HIGH PERFORMANCE MONOCHROME ENVIRONMENTAL CCD CAMERAS

4940 SERIES

The 4940 Series high performance monochrome environmental CCD cameras from Cohu combine advanced video technology and rugged reliability for peak performance in harsh-environment security/surveillance applications.

The 4940 Series cameras feature a high-sensitivity on-chip microlens interline transfer imager, which reduces dark current, lag, and blooming while improving dynamic range and spectral characteristics. For video applications prone to streaking problems, a 1000:1 overload capability allows transmission of clear video signals even when bright incidental light is present in the scene.

The 4940 Series high performance monochrome CCD Cameras' 4.5" sealed and pressurized environmental housing provides maximum protection against rain, snow, dust, humidity, chemical pollutants, extreme temperatures, and other hazards.

Optional features include a fiber optic transmitter and a programmable source ID generator. An internal heater for low temperature operation is standard on all 115V models.

The 4940 Series is backed by a full two-year warranty. Cohu welcomes requests for special products and complete CCTV systems.

FEATURES AND BENEFITS

- **Sealed, Pressurized Environmental Housing** protects against harsh environmental conditions
- **On-Chip Microlens Interline Transfer Imager** improves sensitivity, virtually eliminates overload streaking, and improves dynamic range
- **High Resolution** — for better definition, error-free results
- **High Sensitivity** permits operation over a broad range of light levels
- **Choice of Synchronization Options** for greater versatility
- **High Signal-to-Noise Ratio** for clear, noise-free video
- **Optional Fiber Optic Transmitter and Source I.D. Generator**
- **Made in U.S.A.** — direct factory support
- **Two-Year Warranty**
- **Internal Heater** for low temperature operation
- **1000:1 Overload Capability** permits incidental light overloads up to ten times that of other CCD cameras
- **No Lag or Image Retention** — provides fast, clean, precise images
- **Zero Geometric Distortion** for consistent corner-to-corner linearity
- **26 dB AGC** for increased sensitivity at low light levels
- **Optional IR Filter**
- **“C” or “CS” Lens Mount** expands your choice of lenses
- **State-of-the-Art Design and Construction**

APPLICATIONS

- ITS/Traffic Management
- Mass Transit Systems
- Security/Surveillance
- Military Installations
- Airports
- Industrial Process Monitoring
- Nuclear Power Plants
- Hazardous Waste Management
- Radar Tracking Systems

Cohu 4940 Series High Performance Monochrome Environmental CCD Camera.

Designed and manufactured in U.S.A.

For design help, accessories or pricing, please contact: sales@avsupply or call: 1-858-565-1101

www.avsupply.com
4940 HIGH PERFORMANCE MONOCHROME CCD CAMERA

**ELECTRICAL**

<table>
<thead>
<tr>
<th>Image Area</th>
<th>6.4 x 4.8 mm (corresponding to 1/2&quot; image tube)</th>
</tr>
</thead>
</table>
| Active Picture Elements | RS-170: 768 H x 494 V  
CCIR: 752 H x 582 V |
| Imager Type | On-chip microlens sensor interline transfer CCD |
| Cell Size | RS-170: 8.4 x 9.8 microns  
CCIR: 8.6 x 8.3 microns |
| Resolution | RS-170: 580 horizontal TVL, 350 vertical TVL  
CCIR: 560 horizontal TVL, 450 vertical TVL |
| Sensitivity (faceplate) | @ 2850 K  
Please see Table 1 |
| Electronic Shutter* | Eight steps from 1/50 or 1/60 to 1/10,000 second (1/50 or 1/60, 1/125, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10,000 second) |
| Video Output | 1.0 V p-p @75 ohms, unbalanced |
| Gamma | Variable 0.45 to 1.0 |

*Please see “Standard Features” box on back cover

**AGC**

- 26 dB, variable gain

**Signal-to-Noise Ratio**

- ≥56 db at gamma 1, gain 0 dB
- 38 dB at gamma 1, AGC On

**Auto Lens**

- Separate lens video ratio tracks AGC peak/average adjustment to eliminate AGC/auto lens interaction
- Power: +15V, 100 mA maximum

**Synchronization**

- Genlock, revert to variable phase adjustable line lock with zero crossing detector
- Genlock, revert to crystal
- Crystal Lock
- Internal Clock Speeds
  - RS-170: 28.6363 MHz
  - CCIR: 28.375 MHz

**Power Requirements**

- 12V ac, 50/60 Hz
- 24V ac, 50/60 Hz
- 115V ac, 50/60 Hz
- 230V ac, 50/60 Hz

**Power Consumption (by module)**

- 4.2 watts camera
- 40 watts heater
- 1.5 watts lens

This model has been tested and found to comply within the FCC limits for Class “B.”

**SENSITIVITY**

<table>
<thead>
<tr>
<th>Full Spectrum</th>
<th>With IR Filter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Video, No AGC</td>
<td>0.065 fc (0.65 lux)</td>
</tr>
<tr>
<td>80% Video, AGC On</td>
<td>0.002 fc (0.02 lux)</td>
</tr>
<tr>
<td>30% Video, AGC On</td>
<td>0.0004 fc (0.004 lux)</td>
</tr>
</tbody>
</table>

*Please see Table 1

**MECHANICAL**

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Please see Figure 1.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (less lens)</td>
<td>10.8 pounds (4.9 kg)</td>
</tr>
</tbody>
</table>
| Lens Mount | “CS” mount, 16mm format  
“C” mount with adapter (furnished) |
| Housing Mount | 1/4 - 20 threaded holes |
| Connectors | Please see Figure 1. |

**ENVIRONMENTAL**

**Ambient Temperature Limits**

- Operating: -20 to 60°C  
(-4 to 140°F)
- -40 to 60°C  
(-40 to 140°F) with heater
- Storage: -30 to 70°C  
(-22 to 157°F)

**Humidity**

- Up to 100% relative humidity

**Vibration (less lens)**

- Sine vibration from 5 to 60 Hz, with 0.082 inches total excursion  
(15 g’s @ 60 Hz).
- Random vibration from 60 to 1,000 Hz, 5 g’s rms (0.027g2/Hz without damage).

**Shock (less lens)**

- Up to 15 g’s, 11ms, in any axis under nonoperating conditions, MIL-E 5400T, paragraph 3.2.24.6

**Altitude**

- Sea level to equivalent of 3,000m/10,000 feet  
(508mm/20 inches of mercury)

**Air Contaminants**

- Withstands exposure to sand, dust, fungus, and salt atmosphere, per MIL-E-5400T, paragraph 3.2.24.7, 3.2.24.8, and 3.2.24.9

**Explosion**

- MIL-E-5400T, paragraph 3.2.24.10

**Acoustic Noise**

- Can withstand environments greater than 150 dB continuously for 30 minutes

**EMI**

- FCC rules, Part 15, Subpart J, for Class A devices

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**4940 SERIES DIMENSIONS**

![Diagram of camera dimensions](image)

**NOTE:** DIMENSIONS IN INCHES (MM)

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**CONNECTOR CONFIGURATIONS**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>12/24V ac in</td>
</tr>
<tr>
<td>B</td>
<td>Reserved for Position Reference Return</td>
</tr>
<tr>
<td>C</td>
<td>75 Ω Sync Termination</td>
</tr>
<tr>
<td>D</td>
<td>Reserved for Focus Position</td>
</tr>
<tr>
<td>J</td>
<td>Video Ground</td>
</tr>
<tr>
<td>K</td>
<td>Video Out</td>
</tr>
<tr>
<td>L</td>
<td>Ground (Overall Cable Shield)</td>
</tr>
<tr>
<td>M</td>
<td>External Sync In</td>
</tr>
<tr>
<td>N</td>
<td>Ground (Sync Coax Shield)</td>
</tr>
<tr>
<td>P</td>
<td>Ground (Lens Conductors Shield)</td>
</tr>
<tr>
<td>R</td>
<td>Zoom In</td>
</tr>
<tr>
<td>S</td>
<td>Focus In</td>
</tr>
<tr>
<td>T</td>
<td>Iris In</td>
</tr>
<tr>
<td>U</td>
<td>Ground (Zoom, Focus, Iris Common)</td>
</tr>
<tr>
<td>V</td>
<td>115V ac Camera Power, 60 Hz, Low</td>
</tr>
<tr>
<td>W</td>
<td>115V ac Camera Power, High</td>
</tr>
<tr>
<td>X</td>
<td>AG Ground</td>
</tr>
<tr>
<td>Y</td>
<td>Reserved for Zoom Position</td>
</tr>
<tr>
<td>Z</td>
<td>Ground</td>
</tr>
<tr>
<td>b</td>
<td>Reserved for Position Reference</td>
</tr>
<tr>
<td>c</td>
<td>Auto/Manual Iris Select</td>
</tr>
<tr>
<td>d</td>
<td>12/24V ac In</td>
</tr>
<tr>
<td>e</td>
<td>RXD (Programmable ID Generator)</td>
</tr>
<tr>
<td>f</td>
<td>Ground</td>
</tr>
<tr>
<td>h</td>
<td>TXD (Programmable ID Generator)</td>
</tr>
<tr>
<td>i</td>
<td>TXD (Programmable ID Generator)</td>
</tr>
<tr>
<td>k</td>
<td>Ground (Programmable ID Generator)</td>
</tr>
<tr>
<td>m</td>
<td>Heater Power, 115V ac Low</td>
</tr>
<tr>
<td>n</td>
<td>RXD (Programmable ID Generator)</td>
</tr>
<tr>
<td>r</td>
<td>Heater Power, 115V ac High</td>
</tr>
</tbody>
</table>

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**PROGRAMMABLE SOURCE ID GENERATOR**

The optional Programmable Source ID Generator is a built-in electronic circuit which allows written messages to be superimposed over images displayed on CCTV monitors. Using a computer and RS-422 serial communication, a user types messages that will then appear on the monitor. Text is made up of block letters 28 horizontal TV lines in height. The letters are white with a black outline for maximum legibility. There are two modes of operation, as follows:

1. **ID Mode:** Up to two lines of text (24 characters per line, including spaces) can be stored in non-volatile memory. Text can be placed at the top or bottom of the monitor screen, and can be updated from a computer or a dumb terminal, making this a real-time updatable programmable ID generator. Stored text, which typically provides information such as the location of individual cameras in multi-camera systems, will be continuously displayed until it is updated.

2. **Menu Mode:** In this mode, up to 12 lines of 24 characters can be entered into volatile memory without affecting data stored in the ID Mode. A computer is required to enter data in this mode.

Special cables or connectors are available for programming the Programmable Source ID Generator. Please consult factory for details.
# 4940 Series High Performance Monochrome CCD Camera

## Ordering Information

<table>
<thead>
<tr>
<th>Power Options*</th>
<th>Sync Options &amp; Video Format</th>
<th>Option Filters</th>
<th>Camera Options</th>
<th>Module Options</th>
<th>Lens Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 12V ac, 50/60 Hz</td>
<td>2 RS-170 Genlock (revert to crystal)</td>
<td>0 None</td>
<td>0 None</td>
<td>Auto Iris, CS Mount</td>
<td></td>
</tr>
<tr>
<td>3 230V ac, 50/60 Hz**</td>
<td>3 RS-170 Genlock (revert to phase adjustable line lock)</td>
<td>1 IR Filter (Non-removable)</td>
<td>1 Fiber Optic Transmitter</td>
<td>EHO4 3.7mm, f/1.6, 1/2&quot;</td>
<td></td>
</tr>
<tr>
<td>4 24V ac, 50/60 Hz</td>
<td>5 CCIR Genlock (revert to crystal)</td>
<td></td>
<td>2 Programmable I.D. Generator</td>
<td>EH06 6mm, f/1.4, 1/2&quot;</td>
<td></td>
</tr>
<tr>
<td>5 115V ac, 50/60 Hz</td>
<td>6 CCIR Genlock (revert to phase adjustable line lock)</td>
<td></td>
<td>3 Programmable I.D. Generator and Fiber Optic Transmitter</td>
<td>EHO13 12mm, f/1.4, 1/2&quot;</td>
<td></td>
</tr>
</tbody>
</table>

*Heater for low temperature operation is standard on 115V models. Heater on 12V and 24V models is a special order feature. Please consult factory.

**Please consult factory for availability.

### Notes on Standard Features

**Electronic Shutter:** Internal switches select shutter speeds or the number of integration fields, and enable or disable the external ON/OFF control of the internally-selected shutter or integration mode. These switches are set at the factory prior to sealing and pressurizing the environmental housing. The standard factory settings disable the external ON/OFF control and provide 1/60 second shutter speed. The switches can be set differently at the factory to customer specifications, or in the field by removing the camera from the housing.

**AGC Peak/Average** adjustment is made via an internal control, which is set at 0.45 at the factory prior to sealing and pressurizing the environmental enclosure. Customer may specify different setting.

### Spectral Response

![Spectral Response Graph](https://via.placeholder.com/150)