Acromag, Incorporated
30765 S Wixom Rd, PO Box 437, Wixom, MI 48393-7037 USA
Tel: 248-624-1541 ♦ Fax: 248-624-9234 ♦ www.acromag.com

Using Digital Subscriber Lines (DSL) For Remote Monitoring

This diagram shows a freshwater treatment plant with water transmission. The water needs to be tested after it leaves the plant but before residential use. There are 30 remote pump stations which monitor pH, head loss (pressure), chlorine, turbidity (water clarity), temperature and flow rate. Installed in the field are Allen-Bradley SLC 5/05 PLC's and Acromag 961EN-6006 Ethernet/IP modules. At the plant's control center, a Citect SCADA communicates with the PLC and the Ethernet Remote I/O. The PLC performs control and the SCADA is for data logging, trending and histograms.

In the past, they retrieved the field sensor data by analog signals over leased phone lines (Analog Subscriber Lines, ASL). Using Ethernet and switching to digital signals over leased phone lines (Digital Subscriber Lines, DSL), there is a tremendous cost savings. The Acromag Ethernet I/O captures the field sensor inputs and converts to a digital protocol to be transmitted over DSL.

How they communicate over digital lines:
At the remote pump station, multiple 4-20mA sensor outputs connect to a 961EN-6006 Remote I/O module which converts to Ethernet/IP. The Acromag module has built-in web pages that are initially configured using an Internet browser. The Ethernet/IP runs to a DSL Verizon network. Verizon's routers strip away the TCP/IP portion and pass through the Ethernet communications over its proprietary virtual private network (VPN). At the other end, Verizon's routers restore by adding back the TCP/IP wrapper to run on the Municipal's network. At the control center, the Ethernet link is connected to an Ethernet switch which runs to their Citect SCADA. In the future, there will be a dedicated T-1 line directly from Verizon to the plant instead of sharing the Municipal's network. Everything, routers, switches and DSL infrastructure, are transparent between the 961EN-6006 and the SCADA. The digital phone lines (DSL) cost one-third as much as analog (ASL) so the savings over time can be very high. The older systems, using analog lines, utilized Frequency Shift Signals (FSK) and were hard-wired point-to-point (with fiber optic lines in between). The new digital lines operate at much lower decibel (db) levels so they are more tolerant of line losses or when cables get wet.

Freshwater monitoring over DSL from remote pumping station

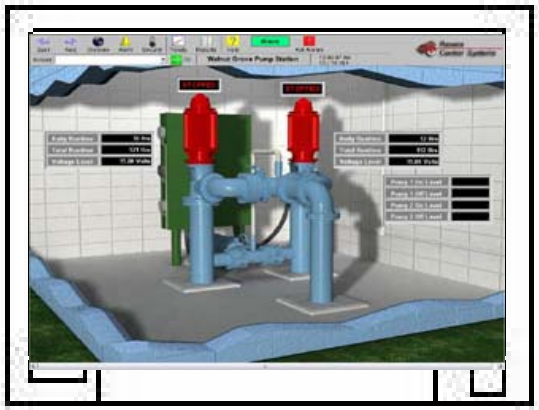
Accurate
Rugged
Dependable

A-B SLC 5/05

DSL

Verizon VPN

DSL



Citect SCADA

Ethernet / IP

Turbidity
Pressure
Chlorine
pH

961EN-6006
4-20 mA
Inputs

Pumping Station

Treatment Plant

Acromag
THE LEADER IN INDUSTRIAL I/O