CAMPBELL SCIENTIFIC®
WHEN MEASUREMENTS MATTER

Water Level and Flow

Instruments for Stand-Alone Monitoring and Control

Campbell Scientific builds systems for unattended, long-term monitoring of water level and flow. They are used in many environments, including wells, dams, streams, weirs, storm-water systems, and water or wastewater treatment plants. They are reliable regardless of salinity level, pollution level, or other harsh environmental conditions. Campbell systems can communicate via GOES satellite, licensed-frequency radio, IP cell modems, spread-spectrum radio, and other methods.

MAJOR SYSTEMS

		Measurements	*Datalogger*	*Power*	*Communications*	*Description*
CanalMaster120/ CanalMaster185 Canal Monitoring Systems		Water Level, Flow, Temperature, Pressure	CR200X	12 Vdc rechargeable battery and solar panel	CanalMaster120 typically PC CanalMaster185 cellular	These low-cost water-level gaging stations allow the user to ac-curately monitor canals. They can be used in remote locations with no access to ac power.
ALERT200 ALERT Flood Warning System		Pulse Count, SDI-12, 0 to 5 V, 4 to 20 mA	none	12 or 24 Ah rechargeable battery	ALERT2 via licensed frequency radio	Rugged, low cost, turnkey system for basic ALERT-style standpipe installation. This system is field configurable.
ALERT210 ALERT Flood Warning System		Pulse Count, SDI-12, 0 to 5 V, 4 to 20 mA, Digital I/O, Low Level AC, Bridge	CR800	12 or 24 Ah rechargeable battery	Typically uses licensed radio with ALERT2	Rugged, turn-key system is designed for ALERT-style standpipe installations. This system is field configurable and fully programmable.

Custom Systems

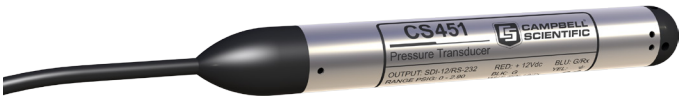
Most of the systems we sell are customized. Tell us what you need and we'll help you configure a system that meets your exact needs.

Dataloggers for Water Level and Flow Measurements

We offer a range of dataloggers, with increasing capabilities. Their versatility allows systems to be customized for each application. Our dataloggers feature wide operating temperature ranges, low power consumption, and the ability to directly interface with a 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 for Water Level and Flow Measurements

Thanks to their ability to measure 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.



Communications

The availability of multiple telecommunications and on-site options for retrieving 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.

Measuring Water 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. We use piezometers, bubblers, or float and pulley systems to measure water level in shallow water applications.

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 water level, and have the added benefit of keeping the sensor out of the measured liquid—critical in corrosive environments.

Measuring Water Flow

Water flow is usually calculated using a structure built across an open channel, such as a weir or flume. The 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.

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.

Water Level and Flow Case Studies

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

Campbell dataloggers regulate water levels in canal system in Florida. The dataloggers measure twin water-level sensors upstream and a single sensor downstream of the gates.
www.campbellsci.com/florida-flood-control

Nearly 60 monitoring stations use Campbell equipment to record water level and quality parameters at reservoirs, canals, pipelines, and springs in Emery County, Utah.
www.campbellsci.com/emery-county-utah

Campbell system monitors and controls water flow to the Pequest Trout Hatchery in New Jersey.
www.campbellsci.com/new-jersey-hatchery

For the Florida canal system, our equipment runs in automatic mode for most situations, with minimal need for staff intervention.

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