

Cla-Val E-Solutions Electronic Valve Controls



This is the first in a regular series of bulletins devoted to the use of electronic valve controls and their integration into modern SCADA systems. Cla-Val is well recognized as a leader in pilot controlled hydraulically operated control valves for water, fuel, and many other fluid control applications. However, as water utilities and other industries install and modernize their systems, figuring out how to "talk to" or communicate to the valves presents unique opportunities and challenges. Cla-Val has responded to these challenges by offering numerous economical alternatives to best suit the applications, from retrofitting existing installations to new applications.

This bulletin will be used to help specifying engineers, water district personnel, and industrial users understand the choices available. Topics will include selecting appropriate electronic valve control components, integrating them into a SCADA system, and avoiding common pitfalls. The focus will be on applications of electronic controls, which provide solutions for the smooth integration of Cla-Val control valves into a state of the art SCADA system.

A modern SCADA system allows remote operation and management of a water system. It reduces operating costs while providing real time information on the status of reservoir levels, system pressures and flows, and pump operating conditions. Often there is a need to change operating conditions remotely, such as increasing flow into one section or reducing pressure into another zone. All of these changes may have previously required personnel to travel to the remote site to adjust the pilot control on the Cla-Val control valve to the desired setting (or "setpoint"). At Black Mountain they needed to be able to monitor and control the flow into their reservoirs.



Black Mountain Reservoir



The Black Mountain Reservoir will serve new developments in northern San Diego, California. The storage reservoir is a concrete, partially buried structure with two interconnected basins. The reservoir is supplied through two 24-inch and one 12-inch Cla-Val control valves. Total storage capacity in the reservoir exceeds 75 acre-feet (25 million gallons). Each 24-inch valve is designed to accommodate up to 30,000 gpm of flow. Each valve is individually directed by a SCADA system to control flow into the reservoir. The valves are the Series 133 metering valves controlled by three Cla-Val 131VC-3 electronic flow controllers.

Cla-Val representative Ralph Siegfried worked closely with the city and design engineers to account for power failure conditions and to provide for separate hydraulic pressure reducing and sustaining controls. These separate hydraulic functions are used only during maintenance periods bypassing the reservoirs. Adding these functions illustrates the versatility of using electronic and hydraulic controls on the same valve.

Each valve is equipped with a differential pressure and position transmitter providing inputs to each flow controller. The flow controller then calculates the flow based on built in valve characteristic curves for each size of valve. The controller continually compares the setpoint flow signal from the central office with the actual flow. Outputs are sent to either an opening or closing solenoid in order to match the setpoint and controlled (or "process") flow variable. The reservoirs have high level switches to close all valves if that condition is reached. The Cla-Val 131VC-3 controllers receive their setpoint from a SCADA PLC located in the same panel. The flow signal from each controller is retransmitted back to the PLC and then back to the central office via radio transmission.



Cla-Val 131VC-3 controllers mounted onto panel (on left) are wired into SCADA PLC inside cabinet. Startup checks are made by Cla-Val personnel to ensure proper operation.

The standard sensor and setpoint signals into the controller are 4 to 20 mA. However during the system startup it was discovered the SCADA PLC was configured to send a 0 to 5 volts remote setpoint signal into the flow controller. This did not present a problem as the Cla-Val controller accepts universal input signals. By simply changing a jumper setting, the problem was solved in 5 minutes. When completed each electronic valve controller displays the setpoint and actual flow in gpm for simple local and remote operation.

Coming in future issues:

- Electronic actuated pilot controls
- Specifying multi-function controls
- Converting existing valves to electronic control for SCADA system incorporation
- More successful installations

For more information visit our website at

www.cla-val.com



Electronics Products Division Manager Don Compton configures and tunes each Cla-Val 131VC-3 controller.

You can depend on Cla-Val for your electronic valve control solutions.

CLA-VAL

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