CSA Announces 2007 Training Schedule

Do you need training? After much planning we are pleased to announce that we have six training courses scheduled to take place in 2007!

CR1000/CRBasic training course is appropriate for all knowledge levels, whether you're a beginner or more advanced, this course will show you how to use your equipment to its full potential! And don't let the name fool you; the course is suitable for all data loggers using the CRBasic programming language, including the following models - CR200 series, CR800 & CR850, CR1000, CR3000 and CR5000 data loggers.
All courses are run over 3 days and include full catering including - morning, afternoon tea and lunch, the use of a CR1000 data logger and course manual. For all enquiries please email training@campbellsci.com.au

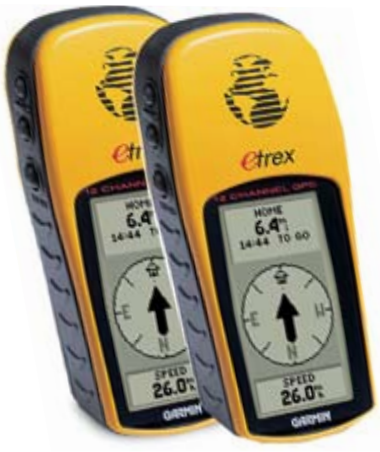
Our first two courses for the year will be held in Melbourne and the Gold Coast - we hope to see you there!

Inside Online...

CSA TRAINING SCHEDULE 2007

DATE	LOCATION	VENUE
30th Jan - 1st Feb	Melbourne	Vibe Hotel, Carlton
17th - 19th April	Gold Coast	Vibe Hotel, Surfers Paradise
May	TBA	TBA
July	TBA	TBA
September	TBA	TBA
November	TBA	TBA

SUBMIT YOUR CASE STUDY - WIN 1 OF 2 GARMIN GPS SYSTEMS



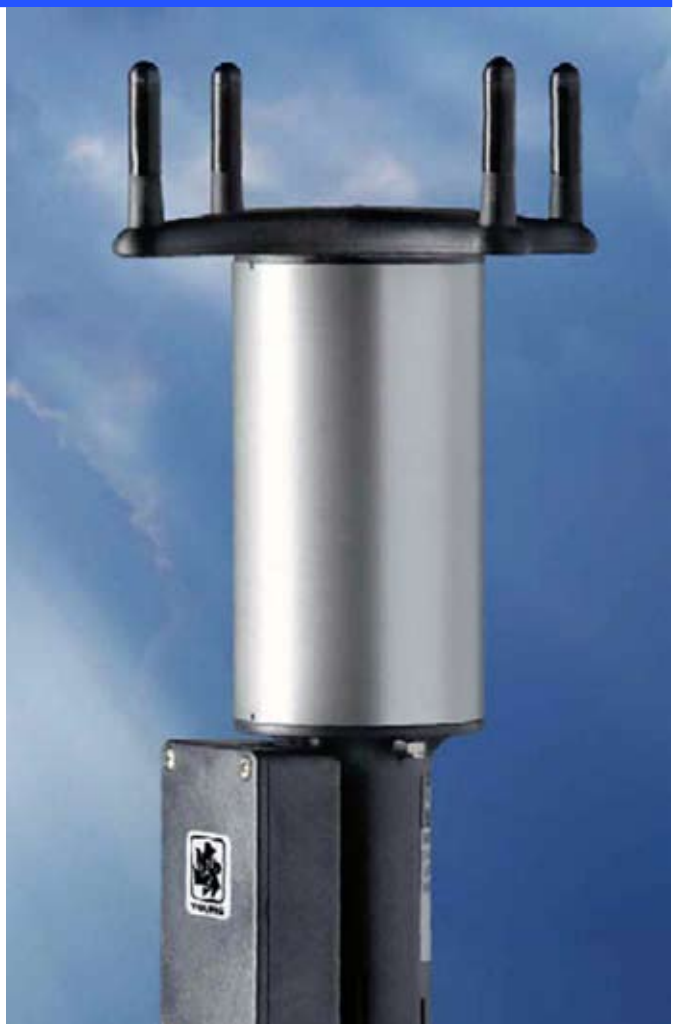
If you're using Campbell Scientific equipment -we want to hear from you!

Until the 31st of December we are giving you the chance to win 1 of 2 Garmin GPS E-Trex Navigation systems, just for submitting your case study to our website. All case studies will be posted on our CSA website (attracts 1500 hits per month) and various industry portals, where appropriate, so it's a great chance for you to share your work with a wider audience.
It's simple - if you have received a CSA case study request via email all you have to do is fill out the form and send it back into bree@campbellsci.com.au OR submit the form online at www.campbellsci.com,au
But remember, the competition ends 31st December 06, so get your entry in before Christmas - who knows? You may get a late Christmas pressie!.

FEATURE PRODUCTS

RM Young 85000
Ultrasonic Anemometer

The RM Young 85000 Ultrasonic Anemometer is a 2-axis, stationary wind sensor. It is ideal for general & specialist meteorological applications requiring accurate, reliable wind measurement.



The sensor features durable, corrosion resistant construction with opposing pairs of ultrasonic transducers secured in a streamlined moulded frame.
The 85000 is fully wind-tunnel tested and calibrated to provide accurate wind measurement over a wide operating range.

The standard sensor includes many useful output options. Analogue voltage outputs are provided for wind speed and wind direction. A variety of serial output formats are also available on the standard sensor including ASCII, NMEA and SDI-12 formats.

The sensor installs easily on our vertical mounting pole or using our CM220 mount. Special mounting adaptors, connectors and cables are not required as wiring connections are safely stored in a convenient weatherproof junction box.

For extended cold-weather use, the 85000 has a heated version, featuring thermostatically controlled heaters in transducers and housing surfaces.

For more information and specifications on the RM Young 85000 please visit our website www.campbellsci.com.au

Campbell Scientific Inc. Releases 14/16 Enclosure

For those applications where the ENC12/14 enclosure is too small and the ENC16/18 is too big, the new ENC14/16 enclosure is just right.

The inside dimensions are approximately 14″ (35.6cm) wide x 16″ (40.6cm) long x 7.5″ (19.1 cm)deep. The ENC14/16 is the preferred enclosure for housing a CR5000 data logger. For applications that require a larger power supply, the enclosure accommodate a BP12 or BP24 battery, charging regulator, data logger, and one or more peripherals.

There are three enclosure mounting bracket options. One option attaches the enclosure to a tripod mast or vertical pipe. Another option attaches the enclosure between the legs of a CM110-series tripod, and the third option attaches the enclosure to two legs of our towers.

AM16/32A Multiplexer Replaces AM16/32

Campbell Scientific have now replaced the AM16/32 multiplexer with the upgraded AM16/32A unit.
The AM16/32A has undergone significant redesign before its release, including the addition of a new processor.

The main benefits to the new unit is the inclusion of a grounding lug and spark gap protection on all channels, protecting data against electrical surges and static discharge events.

The unit is now available for order through CSA.
AM16/32 units are still available until current stock is sold.

TECH TIP

Solar Panel Sizing Guide

Campbell Scientific data loggers are often chosen for their reliability, high quality measurements and low power consumption. One reason why these aspects are so appealing is because many of the applications in which our equipment is used are unattended for long periods without the luxury of mains power. The most common power supply chosen for these sites is solar, but the decision to use solar power inevitably leads to the question
– How much power is needed?

For many small systems that perhaps have few low-powered sensors and low sampling rates, almost any panel will be more than adequate. But what about those installations that have high powered (4-20mA) sensors, sat phones or switch high-power loads? Some use previous experience to judge their needs, others oversize everything to avoid running out - wouldn't it be nice to have an easy precise way of calculating your exact requirements, saving you the guesswork? Below we have provided a series of calculations to help take some of the guesswork out of sizing your next solar system. We also have a Solar Panel Sizing Guide spreadsheet available to all customers, simply email bree@campbellsci.com.au to receive the excel file.

There are 4 important pieces of information that we need to collect in order to determine the size of the solar power supply:

1.Loads/Switching - What are the loads in the system and how often will they be switched on?

This is the most important of all the figures that you will collect. Without knowing the current drain of the different parts of the system, there is no way to calculate the required power supply . In this step, you need to consider anything that will use electrical power – including your data logger, sensors and any communications equipment (cellphones etc) that may be attached. Some sensors need not be included because they consume very little current, but care needs to be taken to ensure the power needs are what you expect. For example, the power consumption of a standard 03001 cup-and-vane wind sensor is negligible and could safely be ignored, but on the other hand, a 03001L sensor that has a 4-20mA output will draw a continuous current of up to 20mA which would be significant in many systems.

When considering how often a device will be switched on (the duty cycle), it isn't necessary to convert all the time periods into the same units. For example, in your system the cellphone might be turned on for 4 hours every day, while your RH sensor might be powered for 2 seconds in every minute. In this case all you need to record is that the cellphone duty cycle is 4 in 24 and the RH sensor is 2 in 60. It doesn't matter that one is in hours and the other is in seconds.

2. Insolation - Where will the system be situated (roughly)?

This information will allow you to estimate the insolation. Insolation is simply amount of solar radiation that will strike the solar panel on average throughout a year.
The manufacturer's power rating for a solar panel is calculated assuming a solar radiation level of 1000W/m2 with the panel perfectly aligned. Unfortunately, a solar panel installed in the field will rarely have perfect alignment and depending on the location may only experience 1000W/m2 of solar radiation for a few hours each day, if at all. As a result, a panel rated at 5W will generally produce significantly less than this when installed. Luckily, there are some simple, colour-coded insolation charts available for the whole globe, which can help you to estimate the average number of "full sun" hours (1000W/m2), that the site will experience each year. We have included the Australian chart in our spreadsheet.

3.Autonomy - How many rainy days should the system be able to handle ?

It seems pretty obvious, but it is often overlooked or ignored. If the system needs to continue to operate when there is no sun, then the batteries will need to hold enough energy for the system to operate during these periods.

4.Recovery - How long should the system take to recover after a period of rain?

For some installations this figure is unimportant because the period between storms can be quite long, but in some tropical places during monsoon season it can be quite important to recharge the batteries within a short period, due to volatile weather. This is the period (in full-sun days), that it will take for the batteries to return to full charge after being completely exhausted.

NOW TO THE MATHEMATICS...

For those of you interested in performing the calculations by hand the equations are listed below, but for those who would like to avoid this sort of mathematics, contact bree@campbellsci.com.au for the Solar Panel Sizing Guide spreadsheet.

Solar Sizing Formula

1. The average daily current energy in mAhrs per day for each load is calculated as follows:

$$Current_{avg} = \frac{24 \times Current\ (mA) \times DutyOn\ Time}{Duty\ Period}$$

As mentioned earlier, it doesn't matter what units are used for DutyOnTime and DutyPeriod, for example if a load is on for 5 minutes in an hour then DutyOnTime would be 5 and DutyPeriod would be 60. Interestingly, the exact same numbers could be used if instead the load was on for 5 seconds in every minute.

2. Next add the current from all the different loads to find the average current of the entire system, and convert to Ahrs per day.

$$Current_{TOT} = \frac{(Current_{avg1} + Current_{avg2} + ..)}{1000}$$

3. Using the total current from step 2 and the period of autonomy, calculate the battery capacity in Ahrs.

$$Cap = \frac{Current_{tot} \times (Autonomy\ (Days) + 1 - \frac{insolation}{24})}{0.8}$$

4. The results of step 2 and 3 combined with the recovery period can be used to calculate the necessary solar panel size.

$$Panel\ Output\ (A) = \frac{(Current_{tot} \times 1.2) + (Capacity / Recovery\ Days)}{insolation}$$

Which can then be converted to Watts as follows:

$$PanelOutput(W) = PanelOutput\ (A) \times 12$$

5. The final step is to calculate the worse case current for the regulator.

$$Regulator(A) = PanelOutput(A) \times 1.35$$

Although the calculations may seem daunting to some, these 5 steps will allow you to dispel the "magic" that often surrounds the sizing of a solar power system.

Unrivalled communication flexibility in new Pakbus® data loggers.

One of the key features of Campbell Scientific's CR-Basic data loggers is the ability to route data between each other using our proprietary Pakbus® protocol. This ability allows loggers to act as repeaters in a network as well as enabling them to make decisions based on measurements made by their neighbours in the network.

This capability is a major advantage when it comes to implementing clustered or networked installations of two or more data loggers.

Wireless networks utilising our CR211 (with inbuilt radio), CR800 or CR1000 data loggers (using RF411 radio modems) are an obvious choice for transfer of data between loggers. An prime example of such a network is Melbourne Water who in 2004 installed six CR210 data loggers and a CR510 Pakbus® logger that measured flow, water height and turbidity in a series of successive ponds used for water treatment. When fresh flow is detected at the first pond, a water sample is taken using an auto-sampler and the remaining six loggers are advised of the event. Each of the other data loggers then start a timer so that they can take samples at successive intervals and pass data back to the base CR510 data logger for telemetry and SMS alarming via cellphone.

Our powerful new data lloggers with PakBus® protocol - the ultimate in flexibility

Another example of where a wireless network provides an advantage is in groundwater applications. In a typical situation, a number of bores are in close proximity. Rather than having a cellphone modem and data logger attached to each bore, a more cost effective solution is to monitor the bores with CR211 wireless data loggers and transmit this back to a central logger which then transmits data back to base via a single cellphone modem. Communication infrastructure and call costs can thus be reduced significantly.

Passing of parameters between data loggers is not, however, restricted to wireless applications. Other Campbell Scientific networking options including RS485, RS232 and ethernet also support this feature.

A typical non-radio application involving data transfer between data loggers is airport monitoring. Airports typically have radio traffic restrictions and in this case RS485 communication via hard wire is the preferred method of communication. A weather station at the centre of an airfield may need to collect data from a present weather sensor located at the end of the runway and transfer this data via an RS485 network to a central monitoring and display location. Pakbus® protocol allows this to occur seamlessly.

Another feature in Pakbus® data loggers is support for simultaneous communications with multiple hardware devices. These unique addressing, routing, and multi-tasking capabilities provide incredible communication flexibility and free the new Campbell Scientific data loggers from depending on the PC for triggering alarms and routing messages.

For a more detailed explanation and examples of hardware configurations, the "Pakbus Networking Guide" is available for download from our website at –
http://www.campbellsci.com/documents/manuals/pakbusnetguide.pdf

Online - Issue 15, Nov/Dec 06
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CSA Closing Times during Christmas

Campbell Scientific Australia will be closed during the Christmas and New Year period from midday Friday 22/12/2006 and re-opening 8.30am (QLD time) Tuesday 2/1/2007. We hope everyone has a safe, happy and relaxing break, and we look forward to speaking with you in the New Year!