COHU|HD

Series 8800^{HD}
HD 1080p H.264
Ultra Long Range
Camera/Positioning System

Helios

- **Full 1080p30 HDTV Image Resolution**
- **CMOS Progressive Scan Sensor, 1/2.7"**
- **True Day/Night Operation with Removable IR Cut Filter**
- **High Power HD Zoom Lens Options up 137.5x and 2,000 mm**
- **HAFOV as low as 0.17 degrees**
- **H.264/MJPEG Video Standards**

- **Web Server Configuration, Operation and ViewinG**
- **Wide Range, Variable Speed, Smooth Positioning Movements**
- **Camera Presets and Tours**
- **IP66/IP67 Ingress Protection**
- **-32°C to 60°C Operation**
- **24Vdc Power Input**
- **Single Field Connector Installation**

CohuHD's 8800^{HD} series combines full HD image resolution with high powered HD performance lens optics for delivering unprecedented image quality and detail for long range surveillance applications in the visible spectrum.

By comparison, CohuHD's 8800^{HD} series can deliver up to six times the resolution and detail of traditional standard definition long range camera systems.

In addition to the superior image quality and excellent long range zoom optic capabilities, the 8800^{HD} series delivers video across standard network infrastructures, with H.264 image compression technology using fractions of the bandwidth traditional MPEG4 or MJPEG requires.

The 8800^{HD} superior image quality is centered around a 1/2.7" CMOS 1080p30 progressive scan sensor. Image performance and color reproduction are superb even under challenging lighting conditions. In night mode, the camera enhances low light viewing by switching the IR (infrared) filter out of the optical path and providing a monochrome image. The camera switches from color to monochrome mode automatically by sensing the illumination level or by remote operator command. Image properties

including exposure, gain, backlight and white balance are controlled automatically, or may be overridden for precise user adjustments as needed.

Long range surveillance is achieved by the integrated HD quality zoom lens optics, with focal range options of 12 mm to 660 mm or 16.7 to 1,000 mm. Both lens options include remotely controlled zoom extenders which can be inserted in the optical path increasing the maximum focal range up to 1,680 mm (0.2° HAFOV) or 2,000 mm (0.17° HAFOV)

The focus assist function insures crisp video with the touch of a button as scene views change.

The 8800^{HD} series offers a standalone camera system or a fully integrated long range HD camera positioning system. The 8800^{HD} camera positioner includes a variable hi-speed pan and tilt drive, 360° continuous pan (azimuth) and +/- 30° tilt (elevation) movements. Manual control positioning speeds range from 0.05° to 45° per second, with preset speeds reaching a maximum 90° /sec, resulting in 180° movements in less than 3 seconds. Preset and directed absolute position movement accuracies are precise to within 0.05°, insuring camera views are on target.

The 8800^{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 and streaming properties, defining camera positioning presets/tours, assigning camera ID labels.

The 8800HD is designed to operate in extreme weather, with its IP67 sealed and pressurized enclosure protection. This eliminates the effects of water intrusion, pollutants and corrosives. It is designed to operate in a broad temperature range, from winter in the Arctic to summer in the desert, with heaters and fans, and electrical and mechanical components that are rated for the full range.

The 8800HD Series will deliver years of reliable service and clean images. It is backed by a two-year limited warranty.

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CAMERA

Sensor Type: 1/2.7" C M O S
Scanning Mode: Progressive
Active Pixels: 1920 x 1080
Pixel Size: 3um x 3um
Resolution/Frame Rate: 1080p30
Shutter: Rolling
S/N Ratio: 39dB
Dynamic Range: 69dB
Camera Format: Day/Night, [Removable IR Filter

SENSITIVITY

Camera/Lens System [f/4, 30% Video, Max Gain]
  0.23 fc, 2.25 lux, 1/30 Shutter
  0.7 fc, 0.70 lux, 1/15 Shutter
  0.035 fc, 0.35 lux, 1/8 Shutter
Sensor Faceplate [50% Video, 28db Gain]
  0.1 fc, 1.0 Lux, 1/30 Shutter

EXPOSURE CONTROL

Shutter: Auto / Manual [1/30 ~ 1/8,000]
Auto: Adjustable MIN / MAX Setting
Minimum Vlaue: 1/8, 1/15 or OFF (1/30)

GAIN CONTROL

Auto: Adjustable MIN / MAX Levels
Manual: Selectable Fixed Gain Level; 0 ~ 36dB

BACKLIGHT COMPENSATION

On/Off with level adjust 1.0 to 3.0

WHITE BALANCE

Auto: 2800K~7500K
Manual: Adjustable Red / Blue (0-16384)

IMAGE PROPERTIES

Contrast	0-100
Brightness	0-100
Saturation	0-100
Sharpness	0-100
Hue	0-100

OPTICS

55x, 137.5x with 2.5x Extender Inserted
60x, 120x with 2.0x Extender Inserted

FOCAL LENGTH (+/- 5%)

55x Option
  12 ~ 660mm
  30.5mm ~ 1,680mm with extender inserted
60x Option
  16.7 ~ 1,000mm
  33.4 ~ 2,000mm with extender inserted

APERTURE @ FOCAL RANGE

55x Option f/4.0 to f/36
60x Option f/3.5 to f/32

ANGULAR FIELDS OF VIEW

55x

12 mm	27.4°h x 15.7°v
660 mm	0.51°h x 0.29°v
1,680 mm	0.20°h x 0.11°v

60x

16.7 mm	19.7°h x 11.1°v
1,000 mm	0.33°h x 0.19°v
2,000 mm	0.17°h x 0.1°v

MINIMUM OBJECT DISTANCE

23 Feet (7 meters)

IRIS CONTROL

Auto with Manual Overide [Open/Close]

FOCUS CONTROL

55x and 60x Options
One Shot Focus Assist: Optimum focus requires the scene to contain sufficient detail and contrast. The scene illumination must be sufficient to produce a minimum video level of at least 50%.
  Manual Control [Near/Far]
  Lens Speed [Slow, Medium, Fast]

BACK FOCUS

55x andf 60x Options
Type: Remote Motorized Back Focus. Provides the ability to compensate for changes in lighting conditions. (i.e. Day / Night mode changes and IR Illumination)

BORE SIGHTING

55x Option
  Without Extender: The Bore sighting shift from Narrow Angle (660mm @ 0.5°) to Wide Angle (12mm @ 27.4°) shall be less than ± 0.1 mRad per degree of the Horizontal Angle of View.

IP VIDEO ENCODING

Streams	Two (2) Individuall configurable streams
Codecs	H.264 and MJPEG
Configurations	H.264 (1080p)
	MJPEG (1080p)
	H.264 (720p) + H.264
	H.264 (720p) + MJPEG
Resolutions	Stream 1 [1080p, 720p]
	Stream 2 [D1, CIF]
Frame Rates	30, 15, 7.5, 6, 5, 3.75, 3, 2, 1.875, 1 [Note: Stream 2 must be <= to Stream 1 frame rate]
Data Rates	Stream 1 [8 Mb to 256Kb]
	Stream 2 [2 Mb to 256Kb]
Camera Latency	Four (4) Frames [0.133 sec]

(Does not include network routing or client rendering latency)

ON-SCREEN DISPLAY (OSD)

Up to four OSD elements are selectable for inclusion in the camera's two IP video streams. (Note: Three elements maximum on a single stream. The OSD elements display on top or bottom of image, on right side of video. The logo element displays on top or bottom of image on left side.

Camera Title	24 characters
Preset Title	24 characters
Sector Zone	24 characters
Positiion Title	3 characters, absolute or compass reading
Time/Date	24 Hour Format, Time Zone
Logo Display	xxx.bmp format, 96 x 96 pixels maximum, in multiples of 32 pixels

VIDEO CONNECTIONS

RTP/RTSP	Eight (8) H.264, Eight (8 MJPEG
RTSP/Interleave	Eight (8) H.264, Eight (8) MJPEG
RTSP Multicast	Eight (8) H.264, Eight (8) MJPEG
HTTP Multicast	Unlimited, H.264 and MJPEG
HTTP Tunneling	Two (2) H.264, Ten (10 MJPEG
MPEG2 TS	Unlimited, H.264 and MJPEG

Note: When streaming at 1080p resolution, the number of connections is reduced by 1/2.

NETWORK INTERFACE

Network Format	Ethernet 802.3 (100BaseT-TX)
Network Protocol	TCP, UDP, IPv4, IGMP, ICMP, DNS, DHCP, RTP, RTSP, NTP, HTTP, ARP, ONVIF Profile S
Media Players	VLC, Quick Time or any media player compliant with RFC 2326, 3984, 3550, 2435, ISO/IEC 13818-1
ONVIF Support	Profile S
Camera Protocols	Cohu T, Profile S,
Security	Yes, 4 Levels

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EVENT MANAGEMENT

DIGITAL I/O

Digital Outputs	One (1) Control Output, Open collector

TRIGGERS

Internal Timer	Interval [Off, 1 Second to 999 hours], Duration [Off, 1 Second to Indefinate

ACTIONS

Presets	Activates a Camera Preset
FTP Snapshot	Captures Image and sends to FTP site folder
Digital Output	Activates a Digital Output
EMAIL	Sends message to EMAIL address

POSITIONER

Pan Range	360° Continuous Rotation
Tilt Range	+30° to -30°
	+30° to -20° with WIper,
Pan Speed	0.05° to 45°/Sec
Tilt Speed	0.05° to 22.5°/Sec
Preset Speed	< 5 seconds for 180° movement
Repeatibility	+/- 0.056°
Resolution	+/- 0.056°
Presets	64, Includes Pan, Tilt, Zoom
Tours	8, Inlcudes 32 Presets with individual dwell times
Patterns	Not Available
Auto Park	Returns to a Preset, Tour or Pattern after timer expires, Timer Value [Off, 1 Minute to 999 Hours]
Privacy Zones	Not Available
Inverted Operation	Not Available

ELECTRICAL

Input Voltage	24 Vdc +/- 10%
Power	Camera Only: 20W Heater Off, 75W Heater On.
	Camera Positioner: 60W Heater Off, 113W Heater On

MECHANICAL

Construction	Powder coated aluminum. External parts corrosion protected with stainless steel fasteners.
Weight	Camera 35 lbs (15.9 kg) Camera Positoner: 75 lbs (34 kg)
Dimensions	See Dimensional Diagrams
Connector Type	39 Pin MS

ENVIRONMENTAL

Temperature	-25F to 140F [-32 C to 60 C]
Protection Rating	IP67, Camera is Pressurized with Dry Nitrogen, 3.5 psi
Salt Fog	MIL-STD-810F, Method 509.4, Procedure I (4 x 24 hour periods, 2 wet, 2 dry), 5%NaCl, 48 hours aggravated test.
Immersion	MIL-STD-810F, Method 512.4. Depth 1.0m duration 0.5 hours.
Sand/Dust	MIL-STD-810F, Method 510.4, Procedure I, with 10.6 ± 7g per cubic meter of dust, at an air velocity of 8.9 ± 1.3m/sec and maximum temperature of +51°C, for a period of 6 hours.
Vibration	Nema-TS2 paragraphs 2.1.9, 2.2.3, 5-30Hz sweep @ 0.5g applied in each of 3 mutually perpendicular planes.

Shock	Nema-TS2 paragraphs 2.1.10, 2.2.4, 10g applied in each of 3 mutually perpendicular planes.
External Icing	Nema-TS2 250-2003, paragraphs 5.6
Corrosion Prot.	Per Nema 250-2003, paragraphs 5.10
Humidity	0-100% N.C per MIL-E-5400T, paragraphs 3.2.24.4 0-100%

ACCESSORIES

Mounts

HD84-101x, HD84-201x Models
- 8186-1 Pedestal Mount
- 8186-2 Wall Mount Bracket Set
- 8186-3 Pole Mount Bracket Set
- 8186-4 Corner Mount Bracket Set
- 8186-5 Parapet Mount Bracket Set

HD84-301x, HD84-401x Models
- 8185-3 Wall Mount Bracket Set
- 8185-4 Pole Mount Bracket Set
- 8185-5 Corner Mount Bracket Set
- 8185-6 Parapet Mount Bracket Set
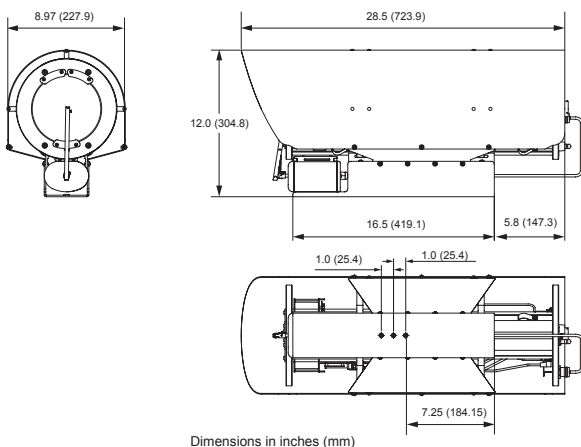
Cables

CA288 Series
CA289 Series

Connectors

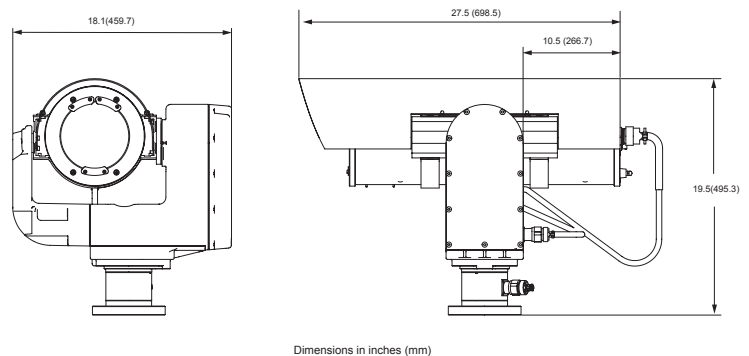|	
1310230-105	Field Cable Connector

Power Supplies

PFC-500-27	Surface Mount PS 24Vdc @ 20A, 90-260Vac
RMF-2024	Rack Mount PS 24Vdc @ 20A, 90-260Vac

CAMERA DIMENSIONS

8.97 (227.9)
28.5 (723.9)
12.0 (304.8)
16.5 (419.1)
5.8 (147.3)
1.0 (25.4)
1.0 (25.4)
7.25 (184.15)

Dimensions in inches (mm)

CAMERA POSITIONER DIMENSIONS

18.1(459.7)
27.5 (698.5)
10.5 (266.7)
19.5(495.3)

Dimensions in inches (mm)

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MOUNTS

HD84-1000, HD84-2000 Models

- 8186-1   Pedestal Mount
- 8186-2   Wall Mount Bracket Set
- 8186-3   Pole Mount Bracket Set
- 8186-4   Corner Mount Bracket Set
- 8186-5   Parapet Mount Bracket Set

HD84-3000, HD84-4000 Models

- 8185-3   Wall Mount Bracket Set
- 8185-4   Pole Mount Bracket Set
- 8185-5   Corner Mount Bracket Set
- 8185-6   Parapet Mount Bracket Set

CONTROL CABLES

CA288 Series
CA289 Series

CONNECTOR KITS

Field Cable Connector: 1310230-105

CERTIFICATIONS

FCC Class A
EMC EN55024:2010 (CISPR24)
IP67 ANSI/IEC 60529-2004
RoHS (Pending)

ORDERING INFORMATION

- HD84-1011   Stand-alone camera system, 55x Lens
- HD84-2011   Stand-alone camera system with faceplate wiper, 55x Lens
- HD84-1012   Stand-alone camera system, 60x Lens
- HD84-2012   Stand-alone camera system with faceplate wiper, 60x Lens
- HD84-3011   Camera positioner system, 55x Lens
- HD84-4011   Camera positioner system with faceplate wiper, 55x Lens
- HD84-3012   Camera positioner system, 60x Lens
- HD84-4012   Camera positioner system with faceplate wiper, 60x Lens

SHIPPING DETAILS

Weight: (Shipped in Separate Containers)
  Camera: 40 lbs (18.1 kg)
  Positoner: 40 lbs (18.1 kg)
Dimensions: inches [cm]
  Camera: 32 x 13 x 16 [81.3 x 33 x 40.6]
  Positoner: 21 x 17 x 25 [53.3 x 43.1 x 63.5]

VIEWING DISTANCES (DETECTION - RECOGNITION - IDENTIFICATION)

Calculation Criteria - Image Resolution and HAFOV, Under Ideal Environmental Conditions
  Object = Moving Person
  Detection = 10 Vertical Pixels on Target
  Recognition = 30 Vertical Pixels on Target
  Identification = 120 Vertical Pixels on Target

VIEWING DISTANCE COMPARISON MATRIX - HUMAN, 6 FT.

Classification	Image Format	Resolution	Sensor	Focal Length	Lens Extender	HAFOV	Identify (120 VPoT)		Recognize (30 VPoT)		Detection (10 VPoT)	
							Imperial (ft)	Metric (m)	Imperial (ft)	Metric (m)	Imperial (ft)	Metric (m)
55x Option												
Long Range	1080p	1920x1080	1/2.7"	660 mm	Out	0.5	10,960	3,332	44,180	13,434	141,000	42,875
Ultra-Long Range	1080p	1920x1080	1/2.7"	1,680 mm	2.5x	0.2	27,895	8,482	112,100	34,087	358,721	109,079
60x Option												
Long Range	1080p	1920x1080	1/2.7"	1,000 mm	Out	0.33	16,640	5,059	66,875	20,335	214,500	65,225
Ultra-Long Range	1080p	1920x1080	1/2.7"	2,000 mm	2.0x	0.17	33,279	10,119	133,750	40,670	428,100	130,176

Note: Variables that affect viewing distance performance such as scene/object contrast ratios, lighting conditions, atmospheric attenuation and optical artifacts are not factored into the calculations.

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