

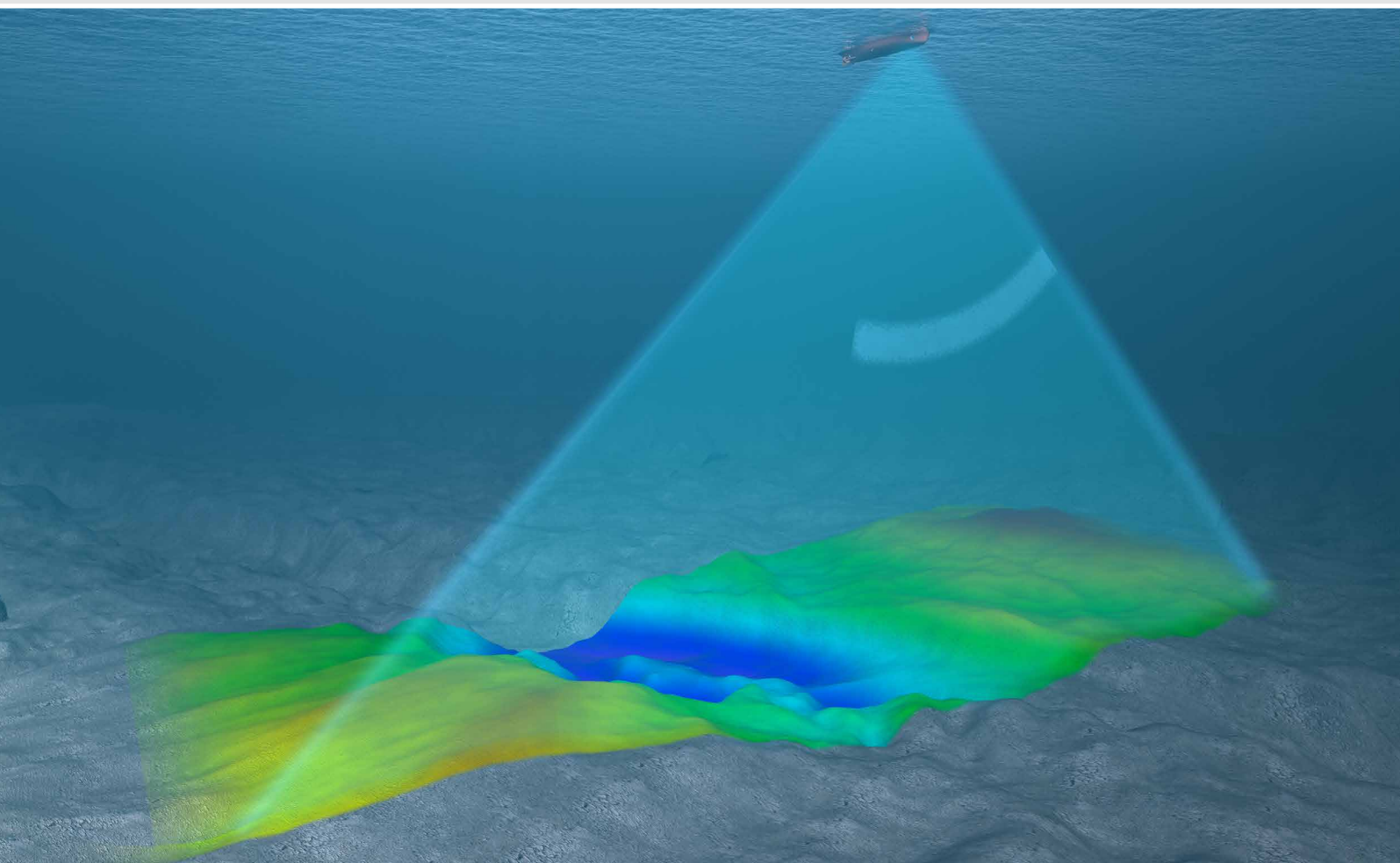
# Wärtsilä ELAC SeaBeam 3020

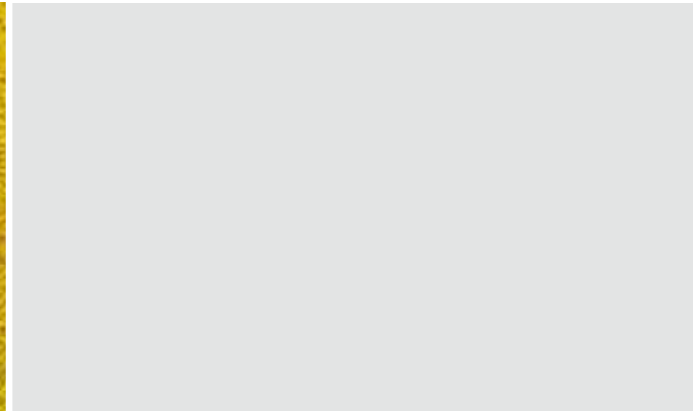
## Deep Water Multibeam System



Image: FASSMER

20 kHz | 9,000 m Depth Performance | 10,000 m Swath Coverage | Swept Beam™ | Multi-Ping





# System Overview

## Modular Design for Customized Beam Width Solutions

### High-Density Mode

ELAC SeaBeam 3020 has 602 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. If the coverage is below 60 degrees, the number of beams is 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 facilitates 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 includes a projector array and a hydrophone array in a mills cross configuration. The projector array consists of up to 25 identical modules, depending on the along-ship beam width. Typically, the projector array has an along-ship beam width of 1° or 2°. However, also intermediate along-ship beam widths like e.g. 1.5° are possible in order to satisfy specific customer requirements. The projector modules utilize Tonpilz resonators.

The hydrophone array consists of up to 15 identical modules, depending on the across-ship beam width. Typically, the hydrophone array has an across-ship beam width of 1° or 2°. Intermediate across-ship beam widths like e.g. 1.6° are also possible in order to satisfy specific customer requirements.

The hydrophone modules utilize ceramic elements which have 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

the Wärtsilä ELAC HydroStar operator software. It communicates with the sonar electronics via Ethernet both for control and reception of sonar data and 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 is WCI-ready, no extra installation is needed. The Water Column Imaging functionality is utilized via an additional PC workstation that logs WCI data and displays real-time images of backscatter 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 multibeam system via Ethernet, and receives data for each ping from the multibeam.

### Bottom Slope Data Interface

ELAC SeaBeam 3020 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.



*Mills cross installation of projector and hydrophone arrays*