CAMPBELL SCIENTIFIC UPDATE

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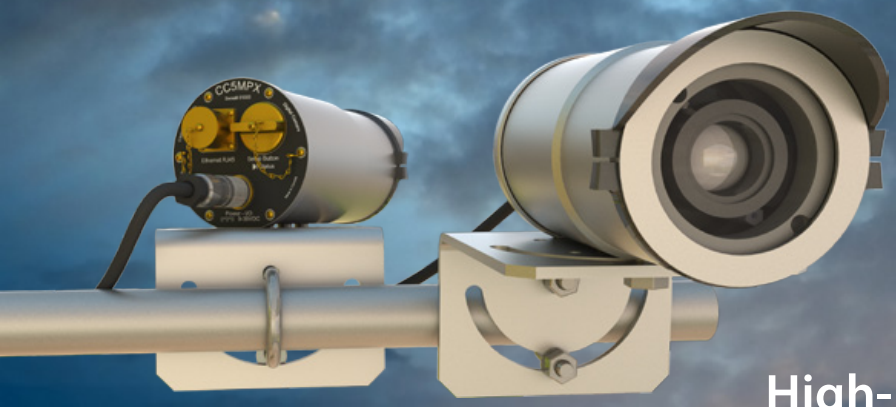

High-Resolution Digital Camera: CC5MPX, *p. 2*

High-Resolution Digital Camera

The CC5MPX is Campbell Scientific's first high-resolution digital network camera with video capabilities. It produces JPG images with a resolution of up to 5 megapixels, and shoots videos with a resolution of up to 720P. The CC5MPX can function as a stand-alone camera or can be connected to a Campbell Scientific datalogger. Several power-conserving modes allow the CC5MPX to be used in remote, battery-powered installations.

Designed to work in harsh environments, the CC5MPX operates at temperatures as low as -40°C and as high as 60°C. It has an integrated, environmentally sealed enclosure that protects the camera from moisture and high humidity. The integrated enclosure also reduces the time required to install the camera.

The CC5MPX has several options for image acquisition and storage. You can take still images or videos based on an internal timer, motion detection, or a trigger from a datalogger. The images or videos can then be stored on an SD card, saved in a datalogger's memory, sent to a PC via email, or transmitted to an FTP server.

New Datalogger Instruction—AC Power

Our dataloggers have powerful onboard instructions that support many, useful measurement capabilities. Because these instruction sets are expandable, we are continually adding new functionality that can be incorporated into existing dataloggers via operating system updates. *(See www.campbellsci.com/downloads.)*

We recently included a new instruction, ACPower, that will be of interest to anyone needing to monitor their electrical system. The ACPower instruction allows a CR800, CR850, CR1000, or CR3000 datalogger to measure voltage and current transducers that are connected to an AC power source. Possible outputs are RMS voltage, RMS current, real power (watts), total real power (watts), frequency (Hz), phase angle (radians), voltage harmonic distortion ratio, and current harmonic distortion ratio.

The ACPower instruction provides three configuration options that support different applications. The single-phase configuration is for monitoring single or multiple loads and may be used for submetering applications. The split-phase configuration is for monitoring two hot conductors plus a neutral conductor, used in residential service-entry panels, as well as residential and commercial distribution panels. The three-phase Y configuration is for monitoring three hot conductors plus a neutral conductor, used in commercial entry and distribution panels.

New HDR GOES Satellite Transmitter

Campbell Scientific is pleased to announce the TX320, a new HDR GOES satellite transmitter. The TX320 uses GOES satellites to transmit data acquired by our data collection platforms (DCP). This new transmitter offers reliable GOES communication for remote hydrologic and meteorologic monitoring throughout the Western Hemisphere.

The TX320 features a USB port that supports connection with PCs for setup and diagnostics.

Additionally, the TX320 retains all of the benefits of its predecessor, the TX312, including:

- Extremely stable clock, allowing up to 28 days of operation between GPS fixes—more reliable operation in areas with poor GPS reception
- Automatic GPS-based correction of real-time clock and temperature-compensated oscillator (TCXO)
- Low quiescent power draw
- Transmission rates of 100, 300, and 1200 bps
- Simple ASCII interface command set

The TX320 is a drop-in replacement for existing Campbell Scientific HDR GOES transmitters. Therefore, you can exchange transmitters without changing the datalogger, program, antennas, or power supply in your station.

Field Testing the Shippingport Bridge

The Shippingport Bridge spans the Ohio River in Beaver County, Pennsylvania. Constructed in 1961, the main river crossing is a three-span, combined deck/through-truss bridge more than 1,300 feet long. As part of a larger evaluation and rehabilitation project, Lehigh University's Advanced Technology for Large Structural Systems (ATLSS) Research Center performed field-testing of this bridge. The scope of the work included controlled-load testing using a test truck of known geometry and weight, and long-term monitoring of the bridge during normal traffic. The ATLSS then used the collected data to estimate the remaining fatigue life at critical points on the bridge.

Strain gages and displacement sensors were installed throughout selected spans in locations known to be fatigue sensitive or that would provide insight into the global load distribution characteristics and general behavior of the bridge. The data were collected using a Campbell Scientific CR9000X datalogger, which then transmitted data via wireless modems to a server located in the ATLSS Center, 300 miles away in Bethlehem, Pennsylvania. This link was also used to upload new programs as needed.

A fully loaded, triaxle dump truck was used for the controlled-load testing phase of this project. The test truck was driven across the bridge multiple times in each lane at both crawl speed and normal traveling speed. The crawl tests determined the static response of the bridge while the tests at normal traveling speed evaluated the dynamic amplification.

For the long-term portion of the test, the bridge was monitored remotely for about three months. During the monitoring period, the CR9000X was triggered to record high-speed, time-history data when high-stress events were detected. In this way, data records were obtained for crossings of the heaviest vehicles.

ATLSS researchers used this controlled-load testing and long-term monitoring to characterize the global and local response of the bridge and to optimize the rehabilitation scheme. Improved confidence in the fatigue life estimates was also achieved.

Preserving King Tut's Tomb

In 1922, when the tomb of Tutankhamen was discovered in Egypt's Valley of the Kings, the tomb was full of treasures, artwork, and other artifacts. In most other tombs that archaeologists discovered, these things had been stolen or vandalized before preservation-minded people could protect them. Tutankhamen's tomb has stayed largely unmolested up to this day, and is now one of the most-visited sites in the Valley of the Kings.

The tomb walls are covered with priceless murals, but as time has passed, the paintings have begun to deteriorate. Since the large number of visitors may be contributing to the problem, Egypt's Supreme Council of Antiquities (SCA) and the Getty Conservation Institute are collaborating on a three-phase plan to evaluate and manage the effects of visitors on the condition of the tomb.

Phase 1 includes measuring the microclimate inside the tomb and in the outdoor area just outside of the tomb. Sensors measure air temperature, humidity, and carbon dioxide, and count the number of visitors.

The data is captured with a Campbell Scientific CR10X datalogger (to be updated to a CR1000 when political conditions permit) and transmitted via cell modem to a land line and then to the project's headquarters at the Getty Center in California. The data are then posted automatically on the project website.

During Phase 2, the Getty and the SCA will analyze the data and determine what effect visitors have on the microclimate of the tomb, and what effect any changes in the microclimate have on the deterioration of the tomb paintings. They will then design strategies to manage the tomb environment and to prevent or repair damage to this priceless treasure.

Phase 3 will entail implementing new procedures, and continuing to monitor the microclimate to gage the effectiveness of the visitor-management strategies. The caretakers of the tomb will also continue to study ways to preserve the tomb and the murals.

New Training Course

Structural and Geotechnical Training

Over the years, Campbell Scientific application engineers have helped hundreds of customers in the structural and geotechnical fields. At the same time, we have built a reputation for our up-to-date, hands-on training classes. Combining these resources, we have designed a course featuring hands-on training on many of the sensors and techniques used in structural and geotechnical monitoring.

First we will focus on measurement techniques, and then we will study the phenomena to be measured and the best sensors to use for each. The first session of this new class will be held July 18-22. Preview the course description and the list of sensors to be covered at *www.campbellsci.com/geo-training-jul11*, and reserve your seat now.

New Product

CS650 Water Content Reflectometer

The CS650 reflectometer, a new multiparameter smart sensor for use in soils and other porous media, is now available. The CS650 measures dielectric permittivity, bulk electrical conductivity (EC), and soil temperature, and uses these measurements to estimate soil-water content for a wide range of mineral soils. Innovative techniques allow this new reflectometer to make more accurate water content measurements in soils with bulk EC up to 0.8 dS m^{-1} without performing a soil-specific calibration. The CS650 has 30 cm rods and a sensing volume of 7.8 liters. This new smart sensor communicates with a datalogger or computer using SDI-12 or RS-232 protocols. Visit the CS650 product page to learn more, ask a question, or get a quote.

Events

Campbell Scientific at NHWC

San Diego, California, will host the 2011 conference and exposition of the National Hydrologic Warning Council (NHWC). This conference is unique in being focused on real-time hydrologic warning systems. Sessions will cover storm-related topics like preparedness, mitigation, and response.

This will be the largest program NHWC has ever offered, with over 100 presentations, 15 workshops, and 30 exhibits. Campbell Scientific is a sponsor of this important conference, and will have engineers there prepared to discuss your measurement needs.

CAMPBELL SCIENTIFIC UPDATE

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Trade Show Calendar

Visit our website for training class schedules and additional listings.

May		
Offshore Technology Conference	Houston, TX	2-5
NHWC Conference	San Diego, CA	9-12
ACWA Spring Conference	Sacramento, CA	10-12
Solar 2011	Raleigh, NC	19-20
Windpower 2011	Anaheim, CA	22-25
EWRI/ASCE	Palm Springs, CA	22-26
June		
International Bridge Conference	Pittsburgh, PA	5-8
National Water Data Conference	Pittsburgh, PA	6-9
A&WMA	Orlando, FL	21-24
July		
InterSolar North America	San Francisco, CA	12-14
August		
APS-IPPC Joint Meeting	Honolulu, HI	6-10
ESA 96th Annual Meeting	Austin, TX	7-12
StormCon 2011	Anaheim, CA	21-25
National Rural ITS Conference	Coeur d'Alene, ID	28-31

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