

# A MANUFACTURER OF OCEANOGRAPHIC AND ENVIRONMENTAL RESEARCH INSTRUMENTS AND SYSTEMS

## Alec Electronics Co Ltd

Alec Electronics Co Ltd was established in September 1973, in Japan, with the goal of producing instruments which contribute to environmental preservation. The company was founded by Mr Hiroshi Togawa and his colleague Mr Hiroaki Yuzuriha, president and executive director respectively. Mr Shoichiro Konashi, the managing director, manages domestic and international sales. The company has a staff of 50, many of whom are engaged in the development, design, system integration and calibration of instrumentation. In 2003 Alec Electronics Co Ltd will celebrate its 30th anniversary. Its agents and dealers network is well established not only in Japan but also in the major countries in the world. Its export volume is steadily increasing.

Global environment is changing on a large scale. Shifts in the global climate are causing erratic and violent weather conditions. These changes are having a noticeable effect on human settlement, fisheries and agricultures, and nature at large. Alec Electronics Co Ltd continually strives to offer instrumentation to assist researchers understand the environmental impacts of the climate shifts. The company constantly endeavours to improve existing products and to develop new and innovative instruments.

### Contribute towards the Preservation of the Environment

The oceanographic and environmental field is a niche market in which many large companies have difficulty competing. Specialised technical-oriented firms are best suited to this market. For 30 years Alec Electronics have concentrated on designing, developing, manufacturing and marketing (domestic and international sales) high-quality oceanographic and environmental instruments and systems. Under their company motto "To Contribute Toward the Preservation of the Environment"™, they strive to develop and produce quality measurement equipment suited to the needs and the demands of the clients. When the company was first established, they developed and produced electro-magnetic current meters for laboratory and field use. As they grew, the range of products was expanded. Today they produce a variety of instruments capable of measuring many parameters in fresh and in sea water. The electro-magnetic and inductive technology developed for electro-magnetic current meters led to a unique conductivity sensor. Their refined optical technology has led to the development of several optical sensors suitable for measuring turbidity/ chlorophyll and light intensity. Sensors have been developed to measure pH, dissolved oxygen, depth, temperature etc. In addition to the large variety of their standard instruments, their skilled engineers are able to design custom-made equipment and systems for specific measurement applications and projects.

### Miniaturise Oceanographic Measuring Instruments

All aspects of the manufacturing process, from the sensor design to the final calibration, are subject to their strict quality control procedures. All their products comply with the ISO 9001:1994 standard. The ISO 9001:2000 will be approved for their oceanographic and environmental development, design, production and sales activities by the midyear, 2003.

End users generally feel instruments developed for oceanographic and environmental measurements were and still are "huge"™, "heavy"™ and "expensive"™. Moreover, it is said that the operation is complicated and the instrument is often defective. In the last ten years Alec Electronics has concentrated on developing light-weight, miniaturised, high-performance and inexpensive instruments. Approximately two years ago, the company introduced the COMPACT and MkV series. These new products, reflecting compliance to those strict requirements, have been introduced to Japanese and world markets. The company's™ reputation, supported by many clients, has permitted the expansion of the "series"™ range to complete the line-up of six instruments listed below. By applying the original miniaturisation technology cultivated during the development of the COMPACT series, cable type and direct-reading multi-parameter water quality meters, the AAQ1183 series, have been completed. These "series"™ represent the result of the company's™ 30 years of sensor development experience and are offered with full confidence that they are compact, affordable and user friendly.

In order to keep the quality of service and production, their Kobe plant maintains in-house calibration facilities. Calibration capabilities include calibration tanks for current meters, conductivity cells, turbidity/chlorophyll sensors and temperature sensors; high-pressure test facilities; a uniform temperature and humidity room; and also a sea-water chemical analysis laboratory.

### Alec Electronics and Their Products

Alec Electronics are recognised as a leading manufacturer of oceanographic and environmental research instruments and systems in Japanese and international markets. They have collaborated with many governmental agencies and universities on research projects throughout the world.

The ultra-miniature/miniature series data recorders are ideal for long-term deployments for up to 2 years. They can be clipped onto moorings or can be used for tagging and tracking marine mammals. Through a convenient computer interface via RS232-C, it is easy to download the recorded data which is stored in 2MB non-volatile flash memory and program them for a variety of sampling strategies. The recorders consist of the MkV and COMPACT series. The COMPACT series instruments are small, highly accurate recorders for

Temperature-Depth (TD), Conductivity-Temperature (CT), two direction Velocity-Direction-Temperature (EM), Wave Height (WH), Chlorophyll-Turbidity-Temperature (CL/CLW) and Dissolved Oxygen-Temperature (DO/DOW). The MkV series instruments are extremely small, light and inexpensive loggers for Temperature (T), Depth (D) and Light intensity (L).

TurboMAP (Turbulence Ocean Microstructure Acquisition Profiler) is a free-falling/uprising profiler designed for measurement of micro-structure in lake and ocean studies. The high-resolution shear probe and thermistor sensor provide the ability for measuring turbulence intensity and thermal structure in small scale, less than centimetre. It is also equipped with high accuracy CTD that is rated up to 2,000 metres. Together with the new bio-optical sensors, biophysical interactions at centimetre scales can be observed in the field. The sophisticated design in mechanics and electronics, which makes the profiler a quite stable platform, extends the measurements to open deep-sea. All data recorded in profiler are sampled at 1024Hz, providing high signal bandwidth for data collection.

The newly designed AAQ1183 series are small, light-weight and high-accuracy multi-parameter water quality meters designed for measurement of depth, temperature, conductivity (salinity), turbidity, chlorophyll, dissolved oxygen and pH up to a depth of 100 metres. A variety of configurations are available. A direct connection with PC through a small I/F unit makes real-time deployment and analysis possible. The data can be stored in a handheld terminal while in the field and transferred in the laboratory upon return. The smart display unit with printing function and position-fixing by GPS shows an immediate data analysis while in the field. A small computer PDA unit provides functions similar to a PC application as well.

The TPM CLOROTEC, ACL2180-TPM represents a novel concept for oceanographic field instrumentation. Designed for in-site measurements in the coastal zone, the TPM CLOROTEC can be configured for three different deployment modes: towing, profiling and mooring. With a single instrument, it is possible to obtain horizontal or vertical distributions, as well as time series of physical and biological parameters. The TPM CLOROTEC is equipped with sensors to measure temperature, salinity, pressure, turbidity and chlorophyll. State-of-the-art electronic techniques make this new instrument compact, light-weight and easy to use.

Electro-magnetic current meters are Alec Electronics's™ best-selling items with constant demand from not only Japan but also world markets. The measurement principle is based on Faraday's™ Law of induction and, because there are no moving parts, the meters always offer very robust, stable and sensitive measurements. Low current speeds can be measured with great accuracy, even in shallow water or in narrow model tanks. As a result of Alec Electronics's™ long standing experience and patented manufacturing techniques, a variety of sensor heads can be used with the meters, such as for dual-axis (x,y) and triple-axis (x,y,z).