



CSA Visits Tumbarumba for Oz Flux Conference...

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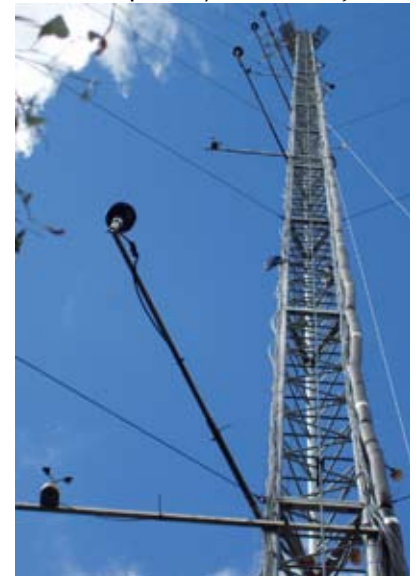
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We've all heard about global warming and climate change issues recently. Scientific discussion of these issues has been gaining momentum over the past few years and recently there has been a significant increase in the priority of the subject from a political standpoint.

Factors affecting this topic involve numerous strands of science and there are many researchers undertaking work which investigates the effects of climate change. Part of this work is the measurement of carbon flux and sequestration. The movement of carbon from the earth into the atmosphere (in the form of carbon dioxide) is considered to be a major factor in the greenhouse effect.

March 2007 saw the Australian "flux research" community come together in Tumbarumba, NSW for a four-day course on Applied Meteorological Techniques. The course was arranged to cover both theoretical and practical aspects of designing and operating an eddy-correlation system. Many



EC System at Tumbarumba - An easy climb at approx 70meters high!

experienced researchers and technicians demonstrated different aspects of running a "flux" system and discussions on the pros and cons of different system configurations proved very useful: particularly for some of the less-experienced students who attended the course.

As representatives of one of the few flux system suppliers in the world, Bert Tanner and Ed Swiatek (CSI) together with Simon Leeds (CSA) were invited to attend the course where they were able to provide support for the instrumentation used in many of these systems. Many of the Campbell Scientific customers at the course took the opportunity to discuss their applications face to face and gained valuable on-site information from the visit.

CRBasic Training - Upcoming courses in Perth, T'ville & Sydney!

Since the introduction of our CR1000 / CRBasic courses in late 2005 it has been full steam ahead, and the coming months show no sign of slowing down. Simon, Gavin and Corinne have just come back from a sellout course in the Gold Coast, which proved very popular amongst our attendees.

In two weeks time we'll be travelling to Perth, for our first commercial training course in WA - 22nd - 24th May. Seats are limited and we may not be holding another course in WA for at least 12 - 18 months so we encourage you to take part if it fits your schedule.

We also have our Townsville course being held on the 26th - 28th June in our home base of sunny Nth QLD? Seats have been discounted by 20% to \$650 - ex GST for all customers, so why not come up and join us - the weather's much better up here!

We will be holding our last CR1000 / CRBasic course for the year in Sydney, November 26th - 28th, bookings will open for the course in late August. For pricing and further details please contact bree@campbellsci.com.au or visit our [website](#)



FEATURED PRODUCTS

CR1000KD - A powerful troubleshooting tool for on-site work...

For many of our customers, data logger keyboard displays are something that they may have heard about but never seen or used. Twenty years ago, PC's weren't as common for the average person and keyboard displays were the method used to program the Campbell Scientific data loggers. As PC's became more affordable, software was developed which made interacting with the logger much more intuitive and straightforward.

Even as technology became more affordable the operation of the keyboard display was retained in the logger operating system for backwards compatibility, as many of our users found it was a quick and useful tool for interrogating the logger.

The new CRBasic-programmed data loggers (CR1000, CR3000 and CR800 series) use a different communications protocol than the previous Edlog models and CSI have developed a new keyboard display, the CR1000KD.

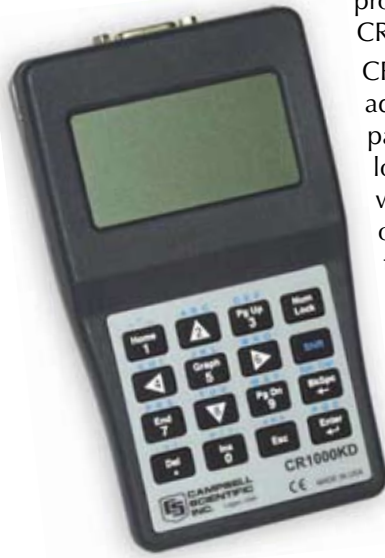
CR1000KD - A powerful troubleshooting tool for on-site work. The CR1000KD has significant advantages over the older style CR10KD in that it has a multi-line, bit-mapped, graphics-capable LCD and a customisable menu structure. The customisable menu structure allows the logger programmer to set up custom menus for display or data input which can be navigated with cursor keys and the Enter key. These custom menus can be used to enter or change alarm or sample set points, set flags, control hardware outputs or to trigger certain sections of code to run. This makes using the keyboard display very simple and easy to use, even for inexperienced users. The keyboard can also be used to plot graphs of data that is stored in the logger which enables users to identify spikes or potential errors in the measured data.

The CR850 and CR3000 data loggers includes built-in keyboard displays which can (in some cases) eliminate the need for a PC on site at all, while the CR1000KD can be used with our new generation of data loggers, excluding the CR200 series.

WANT MORE INFORMATION ON ANY OF THESE PRODUCTS?

Contact our technical sales team on info@campbellsci.com.au

OR visit our website www.campbellsci.com.au



DNP3 Support for SCADA DataView II Upgrade - Now Compatible with All CRBasic Loggers

SCADA software packages are often used in control/monitoring applications due to the flexibility and capability that they offer. Numerous packages are available on the market, each with their own advantages. As the number of devices used in the monitoring field is varied and continually growing, it is difficult for software manufacturers to maintain up-to-date drivers for all the supported hardware. Most packages support a group of standard open communications protocols that allow data to be transferred through methods that are standard across all manufacturers.

Interfacing SCADA packages with the Campbell Scientific range of data loggers is now even easier with the release of the latest firmware which includes DNP3 support. DNP3 is a protocol that describes the method for the transport of data between "master" and "slave" (outstation) devices. This data can be analog measurements, current state information or commands to control certain hardware devices. The introduction of DNP3 support adds another option for users who want to use a graphical interface for data presentation and control of their logger. Our CRBasic loggers have always been able to support MODBUS Master and Slave capabilities, but now offer the extra options associated with DNP3.

The long awaited upgrade for our CD295 - DataView II display has now been released through Campbell Scientific Australia -the unit is now fully compatible with all CRBasic data loggers including the CR200 & 800 Series, as well as the CR1000 & CR3000 data loggers.

The display (previously only compatible with the CR200 series), features a two line, 32-character LCD screen and displays real-time values, allowing you to view data in the field quickly and easily. The DataView II can be housed in two ways, by attaching the display to the enclosure backplate or mounted into the lid for added viewing convenience.

Users of the current CD295 can easily download the new operating system and software by visiting the downloads section of our website. Click the below link to take you there!



DOWNLOAD THE LATEST OPERATING SYSTEM FOR YOUR DATA LOGGER

Go to - <http://www.campbellsci.com.au/downloads>

Implementing Internet Protocols with Campbell Scientific Data Loggers – Part 1

Cell phone communications have been around for a number of years and have become one of the most common telemetry options used with our data loggers. Telemetry in this manner takes the form of the PC Software (normally Loggernet) initiating a phone call to the cell phone. As with all dial-up configurations (sat phone, land line phone, cell phone), this connection is established between the PC modem and cell phone modem and then becomes transparent to allow the PC software and the logger to communicate. This system has advantages over a landline configuration in that the site can be located anywhere that has coverage from the service provider.

Recent advances in communications technology has opened up new possibilities for remote logger communications in the form of packet based data. By operating the cell phone modem in the packet data mode, the cell phone is used to establish a connection to the service provider (e.g. Telstra). This connection effectively connects the modem to the “internet”. Once the logger is on the internet (via the modem’s connection), standard internet protocols can be used to browse a web-page hosted by the logger, send files to and from the logger to a server or use Loggernet (on an appropriately internet-enabled PC) to communicate with the logger.

The Pakbus range of Campbell Scientific loggers (CR8xx, CR1000 and CR3000) have a TCP/IP stack as part of their operating system. Different revisions of the operating systems include different implementations of the internet protocols and their options. This TCP/IP stack is a set of commands/protocols/tools that allow the logger to establish (and in some cases receive) connections with other internet-based devices, providing there is a physical link over which to do so.

How to Configure the Logger Correctly for PPP connections -

Using Device Configuration Utility, some TCP/IP settings must be configured to suit the modem that is being used.

The settings to be entered are -

Port Used: The port on the logger which is connected to the cell-phone modem.

IP Address: The IP address that will be used for the PPP connection (if known). In most cases, this is left as 0.0.0.0, which will rely on the server (Telstra) to allocate an IP address.

User Name: User Name/Login for the PPP connection with the service provider. This varies depending on the type of modem that is being used.

Password: The password for the PPP connection with the service provider. Again, this varies with the type of modem being used.

Modem Dial String: The command(s) that are sent to the modem to establish the packet data connection with the service provider.

Modem Dial Response: The response from the modem which indicates the connection with the service provider has been made successfully.

Other important settings:

Ensure the baud rate of the port specified for PPP is the same as the baud rate of the cell-phone modem (often configured with AT+IPR command) and that the modem is connected to the appropriate port of the logger with the correct physical interfaces (e.g. null modem, SC932A, etc).

What happens?

When TCP/IP settings are configured for a particular logger and it begins operating its program, it will begin to send the dial string to the modem attempting to establish a socket connection with the service provider and have an IP address allocated.

If the connection is not established, the logger will retry continuously in an attempt to establish the connection. The IPTrace option (set in Device Configuration Utility) can be useful for tracking the status of a PPP connection. Alternatively, using a serial sniffing cable to observe the traffic between logger and modem is useful for troubleshooting connections. Attempts to establish this link do not affect the operation of the data logger running its program.

Once the connection is established, the logger’s Status table will be updated with the IP address of the current connection and the logger is ready for internet-based traffic. The use of PPPOpen() and PPPClose() instructions allow the PPP link to be activated and deactivated as required based on the program control. This is required if a single modem is to be used for SMS or dial up connections in conjunction with internet based data transmissions.

The most commonly requested transfers are sending data via FTP from the logger to a server or sending an email to someone with a data file as an attachment. Both of these operations typically involve sending a file from the logger. This file will be created and handled by the logger program which gives unlimited flexibility in terms of data format of the file.

Transferring a file via FTP involves the logger (FTP Client) establishing a connection to an FTP server, logging in and “PUT”ing the file on the FTP server’s site.

The following must be specified for an FTP transfer:

- IP Address of the FTP Server (Port number can be added if non-standard).
- UserName to log in to the FTP Server
- Password to log in to the FTP Server

Sending an Email involves the logger establishing a connection with an SMTP server (such as bigpond.com). Information such as destination email address, subject, etc is sent to the SMTP which is then sent on in the form of an email to the email address specified.

The following must be specified for an email to be sent:

- SMTP Server Address (IP address with port number can be used if needed).
- UserName of the account on the SMTP server.
- The password of the user whose account will be used.
- The Email Address of the person who will receive the message.
- The Email Address to identify who sent the message.
- Some text to form the subject of the message.
- Some text to form the body of the message.

Stay tuned to future newsletters for more details on using PPP and internet connections with your Campbell Scientific loggers. If you can’t wait until the next newsletter and would like to discuss the possibilities of how PPP can work in your network, please don’t hesitate to contact us on info@campbellsci.com.au !

Monitoring Your Water Usage & Soil Moisture

As we all know, water has become a precious resource and the subject of much political & environmental debate over the past 18 months. Monitoring Soil Moisture is required for effective irrigation water management and CSA has various sensors and systems that allow you to control your water supply easily and effectively.

Below are our recommended products to help you manage your water usage -

WATER CONTENT

Soil volumetric water content sensors provide a tool to measure the water content to determine how much irrigation is required.

• HydroSense

The HydroSense is a compact, handheld display and a sophisticated soil water sensing probe in a portable package to provide quick and reliable soil water content measurements. Each measurement takes less than one second and is obtained by inserting the probe rods into the soil and pressing a single button on the display unit. Low power requirements and fast measurement times, makes the HydroSense a versatile tool for monitoring and managing soil in a wide range of conditions.



• CS616 Volumetric Water Content Sensor

The CS616 is a self-contained water content sensor that uses high-speed electronics in the body of the sensor to measure the volumetric water content from 0% to saturation. The probe consists of two 30cm long stainless steel rods connected to the measurement electronics.

• Time Domain Reflectometer



Time Domain Reflectometry (TDR) is widely used to measure soil water content and bulk electrical conductivity. TDR100 generates a very short rise time electro-magnetic pulse that is applied to a coaxial system which includes a TDR probe for soil water measurements, and then quickly and accurately determines soil volumetric water content and soil bulk electrical conductivity.

WATER POTENTIAL

Soil water potential sensors determine the energy status of water in soil or how tightly the water is held in the soil. This is an indication of how hard the plant must work to get water from the soil. We offer various sensors to measure soil water potential by two methods: the heat dissipation method or the electrical resistance method.

EVAPOTRANSPIRATION (ET_o)

Consumptive water use is composed of evaporation of water from the soil surface and transpiration of water through plant tissue to the air. By knowing your crop's evapotranspiration rate, you will understand the water requirements of your crops better.

By measuring solar radiation, wind speed, relative humidity and air temperature, ET_o can be calculated. CSA has a number of weather stations ranging from low cost (WeatherHawk), plug and play (ET107) to custom built stations. These supply the information required to develop an irrigation schedule that provides sufficient water for crops without over-watering. These stations are designed for permanent installations and are ideal for golf courses, irrigation applications and most locations where weather data is desired.

For more information on how to control your water usage please contact us on

info@campbellsci.com.au

Protecting Your Equipment in the Field..

Campbell Scientific products have an excellent reputation for robustness and reliability. However, installing instrumentation with any level of exposure to the elements requires steps be taken to minimise the risk of losing data. Such steps include -

1) Protecting equipment from humidity

Corrosion is a common problem linked to system failure in weather stations and data loggers. Despite the use of high quality door seals, humidity can infiltrate inside enclosures - resulting in corroded connections, potentially inaccurate measurements or more serious power issues such as short circuits. Humidity indicator cards and dessicant bags (both available from CSA) can be used to indicate and lower humidity. Ensure that any cable and / or antenna entry ports are situated on the underside of the enclosure and that they are well sealed.

2) Protecting equipment from animals

- Insects: Place moth balls or naphthalene crystals in enclosures to prevent ants, wasps, spiders and other insects from nesting.
- Birds: Cable ties, with the loose ends pointing up, can be attached to the top edge of solar panels and to sensor mounting arms to deter birds from using them as a perch. A strip of bird control wire wound around the funnel of a tipping bucket will deter birds from nesting in the funnel. Be ware though that it is important that the location of these deterrents do not adversely affect sensor operation or measurement accuracy.
- Goats, birds, rodents and rabbits. The most common cause of damage to sensors is by animals or birds chewing the cables. Route wires through flexible metal or PVC conduit where possible to prevent such damage. Campbell Scientific uses a custom santoprene shield on the majority of their cables to limit damage done by termites and other insects. Impervious to moisture and is also abrasion resistant, santoprene cabling is directly buriable, thus avoiding the cost of conduit where rodents are not a problem.

3) Protecting equipment from lightning

Proper grounding of instrumentation is required for both personal safety

and long term system reliability. Ground surges or transients due to electrical storms can cause system malfunction and/or failure, especially for systems with long sensor leads. It is recommended that you restrict lead lengths as much as possible or use wireless networks in lightning-prone areas. Lightning rods and an earth stake connected by a heavy conductor to your instrumentation are essential in limiting damage to sensitive equipment. Surge protectors are also available for all communications equipment and associated antennas. Although Campbell Scientific data loggers utilise gas discharge tubes for lightning protection, nothing will protect you in the event of a direct hit. So, if possible, site your installation so that it is not the highest object in the immediate vicinity.

4) Protecting the equipment from vandalism

Outdoor weather stations are subject to vandalism, particularly in high-visibility areas. A few tricks include placing a lock on the enclosure, camouflaging the station, disguising enclosure boxes to look like rocks, and putting warning stickers on the enclosures. If at all possible, select a site location where the system is hidden from view.

5) Special: marine applications

Providing enclosures are well sealed, the most common point of failure on equipment deployed in a marine environment is corrosion between the connectors on the cables and electronics box. There are a number of ways to limit corrosion including - coating connectors with lanolin, use two enclosures with one inside another, seal all connectors with silicon or a heavy grease.

6) Data Storage Cards

Campbell Scientific recommends the use of high quality, industrial data storage cards with their data loggers. While cheaper cards can certainly be used, they have not been tested by Campbell Scientific and reliability is unknown. At the end of the day, if your data is valuable, the increased cost of quality memory cards is a small additional price to pay to avoid data loss.

VisualWeather v2.1 Now Available...

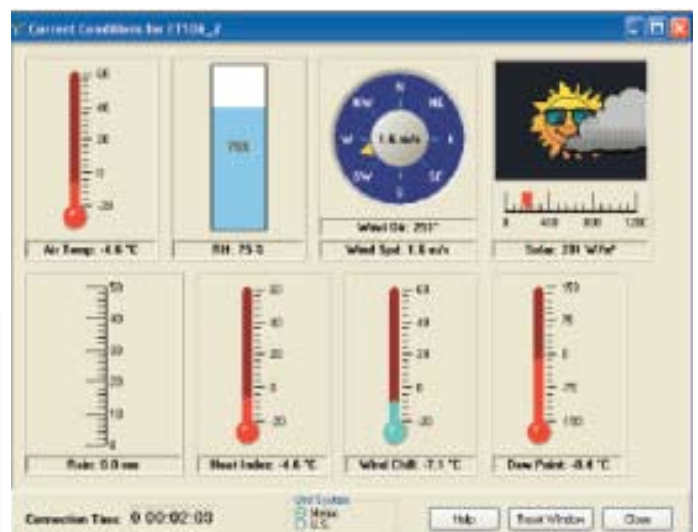
VisualWeather is an ideal package for those with weather stations supporting program generation, real time data monitoring, automated data collection, and report generation. An EZSetup Wizard guides you through the necessary steps of configuring the weather station. To communicate with your station, VisualWeather supports direct connect, telephone, TCP/IP, spread spectrum radios, VHF/UHF radios, and multidrop communications devices.

For a preconfigured weather station, such as our ET107 or Metdata stations, VisualWeather generates a program based on information you provide about the sensors and sends the program straight to your weather station. For custom weather stations we've included our Short Cut program generator with VisualWeather. You can use Short Cut to generate the program and wiring diagram for your custom station. You can then use VisualWeather to send the program to the weather station and map the data fields used for report generation and real time displays.

CSI have recently released VisualWeather v2.1 with the following new features -

- Users can now import data from data files into the Flash Filer Database
- There is now no limit to the number of custom reports that can be generated.
- Multiple screens can now be opened and interacted with at the same time.
- Custom X-Y and GDD Reports were added.

Users of VisualWeather 2.0 can download the upgrade straight from our website (see page 2) or contact us via info@campbellsci.com.au



Virtual thermometers, gauges, and other images display real-time weather conditions.

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Contact us on - online@campbellsci.com.au

New Faces at CSA...

Sarah Fraser is our new receptionist and order entry person. After only three months at CSA, Sarah is already an invaluable member of our team. Her bright and cheery disposition makes Sarah a favourite with both our customers and fellow workmates. As part of her training at CSA, Sarah is currently studying for a Certificate III in Business Administration. Outside of work, Sarah is a keen figure skater.



With more than ten years training behind her, she has represented North Queensland and now teaches figure skating.

Hannah Christie is our newest staff member. Straight out of high school, Sarah joins CSA as a trainee storeperson where she will undergo training for a Certificate III in Transport & Distribution (Warehousing). Although ultimately planning to attend university and study radiography, Hannah is having a break from study for a year or two to save for her studies and to spend time with her four horses. Hannah is a country girl who has already had work experience as a mango picker, vet's assistant and at a saddlery store.

We are thrilled to have two young ladies of the calibre of Sarah and Hannah working at CSA and wish them every success while with our company and in the future.

