

# ONLINE

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- ☐ **Dam Monitoring**
- ☐ **Expanding Data Logger Serial Ports**
- ☐ **CSA Building New Premises**
- ☐ **Remote Satellite Telemetry Solution**
- ☐ **Visiting CSI Application Engineer Doug Neff**



## CSA Farewells Simon Leeds

April 30th saw the departure of one of CSA's long term employees – Simon Leeds.

Prior to starting with CSA in February 2000, Simon had completed his engineering degree followed a year or so playing the professional beach volleyball circuit where he achieved Australian ranking. At his first CSA job interview, I clearly recall Simon arriving on crutches with his leg in a plaster cast having severely dislocated his ankle playing his favourite sport.

Starting as an application engineer, Simon eventually climbed the corporate ladder to be our Technical Support Manager, a member of the CSA Management Committee and a CSA shareholder. In the interim, he married Leah, had two wonderful children (Lucy and Damon), purchased a house onto which he built a deck, became a keen and accomplished mountain biker, and finally took up white water kayaking. Where many employees request a gold watch for their 10 year service award, Simon was presented with a carbon fibre kayak paddle especially imported from the US.

Simon's outgoing personality, excellent product knowledge and strong technical skills made him an asset to our company and a hit with our clients. He became an excellent trainer, able to sense the mood of a class and adjust his delivery, as well as impart the most technical details in a simple to understand manner. I recently had the good fortune to accompany Simon on a trip to SE Asia where he ran three consecutive three-day training classes in Thailand, Vietnam and Malaysia in a total of 11 days - teaching complex principles to students whose native language was not English. In Vietnam, Technical Manager Mr Nam made a moving toast to Simon at the end of the course, stating that "in Vietnam, we show respect to teachers. I would like to show my respect to you, not just as a teacher but as a great teacher".

While Simon's enthusiasm, skills, counsel and personality will be sorely missed at CSA, all is not lost. Simon and Leah's desire to move interstate coincided nicely with an offer of employment from one of our major customers, Greenspan Technical Services where I am certain he will continue to use CS data loggers and equipment. Simon will be working out of their Coff's Harbour office – where he has already checked out the local mountain bike trails and white water rafting locations.

Simon, Leah, Lucy and Damon go with our very best wishes for a wonderful and exciting future.



Steve farewells Simon

## Welcome to Doug Neff from CSI

We are extremely fortunate to receive a visit from Doug Neff of our US parent company, Campbell Scientific Inc. Doug will spend 2 months at CSA, assisting and training some of our newer engineers and generally helping out our AE group.

Doug is a senior application engineer with CSI, having worked there for more than 10 years. He has an Associates of Applied Science in Electrical Engineering Technology and Bachelor of Science in Watershed Science. As well as general data logger support, Doug's special areas of expertise are satellite telemetry, RF and phone communications and serial sensors. Doug likes to keep fit, & while he is at CSA, any spare time will be spent travelling, biking, scuba diving & climbing Castle Hill.

## Up-Coming Events

Drop in and see us if you're in town!

Tradeshow / Conference	Location	Dates	Venue
<a href="#">Irrigation 2010</a>	Sydney	June 8 - 10	Sydney Convention and Exhibition Centre
Irrigation Australia 2010 Trade Fair - Stand 127			
<a href="#">Ecogen 2010</a>	Sydney	September 5 - 8	Sydney Convention and Exhibition Centre
Ecogen 2010 - The Power to Deliver ~ Uniting the Clean Energy Industry			
<a href="#">AHA 2010</a>	Perth	October 19 - 21	Burswood Entertainment Complex Perth
Australian Hydrographers Association Conference 2010			

## Welcome to Owen Davis

As one departs, another arrives. CSA welcomes Owen Davis, a local lad who recently completed his electronic engineering degree at James Cook University. During his degree, Owen gained work experience at Xstrata Copper Mt Isa, Ergon Energy, Eagle Boys Pizza and Dick Smith Electronics. Owen has only been at CSA a month but is already working on customer programs and quotes. Outside of work, Owen plays guitar and sings in a band.



As well as general data logger sales and support, Dave is CSA's resident soil moisture and flux expert and since joining CSA, has established strong ties with Australia's Ozflux scientific community.

Outside of work, Dave enjoys socialising with his CSA mates, fishing and the outdoor life. He and wife Nikki and their three children have recently purchased a block of land at Bluewater, north of Townsville, where they are in the process of building their new dream home.



## CSA Purchases Land and Prepares to Build New Premises

After 17 years of operation, CSA is finally making the transition from leased buildings to our own custom-designed premises. Townsville is largely a blue-collar city and while it is easy to find industrial land, we have struggled for a number of years to find commercial land of suitable size at an affordable price.

In December of last year, we were fortunate to win a tender for a 3685m<sup>2</sup> block in a prime location that was a remediated ex-service station block of land.

Plans are under way to design and build two story premises of 1000m<sup>2</sup> floor space in Stage 1, with the ability to double that floor space as required in Stage 2.

Our new location will be a corner block at 240 Ross River Road, and for those who know Townsville, it is adjacent to the Vale Hotel.

*We'll keep you posted of the latest exciting developments as our new home takes shape.*

## Dave Boadle - Profile

### *An employee profile of a not-so-new employee*

Although Dave Boadle has worked at CSA as an AE for almost 18 months, he has somehow escaped being introduced to our customers in the Online magazine. Perhaps it's because he's just one of those quiet achievers who works like a Trojan and doesn't blow his own trumpet, but for whatever reason, we feel that it's time he was formally introduced.

Dave originally hails from NSW, hence his masochistic desire to wear a powder blue NSW shirt to work when the State of Origin season arrives. Dave brings a wide range of life-experience to the CSA support team. At various times throughout his career, Dave has been employed by the RAN at officer training, worked as a trainee metallurgist at BHP, worked on a fishing trawler on the south coast of NSW, done ecological surveys with the Albany Aboriginal Corporation and managed a 2200 hectare eucalyptus plantation. In 2003, Dave completed a Bachelor of Environmental Science at Murdoch University.



Location for the new CSA premises



# case study

## Space Farmers

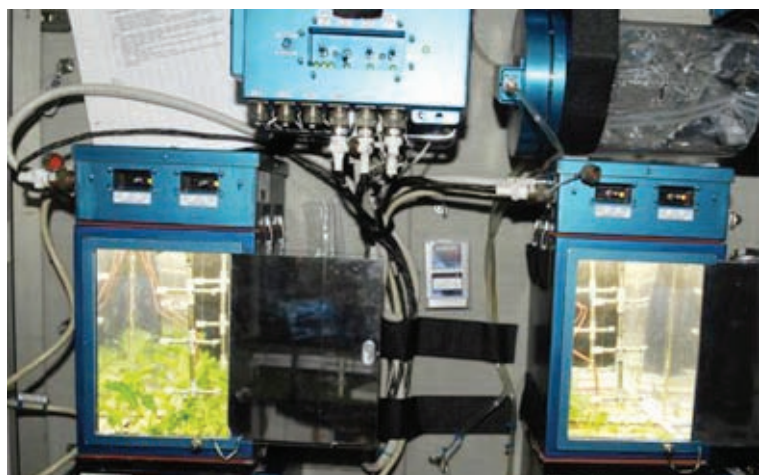
Imagine the bored mind of a space traveller as he looks around the room he has spent months in, seeing again the same high-tech equipment he has been looking at since he left Earth. Then imagine his pleased reaction when his eyes come across a leafy, green garden, and he moves over to pick some lettuce and peas for his lunch. Later, he spends some relaxing time tending the garden, and the worries of the day fade.



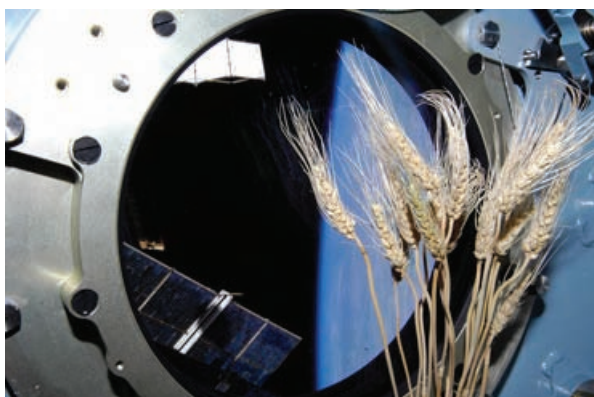
This isn't futuristic science fiction. For eight years, the Russian module of the International Space Station (ISS) has hosted a plant-growing experiment that has a Campbell Scientific measurement and control datalogger at its heart. The Space Dynamics Laboratory (SDL) of Utah State University designed and built this growing chamber, named Lada for the ancient Russian goddess of Spring. Russian cosmonauts have been using it continuously since 2002 to study plant growth in space. They have grown lettuce, peas, radishes, and grain, with the dual purposes of research and food production. The suitcase-sized plot has produced a small but steady supply of vegetables since it was installed. And the research has produced valuable knowledge about reproducing plants and seeds in micro gravity, important knowledge for future long-duration space missions.

The control centre of the experiment consists of a CR10X datalogger and two AM25T multiplexers that monitor a huge number of soil- and air-temperature and water-content measurements, and control the growing environment in the plant chambers. About half of the plant production is eaten by the cosmonauts, and the rest is sent back to labs on Earth for analysis. The research has produced multiple generations of crops from seeds grown in space, showing the viability of continued plant production on long space journeys.

Another benefit of the Lada module is the psychological benefits people reap from working on the project. SDL engineer Shane Topham noted that after it was learned that working with the plants had a calming effect on the cosmonauts, extra time working with Lada was assigned during stressful periods at the ISS. "If they can use that as a psychological tool to help regulate the worry or difficulties psychologically then that's a very good benefit to having plants in space, independent of the food."



The latest Lada components were launched in January 2010, and are scheduled to continue on the ISS through 2012. The research has laid a foundation for improving the quality of life for space travellers on long-term missions to come.



*left: Space-grown wheat, with a view of ISS solar panels and Earth*

# case study

## Australian Nomad Technologies(ANT) Successfully Deploys Campbell Scientific Telemetry Using their Satellite(VSat) Internet Network

Obtaining vital data from telemetry at a remote location has traditionally been done via a land based cable solution. Where there was no telephone connection available due to the site's remoteness, then a mobile telephone based solution (e.g., 3G, etc.) has sometimes been employed. Now there is an extremely reliable solution for most telemetry sites.

ANT has chosen to utilise geostationary satellites for their telemetry networks. Unlike "Low Earth Orbiting" satellites, once a line of sight path to the satellite has been established, it becomes a permanent, fixed path that does not need to be re-established for each data session. There is no satellite hand-over process to go awry, and unlike traditional phone based systems, there is no underground cables to be cut, and remoteness is no longer an issue.

To save on power at the remote location, Jeeva and the techos at CSA have built a script for the logger that will switch the satellite system on every hour (or other period as required) for a period of time long enough to send the required data. It can also be programmed to open and close gates, valves etc , or switch on a camera, on command.

ANT's satellite network covers all of Australia and New Zealand and has proven to be extremely reliable, suffering less than 2 hours of unplanned outage time during the last 12 months. Australian Nomad Technologies (ANT) has developed a VSat satellite system that can be either portable or fixed. ANT has developed this system in conjunction with CSA and various State authorities, to be deployed, either by ANT's installers , or by the customer. A training DVD is supplied with the kit, and further training can be arranged by ANT at the customer's preferred location.

Australian Nomad Technologies provides both portable and fixed Satellite Broadband services.

<http://ausnomadtech.com.au>



### New Research Grade Net Radiometer

In March 2010, the CNR4 replaced the CNR1 and CNR1-L. Like its predecessors, the new CNR4 is a rugged net radiometer from Kipp & Zonen consisting of a pyranometer and pyrgeometer pair that faces upward and a complementary pair that faces downward. Its upper pyrgeometer has a meniscus dome that allows water droplets to easily roll off of it, and increases the field of view to nearly 180° instead of the 150° field of view you get with a flat window.

With the CNR4, each pyranometer and pyrgeometer is individually calibrated for optimal accuracy. The CNR4 also weighs less than its predecessors and contains both an internal thermistor and an internal platinum resistance thermometer (PRT). This radiometer does not include a heater, but the optional CNF4 ventilation and heating unit is available for customers who are concerned about dew or frost forming on the domes. The CNF4 easily attaches to the CNR4 (shown left).



# featured application

## Dam Monitoring

Dams are an important part of our infrastructure and provide us with many benefits, including water, power, flood control, and recreation. Australia has over 500 large dams. As these dams age there is an increased importance for effective maintenance and upkeep to ensure safe and reliable operation.

Fortunately as dams have increased in number and age, tools for facilitating their maintenance have also increased in capability. Automated monitoring systems have become an important part of many dam maintenance programs. These systems usually consist of sensors, dataloggers, and telemetry equipment that work together to measure critical parameters and provide data logging, reporting, control, and alarms. Data can be logged over time to provide information regarding the effects of aging, earthquakes, erosion, storm events, and other variables on the overall health of the dam. Alarms and callouts can be programmed to warn engineers of potential failures. Most important of all, these systems provide 24/7 monitoring and allow detection of many changes that could otherwise go unnoticed.

Common causes of dam failure include overtopping, foundation problems, structural problems, and piping (internal erosion due to seepage). With an effective monitoring program, these causes can be detected early and repaired or mitigated. Due to the number of factors involved (hydrological, geotechnical, structural, and power related), a wide variety of measurements are required for dams. These cover everything from the structure of the dam, to the dam's foundation, to the water in the reservoir.

- \* Structure of the dam—cracks and joints, tilt, inclination, stress, strain, deformation, and seepage flow

- \* Foundations holding the dam in place—pore pressure, slope stability, subsurface water table, regional versus local tilt measurements, and subsurface rock mass deformation

- \* Water in (and upstream of) the reservoir—water level and flow, rainfall

Over the years, our monitoring systems have provided reliable solutions for all types of dams—embankment and concrete, new and existing. A number of factors have contributed to the selection of Campbell Scientific systems. Our systems are flexible enough to measure the wide variety of sensors used in dam monitoring applications. Their low power requirements and rugged design allow them to operate unattended in harsh environments for long periods of time. Telemetry options provide real-time data and alarms to assist in remote management.

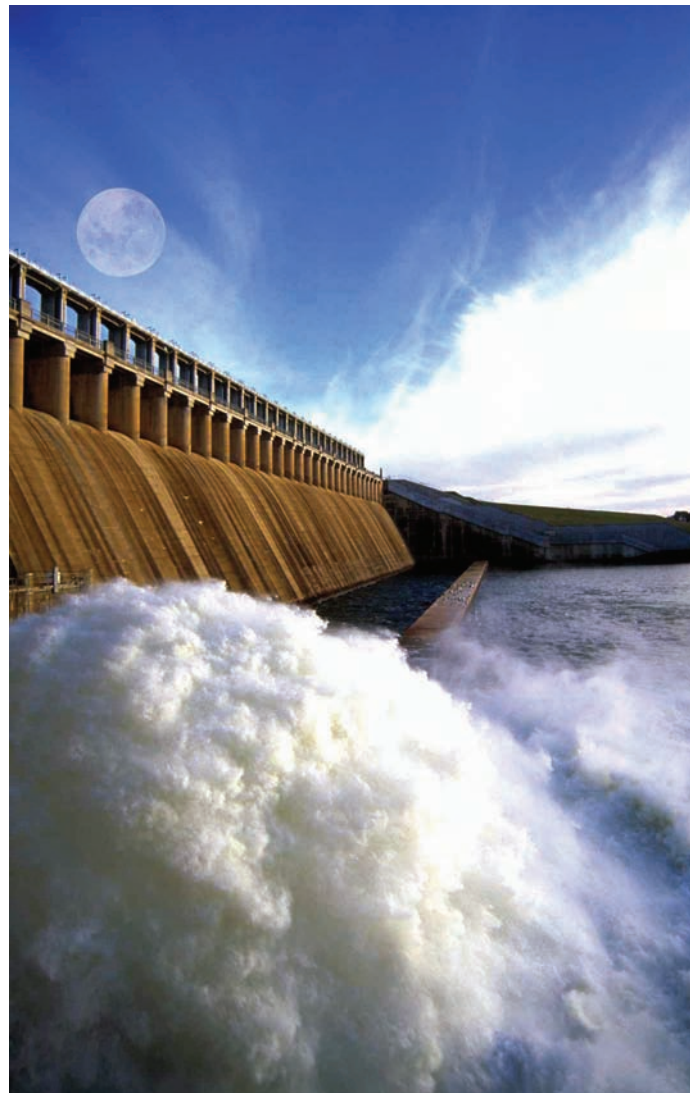
We've also released a number of products in recent years that facilitate dam monitoring.

The [AVW200](#) is a measurement interface that eliminates external electromagnetic noise that often plagues vibrating-wire measurements. The CS450 is our new submersible pressure transducer that provides measurement accuracy to .05%. Our new RF450 radios provide long-distance transmission ranges without the need for an FCC license.

We look forward to facilitating effective monitoring through product development and application support. Don't hesitate to contact us if you have questions about your dam monitoring application.



*The AVW200 is an interface that eliminates the effects of external electromagnetic noise on vibrating-wire measurements.*



*Hume Dam*

## CRBasic Training Feedback

We recently completed 5 days of CRBasic training in Perth. At the end of each course participants are asked to submit an anonymous feedback survey. I've noticed over the past year that I've been receiving these forms, that the praise for Gavin Shaw as a trainer and for the value the course offers in general has been brilliant. On average 98% of people evaluated Gavin's knowledge-base as excellent and 86% judged the value the course offers as equally high.

These are pretty respectable numbers so I thought we should share what people actually have to say in case you are considering registering.

**Here is a small sample from the past 12 months:**

**"Well done, worth the money" Perth**

**"Excellent presentation, lecturer was fantastic with outstanding knowledge" Perth**

**"Gavin Shaw was excellent. Very patient & helpful. Lots of individual attention" Melbourne**

**"Trainer's knowledge was exceptional & course structure ensured knowledge was built upon in a logical and easy to learn manner" Melbourne**

**"An excellent training course. Well structured and presented" Gold Coast**

**"Brilliant trainer" Gold Coast**

**"Lecturers knowledge & experience were superb" Gold Coast**

**"It was all good. Now I can tackle loggers with confidence" Sydney**

Speaks for itself. If you're wondering if it's right for you, give us a call and speak to Gavin. He'll quickly ascertain what level of training you're ready for.

We have a course coming up in Townsville June 21 - 25. The basic 3 day course is filling up quickly with 6 spots left and there are 5 spots left in the advanced course.



Gavin Shaw

You can get the [registration form here](#)

Complete the form and [email to me](#) to secure your spot.

## The Clean Energy Conference, Adelaide 2010

Steve attended and exhibited at the 2010 Clean Energy Conference in Adelaide earlier in May. Although we had attended this conference before, this was the first time we had exhibited, and it was an excellent opportunity to meet with the large number of corporate clients in wind energy who use Campbell Scientific data loggers and sensors. It was also an eye opener for us to note that at this particular conference, solar energy had a much larger presence than the other energy providers.

At what was a relatively small conference compared with other industries, enthusiasm amongst exhibitors was high despite the recently released federal budget's relatively small commitment to the industry.

## No Change to CSA Prices

Last year we reduced our prices across the boards, reflecting the strong Australian dollar. You may have noticed there's been a drop in the value of our currency over the past month. Nonetheless we have decided to hold our prices unchanged for the time being so you can still take advantage of these savings.

## IRRIGATION 2010 - SYDNEY

Dave Boadle and Sue-Ann Watson will be representing CSA at the Irrigation 2010 Exhibit and Trade Show at the Sydney Exhibition & Conference Centre Darling Harbour from Tuesday June 8 until Thursday June 10.

**Come visit us at *Stand 127* - Entry to the exhibit is free!**

We have a good customer that wants to trade - 4 brand new CR510's, still in the bubble wrap, 4 lightly used 510's - with serial numbers....would ideally like to swap these units for 4 (or more!!) CR800 loggers.

Interested?  
[Email Kimbyl](#)



## Would you like to work in Richmond, NSW on a fantastic new project?

David Ellsworth and Jann Conroy of UWS are seeking an instrumentation tech with good all round mechanical skills to work on UWS' exciting new FACE experiment. If you are interested then contact Jann at [J.CONROY@uws.edu.au](mailto:J.CONROY@uws.edu.au)

## Expanding Datalogger Serial Ports

The new generation of dataloggers include an RS232 9-pin serial port in addition to the CSI/O port of the older generation. This allows the datalogger to connect directly to other manufacturers' serial devices without the need for an interface.

The RS232 port also provides an extra port to connect a laptop or cell phone modem to if the other is tied up with other hardware. For example a modem may be connected to the RS232 port, and the CS I/O could be used to connect a laptop to the datalogger without removing the modem.

RS232 connector, a straight through RS232 cable can be cut in half, with the female end used to connect to DTE devices such as a computer and the male end used to connect to DCE devices such as a modem.

Pin	Function	CR1000 Port (DTE)1	CR1000 Port (DCE)2
2	DTE Rx	C1, C3, C5, C7 [Tx]	C2, C4, C6, C8 [Rx]
3	DTE Tx	C2, C4, C6, C8 [Rx]	C1, C3, C5, C7 [Tx]
5	GND	G	G

1. Use these control ports to connect the female end of a serial cable to the datalogger to communicate with a DTE device such as a computer.
2. Use these control ports to connect the male end of a serial cable to the datalogger to communicate with a DCE device such as a modem.

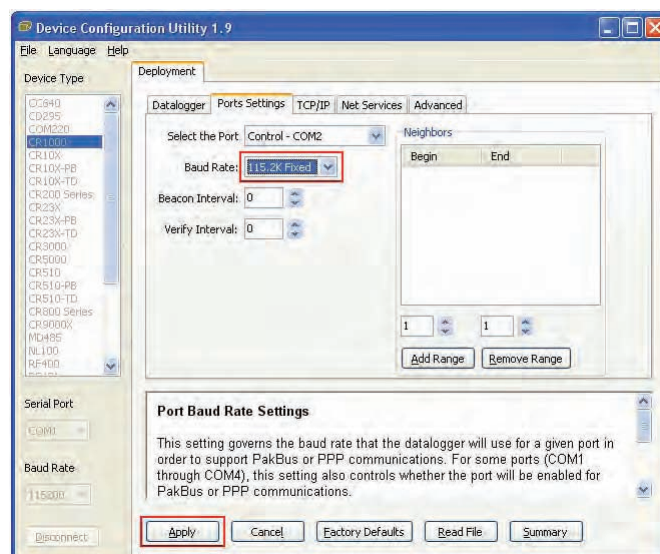
Before the newly added serial port can be used, it needs to be configured with a baud rate; this is done in Device Configuration Utility on the Ports and Settings page.

Select the appropriate comm port from the "Select the Port" box, and then select the desired baud rate. This will depend on what is being connected to the datalogger. In general, use 115200 for laptops running Campbell Software and cell phone modems. For other devices such as modbus sensors and other types of serial output sensors, this baud rate will be specified in the sensor manual and additional programming will be needed to read the data from the sensors.



In addition to the RS232 port, the new generation of dataloggers (with the exception of the CR200) can be configured to have up to 4 more RS232 ports using the control ports.

RS232 signals are transferred using 3 wires; a transmit line (Tx), a receive line (Rx) and a reference line. The control ports of the datalogger can be configured to act as the transmit and receive lines, and a ground can be used for a reference line.



To use these ports with another device which requires an