MONITORING A DAM UNDER CONSTRUCTION

Intelligent Geo Data Logger Reads Vibrating Wire Sensors

A hydroelectric dam under construction in Serbia required monitoring of several environmental and structural properties to ensure its long-term strength and stability. Therefore the dam's construction engineers put forth a proposal for a large number of geotechnical sensors to be installed and used during construction. These sensors included vibrating wire piezometers, joint meters, fill extensometers, and strain gauges.

Each sensor needed to interface with a universal data logger as part of a long-term logging solution. Additionally, the engineers specified that their desired monitoring solution needed to have a large number of vibrating wire sensor inputs, compatibility with a SCADA system, and potential for expansion.

dataTaker DT85G Intelligent Data Logger

- A cost-effective data logger expandable to 320 channels, 640 differential or 960 single-ended inputs
- Supports Vibrating Wire and other Geotechnical sensors
- Compatible with all major sensor brands –Slope indicator, RST Instruments, Geokon, Soil Instruments, Roctest, AGI, etc.
- Built-in web and FTP server gives users remote access to logged data, configuration and diagnostics
- Rugged design and construction provides reliable operation in the environmental extremes of geotechnical applications
- Modbus RTU via RS-485 or TCP/IP

Monitoring Equipment

dataTaker DT85G Geo Logger x2

dataTaker Channel Expansion Module (CEM20) x6

Sensors

Vibrating Wire

- Piezometers
- Jointmeters
- Fill extensometers
- Strain gauges

Flow meters

High-Channel Capability

Technicians chose the dataTaker DT85G because of its compatibility with vibrating wire sensors, its large number of inputs, and its versatile communications capabilities. The dataTaker can monitor a wide variety of geotechnical data logging applications including slope stability, subsidence, dam wall monitoring, tunnel and mining excavation, ground water, tunnel wall monitoring and site assessment.

Ideal for all geotechnical data logging applications, the DT85G model has 16 analog channels capable of measuring up to 16 vibrating wire strain gauges with thermistors or 48 vibrating wire strain gauges without thermistors. Channel count can be expanded simply by connecting dataTaker Channel Expansion Modules (CEM20s). In this example, two DT85G data loggers are each paired with three CEM20 channel expansion modules allowing for a total of 146 vibrating wire sensors to be intelligently distributed throughout the dam structure. The dataTaker system can be further expanded to connect up to 640 vibrating wire sensors.

Vibrating wire sensors were chosen due to their ability to provide highly accurate measurements that are not affected by the electrical resistance of long lengths of cable. Connected to the dataTakers, these sensors now provide information about the dam's stress, fissuring, foundation deformation, uplift, displacement, and seepage flow.

Data Collection

Data storage and retrieval can be achieved via USB memory stick, FTP, cell phone, Modbus for SCADA, Ethernet or Web. Here a SCADA system is used to query the sensor data from the

loggers. There are two methods by which this can be done: either Modbus RTU via RS-485 or Modbus TCP/IP via Ethernet, the latter being the protocol behind the internet, which potentially allows for monitoring worldwide.

Benefits

The hydroelectric dam now uses the pair of dataTaker data loggers as a key part of this advanced sensor instrumentation to continually monitor its structural stability. The low-cost, low-power dataTaker DT85G is extremely versatile and easy to configure for communications, data capture and data analysis.
The dataTaker's high channel count and built-in support for major vibrating wire sensors provides the ideal data acquisition and monitoring solution for engineers working in the geotechnical environment.

For more information on the dataTaker DT85G Geo Data Logger, or to find the ideal solution for your application-specific needs, contact a CAS Data Logger Applications Specialist at (800) 956-4437 or visit our website at www.DataLoggerInc.com.