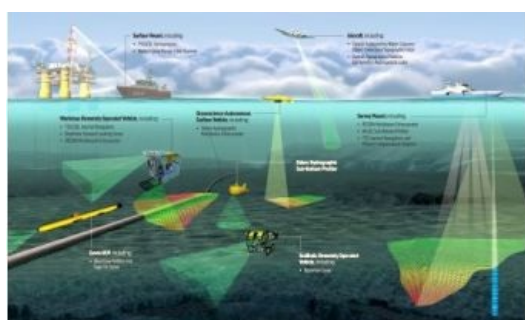
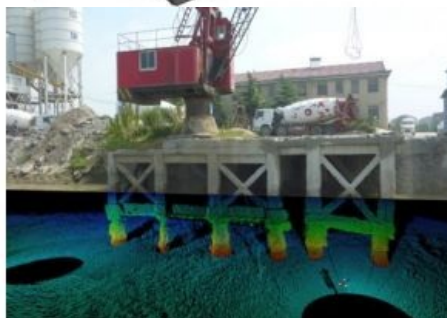
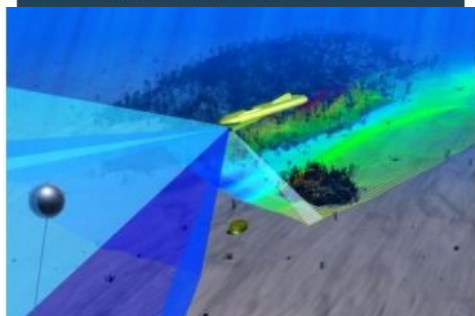
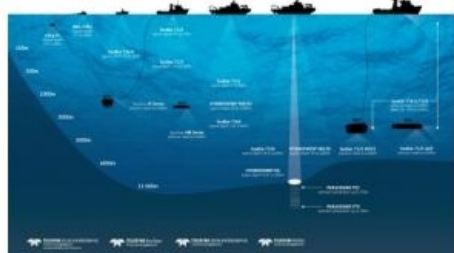


# TELEDYNE MARINE ACOUSTIC IMAGING GROUP

## Teaming up for Multibeam Echo Sounder and Sonar Solutions



Multibeam Echosounder and Sonar Overview



Teledyne Marine Acoustic Imaging Group is part of Teledyne Marine and is a provider of advanced multibeam echo sounder and sonar solutions servicing a variety of markets and applications. Single-beam echo sounders and entry level multibeam echo sounder systems are manufactured by Teledyne Odom Hydrographic, high-resolution multibeam echo sounder systems and long range forward looking sonar systems are manufactured by Teledyne RESON, high-end deep water multibeam systems from Teledyne ATLAS Hydrographic and 2D forward looking sonar as well as 3D multibeam scanning sonar are manufactured by Teledyne BlueView.

Oceanscience, Optech, CDL and TSS are also part of Teledyne Marine, supplying sonar solutions. Teledyne Oceanscience

develops the autonomous remotely operated Z-Boat, which in partnership with Teledyne Odom Hydrographic is equipped with single and multibeam echo sounders. Teledyne Optech develops and manufactures Lidar and camera survey instruments. Teledyne CDL and Teledyne TSS design and manufacture gyrocompasses, attitude and heading reference systems, and inertial navigation systems.

Teledyne Marine Acoustic Imaging Group (MAI) has facilities in Denmark, the Netherlands, Germany, the UK, the USA and China. For support, a global sales network of distribution partners in more than 47 countries has been established. The organisation counts over 40 engineers and hydrographic surveyors working from six service centres.

The Teledyne Marine companies cooperate to develop advanced solutions, such as Teledyne Benthos and Teledyne RESON collaborating to develop a deep tow system including a SeaBat 7125 Dual Head multibeam echo sounder and a Teledyne RDI Doppler Velocity Log for Odyssey Marine Exploration. This vehicle, to be used for search missions down to 6,000m, is currently undergoing final sea trials.

### Hydrography

Within Hydrography, MAI provides a product portfolio for seabed mapping from extremely deep water to shallow water. Within that range, Teledyne Marine can match the client's requirements for size, ease of use and performance with a quality package according to the budget.

Also accessories that contribute to delivering a complete solution ranging from sound velocity sensors, brackets, mounting kits, gondolas, and cables to motion compensation and INS systems including processing station, installation and final hand-over to qualify and ensure the final system performs optimally can be provided by the company.

Teledyne PDS's software solutions provide turn-key packages for MAI's single-beam echo sounders, multibeam echo sounder systems, and multibeam scanning sonar systems. All sonar solutions produce industry standard data to interface with all major hydrographic sonar data collection packages.

## **Offshore**

Teledyne RESON and BlueView offer a product programme for offshore use. The forward looking imaging sonar from Teledyne BlueView assists ROV operators navigating around offshore subsea structure, and for pipeline surveying many companies use the SeaBat 7125. Features such as target detection systems for ROV station keeping and automatic tracking systems to detect and follow pipelines are Teledyne Marine developments. The main applications are pipeline surveying, metrology, inspection & monitoring, obstacle avoidance and leak detection.

Teledyne's sub-bottom profilers look deeper. With PARASOUND, sediment structures from 15cm can be visualised, buried objects can be localised prior to offshore cable trenching, or geologically stable pipeline routes identified. Multibeam echo sounders are also used for gas plume surveys for exploration and environmental monitoring purposes.

## **Civil Engineering & Dredge**

MAI offers a suite of solutions to support civil engineering & dredge operations. The product range includes hydrographic grade single-beam echo sounders, sub-bottom profiles and sound velocity profilers by Odom Hydrographic, 2D imaging sonar systems and 3D multibeam scanning sonar by BlueView and the SeaBat world leading range of multibeam echo sounders all coupled with the power of Teledyne PDS software for hydrographic surveying and dredge guidance operations. The organisation thus provides a range of acoustic and software solutions to meet the demands of the civil engineering and the dredging market. Main application areas are during, pre and post dredge surveys, dredge guidance, construction support, bridge dam & harbour inspection and scour and undercut monitoring.

## **Defence and Security**

MAI supports Defence & Security needs offering Commercial-off-the-shelf (COTS) products providing performance combined with the cost of ownership through the product life cycle typically being much lower than bespoke products. It is represented by products from RESON and BlueView including multibeam echo sounders for tactical bathymetric mapping, 2D forward looking sonar and hydrophones widely used by navies and institutes around the world. Main applications include terrain mapping, obstacle avoidance, mine counter measures, diver detection and first responder support.

Surface vessels rely on charts for safe navigation, but for naval operations charts are often unavailable. Underwater vehicles must avoid objects in their path and are often fitted with single-beam scanning sonar. Their slow update rate only covers part of the forward sector at any given instant. Long range SeaBat systems can operate on surface vessels to 6,000m depth, whilst the most compact low-power BlueView 2D sonar is rated to 3,000m – thus covering a wide range of applications.

For the support of first responders, Teledyne Marine solutions include 2D multibeam imaging sonar such as the RESON SeaBat 7128 for surface vessel mount, to the more compact BlueView multibeam sonar, suitable for surface vessel use or on portable low logistics ROVs and diver hand units.

## **Teledyne PDS Software**

Teledyne PDS is a multipurpose software platform supporting tasks within hydrography, dredge guidance, construction support, search & recovery operations and port entrance monitoring. The suite is developed to solve challenges arising from each specific task in the main application areas. It interfaces with survey instruments such as Lidar, multibeam and single-beam echo sounders and can be used for interfacing to a variety of periphery sensors, including dredge and construction sensors, sound velocity measurements, positioning and motion systems.

Teledyne PDS, now available in a 64-bit version, is optimised for Teledyne Marine products and other available systems from recognised manufacturers, enabling immediate data visualisation and quality control. The software is designed to be used in the maritime world with an intuitive user interface that is easy to learn.