Unidata Newsline

Unidata Newsline No. 9, April 2010

Unidata's New Products

Unidata has released several new and updated products in 2010.

We have refreshed all of our Neon Remote Terminals and Modules to the "D" series which include new features such as additional memory, up to 8 Mb of local data storage, extra input channels and more interfaces, such as the important Modbus RTU RS 485 interface. The packaging for the Neon remote terminals has been improved, to allow easier battery access and extra connections required for the additional channels.

Why 8MB of Memory?

Neon Terminals and Modules report data over the internet and the readings are uploaded to the remote server regularly, however in the event of an extended communications system outage, customers are often concerned to make sure data is recorded locally. With 8 Mb of memory the local storage of readings can continue for months or years even at high logging rates.

Why Modbus?

Many customers wish to use instruments with the Modbus RTU RS 485 interface. Industrial / SCADA applications typically use the Modbus RTU 485 as the preferred method of interfacing. Previously we provided a Modbus facility using a protocol converter, but it is easier to have the Neon Remote Terminals and Modules to have this capability built in and we have been able to make it easier to prepare schemes for Modbus RTU instruments using Starlog 4 Software.

Why More Channels?

Some customers wanted a larger input count on the Neon range, so we have provided some additional channels, up to 4 analogue and 4 digital channels. We have added a special function, such that our 16 channel Prologger, can be connected as a transparent ancillary logger. The Neon Server simply addresses the ancillary logger in the same way as it does a Neon remote terminal or module, and schemes can be uploaded to the Prologger via the Neon Server in a seamless way, making it very easy to connect and use.

We have also released two new Neon products, a Neon Camera System and Module and a GPS module for customers needing to have GPS position for mobile measurement stations.

Why a camera?

Telemetry of readings from a remote site has always been important, and that is our main business, but for remote sites, sometimes there may be unusual site conditions, for example, a log, branches or other debris affecting the measurement environment. With the Neon Camera System, a low resolution photograph of the measurement site can be taken daily, hourly or on demand and sent

up to the Neon Server for the operator to view as required. With a regular photograph, the local conditions around the site can be observed, and site visits can be reduced, saving time and money. A site visit is always best, but a regular photograph is a big help at times.

Why GPS?

For mobile measuring sites, it is useful to have a GPS position recorded for audit purposes with the data so there can be assurance that the data was collected from a particular site. Our GPS product also puts the position onto the Neon Google Maps interface, so the trace of the position over time can be recorded.

The top of the range Prologger, our most accurate logger in the range, has had memory increased to 1MB and a better power supply specification.

Leading the way in Water Efficient Cleaning

The culture and expectation of how cleaning is approached varies widely between industries, and the increasing trends in monitoring and auditing water use are starting to highlight these variations.

There are a number of trends that have become apparent when comparing the water efficiency of cleaning. When combined with technological advances, opportunites can be identified for expanding efficient practices into different areas and industries.

For many sites and utilities, this means a small adjustment in their approach to cleaning could dramatically reduce overall water use.

BMT WBM
"Where will our knowledge take you?"

Figure 1 – Typical Meter and Logger Used for Flow Data Capture.

Water used in cleaning is one of the key water use areas on the majority of commercial sites, and different sites and industries show a wide variety of technical and management-related approaches.

Why is it that vast public areas in shopping centres are cleaned with negligible quantities, while floor hosedown can account for the majority of water bills on small manufacturing sites?

How is it that the daily cleaning of amenities through a large hospital can use less than the daily cleaning of a small pool deck?

Through information gleaned from continuous remote monitoring of water meters in a variety of different projects in Sydney, this paper will draw together some general impressions about water used for floor and surface cleaning.

Clean-In-Place (CIP) systems installed in custom designed manufacturing plant equipment and dishwasher/ glasswasher units are not considered in this discussion, as the water use of these is typically controlled by individual manufacturers, rather than site users and managers.

But there are some principles that can be generalised about water used for rinsing floors, pool decks, cars, trucks, toilets areas, conveyors, mixing tanks cooking pots, trays, animal enclosures, tables and other similar surfaces.

These will be discussed along with barriers and opportunities for water efficiency – the latter of which were generally found to be very cost effective.

The observations and flow monitoring data were generated through water efficiency audits of commercial and industrial sites, pilot trial studies of low flow spray guns, and water checks of various carwash facilities in Sydney.

The data is gleaned from mechanical water meters attached to data loggers that average pulses (at 5 or 10 litres per pulse), averaged over 5 minute periods. This data format focuses on the flowrate of constant use and total volumes, rather than transient peaks and short water use events.

An example of the equipment used is provided as Figure 1.

The logger sends data to an online server via the next G network, allowing temporary wireless installation on existing main meters, and on individual hosetaps on commercial sites.

Other data was gathered using personal surveys of operators and cleaners about their cleaning practices and impressions of changing their processes to make use of lower flow devices.

There can be a large number of relatively disconnected observations drawn about specific industries, sites and even particular users of water on commercial sites. But the purpose of this paper is to draw together wider principles that have been found to be water efficient in particular industries or sectors.

In many cases, these principles are found to relate more to the history or culture of the work than to any technical requirements. Then combined with technology change, there is the opportunity for expansion of ideas and principles into areas and industries where these principles have not yet been trialed or considered.

Extract from Paper by Adam Jones BMT WBM, Sydney Office, courtesy of the author.

BMT WBM are a leading Australian engineering & environmental consultancy company using Unidata Neon Metering Modules in the water efficiency industry.

Satellite Services Update

Unidata has continued its work on integrating several other satellite services into its range for remote monitoring

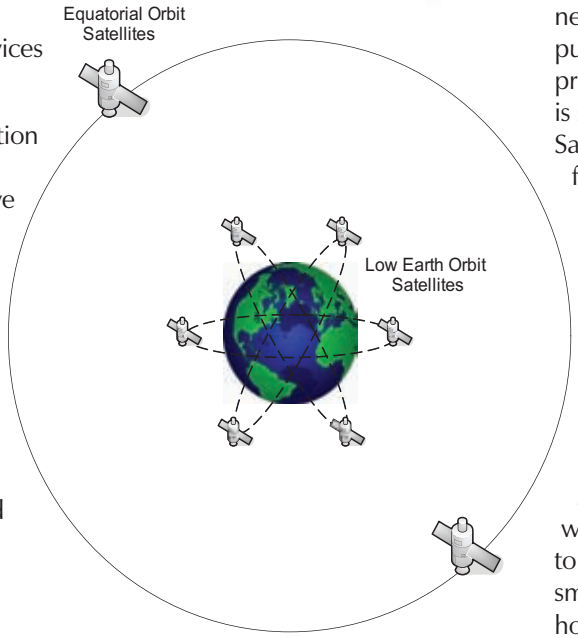
We have completed testing / integration of Iridium, Thuraya, Orbcom and Inmarsat as well as Globalstar, and we have done modelling on the data latency and equally importantly, the costs of these services. We have also modelled power consumption of these services.

It is now clear to us that while these services are all satellite technology there are subtle various of each service which need to be considered and there appears to be two distinct applications, where some are more suitable than others.

If you have the need for what we call "alert" function, services such as Iridium short burst data or Orbcom are probably best, especially Iridium which is a premium service, however the data transmission costs escalate greatly when the data rate is anything more than an occasional transmission of a short packet of data.

If you have the need for a "traditional logging & reporting" function, such as regular hydrographic data from a measurement site, perhaps with water level, flow and quality services such as Globalstar, Inmarsat and Thuraya are probably best as the data transmission costs are more reasonable for larger volumes of data. As technology improves, we expect the data load from "traditional logging & reporting" sites will grow, making the cost of sending larger amounts of data more regularly more important, for example, the routine transmission of an image, albeit a compressed image, from a measurement station camera is a new facility which Unidata, and other suppliers are now supporting.

Satellite services are also used for only the most remote locations. Another



important consideration for such very remote locations is power consumption. The ability to turn off the satellite modem most of the time to conserve power is critical. Some services allow for this easily, however some services need to establish a "session" each time the modem is powered on, and the communications overhead in establishing a session are high, increasing the overall monthly cost to sometimes prohibitive levels.

The physical location of the measurement station is another consideration, and there is a clear distinction between Low Earth Orbit Systems and Geostationary Systems. If a geostationary system is chosen, the satellite antenna must be located such that there is a clear view towards the Geostationary Satellite's location in the sky. Sometimes this is impossible, especially in deep valleys. If a Low Earth Orbit System is chosen, these systems transit the sky and satellite antennae, regardless off location, should be able to "see" a satellite most of the time.

The commercial considerations and ongoing viability of all satellite providers needs to be considered. The primary purpose of the Inmarsat satellites is to provide safety of ships at sea. Inmarsat is short for the "International Marine Satellite Organisation" and is well funded for this purpose and has been operating for many years. Low earth Orbit systems are different, with Iridium providing the highest satellite numbers today, however Iridium satellites are close to end of design life now and at this stage, no replacements have been announced. Iridium however has been used for US Weather and Military services for many years and we would expect this to continue to drive Iridium. Globalstar has the smallest number of satellites today, however they are soon to launch their second generation satellites, with new launches in mid 2010, so we believe Globalstar is most likely be the leader by late 2010.

The geographical location of your measurement station is another important consideration, for example Iridium has coverage in the middle of the Pacific Ocean and in Antarctica, whereas Globalstar has coverage mainly over land areas. Inmarsat and Thuraya are quite location dependent, as you need to ensure a good view towards the satellite. The Thuraya satellite is located near Singapore. Inmarsat satellites are located in the centre of the major Oceans, as would be expected for a marine satellite system.

Finally, it is always prudent to have a mix of services. In a flood alert system for example, perhaps it is best to have a mix of services from different satellite providers and not put all your eggs in one basket. The telecommunications industry calls this network diversity.

We have technical papers on satellite services, especially comparative costing, so please ask us for a copy if you are interested.

Globalstar GO FURTHER. DO MORE. inmarsat iridium ORBCOMM THURAYA

Neon 5 Release and Crossramp Decommissioning

Unidata's Neon Applications Software, Neon 2, was released in 2007 and has served us well for the last 3 years. As we continue to build our Neon products, we are soon to release a new Neon 5 version of the Neon Applications Software.

Neon 5 is a significant technology improvement, with all the internal databases consolidated into MSQL for easier integration of new components, and has much increased communications server speed and capacity. The new Neon 5 will have the capacity and speed for some thousands of connected Neon Remote Terminals and Modules and will have enhanced reporting and diagnostic facilities. We have also added the support of the new camera system and the new GPS reporting system into Neon 5.

After many years of operation, we will decommission the older Crossramp system at the same time we release Neon 5. Crossramp has served us well for many years and we have now migrated all customers from Crossramp to Neon.

Crossramp was Unidata's first Internet Protocol System and the Crossramp system could use the older XRT loggers as well as the newer Neon Remote Terminals. The Crossramp system was at times complex and perhaps difficult to drive, but it has always been a very stable system for many customers.

Unidata Staff Profile - Clint Barnes

Clint Barnes joined Unidata in 2006 after completing his Bachelor of Engineering (Electronic Systems) with Honours degree at Edith Cowan University, majoring in Communications Systems. Since then Clint has been involved with many major projects and has travelled widely with the company, including assignments in Canada and Thailand, as well as several trips to Sydney, Melbourne and Adelaide.

Clint has been involved in the design of Neon Satellite systems and complex data logging systems. Clint current project is implementing the MSP 430 firmware for a new Starflow display unit.

One of the more challenging assignments for Clint has been working on remote field telemetry units for Santos and being surprised finding unusual environmental surprises, for example a birds nest, where the birds flew out from under one of our field enclosures. That was quite an experience! He also found a sticky unusual substance on the wiring which was later determined to be "cow snot". Never a dull moment in Unidata field trips. Clint has also more helicopter hours than anyone in the company from snow covered mountains in Canada to outback in South Australia.

During his spare time Clint is a sport's tragic, he can intelligently comment on just about any form of sport from AFL football to Formula 1 Motor Sport. Clint lives

in Gosnells, and is in the process of building a house, which he plans to move into soon.

I wonder which Australian Rules Football team Clint supports?

NRT/ NRM Firmware Update

The software inside our Neon Remote Terminals and Modules is called firmware, rather than software. We use various models of the MSP430 Ultra Low Power Flash MCU for our Neon Remote Terminals and Modules.

Software implemented inside embedded processors has traditionally been called firmware rather than software as it is closer to the hardware components and was initially only written in assembly language, the language of electronic engineers. These days embedded processor "firmware" is written in high level languages such as C and C sharp or C++ and is tested on a high level workbench before being loaded into the target processor.

In February, we released updated firmware (nrt nrm firmware version 28) for our range of Neon Remote Terminals and Modules and the new firmware has additional features, for example the support of the new features, such as Modbus RS485, the larger 8Mb Memory and the camera and GPS modules as well as additional communications channel resilience to filter our spam messages and better / more accurate analogue channel reading routines. . We also added full support for the newer 3G / Next G and quad band modems which are now being used in the Neon Remote Terminals and Modules.

The new firmware supports firmware downloads across the air (across a GPRS / 3G link or satellite link) allowing units in the field to be updated with new firmware as well as new logging schemes without the need to visit site.

The Neon Applications software supports the new Firmware downloads so it is very easy for staff managing loggers in the field to implement new firmware. There are new facilities for soft or warm reboots, allowing the firmware to be updated and restarted without affecting operating variables with the field units.

The NRT Display unit firmware has also been updated in line with nrt nrm firmware version 28. It makes the display unit easier to use and allows for longer / more automated retry intervals and processes for satellite based systems.

If you have the desire and or need for new firmware please contact us for instructions how to update the firmware over the air.

3G and Next G and WCDMA options for Neon Remote Terminals and Modules

Unidata has recently released it's Neon Remote Terminals and Modules range with the latest 3G / Next G / WCDMA modem components

What do all these terms mean?

3G means third generation of mobile phone technology, with additional features for high speed multimedia, it is digital, and it is implemented using WCDMA, or Wideband CDMA technology. The older CDMA networks have now been turned off in some areas, including Australia.

The first generation, or 1G was analogue / AMPS system for mobile phones.

The second generation or 2G was the first digital phone system, which was called GSM, or Global Systems Mobiles.

The IP packet data sent across a GSM network is called GPRS (General Packet Radio System)

Unidata supports quad band modems, which allow both the older 2G and the newer 3G technology over the 4 currently used bands, being:

GSM	850 / 900 or 1800 / 1900 (MHz)
3G	850 / 900 or 1900 / 2100 (MHz)

What's good about 3G for Environmental Monitoring?

Data logging applications don't really need the high speed multimedia features of 3G networks however coverage in country areas is better with Telstra Next G in Australia.

The Telstra Next G network is a 3G network, but implemented over wideband CDMA technology. The Telstra Next G Network is the network of choice in remote regions in Australia.

The Telstra Next G network provides excellent coverage in city areas as well as country areas. Sometimes Telstra Next G may be the only option for the basement of a high rise building in the city as well, or some other black spot in the city where GSM coverage is poor. The Telstra Next G network has a much wider reception area per cell when compared to higher frequency networks

Please ask us for details of our 3G / Next G Neon Remote Terminals and Modules.

Starlog 4 Logger and NRT Management Software Update

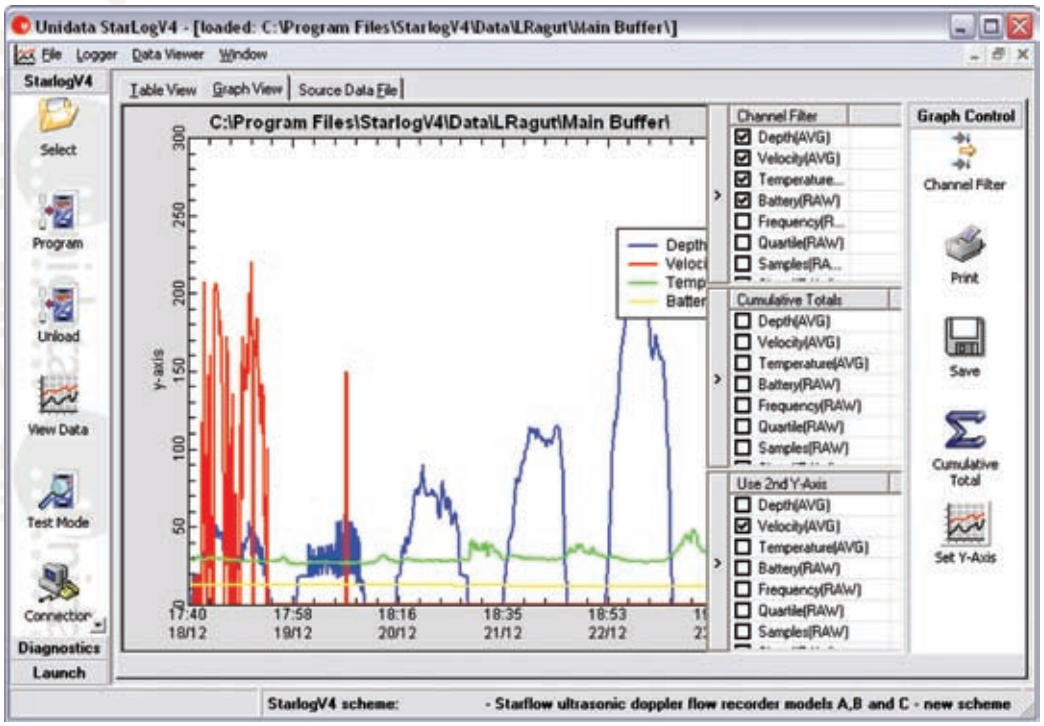
Unidata's Starlog 4 Logger and NRT Management Software continues to grow, with the latest release being Version 76B.

Several new features have been added to Starlog 4 in recent months please see the list of new features below:

- New logger support: 1MB Prologger, 512KB Starflow, 8MB Neon Terminals & Modules.
- New graphical editing of Starflow offset.
- New graphical zooming in Starflow Velocity Trace.
- New second Y-axis support in the Data Viewer.
- New cumulative total support in the Data Viewer.
- Improved channel selection in the Data Viewer.
- Improved Min/Max instrument to support the first occurrence as an alternative to the last occurrence.
- Improved configurability of where unloaded scheme data is stored.

- Corrected problem with repeated use of the firmware updater.
- Corrected depth display in Starflow velocity trace.
- Changed Neon log date/times to display in local time (not UTC).

The latest release is available from our website, as a free update for existing Starlog 4 customers, and as a free 30 day trial for new customers.



New Data Viewer Display. Note the 2nd Y-axis, cumulative totals, channel selection.

Summary of new D Model Neon Remote Terminals and Modules

There are now several different models of Neon Remote Terminals and Modules. The models are summarised below, both the new 2010 and the 2009 models. While the models may be different, and the interfaces available in various models are different, the basic operation of all Neon Terminals and Modules is the same.

All the new 2010 D models can be purchased with 4 analogue channels, 4 digital channels, Modbus RS 485 and 8Mb of memory. All 2010 D models also support the ancillary logger function.

2009 Model #	Description
2001B-101	NRT/NRM MODBUS NO SDI WITH BAT
2001B-810	NRT/NRM (GPRS) NO BAT
2001B-811	NRT/NRM (GPRS) WITH BAT
2002C-10	NRT/NRM Satellite NO BAT
2002C-11	NRT/NRM Satellite WITH BAT
2003C-10	NRT/NRM 3G l NO BAT
2003C-11	NRT/NRM 3G WITH BAT
2011C-100	NMM (GPRS) NO BAT
2011C-110	NMM (GPRS) WITH BAT
2011C-101	NRM (GPRS) NO BAT WITH LCD
2011C-111	NRM (GPRS) WITH BAT AND LCD
2013C-100	NMM (NEXT G) NO BAT
2013C-110	NMM (NEXT G) WITH BAT
2013C-101	NRM (NEXT G) NO BAT WITH LCD
2013C-111	NRM (NEXT G) WITH BAT AND LCD
2012C-10	NRM Satellite NO BAT
2012C-11	NRM Satellite WITH BAT

2010 Model #	Description
-	
2014D-A00	NEON Remote Terminal – GSM (No Bat)
2014D-AB0	NEON Remote Terminal – GSM (With Bat)
2015D-A00	NEON Remote Terminal – Satellite (No Bat)
2015D-AB0	NEON Remote Terminal – Satellite (With Bat)
2016D-A00	NEON Remote Terminal – 3 G/ NextG (No Bat)
2016D-AB0	NEON Remote Terminal –3 G/ NextG (With Bat)
2011D-A00	NEON Metering Module – GSM (No Bat)
2011D-AB0	NEON Metering Module – GSM (With Bat)
2011D-A0L	NEON Remote Module – GSM (No Bat with LCD)
2011D-ABL	NEON Remote Module – GSM (With Bat and LCD)
2013D-A00	NEON Metering Module – 3G /NextG (No Bat)
2013D-AB0	NEON Metering Module-3G/ NextG (With Bat)
2013D-A0L	NEON Remote Module-3G/NextG (No Bat with LCD)
2013D-ABL	NEON Remote Module-3G/NextG (With Bat and LCD)
2012D-A00	NEON Remote Module-Satellite (No Bat)
2012D-AB0	NEON Remote Module-Satellite (With Bat)
2012D-A0L	NEON Remote Module-Satellite (No Bat with LCD)
2012D-ABL	NEON Remote Module-Satellite (With Bat and LCD)

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