Rayfin with LiquidOptics

Water-corrected lens | Digital Stills | IP Camera | 4K and HD video

Rayfin with LiquidOptics, LED strobe/lamp(s) and parallel lasers

Key Features

- Live HD via (Ethernet/Coax) or 4K (Fiber)
- 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 Zoom (5x optical equivalent)
- NTP time server synchronization
- NAS (Network Attached Storage)
- Autonomous scripting with SubC API

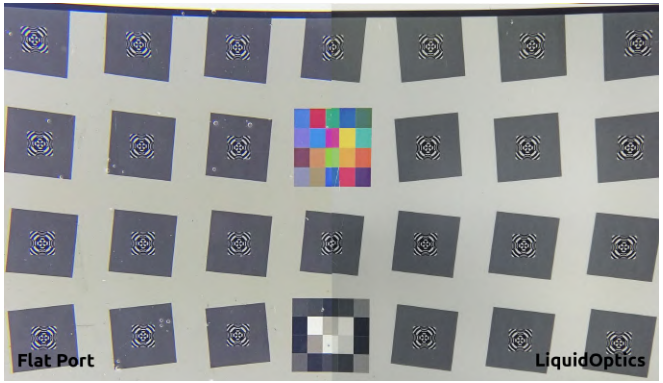
Harshest Conditions. Clearest Images.

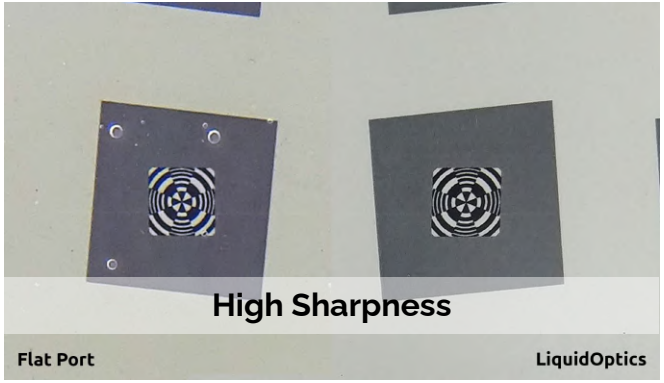
SubC created Ivanoff inspired LiquidOptics to correct for distortion, field of view and chromatic aberration caused by water. The Sapphire construction makes it extremely durable and impact resistant.

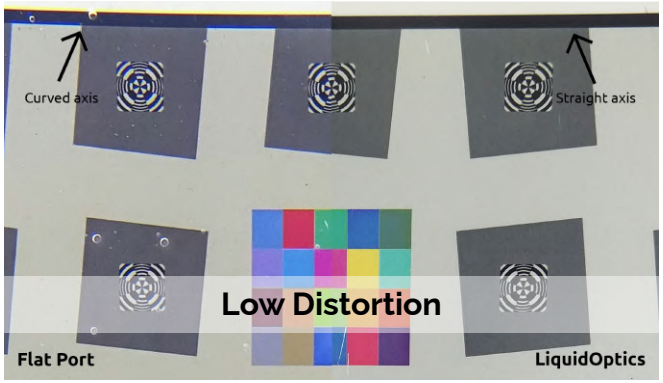
Contact team@subcimaging.com for pricing, rental information or live demonstration

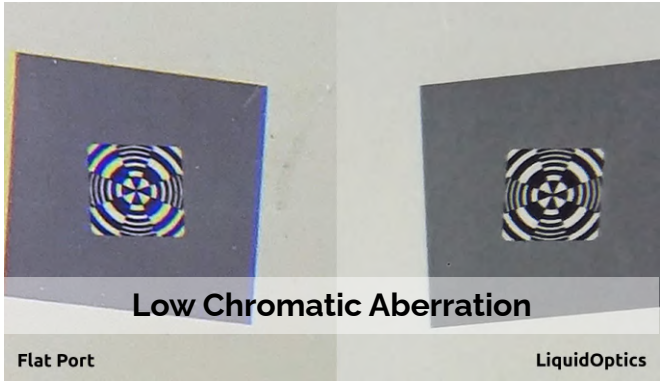
LiquidOptics

An innovation on the Ivanoff water-corrected port design, utilizing Sapphire and relay optics which results in multiple advantages.
http://ftp.subcimaging.com/docs/Presentations/LiquidOptics.pdf





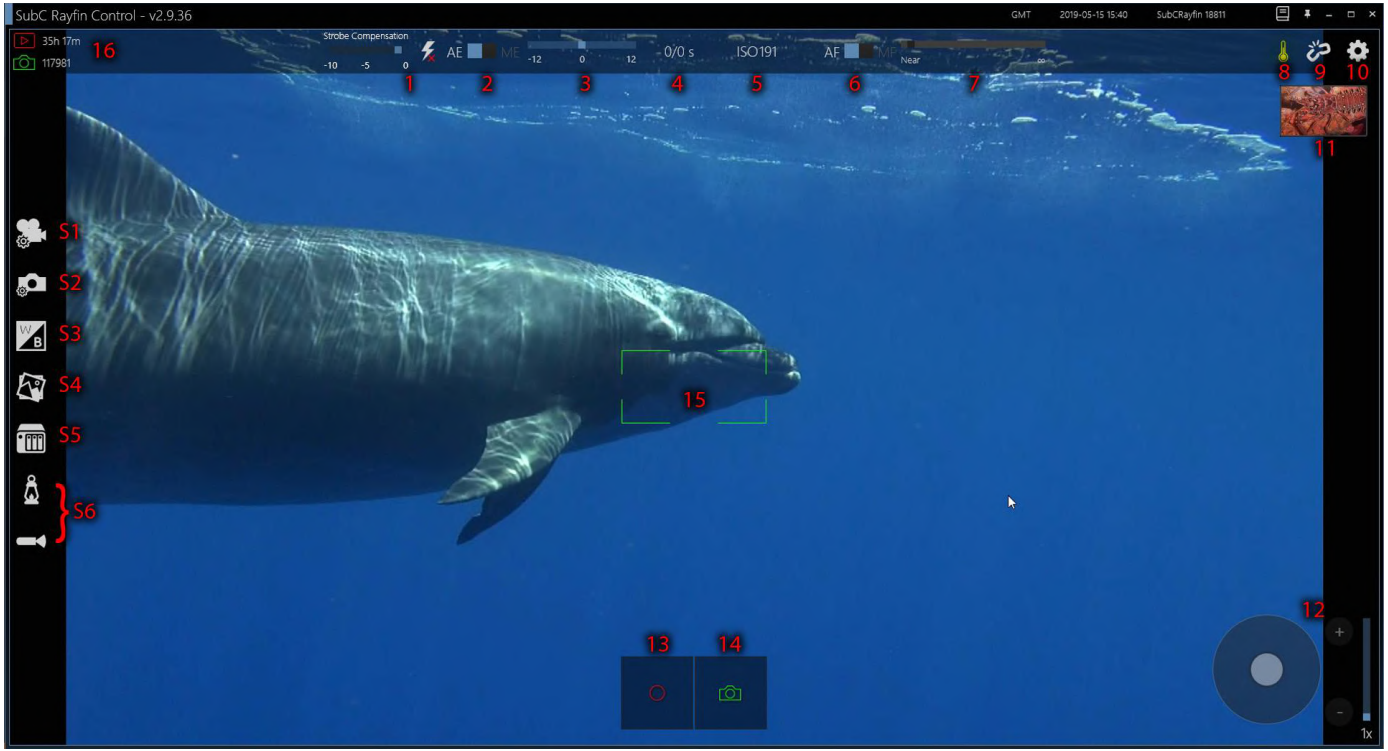




Intuitive and Easy to Use Software

[RCS overview tutorial]

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

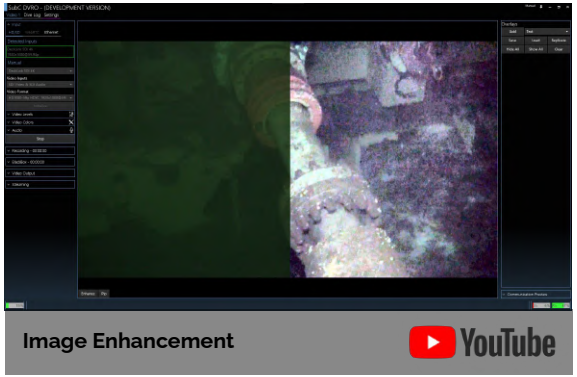
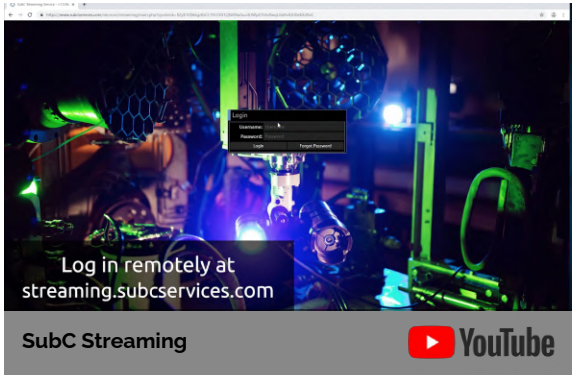


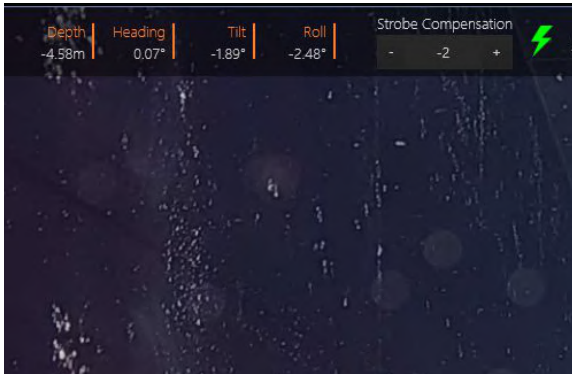
Image Enhancement

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.

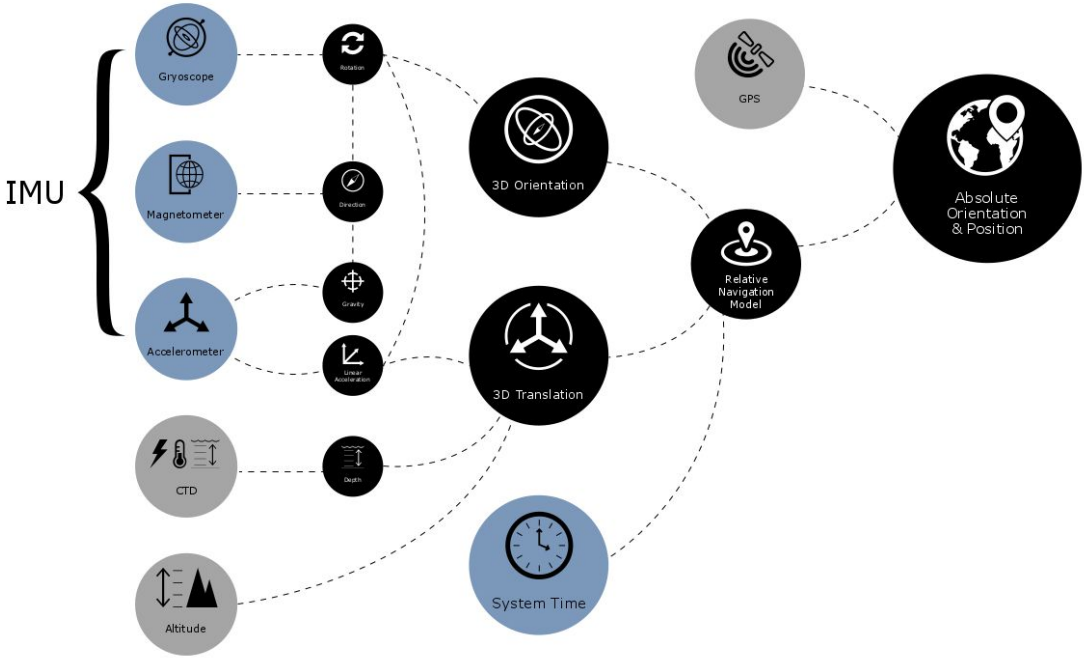
NMEA Data Logging

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.

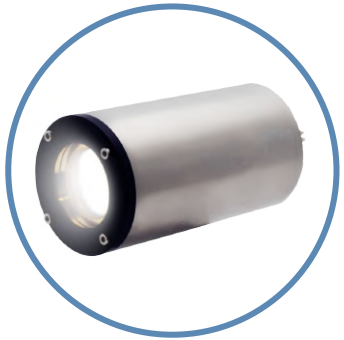
- TCP or UDP port: 8889
- RS232 or RS485 on Aux0 and Aux1

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.

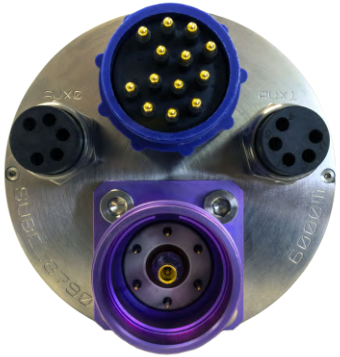
Pan-Tilts and Controllers

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-LO

Ethernet HD video and comms, SD video, serial comms

Software: AR
Electrical: CC
Production: JMH
Quality: AJW

Updated: 2020-01-08

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: 4.62mm f/2.2
Zoom: 21MP sensor zoom
(5x optical equivalent)
Focus Range: 0.5m to infinity

System

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

QC parameters of LiquidOptics

Diagonal FOV: 70° min
Horizontal FOV: 59° min
Vertical FOV: 46° min
Distortion: 2.6% max

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: Sapphire, Grade 5 Titanium
Weight: 1.6Kg in water, 3.2Kg in air
Max in-water operating temp: 30°C
Depth Rating: 6000m

Subconn MCBH5F [AUX0 Port]	Subconn MCBH5F [AUX1 Port]	Subconn DBH13M + DLSA-M [IP, Serial]	#
GND	GND	GND	1
PWR	PWR	Iso GND (Shield) (NC on system end)	2
AUX0 Out	AUX1 Out	PWR	3
AUX0 RS-232 Tx / RS-485 B(-)	AUX1 RS-232 Tx / RS-485 B(-)	(Brown) TP4- [GigE]	4
AUX0 RS-232 Rx / RS-485 A(+)	AUX1 RS-232 Rx / RS-485 A(+)	(White/Brown) TP4+ [GigE]	5
		(Blue) TP3- [GigE]	6
		(White/Blue) TP3+ [GigE]	7
		(Orange) TP1- [10/100]	8
		(White/Orange) TP1+ [10/100]	9
		(Green) TP2- [10/100]	10
		(White/Green) TP2+ [10/100]	11
			12
		Composite	13

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

Email **team@subcimaging.com** for more information

Rayfin-HDC-6000-CRE75-DBH13-LO

HDC- HD-SDI video, Ethernet HD video and comms, serial comms

Software: AR
Electrical: CC
Production: JMH
Quality: AJW

Updated: 2020-01-08

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: 4.62mm f/2.2
Zoom: 21MP sensor zoom (5x optical equivalent)
Focus Range: 0.5m 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 LiquidOptics

Diagonal FOV: 70° min
Horizontal FOV: 59° min
Vertical FOV: 46° min
Distortion: 2.6% max

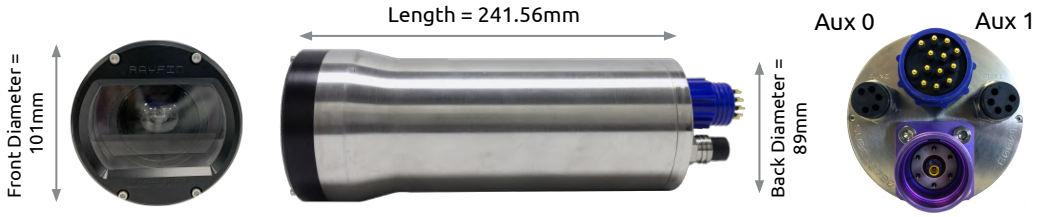
Electronics

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: Sapphire, Grade 5 Titanium
Weight: 1.6Kg in water, 3.2Kg in air
Max in-water operating temp: 30°C
Depth Rating: 6000m

Subconn MCBH5F [AUX0 Port]	Subconn MCBH5F [AUX1 Port]	CRE Titanium FRM06MCX05002001	Subconn DBH13M + DLSA-M [IP, Serial]	#
GND	GND	GND	GND	1
PWR	PWR	PWR	Iso GND (Shield) (NC on system end)	2
AUX0 Out	AUX1 Out	N/C	PWR	3
AUX0 RS-232 Tx / RS-485 B(-)	AUX1 RS-232 Tx / RS-485 B(-)	N/C	(Brown) TP4- [GigE]	4
AUX0 RS-232 Rx / RS-485 A(+)	AUX1 RS-232 Rx / RS-485 A(+)	AUX1 RS-232 Tx / RS-485 B(-)	(White/Brown) TP4+ [GigE]	5
		AUX1 RS-232 Tx / RS-485 B(-)	(Blue) TP3- [GigE]	6
		3G-SDI ***Coax Core**	(White/Blue) TP3+ [GigE]	7
		GND ***Coax Shield**	(Orange) TP1- [10/100]	8
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			(White/Orange) TP1+ [10/100]	9
			(Green) TP2- [10/100]	10
			(White/Green) TP2+ [10/100]	11



Email
team@subcimaging.com
for more information

Rayfin-UHDF-6000-Optolink-DBH13-LO-#nm

6G-SDI over SMFO, Ethernet HD video and comms, serial comms

Software: AR
Electrical: CC
Production: JMH
Quality: AJW

Updated: 2020-01-08

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: 4.62mm f/2.2
Zoom: 21MP sensor zoom (5x optical equivalent)
Focus Range: 0.5m to infinity

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

QC parameters of LiquidOptics

Diagonal FOV: 70° min
Horizontal FOV: 59° min
Vertical FOV: 46° min
Distortion: 2.6% max

Electronics

SDI Resolution: 4K/30p/25p, 1080/60p/50p, 1080/30p/24p, 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: Sapphire, Grade 5 Titanium
Weight: 1.6Kg in water, 3.2Kg in air
Max in-water operating temp: 30°C
Depth Rating: 6000m

Subconn MCBH5F [AUX0 Port]	Subconn MCBH5F [AUX1 Port]	Subconn Optolink (Ti)	Subconn DBH13M + DLSA-M [IP, Serial]	#
GND	GND	6000m rated Solid molded cable only. No PBOF. 6G-SDI video SMPTE ST-2081 Singlemode	GND	1
PWR	PWR		Iso GND (Shield) (NC on system end)	2
AUX0 Out	AUX1 Out		PWR	3
AUX0 RS-232 Tx / RS-485 B(-)	AUX1 RS-232 Tx / RS-485 B(-)		(Brown) TP4- [GigE]	4
AUX0 RS-232 Rx / RS-485 A(+)	AUX1 RS-232 Rx / RS-485 A(+)		(White/Brown) TP4+ [GigE]	5
			(Blue) TP3- [GigE]	6
			(White/Blue) TP3+ [GigE]	7
			(Orange) TP1- [10/100]	8
			(White/Orange) TP1+ [10/100]	9
			(Green) TP2- [10/100]	10
			(White/Green) TP2+ [10/100]	11
			AUX1 RS-485 B(-)	12
			AUX1 RS-485 A(+)	13

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

* wavelength in nm of fiber signal to be specified on Purchase Order

Email **team@subcimaging.com** for more information

Packaging and Quality Control

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)