



3960^{HD} Series

HDTV/H.264 camera positioning system

HDTV 720p30 Image Resolution

Motorized 18x Optical / 6x Digital Zoom

Sensitive Day/Night Technology

Auto/Manual Focus and Iris Control

Dual H.264 / MJPEG Video CODECs

Hybrid IP / Analog Operating Mode

Web Server Configuration/Operation

NTCIP 1205 over IP Communication

Variable Speed Positioning System

Presets, Tours, Sector/Privacy Zones

IP67/IP66 and Nema TS2 Rated



Cohu's 3960^{HD} series combines the advantages of HDTV image quality, efficient H.264 compression, a proven variable speed positioner and advanced environment protection delivering a best in class camera positioning system.

The 3960^{HD} uses 720p30 imaging with an integral 18x optical zoom delivering high definition video from wide to full zoom settings. The camera uses true day/night technology using a removable IR cut filter producing exceptional low light sensitivity as low as 0.002 fc.

The 3960^{HD} includes a variable high-speed pan and tilt drive, with 360° continuous pan and ±90° tilt movements. Fast positioning speeds of up to 120°/sec, results in 180° movements in less than 2 seconds.

Providing dual output stream capability, the 3960^{HD} can deliver two independently configured H.264 streams or an H.264 with MJPEG or H.264 with analog output. Delivering IP and analog outputs, the 3960^{HD} can integrate with analog based systems today while providing a smooth transition over to IP tomorrow.

The 3960^{HD} provides a full function web server, allowing complete administrative and operator control capabilities. Administrative features include configuring network settings, user password assignments, setting video streaming properties, defining camera positioning

presets/tours, assigning camera ID labels etc.

The 3960^{HD} provides comprehensive ID labeling, allowing precise descriptors to be inserted onto the video for operator use. Camera location, presets and sector zones are defined with up to 24 character labels. For direct positioning indications, the camera system can display its azimuth and elevation position in degrees as well as use compass directions.

The 3960^{HD} is designed to operate in extreme weather with its IP67 and IP66 protection, eliminating the effects of water intrusion, pollutants and corrosives, and withstands the effects elevated temperature, electrical and mechanical environments complying with NEMA TS 2 standards. Cohu guarantees years of clean, reliable images and backs it with a world-class warranty.



3960^{HD} shown with optional wiper



3960^{HD} Helios

HDTV/H.264 camera positioning system



3960^{HD} Series Specifications

CAMERA

Imaging Characteristics

Sensor Type: 1/3" CCD
Scanning Mode: Progressive
Total Pixels: 1.3M (1296 x 966)
Resolution/Frame Rate: HDTV 720p30 (1280 x 720) 30fps
Camera Format: Day/Night, via removable IR filter

Sensitivity (F1.6 @ 50% IRE)

Color Mode @ 1/30 Shutter: 0.18 fc (1.8 lux)
Mono Mode @ 1/4 Shutter: 0.002 fc (0.02 lux)

Lens Characteristics

Zoom: 4.7 to 84.6 mm, x18, f1.6 to f3.4
Angular FOV: 55.4 to 3.25 (Horizontal)
Focus/Iris Type: Auto/Manual Override
Digital Zoom: x6 (using web server interface)

Camera Features

Day/Night Mode: Auto, Color or Mono
Wide Dynamic Range: On/Off
Backlight Compensation: On/Off
Shutter/Integration: Auto/Manual [1/4 - 1/10000]
White Balance: Auto/Manual [Red/Blue Adjust.]
Gain Adjustment: 0-40 db

POSITIONER

Movements

Pan Range: 360°
Tilt Range: +90° to -90°
Repeatability: 0.25°

Pan Speed

Maximum: 120°
Preset Solving: (180° movement): <2 sec
Manual Control: 0.1° to >80°

Tilt Speed

Maximum: 120°
Preset Solving: (180° movement): <2 sec
Manual Control: 0.1° to >40°

Features

Pan/Tilt Control: 64 Step Variable Speed
Presets: 64 [includes pan, tilt, zoom, focus coordinate]
Tours: 8 [Includes up to 32 presets with individual dwell per preset]
Sector Zones: 16 [Each includes left/right boundary, 24 character ID, enabled/disable state]
Privacy Zones: 8 [Each zone Includes left/right boundary, enabled/disable state]

VIDEO ENCODING

Video Streams

Video Compression Codecs: H.264 / MJPEG
Video Stream Configurations: *See Figure 1*
Video Stream Resolutions: *See Figure 2*
Video Stream Frame Rates: *See Figure 3*
Video Stream Data Rates: *See Figure 4a and 4b*
Camera Video Latency: 4 frames (133 msec)
(Does not include network routing or client rendering latency)
Analog Video: NTSC or PAL, using full 16:9 image compressed into 4:3

Video Connections

Eight (8) RTSP uni or multi-cast
Unlimited RTP/UDP multi-cast
Two (2) MJPEG (server pull mode)
Two (2) MJPEG (server push mode)

Authentication

Four (4) access levels <Admin, Privilege, User, Guest>
Users assigned user name, password, access level

Media Player Support

VLC, QuickTime
Any media player compliant with RFC 2326, RFC 3984

WEB SERVER CAPABILITIES

Configuration

Network, Video Stream, OSD, Presets, Zones, Security Settings and Upgrades

Control

Pan/Tilt, Lens, Tours, Presets, Zones, Digital Zoom, Auxiliary and Recording

Browser Support

Recommend Internet Explorer 8.x or newer

COMMUNICATION INTERFACES

Network

Data Format: 802.3u (100BASE-TX)
Network Protocols: TCP, UDP, IP IGMP, DNS, DHCP, RTP, RTSP, NTP, HTTP, ARP
Camera Protocols over IP: Cohu, Cohu T, NTCIP 1205, ONVIF (Pending)

Serial

Data Format: RS422, 4 wire asynchronous half duplex
Camera Protocols over Serial: Cohu, Pelco D

ON-SCREEN DISPLAY (OSD)

IP Video

Camera ID: 1 Line, 24 characters
Preset ID: "Preset #" ID Label (Future Programmable)
Sector Zone: Future
Privacy Zone: "Privacy Zone #" ID Label
PT Position/Status ID: Future

Analog Video

Camera ID: Not available
Preset ID: Not available
Sector/Privacy Zone: Not available
PT Position/Status ID: Not available

ELECTRICAL

Input Voltage: 24 Vac or 120 Vac
Power: 50w, + 100w PT heater + 15w wiper
Line Variation: Conforms to Nema TS2 para 2.1.2
Line Interruption: Conforms to Nema TS2 para 2.1.4
Transients: Conforms to Nema TS2 para 2.1.6 (Pending)

MECHANICAL

Construction/Finish: Powder coated aluminum
Connectors: 18 pin MS or 16 pin AMP
Size: *see dimensional figures*
Weight: 18 lbs (8.2 Kg)

ENVIRONMENTAL

International Protection Rating: IP66/IP67
Salt Spray: ASTM-B117
Operating Temperature: -29.2° to 165°F (-34° to 74°C) Compliant per Nema TS2, para 2.1.5.1, using Fig. 2.1 profile
Humidity: 0-100% RH
Vibration: Compliant per Nema TS2 para 2.1.9
Shock: Compliant per Nema TS2 para 2.1.10
Wind: 110 mph (177 kmh) w/30% gust

CERTIFICATIONS

CE: 24 Vac version only
FCC: Class A

SHIPPING INFORMATION

Dimensions: 24 x 20 x 12 (610 x 508 x 305)
Weight: 24 lb (10.8 Kg)

ACCESSORIES

Mounts

Wall: 8425-7
Pole: 8503-0
Corner: 8503-1
Parapet: 9503-2

Replacement Parts

Wiper Blade Assy: 8139078-001

Connector Kits

MS Conn: 1310230-011
AMP Conn: 8498-1

Cables

CA252 Series w/120Vac MS conn.
CA255 Series w/ 24Vac MS conn.
CA271 Series w/ 24Vac AMP conn.
CA272 Series w/ 120Vac AMP conn.

3960^{HD} Helios

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DIMENSIONS in inches (mm)

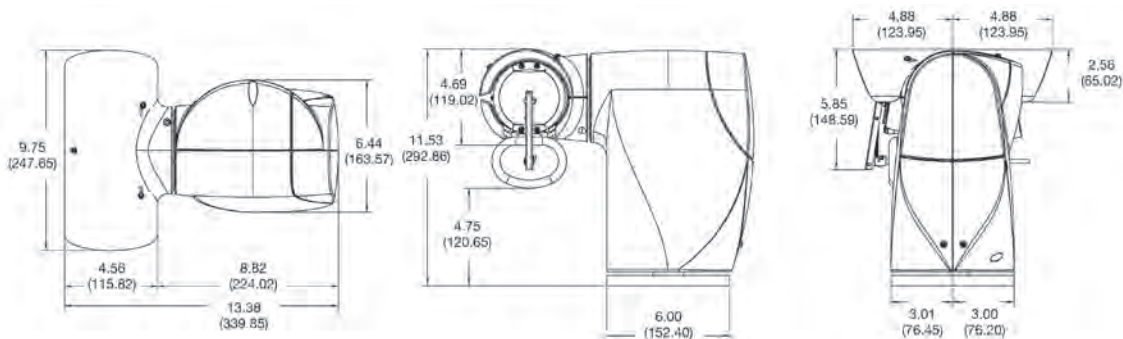


Figure 1 Codec Configurations

Stream Codecs	Maximum Resolution	
	Stream 1	Stream 2
(S1) + (S2)		
H264 + H264	1280 x 720	720x480
H264 + MJPG	1280 x 720	720x480
H264 + Analog	1280 x 720	NTSC/PAL
MJPEG + Analog	1280 x 720	NTSC/PAL

Figure 2 Resolution Configurations

Stream 1	Stream 2	
	H.264 or MPEG	Analog
1280 x 720	720 x 576	NTSC or PAL
	720 x 480	
	704 x 480	
	640 x 480	
	352 x 288	
	352 x 240	

Figure 3 Frame Rate Configurations

Stream 1	Stream 2	
	H.264 or MPEG	Analog
H264 or MJPEG	H.264 or MPEG	Analog
30	30	30fps
15	15	
7	7	
3	3	
1	1	

Figure 4a Data Rate Configurations

Stream 1	Stream 2
8 Mb	2 Mb
6 Mb	1 Mb
4 Mb	512 Kb
2 Mb	256 Kb
1 Mb	
512 Kb	
256 Kb	

Figure 4b Data Rate Configurations

Quality	Typical JPEG File Size	
	Stream 1	Stream 2
100	700 Kb	240 Kb
80	160 Kb	50 Kb
65	110 Kb	40 Kb
50	75 Kb	30 Kb
35	63 Kb	24 Kb
15	35 Kb	18 Kb

ORDERING INFORMATION

3960^{HD} High Definition H.264 Camera Positioning System

HD3 X - X X XX

Power Options

- 4 - 24 VAC Operating Power, MS Connector (no PT heater)
- 5 - 120 VAC Operating Power, MS Connector (no PT heater)
- 6 - 120 VAC Operating Power, MS Connector (with PT heater)
- 7 - 24 VAC Operating Power, AMP Connector (no PT heater)
- 8 - 120 VAC Operating Power, AMP Connector (no PT heater)
- 9 - 120 VAC Operating Power, AMP Connector (with PT heater)

Camera Head Options

- 1 - HDTV 18x Camera
- 2 - HDTV 18x Camera with Faceplate Wiper
- 3 - HDTV 18x Camera (Inverted)
- 4 - HDTV 18x Camera with Faceplate Wiper (Inverted)

Software Options

- 0 - NTCIP 1205 Camera Control

Unassigned

- 00 - None

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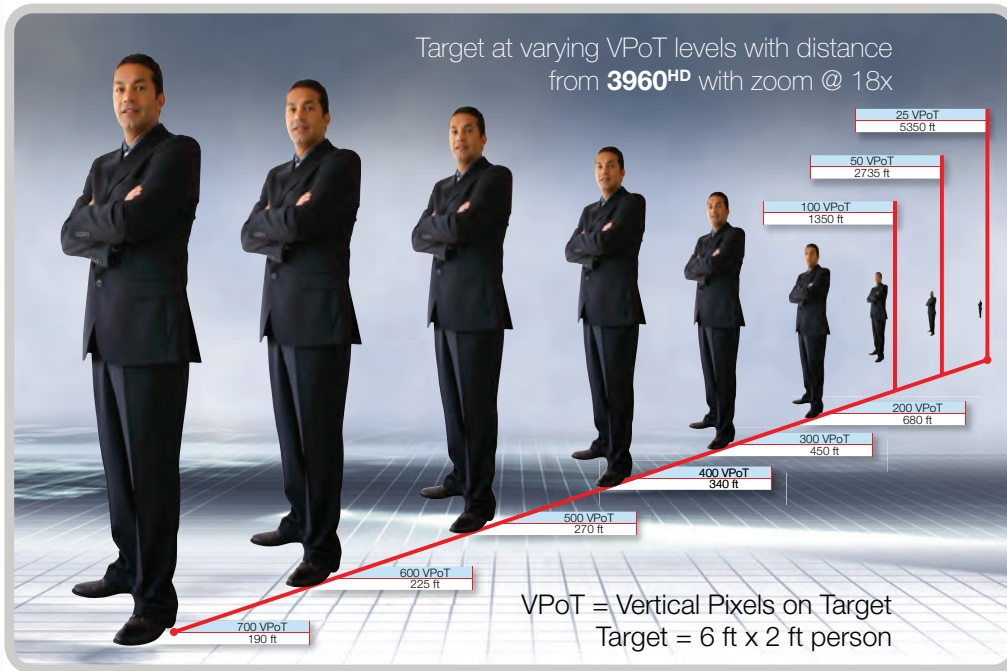


How far can I see?

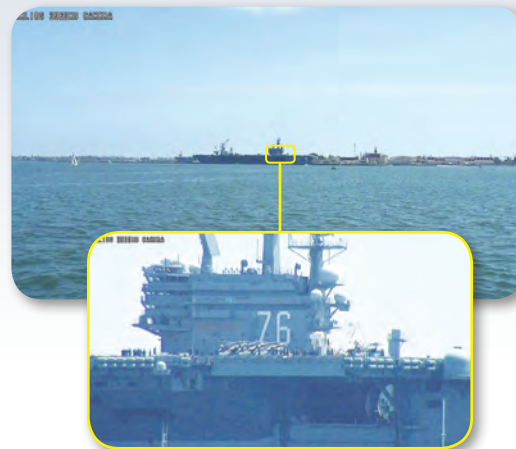
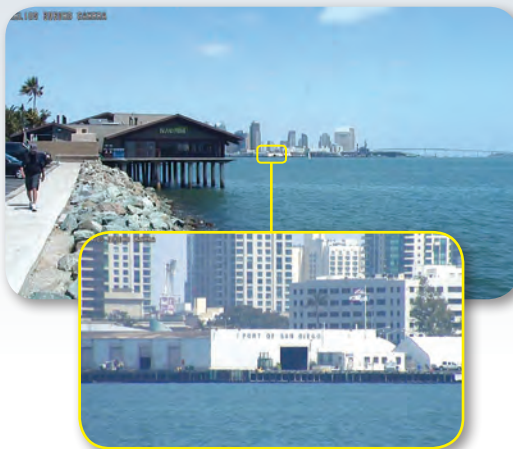
Debatably, the most frequently asked question in the video surveillance realm, with no simple answer. Many variables affect the answer to this question, such as object size, object/scene contrast

ratio, atmospheric conditions, daytime vs nighttime, your definition of "see" to mention just a few. The chart below is intended to provide an indication under ideal conditions the size a person would

appear on a monitor screen at varying distances based on the number of vertical pixels landing on the person. You be the judge as to how far you can see this person.



The images below are scenes of San Diego Bay showing the magnification power of the 3960^{HD}'s 18x optical zoom. The Port of San Diego building and the USS Ronald Reagan are approximately 4,500 ft (1370 m) away.



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