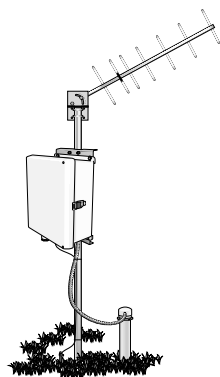


Water Level & Flow

Benefits of Our Systems

1. Systems are customized by choosing number of channels, sensors, and communications method.
2. Multiple channel types accurately measure nearly every available sensor, including SDI-12.
3. Communications options include: phone, cellphone, radio, and satellite (DCP).
4. Onboard mathematical capabilities provide on-site data processing.
5. Time-stamped data is recorded over time in programmable intervals.
6. Systems are expandable: add sensors to sites and sites to networks.
7. Systems are optimized for long-term operation on batteries, even in harsh environments.



Contact your site(s) via satellite, radio, telephone, cellular phone, or other telecommunications options.



CR510

www.campbellsci.com/water-level-flow



The CR10X Measurement and Control System is used extensively for monitoring water level and flow.

Campbell Scientific's systems for unattended, long-term monitoring of flow and level provide unmatched versatility and reliability. Our systems measure flow and level in many environments including wells, dams, streams, weirs, stormwater systems, and water/wastewater treatment plants. Reliability is not compromised by salinity level, pollution levels, or other harsh environments. Key components of our systems are dataloggers, sensors, and communications devices, which can be customized for each site.

Dataloggers

The versatility of our dataloggers allows systems to be customized for each application. A range of dataloggers with increasing capabilities is available. All our dataloggers feature wide operating temperature ranges, low power consumption, and the ability to directly interface with a large variety of sensors. Because our dataloggers operate on batteries (with or without solar panels), they are ideal for long-term, stand-alone operation, such as at remote stilling wells. If additional channels are needed, most of our dataloggers are expandable using multiplexers and other peripherals.

Powerful on-board instruction sets allow unattended control decisions based on time or conditional events. For example, if measured levels are outside a predetermined range, the datalogger can sound alarms, open valves or gates, or call out to a phone to report conditions. Data are typically displayed and stored in the desired units of measure (e.g., cfs, psi, feet, inches, meters, centimeters).

Sensors

Thanks to their multiple channel types, our dataloggers can read nearly every commercially available sensor, allowing systems to be customized for each installation. We offer a variety of water level and flow sensors that feature low drift and high reliability. In addition, nearly all available water quality and meteorological sensors can be measured, generally without external signal conditioning. We helped create the original SDI-12 standard, so you can be sure our systems are SDI-12 compatible.

Measuring Level

Our systems use 6-wire resistive gages or vibrating wire pressure transducers for measuring groundwater level. In deep observation wells, these pressure transducers provide accurate water level measurement. In shallow water applications, we use piezometers, bubblers, or float and pulley systems to measure water level. On the high end of groundwater level measurements, our portable pump and slug test systems can simultaneously measure water level in up to 8 wells, yet are easy to setup and customize from site to site.

For surface water level, measurements are often made in a vertical stand-pipe (stilling well) installed adjacent to a lake, river, or stream. The stream level (stage) is the same as the water elevation in the stilling well. A float and pulley is often used, but pressure transducers, ultrasonic, and resistive tape sensors work well also. Self-calibrating double bubblers are accurate sensors for measuring level, and have the added benefit of keeping the sensor out of the measured liquid—critical in corrosive environments.

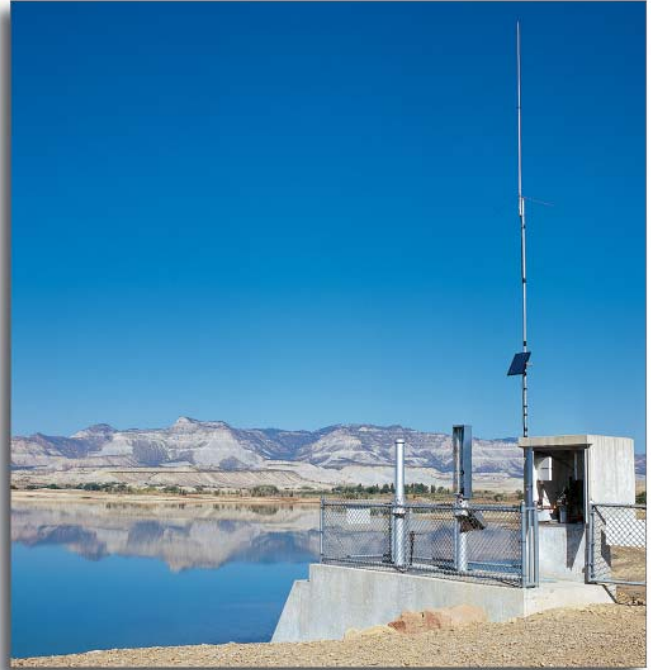
Measuring Flow

Flow is usually calculated using a structure built across an open channel, such as a weir or flume. Water level is measured as it flows through the structure. Discharge rates are determined by using a site-unique rating curve and the water level. A float and pulley system, strain gage pressure transducer, or ultrasonic sensor may be used in stilling wells to measure water level fluctuations, then calculate flow.

New sensors that use ultrasonic and doppler technologies to measure water velocities in two or three dimensions are also available. Velocity is measured directly; additional calculations are not required.

Communications

The availability of multiple communications options for transmitting data also allows systems to be customized to meet exact needs. Off-the-shelf telecommunications options include satellite (DCP), radio, telephone, cellphone, and voice-synthesized phone. Systems can be programmed to send alarms or report site conditions by calling out to computers, phones, radios, or pagers. Real-time or historical data can be displayed or processed with Campbell Scientific software. Data can also be exported as ASCII files for further processing by spreadsheets, databases, or analysis programs.



This station at a reservoir monitors water level and provides remote control of a headgate via radio telemetry.