# Table of Contents

About this document  
Additional information and documents related to the camera system  
FCC compliance  
Support services  
Returns  

1.0 Getting Started  
   1.1 Factory Default IP Address and Settings  
   1.2 System Requirements  
   1.3 Recommended Computer Specifications  
   1.4 3960HD/3960SD/5970SD Interconnection Diagram  
   1.5 3930SD Interconnection Diagram  
   1.6 3920HD/3920SD Interconnection Diagram  
   1.7 3120HD/3720HD Interconnection Diagram  
   1.8 8800HD Interconnection Diagram  
   1.9 Assigning the Static IP Address  

2.0 Accessing the Camera Using the Helios Web Interface  
   Assigning the New Camera IP Address  
   Using the CohuONVIFDiscovery Software to Discover the Camera  
   2.1 Helios Web Interface Home Page Overview  
      2.1.1 Video Control Area  
      2.1.2 Live Video Control  
      2.1.3 LED Indicators  
      2.1.4 On-Screen Display  
   2.2 Setup  
      2.2.1 Configuration  
      2.2.1.1 Communication  
      2.2.1.2 Stream 1  
      2.2.1.3 Stream 2  
      2.2.1.4 OSD (On-Screen Display)  
      2.2.1.5 Time  
      2.2.1.6 User Settings  
      2.2.2 Change Password  
      2.2.3 Properties  
      2.2.3.1 Properties (Applies to 3960HD/3960SD/3920HD/3920SD/3930HD/3720HD/3120HD)  
      2.2.3.2 Properties (Applies to 5970SD)  
      2.2.3.3 Properties (Applies to 8800HD)  
      2.2.4 Upgrade  
      2.2.4.1 Firmware Upgrade  
      2.2.4.2 Web Interface Upgrade  
   2.3 Stream  
   2.4 Lens  
      2.4.1 Lens (Applies to 3960HD/3960SD/3920HD/3920SD/3930HD/3720HD/3120HD)  
      2.4.2 Lens (Applies to 8800HD)  
   2.5 Tours (Applies to 3960HD/3960SD/3920HD/3920SD/5970SD/3720HD/3120HD/8800HD)  
   2.6 Patterns (Applies to 3720HD/3120HD)  
   2.7 Presets (Applies to 3960HD/3960SD/3920HD/3920SD/5970SD/3720HD/8800HD/3120HD)  
   2.8 Park (Applies to 3960HD/3920HD/3720HD/3120HD)  
   2.9. Auxiliary  
   2.10 Sector (Applies to 3960HD/3960SD/3920HD/3920SD/5970SD/3120HD)  
   2.11 Privacy Zones (Applies to 3960HD/3960SD/3920HD/3920SD)  
   2.12 Back Focus (Applies to 8800HD)  
   2.13 Micro Nudge (Applies to 8800HD Camera Positioner System)  
   2.14 Event (Applies to 3960HD/3960SD/3920HD/3920SD/5970HD/3720HD/3930HD/8800HD/3120HD)  
      2.14.1 External I/O  
      2.14.2 FTP (File Transfer Protocol) and Email  
      2.14.3 Auxiliary  
      2.14.4 Event Actions  
   2.15 Privacy Mask (Applies to 3120HD/3930HD with 720p30x Zoom In)  

Appendix 1: Region of Interest (ROI)  
3.0 Warranty
About this document

The Operation Manual is a combined document for the CohuHD™ Helios™ products and contains information on how to configure and operate camera systems using Helios Web Interface for 3960HD/3960SD/3930HD/3920HD/3920SD/3720HD/3120HD/8800HD series. The manual is available from the CohuHD website at:


The information in this manual is subject to change without notice. Please refer to the above website for the latest information.

NOTE: All graphics contained within this document, including screenshots and other displays, are for reference use only and are subject to change.

Additional information and documents related to the camera system

For information on the installation and maintenance of the following camera positioner systems see:

- 3960HD, 3960SD, and 5970SD – see combined Installation Manual 6X-1089
- 3930HD – see Installation Manual 6X-1092
- 3920HD and 3920SD – see combined Installation Manual 6X-1097
- 3720HD – see Installation Manual 6X-1098 and Quick Start Guide 6X-1107
- 8800HD (Standalone and Camera Positioner Systems) – see combined Installation Manual 6X-1105
- 3120HD – see Installation Manual 6X-1109

Manuals are available from the CohuHD website on specific product pages.

Copyright/Intellectual Property Rights statement

Copyright 2014 by CohuHD Costar, LLC. CohuHD Costar, LLC has intellectual property rights to technology embodied in the product described in this manual.

CohuHD™ and Helios™ are trademarks of CohuHD Costar, LLC.

FCC compliance

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications to this device void the warranty.

Support services

Please contact the Customer Service Department for technical assistance.
Returns

This item was thoroughly tested and carefully packed at the factory prior to shipping. Upon acceptance by the carrier, the carrier assumes responsibility for the item's safe arrival. If you receive the item in a damaged condition, apparent or concealed, a claim for damage must be made to the carrier.

If a visual inspection shows damage upon receipt of this shipment, it must be noted on the freight bill or express receipt and the notation signed by the carrier’s agent. Failure to do this can result in the carrier refusing to honor the claim.

When the damage is not apparent until the unit is unpacked, a claim for concealed damage must be made. Make a mail or phone request to the carrier for inspection immediately upon discovery of the concealed damage. Keep all cartons and packing materials.

To return the product to the factory for service, please contact the Customer Service Department for a Return Material Authorization (RMA) Number.

Prominently display the RMA number on the outside of the shipping container(s) and on paperwork contained inside. Give a brief description of why the equipment is being returned and list the symptoms of any problems being experienced with the equipment.

For shipment, send package with enough foam padding or other packing material to prevent damage during shipping. The original shipping carton is a good container if it has not been damaged.

Shipment

**IMPORTANT**

If the camera needs to be shipped, please use the original packaging material which was designed to protect the product during transportation. If the original packaging is lost or damaged, please order a replacement from Customer Service.
1.0 Getting Started

NOTE: All graphics contained within this document, including screenshots and other displays, are for reference use only and are subject to change.

Installation and testing of the camera system can be performed with the built-in Helios Web Interface application.

CAUTION:
Secure the camera system before the power is applied.

1.1 Factory Default IP Address and Settings

The camera system is shipped with:

- Default IP address: 192.168.2.150
- Subnet mask: 255.255.0.0
- Gateway: 192.168.2.1

1.2 System Requirements

WARNING:
Bonding and grounding conditions must be met to protect people and equipment.

In order to test the camera system you need the following items:

- Laptop or desktop computer (for recommended computer specifications see Section 1.3)
- 100/1000BASE-T network card installed in your computer
- Microsoft Internet Explorer, version 8 or 9
- 100/1000BASE-T network switch
- Ethernet CAT5e cable

1.3 Recommended Computer Specifications

The following are recommended computer specifications to run and operate a camera system:

- CPU: Intel i7-860S 2.53 GHz or better
- Operating system: Windows XP Service Pack 3 (SP3) or better
- Memory: 4GB DDR3@1066MHz or better
- Hard Drive: 7200 rpm – minimum speed with sufficient free space
- Video card: NVIDIA® GeForce® 9800 GTX+ with 512 MB RAM or better, or high-end ATI Radeon™ HD series
- Monitor: LCD monitor with 1920 x 1080 or better resolution
- Web browser: Microsoft Internet Explorer version 8 or 9
1.4 3960HD/3960SD/5970SD Interconnection Diagram

Figure 1 shows an interconnection diagram for the 3960HD/3960SD/5970SD series cameras.

**NOTE:** If your PC has a GigE network interface, you can bypass the switch and plug the camera system RJ45 cable directly into the GigE port on your computer.

This diagram represents a typical installation. Each installation site will have its own unique requirements.

NOTE: Analog video, serial (RS232/RS422), and alarm connections are not shown for clarity.

**Figure 1. Interconnection Diagram**
1.5 3930\textsuperscript{HD} Interconnection Diagram

Figures 2 and 3 show interconnection diagrams for 3930\textsuperscript{HD}:

- Figure 2 shows a setup of the camera system with PoE-enabled switch.
- Figure 3 shows a setup of the camera system using the PoE injector with non-PoE switch.

**NOTE:** If your PC has a GigE network interface, you can bypass the switch and plug the camera system RJ45 cable directly into the GigE port on your computer.

These diagrams represent typical installations. Each installation site will have its own unique requirements.

**Power over Ethernet (PoE)**

The 3930\textsuperscript{HD} camera system is compliant with the IEEE 802.3at standard. Power to the camera system is supplied through the network cabling. Two types of PoE implementations are specified by the standard:

- Endspan PoE: Power is applied directly by the switch to the camera system. This method requires the deployment of a PoE-enabled switch.
- Midspan PoE: Power is supplied by an injector placed between an existing non-PoE switch and the camera system.

PoE injectors can be ordered from CohuHD. PoE injector is supplied with the HD15 option. Please refer to the CohuHD web page in the 3930\textsuperscript{HD} series specifications section for ordering information. The PoE injector selected for use with 3930\textsuperscript{HD} must meet the following requirement:

- Be compatible with the IEEE 802.3at standard. For information on PoE injectors, refer to the website: [www.ieee.li/pdf/viewgraphs/introduction_to_poe_ieee802.3af_802.3at.pdf](http://www.ieee.li/pdf/viewgraphs/introduction_to_poe_ieee802.3af_802.3at.pdf).

![Interconnection Diagram with PoE-enabled switch](Image)
Figure 3. Interconnection Diagram with non-PoE Switch
1.6 3920HD/3920SD Interconnection Diagram

Figures 4 and 5 show interconnection diagrams for the 3920HD/3920SD series cameras:

- Figure 4 shows a setup of the camera system using IP output.
- Figure 5 shows a setup of the camera system using analog and IP output.

**NOTE:** If your PC has a GigE network interface, you can bypass the switch and plug the camera system RJ45 cable directly into the GigE port on your computer.

These diagrams represent typical installations. Each installation site will have its own unique requirements.

---

**Figure 4. Interconnection Diagram, IP Output**

**Figure 5. Interconnection Diagram, Analog and IP Output**
1.7 3120HD/3720HD Interconnection Diagram

Figures 6, 7 and 8 show interconnection diagrams for the 3120HD and 3720HD series camera systems:

- Figure 6 shows a setup of the camera system using IP output.
- Figure 7 shows a setup of the camera system with PoE-enabled switch.
- Figure 8 shows a setup of the camera system using the PoE injector with non-PoE switch.

**NOTE**: If your PC has a GigE network interface, you can bypass the switch and plug the camera system's RJ45 cable directly into the GigE port on your computer.

These diagrams represent typical installations. Each installation site will have its own unique requirements.

*Figure 6. Interconnection Diagram, IP Output, 24 Vac*
Power over Ethernet

The 3120HD and 3720HD camera systems are compliant with the IEEE 802.3at standard. Power to the camera system is supplied through the network cabling. Two types of PoE implementations are specified by the standard:

- **Endspan PoE**: Power is applied directly by the switch to the Camera. This method requires the deployment of a PoE-enabled switch.
- **Midspan PoE**: Power is supplied by an injector placed between an existing non-PoE switch and the Camera.

PoE injectors can be ordered from CohuHD. Please refer to the CohuHD web pages in the 3120HD or 3720HD Series specifications sections for ordering information. The PoE injector selected for use must meet the following requirement:

Be compatible with the IEEE 802.3at standard. For information on PoE injectors, refer to the website: www.ieee.li/pdf/viewgraphs/introduction_to_poe_ieee802.3af_802.3at.pdf.
1.8 8800\textsuperscript{HD} Interconnection Diagram

The figure below shows interconnection diagrams for the 8800\textsuperscript{HD} series camera systems.

**NOTE**: If your PC has a GigE network interface, you can bypass the switch and plug the camera system RJ45 cable directly into the GigE port on your computer.

These diagrams represent typical installations. Each installation site will have its own unique requirements.

![Interconnection Diagram](image)

**Figure 9. Interconnection Diagram. Standalone Camera System**

![Interconnection Diagram](image)

**Figure 10. Interconnection Diagram. Camera Positioner System**
1.9 Assigning the Static IP Address

**IMPORTANT:** In order to make changes in network settings and install ActiveX® controls in the local machine the user must be logged in as Administrator. Please contact your local IT department if you do not have Admin privileges.

Set your computer IP address to the same subnet as the camera system IP address.

- Go to Start > Control Panel > Network connections > Local Area Connection.
  1. Local Area Connection dialog box will appear. Click the Properties button.

2. You will see the Local Area Connections Properties dialog box. In the General tab, highlight the Internet Protocol (TCP/IP) line. Click the Properties button.

![Local Area Connection Properties](image)

- Click "Properties""
3. You will see the Internet Protocol (TCP/IP) dialog box. Select the Use the following IP address button in the General tab. Enter IP address: the IP address range is 192.168.2.1 through 192.168.2.254 except the IP address that already is used by the camera system. The subnet mask must be 255.255.0.0. Click the OK button to close the Internet Protocol (TCP/IP).

![Internet Protocol (TCP/IP) dialog box](image)

**General Tab**
- Select “Use the following IP address”
- Enter an IP address which is not used by the camera. The IP address range is 192.168.2.1 through 192.168.2.254 except 192.168.2.150*
- Enter subnet mask: 255.255.0.0
- Click “OK”

**NOTE:** * Since the subnet mask is 255.255.0.0 the IP address can be 192.168.0.1 through 192.168.255.254 except 192.168.2.150 (the default address that has been assigned to the camera).

4. Click the OK button to close the Local Area Connections Properties dialog box and click the Close button to close the Local Area Connection dialog box.

![Local Area Connections Properties dialog box](image)

**Click “OK”**

![Local Area Connection dialog box](image)

**Click “Close”**
2.0 Accessing the Camera Using the Helios Web Interface

The Helios Web Interface works with Internet Explorer (IE) 8 or 9. Microsoft ActiveX® is required to view and control video in the Helios Web Interface.

**IMPORTANT:** In order to make changes in network settings and install ActiveX® controls in the local machine the user must be logged in as Administrator. Please contact your local IT department if you do not have Admin privileges.

Upon delivery, the first time you access the camera system for starting a video stream take the following steps:

- Log in as a local administrator on your computer.
- Start Microsoft Internet Explorer, version 8 or 9.
  
  **NOTE:** You may need to set security level in IE and add the camera system as a trusted site in order to run a video.
- Enter the camera IP address in the browser address box. The default address is http://192.168.2.150.
- The camera will attempt to install an ActiveX control on your PC. Allow the camera to install ActiveX Control by clicking on the prompt “This website wants to install the following add-on: CohuRTPControl.cab from CohuHD.” Click “Install this Add-on” from the submenu.
  
  ![Internet Explorer - Security Warning](image)

- Click Install in the Security Warning window box.
• The Home page will be displayed.

• Press the Start Live Video button to start the video stream.

---

**IMPORTANT:**
Upon delivery, the first time you access the camera you are logged in as an Admin and have unrestricted access to the camera’s configuration and operation. Authentication is turned off and administrator rights are granted without log in. For security reasons, it is recommended that authentication be established promptly. See Section 2.2.1.6.

**Password Protection**
If the camera is password-protected, a dialog box to enter the user name and password will be displayed.

• Type the user name and password.
• Click the OK button.

**Authentication**
Four users’ accounts are defined in the Helios Web Interface to allow different levels of access. Those accounts are:

- Guest
- User
- Priv
- Admin

For more information see Sections 2.2.1.6 and 2.2.2.
Assigning the New Camera IP Address

No two devices on a single Ethernet network can have the same IP address. Use the following steps to change a Camera IP address before a second camera is added to the subnet.

- Set your computer IP address to the same subnet as the Camera IP address.

**IMPORTANT:** In order to make changes in camera configuration the user must be logged in as Administrator.

- Change the Camera address. The Camera address can be changed manually or through a Dynamic Host Configuration Protocol (DHCP) server. See Operation Manual 6X-1090.
  - Click the Camera Setup button.
  - Click the Configuration button.
  - Click the Communication tab.

The Communications tab is used for performing network configuration of the Camera. Changes to this tab can only be made by the Admin account. Care must be taken when modifying parameters on this page as the changes can make the camera inaccessible through the network. Consult with your network administrator before starting to assign new network settings to ensure that your camera won’t conflict with other devices.

- Write down the new camera address to make the camera easy to find later. If the camera IP address becomes lost, use the CohuONVIFDiscovery software to find the camera on a network. The software is available as a free download at [http://www.CohuHD.com/content/downloads](http://www.CohuHD.com/content/downloads). Under Software & Protocol Downloads > Setup Test Applications > Helios and 7500 Camera Series Discovery Tool, click “download now”. See Section 4.6.
Using the CohuONVIFDiscovery Software to Discover the Camera

• Download the software. See Section 4.5. Run the CohuONVIFDiscovery.exe file. Click to start it.
• The CohuONVIFDiscovery window will be displayed.

**NOTE:** Auto discovery feature uses network multicast packets and may not work through network routers.

• Click on the Start Discovery button. A list of cameras will be automatically displayed.

**NOTE:** Use the MAC Address or Model Index to identify CohuHD cameras. "00-09-f2" identifies cameras as CohuHD cameras. The MAC address of the camera is on the serial number label.

• Right click a camera entry. Click Copy IP to Clipboard.

**NOTE:** The CohuONVIFDiscovery software uses the ONVIF device discovery service. If the ONVIF discovery service is disabled, the CohuONVIFDiscovery software will not find the camera.
2.1 Helios Web Interface Home Page Overview

The main window provides information about the user type, name of the camera, software revision and access to configuration/control functions.

Control area:
1. The current user level logged into the camera. See Sections 2.2.1.6 and 2.2.2.
2. The series number of the camera.
3. Logout.
4. Camera configuration/control panel menu. See Sections 2.2 – 2.10.

Video area:
5. Display window for live and recorded video streams. See Section 2.1.1.
6. Video controls. See Section 2.1.2.
7. LED indicators. See Section 2.1.3.
2.1.1 Video Control Area

The video control area is used for viewing video as well as allowing mouse control of the camera.

Changing the Video Display

The video display can be expanded to the full screen by clicking the F11 key on the keyboard. To exit from full screen display, press F11 again.

To close the control area, move the mouse pointer over video viewing area and double click the right mouse button. To bring the control area back, double-click the right mouse button again.

Pan, Tilt, and Zoom (PTZ)

- Pressing down the left mouse button and dragging the mouse allows user to control pan and tilt functions.
- Rolling the mouse wheel allows user to zoom in and out.
- When the camera optical zoom is at its maximum, further zoom in commands will enter digital zoom mode. Zoom out commands affect optical zoom after digital zoom is at its minimum.

2.1.2 Live Video Control

2. Stop Video Display Button: Stops Live Video activity and returns to the Nothing Loaded screen.

2.1.3 LED Indicators

Three LED indicators are located in the right top corner of the video area:

- Right LED glowing solid green indicates that a live video connection is established.

2.1.4 On-Screen Display

The OSD (On-Screen Display) menu allows the user to display the text overlays such as Camera Title, Date Time, Preset, Az/Elev/Zoom, Event, etc.

OSD elements are displayed on the left side of the image (top or bottom). A logo is displayed on the right side of the image (top or bottom) for the standard font size. See Section 2.2.1.4. Up to four OSD elements are selectable for inclusion in the camera’s two IP video streams. Three elements are maximum on a single stream.
2.2 Setup

With appropriate user permission, Setup menu allows you to change the network settings, properties settings and upgrade firmware.

Click the Setup button to display buttons from the drop-down menu:

- Configuration. See Section 2.2.1.
- Change Password. See Section 2.2.2.
- Properties. See Section 2.2.3.
- Upgrade. See Section 2.2.4.

If you are logged in as the Administrator (Admin), you will be able to see all four buttons: Configuration, Properties, Change Password, Upgrade.

If you are logged in as the Privileged User (Priv), you will be able to see the first three buttons: Configuration, Properties, Change Password.

If you are logged in as the User, you will be able to see two buttons: Properties and Change Password.

If you are logged in as the Guest, you will be able to see one button: Change Password.

2.2.1 Configuration

This button is available for the Admin user to make changes in the camera networking settings.

Click the Configuration button to display the camera configuration window with six tabs. The tabs provide pages which allow user to configure the camera.

At the bottom of each page four buttons are displayed:

- Default: Restores the factory default settings.
- Revert: Resets the settings to the previously unsaved settings.
  
  **NOTE:** After saving the button will not restore the previous values.
- Apply: Allows user to apply changes without making them permanent. Resetting the camera will restore the previous values.
- Save: Stores current settings permanently.
2.2.1.1 Communication

The user must be logged in as Admin in order to make changes in the Communications tab.

- Click the Setup button.
- Click the Configuration button.
- Click the Communications tab.

The Communications tab is used for performing network configuration of the camera. Changes to this tab can only be made by the Admin account. Care must be taken when modifying parameters on this page as the changes might make the camera inaccessible through the network.

The Communications menu allows user to assign IP information through a Dynamic Host Configuration Protocol (DHCP) server, or manually.

In DHCP mode the camera will request network configuration from a DHCP server (usually your router) which will assign it to an IP address.

**NOTE:** The camera network interface MAC address is displayed on this screen to aid in DHCP configuration.

**NOTE:** The unique hostname must be assigned for both DHCP and static configurations.

Select “Use the following IP Address” to do static configuration. This will allow the following values to be set manually:

- **IP Address:** The static IP address assigned to the camera. Be sure it is not already assigned on your network.
- **Subnet Mask:** Used to define the size of your subnet.
- **Default Gateway:** Gateway address where all traffic not on the subnet will be routed. Be sure this address is accessible from the Static IP address within the range defined by the Subnet Mask.
- **DNS Server:** A Primary DNS server to be used by the camera.
- **Hostname:** Hostname to be assigned to the camera. The text can be edited to assign a name of the host.
- **MAC Address:** A unique identifier assigned to network interfaces for communications on the physical network segment, assigned by the device manufacturer, not editable.
- **Min. Cmd Latency:** The period of time that a frame is held by a network device before it is forwarded. 30 ms is a recommended number.

**NOTE:** On this page both Save and Apply will save settings permanently.
2.2.1.2 Stream 1

The user must be logged in as Administrator in order to make changes in the Stream 1 tab.

- Click the Setup button.
- Click the Configuration button.
- Click the Stream 1 tab.

Use the Stream 1 tab to set up the transport mode and parameters of the video stream one.

**Encoding:**

Stream one is available in H.264 or MJPG formats.

**Video Format:**

Choose resolution for stream 1 from drop-down menu. The Bit rate can be selected at various levels between 256,000 and 8,000,000 bits per second (bps). Choose 4,000,000 for optimal bandwidth and video quality. Frame rate can be selected from the drop-down menu.

**NOTE:** SD (standard definition) cameras must have both streams enabled. Stream 1 must use a frame rate of 30fps (frame per second).

**Streaming:**

Four supported transport modes can be used for stream one: unicast, multicast, RTP/TCP, and RTP/HTTP/TCP. Selecting Multicast allows you to specify a multicast address to use. In all cases the packet size to use can be specified as 550, 1400 or 8192 bytes.

**Transport Mode:** Choose from the dropdown menu:

- **Unicast RTP/RTSP broadcasting:** For video on demand between a single sender and a single receiver – and if the system does not have multicast capabilities (see Note 1 and Note 2).
- **Multicast broadcasting:** For a large simultaneous number of viewers and for the most efficient usage of bandwidth.
- **RTP/TCP:** Use RTSP Interleaved method to traverse firewalls.
- **RTP/HTTP/TCP:** Use HTTP tunneling method to traverse firewalls.

**NOTE 1:** Multicast requires a custom configuration of most routers. It is not possible to multicast over the Internet.

**NOTE 2:** Only 8 simultaneous connections are allowed for a unicast broadcasting.

**Default Multicast address:** 232.0.0.52

**Multicast Port:** This parameter sets the destination multicast port for stream 2 using the RTP or M2TS transport over UDP. Value: 1-65535. Default: 18000.

**Max Packet Size:** The factory default is 1400. For 10BASE-T networks use 550, 100BASE-T use 1400, and 1000BASE-T (GigE) with jumbo frame support use 8192 bytes.

**RTSP Timeout:** Sets the value of RTSP timeout in seconds. If a RTSP client does not send a keep alive message during this interval, the RTSP server would disconnect the client. Use a value in the range 5 to 300 secs. 60 seconds is a recommended number.

**Multicast TTL:** Set the TTL (Time-to-live) for the multicast UDP packets sent using RTP or M2TS transport. This value is applied to both streams. Value: any value in the range 1 to 255. Default value is 12 hops.
Constrained Mode: UDP video for cellular/wireless networks. Check the box to enable constrained mode for all the RTP over UDP video streams.

With H.264 (not MJPEG) UDP video, CohuHD supports a constrained mode of operation. Constrained mode can greatly improve the reliability of a video stream over cellular and wireless/radio networks that are more prone to network interruptions and may have smaller buffers for handling UDP video packets.

Check the box if you use a cellular connection.

M2TS Mode (MPEG2 Transport Stream): Check the box to enable M2TS Mode for both streams. When the box is checked, the RTP/RTSP/HTTP/CohuMjpeg transport-based streaming for both the streams is disabled.

Because the M2TS packets include the information necessary for decoding the stream, no connection to the camera (for the SDP file) is needed. You can pull the video packets directly off the network.

NOTE:
- The Helios Viewer and IE (CohuHD ActiveX control) do not support this streaming mode.
- Once enabled all other modes of streaming are disabled. You will need to disable the M2TS stream to re-enable the RTSP media server on the cameras.


2.2.1.3 Stream 2

NOTE: Stream 2 is not available if stream 1 has 1920 x 1080 resolution,

The user must be logged in as Administrator in order to make changes in the Stream 2 tab.
- Click the Setup button.
- Click the Configuration button.
- Click the Stream 2 tab.

Encoding:

Stream 2 is available in H.264 or MJPG formats.

Analog Output:
- 3960HD and 3920HD: Analog video is only available with a single digital stream.
- 3960SD, 3920SD, and 5970SD: Analog video is available in addition to two digital streams.
- 3930HD: Analog video is not available.

Video Format:

The resolution for the second stream can be selected at different resolutions and aspect ratios. Resolution and frame rate of stream 2 are equal or lower than stream 1.

Max Packet Size: The factory default is 1400 bytes. For 10BASE-T networks use 550 bytes, 100BASE-T use 1400 bytes, and 1000BASE-T (GigE) with jumbo frame support use 8192 bytes.
**Streaming:**

Four supported transport modes can be used for stream one: unicast, multicast, RTP/TCP, and RTP/HTTP/TCP. Selecting Multicast allows you to specify a multicast address to use. In all cases the packet size to use can be specified as 550, 1400 or 8192 bytes.

**Transport Mode:** Choose from the drop down menu:

- **Unicast RTP/RTSP broadcasting:** For video on demand between a single sender and a single receiver – and if the system does not have multicast capabilities (see Note 1 and Note 2).
- **Multicast broadcasting:** For a large simultaneous number of viewers and for the most efficient usage of bandwidth.
- **RTP/TCP:** Use RTSP Interleaved method to traverse firewalls.
- **RTP/HTTP/TCP:** Use HTTP tunneling method to traverse firewalls.

**NOTE 1:** Multicast requires a special configuration of the router. It is not possible to multicast over the Internet.

**NOTE 2:** Only 8 simultaneous connections are allowed for a unicast broadcasting.

**Default Multicast address:** 232.0.0.52

**Multicast Port:** This parameter sets the destination multicast port for stream 2 using the RTP or M2TS transport over UDP. Value: 1-65535. Default: 19000.
2.2.1.4 OSD (On-Screen Display)

The user must be logged in as Administrator in order to make changes in the OSD tab.

- Click the Setup button.
- Click the Configuration button.
- Click the OSD tab.

The OSD (On-Screen Display) menu allows the user to display the text overlays such as Camera Title, Date Time, Preset, Az/Elev/Zoom, Event, etc.

On-Screen Display is available in two font modes:

- Standard Font (default)
- Large Font (Applies to 3960HD/3920HD/3920SD/3720HD/3120HD. Future option: 3960SD, 5970HD and 8800HD)
- Only Standard Font is available for the analog systems’ OSD.

OSD text is displayed on the left side of the image (top or bottom). Logo is displayed on the right side of the image (top or bottom).

**OSD Setup in Standard Font**

Uncheck the Large Font button to bring standard font letters on the image:

- Text line can have a maximum of 24 characters.
- Up to four OSD elements are selectable for inclusion in the camera’s two IP video streams. Three elements maximum are on a single stream.

**OSD Setup in Large Font**

To bring larger font letters to the display check the Large Font button.

**Large Font Mode Limitations:**

- OSD is available only on Stream 1. Stream 2 does not support OSD in large font.
- Only two lines of text can be displayed on the video.
- Line 1 is used for camera ID description (up to 15 characters in length).
- Line 2 is used for either Compass Direction or Absolute Pan Position. Up to three characters can be used to indicate the degree of position (i.e N, NE, or 0, 90, 180).
- A logo cannot be displayed on the image.

**Large Font**: Check the button to bring larger font letters on the image.

**Enable**: Check the button to enable or disable the OSD display.

**Text at top**: Check the button to display the text at the left top corner of the image. Uncheck the button to display the text at the left bottom corner of the image.

**Logo at top**: Check the button to display the logo at the right top corner of the image. Uncheck the button to display the logo at the right bottom corner of the image.

**Stream 1**

**Line 1**: Choose an element from the pull-down menu. If Title is chosen, enter a description using up to 24 characters in the box to the right.

**Lines 2, 3**: The same as Line 1.

**Stream 2**: The same as Stream 1.
Logo Files

Logo File Limitations:
- HD: 96 x 96 pixels in size; .bmp format; required to be at 32 pixel boundary for both length and width.
- SD: 64 x 64 pixels in size.

Logo 1: Applies to Stream 1. Check the box to load a logo. Browse to find the file. Click the Load button.
Logo 2: Applies to Stream 2. Check the box to load a logo. Browse to find the file. Click the Load button.

Default: Restores the settings to the factory settings, but does not save or apply them.
Revert: Resets the settings to the previously unsaved settings.
Apply: Applies changes without making them permanent. Resetting the camera will restore the previous values.
Save: Stores current settings permanently.

2.2.1.5 Time

The user must be logged in as Administrator in order to make changes in the Time tab.
- Click the Setup button.
- Click the Configuration button.
- Click the Time tab.

The Time menu allows user to synchronize a camera clock with computer systems.

Camera Time: Cannot be changed. The line displays the current Camera time.
Sync to: Two options are available:
PC: Check the PC button to synchronize the time of the camera with the clock of your computer.
NTP (Network Time Protocol): Check NTP button to synchronize the time of the camera with the time of the server running NTP.

IMPORTANT: If the camera time is synchronized through NTP, it will get time directly from the server when rebooted. If the camera is synchronized to a PC, the synchronization process must be repeated after the camera is rebooted. Synchronization with the NTP server is the recommended method.

NTP Server 1: Type the server IP address.
NTP Server 2: Type the backup server address.
Time Format: Choose 12 or 24 hour clock from the pull-down menu.
Time Zone: Choose time zone from the pull-down menu.
Daylight Savings: Check the box if daylight savings time applies.
Default: Restores the settings to the factory settings, but does not save or apply them.
Revert: Resets the settings to the previously unsaved settings.
Save: Stores current settings permanently.
2.2.1.6 User Settings

The user must be logged in as Admin in order to make changes in the User Settings tab.

- Click the Setup button.
- Click the Configuration button.
- Click the User Settings tab.

This tab is used to create and manage user capability and to control user access to the camera.

The Web Interface supports several levels of authentication. The four authentications levels (Guest, User, Privileged User, Administrator) are established:

<table>
<thead>
<tr>
<th>Users Capability</th>
<th>Guest</th>
<th>User</th>
<th>Priv</th>
<th>Admin</th>
</tr>
</thead>
<tbody>
<tr>
<td>View Video</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Basic Camera Control Only</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Advanced Control and Camera Configuration</td>
<td></td>
<td>x</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Full System Capabilities and Network Settings</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
</tbody>
</table>

- Guest: The user is allowed to view and record video but cannot control the camera or change settings.
- User: The user is allowed to view and record video and control basic functions that change the video currently being displayed, but cannot make changes to configuration.
- Privileged User (Priv): The user is allowed to view and record video, modify camera settings, but not allowed to set network and user configuration or download firmware upgrades.
- Administrator (Admin): The user has access to all camera settings and functions, can change network and user configuration, and download firmware upgrades.

**NOTE:** The user name is displayed above CohuHD logo on the Helios Web Interface Home Page. See Section 2.1
The following authentication options are available:

1. Administrator: Requires authentication for administrators only. The button allows free access to the camera at the Priv, User and Guest levels but requires login to perform Admin functions.

2. Privileged: Requires authentication for Administrator and Privileged users. The button allows free access to the camera at the User and Guest levels. This requires login for all users who have the capability to make permanent changes to the camera.

3. User: To restrict access to anyone controlling the camera select the User button which requires login for all the users who can control the camera.

4. Guest: Selecting the Guest button requires all users who access the camera to authenticate.

In addition to the authentication options, the User Settings page has a number of additional security options that affect users who must authenticate.

- Lockout Time: The amount of time that an account is locked out before it can be unlocked and used again.

  **NOTE:** Set lockout time to zero to disable lockouts.

- Password Life: The amount of time before the password will expire and a new password must be established in order for a user to login.

- Inactive Timeout: The amount of time the session will stay active after a user stops accessing the camera. This is used to delete sessions once a user closes the browser or stops viewing the camera.

  **NOTE:** Increasing this time will not allow a user to close the browser and then return to the camera without authenticating again.

- Max Login Time: The amount of time a single user can stay logged in. After this time expires the session will automatically be ended and the users will be required to login again.

  **NOTE:** Set maximum login time to zero to deactivate this feature.

- Control Time Limit: The amount of time assigned for a particular user to control the camera during a session.

- Maximum Attempts: The maximum number of invalid passwords that can be entered during authentication before the account is locked out.

  **NOTE:** A valid login will reset this counter.

**Factory Default User Names and Passwords:**

- Admin: Camera, case-sensitive
- Priv: No password
- User: No password
- Guest: No password
2.2.2 Change Password

- Click the Setup button.
- Click the Change Password button.

The new page will appear. The main functions of the page are: Help, Logout, and Password change.

- Home: Allows user to get back to the Home page.
- Logout: Allows user to terminate the current session.
- Update: Allows user to change a password.
- Help: Allows user to choose a topic from a drop-down list.

Changing the Password

To set the password for the user name follow the next steps:

- Click the Setup button from the Home page.
- Click the Change Password button from the drop-down list.
- Enter one of use names into the test field: Admin, Priv, User, Guest
- Typer the current password for the user level and then the new password twice. Hit Enter in the last text box.

**NOTE:** Passwords are case-sensitive.

**NOTE:** If you login for the first time, type the **Admin** button and use the default password **Camera** (case-sensitive). For security reasons it is recommended that the password be changed after you login for the first time.

User Name and Password Login

If the Camera is password-protected, a dialog box to enter the user name and password will be displayed.

- Type the user name and password.
- Click OK.
2.2.3 Properties

2.2.3.1 Properties (Applies to 3960HD/3960SD/3920HD/3920SD/3930HD/3720HD/3120HD)

The user must be logged in as Admin or Priv. in order to make changes in the Properties tab. The Properties menu allows user to configure the camera settings.

- Click the Setup button.
- Click the Properties button.

Day/Night Mode  Determines whether the camera will produce a color image with the IR cut filter in place or a monochrome image with the IR cut filter removed to provide increased sensitivity.

  Auto   The camera will automatically change between the color and monochrome modes based on camera gain level. As the scene illumination decreases, the camera gain will increase to a point where the camera will change to the monochrome mode, and the IR cut filter will be removed from the light path. As the scene illumination increases, the camera gain will decrease to a point where the camera will change to the color mode, and the IR cut filter will be inserted into the light path.

  Note 1 When changing from either color or monochrome mode to the auto mode there will be approximately a ten second delay before the automatic mode is engaged.

  Note 2 Auto Day/Night mode requires that the shutter mode also be in Auto mode. If the shutter mode is not already in auto mode, selecting auto Day/Night mode will force the shutter into the auto mode.

Color   The camera will remain in the color mode regardless of the camera gain level.

Mono   The camera will remain in the monochrome mode regardless of the camera gain level.

Shutter   Determines the shutter speed, or integration timing of the camera sensor. In Auto mode, the shutter speed will automatically change based on the scene illumination. Selecting a shutter speed greater than 1/60 (1/4 through 1/30) will increase camera sensitivity, but will also increase image lag and blurring. Selecting a shutter speed less than 1/60 second will decrease camera sensitivity, but will also improve the ability to resolve fast moving objects.

  Note 1 Selecting any shutter speed other than auto will force the camera to change from auto day/night mode to either color or mono mode.
White Balance

**Auto:** The camera will automatically compensate for changing lighting conditions to maintain correct color reproduction, especially during the transition from day to night or from night to day.

**Manual:** Prevents the white balance compensation from compensating for changing lighting conditions, and allows the operator to manually change the red and blue levels for a specific lighting condition.

**Max AGC (Automatic Gain Control)**

Sets the maximum gain level that the automatic gain will attain. Increasing this level will increase camera sensitivity under low light conditions, but will also increase camera noise requiring more bandwidth when the image is encoded. Decreasing this level will lower camera sensitivity, but will also decrease camera noise, requiring less bandwidth when the image is encoded.

**EIS (Electronic Image Stabilization)**

*(Applies only to models with 720p30 30x zoom in 3960HD, 3930HD, 3920HD, 3720HD, and 3120HD and 3960SD/3920SD series.)*

EIS helps to stabilize the image if the camera is subject to vibration. EIS must be off to allow integration (slow shutter speed). Select 5Hz or 10Hz from the pull-down menu.

**Backlight Compensation**

Alters the automatic exposure control programming to prevent a bright background from making darker parts of the image too dark.

**Defog**

*(Applies only to models with 720p30 30x zoom in 3960HD, 3930HD, 3920HD, 3720HD, and 3120HD series)*

Defog function helps to enhance image quality for viewing in smoky environments and bad weather, such as rain, snow or fog.

Choose one of three image enhancement levels from the pull-down menu. Level 1 has the weakest effect and level 3 the strongest. Select the optimal level according to the image conditions. To change image color level type 1 through 128 in the color level box.

**Power up Mode**

*(Applies to 3930HD/3720HD/3120HD)*

**Save:** Stores current settings permanently.

**Recall:** Resets the settings to the previously saved settings.

**Default:** Restores the settings to the factory settings, but does not save or apply them.

<table>
<thead>
<tr>
<th>3120HD and 3720HD Factory Settings</th>
<th>3930HD Factory Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shutter : AUTO</td>
<td>Shutter : AUTO</td>
</tr>
<tr>
<td>Day/Night: AUTO</td>
<td>Day/Night: AUTO</td>
</tr>
<tr>
<td>White Balance: AUTO</td>
<td>White Balance: AUTO</td>
</tr>
<tr>
<td>BackLight: Off</td>
<td>BackLight: Off</td>
</tr>
<tr>
<td>EIS: Off</td>
<td>EIS: Off</td>
</tr>
<tr>
<td>EIS Frequency: 10Hz</td>
<td>EIS Frequency: 10Hz</td>
</tr>
<tr>
<td>Defog: Off</td>
<td>Max AGC: 28 dB</td>
</tr>
<tr>
<td>Color Level: 40</td>
<td></td>
</tr>
</tbody>
</table>
2.2.3.2 Properties (Applies to 5970SD)

The user must be logged in as Admin or Priv. in order to make changes in the camera Properties tab. The camera Properties menu allows user to configure the camera settings.

- Click the Setup button.
- Click the Properties button.
- The Properties window will open up.

The Factory Default settings are recommended as the camera setting for general use. See Section 2.2.3.2.4. However, image quality can often be improved by changing camera parameters. When defining preset positions, the operator is encouraged to change the various settings to determine the best settings for each scene. No changes made through this window will damage the camera in any way, and the camera can easily be restored to the Factory Default settings or to the User Start-up conditions. See Section 2.2.3.2.4.

2.2.3.2.1 Video

**Color Mode:** Selecting Color enables the Color output when selecting color Look Up Tables (LUT).

**Mono Mode:** Disables the Color output. The Look Up Tables (LUT) are still active, and changing the Color mode to Mono and selecting different Polarity LUT’s can produce interesting gray scale effects.

**Supplemental Offset:** The 5970 camera has been factory calibrated to compensate for the thermal non-uniformity of the particular lens that is installed on the camera. This fundamental calibration primarily addresses the quality area of the image. A supplemental offset calibration produces an additional array of offset coefficients to further correct for the thermal non-uniformity of the lens, particularly in the periphery area of the lens. Under most conditions enabling the supplemental offset correction will produce a more uniform image. However, under certain scene conditions and temperature conditions, the Supplemental Offset may reduce the image quality. The user is encouraged to compare the supplemental offset modes to determine the optimum operating mode for the scene being viewed.

**NOTE:** When Supplemental Offset is enabled the camera continuously monitors the uniformity of the image and periodically makes uniformity adjustments. These automatic adjustments are sometimes visible in the video.

**Detail or DDE** (Digital Detail Enhancement) is used to better define edges in the image and enhance faint details so they are more visible.

The valid range of Dynamic DDE setting is from 1 to 63 with 17 being the neutral setting where the filter has no effect. Settings below 17 will smooth the image, reducing the appearance of sharp edges. Higher DDE settings will enhance all image non-uniformities resulting in a very detailed but grainy picture, especially in high dynamic range scenes. Typical factory settings are between 22 and 30. Settings from 18 to 39 are normal imaging modes where the edge enhancement can be tuned for the scene.
**Polarity**

Polarity: The 5970 camera detects and images the temperatures in a given scene. The Polarity setting programs the specific palette of colors to represent the temperature in the image. Within the camera, these temperatures are mapped to a range of 0 to 127 values. In a black and white display mode, this range is converted to shades of grey with, for example, 0 being totally black and 127 being totally white. The 0 to 127 range sensed is referenced to a Look-Up Table (LUT) permanently stored in the camera to convert the scene to a video image. Different LUTs are available to change the appearance of the displayed image.

The most common selection is either White Hot (hotter objects appear brighter than cooler objects in the video display) or Black Hot (hotter objects appear darker than cooler objects). Since the difference between these two modes simply reverses the choice of darker or lighter for temperature extremes, this is often referred to as Polarity.

**Orientation**

**Normal:** The pixel on the upper-right corner of the detector array is displayed on the upper-right corner of the video display in Normal mode.

**Invert:** The normal image is flipped vertically. The pixel on the upper-left corner of the detector array is displayed on the lower-left corner of the video display in Invert mode. Invert is used when mounting the camera upside-down.

**Revert:** The normal image is flipped horizontally. The pixel on the upper-right corner of the detector array is displayed on the upper-left corner of the video display in Revert mode. Revert mode produces a mirror-image of Normal mode.

**Both:** The normal image is flipped vertically and horizontally.

**NOTE:** Any time the image orientation mode is changed, a flat-field correction takes place.

**Digital Zoom**

A 320 x 240 5970 Video camera has 1X, 2X and 4X digital zoom capability. With the 1X Zoom mode selected, the camera displays the full sensor array image (320x240 pixels). When the 2X zoom mode is selected, a smaller 160 x 120 central region of the sensor array is mapped to the video output, creating the zoom effect. When 4X zoom mode is selected, a smaller 80 x 60 central region of the sensor array is mapped to the video output.

A 640 x 480 5970 Video camera has 1x, 2x, 4x and 8x digital zoom capability. With the 1x Zoom mode selected, the camera displays the full sensor array image (640 x 480 pixels). When the 2x zoom mode is selected, a smaller 320 x 240 central region of the sensor array is mapped to the video output, creating the zoom effect. 4x zoom mode is 160 x 120 and 8x zoom mode is 80 x 60.

**Focus**

Clicking on the Far or Near buttons will adjust the camera focus accordingly. The focus will continue to change until the button is released or until the focus reaches the limit of its travel.
2.2.3.2.2 Flat Field Correction

Flat-field correction (FFC) is a technique used to improve quality in digital imaging. During FFC, a shutter briefly blocks the detector array, presenting a uniform temperature (a flat field) to every detector element. The video image is frozen during the process, which takes less than a half second, and resumes automatically thereafter. This is especially important when the camera temperature is fluctuating, such as immediately after turn-on or when ambient temperature is changing. FFC can be commanded manually at any time using the Do FFC command button.

Three options are available from the drop-down menu: Manual, Auto and External FFC.

**Manual FFC**: Perform a manual FFC if the image quality is degraded. **Manual mode is not recommended as a normal operating mode**.

To perform a manual FFC:
- Click Manual field from the drop-down menu in the FFC section of the Camera Properties window.
- Click DoFFC button.

**Auto FFC**: In the Automatic FFC mode, the camera performs an FFC whenever focal plane array (FPA) temperature changes by the amount selected in the “Temp Change” window, or at the end of the FFC Interval.

**External FFC**: The External FFC provides the most uniform Flat Field Correction possible by minimizing lens nonuniformities that cannot otherwise be compensated for. In the External FFC mode a uniform source (blackbody) must be placed in front of the camera. The image of this uniform source will be subtracted from all subsequent images. While the External FFC produces the most uniform results, it is not always possible to view a uniform blackbody source when the camera is installed. Some customers have found that a successful External FFC can be achieved by viewing a cloudless blue sky. Other customers have mounted flat black aluminum plates near the camera that can be used as a blackbody source.

**WARNING**: Do not perform an External FFC without viewing a uniform black body source. While no damage will be done to the camera, the resulting video will be unusable. If this ever happen, put the camera into the automatic or manual FFC mode and select “Do FFC”.

**FFC Interval**: This value determines how often the camera will perform an automatic FFC regardless of the temperature change. The FFC interval is entered in as the number of frames between FFC’s. Valid values are in the range 0 to 30,000 frames. The camera operates at a frame rate of 30 frames per second. The default FFC Interval is 7200 frames, or 4 minutes (7200 / 30 = 240 seconds).

**Temp Change**: The camera needs to compensate for FPA temperature changes to maintain a uniform output. It will perform an automatic FFC if the FPA temperature changes by the amount entered into the Temp Change window. The temperature change is specified in degrees C, with valid values in the range 0 to 100 in 0.1 degree increments. The default value is 5, which represents a FPA temperature change of 0.5 degrees C.

**Set**: After making changes to the FFC Interval or Temp Change, selecting SET will send the new values to the camera.

**DoFFC**: Selecting Do FFC will force the camera to do an FFC regardless of the FFC mode.
2.2.3.2.3 Automatic Gain

Automatic Gain Control automatically optimizes the image contrast and brightness based on a histogram-equalization algorithm. Values for the Plateau Value, ITT (Image Transfer Table) Mean, and Max Gain are user programmable.

**Plateau Value:** The Plateau Value sets the limit for the number of pixels in each bin. When this number is small, the Automatic AGC will approach a linear algorithm that preserves a linear mapping between the 14-bit and 8-bit data. The goal of the Automatic algorithm is to try and make each of the 255 bins have the same number of pixels in it, which gives the highest possible dynamic range for the given scene. When the plateau value is higher, the algorithm is more able to redistribute the data to achieve this goal. This prevents wasted levels of grey on regions that have no scene content. The default Plateau Value is 250 (640 x 480) and 150 (320 x 240).

**ITT Mean:** Changing the ITT Mean changes the midpoint of the ITT. It directly affects the brightness of the image by changing the gray scale mid-point. Lowering the ITT Mean value will make the image darker. Increasing the ITT Mean will make the image much brighter. The default ITT Mean setting is 110 (640 x 480) and 127 (320 x 240).

**MAX Gain:** The Max Gain setting sets the upper limit of gain that the algorithm can use as it attempts to stretch the data to fill the full 8-bit range. If the scene has a high level of contrast, it will use much less gain than the maximum gain setting. The default value is 15 (640 x 480) and 8 (320 x 240).

AGC Adjustment tips:

Lowering the Plateau Value results in a somewhat darker image, while increasing the value will make the image lighter in contrast.

Lowering the ITT Mean Value will noticeably darken the image, while increasing the value will make the image significantly brighter.

Gain will bring out details in a thermally low contrast scene, but will increase the image noise. Changes to the Max Gain will only be noticeable when the scene requires active gain. For example, if the automatic algorithms determine that the AGC level should be at 4, changing the Max Gain level from 5 to 10 will not result in an image change for that scene. However, if the automatics determine that the active gain level be at 12, changing the Max Gain value from 15 to 5 will have a very noticeable effect on the image in terms of noise and detail.

AGC Presets:

For convenience, presets for several general AGC settings will be included in a drop down menu. These AGC presets are intended to be used as a starting point to define the best possible AGC settings for a particular scene. **The user is encouraged to compare various AGC settings modes to determine the optimum settings for the scene being viewed.**

- Default/Outdoors: Plateau Value – 250 (640 x 480) and 150 (320 x 240); ITT Mean – 110 (640 x 480) and 127 (320 x 240); Max Gain – 15 (640 x 480) and 8 (320 x 240).
- Low Scene Contrast (for both resolutions): Plateau Value – 150; ITT Mean – 110; Max Gain – 18.
- Indoors (for both resolutions): Plateau Value – 100; ITT Mean – 120; Max Gain – 10.
2.2.3.2.4 Region of Interest (ROI):

The ROI sets the area of the detector that the AGC will react to.

The ROI can only be configured as a rectangular shape. It is created by clicking and dragging a box over the area that is most important. Refer to Appendix 1 at the end of this document for more detailed ROI information.

**NOTE:** Zoom level of the Internet Explore browser (right corner of the properties page) needs to be set to 100% to correctly view the ROI window and define the ROI.

**Full:** Click the button to get ROI to fill the screen.

**Configuration**

**Mode**

**Real Time and Frozen:** The 5970 will freeze the frame imaged when Frozen is selected. Live video will cease and the frozen frame will persist. To return the camera to live video, select Real Time video mode.

**Settings**

**Save:** Stores current settings permanently.

**Recall:** Resets the settings to the previously saved settings.

**Camera**

**Reset:** Starts the camera software and restores Factory Default conditions.

**NOTE:** This is not the same as a power cycle. A power cycle restores the User Saved settings.

**Default:** Select Factory Defaults to restore the camera settings to the Factory Settings:

- FFC Mode: AUTO
- FFC Interval: 7200
- FFC Temp Change: 5
- Analog Video Color Mode: COLOR
- Supplemental Offset: Enabled
- DDE: 22
- Polarity/LUT: White Hot
- Image Orientation: Normal
- Digital Zoom 1x
- Operating Mode: Real Time
- AGC – Plateau: 250 (640 x 480) and 150 (320 x 240)
- AGC – ITT Mean: 110 (640 x 480) and 127 (320 x 240)
- AGC – MAX Auto Gain: 15 (640 x 480) and 8 (320 x 240)
- ROI (Region of Interest): Full Screen
2.2.3.3 Properties (Applies to 8800HD)

- Click the Setup button.
- Click the Properties button.
- The Properties window will open up.

2.2.3.3.1 Day/Night Mode

Determines if the image is color or monochrome and whether infrared wavelengths are used in producing an image.

**NOTE:** There may be a several second delay when switching between Day/Night modes.

Auto: The camera automatically changes between Day mode (Color) and Night mode (Mono) depending on the scene illumination. When the scene gets dark and the camera gain increases, the camera will change to the Night mode (Mono). When the scene illumination increases and the camera gain decreases, the camera will change to the Day mode (Color).

Color: Considered to be “Day” mode. The camera produces a color image and uses an IR cut filter to prevent infrared illumination from reaching the image sensor.

**NOTE:** The camera stays in the Color mode regardless of the scene illumination level.

Mono: Considered to be “Night” mode. The camera will produce a monochrome image and the IR cut filter is removed to allow infrared illumination to reach the image sensor and contribute to the image.

**NOTE:** The camera stays in the Mono mode regardless of the scene illumination level.

2.2.3.3.2 Exposure

Defines the gain and shutter modes and settings.

**NOTE:** The lens iris and the camera exposure controls operate independently. Changes made to one parameter may be automatically compensated for by the other. For example, in auto iris mode, manually changing the shutter speed may not appear to make a difference in the video output from the camera because the iris is automatically compensating for the different shutter speed.

Shutter: The shutter speed determines the exposure time, or integration time, of the camera sensor. A slow shutter speed (1/30) will increase camera sensitivity but also increases motion blurring. A faster shutter speed (1/1000) will capture motion with less blurring but will reduce sensitivity. The Shutter control is grayed out when in Auto Exposure mode.

Auto: Check the Auto box to bring the camera into Auto Exposure mode. The camera gain and shutter speed are controlled automatically by the camera based on the scene illumination when in the Auto Exposure mode. Selecting Auto Shutter mode disables the manual gain section. Selecting any shutter speed other than “auto” locks the shutter speed at that value. The manual gain section is now active, and a fixed manual gain value can be selected.

When the Auto check box is not selected the camera is in manual exposure mode. The user can set the shutter speed and camera gain using the Shutter and Gain controls.

Min Value: This section is only active when the Shutter mode is in Auto. The Min Value setting determines the long term exposure time. When the Min Value is set to 1/8 or 1/15, the camera will automatically go into the long term integration mode when the light level decreases. As described above, increasing the
integration time of the sensor significantly increases the camera sensitivity, but also significantly increase motion blur. Setting the Min Value to “Off” prevents the camera from entering the long term integration mode, and is the recommended mode for most applications.

Max AGC: This section is only active when the Shutter mode is in Auto. The Max AGC set the maximum gain level that the automatic algorithms will apply to the video image. The AGC range is from 10 dB through 36dB. Increasing the Max AGC will increase camera sensitivity, but will also increase the gain noise present in the video image. The recommended Max AGC setting is 28dB.

Manual Gain: This section active when the Shutter mode is NOT in Auto. It defines the amount of gain that is applied to the video image. This gain level is fixed and does not change when the scene illumination changes. The manual gain range is from 1 dB through 36dB.

2.2.3.3.3 White Balance

Auto: The camera will automatically compensate for changing lighting conditions in order to maintain correct color reproduction, especially during the transition from day to night or from night to day.

Manual: Prevents the white balance from compensating for changing lighting conditions, and allows the operator to manually change the red and blue levels for a specific lighting condition.

Backlight Compensation

A bright background can cause the automatic exposure control to make a darker area of the scene too dark. When the dark area of the scene is more important than the bright area, enabling Backlight Compensation will alter the automatic exposure control by placing less emphasis on the bright area, and more emphasis on the darker areas.

2.2.3.3.4 Anti-Flicker Mode

Use this function to reduce flicker in the image caused by fluorescent lighting.

50Hz: Check the button to remove flicker in a 50Hz environment.

60Hz: Check the button to remove flicker in a 60Hz environment.

2.2.3.3.5 Imaging Settings

Image appearance can be adjusted in the range of 0-100 by moving Brightness, Sharpness, Contrast, Saturation, and Hue sliders left or right. The ideal settings will vary from scene to scene, as well as with changing lighting conditions. Because of this constant variability, the Imaging Settings are not stored included as part of a preset position. The default values have been selected to provide the best overall performance.

Brightness and Contrast: In addition to being very scene dependent, the Brightness and Contrast controls are also interactive. Changing one function typically requires changing the other. The most common method of adjusting the Brightness and Contrast settings are to adjust the Brightness so that black picture content displays as true black on your monitor, and then adjusting the Contrast for comfortable viewing brightness.

Sharpness: Increasing the Sharpness level above the default value can enhance the edge details within an image, but can bring out intrascene artifacts that otherwise would not be noticeable. Lowering the Sharpness level can soften the appearance of the image, but will sacrifice the image detail.

Saturation: Determines the color intensity of the image. Increasing the saturation level will make the colors brighter and more vivid than they actually are, while decreasing the Saturation will have the opposite effect. Decreasing the Saturation level to zero will produce a monochrome image.

Hue: Adjusting the Hue alters the mixture of the red, green and blue within an image, while having minimal impact on whites. Increasing the Hue level shifts blues towards green and greens towards orange. Decreasing the Hue level shifts red towards orange and green towards blue.

Default and Save Settings

- Default: Restores the settings to the factory settings, but does not save or apply them.
- Save: Stores current settings permanently.
2.2.4 Upgrade

The user must be logged in as Admin in order to upgrade firmware.

- Click the camera Setup button from the camera configuration/control menu.
- Click the Upgrade button.

Clicking the Upgrade button will open the Cohu camera Information & Upgrade page. The page provides information about the camera, current software version, and component versions. Follow instructions on the page to upgrade your firmware and web interface versions.

- Download the desired software updates for firmware and web interface to your computer.

For current versions of software, contact the Technical Support.

**IMPORTANT:** Please have camera information (model series, model number, current firmware and Web Interface version) available when you call.
2.2.4.1 Firmware Upgrade

- Click the Browse button in the camera firmware section and find the previously saved new firmware upgrade file.

- Click the Start Upgrade button. **CAUTION**: Make sure to install the correct file of the firmware during the upgrade process.

**CAUTION**: The upgrade process takes approximately 12 minutes. Do not interrupt it.

- A series of screens will be displayed:

- The third screen will tell you that the firmware upgrade process is completed. If you have any questions, contact the Technical Support group.
2.2.4.2 Web Interface Upgrade

- Click the Browse button in the Web Interface section and find the previously saved new Web Interface upgrade file.

- Click the Start Web Update button. **CAUTION**: Make sure to install the correct file of the Web Interface during the upgrade process.

**CAUTION**: The upgrade process takes approximately 2 minutes. Do not interrupt it.

- A series of screens will be displayed:

- The third screen will tell you that the Web Interface upgrade process is completed. If you have any questions, contact the Technical Support group.
2.3 Stream

The Stream control selection is available to User, Priv, and Admin users. The Stream button allows user to choose between two streams if the camera is configured for two streams in the video format tab in the configuration window. Select one of two streams to adjust the video stream.

2.4 Lens

2.4.1 Lens (Applies to 3960HD/3960SD/3920HD/3920SD/3930HD/3720HD/3120HD/5970SD)

- Click the camera Lens button from the camera configuration/control menu.

The Lens control selection is available to User, Priv, and Admin users. The manual control section allows user to change control of the camera lens.

- Lens Fast: Allows user to change the speed of lens movement. Select this button to increase the speed and response time of changes to the lens during zoom operations. The indicator next to the button shows the reported status of the camera.

- Manual Iris: Allows user to toggle the iris control between automatic and manual control. The indicator next to the button shows the reported status of the camera.

- Manual Focus: Allows user to toggle the focus control between automatic and manual. The indicator next to the button shows the reported status of the camera.

- Zoom In: Press the In button to zoom until zoom stops at the optical zoom limit.

- Zoom Out: Press the Out button to set the camera to the max field of view.

- Focus Near/Far: Press the Near or Far buttons to control focus.

- Iris Open/Close: Press the Open or Close buttons to adjust the iris.

2.4.2 Lens (Applies to 8800HD)

- Click the camera Lens button from the camera configuration/control menu.

The Lens control selection is available to User, Priv, and Admin users.

- Autor Focus: In Auto mode, the focus will automatically change based on the scene illumination.

When selected, provides a single focus assist. The focus assist routine works best when viewing scenes farther than 250 feet from the camera, with sufficient scene illumination and scene detail. The lens must be zoomed in beyond 30x. If needed, the focus assist can immediately be again.

- Auto Iris: In Auto mode, the iris will automatically change based on the scene illumination.

- Lens Extender: Inserts or extracts the lens extender.

- Lens Speed: Changes the operating speed of the zoom and focus from slow, medium and fast.
• Zoom In: Press the In button to zoom until zoom stops at the optical zoom limit.
• Zoom Out: Press the Out button to set the camera to the max field of view.
• Focus Near/Far: Press the Near or Far buttons to control focus.
• Iris Open/Close: Press the Open or Close buttons to adjust the iris. Selecting Open places the iris in the manual iris mode and opens the iris. Selecting Close places the iris in the manual iris mode and closes the iris.
2.5 Tours (Applies to 3960HD/3960SD/3920HD/3920SD/5970SD/3720HD/3120HD/8800HD)

Privileged User and Administrator are allowed to configure the tours.

A tour is a group of presets that are visited in a defined sequence.

- The system supports eight tours (only four tours for 3120HD and 3720HD).
- Each tour can have a maximum of 32 presets.
- Each preset in a tour has its individual dwell time.
- The dwell time must be between five to 60 seconds.
- Dwell time does not include the travel time between presets.

Below are steps for programming a tour:

- Establish presets between which the camera will tour (see Section 2.7).
- Click the Tours button from the camera configuration/control menu.
- Click the Setup button from the Tours section. The Tour Setup dialog window will be displayed.
- Select the tour number from the drop-down menu.
- Check the undesired presets and delete them by clicking on the Delete button.
- Click on the Append or Insert buttons to add the preset positions to the tour.
- Enter the dwell time in seconds for each checked preset. For 3120HD and 3720HD the dwell time is the same for all presets.
- Click the Apply button to store the programmed tour.
- Select the Start button to start the tour.
- Select the Stop button to stop the tour.
- Select the Clear button to erase this tour.
- Select the Delete button to erase checked presets.
- Select the Append button to add a tour at the end of the list.
- Select the Insert button to add a tour above the checked tour.
- Select the Revert button to reset the settings to the values set in the camera when the page was first loaded.

After the tour is established it can be run from the Tours section of the camera configuration/control menu:

- Close the Tour Setup dialog window if it was open.
- Choose the desired tour from the drop down list.
- Start or stop the tour by clicking the Start or Stop buttons in the Tours section of the camera configuration/control menu.

**NOTE:** If a manual command is received the tour will stop.
2.6 Patterns (Applies to 3720HD/3120HD)

Privileged User and Administrator are allowed to configure patterns.

Patterns are created by stepping the camera through desired series of locations and imaging states.

- The system supports 4 recordable/selectable patterns.
- Each pattern records the following operator commands for later recall: Pan, Tilt, Zoom, Autofocus
- The pattern stops upon receipt of any imaging or PTZ service set commands.
- Pattern data is stored in the flash memory and is not lost if a power failure occurs.

**NOTE**: Patterns record the speed and duration of pan and tilt movements and are not as accurate as presets in tours. Use tours if position accuracy is important.

Below are steps for programming a pattern:

- Select the Patterns tab.
- Select the Pattern number (1-4).
- Select the Record button and then control the camera to program a smooth tour. When complete, press the End button.

**NOTE**: The OSD Pan/Tilt/Zoom information does not update when a pattern is being recorded.

- To play back the pattern, select the pattern number and then select the Start button.
- Select the Stop button to stop running the pattern.

2.7 Presets (Applies to 3960HD/3960SD/3920HD/3920SD/5970SD/3720HD/8800HD/3120HD)

Privileged User and Administrator are allowed to establish presets.

Presets are predefined pan, tilt, zoom, focus camera views that are stored in the camera.

- The camera system supports 64 presets.

**NOTE**: When first received cameras do not have any established presets. Click the Add button to add presets with predefined names: Preset one through Preset 64.

For a preset label to be displayed on the image, the Preset element must be selected in the OSD Configuration Menu. See Section 2.2.1.4.

- Click the Configuration button from the camera configuration/control menu. The Configuration window will appear.
- Click the OSD button.
- Select the Preset element from the pull-down menu.
- Save or Apply configuration. Close the Configuration window.

Below are steps for programming a preset:

- Click the Presets button from the camera configuration/control menu.
- Move the camera to a desired position using Pan, Tilt, Zoom, Focus and Manual Focus commands.
- Type the desired preset name in the window box or choose a predefined name from the drop-down menu.
- Click the Add button to save the preset. Refresh the window if asked.
- Program another preset.
- Click the Go button to send the camera system to the chosen preset.
- Use the Replace button to save a new camera position under the existing name.
- Use the Rename button to rename the preset.
- Use the Delete All to delete all presets.
2.8 Park (Applies to 3960HD/3920HD/3720HD/3120HD)

Privileged User and Administrator are allowed to establish the park position.

Cameras can be set to automatically move to a preset or start a tour after a selected interval of inactivity.

The time can be programmed in seconds, minutes, or hours.

2.9. Auxiliary

Privileged User and Administrator are allowed to configure the auxiliary control function.

This control allows a user to program wiper functions, to display temperature and pressure inside the barrel or dome, and to send the camera system to the home position.

NOTE:

• Guest cannot turn the wiper on.
• User can turn the wiper on.

Wiper (Applies to 3960HD/3960SD/3930HD/8800HD)

Run Time: Type the desired wiper run time. The time can be set from 1 to 9999 seconds (2.77 hours). The run time is total duration that the wiper will be active.

Dwell Time: Type time between cycles. A cycle is 2-3 wipes. The time can be set from 0 to 99 seconds (1.65 minutes).

Set Times: Click the button to send settings to the camera.

Wiper: Check the button to start the wiper.

Aux Control (Applies to 8800HD)

Auxiliary control activates a device, such as a relay.

Momentary mode:

• Click the Momentary button.
• Type the time in seconds in the box.
• Click the Output button. The device will stay active for the programmed amount of time.
• Click the Output button again to deactivate the device.

Latched mode:

• Click the Latched button.
• Click the Output button. The device will stay active for the desired amount of time.
• Click the Output button again to deactivate the device.

Heater Function (Applies to 8800HD)

• Click the Enable button to activate the heater.

Seek Pan/Tilt Home (Applies to 3960HD/3960SD/3920HD/3920SD/3720HD/5970SD/8800HD/3120HD)

Home position is the returning position and serves as the resting position for both pan and tilt.
Show Temperature/Pressure (Applies to 3960\(^{HD/SD}\)/3920\(^{HD/SD}\)/3930\(^{HD}\)/8800\(^{HD}\)/5970\(^{SD}\)/3120\(^{HD}\))

Allows display of the existing status of temperature and pressure inside the camera in the left corner of the video display area. This is intended as a maintenance aid, and allows remote monitoring of the nitrogen charge pressure of the camera barrel.

**NOTE:** For temperature and pressure labels to be displayed, Temperature/Pressure element must be enabled in the OSD Configuration Menu.

- Click the Configuration button from the camera configuration/control menu. The Configuration window will appear.
- Click the OSD button.
- Choose the Temperature/Pressure element from pull-down menu.
- Save or Apply configuration. Close the configuration window.
- Click the Auxiliary button from the control menu on the left side.
- Click the Show Temperature/Pressure button. Close the window.

Pressure/Temperature will be displayed for several seconds in the top left corner of the image. It will turn off automatically.

Compass Display (Applies to 3960\(^{HD/SD}\)/3920\(^{HD/SD}\)/5970\(^{SD}\)/3120\(^{HD}\))

**NOTE:** For a compass label to be displayed, Az Elev Zoom element must be enabled in the OSD Configuration Menu for standard font or Compass element for large font.

Compass display allows users to display compass directions on the video e.g. N, NE, E, SE etc.

- Compass readings are based on the Azimuth position.
- Azimuth position set as North is the user-defined pan position specified to be the zero degree point.
- Azimuth position set as North is normally set to true north. Compass display can be enabled or disabled by the user.

Compass display can be enabled to identify 8 or 16 compass points:

- **8 compass points:** North, South, East, West, Northeast, Northwest, Southwest, and Southeast. Directions are displayed by one or two letters: N, E, W, S, NE, NW, SE, SW
- **16 compass points:** North, South, East, West, Northeast, Northwest, Southeast, Southwest, North Northeast, East Northeast, North Northwest, West Northwest, South Southeast, East Southeast, South Southwest, West Southwest. Directions are displayed by one, two or three letters: N, E, W, S, NE, NW, SE, SW, NNE, ENE, NNW, WNW, SSE, ESE, SSW, WSW.

Below are steps for programming a compass display:

- Click the Configuration button from the camera configuration/control menu. The Configuration window will appear.
- Click the OSD button.
- Choose the Az Elev Zoom element from the pull-down menu (standard font) or Compass element (large font).
- Save or Apply configuration. Close the configuration window.
- Click the Auxiliary button from the camera configuration/control menu. The Compass Display menu will appear.
- Pan the camera to point due North.
- Click the Set North button to set the current pan angle to 0° (North).
- Check the Enable OSD box to display the compass point abbreviations on the video.
- Check the Use Timeout box to display compass points for approximately five seconds after activation.
- Click the 8 Zones button to identify eight compass points.
- Click the 16 Zones button to identify 16 compass points.
- Click the Clear North button to reset the pan angle to defaults.
2.10 Sector (Applies to 3960HD/3960SD/3920HD/3920SD/5970SD/3120HD)

Privileged User and Administrator are allowed to configure sectors.

A sector is a programmed pan area with set boundaries and an identifying label.

- System supports 16 sectors.

**NOTE:** For a sector label to be displayed, Sector/Privacy Zones element must be selected in the OSD Configuration Menu.

To establish the sector follow the next steps:

- Click the Configuration button from the camera configuration/control menu. The Configuration window will appear.
- Click the OSD button.
- Select the Sector/Privacy Zone element from the pull-down menu.
- Save or Apply configuration. Close the configuration window.
- Click the Sector button from the camera configuration/control menu.
- Select the desired sector number from the Sector drop-down menu.
- Check the box Enable ID.
- Type the name of the sector in the name box. Click the Set button.
- Pan the camera to the left edge of the area to be labeled. Click the Left Limit button.
- Pan the camera to the right edge of the area to be labeled. Click the Right Limit button.
- To turn off the selected sector, clear the box labeled Enable.
- Use the Delete button to clear the sector.
- Use the Delete All button to clear all sectors that have been set.

**NOTE:**

- Tilt and zoom positions have no effect on sector labeling.
2.11 Privacy Zones (Applies to 3960HD/3960SD/3920HD/3920SD)

Privileged User and Administrator are allowed to establish privacy zones.

Privacy zones are used to conceal user-defined privacy areas. Up to eight privacy zones can be established.

**NOTE:** For privacy zones to be displayed, Sector/Privacy Zones element must be selected in the OSD Configuration Menu.

Below are steps for setting a privacy zone:

**NOTE:** When establishing a privacy zone be sure that zoom magnification level is 1 (the slider in the Zoom Magnification bar must be all the way to the left).

- Click the Configuration button from the camera configuration/control menu. The Configuration window will appear.
- Click the OSD button.
- Select the Sector/Privacy Zone element from the pull-down menu.
- Save or Apply configuration. Close the configuration window.
- Click the Privacy button from the camera configuration/control menu.
- Select the desired zone number from the Zone pull-down menu.
- Position the left edge of the privacy zone to the right edge of the video area. Be sure that you cannot see any objects that belong to the privacy zone. Click the Left Limit button.
- Position the right edge of the privacy zone to the left edge of the video area. Be sure that you cannot see any objects that belong to the privacy zone. Click the Right Limit button.
- The privacy area will be covered with the solid black color.

**NOTE:** To turn off the privacy zone, clear the check box labeled Enable.

- Use the Delete button to clear the selected privacy zone.
- Use the Delete All button to clear all privacy zones that have been set.
2.12 Back Focus (Applies to 8800HD)

The Back Focus function allows users to have sharply focused images all the time, including during conditions of reduced light levels.

Click on the far or near buttons to adjust the camera focus accordingly. The focus will continue to change until the button is released or until the focus reaches the limit of its travel.

**Back Focus Calibration**

The back focus of a lens refers to the distance between the image sensor and the lens. When the back focus is correctly adjusted, the image will remain in focus while the lens is zoomed in and out. The wavelength of the light illuminating a particular scene plays a significant role in determining the required backfocus distance, as different wavelengths of light require different back focus distances to be in sharp focus. For “color only” cameras, this back focus problem is minimized by using an IR cut filter and optical coatings on the lens elements so that only the visible spectrum of light (400nm ~ 700nm) is allowed to reach the image sensor, and all of the wavelengths within the visible spectrum come into focus at the same back focus distance.

Back focus problems arise when the camera is used as a color day camera and as an IR sensitive monochrome night camera. When the IR cut filter is removed, and especially if an IR illuminator is used to illuminate the scene, the back focus distance must be changed to allow the image to remain in focus throughout the zoom range. The 8800HD camera can be user calibrated so that the back focus distance will automatically change to match the cameras mode of operation and the users’ particular night time lighting method.

**Calibration Procedure:**

**Color Day Mode:** The Back Focus distance for the color day mode is factory calibrated, and does not typically need to be recalibrated. However, if it is necessary, the following procedure can be used to calibrate the Back Focus distance for the color day mode.

1. Verify that the lens extender is OUT.
2. View the color day scene in Auto Shutter mode.
3. Zoom out fully.
4. Open the iris using the manual iris control (Lens Tab, select and hold Iris Open until iris is fully open). **Note:** The auto shutter will automatically compensate for all but the brightest scene illumination levels. If the image is overly saturated with the iris fully open in Auto Shutter mode and zoomed out fully, the iris will need to be closed until the image saturation is at a usable level.
5. Zoom in fully on the desired scene and adjust lens focus for sharp focus.
6. Zoom out fully.
7. Adjust Back Focus (Near and Far on Back Focus buttons) for sharp focus.
8. Select “Day” on the Back Focus button to save this Back Focus setting as the Day mode.

**No Illuminator, Night Mode:**

1. Verify that the lens extender is OUT.
2. While viewing the night scene, verify that the camera is locked in the Night mode (Setup> Properties>Day/NightMode>Mono).
3. Verify the iris is fully open (Lens, select and hold Iris Open until iris is fully open).
4. Zoom in fully on the desired scene and adjust lens focus for sharp focus.
5. Zoom out fully.
6. Adjust Back Focus (Near and Far on Back Focus Tab) for sharp focus. **Note:** In the event that the scene consists of multiple light sources (Low or High Pressure Sodium, Mercury Vapor, Incandescent, etc.) and varied scene topography (plants, bushes, trees, buildings, etc.), it is possible to have different areas of the scene focus at different Back Focus positions. In this case the operator will need to obtain sharp focus on the most important area of the scene.
7. Select “Night” on the Back Focus Tab to save this Back Focus setting as the Night mode.
IR Illuminator, Night Mode (Future Option):

1. Verify that the lens extender is OUT.
2. While viewing the night scene, verify that the camera is locked in the Night mode (Setup>Properties>Day/NightMode>Mono).
3. Verify that the illuminator is ON.
4. Verify the iris is fully open (Lens, select and hold Iris Open until iris is fully open).
5. Zoom in fully on the desired scene and adjust lens focus for sharp focus.
6. Zoom out as wide as possible and still be able to resolve image details in the illuminated area.
   **NOTE:** It is desirable to be able to zoom out fully, but the angle of illumination will typically be significantly less than the widest angle of view of the 8800HD camera, which may result in the illuminator producing a bright white circle of light as the lens is zoomed towards the widest position.
7. Adjust Back Focus (Near and Far on Back Focus Tab) until scene details within the illuminated area are in sharp focus.
8. Select “Illuminated Night” on the Back Focus Tab to save this Back Focus setting as the Night mode.

2.13 Micro Nudge (Applies to 8800HD Camera Positioner System)

Click on Up, Down, Left, and Right buttons to micro nudge the view. This function enhance operator control. The amount of movement provided by the micro-nudge is scaled to the angle of view being produced by the 8880HD camera so that each micro-nudge moves the positioner approximately 1/100 of the horizontal field of view, from the widest angle of view through the narrowest angle of view.
2.14 Event (Applies to 3960HD/3960SD/3920HD/3920SD/5970SD/3720HD/3930HD/8800HD/3120HD)

The Helios cameras can be configured to perform actions when different events happen.

Helios products support the following events:
- External Inputs: Inputs for external signals, such as door contacts. See Section 2.14.1
- Periodic Timer Event: A user-defined time event. See Section 2.14.2
- Low Pressure: Future Option

The camera supports the following actions when an event happens:
- Send Email: Sends an email to a defined email address. SMTP Server must be configured to accept the camera IP’s address.
- FTP (File Transfer Protocol) Snapshot: Saves a JPEG file to a defined FTP server.
- Set OSD Text: Brings predefined text, ExtInput1 or ExtInput2 on the display for 5 seconds.
- Set Output: Sends a signal to an external device when a relay is triggered.
- Goto Preset: Moves the camera to a user-defined preset.

Privileged User and Administrator are allowed to configure events:
- Click the Events tab from the left side menu on the Home page.
- Click the Events Configuration button to display the Events window with four tabs:
  - External I/O. See Section 2.14.1
  - FTP and Email. See Section 2.14.2
  - Auxiliary. See Section 2.14.3
  - Event Actions. See Section 2.14.4

IMPORTANT: In order to bring text overlays on the video image, corresponding OSD options must be set up in the OSD Configuration menu. See Section 2.2.1.4

2.14.1 External I/O

The camera provides:
- 2 contact-closure inputs
- 2 outputs

Each input can be configured to be normally open or normally closed and to trigger on the leading or trailing edge. Also, each input can be enabled or disabled.

Each output can be set up to be momentary or latched and can be enabled or disabled. If the output is set to the momentary mode, the timeout in seconds can be set. If the output is set to the latched mode, change the configuration to clear the output.

To set up External I/O:
- Click on the External I/O tab.
- Configure the Inputs and Outputs as required for your camera. Ensure that Enable is checked, if required.
- Click the Apply button to apply the settings to the camera temporarily, or click the Save button to apply the settings and save in the camera.
- Click on the Event Actions tab to set up the actions that are to be taken if an input event occurs or to set an output in response to a particular camera event. See Section 2.14.4.
2.14.2 FTP (File Transfer Protocol) and Email

The Helios camera can be configured to capture a snapshot in response to a camera event and transfer the image to an FTP site or email address.

To set up FTP:
- Click on the FTP and Email tab.
- Set the IP Address or URL of your FTP server.
- Enter the Username.
- Enter the Password.
- Confirm the Password.
- Enter the Directory where you wish to store snapshots.
- Click the Apply button to apply the settings to the camera temporarily.
- Click the Save button to apply the settings and save in the camera.
- Click on the Event Actions tab to set up the actions that are to be taken if an event occurs. See 2.14.4.

To set up Email:
- Click on the FTP and Email tab.
- Set the IP Address or URL of your SMTP server.
- Enter the Username.
- Enter the Password.
- Confirm the Password.
- Enter the email address where you wish to send email notifications.
- Click the Apply button to apply the settings to the camera temporarily.
- Click the Save button to apply the settings and save in the camera.
- Click on the Event Actions tab to set up the actions that are to be taken if an event occurs. See 2.14.4.
2.14.3 Auxiliary

Auxiliary Settings

The Auxiliary tab contains controls to configure additional settings that are required to handle camera events. The settings include parameters for operation of the periodic timer (see 2.14.4) and controls to configure the format of snapshot file names.

Periodic Timer

The periodic timer requires an Interval and Duration and can be configured to trigger in one of the following modes:

- On Apply or Save: begin immediately when Apply or Save is clicked in the Event Actions tab.
- On Date and Time: begin the event on a particular date and time.
- On Day of Week: begin at the selected time on one or more days of the week.

To set up Periodic Event:

- Click on the Auxiliary tab.
- Configure the Interval and Duration for the periodic event.
- Configure the Event Trigger to be On Apply or Save, On Date and Time or On Day of Week.
- Click the Apply button to apply the settings to the camera temporarily or click the Save button to apply the settings and save in the camera.

To start Periodic Event:

- Set up the periodic event.
- Click on the Event Actions tab.
- Drag and drop the desired actions to the Periodic Timer node.
- To start the timer, click the Apply or Save button.
Snapshot Filename Format

Snapshot filenames can be configured to include the Host Name, IP Address, Event Type, Date, Time, User Text or Sequence Number. In order to create a unique filename for each snapshot, the filename format must include items that vary. In this case, the only two items that vary are the Time or Sequence Number. If you want to overwrite the snapshot file each time, omit these choices from the format.

To set the Snapshot Filename Format:

1. Click on the Auxiliary tab.
2. Select the desired fields from the drop-down list.
   
   **NOTE:** If User Text is selected, type a text message in the User Text edit box. The message will appear on the screen.
3. To start over, click the Clear button and repeat steps 2.
4. Click the Apply or Save button to apply the settings to the camera temporarily or permanently.

### 2.14.4 Event Actions

Event Action Setup

The Event Action tab provides the controls for configuration of one or more actions that will be triggered by the occurrence of a Helios camera event. The list of possible events is contained in a tree view and includes external inputs, periodic timer events, and pressure. For example, you want to capture a snapshot and transfer the image to an FTP site whenever a change in External Input 1 is detected. This is set up by associating the FTP Snapshot action with the External Input 1 event. The steps to configure the action items are as follows:

To set up Event Actions:

1. Click on the Event Actions tab.
2. Click the desired action in the Action list and hold the left mouse button down.
3. Drag the item to the desired event and release the left mouse button. The item will be added to the Event. Up to five actions can be added per event.
4. Click the Apply button to apply the settings to the camera temporarily.
5. Click the Save button to apply the settings and save in the camera.

**Note:** Depending on which events are to be monitored, the associated parameters for the External I/O, FTP, Email and Auxiliary settings must be set up. See Sections 2.14.1-2.14.3.
2.15 Privacy Mask (Applies to 3120HD/3930HD with 720p30x Zoom In)

Privileged User and Administrator are allowed to configure the privacy masks.

Privacy Masks are used to conceal user-defined privacy areas.

Below are steps for setting a privacy mask:

- Click the Privacy tab from the left side menu on the Home page. The Privacy window appears.
- Check the Enable Privacy Masks box to enable the privacy mask function.
- Check the Enable Mask Edit Mode box to activate the Editing Mode, which allows the user to draw, edit and delete privacy masks:
  - To draw a privacy mask:
    - Select the mask name (e.g. Mask 01) from the pull-down menu.
    - Select the Move button to use the mouse to pan to the desired location.
    - Select the Draw button.
    - Press the left mouse button (LMB) and drag the mouse to draw a yellow frame around the area to be concealed. When the LMB is released, the privacy mask will appear as a green rectangle.
    - Repeat the step to create up to four privacy masks for the fixed cameras and up to eight masks for cameras with the pan/tilt support. Only four masks can be created in a single field of view (FOV). See notes below for additional restrictions.
  - To edit the privacy mask:
    - Choose the desired mask from the pull-down menu. The camera will move to the mask location.
    - Draw a mask in a different location.
  - To hide the privacy mask:
    - Choose the desired mask from the pull-down menu.
    - Uncheck the Enable box.
  - To delete a privacy mask:
    - Choose the desired mask from the pull-down menu.
    - Click the Delete button.
  - To delete all privacy masks:
    - Click the Delete All button.
  - Uncheck the Enable Mask Edit Mode box to activate the Active Mode. The privacy masks appear in blue color.
  - Click the Save button to save the configuration.

Enable Privacy Masks: Check/uncheck the box to:

- Enable/disable the privacy mask function.
- Show/hide all existing privacy masks.

Enable Mask Edit Mode: Check/uncheck the box to enable/disable the drawing or editing of the privacy masks. When the Enable Mask Edit Mode box is checked, the privacy masks’ color is green.

Move: Check the button before moving the camera to the desired location.

Draw: Check the button before drawing the mask.

Enable: Check/uncheck the box to enable/disable the selected privacy mask.

Delete: Use the button to delete a selected mask from the pull-down mask menu.

Delete All: Use the button to delete all privacy masks.

Save: Use to save the present configuration.
NOTES:

- A privacy mask can overlap with another privacy mask.
- A maximum of 8 privacy masks are programmable for cameras with the pan/tilt support.
- A maximum of 4 privacy masks are programmable for the fixed cameras.
- A maximum of 4 privacy masks can be programmed in a single field of view (FOV).
- All privacy masks are rectangular in shape.
- The privacy mask color is not user selectable. The privacy mask color codes are:
  - Green: Editing mode.
  - Blue: Active mode.
- Privacy masks should be made twice as big as the area to be concealed.
- Setting privacy masks is not possible if the camera tilt angle is below -43°.
- When a single FOV contains over 3 privacy masks, the camera pan angle must be changed between 71° (for 0° tilt) to 120° (for -43° tilt) before a new privacy mask can be set.
- Privacy masks will not conceal intended areas during a Seek Home operation.
- Certain operations such as Enable/Disable Mask Edit Mode and Delete All take several seconds to complete. Do not attempt any other operations until they complete.
Appendix 1: Region of Interest (ROI)

The ROI sets the area of the detector that the AGC will react to.

Changing the ROI to ignore an unimportant area of the scene can often improve image quality in the more important area of the scene. Since the AGC algorithm looks for the number of pixels with a given value and distributes those pixels evenly, disregarding unimportant pixels may have a beneficial effect on the output. An example situation of this would be excluding the sky. The sky is very cold and having a large portion of the scene containing the sky will drastically change the output of the AGC algorithm. The same is true for bodies of water, large items that are particularly hot or cold, etc. The user is encouraged to try different ROI settings for a particular scene.

![Sample Images](image)

The sample images shown above represent potential image improvements that can be achieved by adjusting the ROI to match the scene being viewed. In images A and B, the sky consumes a large percentage of the image. When the ROI is set for full screen as in image A, the AGC automatics respond more to the sky than the area of importance. By changing the ROI to ignore the sky as shown in image B, the image quality can be noticeably improved. However, if the camera is tilted down to view a different scene as shown in images C and D, the smaller region of interest in image D may not produce as good of an image as image C with the full screen ROI.

For this reason, the ROI is included as part of the 5970 preset feature. An operator can store a preset viewing scene A/B with the ROI set per image B, and store another preset viewing scene C/D with the full screen ROI as shown in image C.

The operator must be aware that when manually moving the camera away from a preset position, all of the camera parameters established as part of the last preset position will remain in effect. The operator may need to RECALL the User Settings or the Factory Default settings to regain the best overall operating parameters.
3.0 Warranty

Please refer to the CohuHD website for product warranty information: