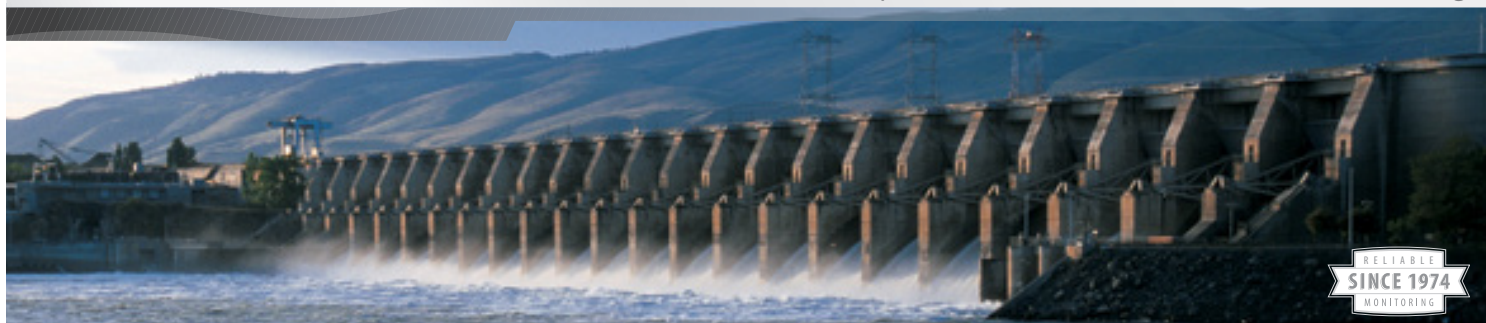




Dam Monitoring

Data Acquisition for Reliable, Stand-Alone Dam Monitoring



Campbell Scientific data-acquisition systems can accommodate any dam-monitoring project. Our systems can measure tilt, convergence, displacement, strain, load, vibration, overburden, water flow, and generated power, and any other phenomenon that can affect dam safety.

They are compatible with a wide variety of sensors and communication peripherals to fit your exact needs. The systems are rugged, have low-power consumption, and are adaptable to the harshest, most remote environments.

SYSTEMS

Structural Monitoring |

Dam and Foundation
Measures parameters that indicate structural integrity



Measurements	Typical Sensors	Datalogger	Communications Supported	Control
cracks and joint size, tilt, inclination, stress, strain, rock mass deformation, slope stability, erosion, seepage flow	vibrating-wire strain gages, vibrating strip sensors, foil strain gages, crack and joint sensors, inclinometers, tilt sensors, accelerometers	CR3000, CR1000X, CR800, CR850, CR9000X	cellular, DNP3, email, fiber optic, field display, FTP, Modbus, NTCIP, radio, satellite, serial, TCP/IP, Wi-Fi	Sounds alarms, actuates electrical devices, or shuts down equipment based on time or measured conditions
level, flow, temperature, turbidity, dissolved oxygen, pH	pressure transducers, thermistors, radar sensors, bubblers, shaft encoders, OBS turbidity sensors, ISFET or glass-bulb pH probes, dissolved oxygen probes	CR3000, CR1000X, CR800, CR850, CR300, CR310	cellular, DNP3, email, fiber optic, field display, FTP, Modbus, NTCIP, radio, satellite, serial, TCP/IP, Wi-Fi	Sounds alarms, actuates electrical devices, or shuts down equipment based on time or measured conditions

Water Monitoring

Measures reservoir levels, watershed inflow, thermal gradients, and water quality



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

We offer a range of dataloggers, from the most basic system with just a few channels to expandable systems that measure hundreds of channels. Scan rates can be programmed from a few hours to 100,000 times per second, depending on the datalogger model. Non-volatile data storage and a battery-backed clock ensure data capture and integrity.



The control functions of our dataloggers allow them to sound alarms and control devices based on time or measured conditions.

More info: 435.227.9120

campbellsci.com/dam-monitoring-structural



Vibrating Wire Interfaces

Campbell Scientific's AVW200-series interface modules and CDM-VW300-series Dynamic Vibrating Wire Analyzers allow the measurement of vibrating-wire strain gages, pressure transducers, piezometers, tiltmeters, crackmeters, and load cells. These sensors are often used for dam safety monitoring applications because of their stability, accuracy, and durability.

Both the AVW200-series and the CDM-VW300-series interfaces use a spectral-interpolation approach that provides superior noise immunity and measurement resolution compared to the time-domain period averaging approach. The AVW200-series

devices are optimal for systems that exclusively require measurement rates slower than 1 Hz. The CDM-VW300-series devices, are appropriate when measuring sensors at rates from 1 to 333.3 Hz.



Sensors

The versatility of our systems begins with sensor compatibility—they can measure virtually every commercially available sensor—allowing them to be used in a variety of ways for a variety of measurements. Our dataloggers have many channel types and

programmable inputs including analog (single-ended and differential), pulse counters, switched excitation, continuous analog output, digital I/O, and anti-aliasing filter.

Communications

The availability of multiple communications options for retrieving, storing, and displaying data also allows systems to be customized to meet exact needs. Onsite communication options include direct connection to a laptop, CompactFlash cards, Wi-Fi, and field

displays. Telecommunication options include short-haul, telephone (land-line, voice-synthesized, and cellular), radio frequency, multidrop, and satellite.

Dam Monitoring Case Studies

Campbell Scientific systems have helped a variety of organizations reach their goals. The following are some dam monitoring, structural monitoring, and water level case studies:



Campbell Scientific equipment monitors seepage at the Wolf Creek Dam. The dam consists of a concrete hydroelectric dam and an earth-filled embankment structure.

A Campbell Scientific automated data-acquisition system (ADAS) is monitoring reservoir seepage while the Wolf Creek Dam near Jamestown, Kentucky is being repaired. The ADAS consists of 81 vibrating-wire pressure transducers being read by Campbell Scientific CR1000 dataloggers and 25 AVW206 wireless vibrating-wire interfaces.

www.campbellsci.com/wolf-creek

In New Zealand, Campbell Scientific equipment monitored lahar mud flow from a volcanic crater lake after tephra dam breaks. 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 CR1000 and CR800 dataloggers were positioned down the path of the lahar to collect data about its level and sediment content.

www.campbellsci.com/new-zealand-lahar

Campbell Scientific gear provides water-level measurement and flood-gate control for the Melbourne-Tillman Water Control District (MTWCD) in Florida. Six new gates were recently added. They are fully automated, and controlled by a bank of four Campbell Scientific CR1000 dataloggers.

www.campbellsci.com/water-diversion



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