ITRC

IRRIGATION TRAINING AND RESEARCH CENTER
California Polytechnic State University
San Luis Obispo, California 93407
www.itrc.org

Telog PR-31 Water Level Tracker

Irrigation districts, farmers, and other agricultural and environmental water users need reliable and low-cost water level sensors with integrated data-collectors to measure water depth with a high level of precision. The scientific management of California's water and energy resources requires that the volume of irrigation water that is delivered, spilled, reused, etc. throughout the state is measured accurately.

The Irrigation Training and Research Center, working under a technical services agreement with the United States Bureau of Reclamation (USBR) Mid-Pacific Region, has undertaken a performance review of advanced electronic water level measurement technologies in irrigation applications. An example is the Telog PR-31 Level Tracker.

Figure 1. Installing a Telog PR-31 data collector at a spill site.

Figure 2. Telog PR-31 data collector.

Principals of Operation
Telog's PR-31 Level Tracker is a simple, compact, and robust system designed to measure water level using a data collector and pressure sensor. The data recorder for this system is the PR-31. Using twelve bits of resolution, the Telog unit can give you 4096 counts in the range of the sensor instead of only 256 counts with an eight-bit logger. This makes the Telog unit accurate to .0028 ft., or about 1/32 in. with a five-psi sensor if the sensor is 100% accurate. This makes it very useful in measuring canal and reservoir water levels. Twelve-bit resolution allows a five-psi sensor to be used and provides better precision that an eight-bit data collector using a one-psi sensor.

The PR-31 data recorder is intended for operation above the bed of a channel. Encased in a stainless steel housing, the PR-31 is waterproof and rated at NEMA 6. (See Figure 1). The battery is housed internally within the data collector. Battery life expectancy is seven years.

All data collected by the sensor is stored in the data collector. The PR-31 data collector can be purchased with the Telog sensor as the WLS-31 Water Level System or alone to accommodate the Druck sensor. The Druck sensor is available in 2.5, 5, 10, 15, 20, 30, 50, and 100-psi pressure ranges. Other ranges are available on a special order basis. The Telog PT-10B sensor is available in 5, 10, and 15-psi ranges. Other ranges are available upon special order. Either sensor is connected to the data collector by a waterproof polyurethane cable. This cable comes in a standard eight-meter length, with custom lengths available.

Figure 3. 5 psi Druck pressure sensor.

Since the data collector is housed in a waterproof stainless steel case, it can be placed nearly anywhere. A stainless steel wire loop is provided, which allows the unit to be locked to a secure structure.

One of the key elements of any data collection system is the ease of programming the unit and the ease of retrieving the data. Telog uses the Telogers software for both of these tasks. Telogers allows parameters such as data collection, logging interval, and units to be changed easily.

For example, the unit can be set to take a depth reading every thirty seconds and record the average, highest, or lowest depth reading over a fifteen-minute interval.

Figure 4. Palm Pilot connected to a laptop computer

Obviously, the shorter the interval is set, the faster the memory will fill, and the shorter the sampling rate is set, the faster the battery will drain. When setting the recording interval, one should check the estimated time to fill the memory in the software. The recorder can also be set to record depths in inches, feet, or psi. The biggest advantage of the Telogers software may be the use of a database for data storage. This allows continuous trending and easy data management.

The software and data collector also allows the use of a palm pilot for data collection. The palm pilot has a conduit to the Telog database on the host computer. However, the palm pilot can only be used to retrieve data from the data collector. The data collector can only be programmed when connected directly to a desktop or laptop computer. Every time the recorder is reprogrammed the memory in the logger is erased.

Figure 5. Telog PR-31 connected to the M125 Palm Pilot.
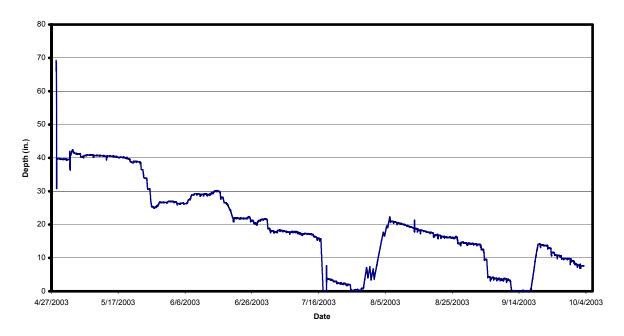
WDF Reservoir Water Level
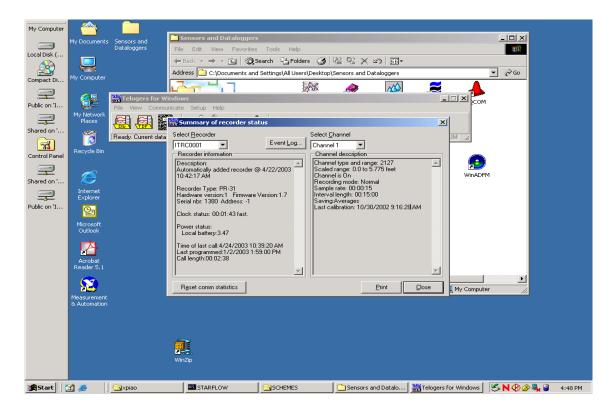
Figure 6. WDF Reservoir Water Level Graph.

Figure 7. Teloger for Windows "Telogers" software.

Field Installation

It is important that the following operational guidelines and site considerations are observed:

- The sensor is placed in the water not the data logger.
- Ensure that the sensor has the appropriate range for the depth of water being measured.
- Place the rubber boot securely over the interface connector when the connector is not in use.
- Ensure that the depth sensor is not covered with mud or silt.

Summary

Researchers and irrigation districts have used the Telog PR-31 in a variety of applications. The Telog provides:

- ✓ 12 bit resolution
- ✓ Programmable data collection and logging rates
- ✓ Long battery life
- ✓ Easy to use software with a built in database
- ✓ Low cost
- ✓ 80,000 data point storage

Cost

$1,200 for the complete system with Druck sensor and fifty feet of cable
$450 for M125 PDA

Sponsored By

United States Bureau of Reclamation
Mid-Pacific Region

Sacramento, California

Use

Projects where the Telog PR-31 has been utilized:

- ✓ Patterson Irrigation District
- ✓ Placer County Water Agency
- ✓ Truckee Carson Irrigation District

For Further Information

Dr. Stuart Styles, P.E.
Director
Irrigation Training and Research Center
California Polytechnic State University
San Luis Obispo, California 93407
(805) 756-2429
sstyles@calpoly.edu
www.itrc.org