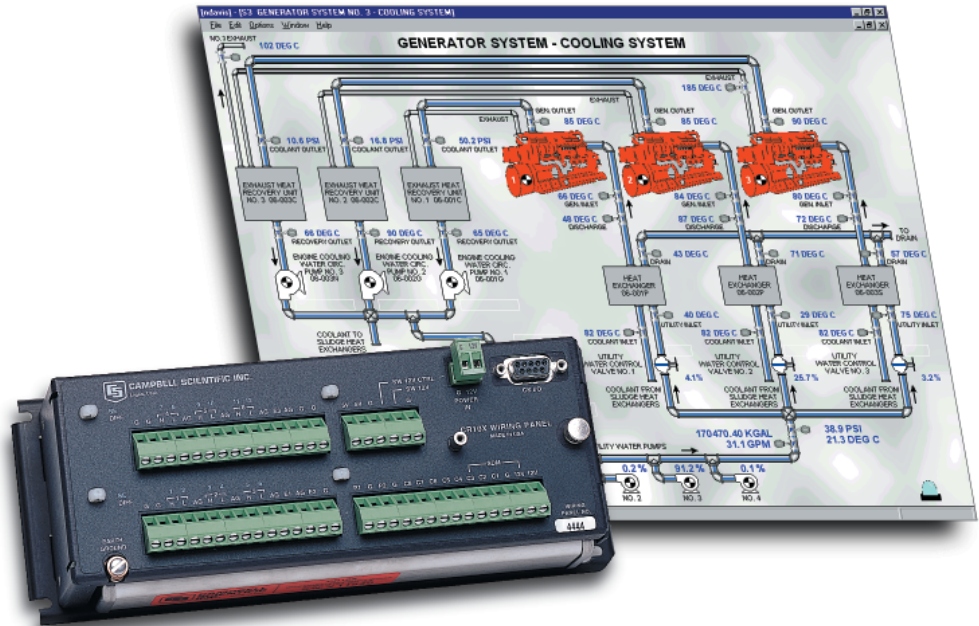


# SCADA

[www.campbellsci.com/scada](http://www.campbellsci.com/scada)

## Benefits of Our Systems

1. Control units function as PLCs, RTUs, or DCUs.
2. Control units perform advanced measurement and control—independent of the central computer.
3. PID control continues, even if communications to the main computer are lost.
4. Control units have their own UPS. During AC power loss they continue to measure and store time-stamped data.
5. Control units have many channel types to measure most commercially available sensors.
6. Control units provide onboard statistical and mathematical capabilities.
7. Systems are easily expandable—add new sites or add sensors to existing sites.
8. Systems are compatible with our own or other vendors' HMI software packages.
9. Control units have wide operating temperature ranges and operate in rugged environments.



*The CR10X control unit performs advanced measurement and control functions either interactively with, or independently of, HMI software.*

Campbell Scientific SCADA systems consist of a supervisory computer running HMI (Human-Machine Interface) software and control units performing data acquisition and control functions. The control units make measurements as well as report back to and execute commands from the supervisory computer. The feature that sets our systems apart from others is the versatility and reliability of our control units. These units provide many benefits that PLCs do not.

## Control Units

Our control units, the CR510, CR10X, CR23X, or CR5000 function as PLCs (Programmable Logic Controllers), RTUs (Remote Terminal Units), or DCUs (Distributed Control Units). These control units can be linked using ethernet (10 or 100 MB Tlink) or other communications options. Because they have their own operating systems, they can be programmed, without ladder logic, to perform advanced measurement and control functions. This eliminates the need for the supervisory computer to do the minute-by-minute control and data acquisition and means that PID control continues, even if communications to the supervisory computer are lost. The control units also provide onboard statistical and mathematical capabilities for data reduction at the remote site and can store up to 2 million time-stamped data points, depending on the model used.

## Power Supply

Another major advantage of our systems is that they are easily equipped with an Uninterruptible Power Source (UPS)—typically rechargeable batteries and/or solar panels. During power loss, they continue to measure and store time-stamped data which can be later transmitted to the supervisory computer.



CR510

## Measurement Capabilities

Each of our control units features a variety of channel types for flexibility in measuring many different types of sensors. For example, magnetic flowmeters can be measured using pulse counting channels instead of being measured as 4-20 mA. Likewise, ultrasonic level transmitters can be measured using SDI-12 protocol on digital ports instead of as 4-20 mA. Our control units also provide extensive signal conditioning and are easily expandable.

Measurement Capabilities by Model	CR510	CR10X <sup>1</sup>	CR23X <sup>1</sup>	CR5000 <sup>1</sup>
Input channels <sup>2</sup> for 4-20 mA, differential and single-ended voltage, and vibrating wire sensors	4	12	24	40
Pulse counters for magnetic flowmeters	2	2	4	2
Switched excitation channels for load cells and valve position potentiometers <sup>3</sup>	2	3	4	4
Digital ports for input status, control output, SDM BUS peripherals, and SDI-12 instruments <sup>4</sup> , such as ultrasonic level transmitters.	2	8	8	8
1-The number of channels on these units is expandable. 2-Halve the numbers shown for differential channels. 3-Some resistive devices can be excited in parallel. 4-Each digital port supports up to 10 SDI-12 devices.				

## Communications

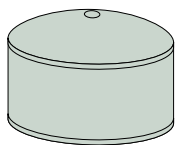
Our control units support multiple communications options, including: ethernet, radio, telephone, cellphone, voice synthesized phone, and satellite. They also feature peer-to-peer event and polled communication, and can call out to a computer, telephone numbers and/or pagers. Remote lift stations, reservoirs, and pumping stations transmit data via dial up leased phone lines, cell phone, radio, or wide area network T1 links.

## HMI Software

The supervisory computer consists of a PC running either Campbell Scientific's HMI software or another vendor's software. InTouch, Intellution, Lookout, and other software packages can be used in conjunction with our OPC client/server software application. Like other HMI software packages, our software provides a graphical interface that the operator uses to view the status of remote sites, acknowledge alarms, and control the units.

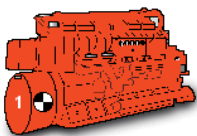
## Example SCADA Application: Wastewater Facility

Because of their versatility, Campbell Scientific systems are used in a variety of SCADA applications. Listed below are just a few of the possibilities within a wastewater plant.



Digester

- Monitor and control temperature



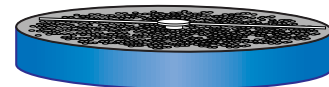
Generator

- Monitor and control temperatures and flow rates within exhaust heat recovery unit and heat exchanger



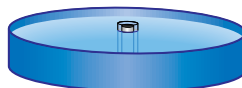
Sedimentation Tank

- Monitor on/off status of pumps
- Control coliform, TSS, and on/off status of pumps



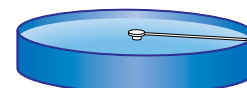
Trickling Filter

- Monitor on/off status of pumps and blowers, dissolved oxygen, flow rate, and wetwell level
- Control on/off status of pumps and blowers



Chlorine Contact Tank

- Monitor ORP
- Control Cl<sub>2</sub> and SO<sub>2</sub> injection



Clarifier

- Monitor torque
- Control on/off status and torque alarms