



Head office

The Netherlands

Slidrecht

Regional offices

EUROPE

The Netherlands

Alblasserdam
Apeldoorn
Delfgauw
Dordrecht
Goes
Hardinxveld-Giessendam
Kinderdijk
Raamsdonksveer
Slidrecht

United Kingdom

Blandford Forum

France

Verberie

ASIA

P.R. of China

Beijing
Shanghai
Tianjin

SOUTH EAST ASIA

Rep. of Singapore

Singapore

India

Mumbai

MIDDLE EAST

United Arab Emirates

Dubai

Nigeria

Lagos

NORTH AMERICA

USA

Houston, TX
Lafayette, LA
Wayne, NJ

SOUTH AMERICA

Brazil

Rio de Janeiro

Engineering & Production

EUROPE

The Netherlands

Hardinxveld-Giessendam
Heusden
Kinderdijk
Krimpen aan den IJssel
Rotterdam
Slidrecht

United Kingdom

Stocksfield

Croatia

Rijeka

Slovakia

Komarno

AFRICA

South Africa

Cape Town

ASIA

P.R. of China

Dalian
Guangzhou
Shanghai

SOUTH EAST ASIA

Malaysia

Kuala Lumpur

IHC Systems B.V.

Industrieweg 30, 3361 HJ Slidrecht
P.O. Box 41, 3360 AA Slidrecht
The Netherlands

T +31 18 443 19 22
F +31 18 443 15 05
sales.sy@ihcmerwede.com
www.ihcsystems.com

IHC Systems

Dedicated to Efficient Dredging



Sensors & Transmitters



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

Automation & Physics

The first impression of presentation and automation systems on board dredgers is of an array of video screens, sophisticated pictures, flashing lamps, etc. Ultimately, however, the 'inner reality', is a question of physics: automation is a way of observing and controlling physical units. The simple presentation and control of a suction pipe on a touch screen is a good example: it actually means knowing where the suction pipe is, following up the command to move it and directing hydraulic, electric and mechanical energy to the correct actuator mechanism.

So information about physical phenomena on board a dredger is vital: a chain is as strong as its weakest link. If the information delivery fails, the whole automation system – however advanced it may be – can freeze. Reliability, availability and safety depend on measurement and detection equipment. To put it another way: when it comes to vessel uptime, cost per cubic metre of payload and return on investment, dredging contractors depend on the assessment of physical data.

To safeguard the quality of its advanced monitoring and automation equipment, IHC Systems supplies a range of sensors & transmitters to monitor and process the availability and position of mechanical parts, process pressures, angles of mechanical parts, distances, liquid flows and levels, forces and torques, geographical position.

Measurement of the flow, density and production of the dredged soil mixture is covered in a dedicated brochure that is also available on our website.

Equipment on board TSHDs, CSDs and excavator dredgers also has to cope with extreme wear, oxidation, vibration, siltation, temperature differences, water immersion and any environmental challenges thrown at them. Civil and industrial sensors & transmitters soon fail in this environment, where – marinised, hardened and rugged – IHC Systems sensors & transmitters keep going. The company can boast of track records with many years of unrelentingly operational sensors & transmitters in the dredging, subsea dredging and heavy minerals mining industry.



Modern TSHDs



excavator dredgers ...



and CSDs ...



are packed with automation receiving ...



vital information from sensors.

Applications

Availability & Position

To detect the availability and position of mechanical parts, IHC Systems supplies a range of rugged reed switches and inductive proximity switches. Appropriate switches are also available for monitoring liquid flows, pressures and levels.

Pressure

Extremely sturdy and wear-resistant transmitters known as Dippers, Duckers and Deckers are used to measure inlet and outlet pressures of dredge pumps and jet pumps, as well as the differential pressure across dragheads. They are of the high-accuracy type.

Draught

Vessel draught is measured with bottom or bulkhead-mounted, water-hammer-resistant transmitters of the ultra-high-accuracy type.

Compared to versions of the past, these transmitters are extremely protected against leakage. A more common range of dampened transmitters are available to measure tank levels, gland and flushing water and hydraulic oil pressures.

Angle

Angles and rotation angles above and below the water are measured with transmitters that can be driven by more than one physical principle: direct connection, pendulum or other gravity-related principles. They are used to monitor suction pipe parts, excavator boom, stick and bucket parts and slewing angles, cutter ladder angles, tilt and list measurement, and gantry and A-frame angles.

Distance

The position of swell compensators, overflow ducts and spud carriers is measured by a transmitter with a spring-tensioned drum – our Sprinter type – equipped with a stainless steel wire that follows the movement of the hardware exactly.



Bottom-mounted draught transmitter



Bulkhead-mounted draught transmitter



Rugged dredge pump pressure measurement



Linear distance measurement



Bottom door position sensors

Flow

Flow measurements of the inductive type – if required with wear-resistant liners – are used to monitor jet water, gland water and flushing water flows.

Level

Rugged ultrasonic and radar-based transmitters are available for the accurate measurement of the mixture level in the hoppers of TSHDs, the height of spuds on CSDs and the level of liquids in tanks that are not easily accessible. Radar transmitters are relatively insensitive for the influences of wind, temperature and interference.

Force & Torque

IHC Systems is a value-adding re-designer and reseller of specialised force and torque measurements, for example for

assessing forces in suction pipe hinges, and the torque and power of dredge pumps.

Measurements of this kind must always be tailored to the specific environment.

Geographical Position

The assessment of the position of a dredger in the environment requires specialised equipment such as DGPS systems, (multi-beam) echo sounders, gyrocompasses and tidal measurements. This equipment is generally supplied by specialists, but many of them see IHC Systems as a preferred reseller in order to safeguard the integration of their outputs in integrated systems.



Radar hopper level measurement

Interfaces

Mechanical

The linkage between the physical process and the measurement device on board dredgers is subject to very stringent requirements with respect to legislation, impermeability for water, accuracy, wear, resistance to heavy forces, sensitivity to obstructions, reliability and the prevention of damage. So IHC Systems' sensors & transmitters are – or can optionally be provided with – certified sea inlets, dredge pipeline adapters, pressure dampers, breaking bolts, flexible couplings, wear-insensitive mechanical transfer parts, sprocket wheels, stainless steel wires, or whatever the tailored solution of the measurement challenge requires. This approach to mechanical interfaces makes IHC Systems' sensors and transmitters the preferred choice of many dredging contractors.

Electrical/electronic

The electronics are as versatile as the mechanical interfaces. The powering and output

possibilities of our sensors & transmitters are, of course, mostly based on the measurement principle, but they can be adapted to almost any unit. Outputs are tailored (or can be tailored optionally) to potentiometer, synchro or encoder values, standardised analogue values, several industrial serial formats, UTP signals, free AC or DC contacts, digital signals and so on, each with their own dedicated powering regime. They can also be executed as smart sensors for remote access and calibration.

Subsea

To return to the idea of the weakest link of the chain, sensors & transmitters – as vital elements of monitoring, control and automation systems – become worthless if water intrudes. To prevent this happening, IHC Systems can supply a whole range of submersible cables, junction boxes, quick connectors and moulding blocks, carefully tailored to the current application down to 150 metres

below the sea surface level. In some cases such as suction pipe position measurement on TSHDs – the STPM function – the use of these cabling systems is mandatory for the IHC Systems guarantee for the system as a whole.

Deep sea

Many of our sensors can be adapted for deep-sea use. As we all know since the Mexico oil spill in 2010: deepsea equipment must be thoroughly tested and loaded before any use to prevent time-consuming and often environmentally harmful failures. So IHC Systems has its own instrumented testing vessel with a nominal allowable pressure of 30MPa, the equivalent of ca. 3000 metres depth. Its 0.6m³ test room has been provided with an underwater floodlight/camera, quick connectors and a modern structure for online data access. Other companies can order specific tests from IHC Systems or rent a time slot on the vessel.



Tailored mechanical interfaces



Submersible cabling

Signal Processing

IHC Systems supplies a range of signal processors, galvanic isolation – individual or in groups – and input/output devices for individual, telemetric or network-based processing. Most of them can be supplied as dedicated, separate or combined units, which are often useful for retrofits and upgrades. Modern vessels commonly read sensor signals in dedicated I/O units integrated in the entire vessel control and automation system.

Research and Developments

IHC Systems never ceases working on the further improvement of sensors and transmitters.

For example, a hysteresis-free suction pipe angle sensor is in the making. Other developments are on their way.



Instrumented 30MPa pressure vessel