NIWA Instrument Systems

accurate and dependable data for science

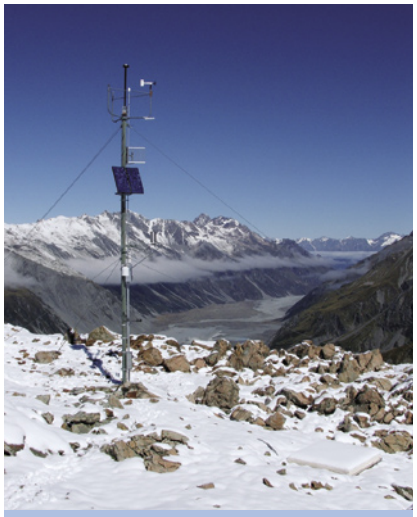
www.niwascience.co.nz/instrumentsystems

Reliable and accurate measurement is essential for research and consultancy. NIWA Instrument Systems is a specialist instrumentation unit supporting NIWA's substantial equipment requirements and extensive environmental monitoring networks. The group also supplies skills, expertise, and products to other organisations in the environmental measurement and general data collection industries.

Our activities include:

- design, development, and manufacture of instrumentation;
- supply of equipment for hydrological, meteorological, and water quality data measurement, recording, and transmission;
- development of customised monitoring systems and equipment for operation in harsh or unique conditions;
- servicing, repair, and re-calibration.

great services

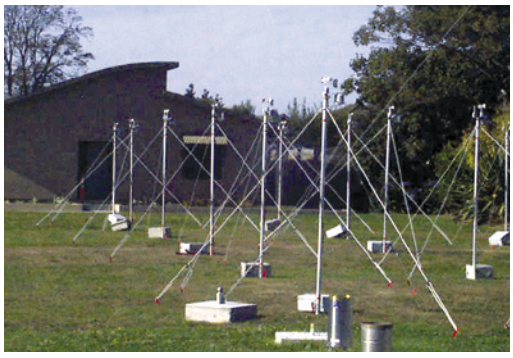


Monitoring in the harshest environments

Extreme winds (often more than 180 km/h) and temperatures (minus 20 °C is common) and regular lightning are a feature of the conditions found at Rose Ridge meteorological station in the Southern Alps. It is among the highest monitoring stations in New Zealand, and is an important part of the network providing information on potential inflows to the hydro lakes of the Waitaki Valley. Extreme environmental conditions in remote locations often mean we have to significantly customise stations when we commission them. For Rose Ridge, this included extensive lightning protection systems and the incorporation of an iridium satellite communications module.

Portable met stations required

In a very short space of time, and making use of NIWA's extensive instrumentation resources, we built, tested, and deployed a network of 23 portable meteorological monitoring stations to collect data for a NIWA client. The scientists were engaged by Network Mapping Ltd from the UK, who, as primary contractors to Transpower, were carrying out a detailed survey of large blocks of the Transpower network of transmission lines. The goal was to determine how much extra power could be put down the lines before they sagged so much they got too close to roads, buildings, trees, and the like. The temperature and sag of the lines are influenced by the ambient air temperature, heating by the flow of current and by the sun, and cooling by the wind. We deployed the portable stations at about 20 kilometre intervals, along several hundred kilometres of the Transpower national transmission grid in order to provide the data the scientists needed. The project requirements were defined just before Christmas, and all the stations were assembled, tested, and in operation by early February.



Testing the portable met stations before they were installed along the transmission line.

Design, build, install

Researchers often demand such specialised data that there is no commercial equipment available to record it. Over the years, Instrument Systems staff have taken many of the research requirements and from them developed a variety of tools, specialised equipment, and accessories for environmental monitoring.

One example is the NIWA AQ Auto-sampler, which automatically collects air samples over time for subsequent laboratory analysis. The auto-sampler means that the air quality scientists can deploy the apparatus and leave it unattended for long periods, knowing the onboard data logging device will control the sampling to give them the information they need.

An automatic air sampler in operation.