



19.680 - CAM Underwater Camera System

Manual

KC Denmark A/S

Research Equipment
Limnology • Oceanography • Hydrobiology

Underwater Camera System – Max. depth 500 m

Camera:

- Resolution: 12 MP
- Field of view (FOV): 145°
- EIS – Electronic Image Stabilization
- Recording time, up to 1 hour and 30 minutes
- Image sensor chip is a SONY IMX 377, 12MP
- Resolutions up to 4K @ 30 frames/second. The default resolution is set to 1080P @ 60 frames/second, this will give the longest recording time possible
- The internal SD card is a SanDISK Extreme PRO 128 GB Pro


Lights, 2 pcs:

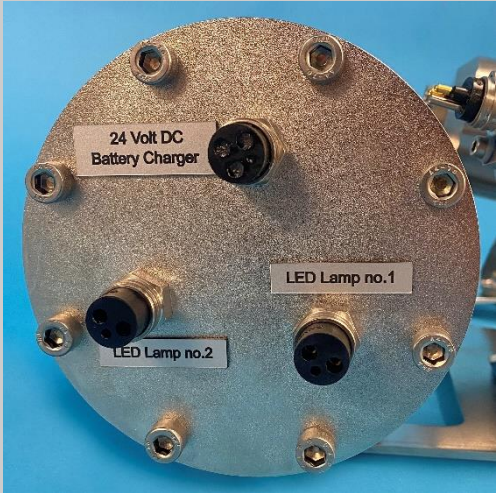

- LED chip, 50 W, each
- Intensity Luminous (lv): 6000 LM
- Viewing angle: 120 -140°
- SubConn connector


Battery and mounting brackets:


- Battery cylinder with SubConn connectors
- Capacity for 90 mins. of recording
- Fully adjustable brackets for lights/camera

Max. depth: 500 m

Item	Preparation	
1	<p>Charging the camera: The camera is charged through the USB adapter that follows the camera; it supports 5-15 V DC power supply. A DC 5 V 1~2 A charger is recommended, a standard USB charger for a mobile phone works as well.</p> <p>It takes about 2 hours to get fully charged. There is no indication of fully charged battery and it is recommended to leave the charger on for a fully 2 hours between each recording.</p> <p>If the camera has not been used for more than 2 weeks, it is recommended to fully charge the camera before use.</p> <p>Low Battery Warning: When powered on, if the charge is less than 25%, the green LED will continue to flash for 3 seconds.</p>	

<p>2</p>	<p>Charging the battery for the lamps: Charge the battery inserting the 3-conductor cable to the battery charger connector. A fully discharged battery requires charging for 8-10 hours, approx. The charger contains advanced electronics preventing overcharging even if connected for a long time.</p> <p>The SubConn connectors requires to be greased with Molykote 44, see recommendations on page 8-11.</p>	 
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Basic Camera Operation		
<p>3</p>	<p>Powering On/Off: Long press for 3 seconds the shutter button (the black knob) with green LED on, the camera is under standby mode.</p> <p>Recording On/Off: In the recording mode, click the shutter button to start recording, the green light flashes; click the shutter button again, the recording stops, the green light stops flashing.</p> <p>OBS: If red LED is flashing, double press the shutter button to return to recording mode.</p>	
<p>4</p>	<p>Abnormal SD Card Status: If the red light continues to flash quickly after powering on, it indicates that the SD card is defect or the "CameraConfig.ini" file is missing.</p>	

Deploying the camera		
5	<p>IMPORTANT: Remove the USB adapter and insert a SubConn dummy into the connector on the rear side of the camera.</p> <p>Connect two cables from the battery cylinder to the lamps; they will light up immediately. You may check if the enlightened area corresponds to the requested recording area; otherwise, you must adjust the lamps/camera accordingly.</p>	
6	<p>Once the equipment returns to the deck, disconnect the lamps and the SubConn dummy, and you are now ready to check the recordings.</p>	

Connection to the PC		
7	<p>After turning on the camera, connect it to the computer via the USB cable, then it will be recognized as a removable disc.</p> <p>IMPORTANT:</p> <ul style="list-style-type: none"> • Make sure the battery capacity exceeds 25%. Please see item 1, "Low Battery Warning" • Make sure the camera is turned on before connecting to the computer • If the camera is turned on after connected to the computer, not all computers will recognize it as a removable disk 	
8	<p>Recorded files: Each file recorded will contain 12 minutes of recording. If you want a single file, containing all the recordings, move the files to the computer and use another software to splice the video clips together.</p> <p>Recommended free software is the VLC media player which offers a lot of features: https://www.videolan.org/vlc/</p> <p>It is recommended to move the files to the computer after each recording and play the files from the computer. (Please remove recording from the cam, to make room for new recordings).</p> <p>Note:</p> <ul style="list-style-type: none"> • Do not try and format the card • Do not remove "CameraConfig.ini", then the camera will not work 	



SubConn®

Handling instructions

Follow these instructions carefully to ensure correct use of your SubConn® connectors.

Handling

- Connectors must be greased with Molykote 44 Medium before every mating
- Always grease O-rings on BH, BCR and FCR connectors with Molykote 111
- Disconnect by pulling straight out, not at an angle
- Do not pull on the cable and avoid sharp bends at cable entry
- When using a bulkhead connector, ensure that there are no angular loads
- Make sure to apply the recommended torque when tightening bulkhead nuts
- SubConn® connectors should not be exposed to extended periods of heat or direct sunlight. If a connector becomes very dry, it should be soaked in fresh water before use

Scan to access
SubConn® greasing
and cleaning
instruction videos



Greasing products



Molykote 44 Medium

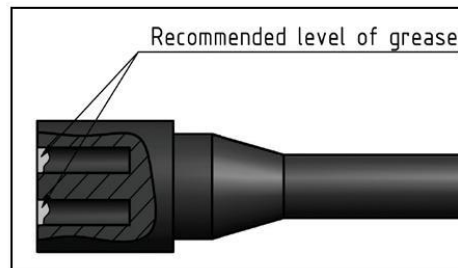


WD-40
or similar products



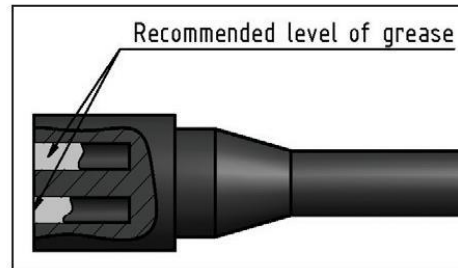
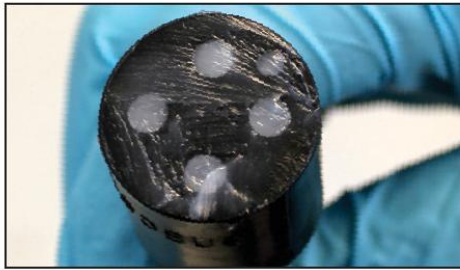
Compound
or similar greasing
products

Greasing and mating above water (dry mate)



- Connectors must be greased with Molykote 44 Medium before every mating
- A layer of grease corresponding to a minimum of 1/10 of the socket depth should be applied to the female connector
- The inner edge of all sockets should be completely covered, and a thin transparent layer of grease left visible on the face of the connector
- After greasing, fully mate the male and female connector in order to secure optimal distribution of grease on all pins and in the sockets
- To confirm that grease has been sufficiently applied, de-mate and check for grease on every male pin. Then re-mate the connector

Greasing and mating under water (wet mate)



- Connectors must be greased with Molykote 44 Medium before every mating
- A layer of grease corresponding to approximately 1/3 of a socket depth should be applied to the female connector
- All sockets should be completely sealed, and a transparent layer of grease left visible on the face of the connector
- After greasing, fully mate the male and female connector and remove any excess grease from the connector joint

Cleaning products



- * General cleaning and removal of any accumulated sand or mud on a connector should be performed using spray based contact cleaner (isopropyl alcohol)
- New grease must be applied again prior to mating

Use of Loctite

- Always use Loctite 5910 to lock non-metallic (PEEK) connectors
- For locking metallic connectors, the use of Loctite 243 is recommended



COAX connector

- Only grease the rubber parts - do not grease coax pin and socket
- Do not mate under water. To be used with locking sleeves only

Bulkhead Connectors - Tightening force

Type	Material	Rec. Torque - Nm
3/8" - 24 UNF	Brass, aluminium	4.0
	Stainless steel, titanium	6.0
	PEEK	2.0
7/16" - 20 UNF	Brass, aluminium	10.0
	Stainless steel, titanium	14.0
	PEEK	4.2
1/2" - 20 UNF	Brass, aluminium	15.0
	Stainless steel, titanium	21.0
	PEEK	5.2
5/8" - 18 UNF	Brass, aluminium	29.0
	Stainless steel, titanium	41.0
	PEEK	10.0
3/4" - 16 UNF	Brass, aluminium	44.0
	Stainless steel, titanium	63.0
	PEEK	15.0
7/8" - 14 UNF	Brass, aluminium	60.0
	Stainless steel, titanium	80.0
	PEEK	20.0
1" - 14 UNF	Brass, aluminium	75.0
	Stainless steel, titanium	100.0
	PEEK	25.0

Recommended oil for pressure balanced systems

- MacArtney recommend DC-200/350 or PMX-200/350 in oil compensated systems

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Storing and Maintenance

All parts of the item can be rinsed using salt water or fresh water. Before storing, we recommend a thoroughly cleaning with fresh water.

Safety Regulations

KC Denmark A/S is not, and cannot be held, responsible for any damage(s) made to equipment or to operators who ignore safety precautions or because of misuse or wrong operation.

An expert maintenance technician fully familiar with the attendant hazards must only do all maintenance, inspection and repairs.

When working with the unit in areas, which are difficult to access or hazardous, ensure to take adequate safety precautions for the operator and others in compliance with the provisions of law on health and safety at work.

Replace worn component with original spare parts.

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