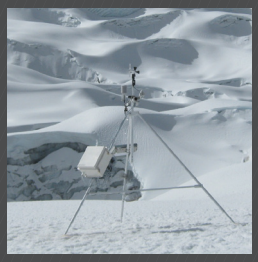
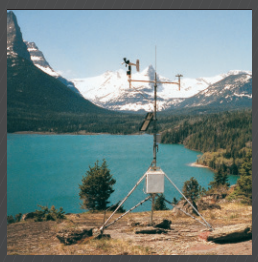
CAMPBELL SCIENTIFIC®

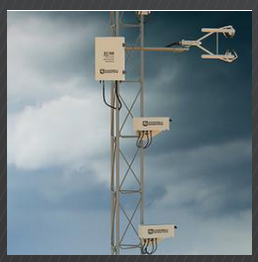
WHEN MEASUREMENTS MATTER

Corporate Profile









RELIABLE SINCE 1974 MONITORING

Campbell Scientific designs, manufactures, and sells rugged dataloggers, data-acquisition systems, and measurement and control products used worldwide in environmental, research, and industrial markets.

Campbell Scientific headquarters in Logan, Utah, U.S.

Campbell Scientific designs, manufactures, and sells rugged dataloggers, data-acquisition systems, and measurement and control products used worldwide in environmental, research, and industrial markets. The company was established in 1974 with its corporate headquarters in Logan, Utah, United States. The majority of Campbell Scientific products are manufactured at its U.S. facility, which employs over 300 people in engineering, production, marketing, and administration departments.

Products, Systems, and Support

Campbell Scientific products are known for their flexibility, precision measurements, and dependability—even in harsh, remote environments. In addition to a family of powerful dataloggers, Campbell Scientific offers a variety of related product lines for the measurement field, including sensors and devices for the collection, storage, communication, and retrieval of data. Using these components, Campbell Scientific employees work with customers to configure unique systems that meet specific instrument and application needs.

Since 1974, we have manufactured over 150,000 systems. Our measurement systems are based around a programmable datalogger. Our dataloggers not only provide advanced measurement capabilities, but can also control external devices. Unattended measurement and control decisions can be based on time or conditional events. Phones, radios, and other devices can be used by the dataloggers to report site conditions.

Because our dataloggers have many channel types and programmable inputs, they can measure almost any commercially available sensor. Datalogger channel types include analog, pulse counter, continuous analog output, digital I/O, and switched excitation. Multiplexers and other peripherals can be used to increase the number of channels.

A full line of telemetry and on-site data storage and retrieval products allow you to retrieve data from the office or in the field. Communicate on site via direct connection to a PC or laptop, external data storage devices, iOS or Android devices, and field displays. Telemetry options include Internet or IP networks, short-haul, multidrop, telephone, radio, and satellite.

Campbell Scientific software gives you the option of controlling our data-acquisition systems from your computer. Programs are available that facilitate datalogger programming, communication management, and graphical display and analysis of data. For first-time users, starter software simplifies programming and data retrieval.

We have developed innovative measurement-and-control systems for a variety of applications, typically with our dataloggers at their core. These systems measure:

- Weather—general weather, air quality, ETo, fire weather, road weather (RWIS), lightning warning
- Micrometeorology—closed-path eddy covariance, open-path eddy covariance, CO_2/H_2O atmospheric profile, trace gas
- Water Resources —aquaculture, flood warning (ALERT), rural water (SCADA), turbidity, storm water (samplers)
- Energy—solar energy, solar resource assessment, concentrated solar power, solar-module performance, wind energy, small wind turbine performance, wind prospecting, general utility (SCADA)
- Soil—time domain reflectometry, soil water, roadbed water content

Our sales and technical support teams provide consistent and reliable support. These employees have degrees in scientific and engineering disciplines and in-depth knowledge of our products. Many of them also possess multilingual capabilities.

The research and development department designs products to meet our customers' measurement needs. Our production facility manufactures these products to ensure consistent, dependable performance.

The ET107 is an automated ETo station for commercial agriculture, irrigation scheduling, and meteorological applications

Applications

The open design of our dataloggers makes them useful in a large number of applications, including:

Weather

- *Agriculture and Plants*
- *Air Quality and Pollution*
- *Avalanche, Ski, Alpine, and Polar*
- *Evapotranspiration and Commercial Irrigation*
- *Fire Weather*
- *Greenhouses*
- *Lightning Warning and Electric Field*
- *Road Weather (RWIS)*
- *Weather and Climate*

Water

- *Aquaculture/Fisheries*
- *Coastal Monitoring*
- *Canal Control*
- *Dam Monitoring (Water Level)*
- *Flood Warning (ALERT)*
- *Oceanography*
- *Rural Water (SCADA)*
- *Stormwater*
- *Wastewater*
- *Water Level and Flow*
- *Water Quality*

Energy

- *Geothermal Energy*
- *Gas and Oil*
- *Hydropower*
- *Solar Energy*
- *Utilities*
- *Wind Energy*

Gas Flux and Turbulence

- *Open-Path Eddy Covariance*
- *Closed-Path Eddy Covariance*
- *Turbulance and Energy Flux*
- *Trace Gas*
- *Atmosphere Profile*

Infrastructure

- *Bridge Monitoring*
- *Building Structures*
- *Construction*
- *Dam Monitoring (Structural)*
- *Geotechnical*
- *Green Buildings and Green Roofs*
- *Historical Preservation*
- *HVAC*
- *Structural Health*
- *Vehicle Testing and Performance*

Soil

- *Compost*
- *Ecology*
- *Landfills*
- *Mining*
- *Pavement and Roads*
- *Permafrost*
- *Seismic*
- *Slope Stability*
- *Soil Science and Soil Moisture*

Case Studies

High Elevation Weather | *Andes Mountains, Peru*

To better understand the dynamics of retreating glaciers, CR1000-based monitoring stations were installed on Coropuna, the largest and highest volcano in Peru. Currently the station monitors air temperature, humidity, wind speed and direction, barometric pressure, net solar radiation, albedo, and snow height. This information will allow us to know the energy exchange between the atmosphere and the glacier.

www.campbellsci.com/peru-glacier2

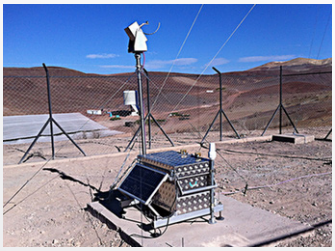
Water Quality of Coal-Mine Runoff | *New Zealand*

Campbell Scientific's CR850 dataloggers are at the core of measurement stations that monitor water quality in coal-mine runoff at the West Coast of New Zealand. Our equipment continuously measures turbidity, water temperature, pH, water level, general weather, and present weather. The stations transmit data to the base stations and automatically control lime dosing that raises the pH of the Mangatini stream to ecologically viable conditions.

www.campbellsci.com/new-zealand-mine

Solar Energy Assessment | *Chile*

Solar Millennium conducted a solar energy resource assessment in the Atacama Desert in Chile. The assessment used our CR1000 datalogger, LoggerNet software, and a variety of sensors. The Irridium satellite network retrieved the data. Campbell Scientific's CR1000 dataloggers were rugged enough to withstand the harsh, remote environment of the Atacama Desert and integrated seamlessly with the satellite solution.



www.campbellsci.com/chile-solar

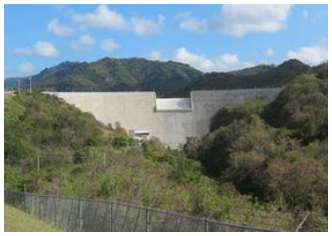
Forest Carbon Sequestration | *Canada*

Our CPEC200 Closed-Path Eddy Covariance System continuously monitors fluxes in a forest on Vancouver Island, British Columbia. The CPEC200 provides year-round measurements that allow scientists to understand how carbon sequestration and water usage varies with age and height of forest stands, as well as human-induced perturbations such as the application of fertilizer.

www.campbellsci.com/canada-cpec200

Dam Structure Monitoring | *Puerto Rico*

In Puerto Rico, two Campbell Scientific CR1000-based systems monitor the health of a new dam by measuring 152 geotechnical instruments. Approximately 325 calculations convert all raw measurements into engineering units. Additionally, there are around 12 interactive views of the dam, and charts that show readings for each instrument versus time (including pool evaluation), ambient and instrument temperature versus time, and system status.



www.campbellsci.com/puerto-rico-dam-monitoring

Freezing Roads | *South Korea*

Throughout South Korea, 45 sites were supplied with a field measurement system to test antifreezing layers on paved roads. Each test site included an antifreezing layer, a CR1000 datalogger, and several CS616 water-content reflectometers. The test site's dataloggers communicated with a central PC running our LoggerNet software. For three years, the Campbell monitoring system assessed the effectiveness of the antifreezing layers in preventing winter damage to South Korea's expressways.

www.campbellsci.com/korea-road

Lightning Warning System | *PGA Tour of America*

Schneider Electric purchased six portable CS110 electric-field meter systems from Campbell Scientific to provide hazardous weather forecasts for the Champions, Seniors, and Ladies Professional Golf Association (LPGA) golf tours, and for several other premiere golf events.

These electric-field meters help protect players and spectators by sensing the potential for lightning and providing warnings before lightning strikes.

www.campbellsci.com/pga-tour-lightning-warning

Measuring Fluxes in Forests | *Alaska*

In the Bonanza Creek Forest, our EC150 open-path CO_2/H_2O analyzer with CSAT3A sonic anemometer and CR3000 datalogger provide year-round eddy-covariance flux measurements. The EC150's low power consumption proved beneficial over the winter months when solar power was limited. Data collected from the Bonanza Creek sites will help improve models of present carbon fluxes and guide predictions of how these processes are changing as the regional and global climates shift.

www.campbellsci.com/ak-ec

Rural Irrigation | *Utah*

Horseshoe Irrigation, in central Utah, chose Campbell Scientific to monitor and manage their water resources. The Campbell networks use a LoggerNet Linux server to collect data and make it available for processing and display by ExacTraq, a web-based application. ExacTraq communicates with various SCADA and data collection systems, and then provides the real-time data online, and through voice or text messages.

www.campbellsci.com/utah-rural-irrigation

Bridge Expansion Monitoring | *Louisiana*

Campbell Scientific gear monitored bridge stresses while widening of the Huey P. Long Bridge in New Orleans, Louisiana. This bridge was instrumented with an array of 827 static and dynamic strain gages that measured axial and bending load effects on 433 truss members.

Our AVW206 Vibrating Wire Interface allowed the many vibrating wire sensors to be measured without losing data due to noise, and permitted an accelerated construction schedule.

www.campbellsci.com/louisiana-bridge

Wind Farm Monitoring | *Tehachapi California*

To meet new requirements, CalWind Resources installed a tower-based weather station and a power meter on its wind farm. The weather station includes our CR800 datalogger and sensors for measuring wind speed and direction at two heights, as well as temperature, relative humidity, and barometric pressure. The power meter monitors voltage, megawatts, and megaVARs. A CR1000 gathers the data from both the weather station and power meter.

www.campbellsci.com/california-wind-energy

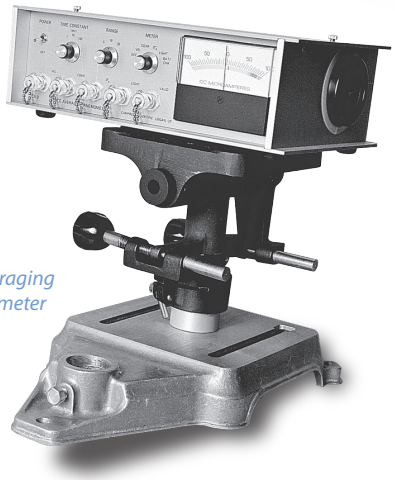
Lahar Observations | *New Zealand*

At Crater Lake on Mount Ruapehu, New Zealand, our digital camera connected to a CR1000 datalogger captured the dramatic collapse of the crater wall and the flood of lake waters through the opening. Sensors and dataloggers were positioned down the path of the lahar to collect data about its level and sediment content.

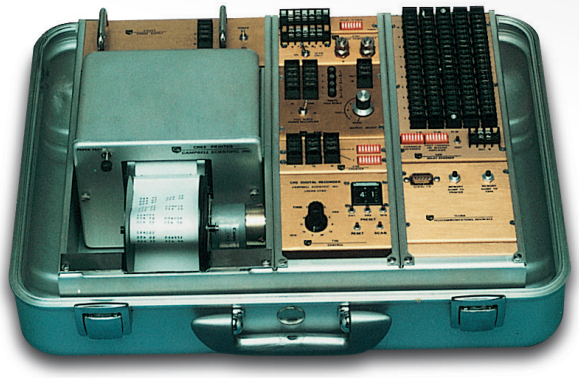
To survive the tremendous force of the lahar, the instruments were mounted on hardened towers or canyon walls.

www.campbellsci.com/new-zealand-lahar

Over 40 Years of Dataloggers



CA9 Path Averaging Laser Anemometer



CR5 Digital Recorder

Our History

Campbell Scientific was organized in 1974 by Eric and Evan Campbell with initial capital from themselves, six brothers, and their father.

Eric was introduced to making field measurements while working part time as a student at Utah State University. The research farm at the University provided an excellent environment for testing new ideas. Soon he had his own business, Logan Scientific Instruments, which produced soil psychrometers and the electronics to read them. He eventually sold his company, allowing him to finance his degree in physics with a minor in electrical engineering.

Evan became a strong asset during this time because of his interest and involvement in mechanical systems. He loved mechanical design and was pursuing a degree in manufacturing engineering.

The Campbell brothers combined their experience and education, focusing their efforts on establishing an emerging company, Campbell Scientific. Dr. Gaylon Campbell, the oldest brother and a professor at Washington State University, provided direction and help with new product ideas and conceptual development.

The first product marketed by Campbell Scientific (1974) was the Model CA9 Path Averaging Laser Anemometer, which was developed for the U.S. Army, White Sands Missile Range, New Mexico. The CA9 was also used to study wing-tip vortices. It confirmed that under common wind conditions these spiraling air shafts caused by aerodynamically clean, but heavy aircraft would sporadically relocate in the center of the runway.

The Model CR5 Digital Recorder was introduced in 1975. The CR5 was a portable, battery-powered datalogger of modular design using CMOS logic technology. It was the first battery-operated system that could make time-averaged measurements from thermocouples, solar radiation sensors, and wind sensors requiring vector averaging. The CR5 was well received by agricultural researchers interested in remote monitoring.

Since the introduction of the CR5, Campbell Scientific has developed increasingly powerful dataloggers as noted on the time line to the right. To date, over 300,000 dataloggers have been manufactured, and customers all over the world have come to depend on their reliability and accuracy.

Through quality products, excellent customer support, and innovative product development, we at Campbell Scientific endeavor to meet the instrumentation needs of our customers.

CAMPBELL SCIENTIFIC®
WHEN MEASUREMENTS MATTER

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