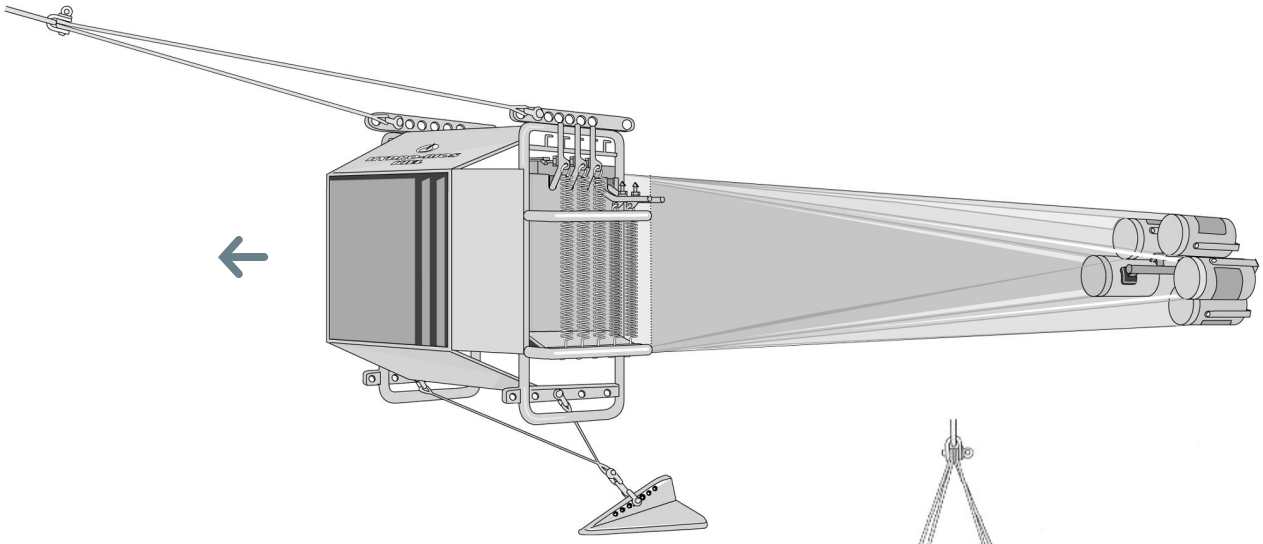
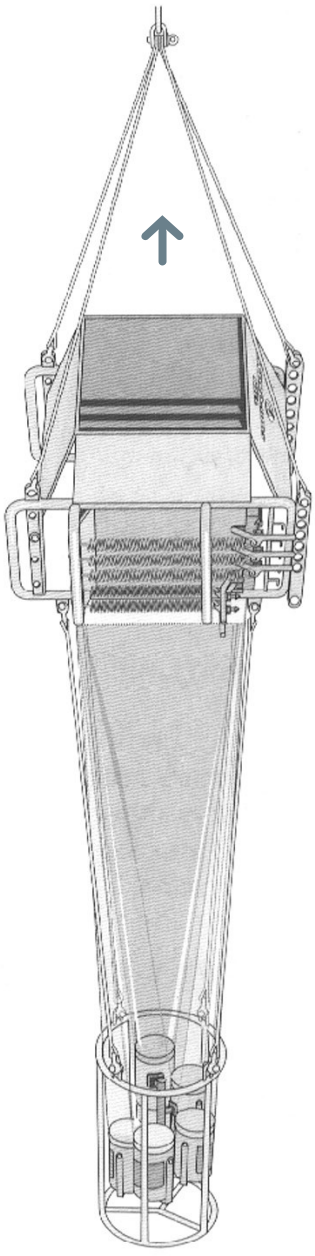
MultiNet

Multiple Plankton Sampler





ABOUT

Smart Sampling at its best – with the improved MultiNet generation of the Multiple Plankton Sampler, the world's leading sampling system for horizontal, oblique and vertical collections in successive water layers.

The MultiNet can be delivered in 4 sizes (apertures): Mini (0.125 m²), Midi (0.25 m²), Maxi (0.5 m²) and Mammoth (1 m²).

Depending on the model 5 or 9 net bags are attached to the stainless steel frame with strong canvas part by means of zip fasteners. The net bags are opened and closed by means of levers which are triggered by a battery powered Motor Unit. The commands for actuation of the net bags are given via single or multi-conductor cable between the Underwater Unit and the included Deck Command Unit.

A wide selection of mesh sizes for the net bags is available to meet the requirements of all standard and non-standard applications. For common horizontal collections a mesh size of 300 microns is recommended (mesh sizes from 100 to 780 microns available), for vertical collections mesh sizes from 55 to 780 microns are applicable.

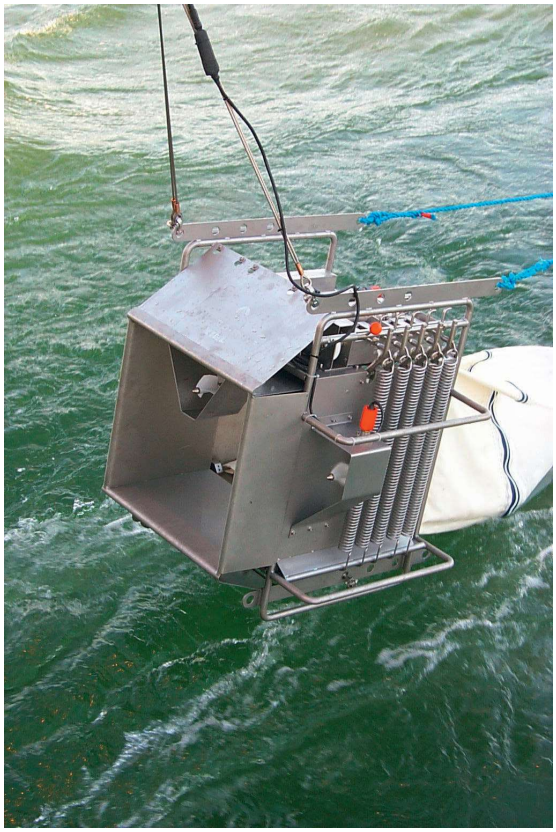
An integrated Pressure Sensor (measuring range according to customers' requirements) allows continuous supervision of the current operating depth. Depth values and all relevant system data are shown on the LCD-display of the Deck Command Unit.

Two Electronic Flow Meters with automatic angle compensation are mounted to the Underwater Unit:

FEATURES

- Horizontal and vertical sampling with one single instrument
- Combined online/offline use (standard)
- Bi-directional communication
- Standard depth range 3000 m
- Long distance FSK-telemetry (> 10000m)
- Low power consumption
- Battery operated Underwater Unit, max. voltage of 5 V at the conductor cable
- Electronics operate from -40°C up to +85°
- EC-conformity (CE) EN 50081-1, EN 50082-1
- Expandable range of sensors

one inside the frame for the determination of the amount of water passing through the open nets, one outside the opening for the determination of clogging effects.
For horizontal collections a V-Fin Depth Depressor is attached to the MultiNet. To carry out vertical collections, a stainless steel support is securely attached to the net buckets and enables a quick lowering to depth.



Operation

In its initial position the MultiNet is brought to water with all net bags closed and the water flowing freely through the frame. The instrument can be lowered with high speed to the greatest desired depth. There the first net bag is opened by push-button control from the Deck Command Unit.
At the end of the horizontal collection resp. after passing the intended depth interval in case of vertical operation, the first net bag is closed by a second command.
The second net is opened simultaneously. This procedure is repeated for the remaining net bags and the Deck Command Unit indicates the number of the currently active net bag.
During operations of Mini and Midi versions the last net (no. 5) remains open to collect plankton from the smallest desired depth up to the water surface.
Using the Maxi and Mammoth versions the last net (no. 9) can be closed before reaching the water surface.

Offline Use

In case that a conducting cable is not available on board, the required sampling depth can be pre-programmed via personal computer. The activation of the net bags is then carried out automatically according to the pre-selected depth intervals. All measuring data are stored inside the internal data memory of 16 MByte during the operation and can be read out by a PC when the MultiNet is back on board.

ACCESSORIES

CT-Set

Together with the optional CT-Set the system offers the full capability of a state-of-the-art oceanographic CTD probe. The CT-Set consists of one conductivity sensor, one temperature sensor and an additional electronics board which are completely integrated into the Motor Unit of the MultiNet. From the CTD data the system computes salinity, density and sound velocity according to UNESCO formulas.

Pitch and Roll Sensor

The Pitch and Roll Sensor has been developed for measurements of pitch angle and roll angle of the Underwater Unit of the MultiNet. It allows continuous supervision of the current orientation during horizontal operations.

OPTIONS

- Additional sensors of various parameters
- Special version for operational depths down to 6000 metres

TECHNICAL DATA

Underwater Unit	Type Mini No. 438 120	Type Midi No. 438 130	Type Maxi No. 438 140	Type Mammoth No. 438 180
Dimensions (w x l x h)	65 cm x 90 cm x 80 cm	80 cm x 90 cm x 95 cm	120 cm x 110 cm x 135 cm	150 cm x 120 cm x 160 cm
Net opening	35.5 cm x 35.5 cm = 0.125 m²	50 cm x 50 cm = 0.25 m²	71 cm x 71 cm = 0.5 m²	100 cm x 100 cm = 1 m²
Net Bags	5 pcs., length: 160 cm	5 pcs., length: 250 cm	9 pcs., length: 365 cm	9 pcs., length: 550 cm
Standard mesh size	300 microns	300 microns	300 microns	300 microns
Plastic Net Buckets	5 pcs., 11 cm dia.	5 pcs., 11 cm dia.	9 pcs., 11 cm dia.	9 pcs., 11 cm dia.
Soft Net Buckets	5 pcs., 11 cm dia.	5 pcs., 11 cm dia.	9 pcs., 11 cm dia.	9 pcs., 11 cm dia.
Overall length ready for operation (from bridle to net bucket	470 cm	560 cm	800 cm	1000 cm
Weights				
Net Frame	approx. 75 kg	approx. 100 kg	approx. 260 kg	approx. 390 kg
Stainless Steel Support	approx. 30 kg	approx. 50 kg	approx. 70 kg	approx. 100 kg
V-Fin Depth Depressor	approx. 22 kg	approx. 22 kg	approx. 70 kg	approx. 70 kg
Materials				
Net frame	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
Motor Unit and Battery Housing	Titanium	Titanium	Titanium	Titanium
Net Bags	Polyamide	Polyamide	Polyamide	Polyamide
Net Buckets	PVC/Canvas	PVC/Canvas	PVC/Canvas	PVC/Canvas
V-Fin Depth Depressor	Aluminium, lead-weighted	Aluminium, lead-weighted	Aluminium, lead-weighted	Aluminium, lead-weighted
Operational Depth	Standard 3000 metres	Standard 3000 metres	Standard 3000 metres	Standard 3000 metres
Pressure Sensor	Standard 3000.0 dbar ± 0.1% f.s. (other ranges on request)	Standard 3000.0 dbar ± 0.1% f.s. (other ranges on request)	Standard 3000.0 dbar ± 0.1% f.s. (other ranges on request)	Standard 3000.0 dbar ± 0.1% f.s. (other ranges on request)
Offline-Set	Data memory: 16 MB	Data memory: 16 MB	Data memory: 16 MB	Data memory: 16 MB
Electronic Flow Meter	2 pcs., 0.0 ... 9.9 m/s	2 pcs., 0.0 ... 9.9 m/s	2 pcs., 0.0 ... 9.9 m/s	2 pcs., 0.0 ... 9.9 m/s
Connection Plug	SUBCONN IL 2 M	SUBCONN IL 2 M	SUBCONN IL 2 M	SUBCONN IL 2 M
Cable Counter Plug	SUBCONN IL 2 F	SUBCONN IL 2 F	SUBCONN IL 2 F	SUBCONN IL 2 F
Cable connection	Electro-mechanical single- or multi-conductor cable, one pole can be in contact with sea water			

Towing Cables	Type Mini No. 438 120	Type Midi No. 438 130	Type Maxi No. 438 140	Type Mammoth No. 438 180
Breaking load for shallow water applications (up to 500 m)	approx. 1500 kg	approx. 2000 kg	approx. 4000 kg	approx. 8000 kg
for deep sea applications (from 500 m up to 3000 m)	approx. 5000 kg	approx. 8000 kg	approx. 12000 kg	approx. 18000 kg
Max. cable resistance (go-and-return line)	1000 Ohms	1000 Ohms	1000 Ohms	1000 Ohms
Deck Command Unit:	Metal housing for use in 19" rack or as table housing, not for use on deck; push-button control for net changing; indication of net number, pressure, battery status, ... Supertwist LCD-display with LED backlight; Interface for Personal Computer (RS 232)			
Power Supply				
Underwater Unit	3 Lithium Batteries DL 123 A/3V, sufficient for approx. 100 hours operation			
Deck Command Unit	85 - 260 VAC	85 - 260 VAC	85 - 260 VAC	85 - 260 VAC
Towing Speed	Recommended for nets with 300 microns standard mesh size			
Horizontal Collections	max. 4 knots	max. 4 knots	max. 4 knots	max. 4 knots
Vertical Collections	max. 1 m per sec.	max. 1 m per sec.	max. 1 m per sec.	max. 1 m per sec.
The single- or multi-conductor cable is not included in our scope of delivery.				

ORDERING INFORMATION	
Products	
438 120	**MultiNet Type Mini,** 0.125 m²
438 130	**MultiNet Type Midi,** 0.25 m²
438 140	**MultiNet Type Maxi,** 0.5 m²
438 180	**MultiNet Type Mammoth,** 1 m²
Accessories	
450 500	**CT-Set for MultiNet** Conductivity sensor: 0 ... 65 ± 0.01 mS/cm, Temperature sensor: -2 ... +32 ± 0.005°C Data rate: 1 Hz (1 data set per second)
438 161	**Pitch and Roll Sensor** Channel Pitch: + 60° ... - 60° ± 1° related to the horizontal Channel Roll: + 60° ... - 60° ± 1° related to the horizontal
Spare Parts	
438 123	**Spare Net Part** (one single net) for MultiNet Type Mini
438 127	**Spare Canvas Part** for MultiNet Type Mini
438 133	**Spare Net Part** (one single net) for MultiNet Type Midi
438 137	**Spare Canvas Part** for MultiNet Type Midi
438 143	**Spare Net Part** (one single net) for MultiNet Type Maxi
438 147	**Spare Canvas Part** for MultiNet Type Maxi
438 183	**Spare Net Part** (one single net) for MultiNet Type Mammoth
438 187	**Spare Canvas Part** for MultiNet Type Mammoth
438 150	**Spare Plastic Net Bucket,** consisting of: a) Fixing Ring with over centre fasteners for attaching to the end of a net b) PVC-Net Bucket with side window, covered with sieve gauze
438 930	**Soft Net Bucket** with bolt rope
438 935	**Mounting ring** for Soft Net Bucket
438 116-in	**Electronic Flow Meter (inner)** for MultiNet
438 116-out	**Electronic Flow Meter (outer)** for MultiNet