SubC Imaging

www.subcimaging.com

CATALOGUE
2019

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RAYFIN LiquidOptics

The Rayfin was developed from the maturity and reliability of SubC's smart camera backbone and is built to exceed the highest requirements of AUV, ROV, observatory, and autonomous systems.

21 Megapixel Stills

▶ 4K & HD Recording

SPECIFICATIONS

Stills: 21 MP
Recording: 4K and HD (H.265 and H.264)
Control: Ethernet and Serial
Download: Live over Ethernet
Automation: Programmable Intervals
Zoom: 10x Sensor Crop
Video: HD over Ethernet or 3G-SDI, SD over Composite

RAYFIN UltraOptics

The Rayfin UltraOptics was developed by integrating various requirements from our clients. It includes digital PTZ within the 21 megapixel sensor.

PTZ 21MP Digital Sensor Pan-Tilt-Zoom

👁 120° Rectilinear Ultra-Wide Angle

SPECIFICATIONS

Stills: 21 MP
Recording: 4K and HD (H.265 and H.264)
Control: Ethernet and Serial
Download: Live over Ethernet
Automation: Programmable Intervals
Zoom: 10x Sensor Crop
Video: HD over Ethernet or 3G-SDI, SD over Composite

LIQUIDOPTICS

- Advanced 1:1 water-corrected optics
- Wide FOV
- Low distortion
- High sharpness
- Accurate colour depth
- Minimal chromatic aberration

SOFTWARE

The software-defined camera system enables a unique usage through region of interest (ROI) binning of the high-resolution camera sensor. Physically moving the camera is not necessary as the pan and tilt is inside the camera and controlled via software. This design helps solve the issue with pan-tilts and 360° camera systems.

1CAM MK6

Built on the reliable 1Cam product line, this sixth generation camera offers various models to suit any underwater application and exceeds the highest requirements of underwater systems.

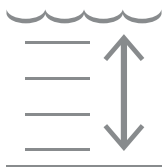## 20x Optical Zoom

4K & HD Video Transmission

SPECIFICATIONS

Recording: 4K and HD (H.264)
Stills: 16.6 MP
Control: Serial
Download: USB
Automation: Programmable Intervals
Zoom: 20× Optical
Video: 4K over Fiber, HD over 3G-SDI, SD over Composite

LIVE VIDEO CAMERAS

Don't need to record or take stills? SubC's cost-efficient live video-streaming cameras may be just what you need.

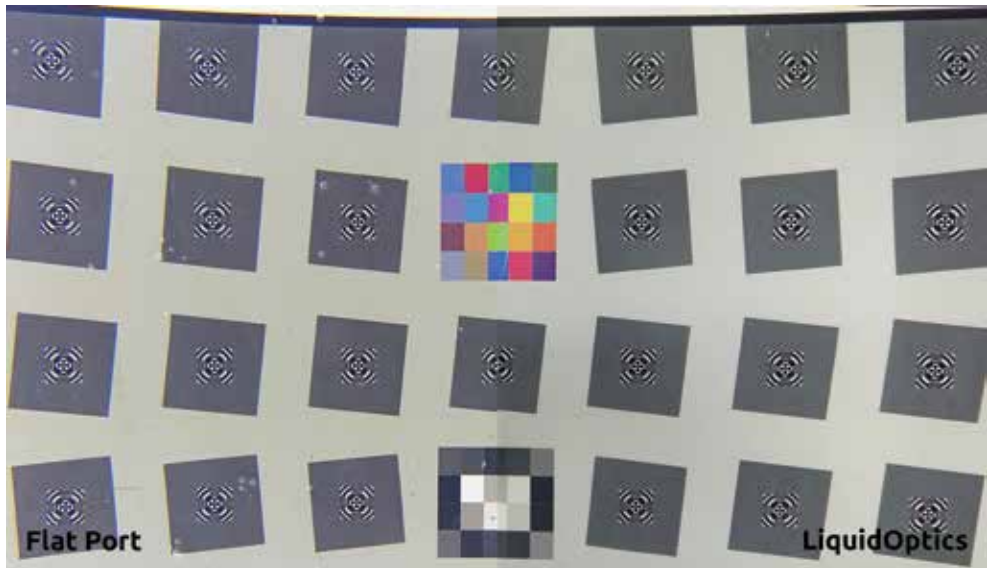## $ Cost-Efficient Options

6000m Depth Rating

MODELS

UHDF:
4K 20x zoom camera that provides live 4K and HD video topside over fiber optics

HDC:
HD 20x zoom camera where live video is transmitted over 75ohm coaxial cable as 3G-SDI

SD:
A low-cost solution for a live SD color 20x zoom camera with 16MP digital stills, 4K and HD recording and great low-light capability

CAMERAS

Our live-streaming cameras provide the same outstanding quality footage as the Rayfin and 1Cam Mk6.

Grenadier:
Lite version of Rayfin, available in both LiquidOptics and UltraOptics.

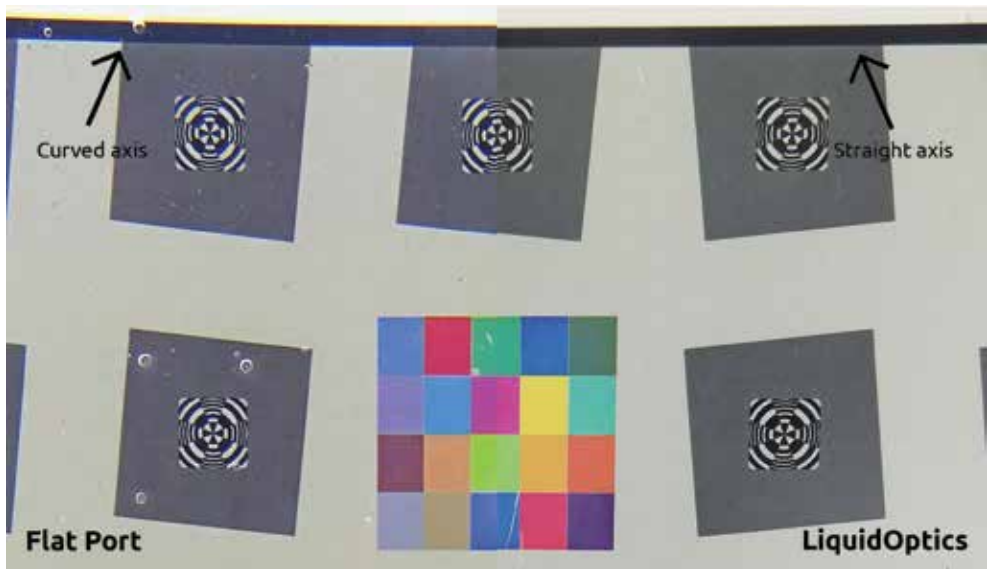**1Cam Lite:**
Lite version of 1Cam Mk6.

FLAT PORT VS. LIQUIDOPTICS

Comparison of images taken with a flat port optic and a water-corrected LiquidOptics camera.

CHROMATIC ABERRATION

Comparison of the chromatic aberration in images taken with a flat port optic and a LiquidOptics camera. There is clear colour bleeding and chromatic aberrations in the image taken with a flat port.
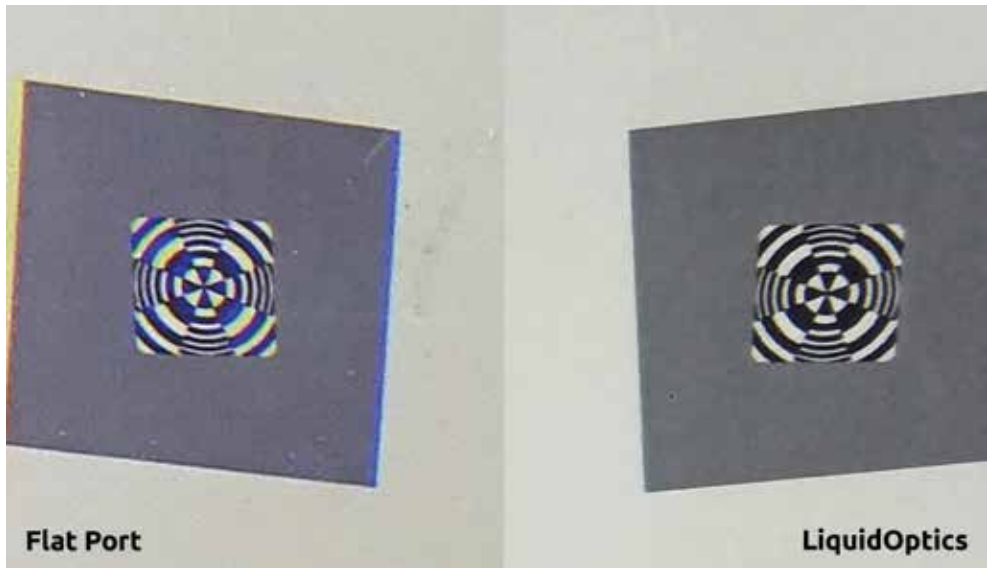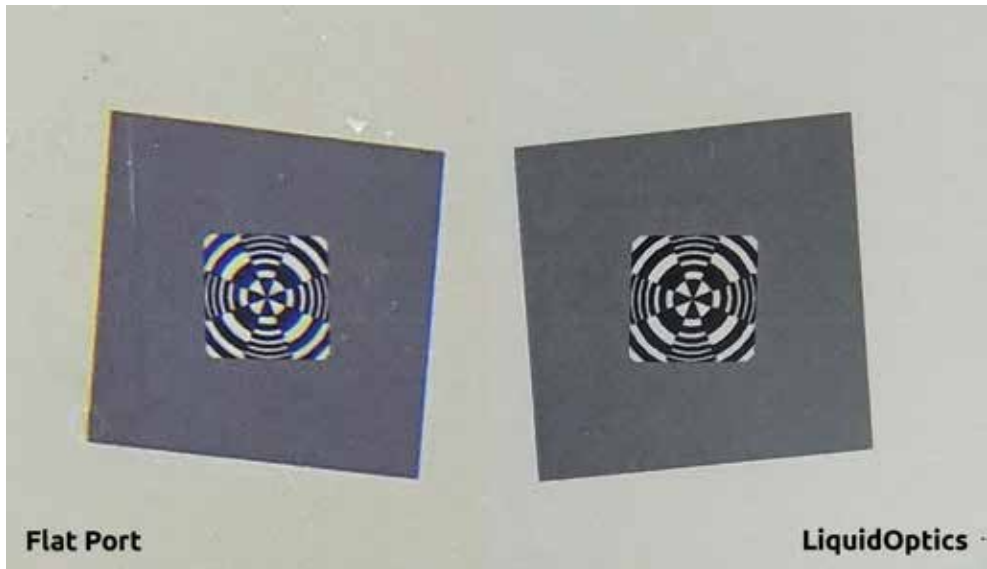

DISTORTION

Comparison of the distortion in images taken with a flat port optic and a LiquidOptics camera. You can see that the axis is more distorted in the image taken with a flat port.

SHARPNESS

Comparison of the sharpness in images taken with a flat port optic and a LiquidOptics camera. The sharpness is much higher in in the LiquidOptics camera. Sharpness is particularly important for any application requiring data processing.

DVRO

The SubC DVRO (Digital Video Recorder with Overlay) is a high-performance piece of equipment with powerful software features that provide overlay, recording and streaming of acquired video from underwater operations.

6 6 Channels of Video

▶ Record and Black Box

SPECIFICATIONS

Case Size: 19" 3U Rack Mount
Storage: 3x Portable Hard Drive Bays
Record Format: H.264, H.263, MPEG2
SD Inputs: 4 Channel Composite BNC
Control: Serial (4x RS232)
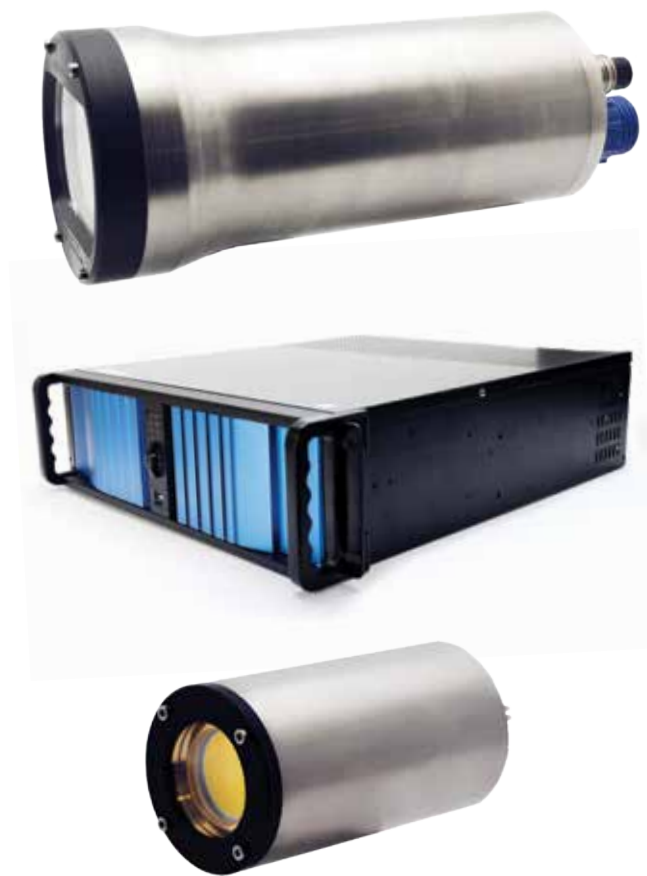**HD Inputs:** 2 or 4 Channel HD-SDI BNC
(Optional: 4K UHD Channel)

4K SUITE

The 4K Suite is equipped with ultra-high definition equipment and seamlessly integrates with ROVs and submersibles. The system was designed specifically for use in ocean science, oil and gas, and film-making.

✎ Dive Event Bookmarking

4K Live 4K Video Transmission

VERSATILITY

This highly versatile solution can stream video over the internet or a local Ethernet connection to preserve its high quality while using existing infrastructure. It also includes automatic splitting of extended recordings, power-loss recovery, BlackBox mode, and works in conjunction with Asset Integrity Management solutions from EIVA and Aker Coabis.

FEATURES

- Dive event bookmarking and Ethernet streaming with the DVRO
- 16.6 megapixel stills recorded to 512GB camera storage
- LEDs can sync in lamp/strobe configuration
- Broadcast quality controls
- Live 4K UHD video transmission via fiber

AQUOREA LED HYBRID

The Aquorea is a hybrid strobe/lamp that incorporates the latest generation of high-power LEDs. It can operate as a stand-alone product with serial control or easily integrated with SubC smart cameras.

80°
Beam Angle

Up to 32,000 Lumen Strobe

SPECIFICATIONS

Lamp Output: 2,400 - 15,000 Lumens
Beam Angle: 80° (circular cone)
Strobe Output: +32,000 Lumens
Reaction Speed: Approx. 190µ Seconds
Efficiency: 137 Lumen/Watt @ 15°C
Control: Serial RS232, RS485 or PWM

AQUOREA LED COLOUR

The Aquorea Colour is an LED lamp that integrates with SubC Cameras. The colour options include Far-Red and Deep-Blue.

Serial RS232/485 and Strobe Enable

Up to 16,000 Lumen Lamp

SPECIFICATIONS

Lamp Output: 2,400 - 15,000 Lumens
Beam Angle: 80° (circular cone)
Strobe Output: +32,000 Lumens
Reaction Speed: Approx. 190µ Seconds
Efficiency: 137 Lumen/Watt @ 15°C
Control: Serial RS232, RS485 or PWM

HYBRID STROBE

The Aquorea has built-in power conditioning with temperature, signal and voltage protections. The LED driver synchronizes the camera exposure time with its activation time while strobing, freezing the stills so that objects photographed can be captured in highest detail. The built-in charge control allows strobing while limiting the current draw from the system's power supply.

OPTIONS

Far-Red:
Designed for marine research and as a reduced luminous intensity output compared to white light. When used in conjunction with a SubC smart camera, it offers superior underwater low-light capability undetectable by marine life.

Deep-Blue:
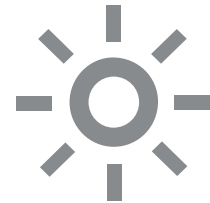Designed for underwater bio-florescence and leak detection.

STINGRAY LASER

The Stingray is an underwater laser module with diffraction beam-shaping optics and was engineered for 3D modelling. Ideal for metrology.

58mW Laser Output Power

Dimmable Green Laser

SPECIFICATIONS

Lamp Output: 2,400 - 15,000 Lumens
Beam Angle: 80° (circular cone)
Strobe Output: +32,000 Lumens
Reaction Speed: Approx. 190μ Seconds
Efficiency: 137 Lumen/Watt @ 15°C
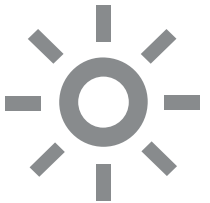**Control:** Serial RS232, RS485 or PWM

SKATE LASER

The Skate is a RS232 dimmable and TTL modulated green laser module that can be controlled by SubC smart cameras. Ideal for metrology and pipeline surveys to precisely quantify any deficiencies or structural issues in conjunction with a laser scanning system.

Line Focus 200nm - 5m

Dimmable Green Laser

SPECIFICATIONS

Wavelength: 520nm (green)
Output Power: 50 (mW-Max)
Line Straightness (%) >25mm: 0.1
Line Uniformity: 95%
Line Fan Angle: 53.9%
Line Depth of Field: 200mm to 5m
Weight: 900g (Water)
Diameter: Ø 37.7mm

OPTIONS

The laser generates patterns composed of multiple laser points with a fan angle of 40° (in air) built by 4689 spots. It features an integrated focusing mechanism with a high-diffraction efficiency.

Additional Lens Options Available:
- Grid
- Perpendicular lines
- Circle
- Parallel lines

PATTERN

Additional Lens Options Available:
- Single line
- Crosshair
- Dot line
- 7x7 dot matrix
- Single dot
- Parallel lines
- 4x4 grid
- Single circle
- 7 concentric circles

MANTARAY PARALLEL LASERS

MantaRay Parallel Lasers were developed to obtain the distance and scale of underwater objects.

Controlled with TTL Reverse Modulation

Parallel Dots Calibrated to 5m

SPECIFICATIONS

Color: 532nm (green)
Output Power: >5 Mw
Weight: 400g (Water)
Parallelism: 100mm ± 10mm at 5m
Depth Rating: 6000m

BATTERY 259

The Battery 259 is a Lithium-Ion based battery module that enables stand-alone operation of equipment in deep-water environments. Ideal to use with SubC smart cameras.

Passed UN38.3 Test

Magnetic On/Off Switch

SPECIFICATIONS

Voltage: 25.9, 29.4 (peak), 17.5 (cut-off)
Capacity: 10,000mAh (259 Watt-Hours)
Ampacity: 4.9 A (continuous)
Weight: 5.2kg (air), 3kg (water)
Dimensions: 270mm x Ø100.8mm

DISTANCE

Distance and scale is accomplished by projecting two parallel beams from the lasers that appear as green dots on the objects.

- Standard Titanium 6000m depth rating
- Control: TTL for on/off up to 1000hz
- Parallel dots calibrated to 5m distance
- Simple attachment to the camera
- Sapphire view ports

PROTECTION

Built-in protection ensures that if the battery output is shorted, it will auto-recover without damage. If the connection to the battery is reversed, neither the charger nor the battery will be damaged.

Protection:
- Over charge (> 29.6 V)
- Over discharge (< 17.5 V)
- Over drain (> 10 Amp)
- Short circuits

CUSTOM SYSTEMS

SubC specializes in creating complete end-to-end imaging and data management systems for the professional offshore market.

Cutting-edge software is developed and supported by our team of experts. Applications include still images, video, lighting, machinevision, and photogrammetry. The core firmware is built for reliability and offers dependable control of integrated sensor functions and peripherals.
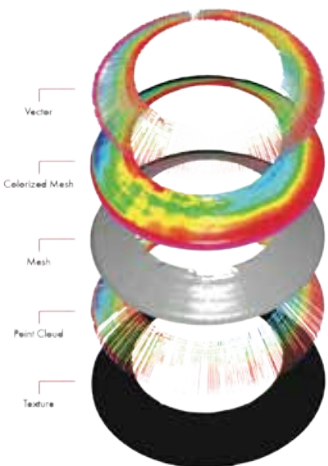
OPTICS

Based on expertise gained while developing our LiquidOptics® and UltraOptics® water-correction systems, custom optical lenses and correction systems can be built in-house.

INTEGRATION

Third-party components can also be integrated with SubC's products to create complete optical systems for manned submersibles, ROV, AUV, observatories and benthic landers.
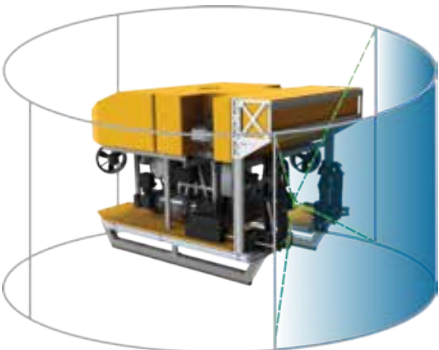
EXAMPLE

3D MODELLING SUITE:
A live 3D recording system that creates 3D models using photogrammetry. The system is constructed using 2x 1Cam Lite, 2x Aquorea LEDs, a Skate laser, an Isopod mux, and a SubC DVRO.

EXAMPLE

SITUATIONAL AWARENESS:
Equips a ROV or underwater system with two to four SubC UltraOptics® cameras. The ultra-wide field of view increases awareness of the surroundings. In an offshore setting, this reduces the possibility of damage to equipment. For marine research, it maximizes the effectiveness of surveys.
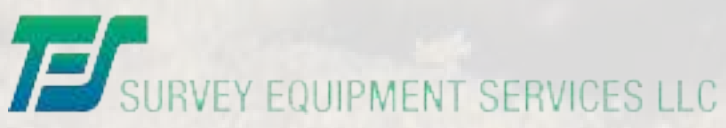
Fisheries and Oceans
Canada

OCEAN
EXPLORATION
TRUST

OCEAN
NETWORKS
CANADA

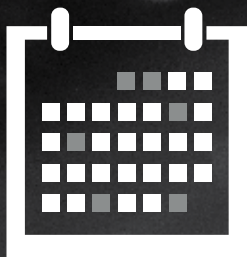NAUTILUS LIVE

SALES & RENTALS

Ashtead Technology
www.ashtead-technology.com

Ashtead House
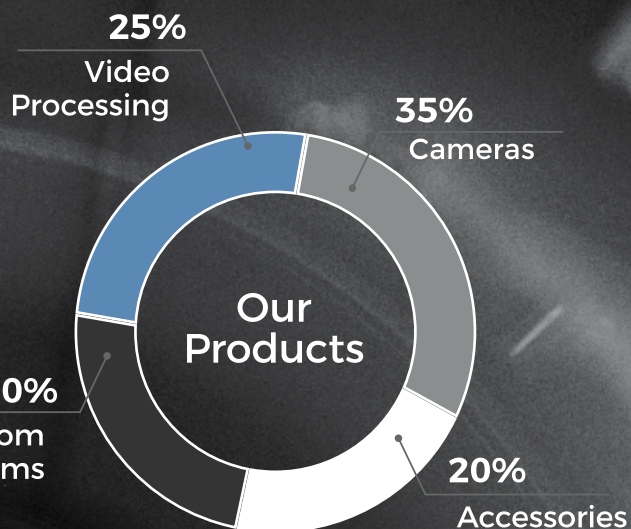Discovery Drive
Westhill
Aberdeenshire, Ab32 6FG
United Kingdom

TES Survey Equipment Services LLC
www.tesme.com

Ashtead House
Discovery Drive
Westhill
Aberdeenshire, Ab32 6FG
United Kingdom

Established
2010

25%
Video
Processing

35%
Cameras

20%
Custom
Systems

Our
Products

20%
Accessories

130+
Clients in

30
COUNTRIES

OVER **700**
Products Delivered

Distributors

Clients