

DEKKER  DREDGERS

# CSD 500-20"

Featuring C-Star MaPos (marine positioning system)  
and C-Star Operational Management System



## CSD 500-20"

The Dekker Cutter Suction Dredgers are used for capital dredging and sand mining. The control room is ergonomic and spacious built and is equipped with air conditioning and heating. The cutter dredgers are robust, effective and straight forward to control. The dredger is controlled by one operator and can easily be transported by road or ship.



### GENERAL:

Type	Cutter Suction Dredger, dismountable pontoon
Classification	ES-TRIN - European Standard Laying down Technical Requirements for Inland Navigation vessels; LLOYDS Classification Society

Weight	135 ton
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### DIMENSIONS:

Dimensions hull	25,00 x 8,05 x 1,70 m
Length over all	38,00 m (as cutter dredger)
Breadth over all	8,90 m
Cutting width	40 m (at max depth)
Cutter diameter	ø 1.625 mm
Cutter type crown	ESCO with GeoVor chisels
Max dredging depth	12 m
Min dredging depth	± 2 m
Draught	± 1,00 m
Suction/discharge line	ø 550 mm / ø 500 mm
Spuds	2 pieces, 18 m x ø 0,60 m
Max. spud cylinder stroke	1,5 m

### POWER DIESEL:

Total installed power	1293 kW
Main diesel engine	954 kW at 1800 rpm Caterpillar 3512C TA
Auxiliary diesel	Caterpillar C12 TA
Prime power rating	339 kW at 1.800 rpm
Fuel type	Diesel
Harbour Generator	Caterpillar C2.2

### POWER TRANSMISSION:

Cutter motor	180 kW at 0-35 rpm
Hydraulic installation	Driving cutter, winches and spuds
Electrical installation	24 V DC and 230/400 V AC, 35 kVa

### VOLUMES/WEIGHTS:

Fuel tanks	20 m <sup>3</sup>
Ballast tanks	8,5 m <sup>3</sup>
Hydraulic oil	2,6 m <sup>3</sup>
Fresh water tanks	11 m <sup>3</sup>

### PERFORMANCE/PUMP DATA:

Dredge pump type	WARMAN GH 500
Max. mixture capacity	4.500 m <sup>3</sup> /hr
Impeller diameter	1.170 mm
Impeller vanes	3
Internal impeller width	280 mm
Spherical passage pump	280 mm

### WINCHES:

Ladder hoisting	Hydraulic winch, 120 kN, 0-15 m/min
Side winches (2x)	Hydraulic winch, 120 kN, 0-15 m/min

### INSTRUMENTATION:

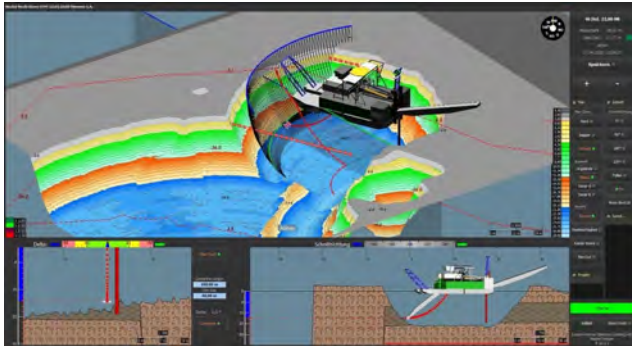
- C-Star MaPos DGPS with 3D visualization
- C-Star Operation Management System
- Dredging depth indicator
- Vacuum and pressure indication of dredge pump
- Engine control panel (DCU)



Featuring:

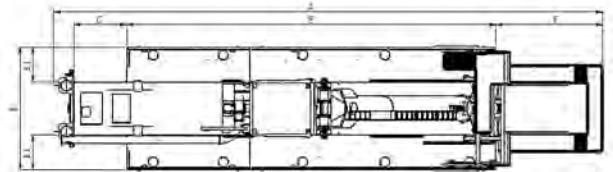
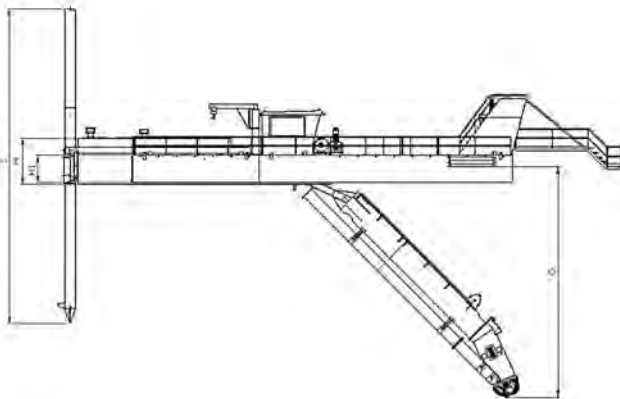
### C-Star 3D MaPos

Position & orientation determination of dredging tool by satellite-based measuring device (DGNS) and sensors.



### C-Star operational management system

Realtime remote access for maximum performance and efficiency



### OPTIONAL:

- Pump-jet system for cutterhead
- Pipeline & floaters
- Booster Pump Stations

- Anchor booms
- Day accommodations
- Communication package
- Dredge Automation package



## Extraction Monitoring Visualisation of dredging in real time



The MaPoS\_DGPS system – short for Marine Position Differential Global Positioning System – is an extraction control system developed by Dekker Dredgers for the efficient extraction of deposits and dredging areas. Our aim: optimal exploitation of extraction areas, the reduction of extraction losses, optimisation of extraction processes, and the minimisation of slope failure risks. Your benefits: precise positioning of the dredger and the excavation apparatus, direct visualisation of all information during the dredging process, and simultaneous documentation of all data using the same software.





**The MaPoS system can be used with any kind of dredger and includes the following components:**

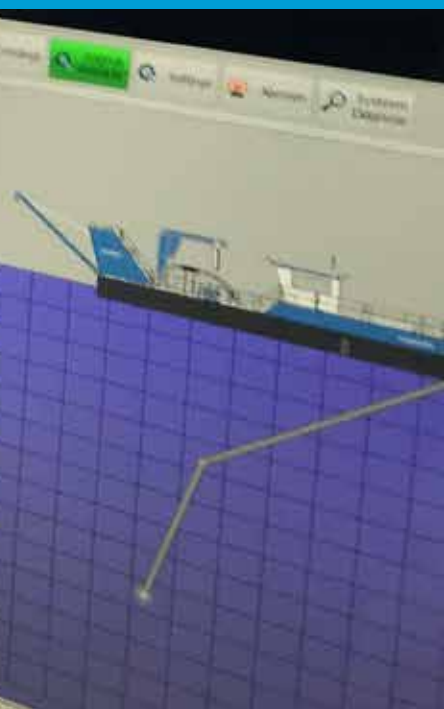
- ▶ a robust industrial PC with the newest technology installed on board the dredger
- ▶ a touchscreen monitor (no keyboard or mouse necessary for operation)
- ▶ dual GPS receiver with integrated digital compass
- ▶ IPC electronics, sensors, and cabling
- ▶ dredger and office analysis software

## The main characteristics of our dredge monitoring system are:

- The dredging can be done systematically within predefined limits according to the approval guidelines and in order to minimize losses of raw material. A further dredging of the already dredged areas will not be necessary afterwards. This results in considerable savings of personnel- and operational costs.
- Exceedance of dredging limits in the critical slope area will be avoided. Thereby the risk of slope failures is minimized.



- Recordings of positions and depths of the dredging are possible and can be provided to approval authorities if necessary.
- The height of the seabed in the dredging area is recorded continuously by deployment of echo sounders. The results are visualized on the monitor of the dredge monitoring system as plan and profiles. Slides within the dredged area and in the periphery can optionally be recorded.



## C-Star MaPos\_DREDGER offers versatile display options for dredger operators and remote monitoring:

Position and orientation determination of dredging tool by satellite-based measuring device (DGNSS/TRK) and sensors. Continuous visualization of information during the dredging process for the operator. Evaluation of the data with the same office and planning software.

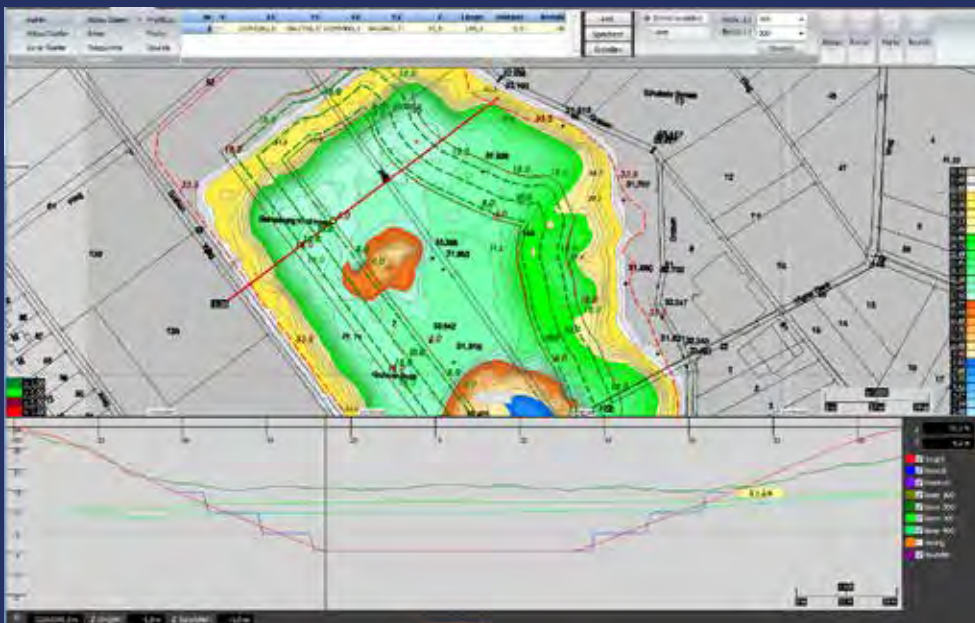
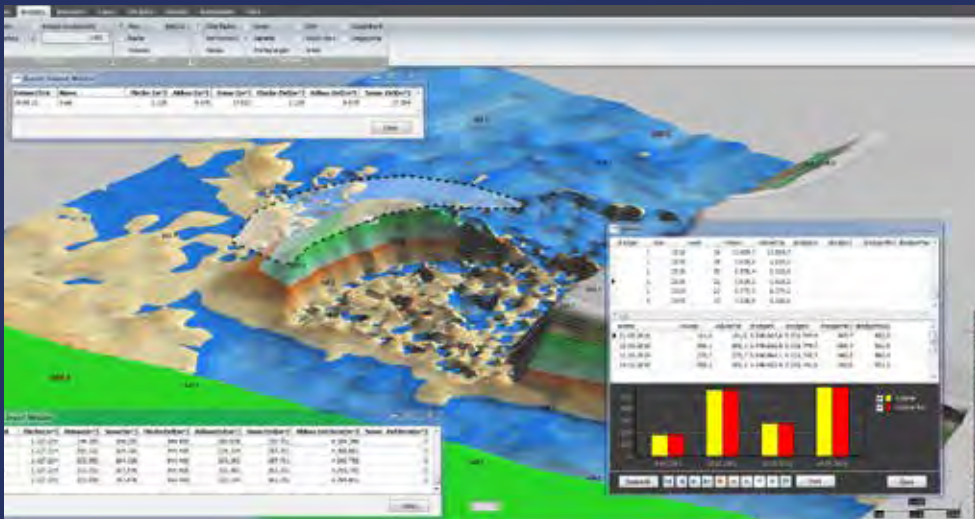
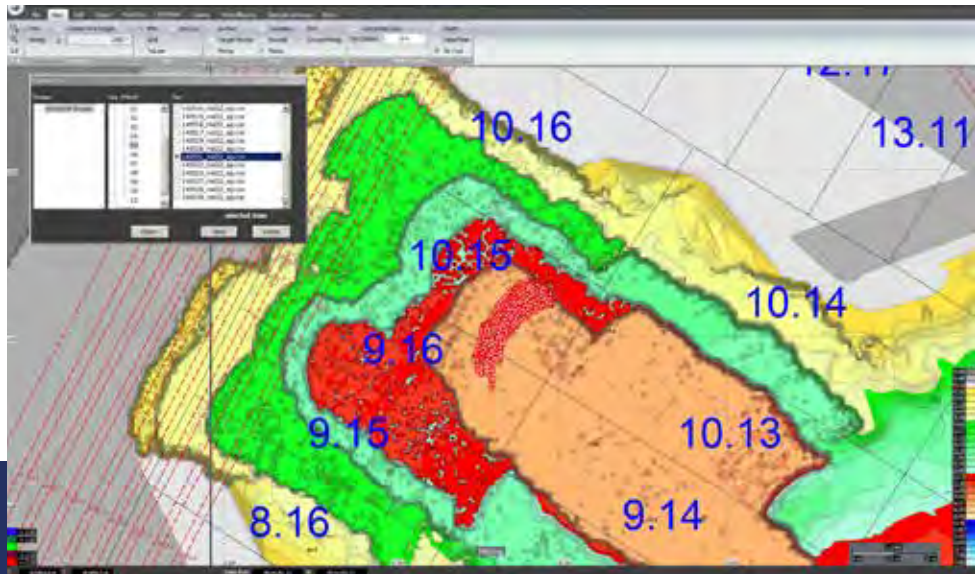
- Freely movable 2D, 3D and profile views;
- Continuously updated remaining material maps and the success control of the dredging process;
- Adjustable grid size to adapt the dredging accuracy;
- Remote maintenance, service and training;
- Choice between dredging display and optional: echo sounder display;
- Field boundaries, mining boundaries, slope angles, mining horizons, tolerance ranges and operating standards;
- Print of plans and cross sections of the dredging area being true to scale;
- Specifications of mining areas for the dredging operator;
- Delimitation of non-minable areas or restricted zones;
- Estimation of the dredged quantities for output assessment;
- Determination of the productive dredging times;
- Comprehension of the dredging paths;
- Export of the data into CAD- or GIS-programmes;
- Real-time visualization of efficiency and productivity;
- Real-time visualization of consumed energy and costs;



- Morphology of the water bottom;
- Actual and target slopes;
- Exploitable material thickness at the current position of the dredger;
- Dredger obstacles, intermediate medium and other special features of the deposit;
- Current position of the loosening tool at an appropriate position accuracy;
- Success control of the intended areal removal by color-coded marking;
- The dredging control is realized by a continuous and direct information of the dredger operator during the dredging process;
- Combination of schematic display and satellite images (GeoTiff), superimposed or in adjustable transparency;
- Data logging for documentation;
- Analysis of the data is possible with the C-Star MaPos\_OFFICE software;
- Visualization of slope landslides in the area of the dredger;
- Working method;
- Dredging performance;
- Display of the optimal cut in accordance to the spud position;
- Spud position/movement and depth/heights;
- Direct data transfer from dredger to operating management computer;

## Optional

- Anchor position
- Pitch and roll of the dredger
- Slope sonar,
- Echo sounders, 360° sonar scanner, turbidity upgrade
- Automatically water-level adjustment
- Acquisition of system operational data (power consumption, mass flow rate, etc.)
- More than one dredger displayed on the screen
- Operation data Dashboard (visualization of energy consumption, dredging performance,





## C-Star MaPos\_DREDGER Software Version 9.x.

The software is used for the collection of data and the visualisation of the dredging process. On board the dredging operator is provided continuously with the following information in a 2D or 3D view of a plan display and also in a user-defined cross-section display:

- Real estate boundaries, mining boundaries, slope angles, quarrying horizons, tolerance ranges and operating standards;
- Morphology of the seabed;
- Target-and actual slopes;
- Remaining material thickness at the current dredging position;
- Dredging barriers, interburden, other features of the deposit;
- Current position of the loosing tool at reasonable accuracy of the position (accuracy within decimetre range);
- Visible success of the intended extensive removal displayed by colour-coded labelling of spatial areas, which are not sufficiently dredged.



## Scope of MaPos\_DGPS:

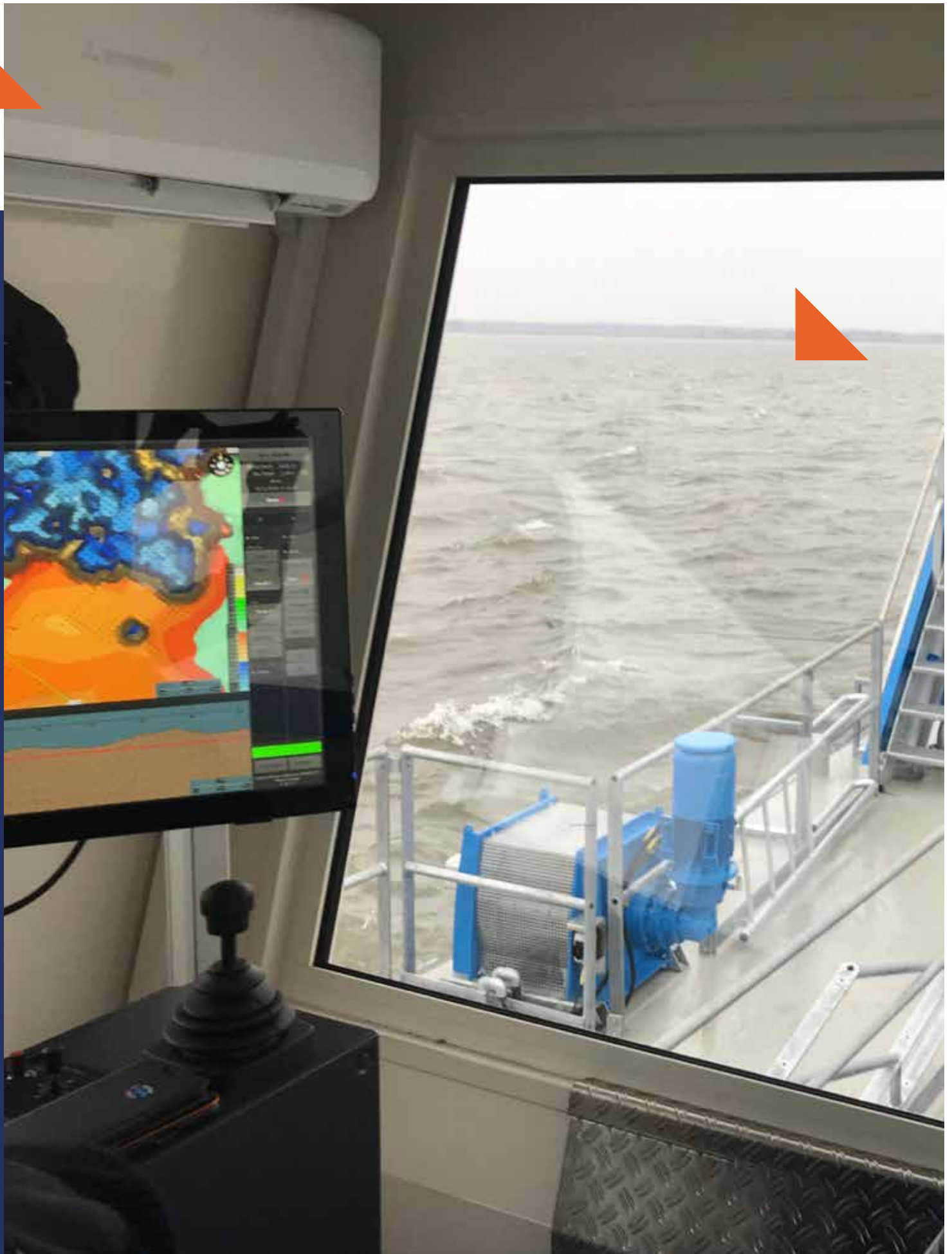
- Durable, up-to-date industry-PC on board of dredger;
- Touchscreen monitor;  
Dual-GPS-receiver/RTK with integrated digital compass;
- IPC-electronics, sensors (e.g. echo sounders, depth sensor), required cables set;
- Dredger software, office software for data evaluation and planning of the dredging process

## MaPos\_OFFICE: features and applications:

- Display modes identical to MaPos\_DREDGER
- Evaluation of activities (warping, working times day/month/year, ...)
- Direct comparison of mining data and optional echo sounder data e.g. as evidence for authorities
- Creation of profile sections, also as a group with freely selectable spacing
- Display of additional map content (e.g. plots, property boundaries, etc.)
- Volume estimation of removed material
- Dredge planning











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