INTRODUCTION

Managing and monitoring flows of water (as well as other types of fluids) is at the core of geosciences across a range of applications, from Mining to Hydro Power and Dam Safety to Infrastructure. Flow monitoring is crucial, for example, in leach pad solution management, tailings dam water management, dewatering and processing applications, as well as for monitoring dam seepage or toe drain flows.

An effective flow monitoring program requires constant and consistent data acquisition to allow for meaningful correlation of trends and data with real-world events.

SOLUTIONS

Canary Systems has developed a robust automated flow monitoring platform consisting of sensors and adapters, dataloggers, telemetry and software, suitable for the entire range of flow monitoring applications. Using an off-the-shelf MCLOG ADAS (Automated Data Acquisition) system with step-up (12-24 V) converter, or an advanced MLDAQ with HART converter, the system can connect to any flow meter that outputs Vibrating Wire, HART or 4-20mA signals.

Weir and Flume monitoring stations are easily expandable for water quality measurements such as turbidity, temperature, pH, conductivity and dissolved oxygen.
FLOW MONITORING

The integrated data acquisition and visualization software MLSuite® allows for programming and ongoing maintenance of the data collection, as well as display of data, reports, alarming and analysis, including the correlation with any other data sources imported into the project database.

Gold Mine in Nevada

- Monitoring pumping rates from tailings storage facility seepage collection ponds
- Using totalization data acquired by HART (Highway Addressable Remote Transducer Protocol) interface
- Data used in monitoring pump usage and seepage rates
- Piezometers are wired to the same MLDAQ stations that gather the seepage pond flows so that engineers can also analyze pressure data from within the impoundment

Copper Mine in Arizona

- Monitoring dewatering wells in large open pits
- Using 4-20mA flow rate output from flow meters to provide totalized values
- Data used in dewatering analysis
- Powering flow meters using a 12-24V step-up converter
- Flow meters and piezometers are connected to the same MCLOG stations for engineers to make dewatering program decisions

Concrete Dam in Massachusetts

- Monitoring for toe drain flow
- Pressure transducer / Geokon Weir Monitor installed in the central weir basin including transient suppressor enclosure
- Data collection programmed via MultiLogger, importing directly into MLSuite software platform

Technical Specifications

- **MCLOG-VW-24S with Step-Up Converter**
  - Datalogger CR300
  - VW Comm Vibrating Wire Module
  - Canary Systems MicroMux or MiniMux
  - B+B Smartworx AirborneM2M wireless interface
  - Operating Temperature: -40 to +70°C (-40 to +160°F)
  - System Power: 12V 24Ah sealed lead-acid battery
  - NEMA 4/12 rated painted steel enclosure

- **MLDAQ-W-50 with HART Converter**
  - Datalogger CR6
  - AC or Solar Panel
  - Optional Canary Systems MiniMux
  - Operating Temperature: -40 to +70°C (-40 to +160°F)
  - System Power: 12V 50Ah sealed lead-acid battery
  - NEMA 4/12 rated painted steel enclosure
  - MLTB-OVP

- **HART Converter**
  - Channel: 1
  - Connector: 2-pin screwed terminal block
  - Network: Point to Point or Multi-drop
  - Baud Rate: 1200 bps
  - Frame: Short or Long
  - Operates as a HART Master and supports all HART commands
  - Support up to 15 HART slave devices
  - Isolation Voltage: 3KVdc on the HART side

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