IHC MERWEDE

IHC Systems

Dedicated to Efficient Dredging

Dredge Track Presentation System

(IHC DTPS)

an IHC Merwede company

The technology innovator.

Efficient Dredging...

'Efficient Dredging' helps contractors to make the most of their dredging equipment: to generate high economic and ecological benefits, achieve optimal utilisation rates, reduce dredging time, make the dredging process smoother, simplify fault diagnosis, reduce downtime and wear, prevent under- and over-dredging, and maximise crew satisfaction.

Even after a shipbuilder has built reliable and efficient equipment, and even after contractors have optimised equipment utilisation, the **Efficient Dredging** concept continues to make a significant contribution, providing dredgers with extra 'senses' and 'hands & feet'.

Relatively modest investments in instrumentation, automation, surveying and simulation techniques produce major improvements in efficiency and accuracy. Automation under dredge master supervision can enhance production by up to 30%.

IHC Systems draws on all kinds of conventional and innovative control, automation, communication and presentation technologies. We also make the most of the knowledge and resources of the entire IHC Merwede group.

The concept is honed in close alliances with contractors and worked out in specific products, systems and services for every category of dredger and in every field. The products can cope with all dredging and mining conditions.

Our knowledge, expertise and experience are dedicated to reducing over-dredging, spillage, energy consumption, emissions, turbidity, ecological side-effects and operational costs. They represent our contribution to a sustainable future for all our stakeholders.

...our contribution to a sustainable future

Benefits

Efficient Dredging starts with dredging in the right place and at the right depth. Dredging in the wrong locations and over-dredging can involve major energy wastage and costs. Under-dredging may mean being called back to finish the job correctly. All dredging scenarios of this kind imply high costs for the dredging contractor, if not the client, and they can also have a negative impact on the hydrodynamic and environmental aspects of the dredging job.

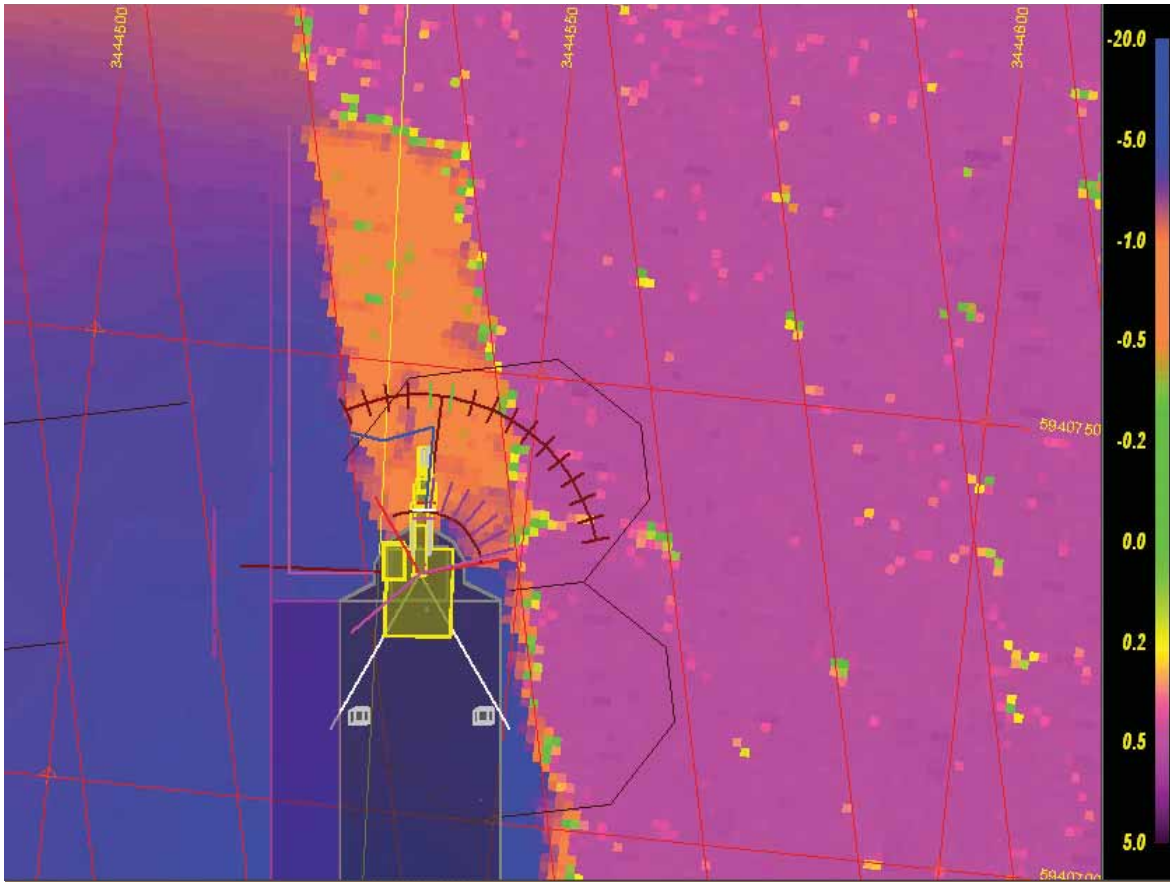
In terms of dredge operations, the need for accurate dredging implies that operators must know the position of dredger in the wide context of the dredging area, accompanied by accurate knowledge about the position of the draghead of TSHDs, the cutter of CSDs or the bucket/tool of excavator dredgers. These positions must refer both to a digital terrain model (DTM) of the actual dredge track/profile and its exact geographical coordinates.

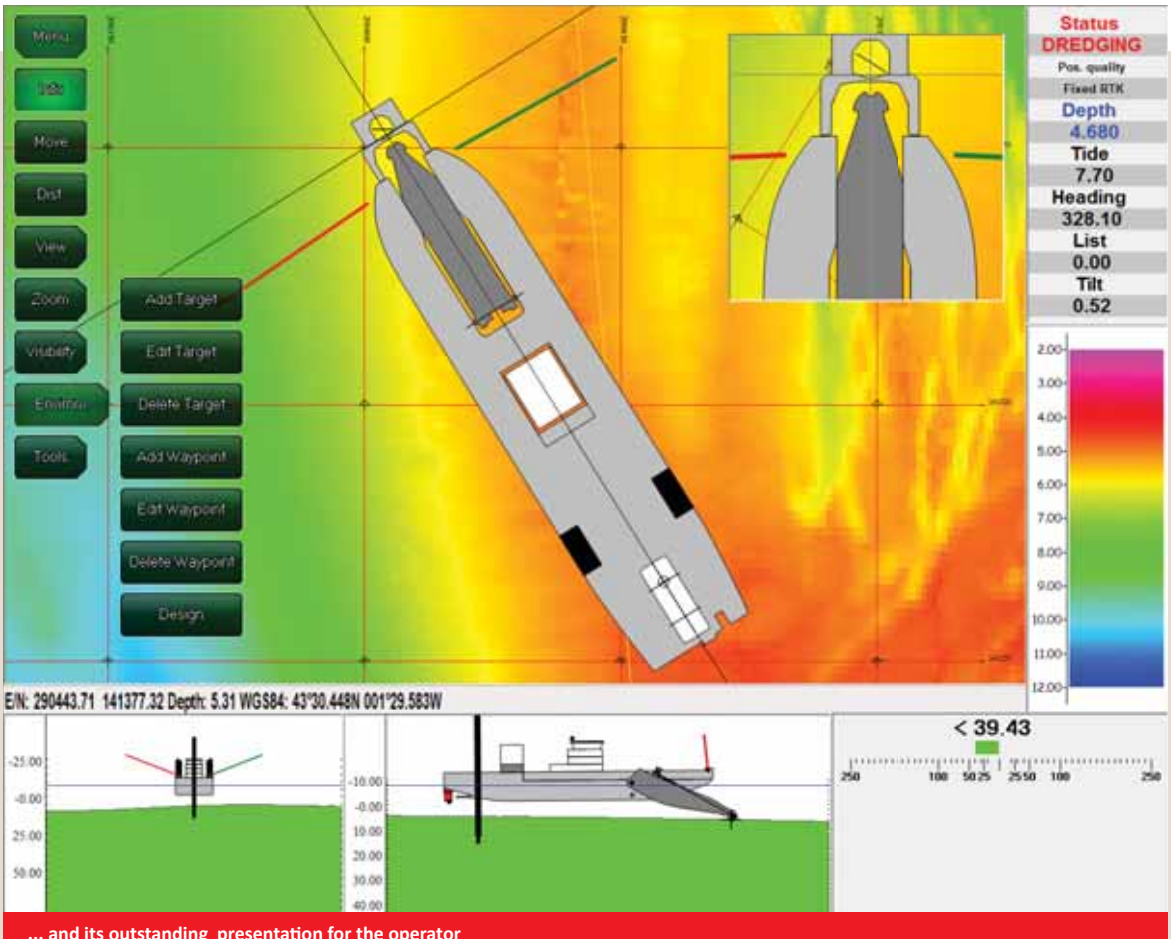
The dredge position-related information is usually generated by IHC Systems' monitoring equipment, such as the STPM®, DLM®, DPM® or XPM® functions. If DGPS, bearing and/or tidal and list/trim information are added, these monitoring systems generate sufficient information to position the dredger's 'tool' precisely within a DTM and the context of the dredging area with the help of DTPS.

IHC Systems DTPS has been designed with the operator in mind. Although it has been built on a strong hydrographical foundation, it is no survey package derivate, and requires almost no online adjustments or configurations. It just presents and reports useful geographic data, particularly designed to serve the operator. Consequently, the operator is provided with an adequate picture of the dredger and 'tool' in an automatically updated DTM, related to in-surveys, various chart datum and projection methods, and current status. DTPS has the capability to exchange data with usual modern survey packages.

The system provides what is needed to dredge in the right place and at the right depth. So numerous dredgers throughout the world have DTPS installed as the main geographical and DTM orientation tool for the operator.

Efficient dredging involves superb equipment ...





... and its outstanding presentation for the operator

Typical System Architecture

The core of the system is a dedicated PC containing the DTPS algorithms and models running on Microsoft Windows. The software is dongle-protected to prevent unauthorised use.

At present, the DTPS function is usually an integrated and/or distributed part of a larger monitoring and automation TCP/IP network such as IHC Systems' dredging control system (see the DCS brochure on the website). The DTPS computer receives its dredger and sensor data from a dedicated computer - the IHC Digisys computer - which is the platform for the respective STPM/ DLM/ DPM/ ACC/ XPM applications. DTPS closely works together with the IHC Digisys platform, which facilitates the configuration of dredger components and DTM data.

The network also provides the data link to other proven on-board systems (hardware and software), such as a programmable logic controller network (PLC), monitored by a fast PC-based, server-client, supervisory control and data acquisition (SCADA) network. The PLCs manage the standardised signal isolation and processing.
The network can use DTPS data elsewhere, for example in the electronic chart (ECDIS) and/or in DP/DT systems for pre-defined track data. DTPS has the capability to exchange data with the usual modern survey packages.

The link between the operator and the DTPS system is provided by a user-friendly TFT colour screen. As standard, it provides the 2½D Digisys dressed-wire presentation of the dredger and the DTM, assisted by other functionally designed and standardised screen pages.

If required, the DTPS function can also be supplied in a stand-alone version. If necessary, additional RS232/485/NMEA channels are installed for reading environmental signal data, for example from a gyro compass, DGPS, etc. The content and extent of sensor equipment varies according to the ultimate functionality specs.

Sensors, transmitters and/or actuators

Depending on the specific configuration and required options, connected equipment may include:

- IHC Systems Digisys computer and/or
- IHC DCS system and/or separate information providers such as:
  - one or more DGPS or DGPS-RTK systems
  - one or more gyro compasses
  - radio tidal measurement
  - draught, list and trim and/or motion sensors
  - single and dual frequency echo sounders

Typical functionality

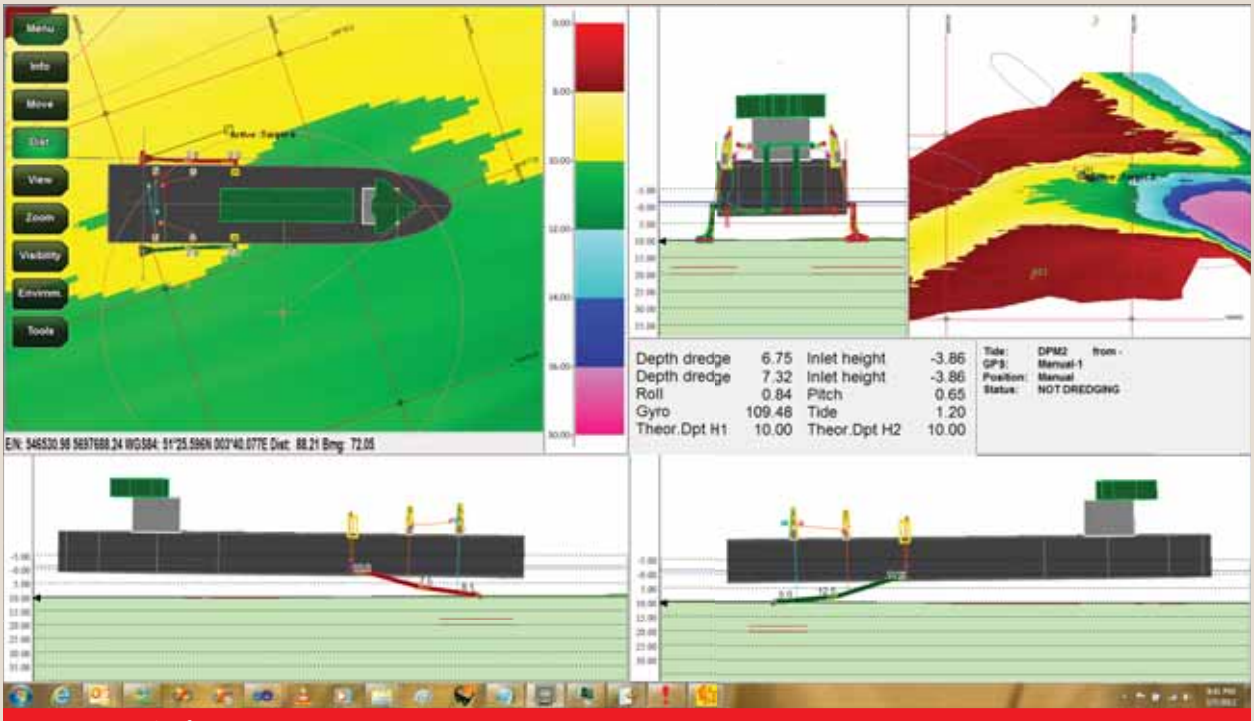
Depending on the specific DTPS functionality and options, the dredging depth and/or lateral position of the dredger and the dredging 'tool' are presented as 'dressed wire models' on the video screen with respect to the waterline and the vessel's centreline and in the context of the dredging area and DTM.

The top, side and back views of the ship, including the suction pipe or cutter ladder or boom and stick, are presented together with detailed tool and bathymetric information in a digital terrain model (DTM) of the dredge area in a particular geographic projection model. The DTM is updated continuously with the depth of the latest dredging activity. Of course, the final DTPS accuracy cannot exceed DGPS or survey/track system accuracy.

DTPS includes highly user-friendly approaches to importing and merging external matrix data, for example from a survey, while the system is running. No restarting is needed afterwards. Either whole batches of matrices can be automatically imported by just inserting a USB memory stick, or the operator can manually browse for a specific matrix and import it, while DTPS carries on running. Just a few mouse clicks suffice.

The video screen allows for the online adjustment of operational parameters, while configuration parameters can be entered off-line. Wizards simplify data input. Presentation-colour preferences, zoom, hide and shift functions are available. DTM resolution can be adjusted off-line.

Daylight and night presentation are based on ECDIS standards. Databases can be used to set up new projects. Transgressing set points for under-depth or over-depth generates audible and visual alarms. In the DCS-integrated version, screen pages are available for fault diagnosis and alarms.



DTPS presentation for a TSHD

Equipment geared to performance

DTPS can be used for sending information to, for example, ECDIS and DP/DT systems. Depending on the type of dredger, DTPS exchanges data with the Digisys computer:

- On board TSHDs with the STPM® and/or DLM® function
- On board CSDs with the DPM® and/or ACC® function
- On board excavators with the XPM® and/or AXC function

Options

- Touch screen operated version
- Electronic Chart System background ECS (S57, VPF, ARC)
- Additional survey package

The integrated and intuitive operator's chair, which may be included in every DCS system, fully exploits the benefits of the IHC DCS, DTPS, STPM® and DLM®

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