Unidata Newsline

Unidata Newsline No. 12, June 2015

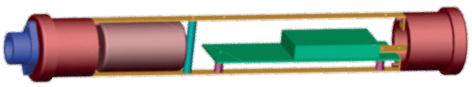
New product release -

Neon Bore Hole Telemetry Module

With the growth in groundwater monitoring activity in the last couple of years, Unidata has developed and released a new internet connected Neon IP Data Logger which assists authorities to better telemeter readings from ground water bores. Bore sites have been traditionally monitored manually, with staff visiting bore sites on a regular basis to dip the bore and obtain the readings. Manual operations are expensive as modern day health and safety regulations usually require two officers to visit remote sites. Minimising trips to sites saves money for government agencies and their contractors.

The other challenge is that there are hundreds, sometimes thousands of bore sites, which are in remote places and are the same design, a bore case with a lock attached, and those sites are often in public areas where vandals may choose to damage data logger equipment. To minimise such problems, it is desirable to have the internet data logger / telemetry unit housed inside the bore case, out of harm's way.

Unidata has developed a new product for the Neon IP Data Logger series, the 2024F NBHTM (Neon Bore Hole Telemetry Module), a small format Neon IP Data Logger unit inside a tubular housing which connects to downhole sensors in bore holes, collects readings from those sensors, and transmits the collected data to a central server via a cellular telephone network.



The 2024F NBHTM incorporates some recently developed technology, namely a Gore-Tex membrane, which allows for pressure compensation through a waterproof membrane, minimising the need for desiccant in pressure compensated pressure sensors. The tubular housing allows for easy insertion with clearance in bores as small as 50mm diameter. There is also a simple magnetic reset switch, which allows the user to easily reset the unit in the field without opening it to the elements.

The 2024F NBHTM IP data logger is designed as a telemetry system for bore holes with diameters of 50mm or greater via 3G /NextG/ WCDMA/ and 2G GPRS cellular networks from any location within the cellular network coverage area.

Different antenna options are available depending on the geographic area, sometimes the small stubby cell phone antenna is sufficient, and for fringe areas a small flat low profile antenna can be used and affixed to the top of the bore case, thereby reducing the risk of theft and damage by vandals.

Continued over page

Neon Bore Hole Telemetry Module continued

Fully bi-directional communications are possible via the Neon server. Data can be collected directly and the 2024F NBHTM can be programmed from any internet connection. The 2024F NBHTM supports integrated logging or automated collection of data from another downhole data logger. Its built-in modem supports packet data, has long battery life and supports GSM 850/ 900/ 1800/ 1900 MHz and 3G 850/ 900/ 1900/ 2100 MHz.

For sensor connections the 2024F NBHTM has an SDI-12 interface for connection to SDI 12 downhole sensors, a Modbus interface for connection to Modbus downhole sensors and an analogue interface for analogue / pressure. The main connector option is an SQL connector. However the 2024F NBHTM can be equipped with other connector options to connect different sensors based on users requirements.

Melbourne water bore site

Perth water bore site

Unidata Staff Profile - Bill Cutler

Bill Cutler, our most senior member of staff retired this year. His 90th birthday is coming up soon, and he thought he should stop working before he turned 90, even though he has only been working part time in recent years.

Bill Cutler worked with Unidata, initially with his company Automated Lab Equipment which he started in 1968. As time went by Bill ended up doing most of his work for Unidata, building enclosures for data loggers and water monitoring instruments, so the companies merged in the 1980s. Bill has been an employee ever since.

Bill completed a Fitter and Turner apprenticeship at the Midland Railway workshops in the 1950s, his experience is huge, and he has always done work of the highest standard.

Bill also had a special seat in the lunchroom, and no one has dared to sit there since his departure.

Bill says his well-earned retirement will be mostly spent playing golf, but he has confessed he does have a golf cart these days. We had a nice send off for Bill on his last day, and he drops by to say hello from time to time, and to occasionally borrow tools because he is doing some house renovations. There is no stopping Bill.

Element Hydrographic Solutions - Satellite Rainfall Stations

Our partner, Element Hydrographic Solutions, has recently installed remote rainfall monitoring systems in a network of remote meteorological sites based on the Neon IP Data Logger- Satellite in the West Pilbara Region of Western Australia. They have prepared a very robust mechanically sound system, designed for remote operation with a minimum of site visits. The photo shows one of the sites at Buckland Hills.

The system design is unique, one of the best we have seen. It has an enclosure close to the ground and a solar panel which is integrated with the sloped enclosure, to maximise the solar energy collected, while keeping the whole installation low down to minimise windage. The satellite service chosen was a Globalstar service, appropriate for this low data rate requirement, and with very small power requirements.

Element Hydrographic Solutions specialises in the monitoring of three main areas: Surface Water, Groundwater & Meteorological parameters. They offer an innovative range of monitoring solutions based on industry experience, training and an understanding of our client's requirements.

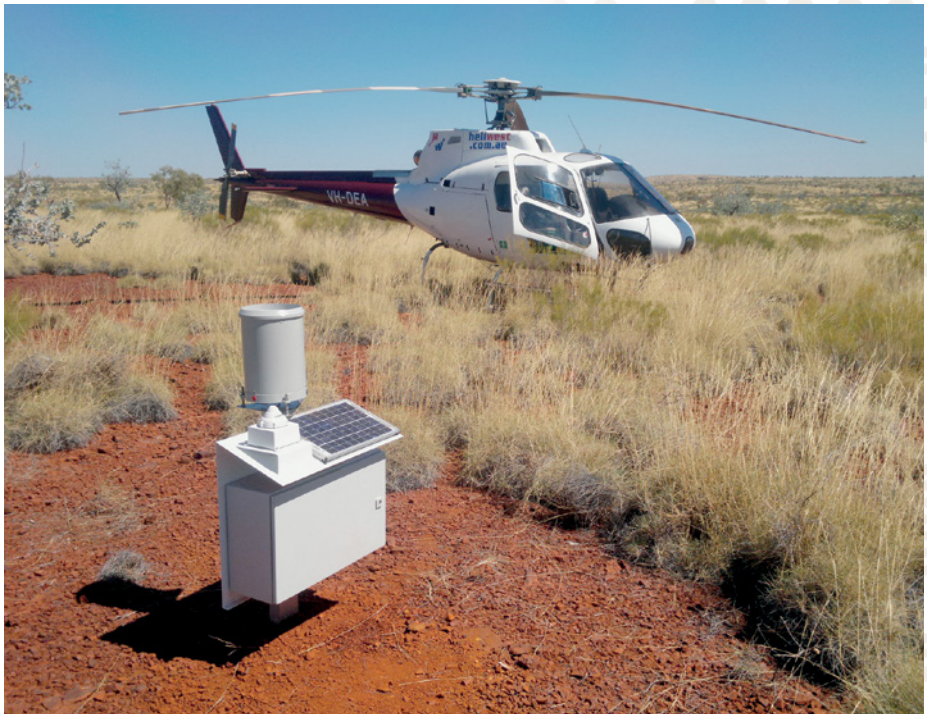
Element Hydrographic Solutions is based in Perth, Western Australia. Element's hydrographic team is nationally focussed on providing hydrographic solutions to a variety of industries including, Mining and Exploration, Agriculture and Local and State Governments.

Nathan Rugless is Element Hydrographic Solutions' Hydrographic Projects Manager / Director, and his wide experience includes Sydney Water, Water Corporation and Ecowise.

Nathan is a regular visitor to Unidata. He has been known to bring the occasional case of beer as a thank you to our engineers for assistance with a project. He is a popular visitor.

element hydrographic solutions

NEON Satellite Teletemered Rainfall Station Cabinet

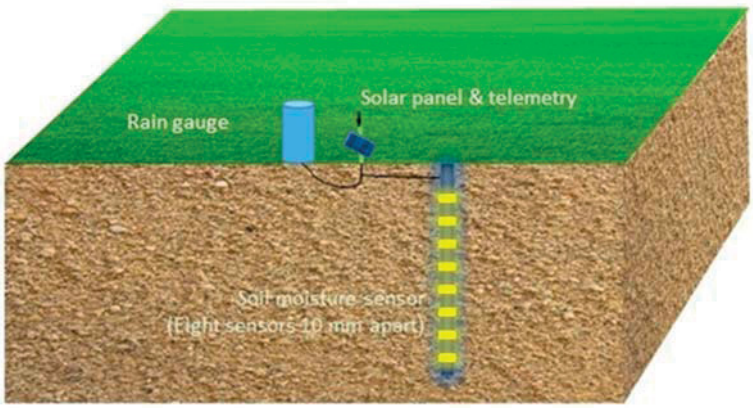


NEON Satellite Telemetered Rainfall Station Install

NIWA Irrimate and Irrimet / Neon IP Data Logger assists Farmers make Irrigation Decisions

NIWAIrriMet

Irrimate, NIWA's compact soil water monitoring station, enables farmers to make informed decisions about when, and how much, to irrigate. Irrimate displays and records soil moisture and rainfall at your farm, using the Unidata Neon IP data logger technology. It lets you view this information in near real-time via the Internet. Irrimate complements NIWA's on farm weather forecasting service. This system is a standalone, solar-powered, internet-connected monitoring station with rainfall and soil moisture sensors wired to it. A Neon Metering Module within the Irrimate communicates the readings to a central Neon server every 10 minutes, and displays the information on line, available to the farmer to view and make key decisions as to irrigation system settings. An array of soil moisture sensors provides a vertical soil moisture profile down through the soil, with a sensor located every 10 cm to a depth of 80 cm. Best accuracy is obtained when these sensors are specifically calibrated for the local soil conditions.



The Irrimate is just one of many support tools that NIWA provides for the agriculture industry, and these tools are mostly Neon based, with the Neon equipment and software being provided by Unidata. NIWA then adds the science and the weather and climate forecasting models to make the solution complete. A companion product, NIWA Irrimet, provides a comprehensive web based decision support system for farmers using the Irrimate system.

NIWA has detailed write ups on these systems. We can send you a copy on request.

RID Trials Neon Remote Terminal - Inmarsat M2M - Least Cost Routing Applications

The Royal Irrigation Department (RID) in Thailand has used the Unidata Neon IP data logger system using the cell phone networks in Thailand for several years to monitor river levels. RID now need a high reliability satellite system to augment the current cell phone Neon IP data loggers, especially in critical areas where the cell phone system may be damaged by flood events.

RID needed some Neon IP data loggers/ neon Remote Terminals Satellite systems for rainfall stations in very remote areas, where satellite is the only option, and to provide a redundant communications path. RID also needed to minimise cost so they chose a least cost routing model, where the measurement stations use the cell phone system most of the time, but can switch over to the satellite system when there is a fault on the cell phone network. The industry routinely calls this process least cost routing. The Unidata Neon IP data logger/ Neon Remote Terminal has this function built in, where the lowest cost communications route is chosen when available, but there is an automatic fall back to the higher cost satellite link when there is a break in the cell phone service. The internal router component within the Neon IP data logger /Neon

Remote Terminal provides this function automatically.

Appropriate satellite airtime arrangements were also needed, whereby RID can have a budget, with a limit, to ensure there were no excessive satellite airtime charges. Unidata worked with a specialist Satellite airtime provider Galaxy 1, experienced in satellite airtime arrangements for machine to machine applications (M2M), to achieve this. They plan to set up a pre- paid satellite service which allows a certain amount of usage before cutting the service off to limit excessive charges.

The demonstration was in RID Headquarters in Bangkok, and the Neon IP data logger satellite antenna was simply placed on the ground and pointed in the general direction of the satellite, and it worked first time.

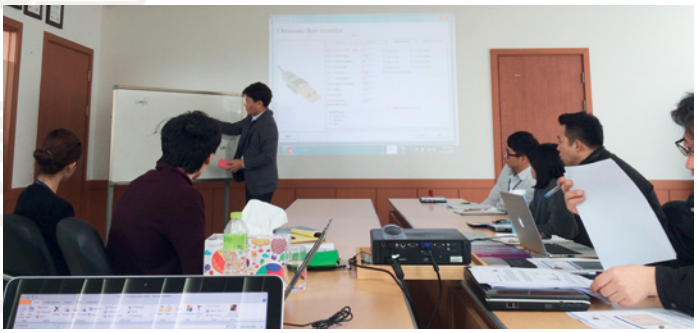
The photo also shows several RID staff, many of which we have worked with for many years, and includes the senior RID personnel Mr Charay and Mr Sumeth.

Major Starflow Project - WESS Global Distributors - Korea

Late 2014 our partner WES Distributors secured a large (100's units quantities) project for Starflow, our ultrasonic doppler flowmeter for open channels and partially filled pipes.

The many starflow units were monitoring industrial outflow, an important requirement for the management of the environment, which has been a major focus for the South Korean Government in recent times.

Kevin Chung and Clint Barnes visited Korea and provided detailed training and installation assistance to WESS Global. With this training assistance the starflow systems were installed within the required time and the project was successful.



What are 1G, 2G, 3G and 4G Networks? When is 2G being closed down?

The "G" in wireless networks refers to the "generation" of the underlying wireless network technology. Technically generations are defined as follows:

1G networks (NMT, C-Nets, AMPS, TACS) are considered to be the first analogue cellular systems, which started early 1980s. There were radio telephone systems even before that. 1G networks were conceived and designed purely for voice calls with almost no consideration of data services (with the possible exception of built-in modems in some headsets).

2G networks (GSM, CDMAOne, D-AMPS) are the first digital cellular systems launched early 1990s, offering improved sound quality, better security and higher total capacity. GSM supports circuit-switched data (CSD), allowing users to place dial-up data calls digitally, so that the network's switching station receives actual ones and zeroes rather than the screech of an analogue modem.

2.5G networks (GPRS, CDMA2000 1x) are the enhanced versions of 2G networks with theoretical data rates up to about 144kbit/s. GPRS offered the first always-on data service.

3G networks (UMTS FDD and TDD, CDMA2000 1x EVDO, CDMA2000 3x, TD-SCDMA, Arib WCDMA, EDGE, IMT-2000 DECT) are newer cellular networks that have data rates of 384kbit/s and more.

4G technology refers to the fourth generation of mobile phone communication standards. LTE and WiMAX are marketed as parts of this generation, even though they fall short of the actual standard.

What does this mean for Unidata Neon IP Data logger Customers?

NEON 2011C/D and 2014C/D are GSM/GPRS and support only GSM 2nd generation network

NEON 2013D/E and 2016D/E support both GSM and 3G network, 2nd and 3rd generation networks.

Telemetry applications do not need anything faster than 3G

Several of our customers will need to migrate from 2G to 3G networks as carriers are soon to close down the older 2G networks. Telstra have announced the closure of the 2G network in 2017, so you should now plan for the closure if you have 2G Neon P Data Logger units. Please contact Unidata for any advice on these matters.

Unidata Quality & Vendor Accreditation - Improving our Systems

Unidata has for many years maintained quality accreditation to the ISO 9000 standard. Annually we have an external auditor visit and do a detailed audit of our processes to ensure we continue to maintain the requirements for ongoing accreditation as well as suggesting improvements for our quality system. The quality auditors from DNV offer suggestions for improvements in our processes as well as checking for compliance with the relevant standards.

Our quality system also needs to keep up with current practice, especially things like Occupational Health and Safety, Environmental Management, Corporate and Social Responsibilities and Code of Conduct, all of which are reviewed by the Quality Auditors from DNV.

Last year we also went through a process to apply for and secure Achilles vendor assessment for the Oil and Gas Industry worldwide. This process was more rigorous than the QA system accreditation and brought to light some areas of our operations which needed to be adjusted and enhanced, especially around Occupational health and Safety and Environmental Management. Maintaining Achilles accreditation allows Unidata to be listed as an approved vendor for many oil and gas companies worldwide. Also, Achilles lists our products and services in approved vendor listings so we can receive enquiries before requests for tenders are advertised.

Both the DNV Quality Auditor and the Achilles Auditor recommended we extend our QA system to also incorporate compliance with the ISO 14001 Standard, where we ensure our operations do not negatively impact the environment. As well we must have continuous process improvement to continue to minimise any negative impact on the environment. To this end we have done things such as replacing halogen lights with LED lights to minimise power usage, we have a Neon Metering Module on our water supply to observe and minimise our water use. We are also improving our waste management and have adopted the new SITA co-mingled waste recovery system. As part of these accreditation system upgrades we have also considered the health of staff, and now supply free bottled drinking water to all staff, allowing them to make the choice to have a more healthy drink instead of the usual high sugar content canned soft drinks we have in the staff room fridge.

We are working towards ISO1400 accreditation and expect to become accredited at our QA audit in early 2016.

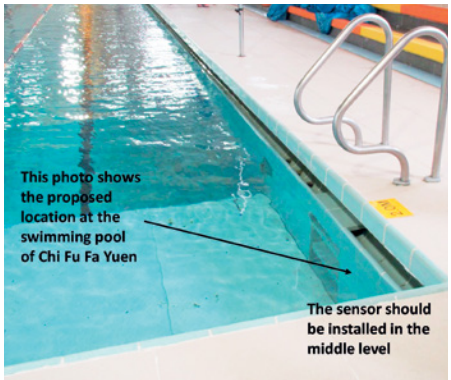
Finally we also have the annual independent financial audit process, currently run by PWC, which assures the shareholders, directors and our customers that the financial results and the financial processes are correct, and areas for improvement are noted and adopted on an annual basis.

Elena O'Neil manages and maintains all of these QA and vendor accreditation and financial audit processes and systems, it is a lot of work, but the outcome for our customers and our staff is a positive one.

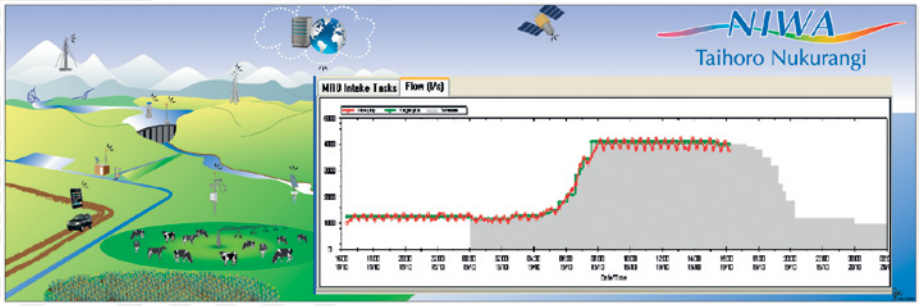
Neon Monitoring of Water Quality at Swim Schools in Hong Kong

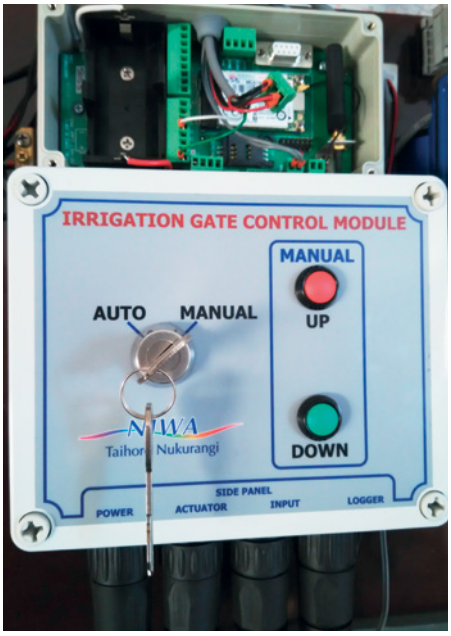
Our partner in Hong Kong, Cinotech has recently worked with Unidata to set up special monitoring for several Stanford elite Swim Schools in Hong Kong. The requirement was to have continuous monitoring of water quality and chemical levels, to ensure the water quality was appropriate for these elite swimming centres, and to be able to have a traceable record of that quality as well as alarms set up in the event of any dates and times when the water quality was outside specification.

A system was set up with a water quality and temperature sensor and a Neon IP Data Logger/ Neon Metering Module such that the swim schools can monitor these important water quality parameters on the Neon Applications Software Web interface. They can also set up alarms for any out of limit conditions, and then send alert text messages to the relevant staff.



There are many Stanford Swim schools in Hong Kong. Their students receive expert training; many go on to become elite athletes. The photos show the measurement points, the Neon IP Data logger/ Neon Metering Module enclosure at the Stanford Swim School.





NIWA Irrigation Systems on the Rangitata River

Our colleagues at NIWA in New Zealand are doing a lot of work with Irrigation Systems, and using Neon Systems in some large scale projects. There is an especially large one on the magnificent Rangitata River, one of the braided rivers that helped form the Canterbury Plains in southern New Zealand.

Farmers have ponds which are fed by take offs from the Rangitata River, and these ponds feed large Irrigation systems. Unidata 6541 Precision Water level Instruments and Neon IP Data Loggers / Neon Remote Terminals / Neon Applications Software are used for monitoring and control of these irrigation systems.

Kevin Chung of Unidata has visited these sites recently and was briefed on how they work so we can suggest irrigation management solutions such as these in Australia and other locations.

The irrigation systems have water ponds fed by water intakes from the river. The systems have automated level measurements using the Unidata 6541 Precision Water Level Instruments and NIWA gate valve control controllers which are monitored and controlled by the Neon IP data Logger / Neon Metering Module which is connected to a dedicated Neon Server system via cell phone and WiFi local networks. NIWA has detailed technical papers on these systems. We can send you a copy on request

inmarsat

inmarsat CERTIFIED

Unidata achieves Inmarsat Certified Partner Accreditation

Unidata has been working with Inmarsat for some time now. This year Unidata went through an accreditation process to become an Inmarsat Certified partner. The Unidata Neon / Neon IP Data Logger system is now an accredited solution for Inmarsat partners worldwide, allowing us to engage better with those partners on satellite telemetry / M2M projects.

Being a certified partner allows us to participate more fully at conferences and become more aware of technology directions as well as being engaged with the senior developers at Inmarsat, and being able to be early adopters for new technology as it becomes available. The satellite telemetry market is growing quickly and we expect tariff for satellite M2M will become more affordable, and more practical for many applications over the next 5 years. Satellite M2M is inherently more reliable than cell phone telemetry which relies on local cell towers, which are at more risk, for example they can be washed away during floods.

Unidata participated at the recent partner's conference / developer's conference in Europe. We were able to interact with several manufacturers and airtime resellers. Hughes Network Systems, one of the manufacturers of Inmarsat BGAN modem equipment also had a stand at this conference so we were able to discuss future product direction / be appraised about their future directions.

Interactions with other Inmarsat Certified Partners allows us to make better technology / product development decisions.

These activities will assist us to maintain a leadership position in satellite telemetry applications and ensure we offer the best Neon IP Data Loggers / Satellite telemetry solutions for our customers.

Unidata also made contact with many Inmarsat airtime partners, and we proposed Neon solutions for their customers.

Unidata presents M2M Solutions at Japan Digital Communications (JDC) Partner Workshop in Tokyo

Kevin Chung recently visited the JDC with Inmarsat M2M Specialist Cliff White to present Unidata IP Data Logger / Neon solutions at a major satellite M2M (Machine to Machine) workshop.

Unidata's Japanese partner Senecom also presented weather station solutions and agriculture solutions which have been equipped with Unidata Neon IP Data Loggers/ Neon Remote Terminal equipment and which have been installed recently. The most recent Neon IP Data Logger / weather station was installed in Okinawa on remote islands. Unidata engineers also worked with Senecom engineers to set up the NTT DoCoMo parameters appropriate for the Neon IP Data Logger / Neon Remote Terminal. The NTT DoCoMo system is considered to be world leading in regard to speed and reliability.

Unidata presentation was provided by Kevin Chung with a translator in the Japanese language. The presentation slides were also translated into the Japanese language.

The workshop / symposium was the first of its kind in Japan and there were more than 100 participants, from many cities throughout Japan.

Vietnam Weather Monitoring Equipment Trials

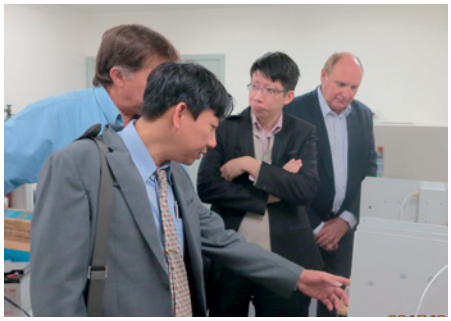
In late 2014 / early 2015 Unidata became involved in an important government project for Vietnam to trial telemetered weather station monitoring equipment.

Kevin Chung and Matt Saunders visited Hanoi in the early phases of the project and we worked with our local partner on the project in 2014. The city of Hanoi is very beautiful city, especially the areas with very narrow streets, the planning and architecture inherited from the French people many years ago. They also have many many motor bikes, very practical in those narrow streets, but a challenge when driving in the city. Our staff were advised to not make quick changes in direction when crossing streets. The system is that pedestrians cross, and motor bikes anticipate the direction of the pedestrians and they avoid them. That is the system, and it works.

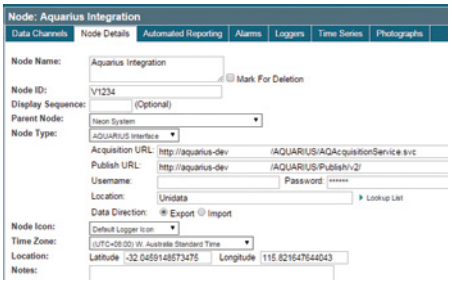
Our partner in Vietnam has involved Unidata in the project and we have now delivered several different Neon IP Data Logger / Neon Metering Modules as well as weather monitoring instruments and these systems are now under evaluation.

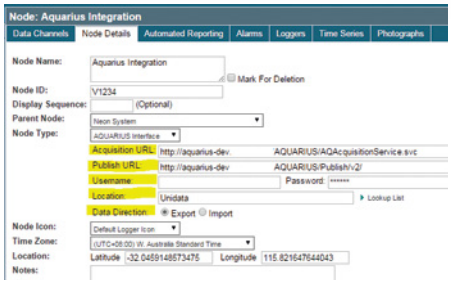
The government is evaluating the performance of different weather monitoring equipment, its operation and its reliability in some challenging locations in Vietnam.

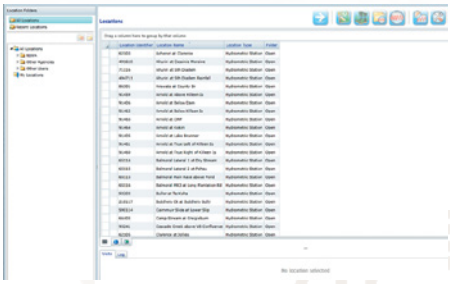
In 2015 representatives from the Government of Vietnam visited Australia and visited several factories to evaluate different weather equipment and software. Unidata accompanied the Government representatives to some of these factories, for equipment relevant to Unidata. The representatives also visited the Unidata factory in Perth, where we were able to show the Neon System and the Neon Applications Software. They also visited the Department of Water facility in Welshpool to examine the equipment used by that department. The government representatives were very thorough in their evaluation, and were very patient with Unidata. They spoke reasonable English. Sadly we were no able to return the favour and have some of the discussions in the Vietnamese language.



Unidata expects the trials will continue for some time, and after the conclusion of the trials, the government shall better know the most suitable equipment for use in Vietnam. We hope to continue our involvement at that time.







Neon Developments
Aquatic Information - Aquarius Package Integration

The Neon Applications software has been enhanced with a sophisticated interface which allows integration with Aquarius servers.

The Aquarius package is being adopted by several large users, especially in the USA, but more recently Aquarius has new installations in the Asia Pacific region.

Unidata has further developed the Neon Application software to use the Aquarius publish and acquisition web services to more easily share data and configuration between the Neon System and the Aquarius system

Neon uses these Aquarius web services to allow configuration of the Aquarius node identifier that a particular Unidata logger is associated with and provides a method of associating Aquarius channel identifiers with Neon data channels. Neon also allows the data channel's Aquarius "data quality" to be configured. Neon can also provide an Aquarius report format that pushes Neon data to an Aquarius server.

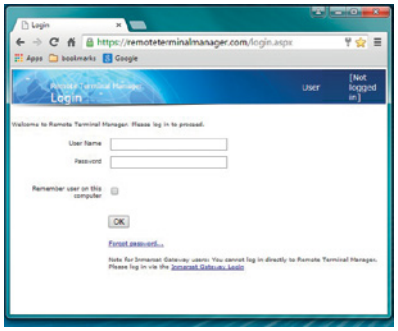
These additions to Neon should allow Aquarius users to more easily connect with a Neon system, which collects sensor data, ready for ingestion into an Aquarius System.

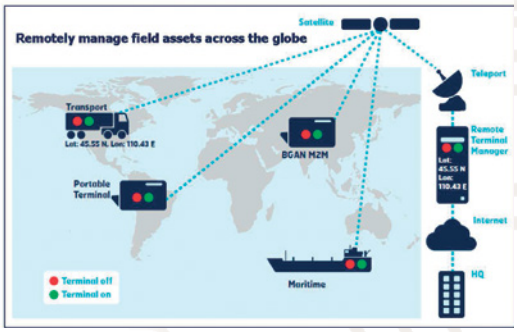
Remote Terminal Manager - On Line Management for Inmarsat Satellite Neon Remote Terminals

Inmarsat, through Galaxy 1, offers a web based management platform called Remote Terminal Manager. This management platform makes it very easy to manage Neon Remote Terminals with Inmarsat BGAN Modems in the field.

The application allows users to remotely monitor control and update Inmarsat BGAN Modem equipment and update configuration over a simple web based platform. You can display the on line status of all your Neon Remote Terminals, Inmarsat BGAN, on a map, and can easily set up alerts to let you know when a data connection is lost.

Remote Terminal Manager uses a separate communication channel to send commands and retrieve information to and from the terminal.





Even if the IP data channel is not available, this dedicated control channel remains using the lowest signal levels. A direct connection between the Remote Terminal Manager platform and the Inmarsat network ensures the highest reliability to exchange control and information.

You can use Remote Terminal Manager to remotely control connection set-up, disconnect, firmware upgrades and terminal resets. This, in combination with retrieving terminal status and the GPS position (if necessary), makes terminal management much easier. This tool is also useful as it allows you to remotely support and trouble-shoot, thus avoiding costly visits to the field.

Please contact support.team@unidata.com.au for further information on this very useful management platform.

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