal** (which makes the picture more 'natural'), **Clarity** (makes the picture more clear), **Bright** (which makes the picture more bright) and **Soft** (which softens the picture).

CCM (Customizable Color Matrix)

If you have purchased the additional license for SRT and the Customizable Color Matrix (CCM), the Camera Settings menu will have an extra tab in the camera settings: CCM. With this feature you can match the colors from the Avonic CM70 series cameras with cameras from other manufacturers. The colormatrix is a 3x3 "table" that affects red, green and blue in the filmed picture and their relation to it.



1. Open **Video > Camera Settings > CCM**
2. Click on *Enable CCM* to enable this feature. You will see the default setting with a natural picture.
3. Read the paragraphs below first before you are changing these numbers!



Channels and Signals

The color matrix becomes visible when the CCM feature is enabled. It has a vertical and a horizontal Red, Green, Blue (RGB) row. By filling these with numbers it is possible to change the colors in the picture.



Note the following:

1. **Channel:** Horizontal RGB **row**. This *corresponds* with red, green and blue parts in the picture, but changes also secondary colors, because these colors are having some red, green and blue in them.
2. **Signals:** Vertical RGB **column**. This *subtracts or adds* red, green, blue from or to the filmed picture.
3. **CCM column:** The sum of Red + Green + Blue (signals). The cell turns red if the number is not 256. You can ignore that since the colors will be changed, even if the number is not exactly 256.



Matching and finetuning colors

Matching and finetuning colors is not so simple as it looks. That is because changing colors in a camera works different if you compare it with painting. It is important that you realize that the cells from the sensor (photovoltaic cells) do not carry any color information, only **luminance** information. In other words: the cells will make colors in the picture **more brighter or darker** in such a way that the balance between the colors shifts.

You need to know also that the processor in the camera, for example, makes everything in the red parts red. That does not mean that everything in the red parts IS actually red! Even if there are a few pixels green or blue, the sensor will see it and will make them red as well. That is why colors can look different in a camera, then when you are painting.



1. There is no database or any tutorial that can help to match colors between specific camera systems of different manufacturers. Every camera system works different and so the color matrix does. Changing a number in a cell, for example, in 256 in the matrix of the CM70 series camera, does not mean that this will change in exactly the same color in the picture from another camera.
2. Practice a lot to learn for yourself what the best settings are to match the colors between the CM70 series camera and a camera from another manufacturer.
3. Read the paragraphs below about channels and signals, subtracting and adding colors to learn how the matrix works.

Subtracting colors

You can subtract colors using numbers **above or below** zero in the **same cell** or in a cell of the **same row**.

For example:

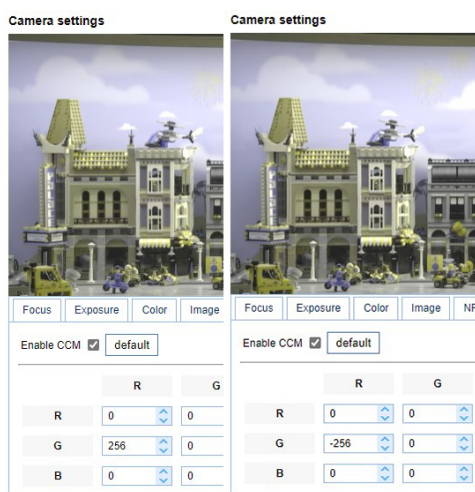
1. If you change the number in the green channel > Red signal in a number **above zero**, it means that you are subtracting the red signal from the green channel, making green parts purple, because the camera sensor removes red into the green parts of the picture. Red and yellow parts become more green, as the red signal is decreased leaving a green tint behind. If you have a sharp eye, you can see that other colors in the picture become slightly lighter. By changing the same number in a number **below zero**, you have the same result, but other colors in the picture become slightly darker.
2. If the number in the Green channel > Green Signal is changed with the same amount as in the Green channel > Red signal, green is subtracted from the picture, removing the greenish tint from the yellow and red parts. This makes the colors as they were before, but less intense and darker (because **light** is removed and not color).



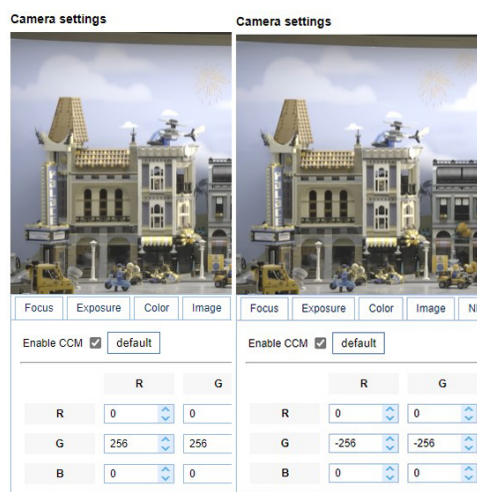
Remember that:

1. **+256** in G-R = Red signal is **subtracted** from the green channel, changing the balance between green and red towards green. This means that red pixels in the picture will turn slightly into green and since there are a lot of red pixels in red and yellow parts, a greenish tint is "left behind" in the picture.
+256 in G-G = Green is **subtracted** from the green channel, changing the balance between red and green as it was by removing the greenish tint from the picture. Since light is removed from the picture, colors become less intense and darker.
2. **+256** in a cell makes the overall picture slightly lighter, while **-256** in a cell makes the overall picture slightly darker.
3. **Subtracting** a color from the picture affects the colors from the whole picture, because there are also pixels from that color in other colors in the picture even if you cannot see them. See the pictures below:

Red and yellow parts green. left: +256, right: -256



Without the greenish tint. left: +256, right: -256



Adding colors

You can add colors by changing the balance between the red, green and blue signals. A color will be added if a number above zero is used in one cell and a number below zero is used in another cell of the same channel, or if the cells of different signals and channels are filled with a number.

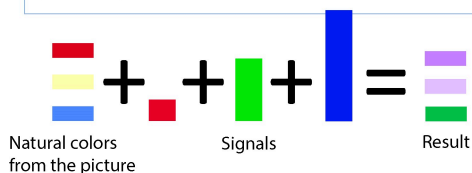
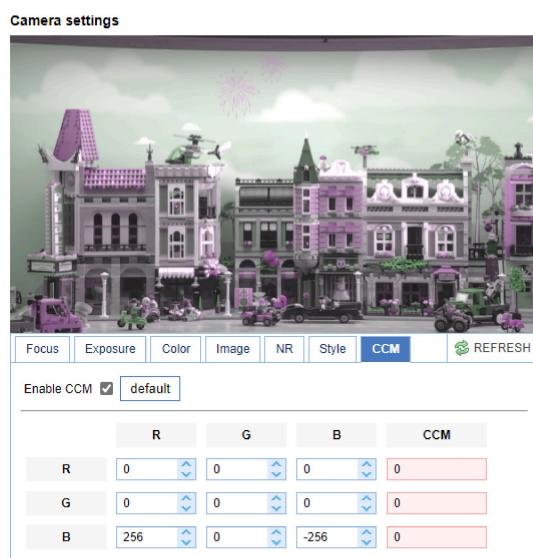
For example:

1. By changing the number in the Blue channel > Red signal to a number above zero and in the Blue channel > Blue signal in a number below zero, you can add blue to the picture, resulting in purple in red and yellow parts in green in blue parts.
2. By doing the opposite, changing the number in the Blue channel > Red signal to a number **below** zero and in the Blue signal > Blue channel to a number **above** zero, you can add red to the picture. However, since zero in a cell is not nothing, the color green will be added too in this case! This means that red parts in the picture will not become (blood) red, but orange and yellow parts become more saturated. Also the difference between the number above zero and below zero will play a role. The greater the difference between the two numbers, the more color is added and the more saturated the picture will become.

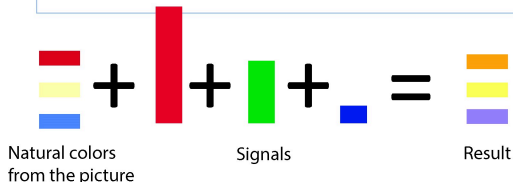
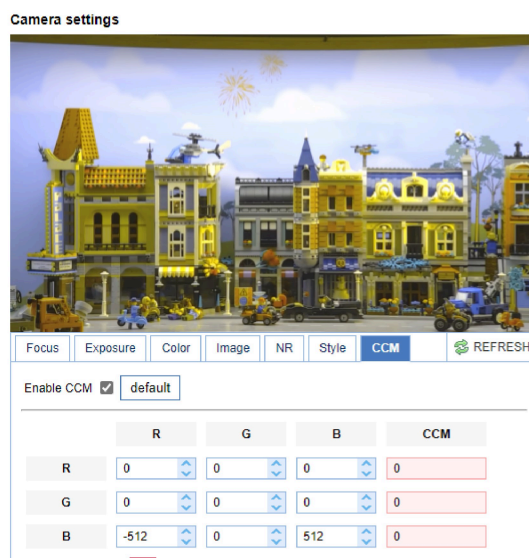


1. Adding colors is possible by using a number *above* and *below* zero in the same channel (row).
2. The bigger the difference between the numbers *above* zero and *below* zero, the more color is added to the picture and the more saturated the picture become.
3. The colors that will be shown in the picture, depends on the *balance* between red, green and blue signals.

+256 red and -256 blue




-512 red and +512 blue



VIDEO - OSD

- Video Encoder
- Streaming Video
- Multicast streaming
- Camera settings
- OSD
- Output format

OSD



Show Time ☒

Show Title ☒

Time Font Color

White

Title Font Color

White

OSD Offset ☒ Title ☐ Time

▲

▼

◀

▶

SAVE

OSD Font Size

According to the resolution ☒

Scale size automatically

Master Stream OSD Font Size

48

Slave Stream OSD Font Size

48

SAVE

Figure 29: WebGUI > VIDEO > OSD

In this area, you can put a camera name and time as overlay on the IP stream (the overlay feature is exclusively available on the IP stream, not on other outputs).



Note that only the output of the camera will be shown with the main stream set to H264.

Fields

You can enable or disable *Show Time* and *Show Title* can be enabled or disabled by marking or unmarking the checkbox next to the respective setting (the time and name settings can be found under the tab **SYSTEM**, sections **Attributes** and **Time**).

You can use the dropdown menus *Time Font Color* and *Title Font Color* to set the desired font colors.

You can use the directional arrows on the right to move the title and time to the preferred position on the screen.

OSD Font Size (related to Camera Name and Time)

You can use *Scale size automatically* for both main stream and sub stream. If checked, the camera name and time overlay will always scale with the image, keeping the proportions intact.



Click **SAVE** to apply your settings. A small confirmation dialogue appears in the bottom right corner.

VIDEO - Output Format

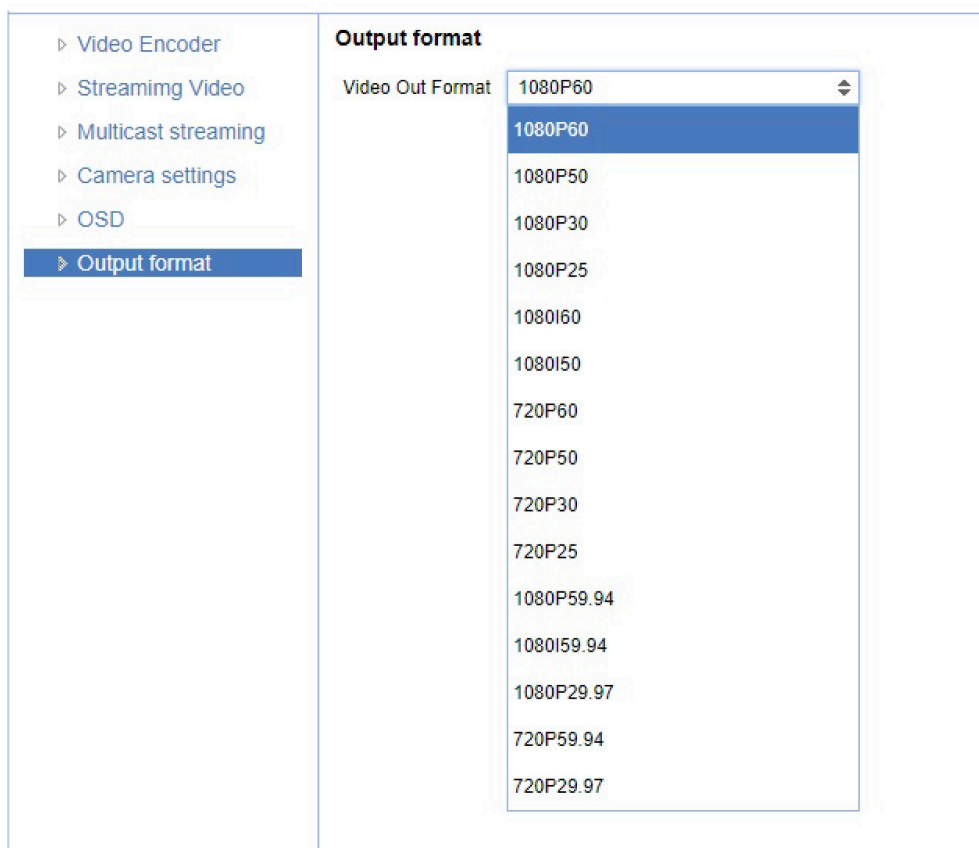


Figure 30: WebGUI > VIDEO > Output Format

This setting is related to the output resolution and frame rate on the HDMI and SDI connectors. Use the WebGUI to set the resolution of the main and sub IP streams. The resolution of the USB output is determined by the computer that is connected to it.



Click **SAVE** (not shown here) to apply your settings. A small confirmation dialogue appears in the bottom right corner.



Video output over IP cannot be a higher resolution than the physical SDI/HDMI output setting.


VIDEO - SRT

These settings are related to the SRT streaming protocol. You can define the port, passkey and encryption bit.

i When not using Encryption, please make sure to set the *Crypto key length* to 0.


SRT Listener Mode and Caller Mode are both supported. You define the Listener mode settings here, whereas you define the Caller Mode settings in the [Streaming Video tab](#).

See the respective figures below for the Listener and Caller Mode Settings, respectively.



| | |
|---|---|
| <ul style="list-style-type: none"> ▶ Video Encoder ▶ Streaming Video ▶ Multicast Streaming ▶ Camera Settings ▶ OSD ▶ Output Format ▶ SRT | <p>SRT</p> <p>Port SRT <input type="text" value="9000"/></p> <p>Password for stream encryption <input type="password"/></p> <p>Crypto key length in bytes <input type="text" value="0"/></p> <p>SAVE</p> |
|---|---|

Figure 31: WebGUI > VIDEO > SRT (Listener Mode)



| | |
|---|--|
| <ul style="list-style-type: none"> ▶ Video Encoder ▶ Streaming Video ▶ Multicast Streaming ▶ Camera Settings ▶ OSD ▶ Output Format ▶ SRT | <p>Streaming Video</p> <p>Stream <input type="text" value="Main Stream"/></p> <p>Enable <input type="checkbox"/></p> <p>Protocol Type <input type="text" value="SRT"/></p> <p>Host Address <input type="text" value="192.168.5.11"/></p> <p>Host Port <input type="text" value="1935"/></p> <p>Stream Name <input type="text" value="live/av0"/></p> <p>User Name <input type="text"/></p> <p>Password <input type="password"/></p> <p>Password for stream encryption <input type="password"/></p> <p>Crypto key length in bytes <input type="text" value="0"/></p> <p>SAVE</p> |
|---|--|

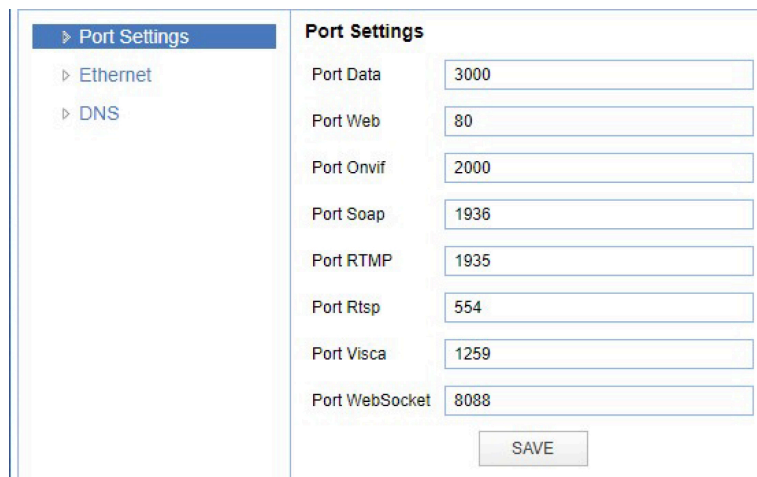
Figure 32: WebGUI > VIDEO > Streaming Video (Caller Mode)

NETWORK



Use the tabs on the NETWORK screen to define the appropriate **Port**, **Ethernet** and **DNS** settings.

Port Settings



| Port Settings | |
|----------------|------|
| Port Data | 3000 |
| Port Web | 80 |
| Port Onvif | 2000 |
| Port Soap | 1936 |
| Port RTMP | 1935 |
| Port Rtsp | 554 |
| Port Visca | 1259 |
| Port WebSocket | 8088 |

SAVE

Figure 33: WebGUI > NETWORK > Port Settings

You can define specific ports for the different streaming outputs and protocols the camera supports.



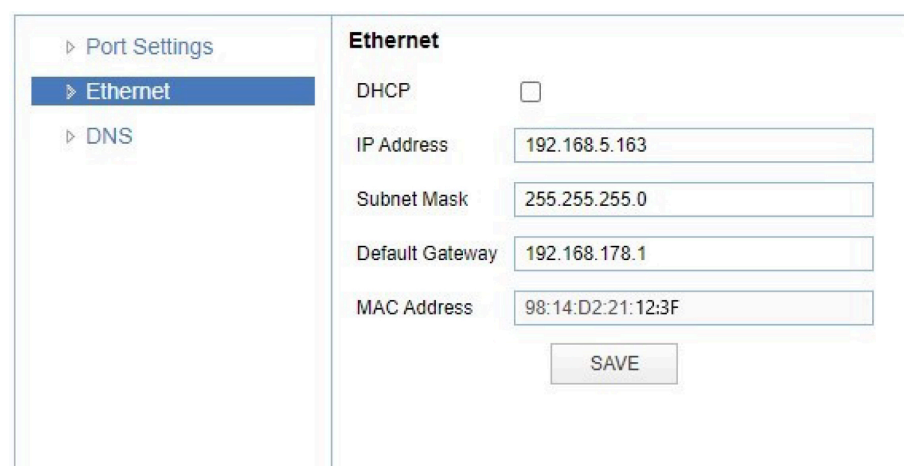
Make sure these settings don't interfere with other uses and services on the same network.



Click **SAVE** to apply your settings. A small confirmation dialogue appears in the bottom right corner.

NETWORK - Ethernet

In this section, you can specify the IP settings for the Ethernet adapter.



| Ethernet | |
|-----------------|--------------------------|
| DHCP | <input type="checkbox"/> |
| IP Address | 192.168.5.163 |
| Subnet Mask | 255.255.255.0 |
| Default Gateway | 192.168.178.1 |
| MAC Address | 98:14:D2:21:12:3F |

SAVE

Figure 34: WebGUI > NETWORK > Ethernet



Execute the following steps to save your settings:

1. Click **SAVE** to apply your settings. A small confirmation dialogue appears in the bottom right corner.
2. Reboot the camera.

NETWORK - DNS

Here, you can specify the **Preferred** and **Alternative DNS Server**.

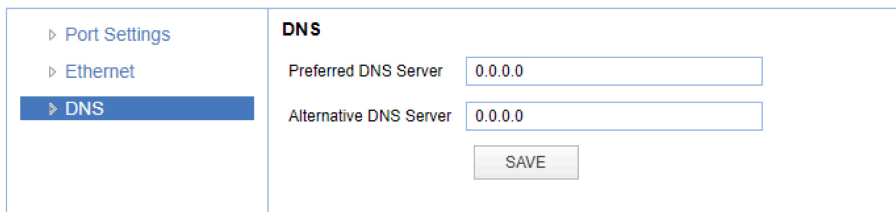


Figure 35: WebGUI > NETWORK > DNS



Click **SAVE** to apply your settings. A small confirmation dialogue appears in the bottom right corner.

SYSTEM

You can use the **SYSTEM** tabs (described below) to define the desired system settings.

License

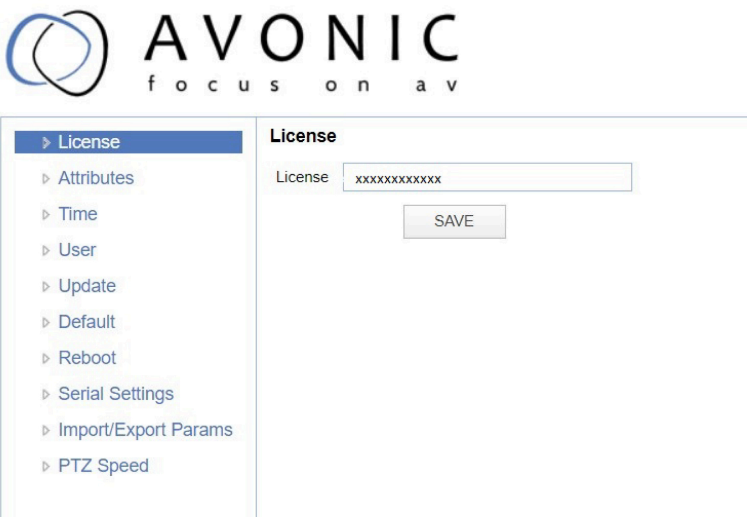


Figure 36: WebGUI > SYSTEM > License

If you have purchased the license for the premium features of this camera, you can enter the License key here to unlock these features. **Reboot is not required as the license is instantly activated.**



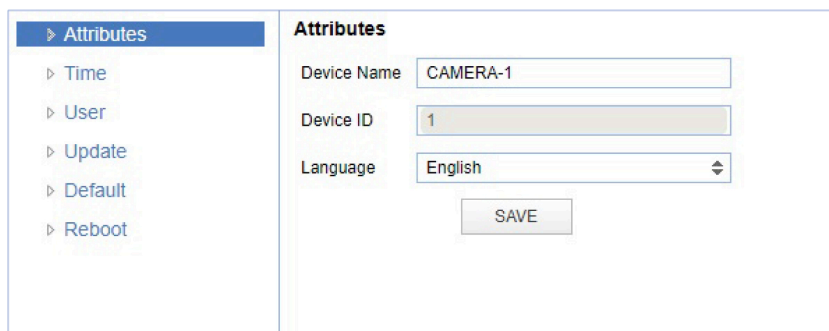
You can acquire a license through your local sales channel or directly at Avonic.



Execute the following steps to enter your license key:

1. Enter your license key in the *License* field.
2. Click **SAVE** to apply your settings. A small confirmation dialogue appears in the bottom right corner

Attributes



The screenshot shows the 'Attributes' page in the WebGUI. On the left is a sidebar with a tree view containing 'Attributes' (selected), 'Time', 'User', 'Update', 'Default', and 'Reboot'. The main content area is titled 'Attributes' and contains three input fields: 'Device Name' with the value 'CAMERA-1', 'Device ID' with the value '1', and 'Language' with a dropdown menu showing 'English'. Below these fields is a 'SAVE' button.

Figure 37: WebGUI > SYSTEM > Attributes

Specifying a specific device name to be displayed in the OSD can be useful when using multiple cameras on the same LAN. The Device-ID is always 1 (addressing is done via IP). The language cannot be changed.

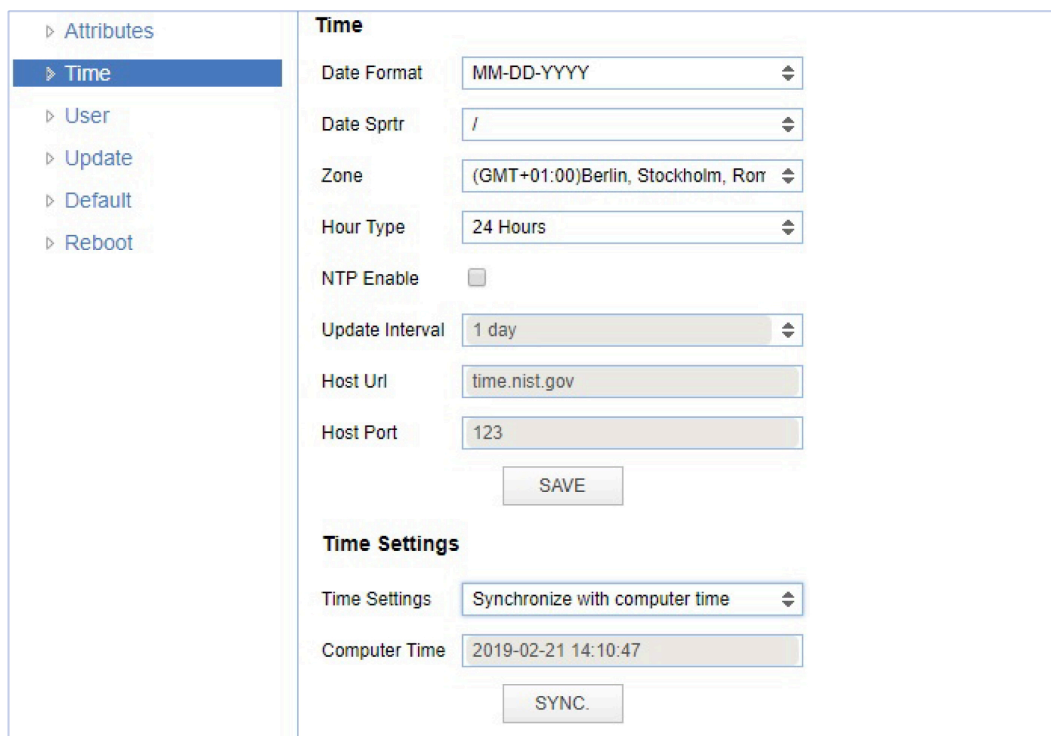


The ONVIF protocol does NOT accept spaces in the camera name.



Click **SAVE** to apply your settings. A small confirmation dialogue appears in the bottom right corner.

Time



The screenshot shows the 'Time' page in the WebGUI. The sidebar on the left is the same as in Figure 37, but 'Time' is now selected. The main content area is titled 'Time' and contains several settings: 'Date Format' (dropdown: MM-DD-YYYY), 'Date Sprtr' (dropdown: /), 'Zone' (dropdown: (GMT+01:00)Berlin, Stockholm, Rom), 'Hour Type' (dropdown: 24 Hours), 'NTP Enable' (checkbox, unchecked), 'Update Interval' (dropdown: 1 day), 'Host Url' (text input: time.nist.gov), and 'Host Port' (text input: 123). Below these is a 'SAVE' button. Under the heading 'Time Settings', there is a 'Time Settings' dropdown (set to 'Synchronize with computer time') and a 'Computer Time' text input (showing '2019-02-21 14:10:47'). At the bottom is a 'SYNC.' button.

Figure 38: WebGUI > SYSTEM > Time

You can *manually* set the time and date, or synchronize the time and date via a computer or an external server on the LAN or WAN.



Either click **SAVE** to apply your manual settings, or **SYNC** to synchronize the time and date.

User

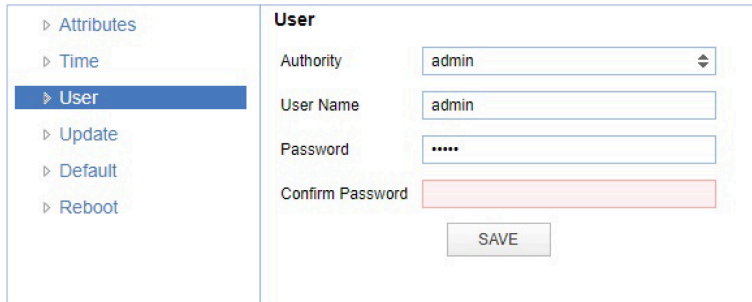


Figure 39: WebGUI > SYSTEM > User

You can define different users with specific permission levels and different username / passwords combinations. There are 2 levels of users: *administrators* with access to all features, and *user-1* and *user-2* with access to the preview and PTZ controls.



Click **SAVE** to apply your settings. A small confirmation dialogue appears in the bottom right corner.

Update

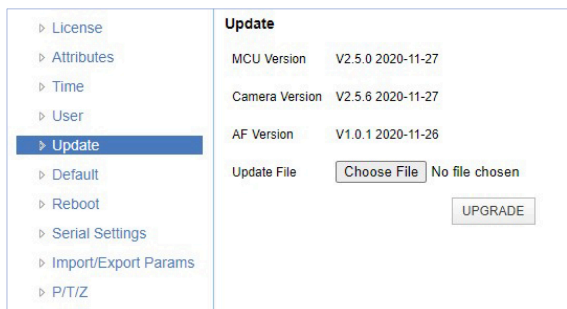


Figure 40: WebGUI > SYSTEM > Update

By default, this screen shows a readout of the current firmware versions. The *Update file* provides a firmware upgrade functionality via this screen. When the camera is done uploading and processing the update, it will automatically reboot.



Execute the following steps to perform a firmware upgrade.

1. Click **Choose File** to select the firmware update file.
2. Click **UPGRADE** to start the firmware upgrade wizard.
3. Follow the steps in the wizard.
4. Wait until the process finishes and reboots.
5. Refresh your browser and log in again after the reboot.

Default

If necessary, you can perform a factory reset. This restores all default settings.



Figure 41: WebGUI > SYSTEM > Default



Click on the button **This will restore the factory defaults** to perform a factory reset. When completed, the camera automatically reboots. The camera will be ready for use again after the boot cycle.

Reboot

If necessary, you can manually perform a camera reboot.

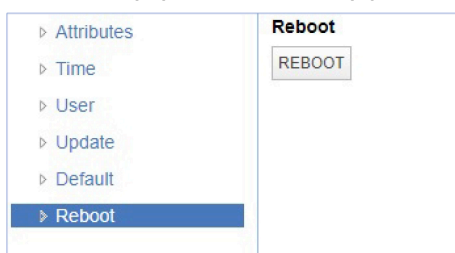


Figure 42: WebGUI > SYSTEM > Reboot



Click on the button **Reboot** to reboot the camera. It will be ready for use again after the boot cycle.

Serial Settings

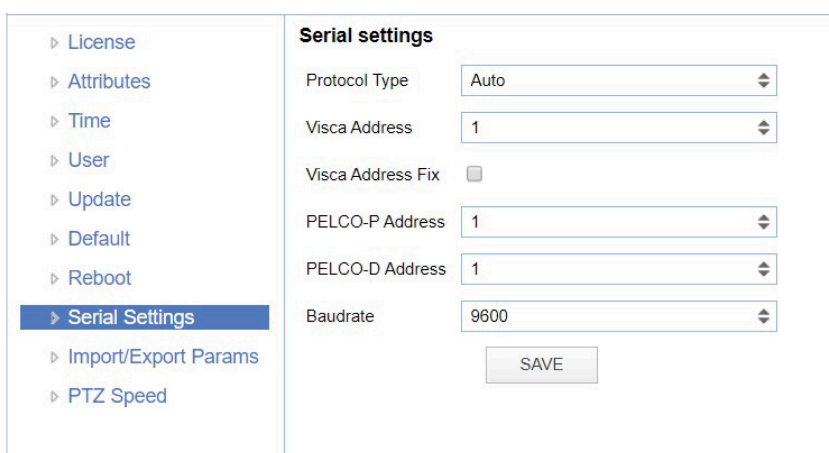


Figure 43: WebGUI > SYSTEM > Serial Settings

You can choose the preferred protocol to use and the accompanying address to go with it. Or you can select the default protocol type 'Auto' to let the camera detect which protocol is being used.

Note that *addressing* is still needed, even with the automatic setting.



Click **SAVE** to apply your settings. A small confirmation dialogue appears in the bottom right corner.

Import/Export Parameters

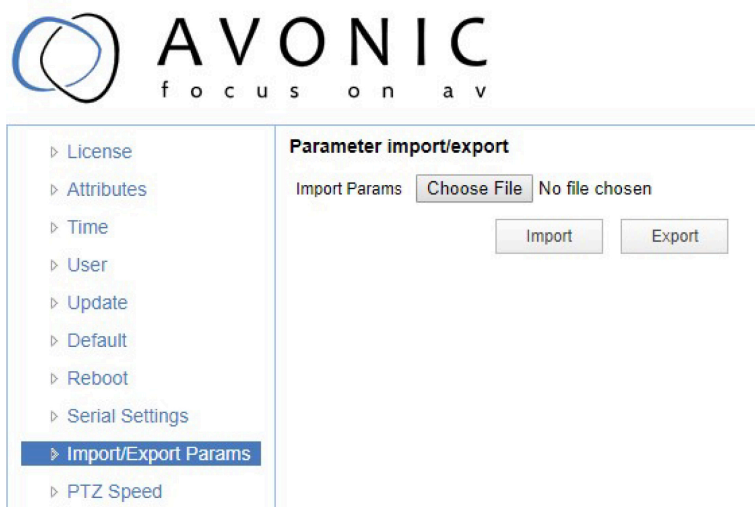


Figure 44: WebGUI > SYSTEM > Import/Export

The CM7x cameras have the ability to import or export a configuration.



Execute the following steps to import or export your configuration parameters:

1. Select the appropriate button to import or export your configuration parameters.
2. Follow the steps in the wizard that appears.



The exported settings do NOT include any presets that are stored in the camera!

P/T/Z

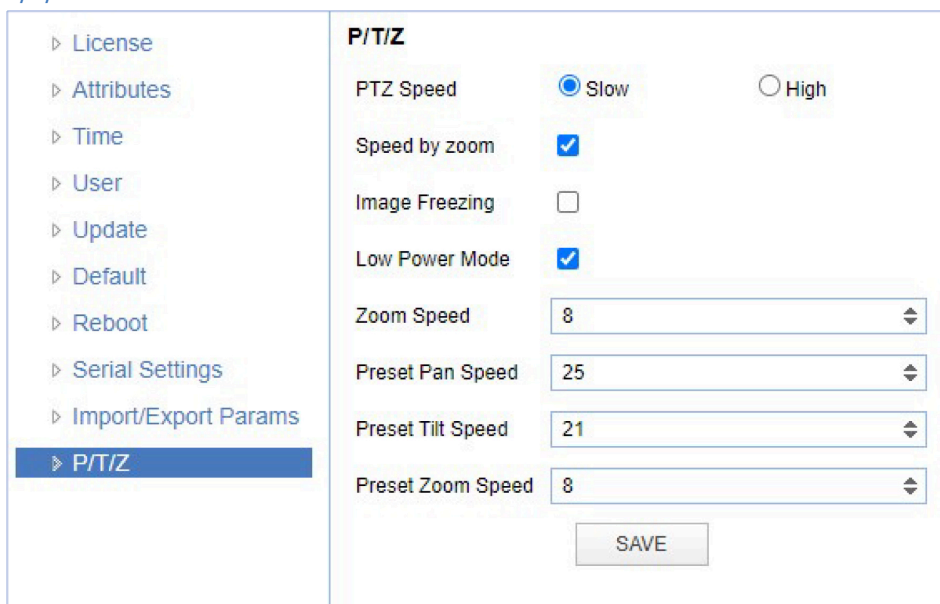


Figure 45: WebGUI > SYSTEM > P/T/Z

In this window, you can define various P/T/Z settings for your camera. These are:

| | |
|--|--|
| PTZ Speed | It is possible to increase the maximum pan and tilt speed, this can be useful in a conference system where quick action is necessary. The camera will produce slightly more noise when this setting is set to 'high'. |
| Speed by zoom | This mode affects PTZ speed when the camera is zoomed in to its max. If you move the stick of your controller when this mode is disabled, it will move too fast to control it. Enabling reduces this speed in relation to the current zoom factor. |
| Image Freezing * | You can freeze the image when the camera moves from one preset to another preset when you use your (remote) controller. |
| Low Power Mode: | The camera will go in stand by mode to reduce its power when this mode is enabled. |
| Note | In order to reduce the power the camera uses, the camera will shut down the IP Port. To activate the camera again, use a serial connection or the IR Remote to set off the Low Power Mode. |
| Zoom Speed | You can set the speed to which the camera will zoom in to the image. The higher the number, the faster the camera will zoom in. This works only when the remote controller is used to control the camera. |
| Preset Pan, Tilt and Zoom Speed | This mode affects the speed to which the camera is switching from one preset to another when you use your (remote) controller. The higher the number, the faster it will switch. |



* If you are using audio during streaming, put it first **OFF** before freezing the image! Freezing the image could produce a paused audio output on the IP Stream. This leads to (audio) stuttering. The video stutters when it is re-engaged, but this is rather easily solvable by putting the iFrame value at 4 or 5 times per second, that is quick enough to counteract the video stutter.

MJPEG Snapshot

The Avonic CM7x-IP cameras are equipped with a MJPEG snapshot feature to, for example, implement into third party software.



To access the MJPEG snapshot feature, use the following format: <http://IP/img/capjpg/snapshot.jpg>.

Every time the page is refreshed, the picture will be updated.

Using the Remote Control

The Product is provided with an IR Remote Control for full control of the camera and use of the OSD menu.



Figure 46: Remote Control

The various options (a. through n.) are described below.

a. Power



1. Press the **Power** button to turn on the camera. If the position preset '0' has been stored, this will be called after initialization.
2. Press the **Power** button again to turn the camera off. It will turn to the back when turned off, this is called the "privacy mode".

b. Set

This button has **no** function with this camera.

c. Camera Select

Up to 4 different cameras can be controlled with one IR remote Control. You can use the **camera select** buttons [1,2,3,4] to select the IR channel that the remote control is using. The default camera IR channel is 1.



1. To control a camera on first use, select camera 1 (IR channel 1) on the remote control.
2. To control a second camera, you first need to change the IR channel stored in the camera from 1 to 2. Then do the following:
 - a. First turn off the other cameras in the room you don't want to change, to prevent that other cameras also get changed accidentally.
 - b. Select camera 1 on the remote control, because the camera is still configured to listen to IR channel 1.
 - c. Press [*]→[#]→[F2] to change the IR channel inside the camera to IR channel 2. The camera will confirm this on the screen.
 - d. Select camera 2 on the remote control to control this camera.

Key Combinations: (Default IR address is 1)

| | |
|--------------|----------------------|
| [*]→[#]→[F1] | Camera Address No. 1 |
| [*]→[#]→[F2] | Camera Address No. 2 |
| [*]→[#]→[F3] | Camera Address No. 3 |
| [*]→[#]→[F4] | Camera Address No. 4 |



The Function buttons F1, F2, F3 and F4 are the colored buttons on the remote.

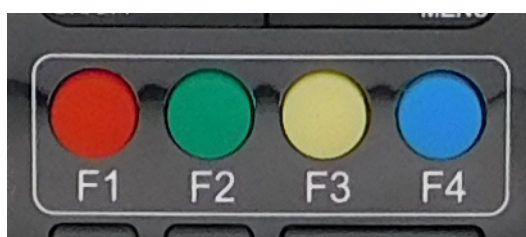


Figure 47: Function Buttons on Remote

d. Number Keys

The number keys are used to call presets.



Press the number [0-9] of the desired preset and the camera will respond accordingly (See 'h' on how to set & clear presets).

e. Focus + -



1. Push the button [manual focus] first before using the focus buttons.
2. Focus the camera with the [+] and [-] button.
If the camera does not respond, check if the camera is set to auto-focus.

f. Auto/Manual Focus



Set the camera to 'auto focus' or 'manual focus'.
If the camera is configured to 'auto focus', the buttons [Focus + -] are disabled.
If the camera is in 'manual focus' and the *Zoom* buttons are used, the camera automatically switches to 'auto focus'.

g. Zoom + -



Zoom the camera with these buttons.

h. Set & Clear Preset

A preset is a specific position of a camera that you save in the camera. A preset is assigned to a number from 0-9.



1. To set a preset, first point the camera in a specific directing and a specific zoom position.
2. Assign the position to a number with the button *Set Preset*.
3. You can call the preset by pressing one of the numbers 0-9 on the remote control.

Set Preset: [SET PRESET]→[<number>]

Call Preset: [<number>]

Clear Preset: [CLEAR PRESET]→[<number>]

If the position preset '0' has been stored, this position will be called after initialization.



Use ONLY presets between 0-9 when using the Remote Control. For presets 10 or higher you need a serial or IP connection!

i. PTZ Keys (up/down/left/right)



Use these keys to move the camera in the desired direction.

j. Home



Use this key to set the direction of the camera to the center position.

k. BLC ON/OFF



Use this key to enable / disable the Back Light Control feature.

l. Menu



1. Use the *Menu* button to open the *On Screen Display (OSD)* menu. This menu is visible on the HDMI/SDI/IP output.
2. If the menu is not in English, press [*]→[#]→[4] to change the Menu language into English.

m. Function Keys (F1/F2/F3/F4)

Used to configure the IR channel of the camera. See '[c. Camera Select](#)' above for instructions.

n. Blank Buttons

These buttons have NO function with this camera.

Other Key Combinations

The following key combinations on the Remote Controller have specific functions. These are:

| Combination | Function |
|----------------------|--|
| [*] → [#] → [4] | Menu set to English |
| [*] → [#] → [6] | Restore factory defaults |
| [*] → [#] → [9] | Flip switch (just temporary flip to view the image flipped) |
| [*] → [#] → [Auto] | Enter into the aging mode, only for quality control purposes |
| [*] → [#] → [Manual] | Restore the default username, password, and IP address |
| [#] → [#] → [#] | Clear all presets |
| [#] → [#] → [0] | Switch the video format to 1080p60* |
| [#] → [#] → [1] | Switch the video format to 1080p50* |
| [#] → [#] → [2] | Switch the video format to 1080i60* |
| [#] → [#] → [3] | Switch the video format to 1080i50* |
| [#] → [#] → [4] | Switch the video format to 720p60* |
| [#] → [#] → [5] | Switch the video format to 720p50* |
| [#] → [#] → [6] | Switch the video format to 1080p30* |
| [#] → [#] → [7] | Switch the video format to 1080p25* |
| [#] → [#] → [8] | Switch the video format to 720p30* |
| [#] → [#] → [9] | Switch the video format to 720p25* |



The camera returns to the video output setting of the rotary dial after a reboot.



Use ONLY presets between 0-9 when using the Remote Control. For presets 10 or higher you need a serial or IP connection!

OSD Menu

Each camera is provided with an **On-Screen Display (OSD) Menu**.

This is an integrated on-screen menu that can be accessed within the camera to change specific functions that effect how the camera processes an image.

The OSD Menu is visible on the HDMI, SDI, USB and IP outputs.

The OSD menu can be accessed by the Remote Control or an Avonic PTZ controller.

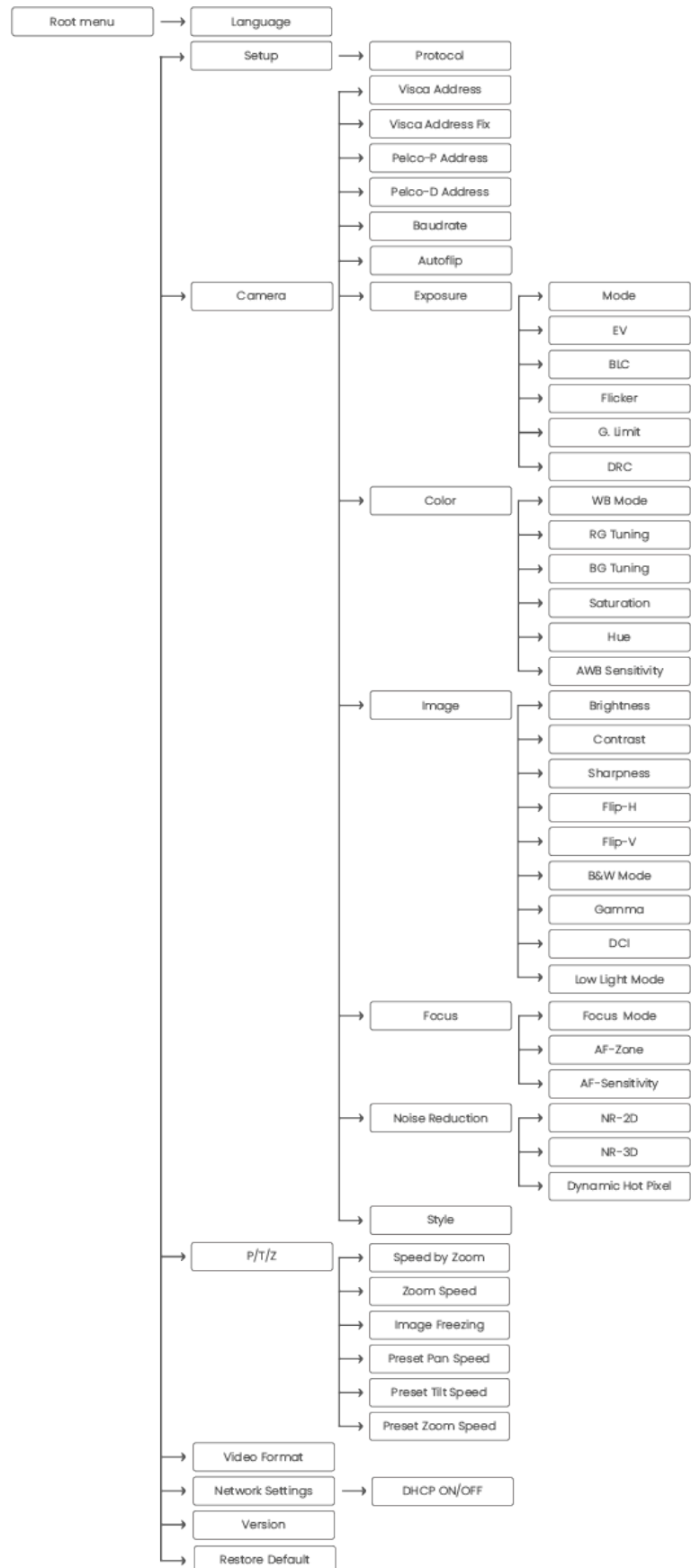


Figure 48: OSD menu structure

1. MENU

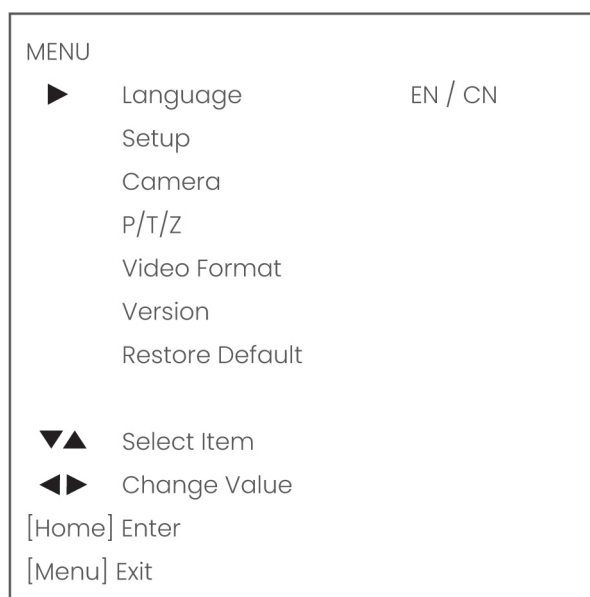


Figure 49: OSD - MENU



1. Press the **MENU** button to display the main menu on the screen.
2. Use the arrow buttons to move the cursor to the item to be set. Press the **HOME** button to enter the corresponding sub-menu.
3. Press [◀▶] to change settings. Press [**MENU**] again to go back.

2. SETUP

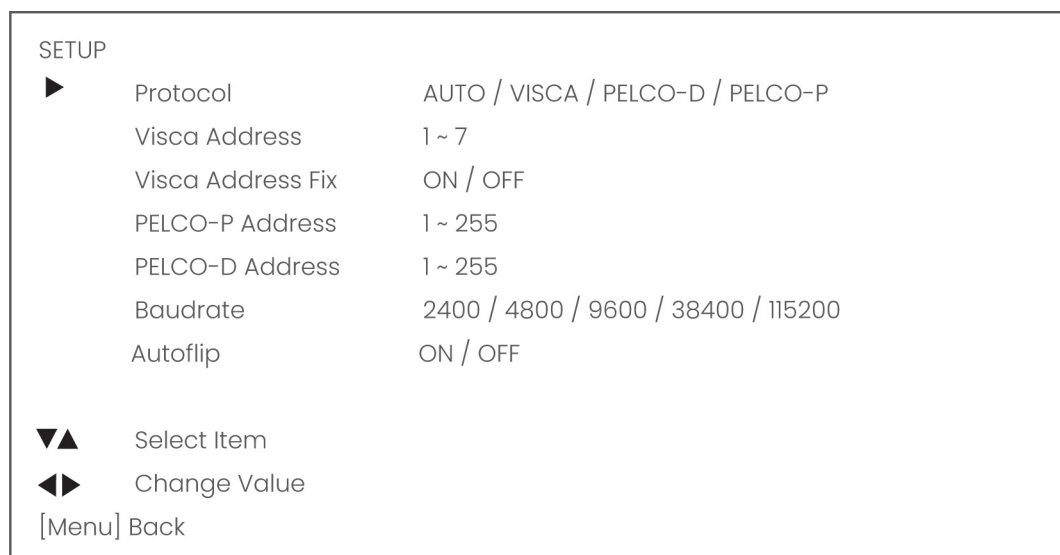


Figure 50: OSD - SETUP

3. CAMERA



Figure 51: OSD - CAMERA

3.1 EXPOSURE

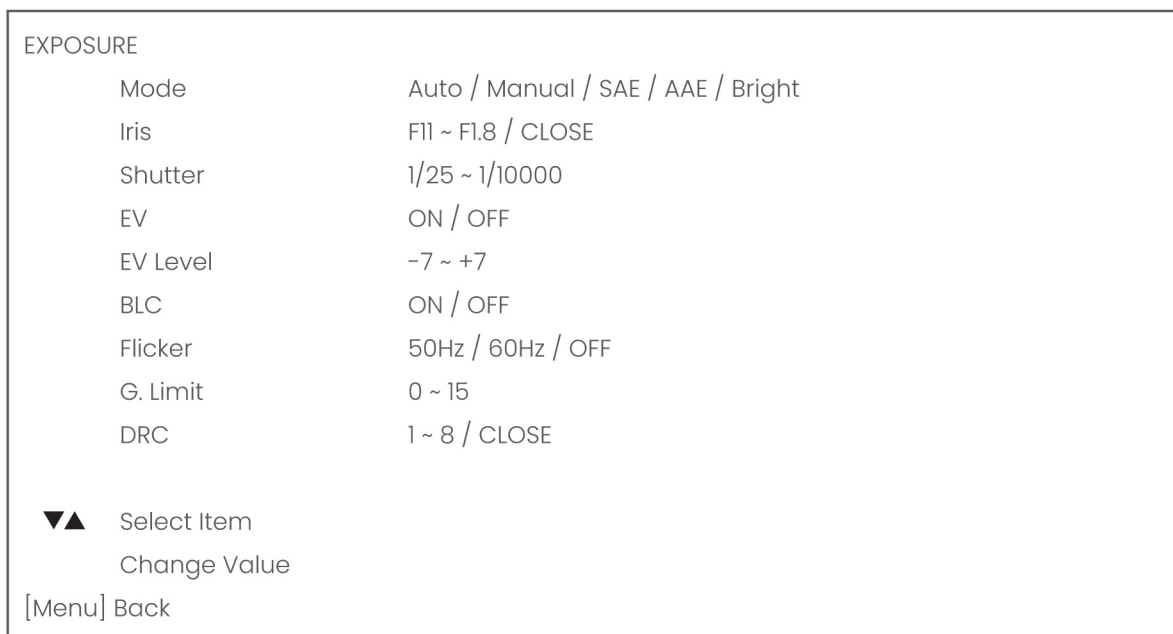


Figure 52: OSD - EXPOSURE

3.2 COLOR

| | |
|-----------------|---|
| COLOR | |
| WB Mode | Auto / 2400K ~ 7100K 100K increments / Manual / OnePush |
| RG Tuning | -10 ~ 10 |
| BG Tuning | -10 ~ 10 |
| RG | 0 ~ 255 |
| BG | 0 ~ 255 |
| Saturation | 60% ~ 200% |
| Hue | 0 ~ 14 |
| AWB Sensitivity | Low / Middle / High |
| ▼▲ Select Item | |
| ◀▶ Change Value | |
| [Menu] Back | |

Figure 53: OSD - COLOR

3.3 IMAGE

The Flip function can be set, although the camera has an automatically flip function.

| | |
|-----------------|-------------------------------------|
| IMAGE | |
| Brightness | 0 ~ 14 |
| Contrast | 0 ~ 14 |
| Sharpness | 0 ~ 15 |
| Flip-H | ON / OFF |
| Flip-V | ON / OFF |
| B&W-Mode | Color / B&W |
| Gamma | 0.45 / 0.50 / 0.55 / 0.63 / Default |
| DCI | 1 ~ 8 / Close |
| Low Light Mode | ON / OFF |
| ▼▲ Select Item | |
| ◀▶ Change Value | |
| [Menu] Back | |

Figure 54: OSD - IMAGE

3.4 FOCUS

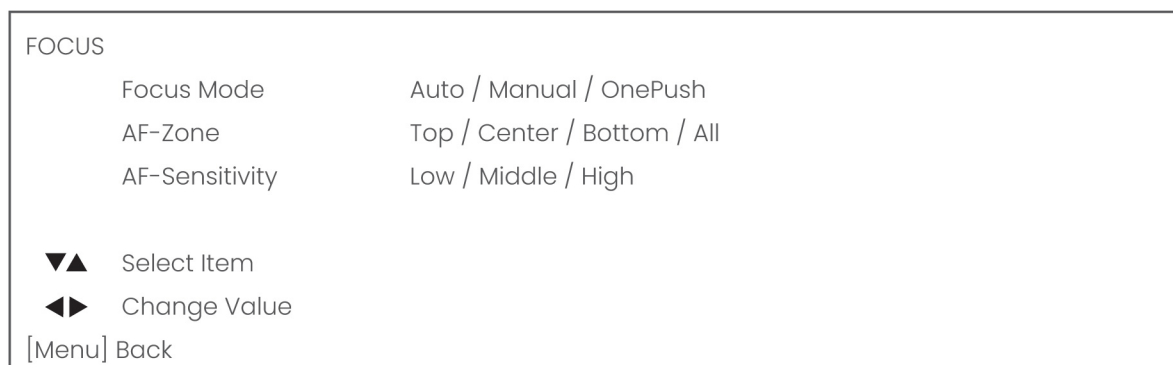


Figure 55: OSD - FOCUS

3.5 NOISE REDUCTION

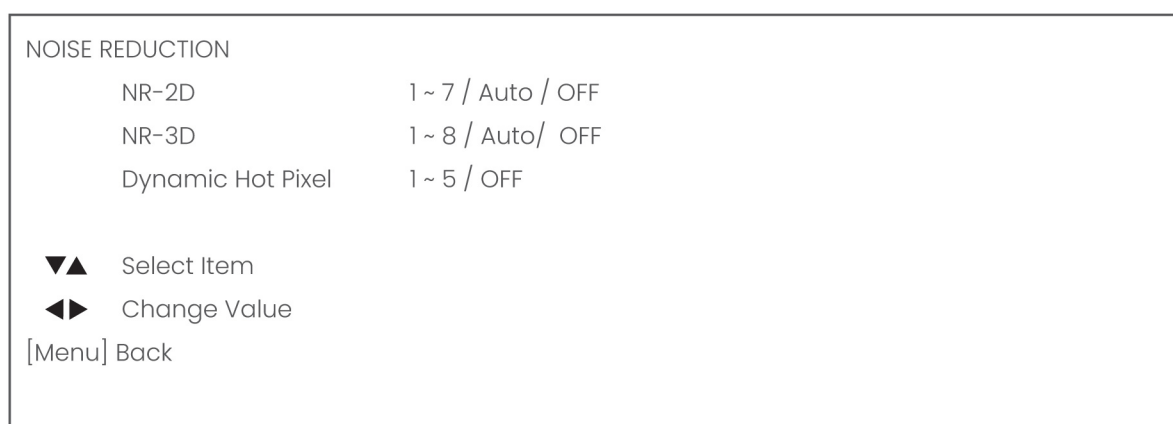


Figure 56: OSD - NOISE REDUCTION

3.6 STYLE

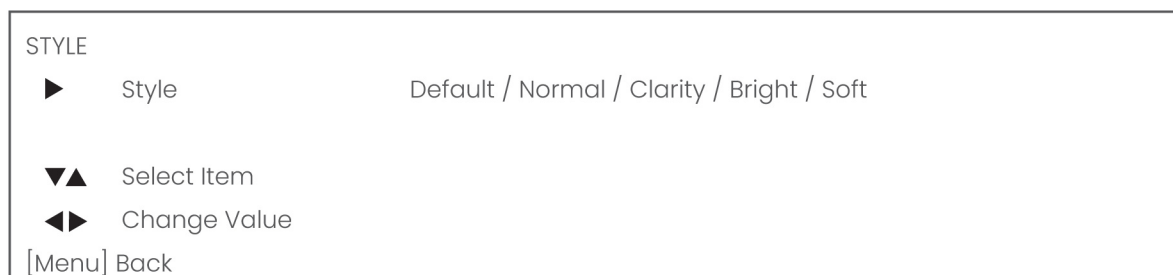


Figure 57: OSD - STYLE

4. PTZ

| | |
|--|----------|
| PTZ | |
| Speed by Zoom | ON / OFF |
| Zoom Speed | 1 ~ 8 |
| Image Freezing | ON / OFF |
| Preset Pan Speed | 1 - 25 |
| Preset Tilt Speed | 1 - 21 |
| Preset Zoom Speed | 1 - 8 |
| ▼▲ Select Item ◀▶ Change Value [Menu] Back | |

Figure 58: OSD - PTZ

6. NETWORK SETTINGS

| | |
|-------------|-----------------|
| DHCP | ON/OFF |
| IP Address | xxx.xxx.xxx.xxx |
| [Menu] Back | |

Figure 59: OSD - NETWORK SETTINGS

7. VERSION

| | | | |
|----------------|----|------|--|
| VERSION | | | |
| MCU Version | nr | date | |
| Camera Version | nr | date | |
| AF Version | nr | date | |
| [Menu] Back | | | |

Figure 60: OSD - VERSION

8. RESTORE DEFAULT

| | |
|----------------------------------|----------|
| RESTORE DEFAULT | |
| Restore default? | NO / YES |
| ▼▲ Select Item ▶ Change Value | |
| [Menu] Back | |
| [Home] OK | |

Figure 61: OSD - RESTORE DEFAULT

Using the Select Switch

The rear of the Product is provided with a Select Switch that can be used to manually select a video format. This switch is important for the video quality during video recording or streaming.

See the table below for a description of the possible settings and the associated video output quality.



Figure 62: Select Switch

| | | | |
|---|---------|---|----------------------------|
| 0 | 1080p60 | 8 | 720p30 |
| 1 | 1080p50 | 9 | 720p25 |
| 2 | 1080i60 | A | 1080p59.94 |
| 3 | 1080i50 | B | 1080i59.94 |
| 4 | 720p60 | C | 720p59.94 |
| 5 | 720p50 | D | 1080p29.97 |
| 6 | 1080p30 | E | 720p29.97 |
| 7 | 1080p25 | F | Default (via OSD / WebGUI) |

A few notes on the select switch:

- The setting 'F' is the *default* setting. If you set the switch to 'F', you can set the video format via the [OSD Menu](#) or the [WebGUI](#).
- The *highest* video output quality 1080p60 (setting '0').
- The *lowest* video output quality is 720p25 (setting '7').



It is recommended to set up the video output through the WebGUI or the OSD Menu, because this is much easier, than selecting the [video output](#) manually. If this is not possible, you can use the Select Switch.



IMPORTANT

- After changing the switch, you need to restart the camera to take effect.
- 720p30, 720p29.97 and 720p25 are not supported by the SDI output.
- There are four ways to select the video output of the camera (OSD / direct button combination on the remote control / WebGUI / rotary dial). The rotary dial takes priority after a reboot, except on setting F, where all the outputs are defined digitally.

Maintenance

Camera Maintenance



Take the following actions to maintain the camera:

- If you will not be using the camera for a long time, turn off the power switch and disconnect the AC powercord of the AC adaptor to the outlet.
- Use a 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 neutral detergent.



Do not use any type of solvents, which may damage the surface.

Usage Precautions



Take the following precautions to ensure good image quality:

- Do not film extreme bright objects for a prolonged period of time, such as sunlight, light sources, etc.
- Do not operate in unstable lighting conditions, otherwise the produced image could be less than optimal.
- Do not operate close to powerful electromagnetic radiation, such as TV or radio transmitters, etc.

Transport and Storage

The camera must be transported in its original packaging box. Inside the box, it is recommended to wrap the camera in the original plastic bag and to place it in the protective foam.

Specific guidelines apply to the environmental temperature and humidity when operating and storing the camera.



See '*Operating humidity*' and '*Storage temperature*' in the provided **Datasheet** for the applicable values.

Disposal and Recycling

In general, the term 'E-Waste' applies to items of all types of electrical and electronic equipment and its parts that have been discarded by the owner as waste without the intention of re-use.

Avonic outsources the disposal and recycling of its E-Waste camera materials to the **Stichting Open**.



See <https://stichting-open.org/> for more information about the disposal and recycling.

Troubleshooting

General



1. Turn the camera off and on again and check if the problem persists.
2. If it does, restore to the factory default.

Power Issues



If the camera does NOT perform a self-test and / or if the power LED is OFF:

1. Check the net power.
2. Check the power supply.
3. Check the physical power button on the back of the camera.

Image

No image



1. Check the power of the camera and monitor.
2. Check the quality and length of the video cable.
3. Check if the video specifications of monitor match the specifications of the camera.
4. Check if the Iris under *Exposure settings* is set to 'closed'.

Abnormal image



1. Check the quality and length of the video cable.
2. Check the cable connections.
3. Check if the Iris under *Exposure settings* is set to 'closed'.

Dithering or flickering image



1. Check the camera fixation and nearby vibration sources.
2. Check the *Anti-flickering* setting in the OSD.
3. Check the *Noise Reduction* settings in the OSD.

Color issues



Check the OSD settings for *exposure*, white balance, color temp, Red and Bluetuning.



When experiencing image problems, you may also check [Appendix D - CMOS Image Sensor Characteristics](#)

Autofocus Issues



- Check the [autofocus](#) (position, speed etc.) before streaming
- Check [Video/Camera Settings](#) in the WebGUI or the OSD menu (for example: if the image is too bright, too dark, or too noisy, the camera will have difficulties to focus)



Check environmental conditions and the subject of focussing. The camera will have difficulties to focus in the following situations:

- Light: Strong light, low light/dark areas and backlight conditions
- Moving subjects
- Small objects before a plain or solid background
- Blurry or unsharp subjects: filming through wet glass or dirty objects
- Distance: filming two or more different subjects, some near and some far away
- Position in the image: subject positioned in the corners of the picture
- Faces: partly hidden faces, sideways filmed faces, diagonal or up side down
- When the camera itself moves, or when the iris is narrowed down



When you experience one or more of the above mentioned problems check also our [Appendix - CMOS characteristics](#)

Control

No self-test (PTZ cameras only) and no power LED



1. Check the net power
2. Check the power supply

Remote Controller does not work



1. Check the power of the controller.
2. Check the RS-232 or RS-485 cable quality, length, polarity and network architecture.
3. Check the serial communication settings on the camera and controller.
4. Check the VISCA / PELCO address settings on the camera and controller.
5. Check the IP network settings on the camera and controller.

WebGUI

Cannot enter WebGUI



1. Check the network cable.
2. Check if the computer is connected to the same subnet as the camera.
3. Use an *incognito* window in your browser, sometimes cache issues arise when using multiple cameras that have the same default IP address
4. Reset the factory default IP settings by pressing **[*] [#] [Manual]** and **Reboot**.

Firmware update failed



1. Check firmware file integrity, download it again.
2. Make sure you are trying to flash the UVC file for the correct color camera (ARM is generic, UVC is color-dependent).

Appendix A - VISCA Settings and Command List

VISCA is a professional camera control protocol used with PTZ cameras. It works by sending commands to the camera either over a serial or over an IP connection, in return the camera sends ACK acknowledgment and COM completion answers to let the sender know the commands have been received and completed. The [list](#) below describes the commands, ranges and camera answers.

Since the CM40 and CM70 series can be used both to control the camera, one document is provided for these series. Because the CM40 series differs in some features with the CM70 series, you need to read carefully the Command List. This VISCA Settings and Command list is available as an appendix in de manuals of the CM40 and CM70 series and as an separate document that you can download on the [product website](#).

Visca over Serial Connection

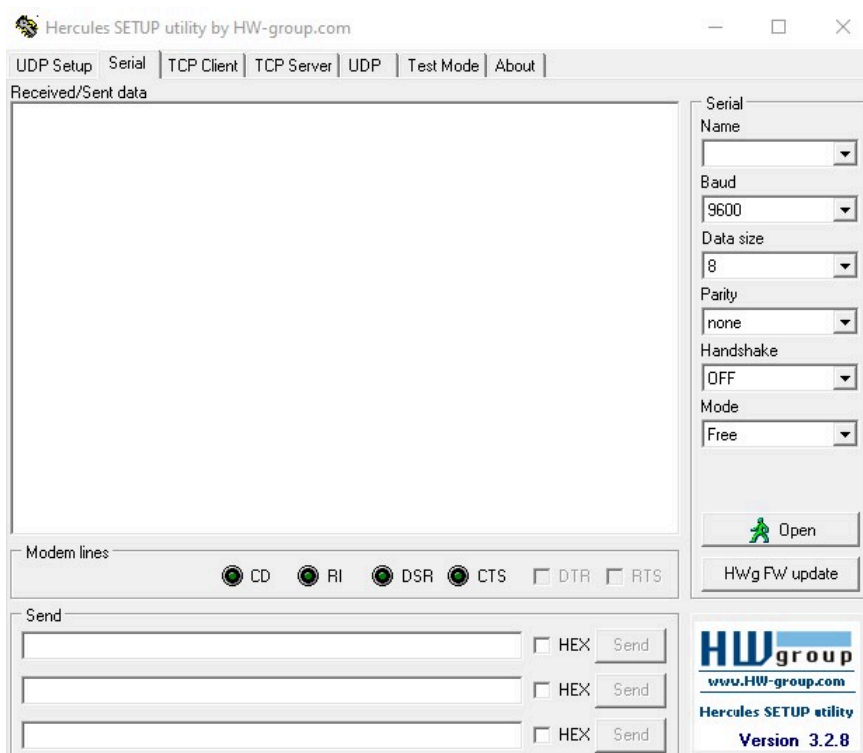
Visca is based on RS232 Serial communications at 9600 bit/s, 8N1, no flow control. VISCA uses a serial repeater network configuration to communicate between the controller (device #0) and up to 7 peripherals (#1 through #7). The daisy chain cable configuration means that a message walks the chain until it reaches the target device identified in the data packet. Responses then walk the rest of the way down the chain and back up again to reach the sender. Some packets are broadcast to all devices.

A command data packet consists of:

- Address byte (1) message header
- Information bytes (1..14)
- Terminating byte (1) 0xFF



You can use *Hercules SETUP Utility* application and a serial connection to make this work.



VISCA over IP

Avonic IP cameras are implemented with a TCP and an UDP server. The TCP as well as the UDP port are by default set to port [1259](#).



The default VISCA address setting is **always 1** when using VISCA over IP. As all cameras are uniquely identified by their IP address, all VISCA addresses are set to 1, the serial addressing plays no part. For VISCA over IP, every command starts with **81 xx xx xx** .



To control the camera, you need an TCP or UDP supported application, like *Hercules SETUP utility* or *Packet Sender* for example. Follow the instructions below:

1. Open the TCP/ UDP supported application.
2. Fill in the camera's IP Address, TCP/UDP port number and connect the application to your camera. 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.
3. Fill in the command to be sent to the camera. The camera will send you the return commands.
4. If you see the returned commands (in exception with UDP), the camera has executed the command. You can check this in the WebGUI of the camera.



Default settings:

- TCP port 1259
- UDP port 1259 (same port as TCP; is correct)
- VISCA address 1

The pictures below are showing an example of a VISCA command (Focus near) with their return commands. The green RX commands in the picture "Receive message" is the ACK command (to let the sender know that the command is received and executed) and the COM command (to confirm that the command has been successfully executed and completed). You can find these commands in the [Camera Return Command](#) list and the [Inquiry Command list](#).



Note that the pictures below are ONLY an example to show you how a TCP supported application works. The pictures could be different from the application you are using!

Net

Protocol

☒ TCP
 ☐ UDP

IP Address

192.168.5.163

Port

1259

Connect

VISCA IP address and port

PTZ Manual

8x 01 04 08 03 FF > 81 01 04 08 03 FF

VISCA command example

Receive message

Clear

TX: 81 01 04 08 03 FF (11:33:44.785)

RX: 90 41 FF (11:33:44.791)

RX: 90 51 FF (11:33:44.844)

Visca over IP using the full Sony Visca protocol

All Avonic cameras are capable of being controlled using the UDP Sony version of Visca consisting of long Visca commands, including headers and message counters. The advantage of using this version of Visca is the fact that the camera responds with the same header **counter** as was used in the command. This makes it possible to match each response to each command sent. This is especially helpful when programming automated camera control systems.



For the following example Hercules SETUP utility is used to recall preset 1 using VISCA. Follow the instructions below:

1. Set the local port and camera port. Both must be set to **52381**. Any other port won't work!

The camera will send its answers back to the port that was used to send the command (port 52381).



Make sure that you have your **sent and receive** window set to display HEX data.

In the example below the camera is switched between:

- Preset 1: Visca command 81 01 01 3F 02 01 FF and
- Preset 2: Visca command 81 01 01 3F 02 02 FF



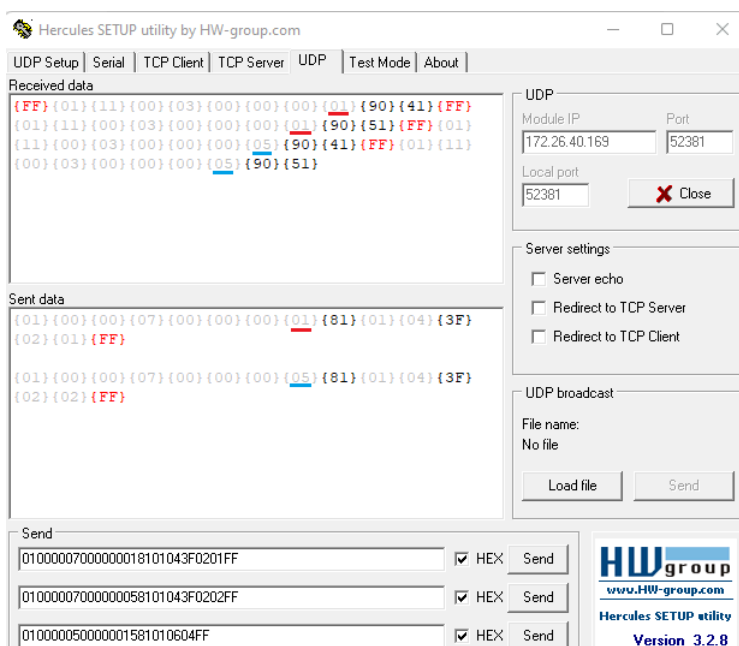
1. Type the command in the **Send** box. The command consists of the **(camera) address**, marked in blue and 7 bytes marked in red. This means that the complete Visca command looks like this:
 - Preset 1: Visca command 01000007000000001810101F0201FF
 - Preset 2: Visca command 010000070000000058101013F0202FF

The Visca over IP header consists of the 3rd and 4th bytes of the complete header. They indicate length of the payload (VISCA command). At this point, the value can vary depending on what Visca command is sent. Using the example of **Preset Recall 1** from above:

- 010000070000000018101013F0201FF the 4th byte is '7' meaning the payload of the Visca command is 7 bytes. Another point in the header is the message counter possibility on the 8th byte, in this instance it's '1'. On the second command where **Preset 2** was recalled, the message counter was set to '5'.



1. Click on **Send**. If you have done this correct, you should get the same as on the picture below:



Camera Return Commands

All parameter values are in HEX.

- x = Camera Address
- y = Socket Number
- z = Camera Address + 8



This is one list for all Avonic PTZ Cameras (CM40 series and CM70 series). Some features are CM70 series ONLY and will not work with a CM40 series camera.

| 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

All parameter values are in HEX

- x = Camera Address
- y = Socket Number
- z = Camera Address + 8

| Camera Control Commands | | | |
|-------------------------|-----------------------|----------------------------------|--|
| Command | Function | Command Packet | Comments |
| Address Set | Broadcast | 88 30 01 FF | Address setting |
| CAM_Power | On | 8x 01 04 00 02 FF | Power ON |
| | Off | 8x 01 04 00 03 FF | Power OFF |
| | Reboot | 8x 0A 01 06 01 FF | Reboot |
| CAM_Zoom | Stop | 8x 01 04 07 00 FF | |
| | Tele (Standard speed) | 8x 01 04 07 02 FF | |
| | Wide (Standard speed) | 8x 01 04 07 03 FF | |
| | Tele (Variable speed) | 8x 01 04 07 2p FF | p = 0(low speed) -F(high speed) |
| | Wide (Variable speed) | 8x 01 04 07 3p FF | |
| | Direct | 8x 01 04 47 0p 0q 0r 0s FF | pqrs(0-F): Zoom Position |
| | Zoom Wide ~ Tele | 00 00 00 00 ~ 04 00 00 00 (PQRS) | |
| CAM_Focus | Stop | 8x 01 04 08 00 FF | |
| | Far (Standard speed) | 8x 01 04 08 02 FF | |
| | Near (Standard speed) | 8x 01 04 08 03 FF | |
| | Far (Variable speed) | 8x 01 04 08 2p FF | p = 0(low) - F(high) |
| | Near (Variable speed) | 8x 01 04 08 3p FF | |
| | Direct Focus Position | 8x 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 | 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 |
| | OnePush mode | 8x 01 04 38 04 FF | |
| | OnePush trigger | 8x 01 04 18 01 FF | |
| | Focus Near ~ Far | Variable ~ 00 00 00 00 (PQRS) | pqrs: 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 |
| | OnePush trigger | 8x 01 04 10 05 FF | One Push WB Trigger |
| | Manual | 8x 01 04 35 05 FF | Manual Control mode |

| Camera Control Commands | | | |
|---|----------------------|----------------------------|---|
| Command | Function | Command Packet | Comments |
| CAM_Bgain | Reset | 8x 01 04 04 00 FF | Manual Control of BGain |
| | 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_Rgain | Reset | 8x 01 04 03 00 FF | Manual Control of RGain |
| | 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_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_Iris | Reset | 8x 01 04 0B 00 FF | Iris Setting (CAM_AE is set to Manual) |
| | Up | 8x 01 04 0B 02 FF | |
| | Down | 8x 01 04 0B 03 FF | |
| | Direct Iris Position | 8x 01 04 4B 00 00 0p 0q FF | (Manual and Iris Priority) min p = 0 q = 0 max p = 0, q = C |
| CAM-Shutter | Direct | 8x 01 04 4A 00 00 0p 0q FF | min p = 0 q = 0 max p = 1 q = 0 |
| CAM_Gain | Reset | 8x 01 04 0C 00 FF | Gain Setting |
| | Direct | 8x 01 04 0C 00 00 0p 0q FF | pq: Gain Position 0 ~ 20 (0 = 00 HEX) Manual exposure |
| | Gain Limit | 8x 01 04 2C 0p FF | p: Gain Position 0 ~ 15 (0 = 00 HEX) Auto exposure |
| CAM_Bright (only works with exposure mode Bright enabled) | 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 (0 ~ 23 max p = 1 and q = 7) |
| CAM_ExpComp(EV and EV Level) | 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 | pq: ExpComp Position (min pq = 0 max pq = 0E) |
| CAM_BackLight | On | 8x 01 04 33 02 FF | Back Light Compensation On/Off |
| | Off | 8x 01 04 33 03 FF | |

| Camera Control Commands | | | |
|---------------------------|-------------------|----------------------------|---|
| Command | Function | Command Packet | Comments |
| CAM_NR(2D)Level | - | 8x 01 04 53 0p FF | p: NR Setting (0: Off, level 1 to 7, 8 = AUTO) |
| 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 5) |
| 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(preset) | 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 | |
| Freeze (CM70 series ONLY) | Freeze ON | 8x 04 04 62 02 FF | Freeze ON immediately |
| | Freeze OFF | 8x 04 04 62 03 FF | Freeze OFF immediately |
| | Preset Freeze ON | 8x 04 04 62 22 FF | Freeze ON when running preset |
| | Preset Freeze OFF | 8x 04 04 62 23 FF | Freeze OFF when running preset |
| SYS_Menu | Off | 8x 01 06 06 03 FF | Turns the OSD menu On/Off |
| | On | 8x 01 06 06 02 FF | |
| CAM_ColorGain | Direct | 8x 01 04 49 00 00 00 0P FF | p: Color Gain setting 0h (60%) to Eh (200%) |

| Camera Control Commands | | | |
|-------------------------|--------------------------|---|---|
| Command | Function | Command Packet | Comments |
| 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 | |
| | Pan range: -170° ~ +170° | 0F 06 07 00 ~ 50 00 09 09 (YYYY) | |
| | Tilt range: -30° ~ +90° | 0F 0E 04 05 ~ 00 05 01 00 (ZZZZ) | |
| | 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: Down-Left 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_Autoflip | Autoflip ON | 8x 01 02 70 02 FF | Autoflip ON |
| | Autoflip OFF | 8x 01 02 70 03 FF | Autoflip OFF |
| 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 |

| Camera Control Commands | | | |
|---|--|----------------------------|--|
| Command | Function | Command Packet | Comments |
| 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 setting0h (– 14 degrees) to Eh (+14 degrees) |
| Pan-tilt_MaxSpeed | High SpeedPan/Tilt ON | 8x 0A 01 31 03FF | High Speed PTON |
| | High SpeedPan/Tilt OFF | 8x 0A 01 31 02FF | High Speed PTOFF |
| ARM/MCU_Version Inq | Inquiry ARM/MCU Version | 8x 09 0A 0103 FF | Returned version in HEX, for example: 02 05 00 (version 2.5.0) |
| CAM/UVC_Version Inq | Inquiry Cam/UVC version | 8x 09 00 02FF | Returned version in HEX, for example: 02 05 09 (version 2.5.9) |
| CAM_TallyLight(Cm7x only with license active) | Red | 8x 01 7E 010A 00 02 03 FF | Tally Light RedON |
| | Green | 8x 01 7E 010A 00 03 02 FF | Tally Light GreenON |
| | Off | 8x 01 7E 010A 00 03 03 FF | Tally Light OFF |
| Preset_H_Speed | Horizontal (Pan) speed between presets | 81 01 03 01 qqFF | qq= speed setting1 ~ 25 (1 = 00 HEX, 25 = 18 HEX) |
| Preset_V_Speed | Vertical (Tilt) speed between presets | 81 01 03 02qq FF | qq = speed setting1 ~ 21 (1 = 00 HEX, 21 = 14 HEX) |
| Preset_Z_Speed | Zoom speed between presets | 81 01 03 03qq FF | qq = speed setting1 ~ 8 (1 = 00 HEX, 8 = 07 HEX) |
| Blue_Tuning (autowhitebalance active) | more or less blue whilemaintaining auto white balance active | 81 0A 01 13 ppFF | pp = setting -10 ~ +10(00~14 HEX) |
| Red_Tuning (autowhitebalance active) | more orless red while maintaining auto white balance active | 81 0A 01 12 ppFF | pp = setting -10 ~ +10(00~14 HEX) |

| Camera Control Commands | | | |
|--|----------|----------------------|------------------|
| Command | Function | Command Packet | Comments |
| VideoSystem_Set (CM40 series: It is possible to set the video format, but since the video format is dictated by the computer the camera is connected with, the picture will NOT change to that format.) | | 8x 01 06 35 00 pp FF | pp: Video Format |
| | | | 00: 1080p60 |
| | | | 01:1080p50 |
| | | | 02: 1080i60 |
| | | | 03: 1080i50 |
| | | | 04: 720p60 |
| | | | 05: 720p50 |
| | | | 06: 1080p30 |
| | | | 07: 1080p25 |
| | | | 08: 720p30 |
| | | | 09: 720p25 |
| | | | 0A: 1080p59.94 |
| | | | 0B: 1080i59.94 |
| | | | 0C: 720p59.94 |
| | | | 0D: 1080p29.97 |
| | | | 0E: 720p29.97 |

Inquiry Commands

all parameter values are in hex

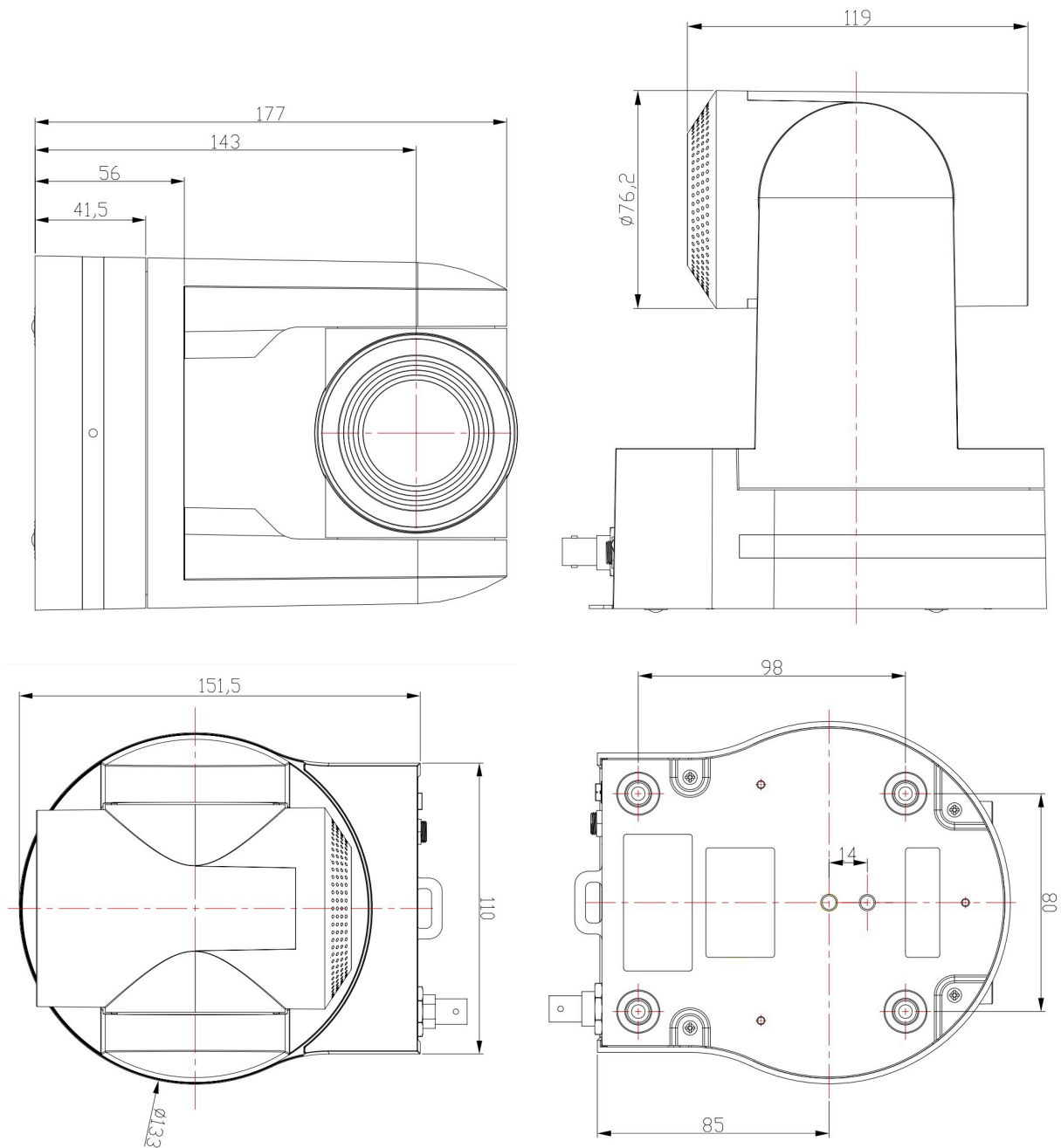
- x = camera address
- y = socket number
- z = camera address + 8

| Inquiry Commands | | | |
|-------------------------------------|----------------|----------------------|---|
| Command | Function | Command Packet | Comments |
| CAM_ZoomPosInq | 8x 09 04 47 FF | 90 50 0p 0q 0r 0s FF | pqrs: Zoom Position |
| CAM_FocusAFModeInq | 8x 09 04 38 FF | 90 50 02 FF | Auto Focus |
| | | 90 50 03 FF | Manual Focus |
| | | 90 50 04 FF | OnePush Focus |
| CAM_FocusPosInq | 8x 09 04 48 FF | 90 50 0p 0q 0r 0s FF | pqrs: Focus Position |
| CAM_WBModeInq | 8x 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 | 8x 09 04 43 FF | 90 50 00 00 0p 0q FF | pq: R Gain |
| CAM_BGainInq | 8x 09 04 44 FF | 90 50 00 00 0p 0q FF | pq: B Gain |
| CAM_GainInq (CM70 series ONLY) | 8x 09 04 0C FF | 90 50 00 FF | Manual Exposure Direct Gain |
| CAM_AEModeInq | 8x 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 | 8x 09 04 4A FF | 90 50 00 00 0p 0q FF | pq: Shutter Position |
| CAM_IrisPosInq | 8x 09 04 4B FF | 90 50 00 00 0p 0q FF | pq: Iris Position |
| CAM_BrightPosInq | 8x 09 04 4D FF | 90 50 00 00 0p 0q FF | pq: Bright Position |
| CAM_ExpComp-ModeInq | 8x 09 04 3E FF | 90 50 02 FF | On |
| | | 90 50 03 FF | Off |
| CAM_ExpCompPosInq | 8x 09 04 4E FF | 90 50 00 00 0p 0q FF | pq: ExpComp Position |
| CAM_Backlight-ModeInq | 8x 09 04 33 FF | 90 50 02 FF | On |
| | | 90 50 03 FF | Off |
| CAM_Noise2DLevel | 8x 09 04 53 FF | 90 50 0p FF | Noise Reduction (2D) p: 0 to 7, 8 = AUTO |
| CAM_Noise3DLevel | 8x 09 04 54 FF | 90 50 0p FF | Noise Reduction (3D) p: 0 to 8 |
| CAM_FlickerModeInq | 8x 09 04 55 FF | 90 50 0p FF | p: Flicker Settings(0: OFF, 1: 50Hz, 2: 60Hz) |
| CAM_Aperture-ModeInq (Sharpness) | 8x 09 04 05 FF | 90 50 02 FF | Auto Sharpness |
| | | 90 50 03 FF | Manual Sharpness |
| CAM_ApertureInq(Sharpness) | 8x 09 04 42 FF | 90 50 00 00 0p 0q FF | pq: Aperture Gain |
| CAM_PictureEffectModeInq | 8x 09 04 63 FF | 90 50 00 FF | Color |
| | | 90 50 04 FF | B&W |

| Inquiry Commands | | | |
|--|-------------------|-------------------------------------|---|
| Command | Function | Command Packet | Comments |
| CAM_MemoryInq | 8x 09 04 3F FF | 90 50 0p FF | p: Memory (Preset) number last operated. |
| SYS_MenuModeInq | 8x 09 06 06 FF | 90 50 02 FF | On |
| | | 90 50 03 FF | Off |
| CAM_LR_ReverseInq | 8x 09 04 61 FF | 90 50 02 FF | On |
| | | 90 50 03 FF | Off |
| CAM_PictureFlipInq | 8x 09 04 66 FF | 90 50 02 FF | On |
| | | 90 50 03 FF | Off |
| CAM_ColorGainInq | 8x 09 04 49 FF | 90 50 00 00 00 0p FF | p: Color Gain setting 0h (60%) to Eh (200%) |
| CAM_BTuningInq | 81 09 0A 01 13 FF | 90 50 pp FF | pp = setting -10 ~ +10 (00~14 HEX) |
| CAM_RTuningInq | 81 09 0A 01 12 FF | 90 50 pp FF | pp = setting -10 ~ +10 (00~14 HEX) |
| VideoSystemInq (CM40 series: It is possible to set the video format, but since the video format is dictated by the computer the camera is connected with, the picture will not change to that format.) | 8x 09 06 23 FF | 90 50 00 FF | 1920x1080p60 |
| | | 90 50 01 FF | 1920x1080p50 |
| | | 90 50 02 FF | 1920x1080i60 |
| | | 90 50 03 FF | 1920x1080i50 |
| | | 90 50 04 FF | 1280x720p60 |
| | | 90 50 05 FF | 1280x720p50 |
| | | 90 50 06 FF | 1920x1080p30 |
| | | 90 50 07 FF | 1920x1080p25 |
| | | 90 50 08 FF | 1280x720p30 |
| | | 90 50 09 FF | 1280x720p25 |
| | | 90 50 0A FF | 1920x1080p59.94 |
| | | 90 50 0B FF | 1920x1080i59.94 |
| | | 90 50 0C FF | 1280x720p59.94 |
| | | 90 50 0D FF | 1920x1080p29.97 |
| | | 90 50 0E FF | 1280x720p29.97 |
| Pan-tiltMaxSpeedInq | 8x 09 06 11 FF | 90 50 ww zz FF | ww: Pan Max Speed zz: Tilt Max Speed |
| Pan-tiltPosInq | 8x 09 06 12 FF | 90 50 0w 0w 0w 0w 0z 0z 0z 0z FF | www: Pan Position zzzz: Tilt Position |
| CAM_GainLimitInq | 8x 09 04 2C FF | 90 50 0q FF | p: Gain Limit |
| | 8x 09 04 2C FF | 90 50 07 FF | Auto exposure |
| CAM_DHotPixelInq | 8x 09 04 56 FF | 90 50 0q FF | p: Dynamic Hot Pixel Setting (0: Off, level 1 to 6) |
| CAM_AFSensitivityInq | 8x 09 04 58 FF | 90 50 01 FF | High |
| | | 90 50 02 FF | Normal |
| | | 90 50 03 FF | Low |
| CAM_BrightnessInq | 8x 09 04 A1 FF | 90 50 00 00 0p 0q FF | pq: Brightness Position |
| CAM_ContrastInq | 8x 09 04 A2 FF | 90 50 00 00 0p 0q FF | pq: Contrast Position |

| Inquiry Commands | | | |
|-----------------------|----------------|----------------------|---|
| Command | Function | Command Packet | Comments |
| CAM_FlipInq | 8x 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 | 8x 09 04 A7 FF | 90 50 00 00 0p 0q FF | pq: Iridix Position |
| CAM_AFZone | 8x 09 04 AA FF | 90 50 00 FF | Top |
| | | 90 50 01 FF | Center |
| | | 90 50 02 FF | Bottom |
| CAM_ColorHueInq | 8x 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 |
| CAM_ZoomPosInq | 8x 09 04 47 FF | 90 50 0p 0q 0r 0s FF | pqrs: Zoom Position |
| CAM_FocusAFModeInq | 8x 09 04 38 FF | 90 50 02 FF | Auto Focus |
| | | 90 50 03 FF | Manual Focus |
| CAM_FocusPosInq | 8x 09 04 48 FF | 90 50 0p 0q 0r 0s FF | pqrs: Focus Position |
| CAM_WBModeInq | 8x 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 | 8x 09 04 43 FF | 90 50 00 00 0p 0q FF | pq: R Gain |
| CAM_BGainInq | 8x 09 04 44 FF | 90 50 00 00 0p 0q FF | pq: B Gain |
| CAM_AEModeInq | 8x 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 | 8x 09 04 4A FF | 90 50 00 00 0p 0q FF | pq: Shutter Position |
| CAM_IrisPosInq | 8x 09 04 4B FF | 90 50 00 00 0p 0q FF | pq: Iris Position |
| CAM_BrightPosInq | 8x 09 04 4D FF | 90 50 00 00 0p 0q FF | pq: Bright Position |
| CAM_PowerInq | 8x 09 04 00 FF | y0 50 02 FF | On |
| | | y0 50 03 FF Off | Off (Standby) |

Appendix B - Dimensions



Appendix C - HTTP API

With the HTTP API you can control the camera by using a web browser like Microsoft Edge or Google Chrome for example. It is possible to change multiple settings at once using this feature. This document is available as an Appendix in the CM7x manual and as a separate document that can be downloaded on the [product website](#).

How to use HTTP API

To use the HTTP API you need the following link:

<http://192.168.5.126/ajaxcom?szCmd=>



Follow instructions below:

1. Click on the link above, or copy and paste it to your browser.
2. Note that the IP Address in this link is an **example of an IP address**. Change this IP Address to the one you use for your camera. See [Network > Ethernet > IP Address](#).
3. Copy the code from the list. Remember that some codes are documented over **multiple lines** and that you need to **copy this from the first to the last bracket!** See the example below:

| Function | Code | Command | Setting |
|--------------------------|--|--------------|-------------------|
| Enable | <code>{"SetEnv":{"StreamPublish":{"stMaster":{"wHostPort":1935,"bEnable":1,"nProtoType":3,"nChannel":0}}}}</code> | bEnable | 0: off 1: on |
| Protol Type | | nProtoType | 2: srt 3: rtmp |
| Host Address | <code>{"SetEnv":{"StreamPublish":{"stMaster":{"wHostPort":1935,"nProtoType":3,"szHostUrl":"192.168.5.12"},"nChannel":0}}}}</code> | szHostUrl | user-defined |
| Host Port | <code>{"SetEnv":{"StreamPublish":{"stMaster":{"wHostPort":19355,"nProtoType":3,"nChannel":0}}}}</code> | wHostPort | [0,65535] |
| Stream Name | <code>{"SetEnv":{"StreamPublish":{"stMaster":{"wHostPort":19355,"nProtoType":3,"szStreamName":"live/1213"},"nChannel":0}}}}</code> | szStreamName | user-defined |
| User Name | <code>{"SetEnv":{"StreamPublish":{"stMaster":{"wHostPort":19355,"nProtoType":3,"szUserName":"user"},"nChannel":0}}}}</code> | szUserName | user-defined |
| Password | <code>{"SetEnv":{"StreamPublish":{"stMaster":{"wHostPort":19355,"nProtoType":3,"szPassword":"password"},"nChannel":0}}}}</code> | szPassword | user-defined |
| SrtKey (SRT Effectie) | <code>{"SetEnv":{"StreamPublish":{"stMaster":{"wHostPort":19355,"nProtoType":3,"szSrtKey":"0123456789"},"nChannel":0}}}}</code> | szSrtKey | user-defined |
| SrtKeyLen (SRT Effectie) | <code>{"SetEnv":{"StreamPublish":{"stMaster":{"wHostPort":19355,"nProtoType":3,"szSrtKeyLen":10},"nChannel":0}}}}</code> | szSrtKeyLen | [0-32] |

RTP Multicast

4. Paste the code at the end of HTTP link. It will look like this:

[192.163.5.126/ajaxcom?szCmd={\"SysCtrl\":{\"PtzCtrl\":{\"nChannel\":0,\"szPtzCmd\":\"left_start\",\"byValue\":50}}}}](http://192.163.5.126/ajaxcom?szCmd={\)

5. Change the settings in the link. In this case:

[192.163.5.126/ajaxcom?szCmd={\"SysCtrl\":{\"PtzCtrl\":{\"nChannel\":0,\"szPtzCmd\":\"left_start\",\"byValue\":50}}}}](http://192.163.5.126/ajaxcom?szCmd={\)

6. Press **ENTER**. If *correct*, you get in return:

[192.163.5.126/ajaxcom?szCmd={\"SysCtrl\":{\"PtzCtrl\":{\"nChannel\":0,\"szPtzCmd\":\"left_start\",\"byValue\":50}}}}](http://192.163.5.126/ajaxcom?szCmd={\)
`{\"nRetVal\":0, \"szError\":\"\"}`

If *failed*, you get in return.

[192.163.5.126/ajaxcom?szCmd={\"SysCtrl\":{\"PtzCtrl\":{\"nChannel\":0,\"szPtzCmd\":\"left_start\",\"byValue\":50}}}}](http://192.163.5.126/ajaxcom?szCmd={\)
`{\"nRetVal\":-1879048185, \"szError\":\"\"}`

7. In case of a failed return, check the following:

- Brackets in the code. Have you copy and paste the first and the last bracket?
- Syntax errors in the code/ correct numbers in the key values. Some camera settings are having a specific range. The SRT key for example has a range of 0 - 32. If you have typed 33 it would exceed the range of this key.
- No long white spaces between the key values of the code. For example this " code " is error and this "code" is right.
- If you have typed the correct IP address of the camera.

8. If you have done it correct, you can check the settings you have changed in the WebGUI of the camera.

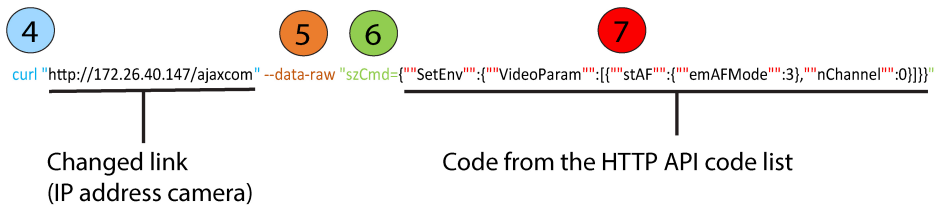
Curl

It is also possible to change the camera settings at once by using the *Command Prompt* from Windows.



Follow instructions below:

1. Click on **Start** in the left corner of your screen in Windows.
2. Type *Notepad* and open this application.
3. Copy and paste the following http link: <http://192.168.5.126/ajaxcom> and the **code** in the [HTTP API code list](#) in Notepad.
4. Type *curl*, change the default IP address in the IP Address of your camera, and surround it by quotation marks.
5. Add *--data-raw* between the http link and the code.
6. Type *szCmd* and surround it by quotation marks.
7. **Double** the quotation marks between the brackets! See the example below.

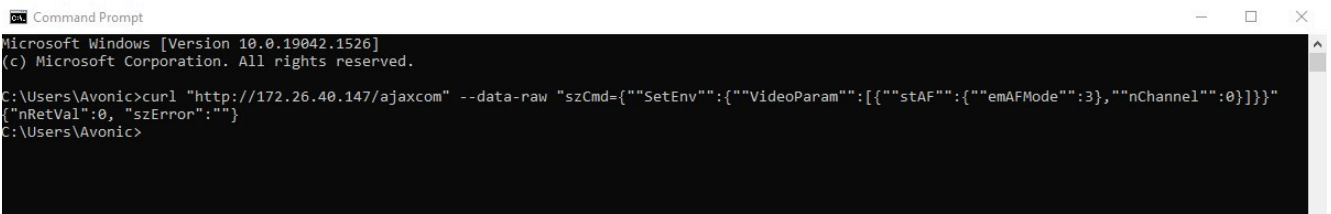


8. Modify the parameters in the code. In the example above *EmAFmode:3* and *nChannel:0* See the [HTTP API code list](#).

9. Click on **Start** in Windows again, type *CMD* and press **Enter**.

10. Copy and paste the link/ code from notepad in *Command Prompt* and press **Enter**.

11. If correct it returns: `{"nRetVal":0, "szError":""}`



```

Microsoft Windows [Version 10.0.19042.1526]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Avonic>curl "http://172.26.40.147/ajaxcom" --data-raw "szCmd={\"SetEnv\": {\"VideoParam\": {\"stAF\": {\"emAFMode\": 3, \"nChannel\": 0}}}}"
{"nRetVal":0, "szError":""}
C:\Users\Avonic>
  
```

{"GetEnv"}

You can also use the HTTP API to **display the current settings** of the camera in your browser or in the *Command Prompt* application. To do this, you need the {"GetEnv"} codes from the HTTP API code list. If correct you get the following result:

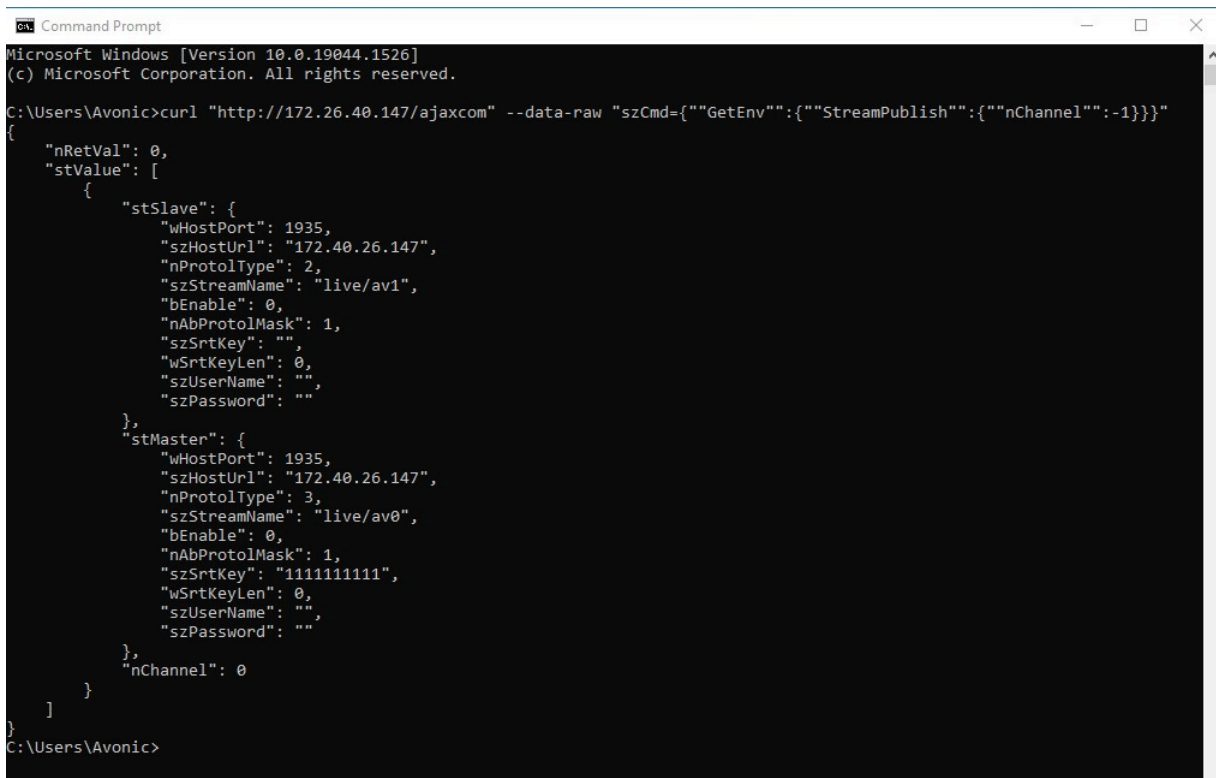
```

← → ↻ ⚠ Not secure | 172.26.40.147/ajaxcom?szCmd={"GetEnv":{"StreamPublish":{"nChannel":-1}}}

{
  "nRetVal": 0,
  "stValue": [
    {
      "stSlave": {
        "wHostPort": 1935,
        "szHostUrl": "172.40.26.147",
        "nProtolType": 2,
        "szStreamName": "live/av1",
        "bEnable": 0,
        "nAbProtolMask": 1,
        "szSrtKey": "",
        "wSrtKeyLen": 0,
        "szUserName": "",
        "szPassword": ""
      },
      "stMaster": {
        "wHostPort": 1935,
        "szHostUrl": "172.40.26.147",
        "nProtolType": 3,
        "szStreamName": "live/av0",
        "bEnable": 0,
        "nAbProtolMask": 1,
        "szSrtKey": "1111111111",
        "wSrtKeyLen": 0,
        "szUserName": "",
        "szPassword": ""
      }
    },
    "nChannel": 0
  ]
}

```

Web browser



```

C:\Users\Avonic>curl "http://172.26.40.147/ajaxcom" --data-raw "szCmd={"GetEnv":{"StreamPublish":{"nChannel":-1}}}"
{
  "nRetVal": 0,
  "stValue": [
    {
      "stSlave": {
        "wHostPort": 1935,
        "szHostUrl": "172.40.26.147",
        "nProtolType": 2,
        "szStreamName": "live/av1",
        "bEnable": 0,
        "nAbProtolMask": 1,
        "szSrtKey": "",
        "wSrtKeyLen": 0,
        "szUserName": "",
        "szPassword": ""
      },
      "stMaster": {
        "wHostPort": 1935,
        "szHostUrl": "172.40.26.147",
        "nProtolType": 3,
        "szStreamName": "live/av0",
        "bEnable": 0,
        "nAbProtolMask": 1,
        "szSrtKey": "1111111111",
        "wSrtKeyLen": 0,
        "szUserName": "",
        "szPassword": ""
      }
    },
    "nChannel": 0
  ]
}
C:\Users\Avonic>

```

Command Prompt

HTTP API code list

IR Remote Control

| IR Enable/Disable | | | |
|-------------------|--|---------------|---------|
| Command | Code | Command | Setting |
| szCmd | { "SetEnv": { "ArmPtz": { "bIrCtrlEnable": 0 } } } | bIrCtrlEnable | 0: ON |
| | | | 1: OFF |

PTZ

| PTZControl | | | |
|---|--|-----------------|-----------------|
| Code: http://192.168.5.126/ajaxcom?szCmd={\"SysCtrl\":{\"PtzCtrl\":{\"nChanel\":0,\"szPtzCmd\":\"left_start\",\"byValue\":50}}\"} | | | |
| Command | Setting | Function | Command |
| nChanel | 0 | | |
| byValue | 0,100 used to control the speed of ptz | | |
| szPtzCmd | | | |
| | | left start | left_start |
| | | left stop | left_stop |
| | | leftup start | leftup_start |
| | | leftup stop | leftup_stop |
| | | leftdown start | leftdown_start |
| | | leftdown stop | leftdown_stop |
| | | rightstart | right_start |
| | | rightstop | right_stop |
| | | rightup start | rightup_start |
| | | rightdown start | rightdown_start |
| | | rightdown stop | rightdown_stop |
| | | upstart | up_start |
| | | upstop | up_stop |
| | | downstart | down_start |
| | | downstop | down_stop |

PTZ speed

| Set PTZ Speed | | | |
|---------------|--|-----------|---------|
| Command | Code | Command | Setting |
| szCmd | { "SetEnv": { "PTZSpeed": { "nPTZSpeed": 1 } } } | nPTZSpeed | 0: Slow |
| | | | 1: High |

Speed by zoom

| Set Speed By Zoom | | | |
|-------------------|---|--------------|-----------------|
| Command | Code | Command | Setting |
| szCmd | { "SetEnv": { "ArmPtz": { "bSpeedByZoom": 0 } } } | bSpeedByZoom | 1: on 0: off |

Image Freezing

| Set Image Freezing | | | |
|--------------------|--|----------------|-----------------|
| Command | Code | Command | Setting |
| szCmd | {"SetEnv":{"ArmPtz":{"bImageFreezing":0}}} | bImageFreezing | 1: on 0: off |

Low power mode

| Set Low Power Mode | | | |
|--------------------|--|----------------|-----------------|
| Command | Code | Command | Setting |
| szCmd | {"SetEnv":{"ArmPtz":{"emLowPowerMode":0}}} | emLowPowerMode | 2: on 3: off |

Zoom Speed

| Set Zoom Speed | | | |
|----------------|--|------------|---------|
| Command | Code | Command | Setting |
| szCmd | {"SetEnv":{"ArmPtz":{"nZoomSpeed":0}}} | nZoomSpeed | 0 - 7 |

Preset Pan Speed

| Set Preset Pan Speed | | | |
|----------------------|---|-----------------|---------|
| Command | Code | Command | Setting |
| szCmd | {"SetEnv":{"ArmPtz":{"nPresetPanSpeed":0}}} | nPresetPanSpeed | 0 - 24 |

Preset Tilt Speed

| Set Preset Tilt Speed | | | |
|-----------------------|--|------------------|---------|
| Command | Code | Command | Setting |
| szCmd | {"SetEnv":{"ArmPtz":{"nPresetTiltSpeed":0}}} | nPresetTiltSpeed | 0 - 20 |

Preset Zoom Speed

| Set Preset Zoom Speed | | | |
|-----------------------|--|------------------|---------|
| Command | Code | Command | Setting |
| szCmd | {"SetEnv":{"ArmPtz":{"nPresetZoomSpeed":0}}} | nPresetZoomSpeed | 0 - 7 |

Focus Mode

| Focus Mode Commands | |
|---------------------|--|
| Focus Mode | |
| Code | {"SetEnv":{"VideoParam":[{"stAF": {"emAFMode":3,"nChannel":0}}]} |
| Command | Setting |
| nChanel | 0 |
| emAFMode | 2: Auto |
| | 3: Manual |
| | 4 OnePush |

| Focus Mode Commands | | | |
|---------------------|---|----------------------|----------------|
| Zoom and focus | | | |
| Code | { "SysCtrl": { "PtzCtrl": { "nChanel": 0, "szPtzCmd": "zoomdec_start", "byValue": 0 } } } | | |
| Command | Setting | Function | Command |
| nChanel | 0 | | |
| byValue | 0 | | |
| szPtzCmd | | | |
| | | Zoom add start | zoomadd_start |
| | | Zoom add stop | zoomadd_stop |
| | | Zoom decrease stop | zoomdec_start |
| | | Zoom decrease stop | zoomdec_stop |
| | | Focus add start | focusadd_start |
| | | Focus add stop | focusadd_stop |
| | | Focus decrease start | focusdec_start |
| | | Focus decrease stop | focusdec_stop |

Preset

| Preset Commands | | | |
|-----------------|--|--------------|--------------|
| Code | { "SysCtrl": { "PtzCtrl": { "nChanel": 0, "szPtzCmd": "preset_set", "byValue": 0 } } } | | |
| Command | Setting | Function | Command |
| nChanel | 0s | | |
| ByValue | 0, 254 | | |
| szPtzCmd | | | |
| | | Set preset | preset_set |
| | | Call preset | preset_call |
| | | Clean preset | preset_clean |

Audio

| Audio Configure | | | |
|---------------------|---|-----------|------------------------------|
| Get audio configure | | | |
| Code | { "GetEnv": { "Audio": { } } } | | |
| Set audio configure | | | |
| Code | { "SetEnv": { "Audio": { "nSampleBits": 16, "nAudioSmstMask": [33554888, 33554888, 33554433], "bEnable": 0, "nInpVolume": 4, "nBitRate": 64, "nAEncType": 7, "byAudioCodecList": [6, 7, 2], "nSampleRate": 44100, "nChannel": 1 } } } | | |
| Function | Code | Command | Setting |
| Enable | { "SetEnv": { "Audio": { "bEnable": 1 } } } | bEnable | 0: off 1: on |
| Encode Type | { "SetEnv": { "Audio": { "nAEncType": 7 } } } | nAEncType | 6: Mp3AAC 7: G.711A 2: |

| Audio Configure | | | |
|-----------------|---|--|----------------------------------|
| Sample Rate | <code>{"SetEnv":{"Audio":{"nSampleRate":32000}}}</code> | nSampleRate (Only supporting these sample rates and gy11a can only be 8000.) | 16000 32000 44100 48000 |
| Sample Bits | <code>{"SetEnv":{"Audio":{"nSampleBits":16}}}</code> | nSampleBits | 16 |
| Bit Rate | <code>{"SetEnv":{"Audio":{"nBitRate":96}}}</code> | nBitRate | 32 48 64 96 128 |
| Channel | <code>{"SetEnv":{"Audio":{"nChannel":2}}}</code> | nChannel | 1: Mono 2: Stereo |
| Input Volume | <code>{"SetEnv":{"Audio":{"nInpVolume":5}}}</code> | nInpVolume (range 1 to 10) | Exp:[1, 10] |

Video

Video encoder

| Video Encode | |
|-----------------------------|---|
| Get video encode parameters | |
| Code | <code>{"GetEnv":{"VideoEncode":{"nChannel":-1}}}</code> |
| Set video encode parameters | |
| Code | <code>{"SetEnv":{"VideoEncode":{"stSlave":{"byIFrameMinQP":20,"byImageQuality":1,"szStreamName":"live/av1","dwVideoCodecMask":160,"emBitRateCtrl":0,"byImageSizeList":[26,7,9,27,4,5],"dwMaxBitRate":40960,"nFrameRate":25,"nMaxFrameRate":30,"emVideoCodec":5,"nIFrameInterval":75,"emImageSize":27,"nBitRate":512,"byProfile":2},"stMaster":{"byIFrameMinQP":20,"byImageQuality":0,"szStreamName":"live/av0","dwVideoCodecMask":160,"emBitRateCtrl":0,"byImageSizeList":[5,4,9],"dwMaxBitRate":40960,"nFrameRate":25,"nMaxFrameRate":60,"emVideoCodec":5,"nIFrameInterval":75,"emImageSize":5,"nBitRate":4096,"byProfile":2,"nChannel":0}}}}</code> |

Video encode settings

| Video Encode Settings | | | |
|-----------------------|---|---|---|
| Function | Code | Command | Setting |
| Compressed Format | <code>{"SetEnv":{"VideoEncode":{"stMaster":{"emVideoCodec":5,"nChannel":0}}}}</code> | emVideoCodec | 5: H.264 7: H.265 (BP profile only) |
| Profile | <code>{"SetEnv":{"VideoEncode":{"stMaster":{"byProfile":0,"nChannel":0}}}}</code> | byProfile | 0: BP 1: MP 2: HP |
| | <code>{"GetEnv":{"VideoEncode":{"nChannel":-1}}}</code> and receive its returning value. Compared to webpage and this, you can know the different value meaning different image size. | byImageSizeList (Lists all imagesize, different products have different image size) | |
| Image Size | <code>{"SetEnv":{"VideoEncode":{"stMaster":{"emImageSize":4,"nChannel":0}}}}</code> | emImageSize | 5: 1920*1080 4: 1280*720 9: 640*480 27: 320*180 26: 640*360 |
| Rate Control | <code>{"SetEnv":{"VideoEncode":{"stMaster":{"emBitRateCtrl":1,"nChannel":0}}}}</code> | emBitRateCtrl | 0: CBR 1: VBR |

| Video Encode Settings | | | |
|-----------------------|--|-----------------|---|
| Function | Code | Command | Setting |
| Image Quality | <code>{"SetEnv":{"VideoEncode":[{"stMaster":{"byImageQuality":5},"nChannel":0}]}}</code> | byImageQuality | 0: worst quality 1: between 2: between 3: between 4: between 5: Best quality |
| Bit Rate (kb/s) | <code>{"SetEnv":{"VideoEncode":[{"stMaster":{"dwMaxBitRate":200},"nChannel":0}]}}</code> | dwMaxBitRate | [64, 40960] |
| Frame Rate (F/S) | <code>{"SetEnv":{"VideoEncode":[{"stMaster":{"nFrameRate":25},"nChannel":0}]}}</code> | nFrameRate | [5, 60] |
| Frame Interval | <code>{"SetEnv":{"VideoEncode":[{"stMaster":{"nIFrameInterval":70},"nChannel":0}]}}</code> | nIFrameInterval | [1, 300] |
| Frame Min QP | <code>{"SetEnv":{"VideoEncode":[{"stMaster":{"byIFrameMinQP":70},"nChannel":0}]}}</code> | byIFrameMinQP | [10, 51] |
| Stream Name | <code>{"SetEnv":{"VideoEncode":[{"stMaster":{"szStreamName":"live/av01"},"nChannel":0}]}}</code> | szStreamName | user-defined |

Video Streaming

Stream Publish

Get stream publish parameters

| | |
|------|---|
| Code | <pre>{"GetEnv":{"StreamPublish":{"nChannel":-1}}}</pre> |
|------|---|

Set stream publish parameters

| | |
|------|---|
| Code | <pre>{"SetEnv":{"StreamPublish":[{"stSlave":{"wHostPort":1935,"szHostUrl":"192.168.5.11", "nProtoType":2,szStreamName":"live/ av1","bEnable":0,"nAbProtoMask":1,"szSrtKey":"","wSrtKeyLen":0,"szUserName":"","szPassword":"","stMaster": {"wHostPort":1935,"szHostUrl":"192.168.5.11","nProtoType":3,"szStreamName":"live/ av0","bEnable":0,"nAbProtoMask":1,"szSrtKey":"111111111","wSrtKeyLen":0,"szUserName":""," "szPassword":"","nChannel":0}}}]}}</pre> |
|------|---|

NOTE: When modifying one param, you should take along wHostPort. Otherwise, the host port will be zero.

| Function | Code | Command | Setting |
|--------------|---|--------------|-------------------|
| Enable | <pre>{"SetEnv":{"StreamPublish":[{"stMaster": {"wHostPort":1935,"bEnable":1,"nProtoType":3},"nChannel":0}]}}</pre> | bEnable | 0: off 1: on |
| Protol Type | | nProtoType | 2: srt 3: rtmp |
| Host Address | <pre>{"SetEnv":{"StreamPublish":[{"stMaster": {"wHostPort":1935,"nProtoType":3,"szHostUrl": "192.168.5.12"},"nChannel":0}]}}</pre> | szHostUrl | user-defined |
| Host Port | <pre>{"SetEnv":{"StreamPublish":[{"stMaster": {"wHostPort":19355,"nProtoType":3},"nChannel":0}]}}</pre> | wHostPort | [0,65535] |
| Stream Name | <pre>{"SetEnv":{"StreamPublish":[{"stMaster": {"wHostPort":19355,"nProtoType":3,"szStreamName":"live/1213"}, "nChannel":0}]}}</pre> | szStreamName | user-defined |
| User Name | <pre>{"SetEnv":{"StreamPublish":[{"stMaster": {"wHostPort":19355,"nProtoType":3,"szUserName":"123"}, "nChannel":0}]}}</pre> | szUserName | user-defined |
| Password | <pre>{"SetEnv":{"StreamPublish":[{"stMaster": {"wHostPort":19355,"nProtoType":3,"szPassword":"123"}, "nChannel":0}]}}</pre> | szPassword | user-defined |

| Stream Publish | | | |
|-------------------------|--|------------|--------------|
| SrtKey (SRT Effectie) | <code>{"SetEnv":{"StreamPublish":[{"stMaster":{"wHostPort":19355,"nProtoType":3,"szSrtKey":"0123456789"},"nChannel":0}]}}</code> | szSrtKey | user-defined |
| SrtKeyLen (SRTEffectie) | <code>{"SetEnv":{"StreamPublish":[{"stMaster":{"wHostPort":19355,"nProtoType":3,"wSrtKeyLen":0},"nChannel":0}]}}</code> | wSrtKeyLen | [0-32] |

(RTP) Multicast Streaming

| RTP Multicast | |
|--|--|
| Get rtp multicast parameters | |
| Code | <code>{"GetEnv":{"StreamRTPMulticast":{"nChannel":-1}}}</code> |
| Set rtp multicast parameters | |
| Code | <code>{"SetEnv":{"StreamRTPMulticast":[{"stSlave":{"nProtoType":0,"bEnable":0,"wMultiCastPort":4002,"szMultiCastUrl":"224.1.2.3"},"stMaster":{"nProtoType":1,"bEnable":0,"wMultiCastPort":4000,"szMultiCastUrl":"224.1.2.3"},"nChannel":0}]}}</code> |
| NOTE: When modifying one param you should take along bEnable and awMultiCastPort. Otherwise, it will be set to 0. Suggesting that when setting env, you can distinguish the stMaster and stSlave. | |

RTP Multicast Settings

| RTP Multicast Settings | | | |
|------------------------|--|----------------|-----------------------------|
| Function | Code | Command | Setting |
| Enable | <code>{"SetEnv":{"StreamRTPMulticast":[{"stMaster":{"bEnable":1,"wMultiCastPort":4004},"nChannel":0}]}}</code> | bEnable | 0: off 1: on |
| Protol Type | <code>{"SetEnv":{"StreamRTPMulticast":[{"stMaster":{"bEnable":1,"nProtoType":1,"wMultiCastPort":4004},"nChannel":0}]}}</code> | nProtoType | 0: RTP 1: TS |
| Multicast Address | <code>{"SetEnv":{"StreamRTPMulticast":[{"stMaster":{"bEnable":0,"szMultiCastUrl":"224.1.2.23","wMultiCastPort":4004},"nChannel":0}]}}</code> | SzMultiCastUrl | 224.0.0.0~ 255.255.255.0 |
| Multicast Port | <code>{"SetEnv":{"StreamRTPMulticast":[{"stMaster":{"bEnable":1,"wMultiCastPort":4004},"nChannel":0}]}}</code> | wMultiCastPort | Even [0, 65535] |

Camera Settings

| Video Parameters | | | | |
|----------------------|---|----------|---------|---------|
| Get video parameters | | | | |
| Code | { "GetEnv":{ "VideoParam":{ "nChannel":-1} } } | | | |
| Set video parameters | | | | |
| Focus | | | | |
| Function | Code | Command | Setting | |
| Focus Mode | { "SetEnv": { "VideoParam": [{ "stAF": { "emAFMode":2 }, "nChannel":0 }] } } | emAFMode | 2: | Auto |
| | | | 3: | Manual |
| | | | 4: | OnePush |
| AF-Zone | { "SetEnv": { "VideoParam": [{ "stAF": { "emAFZone":1 }, "nChannel":0 }] } } | emAFZone | 0: | Top |
| | | | 1: | Center |
| | | | 2: | Bottom |
| | | | 3: | All |

| Video Parameters | | | | |
|------------------|---|--------------|----|--------|
| AF-Sensitivity | { "SetEnv":{ "VideoParam":{ {"stExp":{ "stExpMode":{ "emExpMode":0}}, "nChannel":0}}} } | nSensitivity | 1: | High |
| | | | 2: | Middle |
| | | | 3: | Low |

Exposure

| Camera Settings | | | | |
|-----------------|---|--------------|-------------------------------|--|
| Exposure | | | | |
| Mode | { "SetEnv":{ "VideoParam":{ {"stExp":{ "stExpMode":{ "emExpMode":0}}, "nChannel":0}}} } | emExpMode | 0: 3: 10: 11: 13: | Auto Manual SAE AAE Bright |
| Exposure: Auto | | | | |
| EV | { "SetEnv":{ "VideoParam":{ {"stExp":{ "expcomp_mode":2, "nChannel":0}}} } | expcomp_mode | 2: 3: | ON OFF |
| EV Level | { "SetEnv":{ "VideoParam":{ {"stExp":{ "expcomp":8, "nChannel":0}}} } | expcomp | [0, 14] | |
| BLC | { "SetEnv":{ "VideoParam":{ {"stExp":{ "backlight":2, "nChannel":0}}} } | backlight | 2: 3: | ON OFF |

| Camera Settings | | | | |
|------------------|---|-------------|----------------|---------------------|
| Exposure: Auto | | | | |
| Function | Code | Command | Setting | |
| Flicker | { "SetEnv":{ "VideoParam":[{ "stExp":{ "antiflicker":0}, "nChannel":0}]} } | antiflicker | 0: 1: 2: | OFF 50HZ 60HZ |
| G.Limit | { "SetEnv":{ "VideoParam":[{ "stExp":{ "gainLimit":5}, "nChannel":0}]} } | gainLimit | [0, 15] | |
| DRC | { "SetEnv":{ "VideoParam":[{ "stExp":{ "drc":6}, "nChannel":0}]} } | drc | [0, 8] | |
| Exposure: Manual | | | | |
| shutter | { "SetEnv":{ "VideoParam":[{ "stExp":{ "stShutter":{ "nShutter":16}}, "nChannel":0}]} } | nShutter | [0, 16] | |
| Iris | { "SetEnv":{ "VideoParam":[{ "stExp":{ "stIris":{ "nIris":12}}, "nChannel":0}]} } | nIris | [0, 12] | |
| DRC | { "SetEnv":{ "VideoParam":[{ "stExp":{ "drc":8}, "nChannel":0}]} } | drc | [0, 8] | |
| Exposure: SAE | | | | |
| shutter | { "SetEnv":{ "VideoParam":[{ "stExp":{ "stShutter":{ "nShutter":16}}, "nChannel":0}]} } | nShutter | [0, 16] | |
| DRC | { "SetEnv":{ "VideoParam":[{ "stExp":{ "drc":7}, "nChannel":0}]} } | drc | [0, 8] | |

| Camera Settings | | | | |
|-----------------------|--|-------------|----------------|---------------------|
| Exposure: AEE | | | | |
| Flicker | {"SetEnv":{"VideoParam":[{"stExp":{"antiflicker":0,"nChannel":0}}]}} | Antiflicker | 0: 1: 2: | OFF 50HZ 60HZ |
| G.Limit | {"SetEnv":{"VideoParam":[{"stExp":{"gainLimit":5,"nChannel":0}}]}} | gainLimit | [0, 15] | |
| Iris | {"SetEnv":{"VideoParam":[{"stExp":{"stIris":{"nIris":12},"nChannel":0}}]}} | nIris | [0, 12] | |
| DRC | {"SetEnv":{"VideoParam":[{"stExp":{"drc":6,"nChannel":0}}]}} | drc | [0, 8] | |
| Exposure: Bright | | | | |
| Bright | {"SetEnv":{"VideoParam":[{"stExp":{"bright":0,"nChannel":0}}]}} | bright | [0, 23] | |
| Flicker, G.Limit, DRC | You can find the same configure at AAE | | | |

Color and Image

| Camera Settings | | | | |
|-----------------|--|-------------|--|--|
| Color | | | | |
| Function | Code | Command | Setting | |
| WB Mode | {"SetEnv":{"VideoParam":{"stColor":{"stWbMode":{"emWbMode":0},"nChannel":0}}}} | emWbMode | 0: 1: 7: 2: 8: 4: 9: 10: 6: 11: 5: 3: | Auto 3000K 3500K 4000K 4500K 5000K 5500K 6000K 6500K 7000K Manual OnePush |
| RG Tuning | {"SetEnv":{"VideoParam":{"stColor":{"rgaintuning":0,"nChannel":0}}}} | rgaintuning | [0, 20] | |
| BG Tuning | {"SetEnv":{"VideoParam":{"stColor":{"bgaintuning":20,"nChannel":0}}}} | bgaintuning | [0, 20] | |
| Saturation | {"SetEnv":{"VideoParam":{"stColor":{"saturation":0,"nChannel":0}}}} | saturation | [0, 14] | |
| Hue | {"SetEnv":{"VideoParam":{"stColor":{"hue":14,"nChannel":0}}}} | hue | [0, 14] | |
| AWB Sensitivity | {"SetEnv":{"VideoParam":{"stColor":{"awbsens":0,"nChannel":0}}}} | awbsens | 0: 1: 2: | Low Middle High |

| Camera Settings | | | | |
|-----------------|--|-----------|--------------|--|
| Image | | | | |
| Bright | {"SetEnv": {"VideoParam": [{"stImg": {"luminance": 0}, "nChannel": 0}]}} | luminance | [0, 4] | |
| Contrast | {"SetEnv": {"VideoParam": [{"stImg": {"contrast": 0}, "nChannel": 0}]}} | contrast | [0, 14] | |
| Sharpness | {"SetEnv": {"VideoParam": [{"stImg": {"sharpness": 1}, "nChannel": 0}]}} | sharpness | [0, 15] | |
| Gamma | {"SetEnv": {"VideoParam": [{"stImg": {"gamma": 0}, "nChannel": 0}]}} | gamma | [0, 4] | 0: Default 1: 0.45 2: 0.50 3: 0.55 4: 0.63 |
| DCI | {"SetEnv": {"VideoParam": [{"stImg": {"dci": 0}, "nChannel": 0}]}} | dci | [0, 8] 0: | OFF |
| B&W Mode | {"SetEnv": {"VideoParam": [{"stImg": {"nBWMode": 0}, "nChannel": 0}]}} | nBWMode | 0: 4: | Color B & W |
| Flip-H | {"SetEnv": {"VideoParam": [{"stImg": {"nFlipH": 3}, "nChannel": 0}]}} | nFlipH | 2: 3: | ON OFF |

| Camera Settings | | | | |
|-----------------|---|------------|----------|-----------|
| Image | | | | |
| Function | Code | Command | Setting | |
| Flip-V | {"SetEnv": {"VideoParam": [{"stImg": {"nFlipV": 2}, "nChannel": 0}]}} | nFlipV | 2: 3: | ON OFF |
| AutoFlip | {"SetEnv": {"VideoParam": [{"stImg": {"nAutoFlipV": 2}, "nChannel": 0}]}} | nAutoFlipV | | ON OFF |
| DZoom | {"SetEnv": {"VideoParam": [{"stImg": {"nEZoom": 3}, "nChannel": 0}]}} | nEZoom | 2: 3: | ON OFF |

Noise Reduction

| Camera Settings | | | | |
|-------------------|--|-----------|--------|---|
| NR-2D | {"SetEnv": {"VideoParam": [{"stNR": {"noise2D": 0}, "nChannel": 0}]}} | noise2D | [0, 8] | |
| NR-3D | {"SetEnv": {"VideoParam": [{"stNR": {"noise3D": 0}, "nChannel": 0}]}} | noise3D | [0, 8] | 0: OFF 8: Auto |
| Dynamic Hot Pixel | {"SetEnv": {"VideoParam": [{"stNR": {"dhotpixel": 3}, "nChannel": 0}]}} | dhotpixel | [0, 5] | 0: OFF |
| Style | {"SetEnv": {"VideoParam": [{"stColor": {"nStyleInx": 0}, "nChannel": 0}]}} | nStyleInx | [0, 4] | 0: Default 1: Normal 2: Clarity 3: Bright 4: Soft |

Video OSD

| Video OSD | | | |
|---|--|---------|------------------------|
| Get video parameters | | | |
| Code | { "GetEnv": { "VideoOsd": { "nChannel": -1 } } } | | |
| Set set video parameters | | | |
| Code | { "SetEnv": { "VideoOsd": [{ "stTime": { "bEnable": 1, "nIndex": 0, "nXPos": 0, "szText": "", "nYPos": 10000, "stFtColor": { "byAlpha": 128, "byRed": 255, "byGreen": 255, "byBlue": 255 }, "stBkColor": { "byAlpha": 0, "byRed": 0, "byGreen": 0, "byBlue": 0 } }, { "stTitle": { "bEnable": 0, "nIndex": 0, "nXPos": 0, "szText": "", "nYPos": 0, "stFtColor": { "byAlpha": 128, "byRed": 255, "byGreen": 255, "byBlue": 255 }, "stBkColor": { "byAlpha": 0, "byRed": 0, "byGreen": 0, "byBlue": 0 } } }, "nChannel": 0] } } | | |
| NOTE: All params can be saved by this command and also you can set one param alone. | | | |
| Function | Code | Command | Setting |
| Show Time | { "SetEnv": { "VideoOsd": [{ "stTime": { "bEnable": 1, "nChannel": 0 } }] } } | bEnable | 0: Not show 1: Show |
| Show Title | { "SetEnv": { "VideoOsd": [{ "stTitle": { "bEnable": 1, "nChannel": 0 } }] } } | bEnable | 0: Not Show 1: Show |

| Video OSD | | | |
|----------------------|--|---------|-------------------|
| Set video parameters | | | |
| Function | Code | Command | Setting |
| Time FontColor | { "SetEnv": { "VideoOsd": [{ "stTime": { "stFtColor": { "byAlpha": 128, "byRed": 255, "byGreen": 255, "byBlue": 0 } }, "nChannel": 0 }] } } | byAlpha | 128 |
| | | white | rgb (255,255,255) |
| | | black | rgb (0,0,0) |
| | | yellow | rgb (255,255,0) |
| | | red | rgb (255,0,0) |
| | | blue | rgb (0,0,255) |
| Title FontColor | { "SetEnv": { "VideoOsd": [{ "stTitle": { "stFtColor": { "byAlpha": 128, "byRed": 255, "byGreen": 255, "byBlue": 0 } }, "nChannel": 0 }] } } | byAlpha | 128 |
| | | white | rgb (255,255,255) |
| | | black | rgb (0,0,0) |
| | | yellow | rgb (255,255,0) |
| | | red | rgb (255,0,0) |
| | | blue | rgb (0,0,255) |
| OSD Offsetx pos | Time: { "SetEnv": { "VideoOsd": [{ "stTime": { "nXPos": 9200, "nChannel": 0 } }] } } | nXPos | [0, 10000] |
| | Title: { "SetEnv": { "VideoOsd": [{ "stTitle": { "nXPos": 9200, "nChannel": 0 } }] } } | | |
| OSD Offsety pos | Time: { "SetEnv": { "VideoOsd": [{ "stTime": { "nYPos": 1200, "nChannel": 0 } }] } } | nYPos | [0, 10000] |
| | Title: { "SetEnv": { "VideoOsd": [{ "stTitle": { "nYPos": 1200, "nChannel": 0 } }] } } | | |

| OSD Font Size | |
|------------------------------|---|
| Get OSD font size parameters | |
| Code | { "GetEnv": { "TTFFontSize": { "nChannel": -1 } } } |
| Set video parameters | |
| Code | { "SetEnv": { "TTFFontSize": { "nFontSize": [48,48], "bAutoSize": 1 } } } |

| OSD Font Size | | | |
|---------------|------|-----------|---------------|
| Function | Code | Command | Setting |
| | | bAutoSize | 0: off, 1: on |
| | | nFontSize | [8,200] |

Output Format

| (Video) Output Format | | | | |
|--------------------------|---|--|---|------------|
| Get video out parameters | | | | |
| Code | { "GetEnv": { "VideoOut": { "nChannel": -1 } } } | | | |
| Set video out parameters | | | | |
| Code | { "SetEnv": { "VideoOut": { "nNetMode": 2, "emVoutFormat": 9, "byFormatList": [10,9,4,3,8,7,6,5,26,25,20,21,22,23,24] } } } | | | |
| Function | Code | Command | Setting | |
| | | nNetMode: default value 2, do not modify it | – HD output – HD output + SD network – SD output + HD network | |
| | | emVoutFormat: Setting the current video out format. | 10: | 1080P60 |
| | | | 9: | 1080P50 |
| | | | 4: | 1080P30 |
| | | | 3: | 1080P25 |
| | | | 8: | 1080I60 |
| | | | 7: | 1080I50 |
| | | | 6: | 720P60 |
| | | | 5: | 720P50 |
| | | | 26: | 720P30 |
| | | | 25: | 720P25 |
| | | | 20: | 1080P59.94 |
| | | | 21: | 1080I59.94 |
| | | | 22: | 1080P29.97 |
| | | 23: | 720P59.94 | |
| | | 24: | 720P29.97 | |

SRT

| SRT | | | |
|----------------------------|--|----------|--------------|
| Get network SRT parameters | | | |
| Code | { "GetEnv": { "NetWork": { "nChannel": -1 } } } | | |
| Set network SRT parameters | | | |
| Code | { "SetEnv": { "NetWork": { "stSrt": { "wSrtLen": 0, "wSrtPort": 9000, "szSrtPin": "xxxxxxxxxx" } } } } | | |
| Function | Code | Command | Setting |
| crypto key length in bytes | | wSrtLen | [0-32] |
| Port SRT | | wSrtPort | Default 9000 |
| Password stream encryption | | szSrtPin | user-defined |

Network

Network configure and port settings

| Network Configure | | | |
|-----------------------------|--|------------|------------|
| Get network port parameters | | | |
| Code | { "GetEnv":{ "NetWork":{ "nChannel":-1} } } | | |
| Set network port parameters | | | |
| Code | { "SetEnv":{ "NetWork":{ "stNetPort": { "wPortSoap":1936,"wPortData":3000,"wPortWeb":80,"wPortRtsp":554,"wPortVisca": 1259,"wPortOnvif":2000,"wPortRtmp":1935} } } } | | |
| | You can also set one of these parameters like this: { "SetEnv":{ "NetWork":{ "stNetPort":{ "wPortSoap":1936} } } } | | |
| Port Settings | | | |
| Function | Code | Command | Setting |
| Port Data | | wPortData | [0, 65535] |
| Port Web | | wPortWeb | [0, 65535] |
| Port Onvif | | wPortOnvif | [0, 65535] |
| Port Soap | | wPortSoap | [0, 65535] |
| Port Rtmp | | wPortRtmp | [0, 65535] |
| Port Rtsp | | wPortRtsp | [0, 65535] |
| Port Visca | | wPortVisca | [0, 65535] |

Ethernet

| Ethernet | | | |
|-------------------------|---|---------|---------------|
| Get Ethernet parameters | | | |
| Code | { "GetEnv":{ "NetWork":{ "nChannel":-1} } } | | |
| Set Ethernet parameters | | | |
| Code | "SetEnv":{ "NetWork":{ "stEth": [{"byValid":5,"szIPAddr":"192.168.5.126","szSubMask":"255.255.255.0","szMacAddr":"E4:77:D4:01:8A:49", "szGateway":"192.168.5.1","bDefault":1}]} } | | |
| Function | Code | Command | Setting |
| DHCP | { "SetEnv":{ "NetWork":{ "stEth":[{"byValid":5}]} } } | byValid | 5:off 7:on |
| IP Address | { "SetEnv":{ "NetWork":{ "stEth":[{"szIPAddr":"192.168.5.127"}]} } } | | |
| Subnet Mask | { "SetEnv":{ "NetWork":{ "stEth":[{"szSubMask":"255.255.255.0"}]} } } | | |
| Default Gateway | { "SetEnv":{ "NetWork":{ "stEth":[{"szGateway":"192.168.5.1"}]} } } | | |

DNS

| DNS | |
|--------------------|--|
| Get dns parameters | |
| Code | { "GetEnv":{ "NetWork":{ "nChannel":-1} } } |
| Set dns parameters | |
| Code | { "SetEnv":{ "NetWork":{ "stDns":{ "szDns1":"8.8.8.8","szDns2":"0.0.0.0" } } } } |

| DNS | | | |
|------------------------|---|---------|---------|
| Function | Code | Command | Setting |
| Preferred DNS Server | {"SetEnv":{"NetWork":{"stDns":{"szDns1":"8.8.8.8"}}}} | | |
| Alternative DNS Server | {"SetEnv":{"NetWork":{"stDns":{"szDns2":"8.8.8.8"}}}} | | |

System

| System Configure | | | |
|------------------------|--|------------|--------------------------------------|
| Get sysattr parameters | | | |
| Code | {\"GetEnv\":{\"SysAttr\":{\"nChannel\":-1}}} | | |
| Set sysattr parameters | | | |
| Code | {\"SetEnv\":{\"SysAttr\":{\"nLanguage\":0,\"szDeviceID\":\"1\",\"emVideoStandard\":1,\"szDevName\":\"testname\"}}} | | |
| Function | Code | Command | Setting |
| Device Name | | szDevName | user-defined, cannot use white space |
| Device ID | | szDeviceID | cannot modify |
| Language | | nLanguage | 0: Simplified Chinese 2: English |

License

| License | |
|------------------------|---|
| Get License parameters | |
| Code | :"QueryState":{"QueryLicenseState":{}} |
| Set License parameters | |
| Code | {"SetEnv":{"LicenseKey":{"bLicenseEnable":0,"szKeyText":"483B4EB1D0"}}} |

Time

| SysTime | | | |
|----------------------------|---|-------------|---|
| Get system time parameters | | | |
| Code | {\"QueryState\":{\"QuerySysTime\":{}}} | | |
| Set system time parameters | | | |
| Code | {\"SetEnv\":{\"SysTime\":{\"nDateSprtr\":2,\"nDateFormat\":0,\"nZone\":1,\"nHourType\":0,\"stNtp\":{\"bEnable\":1,\"nHostPort\":123,\"nUpdateInterval\":2,\"szHostUrl\":\"ntp4.aliyun.com\"}}}} | | |
| Function | Code | Command | Setting |
| Date Format | {\"SetEnv\":{\"SysTime\":{\"nDateFormat\":0}}} | nDateFormat | 0: YYYY-MM-DD 1: MM-DD-YYYY 2: DD-MM-YYYY |
| Date Sprtr | {\"SetEnv\":{\"SysTime\":{\"nDateSprtr\":0}}} | nDateSprtr | 0: . 1: - 2: / |

| SysTime | | | |
|------------------------|---|-----------------|---|
| Function | Code | Command | Setting |
| Zone | <code>{"SetEnv":{"SysTime":{"nZone":0}}}</code> | nZone | [0, 32] 0: GMT 1: GMT+01:00 2: GMT+02:00 3: GMT+03:00 4: GMT+03:30 5: GMT+04:00 6: GMT+04:30 7: GMT+05:00 13: GMT+08:00 20: GMT-01:00 31: GMT-11:00 32: GMT-12:00 |
| Hour Type | <code>{"SetEnv":{"SysTime":{"nHourType":0}}}</code> | nHourType | 0: 24 Hours 1: 12 Hours |
| NTP Enable | <code>{"SetEnv":{"SysTime":{"stNtp":{"bEnable":1}}}</code> | bEnable | 0: off 1: on |
| Update Interval | <code>{"SetEnv":{"SysTime":{"stNtp":{"nUpdateInterval":2}}}</code> | nUpdateInterval | [1, 10] |
| Host URL | <code>{"SetEnv":{"SysTime":{"stNtp":{"szHostUrl":"time.nist.gov"}}}</code> | szHostUrl | user-defined, ntp server address |
| Host Port | <code>{"SetEnv":{"SysTime":{"stNtp":{"nHostPort":123}}}</code> | nHostPort | user-defined: [0, 65535] |
| Time Settings | <code>{"SysCtrl":{"SetTime":{"bTimeType":1,"nZone":19,"stDateTime":{"dwYear":2018,"byHour":15,"byMinute":38,"byDay":1,"byMonth":11,"bySecond":2}}}</code> | | Synchronize with computer time or set manual: |
| Synchronize NTP Server | <code>{"SysCtrl":{"SyncNtp":""}}</code> | | |

User

| SysUser | | | |
|------------------------|--|------------|--|
| Get sysuser parameters | | | |
| Code | { "GetEnv": { "SysUser": { } } } | | |
| Set sysuser parameters | | | |
| Code | { "SetEnv": { "SysUser": { "stUsers": [{ "nUserType": 0, "szUserName": "admin", "szPassword": "admin" }, { "nUserType": 1, "szUserName": "user1", "szPassword": "user1" }, { "nUserType": 1, "szUserName": "user2", "szPassword": "user2" }] } } } | | |
| Function | Code | Command | Setting |
| Authority | | nUserType | 0: admin 1: user1 or user 2 |
| User Name | | szUserName | user-defined: no white space |
| Password | | szPassword | user-defined, no white space. This command must set three users at the same time. |

Update

| Update | |
|---|---|
| Get update parameters | |
| Code | <code>{"QueryState":{"QueryVersion":{}}}</code> |
| Code | Get the return value and split it like this: <code>szText.Format("%.%.%.%-%", (stVersion.dwCamVersion >> 16) & 0xFF, (stVersion.dwCamVersion >> 8) & 0xFF, (stVersion.dwCamVersion & 0xFF), (stVersion.dwCamDate >> 16) & 0xFFFF, (stVersion.dwCamDate >> 8) & 0xFF, (stVersion.dwCamDate & 0xFF));</code> |
| Set update parameters | |
| Not supported update with API, you can do this through webpage. | |

Default and Reboot

| Default | |
|---------|---|
| Code | <code>{"SysCtrl":{"Default":{}}}</code> |
| Reboot | |
| Code | <code>{"SysCtrl":{"Reboot":{}}}</code> |



The URL supports to set all params at one time and also can set one of them through split URL into one other command. Different commands can be found at different settings.

Appendix D - CMOS Image Sensor Characteristics

The following occurrences that may appear in images are specific to CMOS (Complementary Metal Oxide Semiconductor) image sensors. They do not indicate malfunctions.

White Flecks

Although the CMOS image sensors are produced with high-precision technologies, fine white flecks may be generated on the screen in rare cases. These flecks are caused by natural and / or artificial radiation, which causes a "false exposure" on the image sensor. The shape of these spots may vary from dots to lines or other—sometimes irregular—shapes.

These spots occur in random locations of the image, occur only in a single frame and are more visible in dark images. This is a principle issue of all image sensors and *is not a malfunction*.

The white flecks especially tend to be seen in the following cases:

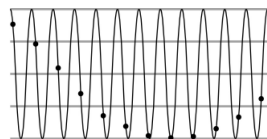
- When operating at a high ambient temperature
- When you have raised the gain (sensitivity)

The white flecks may be reduced by turning the camera off, then on again.

Aliasing

When fine patterns, stripes, or lines are shot, they may appear jagged or flickering. *Aliasing* refers to the effect that is produced when a signal is imperfectly reconstructed from the original signal. It occurs when a signal is not sampled at a high enough frequency to create an accurate representation.

This effect is shown in the following example of a *sinusoidal function*:



In this example, the dots represent the sampled data and the curve represents the original signal. Because there are not enough sampled data points, the resulting pattern produced by the sampled data is a poor representation of the original.

Focal Plane

Owing to the characteristics of the pickup elements (CMOS image sensors) for reading video signals, subjects that quickly move across the screen may appear slightly skewed (i.e., tilted to the left or right, depending on the direction of camera or subject movement). Since a CMOS sensor typically captures one row at a time within approximately 1/60th or 1/50th of a second (depending on the refresh rate), it may result in a "rolling shutter" effect. In such cases, the image is skewed.

Flash Band

If you film a strobe or quick-flashing light, brightness may differ between the upper and lower halves of the picture. See the Focal Plane explanation above for a clarification of this occurrence.

Flicker

If you are recording under lighting that is produced by discharge tubes (such as fluorescent, sodium or mercury-vapor lamps), the screen may flicker, colors may vary, or horizontal stripes may appear distorted.

In such cases, set the *anti-flicker* setting to 'on'.



Depending on lighting types, such occurrences may not be improved with the anti-flicker setting. It is recommended to set the shutter speed to 1/100s in areas of 50 Hz power supply frequency, and to 1/60s in areas of 60 Hz power supply frequency.



Avonic PTZ Camera 30/20x/12x zoom
CM70-IP/CM71-IP/CM73-IP
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