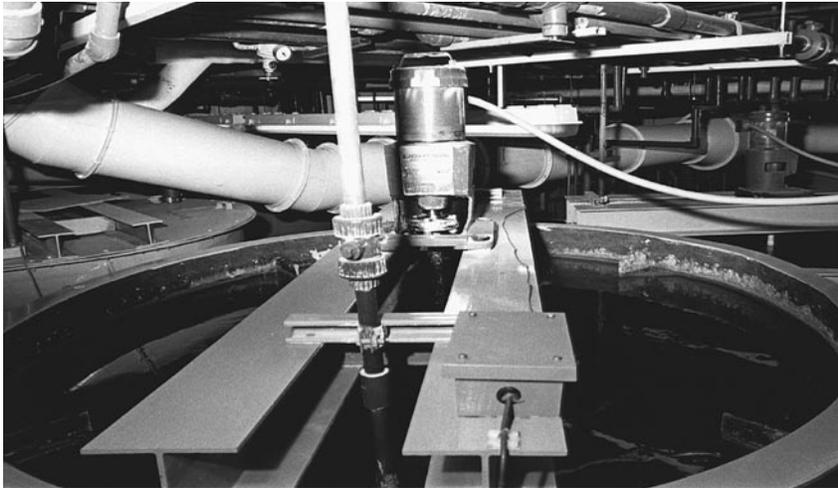


Wastewater Treatment



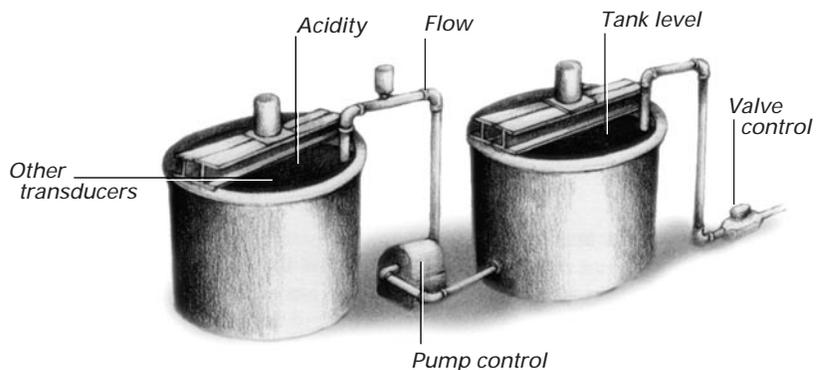
HP Data Acquisition Application Note

Description

Nearly all commercial and industrial buildings have wastewater that must be preprocessed before it can be discharged into a municipal sewage system. Cleaning fluids, process chemicals, and excessive sewage require processing through a series of tanks where neutralizing chemicals are added, and waste materials are allowed to precipitate. The resulting sludge is removed to a dump site, and the "clean" wastewater is released into the municipal sewage system.

Problem

The preprocessing system must be carefully controlled at all times. Adding chemicals to the water, monitoring acidity, checking flow rates, monitoring tank levels, and verifying the purity of the discharged water must be monitored and controlled constantly to avoid potentially harmful and illegal wastewater discharge.



Solution

A VXIbus data acquisition and control system from Hewlett-Packard not only measures the various parameters in the process, but also controls the process. Using the intelligence of the instrument and the computer, the correct amounts of chemicals are added to the "dirty" water to purify it.

Because of the ease-of-use of this system, facility engineers can install this system in a short time. An accurate and reliable system will usually pay for itself in six months.

Applications

Factories
Office complexes
Chemical plants
Hotels
Airports
Sports complexes
Sewage treatment plants

Departments

Maintenance
Facilities

Implementation

Valve control

On/off valves are used to regulate the amount of water and chemicals in the tanks. Software in the instrument controls how long the valves are on or off based on factors such as flow rate and tank level. Control valves can be opened, closed, or placed into any in-between position. They are controlled by analog voltages (0-5 Vdc) or digital on/off signals.

Flow

Flow meters measure the flow rate into or out of tanks. They generally output a current (4-20 mA) or voltage (0-10 Vdc) that is proportional to flow. Some flow meters output a pulse train with a frequency proportional to flow rate.

Tank level

Continuous level meters are used to measure the level of liquid in a tank. They output either voltages or currents that are proportional to level. Point level switches indicate when tank level has exceeded a limit, either too high or too low. These switches are monitored with digital inputs.

Pump control

Although most tanks use gravity feeds, sometimes pumps are required to move fluids or sludge. The data acquisition instrument can control these pumps. Some pumps are constant speed (on/off) and others are variable speed and are regulated by 0 to 10 volt DC signals.

Acidity

Acidity is an important measure of water "cleanliness." A pH meter measures acidity and outputs a voltage (0-1 Vdc) proportional to the acid content of the water. This data is used to control the addition of neutralizing chemicals in subsequent process stages.

Other transducers

Other transducers may be used to monitor parameters like temperature or radiation levels in the water. The type of transducer will depend on the application and the type of chemical in the "dirty" water.

Key System Features

- VXIbus open architecture
- Data Acquisition and Control on a single programmable VXIbus card (E1419A)
- Graphical programming language (HP VEE)
- Flexibility with deterministic control
- Wide choice of inputs/outputs
- Built-in control algorithms
- Up to 32 user-written "C" code algorithms
- 65,000 reading FIFO buffer
- 500 reading Current Value Table (CVT)
- All algorithms can write to FIFO/CVT
- Data can be time-stamped

Typical Configuration

Data Acquisition System	Qty
HP E1421B VXI 6-Slot Card Cage	1
HP E1406B VXI Slot 0 Command Module	1
HPE1419A Multifunction Measurement & Control Card	1-2
Analog input channels	20-60
Counters channels	1-3
Digital input channels	4-24
Voltage DAC channels	4-12
Digital output channels	8-32
Computer and Software	
HP Vectra Series PC with HP 82341C HP-IB Interface Card	
HP VEE for Windows 95	
HP LaserJet or InkJet printer	