

Nortek AS

Being young does not mean being behind. Nortek AS has set out to prove that a young company can help push the industry forward, and it has come a long way since it opened up shop outside Oslo in 1996. Putting innovation at the forefront since the start, the company has managed to fight its way up the ladder despite strong competition. In recent years it has taken a lead within Europe and has set new standards for what size and weight means in the world of acoustic Doppler systems.

At the helm of Nortek is Atle Lohrmann, who has fifteen years experience with acoustic Doppler instrumentation. A physical oceanographer by education, he started out his working life as a research scientist at the ship classification society Det Norske Veritas and later worked for RD Instruments from 1989-1992. In the summer of 1992, having left RD Instruments, Atle and equal partner Ramon Cabrera started Sontek in San Diego. A full circle was completed with the formation of Nortek AS back in Norway in the April of 1996.

The Company

As for all new companies, the first years (1996-2000) were the toughest - finding skilled people in the area around Oslo who could help carry the torch, vetting suppliers and subcontractors, establishing a sales network across the globe and developing a competitive hardware platform - a big job if you start in an empty warehouse, but doable with enough energy and determination. Since then, Nortek's instruments have managed to find their way into just about all the world's waters. Not only does this mean their instruments are utilised all over the world (46 countries), but in all bodies of water, whether laboratories, coastal waters, rivers or at full ocean depths.

The year 1999 marked Nortek's re-entry into North America with the formation of NortekUSA in co-operation with Dr Lee Gordon, former Marketing VP at RD Instruments. As a natural compliment to the success of NortekUSA a new company, NortekUK, was established in September of 2002. Efforts in the UK are led by Gordon Jones, in co-operation with Andy Smerdon of Aquatec, both of whom have extensive experience in sales, support and system integration. As of 2002, Nortek AS in Norway has a staff of twenty two, with a strong technology development team of six MSc and Ph.D engineers.

Doppler, Doppler

Nortek is part of what is sometimes loosely referred to as the "Doppler industry"™, comprising four to five companies located in the US, Japan and Norway, all of which use the acoustic Doppler principle to measure the velocity of water. The group of companies grew from having an annual revenue of Euro 7 million in 1992 to about Euro 30 million in 2001. This corresponds to an annual industry growth rate of more than 15 per cent: not quite dot.com numbers, but still very healthy.

First introduced in powerful but expensive current profilers in around 1980, the Doppler principle soon proved to be very effective base technology and the community is seeing a steady stream of new applications and new niche markets. One big reason for their winning market share is the remote sensing character of these systems - only the Doppler principle allows you to measure in a place that may be located 100m away from your instrument. In addition, the instruments do not need re-calibration, which is a powerful incentive in our fast pace world. Nortek, as most of its other brethren in the industry, has always chosen to focus on technology development and new application areas as the primary means of increasing business. As a consequence, the company makes only Doppler products, even when related products may provide tempting opportunities.

Coastal Oceanography

Since the company's™ first steps, its market focus has always been on coastal oceanography in all its forms. This means short range system operating at high acoustic frequencies, where design choice is different than for the long-range current profilers popular in the offshore industry and in open ocean measurement. When development of the "Para-dopp"™ hardware platform began in 1998 it was with coastal applications in mind. This narrow focus made many improvements possible, simply because different design paths were clearer. For example, rather than traditional CPU design, a fixed point DSP is used to handle the processing load and all "unnecessary"™ configuration and processing was moved from the instruments to the software. More importantly, the use of FPGA proved a good foundation for a timing controller that was easy to reconfigure and that allowed for tight control of the power nets - a major stumbling block in the design of Doppler instruments. Particularly useful is the ability of the power nets to be switched on/off within milliseconds. This was then combined with variable acoustic transmit power - a first in the industry - and as a result the power consumption could be reduced by a factor of three to ten. The consequence was less battery power and smaller instruments, suited to the requirements of coastal science and engineering work. The scientist no longer needed a crew to deploy an instrument; one-man shows became feasible and the customers responded positively to this opportunity.

Nortek's™ innovative approach to Doppler instruments was a hit and the positive response spurred further innovation. New ways were sought to improve current meter flexibility. Realising that no two data collection exercises are ever the same, Nortek began to offer a wider variety of transducer heads and heads made to order. Transducer heads used to be machined to a fixed shape. Nortek removed this restriction by using plastic moulding technology to make any transducer head configuration specified by the customer. As an example the current profilers could now measure above, to the side, or even off to an angle.

The Paradopp platform handled the demands for the first family of Doppler instruments. These are the Aquadopp Current Meter for single point measurements, Vector Velocimeter for high resolution studies in the surf zone, and the Aquadopp Current Profiler, which has become the "workhorse"™ for stationary current profiling in water depths ranging from 1 to 50m.

Waves Too

The product range soon grew to include instruments for combined current profiles and wave measurement, such as the AWAC. Of special interest is the fact that now the wave directional spectra provided a higher level of detail as compared to the PUV spectra typical for bottom mounted instruments. Whereas the PUV spectra typically limit wave measurements to 5-s wave (or longer), the AWAC equipped with the new Acoustic Surface Tracking firmware can track waves with periods as short as 1-s. As a result, the non-linear shape of the surface is

not lost in the measurements and the resolution of the data exceeds that of a wave directional buoy. Comparative tests (and introduction of operational systems) have been performed in Taiwan, Japan, Australia, Scotland and France. Results so far are overwhelmingly positive, once again proving the power of the Doppler principle as a key technology for physical measurements in the coastal seas.

Qmetrix - A Freshwater Extension

In 2002, Nortek launched Qmetrix, a co-operative effort with partners Sicco Kamminga and Jan van de Velde. Following a trend to move Doppler instrumentation into fresh water channels and rivers, Qmetrix has made the channel-rich Netherlands its home. The fresh water effort is focused on monitoring and calibration of water discharge (Q), an application that has exploded since its introduction in 1999 and the subsequent approval of the "Index Velocity Method"™ by the USGS. In brief, the method means that water discharge can be calibrated by measuring water level (stage) and the velocity at an arbitrary point away from the channel side-walls. Well suited for the use of Doppler technology, instruments for both calibration and monitoring have been tested in several different countries, although the leading users are still in the US. With the formation of Qmetrix, Nortek and its partners hope to gain acceptance for the methodology also on the European continent.

A Future on the Move

Future objectives are not very different from those envisaged at the formation of Nortek. If the company can provide customers with instruments that allow them to be successful, Nortek will be successful. For now, things are heading in the right direction and the company is on a steady course to grow at least at the rate of the overall "Doppler industry"™. For the immediate future, however, a new home providing many of the comforts required to improve operation and make room for new people is at top of the list. The move is anticipated in March 2003, when the company will occupy a new building with 1,500 square metres of space located on a single floor. The address will still be in Sandvika, outside Oslo, or about 40 minutes from the airport by train. Visitors are most welcome.

<https://www.hydro-international.com/content/article/nortek-as>
