



## Dam Monitoring — Structural

Data Acquisition for Reliable, Stand-Alone Dam Monitoring

### Data Acquisition Systems for Dams

#### Dataloggers

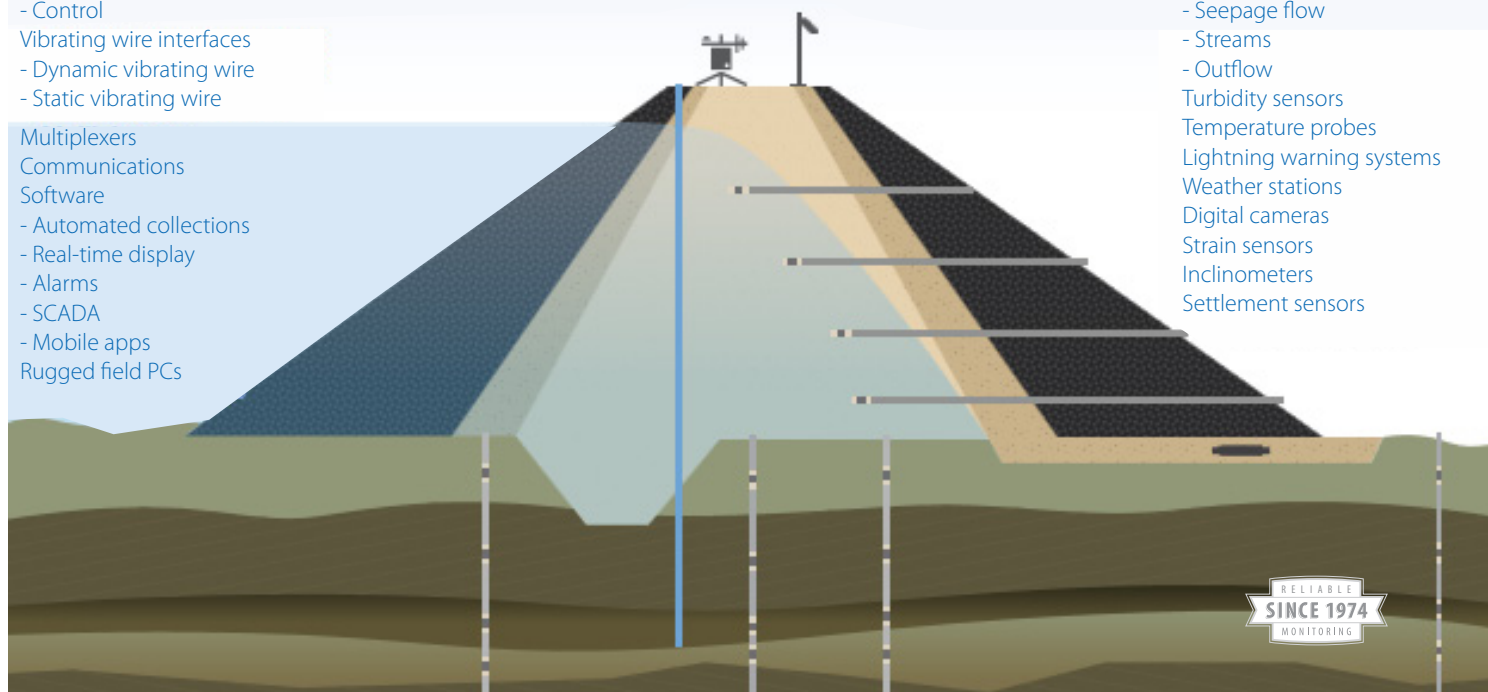
- Monitor
- Control
- Vibrating wire interfaces
  - Dynamic vibrating wire
  - Static vibrating wire

#### Multiplexers

- Communications
- Software
  - Automated collections
  - Real-time display
  - Alarms
  - SCADA
  - Mobile apps
- Rugged field PCs

#### Pressure Transducers

- Reservoir level
- Seepage flow
- Streams
- Outflow
- Turbidity sensors
- Temperature probes
- Lightning warning systems
- Weather stations
- Digital cameras
- Strain sensors
- Inclinometers
- Settlement sensors



Campbell Scientific data-acquisition systems can accommodate any structural dam-monitoring project. Our systems can measure tilt, convergence, displacement, strain, load, vibration, and overburden, as well as any other phenomenon that can affect dam structural in-

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

## Custom Systems

We offer a variety of products that can be used to create custom Dam Monitoring—Structural systems. Please don't hesitate to let us help you configure a full 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. Measurement types, processing algorithms, and recording intervals are also programmable. On-board processing instruction sets allow data reduction in the field.

The control functions of our dataloggers combined with their programmability allow them to sound alarms, actuate electrical devices, or shut down equipment based on time or measured conditions.



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

More info: 435.227.9120

[campbellsci.com/dam-monitoring-structural](http://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.



AVW211



CDM-VW305

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, radio frequency, multidrop, and satellite. Voice-synthesized modems are available, so the system can actually call and tell you what is happening.

