



# Flood Warning

[www.campbellsci.ca](http://www.campbellsci.ca)

## Benefits of Our Systems

1. Choose from standard ALERT, hybrid ALERT, or a customized flood warning system.
2. Supports both the standard ALERT 300 baud rate and a new 3000 baud rate which improves bandwidth use during storms.
3. Smart, remotely-configurable, ALERT repeaters provide an adaptable network for stations in the same general area.
4. Upgrade existing ALERT stations with additional sensors or an updated datalogger or transmitter.
5. Open design allows a high level of station customization.
6. LoggerNet management software simplifies operation and data retrieval across our customized flood warning networks.
7. Batteries/solar panels support long-term operation.
8. Systems operate reliably in harsh environments.



*Our low-cost datalogger, the CR800, is ideal for standard flood warning stations.*



*The CR1000 provides adequate inputs for most hybrid flood monitoring stations.*



Campbell Scientific manufactures a range of versatile and reliable flood warning stations and systems. We offer standard ALERT systems for monitoring and transmitting precipitation and/or water level, as well as hybrid stations that can monitor many other parameters, such as wind speed and direction, relative humidity, temperature, soil moisture, solar radiation, or water quality. We also manufacture customizable, high-speed, networked systems that take advantage of the latest communications technologies to provide advanced solutions for flood warning. All of these systems benefit from the experience we've gained over the last 30 years in designing and supporting a wide variety of reliable, stand-alone monitoring systems.

## ALERT Stations

Our ALERT stations match all standard ALERT protocols. Our dataloggers, proven in thousands of applications world-wide, provide multiple types of inputs (pulse, analog, SDI-12, and others) which allows use of almost any type of water level sensor including pressure transducers, shaft encoders, ultrasonic distance sensors, and bubblers. Onboard algorithms can calculate hourly and daily minimums, maximums, averages, totals, flow, or any other statistical value. These values can be stored onboard the station, providing a backup of data. A solar panel can continuously charge the battery for extended unattended monitoring.

Additional sensors, such as soil moisture, water quality, or meteorological sensors, can easily be integrated. We can upgrade older stations, even those from other manufacturers, with the latest datalogger and transmitter, often allowing you to use the same sensors and standpipe or enclosure.

### Hybrid ALERT Stations

Our hybrid stations consist of an ALERT station integrated with additional sensors and communications peripherals. One or two radio frequencies can be used, as needed. With a single frequency, two-way communications would be avoided during storm events to allow more bandwidth for one-way ALERT communications. However, some customers choose to use two frequencies—one for ALERT and the other for a fully-functional, two-way communications network. This provides the following inherent advantages:

- Retries of missed packets
- Diagnostics
- Clock syncing
- Re-programming from the base station
- Historical data collection (no holes in the data)
- Interactive control capability
- Voice modem call-out of alarms

The ability to measure additional parameters at an ALERT site, or integrate ALERT capabilities with another type of measurement site can lead to collaboration between organizations that can help keep costs down.

### Customized Flood Warning Network with LoggerNet Software

A flood warning network that uses LoggerNet software takes advantage of two-way RF communications and the latest in network management software. LoggerNet is a client/server software program used for managing large networks of monitoring stations. A LoggerNet-based system is a viable solution to flood warning applications because of the speed with which LoggerNet can poll multiple RF stations and the speed and versatility with which LoggerNet can make the data available to multiple interested parties. For example, DIAD has a client that links DIADvisor to the LoggerNet server.

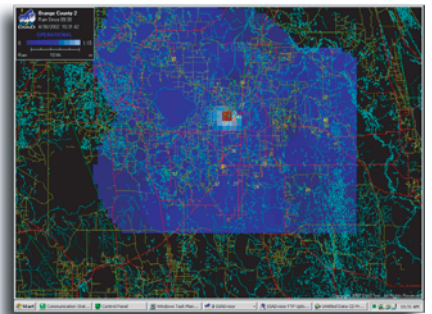
When a “send data” command is broadcast to a group of remote stations, the stations transmit predefined data to the LoggerNet server in their own time window. Transmission windows can be as short as 100 ms, allowing multiple sites to be polled per second. As the data is collected, LoggerNet clients can access it from LANs or via the Internet, making data available to multiple users/agencies in near real time.

### Other Resources and Options

To meet customer needs, other resources and communications options can be combined with flood warning systems. Commonly, local governments will combine resources to obtain the best possible system. In other situations, federal agencies can be involved to increase system coverage and robustness, and even help with the budget. For example, GOES satellite transmitters can be added to stations to provide automated data archival through the National Weather Service (NOAA/NESDIS) and the US Geological Survey. Multiple purpose data collection systems bring to bear the resources and expertise of environmental data experts.



*ALERT stations, hybrid ALERT stations, customized water quality/stage stations, and weather stations can all supply data to a LoggerNet-based system.*



*DIADvisor and LoggerNet software display data from a monitoring network in Orange County, FL.*

