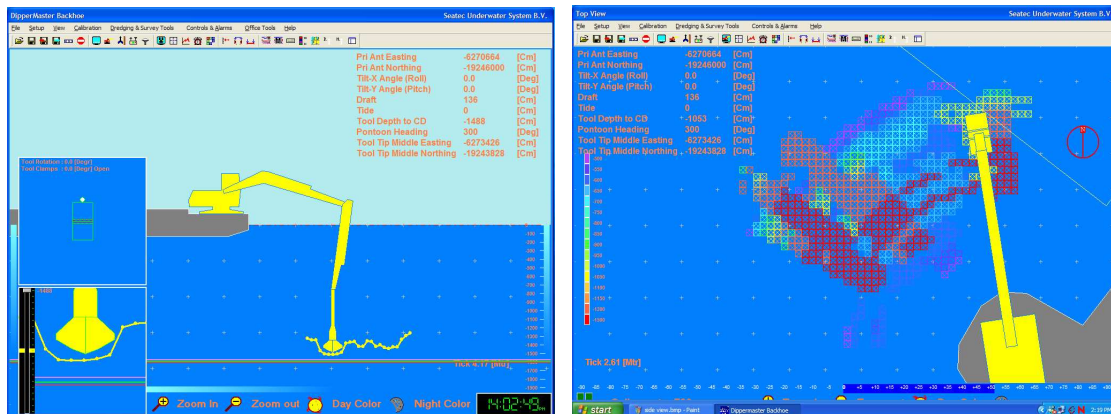


DMMS-003 Dippermaster Monitoring System



Seatec offers state of the art equipment position information systems for earth-moving and dredging installations that can be offered installation-, functionality-, quality- and design-specific.

DipperMaster Monitoring System DMMS-003 has been developed for floating excavators where a graphical presentation (top and side view) of the (submerged) equipment is required. Tool position information for reference and registration purposes is generated.

Sensors are mounted on all relevant equipment parts to measure the corresponding angles. The tool position is calculated in reference to a pre-set point on the excavator. The position in world / local coordinates is defined with a draft sensor and tide, heading and position information devices. Analog sensors are connected to an interface cabinet which performs data acquisition and supply functions while serial devices can be coupled to local multiports.



The central processing unit offers all required functions for data management and presentation which are available via pointing device, keyboard and monitor(s).

Computer, monitor(s) and interface units are to be mounted in the operator crane cabin.

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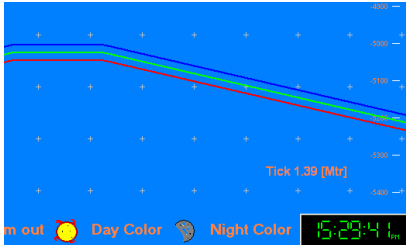
Position information acquisition

To obtain the required information, the system can be offered with the following items:

- Boom, stick and tool angle measuring package**
This package provides information about the boom, stick and tool angle of the excavator. It consists of three rotation angle transmitters and interfaces.
- Swing angle measuring package**
This package provides information about the swing angle of for instance a grab tool. It consists of a rotation angle transmitter and an interface.
- Tilt-x/y measuring package**
This package provides excavator inclination-information. It consists of two inclination sensors and an interface.
- Slew angle measuring package**
This package provides information about the swing angle of the excavator. It consists of a rotation-sensor and an interface.
- Draft measuring package**
This package provides draft information. It consists of a pressure transmitter with a certified shut-off valve and an interface.
- Tidal interface**
This serial interface imports tidal data from a tidal station.
- 2D position-interface**
This serial interface imports horizontal position data from a position source like for instance a GPS-receiver. With an extra position interface the heading is calculated from the position differences.
- 3D position-interface**
This serial interface imports horizontal and vertical position data from a position source like for instance an RTK-receiver. It's an alternative for a 2D position- and tidal-interface. With an extra position interface the heading can be calculated from the position differences.
- Heading interface**
This serial interface imports heading data from a heading source such as a compass.

Functionality

DipperMaster Monitoring System DMMS-003 offers a graphical-position presentation in a top- and side-view and registration of relevant position information.



The software presents registered positions in relation to a profile with a top and bottom-limit. The position between the top-limit and the profile, between the profile and the bottom-limit or below the bottom-limit. Through a menu more profiles with variable depths can be defined from which a profile can be chosen.

Through a diversity of configuration menus the system can be dimensioned and adjusted.

The system can be offered with a wide variety of functions:

- Colour coded level marking**
This software-module presents logged positions in relation to the level. The position is displayed in colour depending on the level. The relation between colour and vertical position is set through a menu in which a minimum and maximum registration-level and the corresponding colours can be defined.
- 3D profile import**
This software module allows for importing profiles that create a design profile from a 3D point cloud.
- Data import**
This software module converts x,y,z-format (ASCII) data in to the program-format (DTM) and shows it on screen. For purpose of displaying external survey- en process files. The external data-file must be locally available.
- Data export**
This software module converts (DTM) formatted-data in to x,y,z-format (ASCII). To make the internal data-files suitable for survey-programs. The exported data file is locally available.
- Chart import**
This software module provides a graphical presentation of a local chart electronically available in DXF format. Several entities are supported.
- Installation outline import**
This software module provides a graphical presentation of the excavator outline electronically available in DXF format. Several entities are supported.
- Annotation**
This software module offers a graphical marking function with standard symbols.
- Office package**
This software package provides data conversion facility from program format (DTM) in to x,y,z-format (ASCII) and some other dredge preparation functions.
- GSM / modem interface**
This software module allows information exchange between the DipperMaster Monitoring System and Office package through a GSM / modem connection.

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- Remote monitoring**
This software package offers a copy of the DipperMaster Monitoring System-presentation on a different PC via a serial- or server connection.
- Alarming**
This software module offers acoustic and visual alarms on several adjustable parameters.
- Coordinate conversion**
This software module offers conversion of world coordinate systems to local coordinate systems.
- Control**
For active protection of the installation several control modules are available:
- Profile Approach**
This software module offers a 3-channel digital steering control with adjustable distances between the tool tip and the profile.
- Slew Limitation**
This software module offers 2 digital channels for bi-directional crane movement control on adjustable minimum and maximum slew angle.
- Pontoon Protection**
This software module offers 8 digital channels for bi-directional excavator movement control with adjustable distances between the tool tip and pontoon.
- Tool Alignment**
This software module offers a 2-channel digital steering control for adjusting positive and negative differences between the tool swing angle and the pontoon heading.

For (a combination of) these modules a control unit is placed which can be expanded with several interface packages.

Quality

Depending on the circumstances, different qualities of implementation can be offered:

- Monitor(s) in a sun readable high brightness variant or in a standard TFT variant.
- Computer and data acquisition unit with or without specific mounting racks with shock absorbers and strain relieves for the cables.
- Industrial or commercial grade computer components.

Design

Several design possibilities can be offered regarding the display components and the computer model:

- Monitor(s) in desktop, wall mount or pedestal shape.
- Computer in 19" rack mount, desktop, compact wall mount or laptop shape.

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