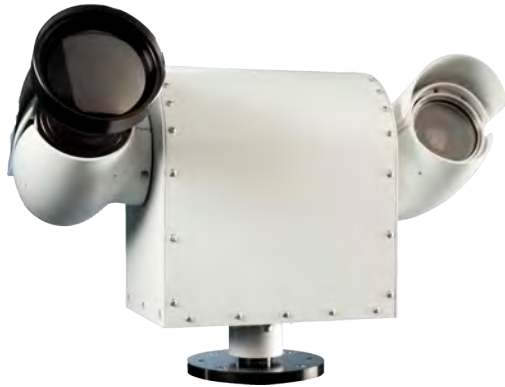


# COHU|HD

## Series 6960 Dual Imaging Visible/Thermal LWIR Camera Positioning System



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- ▶ VOx Microbolometer FPA Technology
- ▶ 640x480 and 320x240 Image Resolutions
- ▶ Wide Range of Lens Options
- ▶ Remote Focus Control
- ▶ Variable Speed Positioning System
- ▶ Presets, Tours, Sector/Privacy Zones
- ▶ IP67 Camera Ingress Protection
- ▶ Nema TS2 Rated -34°C to 74°C Operation
- ▶ Day/Night Visible Camera
- ▶ Motorized 35x Optical/12x digital Zoom
- ▶ Auto/Manual Focus and Iris control
- ▶ Camera Electronic Image Stabilization

The CohuHD 6960 Series is a full-spectrum camera site surveillance solution in one integrated package.

CohuHD designed this product to meet stringent quality objectives and demanding environmental requirements at a price that makes it affordable to all levels of security professionals.

This functionality is ideal for both intrusion detection and assessment of targets.

Two cameras on one positioner provide reliable surveillance or process monitoring in daylight, no light, and obscured visibility conditions.

Select a thermal imager for extreme low light conditions, or environments clouded by haze, rain, smoke, or fog. A second camera is used for precise recognition, identification, or assessment.

The 6960 offers a choice of uncooled VOx 320x240 or 640x480 LWIR FPA detectors and a wide selection of hard carbon coated lenses. The thermal

cameras deliver high quality video, even in extreme conditions such as total darkness, smoke, atmospheric haze or dust, rain, light foliage, and most types of fog.

The day/night camera provides sharp color images in the daylight. When the sun goes down, the camera automatically switches to a monochrome mode that can still provide details in very low light conditions.

What sets the 6960 Series apart is that it can be fully customized at off-the-shelf economy. The 6960 Series provides additional value by using Cohu's dependable i-Series design for fast and accurate positioning with the ability to look straight up and down and in a 360° sweep.

The 6960 series 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 delivers years of clean, reliable images and backs it with a world-class warranty.



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#### Thermal Camera

Detector: Uncooled VOx Microbolometer  
Image Resolution (Model Dependent):  
640x480 (NTSC), 320x240 (NTSC)  
Pixel: 17µm (640 core), 25µm (320 core)  
Spectral Band: 7.5 - 13.5 µm  
Sensitivity (NEΔT): <50 mK @ F1.0 w/noise reduction  
Time to Image: <60 Seconds  
Frame Rate: 30Hz (NTSC)  
Digital Zoom:  
2x, 4x, 8x (640 core)  
2x, 4x (320 core)  
Palettes: 12, (White Hot, Black Hot, 10 Color Palettes)  
Image Orientation: Normal, Invert, Revert, Both  
Scene Range:  
-40°F to +320°F [-40°C to +160°C]  
Supplemental Offset: Selectable ON or OFF  
Digital Detail Enhancement: Adjustable from 1 to 63  
Flat Field Correction (FFC): External, Manual/Auto [Interval/Temp Change]  
Auto Gain:  
Plateau Value: 10 to 1000  
ITT Mean: 0 to 255  
Max AGC: 0 to 255  
AGC Presets:  
Default Values  
Low Scene Contrast  
Indoors

#### Thermal Lens

Lens Options Available (Model Dependent):  
35mm, F1.2  
60mm, F1.25  
100mm, F1.6  
Lens Type:  
Athermalized, Hard Carbon Coated  
Ingress Protection: IP67  
Focus Type: Motorized [Near/Far Control]  
Fields of View:

**35MM f/1.2:**  
320 NTSC: 13.0° x 9.8°  
640 NTSC: 17.7° x 13.3°

**60MM f/1.25:**  
320 NTSC: 7.6° x 5.7°  
640 NTSC: 10.4° x 7.8°

**100MM f/1.6:**  
320 NTSC: 4.6° x 3.4°  
640 NTSC: 6.2° x 4.7°

#### Visible Camera

Image Sensor: 1/4" Sony Ex-View HAD™  
Pixels: NTSC: 811 x 508, PAL: 795 x 596  
Resolution: Typical 540 HTVL; 400 VTVL  
Day/Night Method: Removable IR cut filter  
Sensitivity:  
0.1 fc (1.0 lx) @ 1/60 shutter (color)  
0.01 fc (0.10 lx) @ 1/4 shutter (color)  
0.005 fc (0.05 lx) @ 1/2 shutter (color)  
0.001 fc (0.01 lx) @ 1/4 shutter (mono)  
Video Output: 1.0 V p-p @ 75 ohms  
Integration Settings:  
1/30, 1/15, 1/8, 1/4, 1/2 fields per second  
Shutter Speed Settings  
1/60, 1/120, 1/180, 1/250, 1/500, 1/1000,  
1/2000, 1/4000, 1/10,000, 1/30,000  
Wide Dynamic Range: Two shutter speeds in alternative video fields combined into one progressive scan frame  
Electronic Image Stabilization  
5hz Mode: 16db suppression @ 3-13hz  
16hz Mode: 16db suppression @ 7-17hz  
Sync: Crystal

#### Visible Lens

Integrated Zoom: 35X optical zoom  
Focal Range: 3.4mm to 119mm (±15%);  
Aperture: f1.4 to f4.2  
AFOV: 56° to 1.7° (±15%)  
Lens Focus: Auto/manual  
Digital Zoom: Up to 12X with smooth transition produces an effective focal length from 3.4mm to 1428mm (±15%)

#### Signal Interfaces

Video Output 1: Optical or Thermal Camera  
Video Output 2: Thermal Camera  
Serial Data: RS422 (4 wire, half duplex)  
Protocol: Cohu, Pelco D&P

#### On Screen Display (OSD)

Camera ID: 2 lines of 24 characters  
Preset ID: 1 Line of 24 characters  
Sector ID: 1 line of 24 characters per zone  
Privacy ID: 1 line of 24 characters per zone  
Low Pressure: 1 line of 24 characters  
Compass ID: 1 line, includes compass direction and absolute position

#### Pan/Tilt Positioner

Pan Range: 360° continuous rotation  
Tilt Range: -90° to +90°  
Pan Speed: Max Speed: 90°/sec  
Preset: 180° movement (start to stop) <3 sec  
Manual: 0.1° to >40°/sec  
Tilt Speed: Max Speed: 90°/sec  
Preset: 180° movement (start to stop) <3 sec  
Manual: 0.1° to >40°/sec  
Accuracy: <0.1°  
Repeatability: <0.1°  
Absolute Positioning  
Set Position: ±0.1° precision  
Get Position: ±0.1° precision  
Presets: 64 preset positions (each preset includes pan, tilt, and 24-character ID label)  
Video Tours: 8 tours, each consisting of 32 presets with dwell time per preset per tour  
Sector Zones  
Up to 16 programmable zones in the horizontal plane  
Privacy Zones (Video Output 1 only): 8 programmable zones can be set for video blanking  
Compass Direction (Video Output 1 only): 8 or 16 direction points (i.e. north, NE, east, SE, south, SW, west, and NW) can be displayed. Function can be on/off, 3-sec. time out or permanent  
Absolute Position (Video Output 1 only): Displayed in 0-359° AZ and +95° to -95° EL. Function can be on/off, 3-sec. time out or permanent



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### Electrical

#### INPUT VOLTAGE

24 Vac or 120 Vac Model Dependent

#### POWER

36 Watts [160 Watts with Pan/Tilt Heater Option]

#### LINE VARIATION

Conforms to Nema TS2 para 2.1.

### Mechanical

#### CONNECTOR

18 Pin MS style PT06E-14-18S(SR)  
weather-proof non-corrosion type

#### WEIGHT

Maximum 18.5lbs (8.4kg)

#### DIMENSIONS (D x H x W)

Maximum 6.7" [171mm] x 11.4" [290mm] x  
13.30" [338mm]

#### CONSTRUCTION

Powder Coated 6061 T6 aluminum; All  
internal and external parts corrosion  
protected, stainless steel fasteners

#### CAMERA MOUNT

6" Base plate with Four (4) 1/4-20 Threaded  
Holes @ 4.75" BC, [7.00" BC Base Plate  
Available, Use 8481-9]

### Environmental

#### TEMPERATURE

-34C to 74C Tested across low and high  
voltage ranges per Nema-TS2 paragraphs  
2.1.2 and 2.1.3.

#### VIBRATION

Per Nema-TS2 paragraphs 2.1.9, 2.2.3,  
5-30Hz sweep @ 0.5g applied in each of  
3 mutually perpendicular planes

#### SHOCK

Per Nema-TS2 paragraphs 2.1.10, 2.2.4,  
10g applied in each of 3 mutually  
perpendicular planes.

#### WATER SPRAY

Per IEC 60529+A1, 1999, Para 14.2.6,  
Solid water stream delivered thru 12.5mm  
nozzle @ 25 gallons/minute @ 9ft for 3  
minutes

#### EXTERNAL ICING

Per Nema-TS2 250-2003, paragraphs 5.6  
*(Note: Requires Pan/Tilt Heater Option)*

#### CORROSION PROTECTION

Per Nema 250-2003, paragraphs 5.10

#### HUMIDITY

0-100% N.C per MIL-E-5400T, paragraphs  
3.2.24.4

#### INGRESS/PROTECTION STANDARDS

IP66, IP67, ASTM-B117 Marine

### Certifications

#### PROTECTION

Positioner Body: IP66  
Camera Head: IP6  
Entire Assembly: ASTM-B117 Marine

#### EMISSIONS

FCC Class A

### Accessories

#### MOUNTS

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

#### CONTROL CABLES

CA265 Series w/120Vac MS conn.  
CA264 Series w/ 24Vac MS conn.

#### CONNECTOR KITS

MS Conn: 1310230-011



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The process of actually seeing an object is commonly categorized as detecting, recognizing, or identifying the object. Based on the Johnson Criteria, to detect a moving target, the critical dimension of the object must be covered by four or more pixels ( or 2 line pairs ) of the imaging systems video. An increasing number of pixels (or line pairs) covering the object determines the ability to recognize or identify the object. DET = 2 VPOT, REC = 8 VPOT, ID = 14 VPOT

LENS	HUMAN						VEHICLE					
	320 x 240			640 X 480			320 x 240			640 X 480		
	DET	REC	ID	DET	REC	ID	DET	REC	ID	DET	REC	ID
35 MM	1700 M	340 M	190 M	2500 M	500 M	280 M	2840 M	450 M	260 M	4175 M	660 M	380 M
60 MM	2925 M	585 M	325 M	4295 M	860 M	480 M	4870 M	770 M	440 M	7150 M	1130 M	650 M
100 MM	4875 M	975 M	540 M	7150 M	1430 M	795 M	7700 M	1280 M	735 M	11900 M	1880 M	1080 M

### Ordering Information

#### POSITIONING SYSTEM

- 6965-4000-PEDD Positioning System, 120Vac
- 6965-4010-PEDD Positioning System, 120Vac, with PT Heater
- 6964-4000-PEDD Positioning System, 24Vac

#### VISIBLE CAMERA HEAD OPTIONS

- 6940-5000 Visible Camera, NTSC
- 6940-5010 Visible Camera, NTSC, with Wiper
- 6940-8000 Visible Camera, PAL
- 6940-8010 Visible Camera, PAL, with Wiper

#### THERMAL LWIR CAMERA HEAD OPTIONS

- ER6960N1 320x240, NTSC, 35MM Lens
- ER6960N2 320x240, NTSC, 60MM Lens
- ER6960N3 320x240, NTSC, 100MM Lens
- ER6960N4 640x480, NTSC, 35MM Lens
- ER6960N5 640x480, NTSC, 60MM Lens
- ER6960N6 640x480, NTSC, 100MM Lens
- ER6960N7 640x480, NTSC, 35MM Lens, 9 Hz
- ER6960N8 640x480, NTSC, 60MM Lens, 9 Hz
- ER6960N9 640x480, NTSC, 100MM Lens, 9 Hz
- ER6960P1 320x240, PAL, 35MM Lens
- ER6960P2 320x240, PAL, 60MM Lens
- ER6960P3 320x240, PAL, 100MM Lens
- ER6960P4 640x480, PAL, 35MM Lens
- ER6960P5 640x480, PAL, 60MM Lens
- ER6960P6 640x480, PAL, 100MM Lens
- ER6960P7 640x480, PAL, 35MM Lens, 9 Hz
- ER6960P8 640x480, PAL, 60MM Lens, 9 Hz
- ER6960P9 640x480, PAL, 100MM Lens, 9 Hz



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