



Lander frame for 6000 m  
Model 100.113

# Manual

**KC** Denmark

Research Equipment  
Limnology • Oceanography • Hydrobiology

<b>Table of contents</b>	<b>Item</b>	<b>Page</b>
Adding the acoustic release and the burn wire system	1-9	3-6
Adding the ballast	10-16	7-8
The catch ring	17	9
Antenna	18	9
Beacon and flash	20-21	10
Incubator chamber	22-23	10-11
Multiple water sampler	24-25	11
Profiler	26-27	12
Adjusting the height	28	12
Zinc anodes	29	13
Adding buoyancy	30-31	13
Power supply and charging	32-34	13-14
Programming	35	14
Maintenance	36	14
Schematic – Burn wire system	37	15
SubConn handling instructions		16-19

## Manual for lander frame

**Model no.  
100.113**



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.

This manual may contain photos or details from similar systems for illustration purpose, thus it might not show the present product or your actual order. The instruments may require additional brackets, racks or cables for the mounting. Every instrument comes with a separate manual.

**Before deployment, always ensure that the capacity of the buoyancy exceeds actual weight of the frame and its accessories except for the ballast itself. It is highly recommended testing in shallow water before deployment into the ocean.**



## Adding the acoustic release with burn wire system

1

Fasten the acoustic releases leaving a space of 25 mm at the bottom of the bracket.

If you prefer another spacing you must do a simultaneously adjustment of the wheel, item 5, or on the rigging screw, item 7.



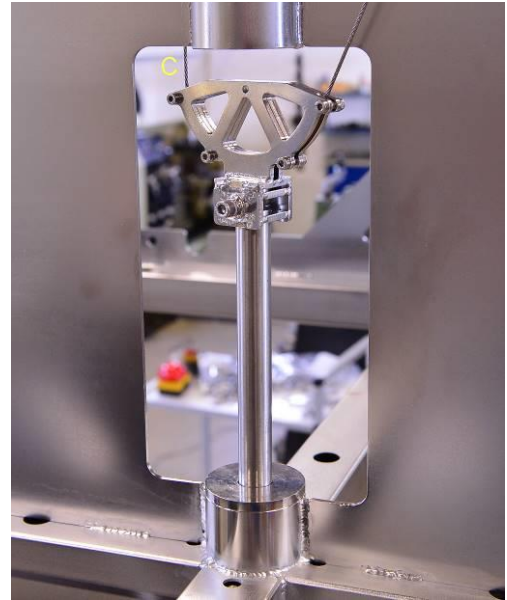
2

Attach the 2 mm wire (A) to acoustic release #1; the wire goes via "B" to the opposite side of the vertical plate; see item 3.



3

Pull up the vertical bar with the bracket and hold it as shown while loading the wire.



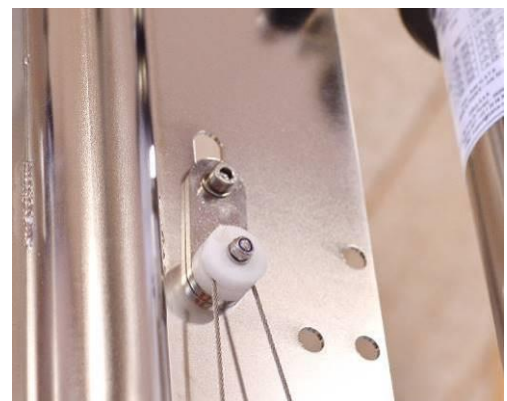
4


The wire goes via the wheel "D", insert the ring at end of wire to the locking mechanism at "E".




5

You may loosen the wheel and adjust it later on to ensure a taut wire. More adjustment can be done with the rigging screw "I", see item 7.



6	The end of the wire is locked at "E", see item 4.	
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<b>The burn wire system</b>		
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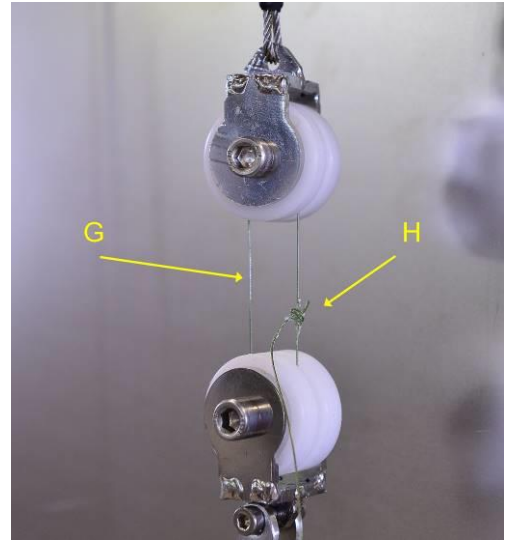
7	<p><b>Brief characteristic for the burn wire system:</b></p> <p>The burn wire link is a small loop of stainless steel wire encapsulated in a holder with 2 wheels "E" and "F". The burn wire (erosion link) will release the sampler by a fast electrolytic erosion of the exposed stainless steel part of the loop "G" and the anode "L", thereby freeing the release bracket. This occurs when a positive voltage is connected to it by an internal electronic timer (computer or similar, none of these items are part of the standard delivery).</p> <p>The burn wire itself has an epoxy coating to restrict the intended erosion to two points at the base of the loop to speed the release and save on battery drain.</p> <p>Replace the burn wire (on wheel "E" and "F") after each release.</p>	
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8

Remove the encapsulation for a length of approx. 5 mm "G"; a small knife will do the job.

"H" shows a small knot for the wire.

A schematic for the burn wire system can be found on page 15.



9

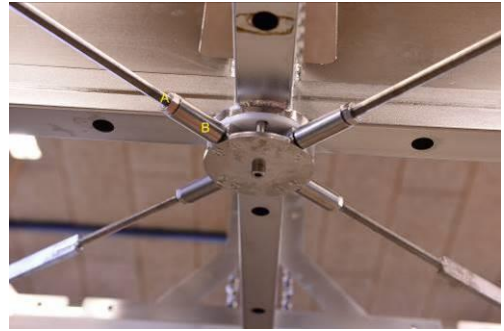
The steel wire from wheel "F" goes to acoustic release #2.



## Adding the ballast

10

Loosen 4 nuts "A" and the holder "B" by turning counterclockwise for approx. 25 mm, so each bar is released into a sloping angle, see item 11.



11





The arm is released for inserting the chain at the opposite end.






12



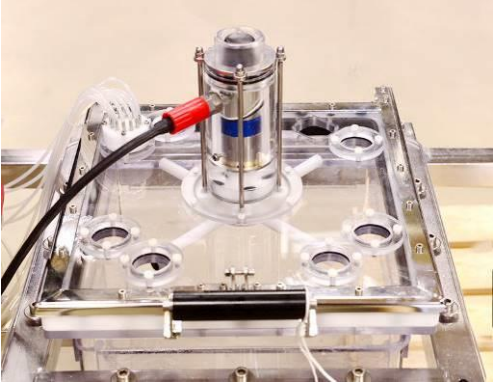
The chain "D" holds the bucket "E" for the ballast.






<p>13</p>	<p>Insert and hold the chain "C" into the locking mechanism, raise the release arm to horizontal position as shown in item 14.</p>	
<p>14</p>	<p>The locking arm in horizontal position holds the chain for the ballast.</p>	
<p>15</p>	<p>Turn "B" clockwise and align the end of "B" into the release mechanism so the arm remains in horizontal position. Secure with the nut "A". Do not tighten "B" too close against the release mechanism at the centre, as it may hinder a correct release.</p>	
<p>16</p>	<p>When ready for deployment fill up the ballast buckets with a suitable ballast, like concrete, lead or similar heavy materials.</p>	



<b>Catch ring</b>		
17	Mount the catch ring on top of the lander frame.	
<b>Antenna</b>		
18	Mount the holder for the antenna on the upper, horizontal frame.	
19	Fasten the antenna to the holder.	

	<p><b>Beacon and flash</b></p>	
<p>20</p>	<p>We can provide brackets for any beacon and flash systems but we have very good experience with the products from MetOcean Canada.</p> <p>The photo shows:</p> <p>NOVATECH RF-700A1 VHF radio Locatable System. Transmitter 7.300 m depth, Frequency Range: 154.585, 159.480, 160.725, 160.785 MHz, additional frequency options available.</p> <p>NOVATECH ST400A XENON FLASHER for 7.300 m depth. It is activated by a pressure switch, which enables the unit to automatically power OFF below 10 m and activate upon surfacing.</p>	
<p>21</p>	<p>Beacon receiver. DF-500N with four factory preset channels (154.585, 159.480, 160.725, 160.785 MHz) and two optional custom channels.</p>	
	<p><b>Incubator chamber</b></p>	
<p>22</p>	<p>The incubator chamber with support for various probes; at the upper left corner you will find 24 tubes for a multiple water sampler.</p> <p>The chamber is made of Polycarbonate, dimension 300 x 300 x 350 mm. The chamber has a flat bottom.</p>	

<p>23</p>	<p>Incubator chamber manufactured from AISI 316 stainless steel, dimension 300 x 300 x 350 mm. It can be equipped with a hydraulic shovel to keep the sample upon retrieving the lander. The chamber can be coated with green Teflon (800 µm) upon request.</p>	
<p><b>Multiple water sampler</b></p>		
<p>24</p>	<p>Standard delivery takes 8, 12 or 24 samples, but one or more syringes can be operated in reversed order for injecting of preservation liquid or similar into the benthic chamber, either on start of the sampling or later on during the process.</p> <p>It is highly recommended to order this option with the sampler, as a subsequent mounting demands some disassembly of the sampler.</p>	
<p>25</p>	<p>The center and the upper part of the motor has a very strong magnetic field and may delete or alter sensitive magnetic data stored on cards or other media.</p>	

## Profiler

26

The profiler allows profiling into the sea bed with intervals of 0,05 mm/each step. On request, a higher resolution is available.



27

The standard holder for sensors supports up to 8 sensors/probes.



## Adjusting the height

28





The height of the lander's feet will determine the penetration depth for the flux chambers. You can adjust the height of the lander by removing the bolt in each leg and pulling out the leg to the desired depth. Insert the bolt and secure it.




### **IMPORTANT: Protecting the flux chambers and/or sensors for the profiler:**

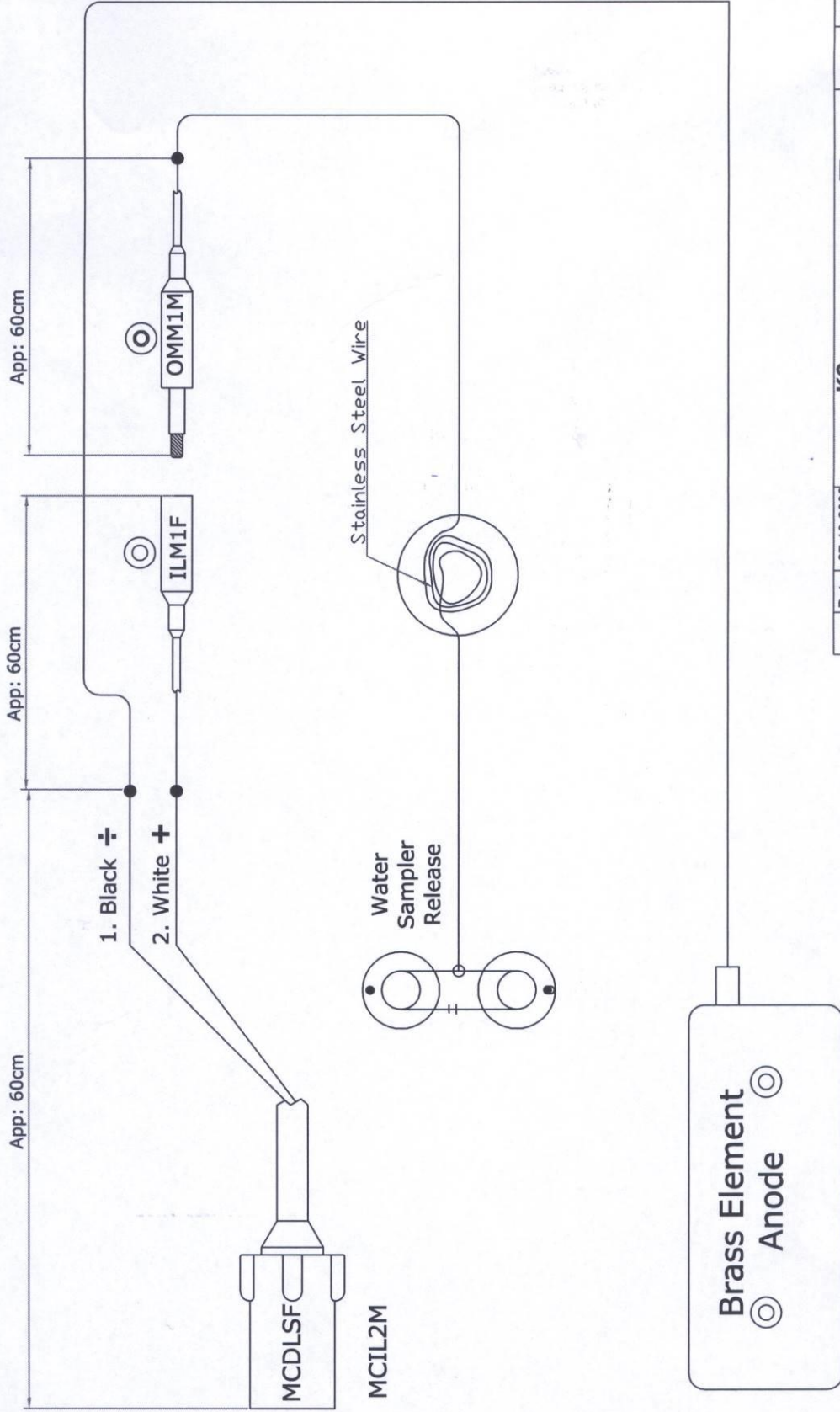
Before adjusting the height, it is very important to lift up the lander or add some stable spacers beneath its legs, i.e. 1 or 2 pallets to avoid damage to probes or incubator chamber as they are positioned beneath the lander's feet.

If preferable, you can do all other installation at once and adjust the height when you are ready to deploy the lander.



	<h2>Zinc anodes</h2>	
<p>29</p>	<p>Before deployment, check the zinc anodes on each side of the frame. Replace, if corrosion applies to one or more anodes.</p>	
	<h2>Adding buoyancy</h2>	
<p>30</p>	<p>Mount the buoyancy. The photo shows 17" Nautilus Vitrovex glass spheres floatation with ribbed orange hard hats. Buoyancy app. 25 kg each unit.</p> <p><b>Before deployment, always ensure that the capacity of the buoyancy exceeds actual weight of the frame and its accessories except for the ballast itself.</b></p>	
<p>31</p>	<p>A lander frame shown with Syntactic Foam Blocks for 11500 m. Buoyancy app. 38 kg each unit.</p> <p><b>Before deployment, always ensure that the capacity of the buoyancy exceeds actual weight of the frame and its accessories except for the ballast itself.</b></p>	
	<h2>Power supply and charging</h2>	
<p>32</p>	<p>All cables and connectors are marked and they can easily be identified.</p>	

32	<p>Power supply consists of one or more batteries in various housing. The photo shows a high capacity battery for 11000 m.</p>	
33	<p>Battery cylinder for 6000 m depth with room for electronics.</p>	
34	<p>The lander comes with one or two chargers for the batteries; each charger has a label identifying the appropriate battery.</p> <p>Both chargers are microprocessor-controlled and provides you with a fully automatic, hands-off charging; you will never need to fear overcharging or undercharging.</p>	
<p><b>Programming</b></p>		
35	<p>Install the corresponding software for every unit; some units may require inserting a plug right before deployment so the programmed sequence will start.</p>	
<p><b>Maintenance</b></p>		
36	<p>Before storing the lander and its accessories, it is important to clean all parts with fresh water, especially when used in salt water.</p> <p>Grease the SubConn connectors as per the following instructions, especially page 16 and 18.</p>	



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**Diagram for  
 Burn-wire Cable**

100.000



# 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

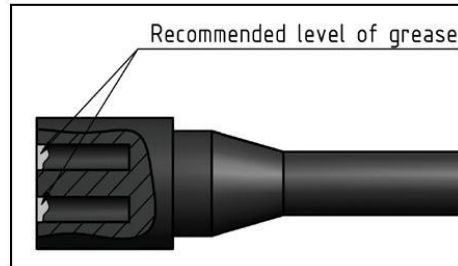


WD-40  
or similar products



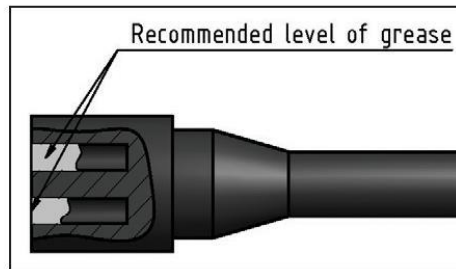
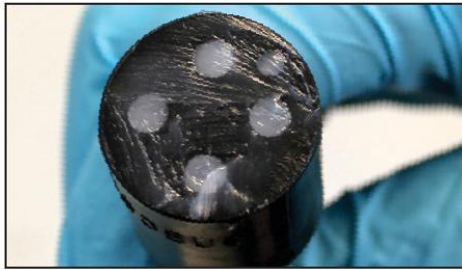
Compound  
or similar greasing  
products

## 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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