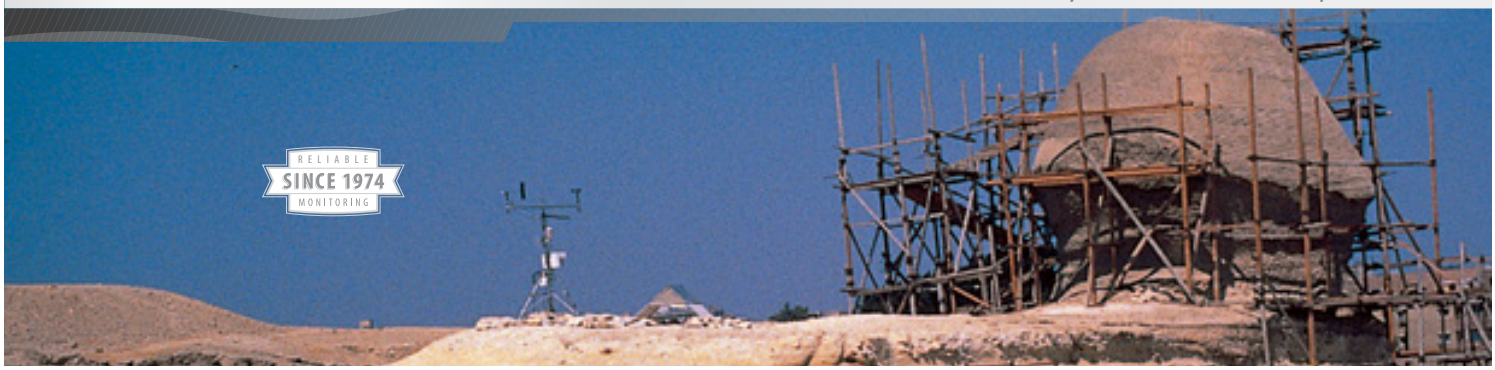
CAMPBELL SCIENTIFIC®
WHEN MEASUREMENTS MATTER

Historical Preservation

Reliable, stand-alone data acquisition for historical preservation



Campbell Scientific designs and builds measurement and control systems that can monitor both indoor and outdoor sites, even in harsh, remote conditions. Our robust, versatile systems aid in the preservation and management of historical sites and artifacts by monitoring and recording the parameters that affect deterioration. They are compatible with a broad spectrum of sensors and input types, and can control HVAC equipment, alarms, and most communication tools.

MAJOR SYSTEMS

		Measurements	*Datalogger*	*Power*	*Communications*
GRWS100 | General Research-Grade Weather Station Reliable Weather Monitoring		wind speed, wind direction, air temperature, precipitation, relative humidity, barometric pressure, solar radiation (sun-plus-sky radiation)	CR1000	PS150 12 Vdc Power Supply recharged with 10 W solar panel	cellular, DNP3, email, fiber optic, field display, FTP, Modbus, NTCIP, radio, satellite, serial, TCP/IP, Wi-Fi

Custom Systems

Most of the systems we sell are customized. Tell us what you need and we'll help you configure a system that meets your exact needs.

Dataloggers

Our systems are based around battery-powered, programmable dataloggers that measure the sensors, then process, store, and transmit the data. Each datalogger has multiple channel types, allowing nearly all sensor types to be measured by a single unit. For example, light, air temperature, and relative humidity sensors can all be measured simultaneously by the same datalogger. Using multiplexers, one datalogger can measure hundreds of sensors. Multiple dataloggers at a site can be networked and transmit data to a single central computer for display, analysis, or archive.

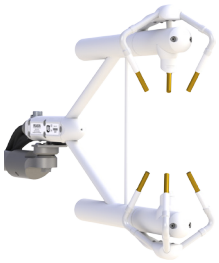
Statistical and mathematical functions are built into our dataloggers, allowing data reduction at the measurement site. For example, if temperature measurements are taken in 10 minute intervals, the datalogger can process the data and output hourly averages with maximum and minimum temperatures. Measurements can be recorded for historical analysis and displayed in real-time in the desired units of measure (e.g., °F, °C, °K).

Because our dataloggers are programmable, they are capable of performing responsive measurement and control sequences. Powerful on-board instruction sets allow unattended measurement and control decisions based on time or conditional events. This includes activating or shutting down equipment, sounding alarms, or calling out to phones. Our systems can even perform functions based on multiple conditions or events, such as deciding to increase or decrease air exchange based on time of day, outside temperature, and/or inside temperature.

The reliability of our control units ensures collection of time-stamped data, even under adverse circumstances. Because they have their own power supply (alkaline or rechargeable batteries), the dataloggers continue to measure and record existing conditions during power outages. Time-stamped data provides valuable information for identifying and verifying past events.

Sensors

We manufacture many sensors ourselves and offer a wide variety made by other manufacturers. Since our dataloggers are compatible with most available sensors, you have the flexibility to customize a monitoring system to your site.



Data Retrieval

We offer multiple communications options for data retrieval, which can be mixed within the same network. Telecommunications options include Wi-Fi, Ethernet, short-haul, telephone (land line, voice-synthesized, cellular), radio frequency, multidrop, and satellite. On-site options include storage module and laptop computer

Outdoor Historical Preservation Sites

At outdoor sites, weather stations provide valuable meteorological data on relative humidity, wind speed and direction, temperature, solar radiation, precipitation, and other weather conditions. Parameters influencing structural integrity such as crack size, tilt, vibration, and soil moisture can also be monitored. Indoor and outdoor systems at the same site can be networked.

Indoor Historical Preservation Sites

At indoor sites such as museums, our systems can monitor relative humidity, temperature, light, CO_2, particulate matter, and many other parameters. Data can be transmitted to a central computer for real-time display or archival and analysis. Automated control based on the measured parameters is also possible. For example, if temperature levels are outside a preset range, the system can activate or shut down HVAC equipment. Alarms can also be triggered or phone numbers dialed to alert key personnel. Our voice-synthesized phone modems can even call and verbally inform you if a problem is detected.

Historical Preservation Case Studies

Our systems have helped a variety of organizations reach their goals. The following are just a few of these systems:

Campbell Scientific gear monitors the Mogao Caves in China. These caves comprise a treasure-trove of Buddhist wall paintings and painted sculpture. Parameters measured include relative humidity, air temperature, surface temperature, carbon dioxide, indoor and outdoor particulates, and visitor count and duration.
www.campbellsci.com/mogao-grottoes-preservation

Our dataloggers measure environmental conditions that can affect the Mawson's Hut, which is a historic structure associated with the 1911-1914 Australian Antarctic Expedition. Located on Cape Denison, the site experiences extreme winds (maximum average of 44 mph) and temperatures (ranges from 0° to -20°C).
www.campbellsci.com/mawsons-hut

To monitor microclimate in the Tutankhamen tomb and at its site, sensors measure air temperature, relative humidity, and carbon dioxide, and count the number of visitors. A Campbell datalogger monitors the sensors and then transmits the data, via cell phone, to the project's headquarters at the Getty Center in California.
www.campbellsci.com/king-tut-tomb-monitoring

A preservation project at Castillo de San Marcos, St. Augustine, FL uses our equipment to monitor cracks in the fort's walls, tilt of the large segments between the major cracks, change of soil moisture within the bastion, and weather conditions. We provided the datalogger, multiplexers, weather stations, and soil moisture probes.
www.campbellsci.com/castillo-de-san-mar

Long-term monitoring at the Castillo de San Marcos is used to determine the cause of cracks in the walls of the 17th century fort.