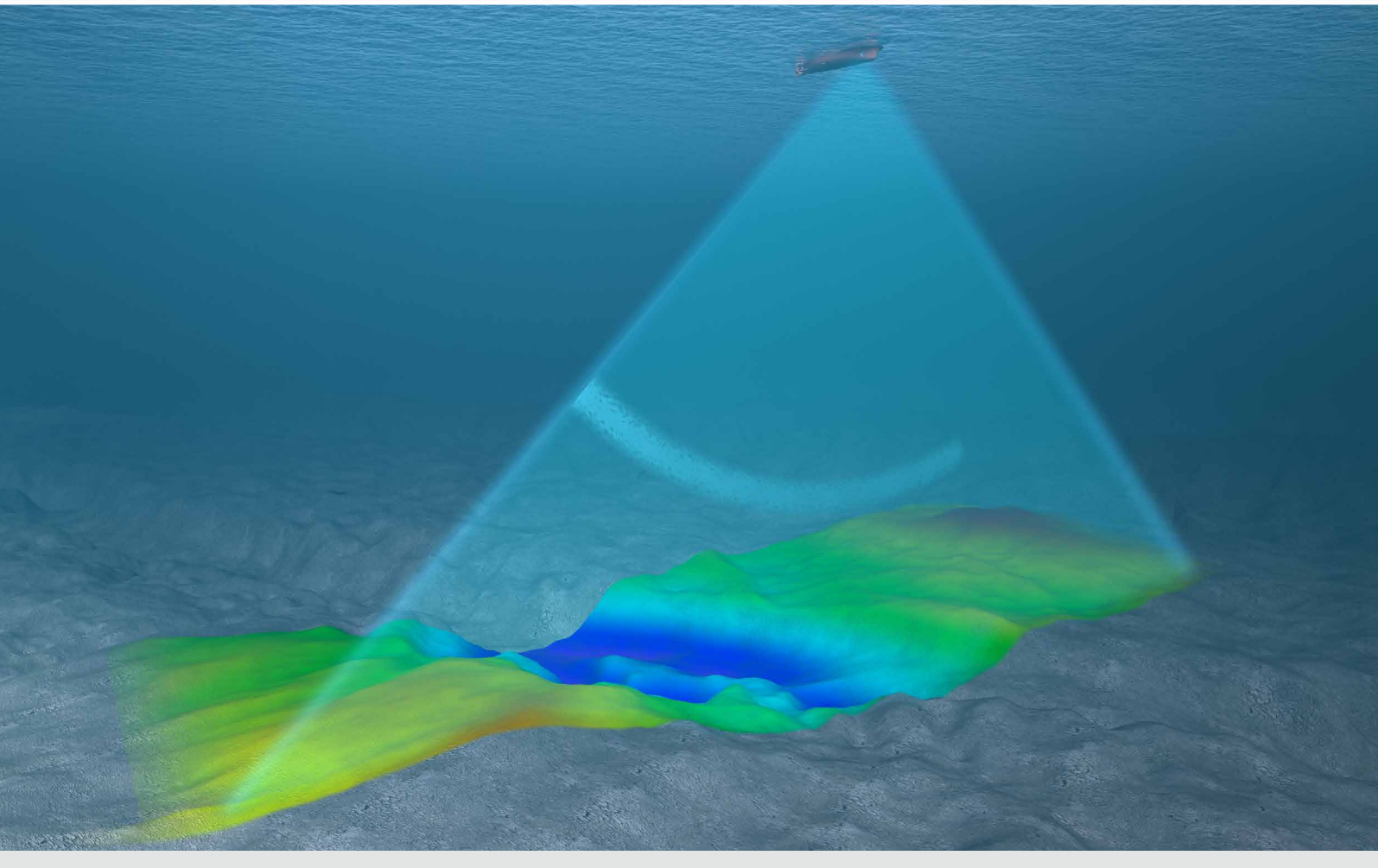
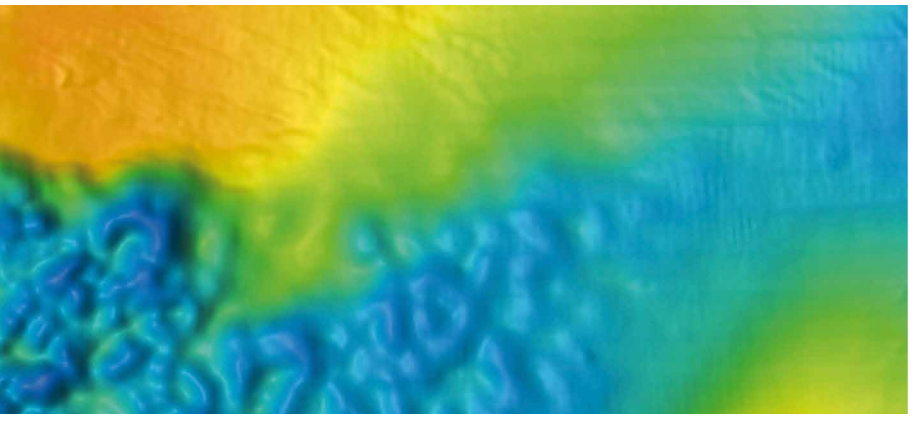
WÄRTSILÄ

Wärtsilä ELAC SeaBeam 3020 ICE

Ice-Hardened Multibeam System

20 kHz | 7,000 m Depth Performance | 9,000 m Swath Coverage | Swept Beam™ | WCI





System Overview

Compact Design for ELAC SeaBeam 3020 ICE Installation

High-Density Mode
ELAC SeaBeam 3020 ICE has 734 beams in equiangular and multi-ping mode. The swath coverage can be decreased from the maximum down to 60 degrees, leaving the number of reception beams constant. In case the coverage is below 60 degrees, the number of beams will be decreased.

Transmitter and Receiver Control Units
The transmitter control unit supplies the drive signals to the entire projector array. Each output is separately controlled for power level, phase and frequency. This facilities programmable shading and steering as well as transmit beam stabilization using Swept Beam™.

The receiver control unit controls the overall ping cycle. It contains the receiver circuits for the hydrophones as well as the signal processor for beamforming, bottom detection and data reduction. The control units are interfaced to the operator station via Ethernet.

Transducer Array
The transducer array incorporates a projector and a hydrophone array in mills cross configuration. The 20 kHz projector array has an along-track beam width of 2°. It consists of 13 identical modules. The projectors use Tonpilz resonators.

Ice-hardened hydrophone frame: manufactured in Germany (left) and ready to be installed (right)

The hydrophone array has an athwart ship beam width of 2° normal to the array. It consists of 64 identical staves. The hydrophones use ceramic elements with broadband performance to provide excellent phase uniformity across the array and multi-frequency capability.

Operator Station
The operator station, a PC of latest technology, provides a graphical user interface on high-resolution TFT monitors for controlling the system using Wärtsilä ELAC HydroStar operator software. It communicates with the sonar electronics via Ethernet both for control and reception of sonar data. It also performs the sound velocity correction, heave compensation, navigation merging and data record construction. A variety of real-time data displays are available for quality control.

Water Column Imaging (WCI) Workstation
ELAC SeaBeam 3020 ICE is WCI-ready, no extra installation is needed. The Water Column Imaging (WCI) functionality is utilized via an additional PC workstation that logs WCI data and displays real-time backscatter images from the water column and sea floor, both below and to the sides of the vessel. The WCI workstation connects to the ELAC SeaBeam 3020 ICE multibeam system via Ethernet and receives data for each ping from the multibeam.

Bottom Slope Data Interface
ELAC SeaBeam 3020 ICE provides a serial data output of bottom slope data which are based upon the assumption of a plain bottom. These data are calculated via linear regression and are e.g. useful for the automatic steering of a sub-bottom profiler.