Rayfin with UltraOptics

Ultra-wide angle lens, Digital Stills, IP Camera, 4K and HD video

Key Features

- Live HD (Ethernet or Coax) or 4K (Fiber)
- Accepts Pan-tilt unit controls
- 21MP digital stills (JPEG and RAW) with LED strobe synchronization
- 4K and HD video clips stored to 512GB solid state memory
- Real-time media download and control of all functions (Exposure, focus, etc.)
- Sensor-crop PTZ (5x optical equivalent)
- NTP time server synchronization
- NAS (Network Attached Storage)

Contact team@subcimaging.com for pricing, rental information or live demonstration

Harshest Conditions. Clearest Images.

SubC’s wide-angle UltraOptics are designed for situational awareness. The enhanced 120° field-of-view and low distortion, combined with sensor PTZ make it a viable replacement for mechanical PTZ units.
Intuitive and Easy to Use Software

1. Strobe toggle
2. Auto/manual exposure toggle
3. Auto exposure value
4. Shutter Speed
5. ISO Value
6. Auto/manual focus
7. Manual focus slider
8. Internal temperature indicator
9. Disconnect from camera
10. Settings button
11. Thumbnails
12. Digital pan/tilt/zoom control
13. Record video
14. Take still
15. Focus reticle
16. Media storage remaining

S1. Recording Settings
S2. Still Settings
S3. White Balance Settings
S4. Gallery
S5. Network Attached Storage
S6. Attached Aux Device Settings

The Rayfin includes 2 years of free software updates.
Built-In Features for Versatility

Image Enhancement

Real-time image enhancement is a feature that is now available with the SubC DVRO. This built-in tool will help operators get the job done quickly and efficiently by allowing them to clearly see the videos and stills they’re capturing in real time.

Secure VSAT Video Streaming

SubC Streaming is a cloud-based service that delivers high quality video and audio to your browser using WebRTC and the Rayfin Software. A username and password is all you need to log into SubC’s secure server to view your footage in real time.

Built-in IMU for Heading, Tilt and Roll Data with Live OSD View

The Rayfin is a data logger as well as a real-time platform - the IMU and optional depth sensor data is displayed in the control software. NMEA sensor data is automatically time stamped and logged as a CSV in the Rayfin file system. Other sensors can be integrated on request.
The camera can also operate as a NMEA data logger so you can pipe in live data from other sensors.

NMEA formatted data can be sent to the camera via Serial or Ethernet.
- TCP or UDP port: 8889
- RS232 or RS485 on Aux0 and Aux1

The data will be time-stamped and stored in a CSV file alongside the images. The camera contains an internal accelerometer, magnetometer and gyro (IMU) track orientation and this data can also be logged. System time, altimeter, depth, position, heading and other data can be input and recorded in real time.

Compatible sensors include system clocks, depth, altimeter, gyro, CTD and others with NMEA formatting.
Multi-purpose Auxiliary Ports

LED strobe and lamp

The camera controls the LED as a lamp when recording video or as a strobe by syncing with the exposure time to capture objects in highest detail for digital stills.

Parallel and Line Lasers

Lasers connect to aux ports with TTL control. The MantaRay projects two parallel beams for distance and scale. The Skate projects a precision uniform beam line for image processing.

NMEA Sensors

The camera is a data-logger for NMEA sensors. Each string receives a time-stamp and is logged in parallel with internal camera sensors, video and images.

Pan-Tilts and Controllers

The camera ports can drive pant-tilt devices through software direct controls. The aux ports can also be configured as a controller for the camera.
Video Transmission Options

**HD over Ethernet (HDE)**
Live video, control and media are transferred over 10/100 and Gigabit Ethernet. Composite video and serial control for older system compatibility.

**HD over Coax (HDC)**
Uncompressed HD video transferred over HD-SDI. Live video and stills are also transferred over Ethernet connection. Serial control included.

**Ultra HD over Fiber Optics (UHDF)**
4K over fiber optics. Ethernet, HD video and comms for uncompromised live video quality. Serial control included.

**PowerLine Ethernet (PLE)**
Power and Ethernet over 2 wires. Used for drop camera systems to reduce the cost of cabling.
# Rayfin-HDE-SD-6000-DBH13-UO

**UltraWide angle - Ethernet HD video and comms, SD video, serial comms**

**Sensor and Lens**
- **Pixel count:** 21MP
- **Max image size:** 5344 x 4008
- **Max shutter speed:** 1/32500
- **Max video resolution:** 4K UHD
- **Sensor:** Exmor RS™
- **Lens:** 1.92mm f/1.8
- **Zoom:** 21MP sensor zoom (5x optical equivalent)
- **Focus Range:** 0.1m to infinity

**System**
- **Max Continuous Still Rate:** 3Hz
- **Recording codecs:** H.265(HEVC), H.264
- **Live video:** IP Ethernet, Composite
- **Streaming codec:** H.264
- **Max in-water operating temp:** 30°C
- **Depth Rating:** 6000m

**Electronics**
- **Tx:** 60m (GigE), 80m (10/100)
- **Tx with 2x LED:** 20m (GigE), 40m (10/100)
- **Protection:** Short circuit, UV-OV, ESD, OT
- **Voltage:** 16.5 - 32.5 Vdc
- **Control:** Ethernet, Serial RS232/485
- **Power(W):** 7.5(idle), 8(recording), 13.5(peak)

**Mechanical**
- **Materials:** BK7, Grade 5 Titanium
- **Weight:** 2.32Kg in water, 4.45Kg in air
- **Max in-water operating temp:** 30°C
- **Depth Rating:** 6000m

## Important notes:
- SubC bulkheads are wired to Ethernet B standard.
- 13 pin bulkhead is limited to 4A per pin. The camera automatically limits power to the LEDs.
- In-line cable part number for Ethernet bulkhead: Subconn DIL13F + DLSA-F

<table>
<thead>
<tr>
<th>Subconn MCBH5F [AUX0]</th>
<th>Subconn MCBH5F [AUX1]</th>
<th>Subconn DBH13M + DLSA-M [IP, Serial]</th>
</tr>
</thead>
<tbody>
<tr>
<td>GND</td>
<td>GND</td>
<td>GND</td>
</tr>
<tr>
<td>PWR</td>
<td>PWR</td>
<td>Iso GND (Shield) (NC on system end)</td>
</tr>
<tr>
<td>AUX0 Out</td>
<td>AUX1 Out</td>
<td>PWR</td>
</tr>
<tr>
<td>AUX0 RS-232 Tx / RS-485 B(-)</td>
<td>AUX1 RS-232 Tx / RS-485 B(-)</td>
<td>(Brown) TP4- [GigE]</td>
</tr>
<tr>
<td>AUX0 RS-232 Rx / RS-485 A(+)</td>
<td>AUX1 RS-232 Rx / RS-485 A(+)</td>
<td>(White/Brown) TP4+ [GigE]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Blue) TP3- [GigE]</td>
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<tr>
<td></td>
<td></td>
<td>(White/Blue) TP3+ [GigE]</td>
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<td></td>
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<td>(Orange) TP1- [10/100]</td>
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<tr>
<td></td>
<td></td>
<td>(White/Orange) TP1+ [10/100]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Green) TP2- [10/100]</td>
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<tr>
<td></td>
<td></td>
<td>(White/Green) TP2+ [10/100]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Composite</td>
</tr>
</tbody>
</table>

**QC parameters of UltraOptics**
- **Diagonal FOV:** 116° min
- **Distortion:** 2% max
Rayfin-HDC-6000-CRE75-DBH13-UO
UltraWide angle - HD-SDI video, Ethernet HD video and comms, serial

**Electronics**

**HD-SDI Resolution:** 1080/60p/50p, 1080/30p/24p, 720/60p/50p
*Tx:* 20m (HD-SDI), 60m (GigE), 80m (10/100)
*Tx with 2x LED:* 10m (HD-SDI), 20m (GigE), 40m (10/100)

**Protection:** Short circuit, UV-OV, ESD, OT

**Voltage:** 16.5 - 32.5 Vdc

**Control:** Ethernet, Serial RS232/485

**Power:**
- **(W):** 7.5 (idle), 8 (recording), 13.5 (peak)

**Mechanical**

**Materials:** BK7, Grade 5 Titanium

**Weight:**
- 2.32Kg in water, 4.45Kg in air

**Max in-water operating temp:** 30°C

**Depth Rating:** 6000m

**Sensor and Lens**

**Pixel count:** 21MP

**Max image size:** 5344 x 4008

**Max shutter speed:** 1/32500

**Max video resolution:** 4K UHD

**Sensor:** Exmor RS™

**Lens:** 1.92mm f/1.8

**Zoom:** 21MP sensor zoom (5x optical equivalent)

**Focus Range:** 0.1m to infinity

**System**

**Max Continuous Still Rate:** 3Hz

**Recording codecs:** H.265(HEVC), H.264

**Live video:** IP Ethernet, 3G-SDI, HD-SDI

**Streaming codec:** H.264

**Internal recording capacity:** 512 GB

**Latency Ethernet:** 225ms ±50ms

**Latency HD-SDI:** 85ms ±25ms

**QC parameters of UltraOptics**

**Diagonal FOV:** 116° min

**Distortion:** 2% max

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**Important notes:**

- SubC bulkheads are wired to Ethernet B standard.
- 13 pin bulkhead is limited to 4A per pin. The camera automatically limits power to the LEDs.
- In-line cable part number for Ethernet bulkhead: Subconn DIL13F + DLSA-F

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**Updated:** 2019-05-29

Email team@subcimaging.com for more information
Rayfin-UHDF-6000-Optolink-DBH13-UO-#nm
UltraWide angle - 6G-SDI over SMFO, Ethernet HD video and comms, serial comma

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**Electronics**

**SDI Resolution:** 4K/30p/25p, 1080/60p/50p, 720/60p/50p
**Tx:** 60m (GigE), 80m (10/100)
**Tx with 2x LED:** 20m (GigE), 40m (10/100)
**Tx Power Fiber:** 20+ dB

**Protection:** Short circuit, UV-OV, ESD, OT
**Voltage:** 16.5 - 32.5 Vdc
**Control:** Ethernet, Serial RS232/485
**Power(W):** 7.5(idle), 8(recording), 13.5(peak)

**Mechanical**

**Materials:** BK7, Grade 5 Titanium
**Weight:** 2.32Kg in water, 4.45Kg in air
**Max in-water operating temp:** 30°C
**Depth Rating:** 6000m

**System**

**Max Continuous Still Rate:** 3Hz
**Recording codecs:** H.265(HEVC), H.264
**Live video:** HDMI 2.0b over Fiber, Ethernet
**Streaming codec:** H.264
**Internal recording capacity:** 512 GB
**Latency Ethernet:** 225ms ±50ms

**Sensor and Lens**

**Pixel count:** 21MP
**Max image size:** 5344 x 4008
**Max shutter speed:** 1/32500
**Max video resolution:** 4K UHD
**Sensor:** Exmor RS™
**Lens:** 1.92mm f/1.8
**Zoom:** 21MP sensor zoom
(5x optical equivalent)
**Focus Range:** 0.1m to infinity

**Important notes:**
- SubC bulkheads are wired to Ethernet B standard.
- 13 pin bulkhead is limited to 4A per pin. The camera automatically limits power to the LEDs.
- In-line cable part number for Ethernet bulkhead: Subconn DIL13F + DLSA-F
- Includes topside conversion box: HDMI 2.0b output

**Selections Required:**
- Wavelength (nm) - Stock 1270, 1330nm or non-stock CWDM bands

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<tr>
<th>Subconn Optolink (Ti)</th>
<th>Subconn DBH13M + DLSA-M [IP, Serial]</th>
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<tbody>
<tr>
<td>GND</td>
<td>GND 6000m rated</td>
</tr>
<tr>
<td>PWR</td>
<td>Solid molded cable only. No PBOF.</td>
</tr>
<tr>
<td>AUX0 Out</td>
<td>AUX1 Out 6G-SDI video SMPTE ST-2081</td>
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<td>AUX0 RS-232 Tx / RS-485 B(-)</td>
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**Updated:** 2019-05-29

Email team@subcimaging.com for more information

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**QC parameters of UltraOptics**

**Diagonal FOV:** 116° min
**Distortion:** 2% max

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**Software:** AR
**Electrical:** CC
**Production:** JMH
**Quality:** AJW
Included with your shipment:

1. Impact resistant shipping case with designed foam insert
2. Rayfin camera
3. Lasers, calibrated delrin mount and for attachment
4. Aquorea LED(s)
5. Component compartment:
   a. 3m straight LED cable to plug into camera.
   b. 0.5m Y-splice laser cable to plug into camera
   c. 2x Titanium hose clamps for attachment of lasers to the camera
   d. High pressure dummy plugs for camera Aux0 & Aux1 bulkheads
   e. Test whip bench testing the camera and downloading offline
   f. AC cable (matching your region) and AC-DC power supply (24VDC)
   g. Cat5e Ethernet cable
6. USB stick with:
   a. Windows 10 compatible Rayfin control software
   b. Product manuals
   c. QC documentation.
7. Documentation: complete QA checklist, pressure test certificates, packing list, datasheets and quick start guide. (under the lid foam)