update

NIWA
Taihoro Nukurangi

Instrument Systems

collecting data, delivering solutions

Neon – data collection in the internet age

NIWA Instrument Systems and Unidata have jointly developed Neon – IP capable data loggers and supporting systems. Neon delivers a 'measurement-to-web' service for near real-time environmental monitoring.

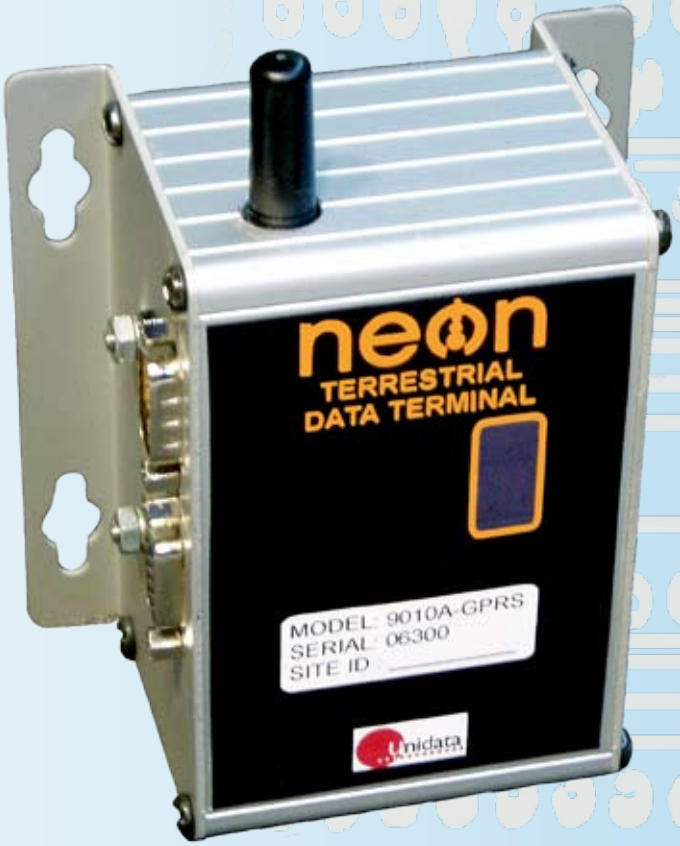
Fifty years ago, data was collected manually. Hydrologists and climatologists would have to visit monitoring sites to collect charts on which the data were physically recorded.

Twenty-five years ago, electronic dataloggers became available. Data were recorded in electronic memory and every few weeks or months, again, someone had to visit a site to download the data for analysis. By then the data was already historical.

Today, with the advent of cellular and satellite communication technology, and the internet, data can easily be logged and transferred to a central server as often as every minute, and users can view data on the internet very soon after the measurement has taken place, in 'near real time'.

Neon – IP capable dataloggers, manufactured in Australia by Unidata, and referred to as the Neon Remote Terminal, or NRT, are now available. An NRT is a small self-contained combined datalogger and communications terminal that connects to sensors in the field, collects data from those sensors, and transmits data to a central server. The NRT loggers are fully programmable and may be configured to simply return sensor data or can generate a huge range of mathematically-derived values including statistical analyses, as well as complex linearization functions. Long battery life and low operating costs are made possible through the use of advanced IP technology. NRTs may be programmed via the Neon server.

At present, there are two models of NRT. The first, the NRT – Terrestrial Data Terminal, with two build options available, is designed to collect remote data via the GSM/GPRS or CDMA 1xRTT Cellular Networks from any location that has cellular coverage. The second collects data via the international Globalstar LEO Satellite Network from many locations around the globe.



The Neon Client System, a suite of software and documentation, allows clients to set up their own Neon system on an existing server or new server hardware located at the client's premises. Alternatively, clients may wish to use the Neon Data Service using the Neon secure server which is housed at Unidata's offices. Data can be routinely delivered back to the client from this server via email, SMS, or a range of other data transfer mechanisms as well as being presented via the web.

River gauging gets smart

Acoustic Doppler current profilers (ADCPs) are transforming the way we gauge the flow of rivers, and a nifty device developed by NIWA is making the job even easier.

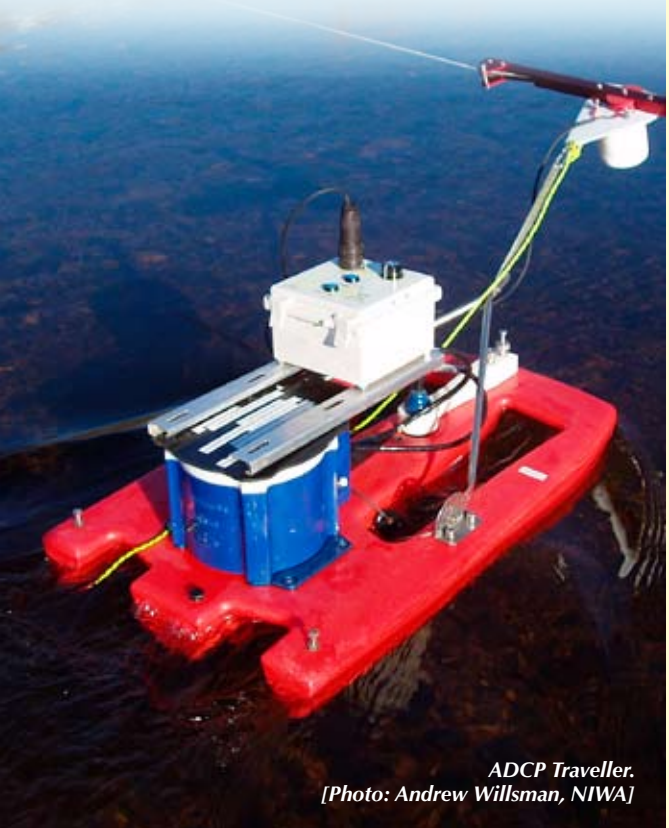
ADCPs are sophisticated echo-sounders which can measure water depth and velocity across a full cross-section of a river. Older methods typically involve an operator gauging the river at selected points while wading, standing on a bridge, or even suspended in a cable car.

By using a large ADCP mounted on a jet boat, we can much more accurately gauge big rivers like the Waikato, but we also use ADCPs mounted on a 'float' to gauge smaller streams.

The manufacturer's recommended method for deploying a float-mounted ADCP involves an operator dragging the float back and forth along a line strung across the stream. This is tedious and difficult because each traverse of the stream must be smooth, constant, and slow.

Andrew Willsman of NIWA's Dunedin branch office invented a remote-controlled 'traveller' which moves the float at very slow, steady speed, ensuring high quality flow measurements. At one site where we were getting 10% or more variation in flow measurements between traverses, we get just 2% variation using the traveller.

The traveller has been further developed by NIWA Instrument Systems and is now available for sale.



ADCP Traveller.
[Photo: Andrew Willsman, NIWA]

New Precision Water Level Instrument

The Unidata 6541A Precision Water Level Instrument, used throughout the world for nearly two decades, has now been superseded by the 6541B. In addition to the features present on the 6541A, the 6541B supports the Serial Data Interface (SDI-12), has an extra High Speed Serial Interface (HSIO) and has an optional on-board 4-20mA current loop output.

The SDI capability allows the encoder to be easily and directly connected to a three-wire SDI bus, to which other SDI instruments may also be connected. Each instrument connected to the SDI bus is given a unique address, thus allowing a data logger to request data from a specific instrument.

The new Unidata 6541B Encoder.
[Photo: Dave Gibb, NIWA]

Application: Opuha Dam

Recently five of the new 6541B encoders were used in a monitoring system at the Opuha Dam, near the Canterbury town of Fairlie.

The system precisely measures the rate at which water seeps from several cavities around the dam. A small amount of seepage is normal for this type of structure, and continuous monitoring is a condition of the Resource Consent under which the dam operates. The day-to-day operation of monitoring stations around the dam, and all data management, is done by Environmental Consultancy Services, based in Timaru.

Each of the five green enclosures shown in the photograph houses a 6541B encoder which measures the water level in a stilling-well coupled to the associated flume. [Photo: Lindsay Anderson, ECS]

Seepage water is collected from five strategic monitoring points and each is separately piped to a calibrated flume. In each of the flumes, a separate 6541B encoder measures the water level. (The power station controller converts the water level data to flow data.) The concentration of suspended sediments present in the seepage water is also monitored, using a turbidity sensor. The water is then returned to the Opuha River.

For more information on NIWA Instrument Systems, contact us:

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