

JULY 2015 NEWSLETTER



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TRAINING

Campbell Scientific offers multi-day training courses for our data loggers and software.

These comprehensive courses are designed for those without much data logger experience, or for those wanting to increase their knowledge. The courses have an emphasis on programming; see individual courses for itinerary. "Hands-on" programming exercises and course handouts are used to reinforce the concepts covered by the instructors.

Our next training course will be held in Townsville, this is a popular training course at our main office and spots will fill quickly.

Find out more at campbellsci.com.au/training. Early bird Sydney code (30 % off standard prices): SYN%15@

JULY 20	TOWNSVILLE	2015 TRAINING SCHEDULE	
Field Operators Training Course		July 20 - 24	Townsville
JULY 21-22		September 7 - 11	Sydney
Programming Training Course			
JULY 23-24	TOWNSVILLE		

Communications Training Course



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MESSAGE FROM THE MD

It has been a busy year for Campbell Scientific Australia, with some very exciting changes in the company that we have been working toward for some time now implemented.

As many of you may know, from our office in Townsville, North Queensland we have serviced all of Australia and the South East Asia region. This year we welcomed Jeep Chindavijak, as Managing Director of Campbell Scientific South East Asia (CSSEA), to the group. CSSEA launched 1st May 2015, is headquartered in Bangkok, and manages operations in the developing Mekong Frontier of Myanmar, Cambodia and Laos in addition to Thailand and Vietnam.

Together CSA with CSSEA offer significant resources to our customers wishing to do business in the developing South East Asia region.

I also attended the global annual Campbell Scientific Group Company conference in Logan, Utah. The conference provided an opportunity to discuss new products and product trends with Kevin Rhodes, Product Manager for Dataloggers, providing a glimpse into future datalogger development. The recent CR6 release added to our product range and our plans are to release more peripherals to support even more diverse applications. Check out a couple of the latest products in this newsletter.

Robert Kurz

ATHIMITINI

Managing Director

Robert Kurz



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LAUNCH OF

CAMPBELL SCIENTIFIC SOUTH EAST ASIA

The Campbell Scientific group has expanded significantly in the Asian region to serve those developing markets for measurement and environmental monitoring equipment.

We are now proud to announce that we have created a new Campbell Scientific group company based in Bangkok which officially launched operations on Friday the 1st of May 2015. Campbell Scientific South East Asia (CSSEA) will be responsible for operational management of the business in Thailand, Vietnam, Cambodia, Laos and Myanmar.

All other territories including the Philippines, Indonesia, Malaysia, Singapore, Brunei, Papua New Guinea, East Timor and the Pacific Islands, Corinne Malot - our SE Asia coordinator at CSA - will continue to be involved supporting and growing business for these regions as usual, with the collaboration of our local representatives where applicable. Mr. Thitipong "Jeep" Chindavijak, who has been working with Campbell Scientific products for over 10 years, will be the Managing Director of CSSEA. We anticipate CSSEA will be heavily involved in SE Asia and Campbell Scientific expects the initiative will provide very valuable commercial benefits and value-add of a local office to the north region of SE Asia.

We wish good luck and a prosperous start to our new CSSEA team!

More information regarding CSSEA can be found at www.campbellsci.asia



Left to right: Wasin, Thitipong and Nutthanun



NEW PRODUCTS

Several years ago, Campbell Scientific introduced the OBS500 turbidity probe that featured dual backscatter and side scatter sensors, a shutter mechanism that keeps the lenses clean, and a refillable biocide chamber that prevents fouling. Our newest product in this line, the OBS501, provides these features but performs better in heavy sediment load environments.

The OBS501 is constructed to prevent sand grains or packed sediment from getting wedged between the shutter and sensor body, which inhibits the shutter's movement. To do this, the OBS501's shutter and body were designed to eliminate parallel surfaces between moving parts wherever possible. The probe also uses a flushing action that moves the sediment down and out of the cavity behind the shutter. A new operating system allows the OBS501 to sense if the shutter's motor is working harder than normal. If it is, the shutter moves slightly back and forth to dislodge sand grains before fully opening or closing. Changes to the SDI-12 instruction set also make it easier to place the shutter in the normally open mode, which is a more reliable mode in heavy sediment loads environment.

Campbell Scientific tested the OBS501 in challenging sediment load conditions, and its performance was impressive. Now released, the OBS501 promises to be a valuable new addition to our turbidity sensor family.

SDM8X50

The SDM8X50 is a new 50 ohm, coaxial, 8:1 multiplexer for TDR100-based systems that has replaced the SDMX50-series coaxial multiplexers.

The main improvement over the SDMX50 series is hermetically-sealed, non-latching mechanical relays for both the ground and signal lines of each multiplexer channel and <u>on the lines shared internally by multiple channels</u>.

BENEFITS OF THESE RELAYS ARE:

- Quieter operation
- No oxidation build up—Oxidation can cause erroneous TDR readings.
- Longer lasting—Specified for 100 x 106 operations, these relays provide 20 times more operations than provided by the SDMX50-series relays.

 Better surge protection—Relays unlatch 30 s after receiving a channel advance command so that electrical surges are less likely to have an electrical pathway back into the TDR100 and damage the TDR100's input diodes.

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NEW PRODUCTS

05108

The 05108 Wind Monitor-HD has important features that greatly extend the service life of this popular sensor. It promises improved survivability for the most severe wind measuring applications.

The reliability of the Wind Monitor sensor is well known. The sensitive vane and propeller combination has proven effective for countless applications in many disciplines. The Wind Monitor-HD (Heavy Duty) model is designed to address the most common concern of mechanical wind sensors: bearing replacement. The HD utilizes extremely long-wearing, oversize ceramic bearings to increase service life many times longer than standard stainless steel bearings. In addition to being more wear-resistant, ceramic is resistant to corrosion in environments that are hostile to steel bearings.

The Wind Monitor-HD also has oversized propeller shaft, high pitch propeller and stainless steel locking propeller nut, all features that will enhance long-term reliability of the sensor.



CSA TEAM

Front row (from left): Alex Thomas, David Hammond, Rob Kurz, Corinne Malot, Ron Russo

Back row: Mehrad Arashrad, Sandra Lundie, Polo Imo, Thomas Menamparampan, Kahill Mitchell, Shaun Pope, Scott Daltonalomes, Gavin Hewitt, Florent Ripaud, Natacha Vendola, Jordan Marano, Jurgen Engel, Daniel Roebuck, Bernadette Evans

(absent: Sue Lingard) Taken on April 1, 2015





CASE STUDY CANE RESEARCH

Equipment Used: CR800, CS451, RF411, 3G Modem, water sampler, flow cell chamber for measurements

The Australian sugar industry is not just one of the world's most efficient and innovative producers and exporters of sugar - it is also the leader in the adoption of sustainable farming practices.

The management of crops to increase the efficiency of treatments and decrease costs along with promoting more sustainable farming is a key part of ensuring these goals are met.

Campbell Scientific equipment is used in platforms to manage stations in cane research farms across Queensland. The layout of these stations consists of a constructed flume to capture runoff across a known area of planted cane. A CR800 series data logger is utilised within a trailer or enclosure to monitor environmental conditions, control equipment and provide alerts to personnel.

When rainfall or irrigation runoff is detected the flow rate of water is calculated based on the flume cross section and from a CS451 pressure transducer water depth measurement. This flow rate is accumulated and used to either trigger the collection of a sample for later analysis or can be used for in situ testing.

The status of each station is important for the ongoing operation. SMS messages are constructed by the stations for operators to identify when a site requires sample collection or attention.

As a platform for many research projects in North Queensland these stations have proved valuable and customisable to suit the needs of growers and industry researchers.

	PARAMETERS		
In Stream	Catchment flow (ML), Nitrate (NO3), Electrical Conductivity (EC), Chemical Oxygen Demand (COD), Total Suspended Solids (TSS), Temperature (DegC)		
Farm Level	Approximate event discharge (L/s), Nitrate (NO3), Chemical Oxygen Demand (COD), Total Suspended Solids (TSS)		
Farm Management	Area under cropping, Fertilizer applied (mixture, rate), Irrigation applied, Cultural operations, time of operations		



CASE STUDY WASTE WATER REUSE IN AQUACULTURE APPLICATIONS

즹 FishFarm

90

85⁻ 80⁻ 75⁻ 65⁻ 55⁻ 55⁻ 45⁻ 40⁻

35

30

25

20

15 10 FifteenMin

05-30 00:00 05-31 00:00 06-01 00:00 DOppm_Avg -- AirTemp_Avg -- RH_Avg

🕏 🕬 🗭 🗊 📶 💼 11:32 AM

TABLE 🛛 🧔

In many processes there are wastes that can be repurposed or reclaimed for use in secondary applications. This is especially important in processes of oxygen, a DO sensor is located in the fish tank and a temperature sensor is attached to the aerator pump. If the sensors record readings outside of a predetermined range,

that use water as a key resource such as fresh water fish farms and aquaculture.

At the University of South Australia, a research project is underway to determine appropriate methods to reuse wastewater and solids from intensive inland freshwater fish farming. This project makes use of the CR800 data logger abilities to measure, calculate and store data, send and respond to SMS messages and communicate with LoggerLink by 3G TCP/IP for remote mobile data access. A 6 x 3m insulated shed houses a pilot scale recirculating aquaculture system (RAS) and an adjacent greenhouse has been erected to utilise waste water and solids.

The 7000L combined fish tank and water treatment system supports 80kg of Jade Perch (a species native to northern Australia) in an aerated and heated 4000L tank.

The health of fish is critical and apart from daily visits the system must be monitored remotely. To monitor the supply

the telemetry system notifies the operator by SMS. The system can also be accessed using Campbell Scientific's mobile app LoggerLink for real time data and trending by utilising dynamic DNS (eg. yourname.dyndns.org).

Adjacent to the RAS is a 6 x 18m greenhouse. A constant stream of waste water (10% of fish tank volume per day) and solids is supplied from the RAS to reservoirs in the greenhouse. This water and the solids are applied to crop vessels within the greenhouse through a combination of drip irrigation and manual application. The crop vessels are grouped for comparison of crops grown with waste water and fresh water irrigation.

To determine the evapotranspiration potential inside the greenhouse an additional set of sensors for relative humidity, temperature and solar radiation are deployed for measurements and calculation within the CR800 data logger. This data allows more accurate irrigation scheduling and a comparison of the greenhouse's ability to 'consume' water relative to outdoor conditions.



A 6 x 3m insulated shed houses a pilot scale recirculating aquaculture system (RAS) and an adjacent greenhouse



6x18m Greenhouse adjacent to the RAS



TECH TIP: NEW CRBASIC INSTRUCTIONS IN OS28

Our family of data loggers is always getting a fresh set of improvements to complement the vast functionality already available. If you haven't already updated to the latest operating system for your next project or a revisit of a current application, you can find all the latest operating systems, software updates and tools at (http://campbellsci.com.au/downloads). In the latest operating system update there have been some useful additions to CRBasic and some changes to data logger table definitions that are worth knowing about.

TotalRun()

The TotalRun instruction is used to output a running total of a measurement.

TotalRun(Dest, Reps, Source, Number, RunReset [optional])

The running total is calculated by adding together the last known number of measurements in previous scans, excluding NaN values. You can easily set up a running total with a single line of code and use this value to control events, store to a table or reset the total using the RunReset Boolean option.

If you have ever wanted to work out a running total for rainfall, wind, flow you can appreciate the simplicity of a single instruction instead of managing an array of data correctly or using other instructions creatively.

ConstTable()/ EndConstTable

ConstTable (TableName, Hidden) Const A = value Const B = value EndConstTable

This table can be used to declare constants that can be changed using a keyboard display or using the terminal mode. The program is then recompiled with the new values. OS 28 added the ability to change



the constants via datalogger support software.

In applications that require calibration constants, site specific data values, phone or email contact lists or messages and many more constants, this table can provide a strong feature to allow a single version of a program to be used instead of managing site specific versions or future constant modifications.

SetStatus(), SetSetting()

The SetStatus and new SetSettings instructions are used to change settings in our data loggers.

You may have noticed that values such as PakBus address have disappeared from the Status Table.

The Status table has been reduced in size and reorganised. Previously the Status table held data logger configuration settings; these are now accessible through the Settings Editor window in LoggerNet's Connect Screen while connected to a data logger or with Device Configuration Utility.

The use of these instructions has changed, you can now declare them outside of BeginProg. See CRBasic help for more information on their use. You can still access fields in code using the TableName. Fieldname(1,1) syntax.



MEET OUR STAFF: BERNADETTE

Bernadette has been with CSA since 2011 as part of the Administration team. Originally from South Australia, she has also worked in the Northern Territory for a number of years before moving to Townsville in 1999.

Bernadette has worked in many differing industries including transport, hospitality, construction and finance gaining certificates in reception, computing and project management before joining CSA. Her experience gives our Administration team an edge and Bernadette will often be the first person you talk to when calling our office for sales or support and can also help with settling your account and invoicing.

Relaxation pursuits include reading, gardening, spending time with her menagerie of pets and enjoying the Townsville lifestyle.