

Delivering Quality Solutions for Operational Results

More and more utilities are deciding to obtain control system programming services as a professional service, rather than a low-bid commodity. They have learned that programming quality cannot be controlled with a low-bid, construction contract approach.

Since 1993, Carollo Engineers has been a leader in providing quality programmable logic controller (PLC) and human-machine interface (HMI) programming services to water and wastewater utilities. Our clients have benefitted from having their engineer design *and* program their process control systems, especially when their engineer has the programming resources of Carollo.

Experience That Counts

Carollo has provided programming, integration, and system implementation services for agencies serving populations ranging from less than 10,000 to more than 2 million, including some of the largest water and wastewater agencies in the U.S. Our dedicated staff of programmers and electrical/control engineers has the experience and engineering expertise to tackle the largest and most complex projects, and bring personalized attention to the smallest.

We are not just programmers. Our staff includes process and system design professionals, licensed treatment plant operators, technology design experts, and leaders in providing quality supervisory control and data acquisition (SCADA) systems.

The Right Approach

The SCADA system is generally the last portion of a construction project to be completed, and often is the most troublesome. On most construction projects, the treatment plant staff have minimal input on the "look and feel" of the operator interface and the details of control strategy operation. Every small modification can become a significant change order.

That's because the contractor-programmer performs its work far from the owner's facilities. By the time the SCADA software is completed, placed in operation, and staff can really see how it works, the general contractor and programmer are out of time and money, and are primarily motivated to wrap things up and leave.

Carollo can eliminate these hassles by performing the programming as a direct extension of our engineering services.

When Carollo performs system programming, we establish a relationship with you before the work starts and continue that relationship long after your new control system is commissioned. We interact with your staff to select screen colors and symbols,

command sequences, and other "look and feel" aspects of the SCADA operator interface. We also reserve part of our budget for post-installation refinements. This way, operations staff can "test drive" the new SCADA system before the final configuration is performed.

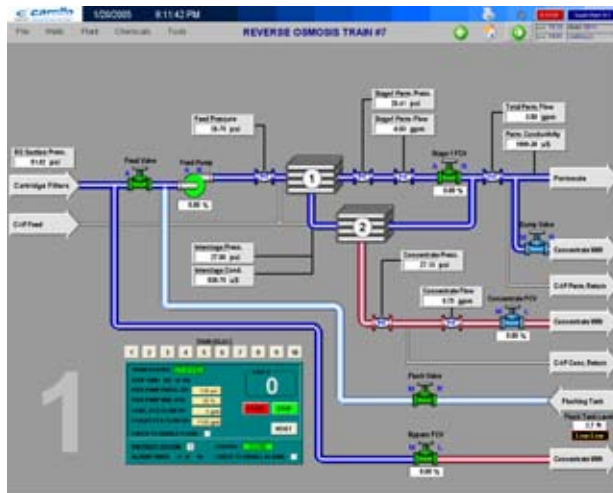
Because we are programmers, engineers, and operators, we can provide the most effective,

innovative control solutions customized to meet your needs. We take advanced control strategies from conception to successful implementation, working with your operations staff each step of the way.

SCADA Technology Experience

Carollo's outstanding team of programmers and control system engineers is experienced in implementing the full range of control, SCADA, and information system technologies. We can deliver comprehensive solutions, from planning through design and complete implementation, including:

- ▼ Excellent project management capabilities for all SCADA project phases.
- ▼ Configuration expertise in all SCADA HMI programming packages and local operator displays.



Carollo programmers will work with your operations staff to develop easy-to-use SCADA graphic screens.

"Dedicated to creative, responsive, quality solutions for those we serve."



- ▼ Extensive programming experience with all of the major PLC products.
- ▼ Programming in high-level languages, such as MS Visual Basic.
- ▼ Many years of experience setting up Ethernet local-area networks (LANs), fiber optic systems, and wide-area networks (WANs).
- ▼ Experience with implementation of radio systems, including Spread Spectrum radios.
- ▼ Ability to troubleshoot systems and fix hardware or software problems.
- ▼ Extensive experience cutting over from old to new systems with minimal operational disruption.

Optimization

Automation and optimization have become increasingly important parts of our firm's services. Recent projects have increasingly focused on greater levels of automation for enhanced operational efficiency, process control standardization, unattended operation, and integration of computer control systems data with overall utility information management systems.

Carollo is a leader in the application of distributed control and SCADA systems to improve operational efficiency. We achieve this by optimizing the operator's interaction with the process and reducing chemical and energy use. Carollo's licensed, experienced operators work with programmers and control engineers to develop practical approaches to advanced control strategies.

Maintenance Services

Carollo provides ongoing service to our clients once a project is complete. Our technicians are available to service your control systems whenever we are needed.

Our approach to maintenance services is to develop

long-term relationships and serve as an extension of your staff. Your assigned programmer will get to know your staff and your facilities, and work with you to solve problems and improve performance.

SCADA maintenance services include: troubleshooting equipment, preventative maintenance, system backups, supplementary instruction, software upgrades, control logic modifications, and system enhancements.

Benefits

Carollo delivers SCADA systems that work. A SCADA system should provide the engineer's control concepts in usable form for the operator. By eliminating the low-bid contractor from the delivery

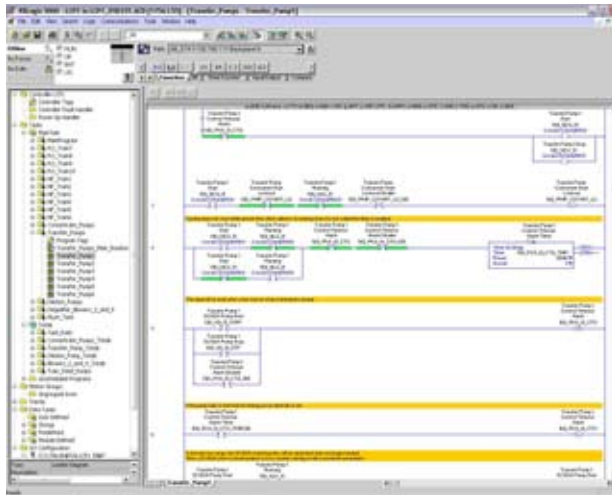
process, the Carollo engineer/programmer can work directly with your operations staff to refine control strategies into practical, effective operational logic and easy-to-use graphic screens.

We streamline the automation process. By eliminating the contractor-programmer "middle man," many of the typical construction hassles over SCADA software are eliminated. Because we have extensive

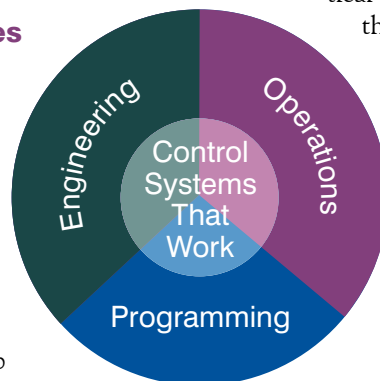
experience programming our own control strategies, we can efficiently deliver quality SCADA solutions that improve treatment performance, reliability, and efficiency.

We achieve operations staff participation, buy-in, and utilization of new controls. Carollo delivers practical control solutions directly to the user, tailored to the needs of each of our clients. We understand

that early involvement of operations staff in the development of SCADA screens, staff training, and easy-to-use documentation are keys to realizing full operator use of new SCADA controls.



Carollo's systematically organized and thoroughly documented PLC code results in fewer "bugs" during startup and easier maintenance for the life of the system.



Carollo combines our programming, process engineering and operations expertise with your operations staff's knowledge to deliver control systems that improve your plant's performance.