INNOVATIVE TECHNOLOGIES IN THE MARINE FIELD

Innomar Technologie GmbH

Innomar is a young company striving for the development of innovative technologies in the marine field. It was founded in Rostock which is an old seaport situated in the north of Germany on the coast of the Baltic Sea. The companyâ€™s main achievement to date has been in underwater instrumentation for the exploitation of the non-linear or parametric effect. The use of parametric acoustics offers particular advantages over linear systems which is why Innomar created the first mobile parametric sub-bottom profiler on the international market. This article explains the foundation, product range, market philosophy and future expectations of the company.

The intense competition in the global market, as well as the consequently rapid progress in the field of new technologies, demands consistent improvement of products. Innovation, flexibility and customer satisfaction are the major keywords of Innomar. Today, a team of eight engineers is at the core of the company. They are all committed to fulfilling these principles. Within just five years Innomar was able to gain a good reputation with a new technology in the field of sub-bottom profiler equipment.

Innovative Right from the Start

In 1997 after many years of research work at the University of Rostock, a small group of motivated engineers decided to establish a company for the development, production and application of efficient underwater acoustic systems. The highly skilled staff had a lot of experience in hardware and software development for marine applications. Indeed, there still exists a close co-operation with the department for electrical engineering and information technology at the University.
Innomar started with the development of a parametric sub-bottom profiler system which has been continuously improved with new features since then. This product line, known as the SES-96, uses the non-linear acoustic effect and has been introduced into the international market very successfully. The detection of fluid mud layers and sediment structures for dredging tasks, the search for embedded objects, wrecks, pipe-lines or mineral resources and geological surveys, are only a few of the applications for which the SES-96 system is perfectly suited.

Product Line SES-96

Innomarâ€™s product line consists of high quality sub-bottom profiler systems with different extension levels. Parametric acoustics stand for excellent resolutions both in the vertical and horizontal direction even at low frequencies. Moreover, the accurate depth determination at high frequencies in very shallow as well as deep water and a penetration up to 50 metres depending on the material, depth and frequency, are further benefits of these parametric systems. Another product highlight is the transmission of short pulses without ringing effect. Due to a very mobile system it is possible to achieve results of high quality for surveys with big research vessels in the open sea as well as with small vessels in shallow water and complicated areas like harbour basins. Furthermore, the system has a very small half power beam width of Â±1.8 degrees valid for all generated difference frequencies, which is an enormous advantage of the parametric SES-96 system over linear echo sounders. Additionally, the directivity has no side-lobes and is independent of the generated difference frequency.
The improved system variants, SES-96 standard and SES-2000, offer the possibility of electronic beam steering and beam stabilisation. In combination with a motion sensor, ship movements can be corrected under bad survey conditions. Other features include the transmission of multi-frequency signals and the determination of material properties.
Moreover, the system is delivered with real-time processing software which provides online results with very good quality. Finally, the digital storage of data opens the possibility of extended post-processing like layer tracking and digitisation as well as the correlation with probe data for easier and faster data interpretation.

Market Views and Philosophy

Innomar has customers and co-operation partners worldwide, including private companies as well as governmental institutions and research organisations. The main customers however are dredging companies, survey companies, waterway and harbour authorities. During recent years Innomar has had survey projects not only in Germany but also in numerous countries all over the world, e.g. in The Netherlands, the United States, India, China, South Africa and France. The applications have ranged from a survey in the Arabian Sea where the task was to determine the rock layer and to find sand areas, to a survey in Hong Kong where the aim was to detect the dredging level below siltation.
Innomarâ€™s reputation is especially good for its reliability concerning the quality of the products, excellent customer support and the precise measurement results received with its systems. To fulfil the quality standard continuously, the company has been certified by DIN EN ISO 9001:1994 since 1999. One of the main strategies is to endeavour to respond to both market changes and individual requests; so a lot of system improvements are based on direct feedback from clients. Sales representatives worldwide are also responsible for good customer support. The companyâ€™s philosophy is, in the first place, to satisfy customers while at the same time keeping up with technological advance. To reach these aims, it is necessary, amongst other things, to participate in congresses, workshops and fairs, to develop oneâ€™s knowledge and to keep in close contact with customers.
Furthermore, Innomar is in co-operation with universities like the university of Trier, with institutes, e.g. the Baltic Research Institute, and with research departments of bigger companies, e.g. Royal Boskalis Baggermaatschappij b.v. Additionally, the company is a member of

the Hydrographic Society so as to take part actively in defining the future standards of hydrographic systems and applications.
The service includes the development, production, sale as well as rent of underwater acoustic systems and marine electronics. Moreover, the development of user specific software with ease of operation is offered. Of course, an after-sales service, e.g. advice and solutions for problems concerning the system, the evaluation of data and echo prints or underwater acoustics in general, is also guaranteed.

Future Plans
Naturally, the focus of Innomarâ€™s future work will be concentrated on improving the efficiency of the products as well as on developing new features for extended applications, e.g. a side-scan option, a bottom classification system and the use of parametric sub-bottom profilers within ROV and AUV. As an addition to the main product line, the design, development and production of special marine instruments is planned.
At present the development of two new variants of the SES system is at the final stage. One of them is the SES-2000 medium which is going to have a slightly bigger transducer and more powerful transmitter stages so that the depth range can be increased of up to 1500 metres. The other variant is the SES-2000 deep which is designed for deep-water applications with depths of up to 6,000 metres.
Within the coming years Innomar sees a good chance to open up new markets in North and South America and in Australasia. Furthermore, some market segments will become interesting for the company, especially the Offshore Industry.
Since the foundation of Innomar, the development of innovative technologies has played and will continue to play a great role for the companyâ€™s success. On the whole, the most important task remains to meet the needs of customers by delivering high-quality products with ease of use at the same time.