

The Sage Advisor

SCADA, SECURITY & AUTOMATION NEWSLETTER

Volume 21, Issue 2 • Fall/Winter 2011

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CONTROL MICROSYSTEMS

is now

**Schneider
Electric**

Telemetry & Remote SCADA Solutions

On June 1st 2011, one year and one month after the acquisition of SCADAGroup, Control Microsystems and Trio Datacom celebrated their new identity under **Schneider Electric brand as Telemetry and Remote SCADA Solutions within Industry Business.** This event was commemorated as Schneider Electric signage was unveiled throughout several locations in Canada, USA, Europe and Australia.

This celebration capped off an intensive, 6-month, company-wide program to migrate under one brand: Schneider Electric. In a very short timeframe, the two companies held a wide range of activities all aimed at incorporating the new brand. Beginning with the product design and packaging, the Schneider Electric identity was quickly incorporated onto the building signage, business cards, stationary, marketing collaterals, and more.

Becoming one company with Schneider Electric opens doors of opportunity for all employees and customers. The company is proud to assume a broader role by offering products and solutions critical to the overall Schneider Electric strategy to become the global specialist in Energy management.

As a global specialist in energy management with operations in more than 100 countries, Schneider Electric offers integrated solutions across multiple market segments, including leadership positions in energy and infrastructure, industrial processes, building automation, and data centers/networks, as well

as a broad presence in residential applications. Focused on making energy safe, reliable, and efficient, the company's 110,000 plus employees achieved sales of 19.6 billion euros in 2010, through an active commitment to help individuals and organizations "Make the most of their energy."

Thanks to its Telemetry & Remote SCADA Solutions division, Schneider Electric provides integrated, secure and reliable SCADA solutions for water treatment plants and pumping stations, on-shore oil and gas extraction, transportation and storage, as well as electrical utilities applications, allowing their customers to maximize system functionality and reduce operational costs. Key solution components include remote process monitoring and control (SCADAPack RTU controllers), long range wireless communication (Trio radios), integrated SCADA host optimized for wide area use (ClearSCADA software), and wireless instrumentation (Accutech sensors). Industry-specific solutions include dedicated water pump up and pump down controller (FlowStation), gas flow measurement (Realflo), and gas well automation (ProductionPlus).

More information about Control Microsystems' migration to the Schneider Electric brand can be found at: <http://www.controlmicrosystems.com/corporate-info/brand-migration/>.

New SCADAwise™ Short Courses

Sage Designs has often been asked to offer some basic SCADA training. This Fall, we introduce two half-day courses: SCADAwise Basics and SCADAPack Basics.

SCADAwise Basics (3.5 Contact Hours) is a course designed for Management or Operations personnel who wish to become more familiar with the subject of SCADA without delving deeply into technical detail. While we discuss many aspects of a very technical subject, no previous

technical training is required to grasp the basics.

SCADAPack Basics (3.5 Contact Hours) is a course designed for mildly technical people who own SCADAPack controllers, but will never write programs. In this course, we will practice uploading and downloading programs, updating firmware and learn about various diagnostic features of the SCADAPack product line.

Earn Contact Hours. See inside for more details.

Top Three Techniques to Realize More Value Out of Your SCADA System

Supervisory Control and Data Acquisition (SCADA) is widely used by water and wastewater facilities around the world to automate operations and improve outcomes. A SCADA system helps plant operators implement control strategies to safely operate pump and lift stations, filtration and backwash systems, distribution networks, and treatment plants. SCADA systems also play an important role in securing the infrastructure through video surveillance technology, audit trail and water quality monitoring throughout the distribution system. There are, however, other strategies that could be implemented by the utility to leverage its SCADA system to drive significant cost savings and help the facility recover the cost of system implementation.

Here are the top three techniques to maximize the benefits from your SCADA system:

1. Energy Reduction

Water and wastewater systems and their pumping facilities are the most energy-intensive systems owned and operated by local governments. These systems can

account for as much as 35% of the energy consumed by the local governments. The United States' Environmental Protection Agency (EPA) estimates that as much as 10% of the total energy that is currently consumed could be saved. Pumps and lift stations are the most attractive targets to implement energy reduction strategies, since every gallon of water that passes through the system represents a significant energy cost. With many power utilities moving towards Time-of-Use (TOU) energy pricing schemes as part of

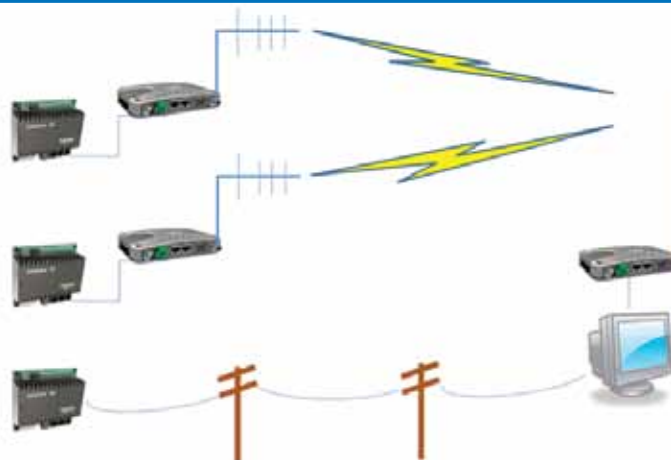
Continued on page 6

Inside This Issue

- The Future of ClearSCADA
- SCADA Basics (Part 1)
- New SCADA Training Courses
- City of Victorville SCADA
- Snake Byte
- Control Microsystems is now Schneider Electric
- Top 3 Techniques to Realize More Value out of Your SCADA System

SCADA Basics: Part 1*

Supervisory Control and Data Acquisition (SCADA) systems are as diverse as their applications. For many, SCADA is a system on a manufacturing plant floor where distributed PLCs run local machines and a host Human / Machine Interface (HMI) package which allows operators and management personnel to adjust the machine's parameters to optimize control. For others, the term implies an application where the RTU or PLC is remote from the server, requiring more dependency on wider area communication solutions. We will only consider those with more remote controllers. For those widely-distributed systems such as those found in water, electrical distribution or sewage collection systems, the communications system is the biggest challenge, and



keeping in touch with your remotes is where most of the difficulties lie.

The basic SCADA system consists of three components: the remote controllers, the communications media and the host.

We will cover each of these major parts of a basic system and try to explain how they fit together to form a system. We will also discuss some details of where they can go wrong.

RTU vs. PLC Controllers (How do you spell remote?)

For some, an RTU (Remote Terminal Unit) is a cabinet with a controller, radio, display, power supply and wiring. Another definition is a controller which has been designed for use in that cabinet. I will use the later definition. A PLC (Programmable Logic Controller) can also be used in that cabinet as the controller, but the question is: what are the similarities and differences between a PLC and an RTU and what makes sense in your application?

The similarities between an RTU and a PLC are that either can execute code, control pumps, processes or other equipment, and communicate with a SCADA host. Also, both are probably programmed in similar languages. What makes them different is a question of environmental specifications, communications capabilities, power usage and other details.

In the past, Ladder Logic was strictly the domain of the PLC and finds its origins in a union/auto manufacturer labor dispute. The union had made it clear that each year in preparation for the new year models, electricians had been responsible for rewiring the cabinets containing the discrete relay control systems and they weren't about to abdicate control of this work, or the programming that replaced most of this, to electrical engineers. The solution was Ladder Logic Diagramming (LLD), a graphical programming language that relies on symbols and terminology familiar to industrial electricians that work in the area of controls, greatly reducing the need for training, and thus, the PLC was born. Its job was to control more and more parts of the assembly line, and as time wore on,

processors became more powerful and capabilities expanded. Today, PLCs have come to control just about every aspect of the manufacture of automobiles and most other automated manufacturing processes as well. Early PLCs were standalone controllers, but in later years they had communications capabilities added, so they could pass information between other controllers on the floor, as well as to operators and management, allowing for more informed and timely decisions.

At about the same time as PLCs were being developed, scientists and others were interested in gathering information from remote locations, where environmental conditions could be severe and communications links not always assured. This meant that the controllers needed to have data logged locally and be able to communicate over any media that might be available at a site. For scientists, a true programming language was desirable and BASIC was often used in these controllers. RTUs were developed to fill this need, with tough environmental specifications, lots of data storage, and low-power requirements for solar and battery operation. Multiple communications ports were often supplied to meet a wide variety of communications challenges.

As time and technology progressed, the PLCs have become better at communications and surviving tough environments, and have retained their capabilities of running much larger programs needed for complex systems, such as plants or factories. While a PLC will often have much more memory for complex programs, an RTU will typically have more memory set aside for storage of data. RTUs have adopted more accessible programming languages such as LLD,

making the two devices look more similar. There are clear advantages to an RTU in remote control applications. For the best of both worlds, many hybrids have been developed, but subtleties are still apparent.

When choosing which technology to implement, pay close attention to the specifications for the hardware.

- Is the device low power, so that it can be run on a solar power system or run for hours on a UPS battery backup?
- Are the boards conformal coated for corrosion resistance in H₂S, chlorine or other harsh environments?
- Does the hardware have surge withstand capabilities so the unit can survive the less reliable line power or lightning strikes often occurring in remote areas?
- Does the controller have several communications ports?

On the software side of things, there are several things to look for as well.

- Are there RTU functions in the software to provide for polling of other remotes?
- Are there flow integration functions?
- Is data logging supported?
- Are multiple, radio-friendly protocols supported?

These and other differences can be seen when comparing a product with its heritage in the RTU rather than the PLC arena.

***This is an excerpt from our new ½-Day SCADAwise Basics course.**



14-year-old Controller Survives Snake Attack

Working in the utilities industry, sometimes you see strange things. The other day, a client called me because the night before one of his lift station RTUs had failed. We met at the station to investigate. Sure enough, there were no lights on the MODEM port, and no lights on the RTU aside from the power LED. We swapped out the Control Microsystems' TeleSafe Micro16 (the precursor to the SCADAPack line of controllers) with another unit borrowed from a well station that was currently out of service. Then we looked at the failed TeleSafe. Through one of the cutouts in the frame, we saw an interesting thing, then removed some screws and lifted the circuit board off the frame and the problem with the RTU became obvious...

There was an un-authorized snake in the works! A partly-crispy, partly wet, very dead snake, the elusive "California Circuit Shorter." This is the first failure of any of the 11 TeleSafe Micro16's in 14 years of service. No fault of the equipment at all. After removing the offensive reptile, you could see the corrosion caused by being shorted out by a live, wet body. The circuit board cleaned up pretty well with a rag and a bit of wire brushing. So we thought, what the heck, let's try this puppy out. The 14-year-old, snake-bit TeleSafe Micro16 happily went right back to work, which is lucky for us as Control Microsystems replaced this model with the 300 Series SCADAPacks about three years ago.

Aside from being the cause of a strange day, this is a testament to the high quality manufacturing and performance of Control Microsystems products (now branded Schneider Electric Telemetry & Remote SCADA), and no, I don't represent them. I've never represented any company in my 25 years in the business — I just like their stuff. You can buy CMI products and other cool equipment from Sage Designs, Inc. in Mill Valley, CA. More photos taken for this story can be found at: http://css-technologies.com/?page_id=137

— Written by: J.A. (Joe) Falejczyk, CSS-Technologies.com

SCADAwise™ Short Courses

SCADAwise Basics

November 9, 2011

8AM — 1PM
SpringHill Suites by Marriott
10593 Fairway Drive
Roseville, CA 95678

December 7, 2011

8AM — 1PM
Holiday Inn Hotel & Conference Center
9000 W. Airport Drive
Visalia, CA 93277

This ½-day course is designed for the non-technical person who wants to understand basic SCADA principles.

- PLCs vs. RTUs
- Radio Systems
- Host SCADA Software
- Open Architecture Systems
- SCADA Protocols

(3.5 Contact Hours)

SCADAPack Basics

November 9, 2011

Noon — 5 PM
SpringHill Suites by Marriott
10593 Fairway Drive
Roseville, CA 95678

December 7, 2011

Noon — 5 PM
Holiday Inn Hotel & Conference Center
9000 W. Airport Drive
Visalia, CA 93277

This ½-day course is designed for the mildly technical person who owns SCADAPack Controllers, but will never write programs.

- Tour of New Telepace Studio Software
- Indicator Lights on SCADAPack Controllers
- Communication Port Setup and Diagnostics
- Boot Modes
- Downloading and Monitoring Programs

(3.5 Contact Hours)

What should I bring? Your thinking cap only. The **SCADAPack Basics Course** offers limited hand-on portions, equipment provided.

What is provided? Lunch (from Noon-1PM), coffee, soft drinks and snacks during course day.

To Register: Call 1-888-ASK-SAGE to reserve your seat. Then complete the information below and send to us via fax to 1-888-FAX-SAGE or by email info@sagedesignsinc.com. A confirmation will be emailed to you.

Name (please print):	Title:
Company:	Phone:
Address:	Fax:
City/State/Zip:	Email:
Lunch choice (Nov 9) – A, B or C:	Lunch Choice A = Chicken Pesto Ciabatta, Choice B = Creole Chicken Wrap or Choice C = Penne Pomodoro (vegetarian)
Lunch choice (Dec 7) – A, B or C:	Lunch Choice A = Chicken Cordon Bleu, Choice B = Marinated Beef Tenderloin or Choice C = Pasta Primavera (vegetarian)

- Roseville (November 9, 2011)** — **OR** — **Visalia (December 7, 2011)**
- SCADAwise Basics Course (Morning Class only, lunch from 12-1PM) \$ 450.00 (non-taxable services)
- SCADAPack Basics Course (Afternoon class only, lunch from 12-1) \$ 450.00 (non-taxable services)
- Both SCADAwise Basics & SCADAPack Basics Courses (all day rate) \$ 795.00 (non-taxable services)

METHOD OF PAYMENT: Purchase Order, Prepaid Check, Visa or Mastercard. Payment should be made to Sage Designs, Inc. Course fees are due on or before the first day of class. No Shows or Cancellations made less than 6 business days prior to the first day of training will be billed at the full amount and are not refundable. A confirmation notice will be sent to all registrants on or before the deadline date.

- Purchase Order Billing:** After telephoning your intent to register, fax/email Purchase Order addressed to Sage Designs, Inc. Total to be invoiced against PO # _____ is \$ _____.
- Prepaid Check:** After telephoning your intent to register, mail a check addressed to Sage Designs, Inc. along with a copy of this form. Total Prepaid Check Amount: \$ _____.
- Visa or MasterCard Billing:** After telephoning your intent to register, fax or email this form. Total to charge on the first day of course \$ _____.
- Visa or Master Card Acct #:** _____ **Expires (MO/YR):** _____
- Cardholder Name (please print):** _____ **Phone:** _____
- Cardholder Authorization Signature:** _____ **email:** _____
- Cardholder Billing Address:** _____
- City:** _____ **State:** _____ **Zip:** _____

***** Registration Deadlines: November 2, 2011 (Roseville) and November 30, 2011 (Visalia)*****

SCADAwise™ Training Classes

ClearSCADA

SCADAPack

ClearSCADA Training Course

October 24-27, 2011 – Mill Valley, CA
March 5-8, 2012 – Visalia, CA

- Day 1 (8AM- 4PM) Installing ClearSCADA, Introduction to ClearSCADA, Components, Using ViewX, Using WebX, ClearSCADA Help
- Day 2 (8AM - 4PM) Configuring using ViewX, Database Organization, Basic Telemetry Configuration, Creating Mimics, Creating Trends
- Day 3 (8AM - 4PM) Configuring using ViewX, Templates & Instances, Logic Languages, Security, Communications Diagnostics
- Day 4 (8AM - 4PM) Reports, System Configuration, System Architecture, Questions

Cost: ClearSCADA Training Course \$1,890

(28 Contact Hours)

SCADAPack Telepace Studio Training Course

November 1-3, 2011 – Mill Valley, CA
February 7-9, 2012 – Visalia, CA

An optional SCADAPack 350, SCADAPack 334 or SCADAPack 32 is available at a special price with the course—an excellent way to get started using SCADAPack controllers.*

- Day 1 (8AM - 4PM) SCADAPack controller operation, Series 5000 I/O, Telepace Studio introduction
- Day 2 (8AM - 4PM) Telepace Studio advanced programming techniques and advanced functions
- Day 3 (8AM - 2PM) Controller communications, Modbus Master/Slave protocol, Diagnostics, Modems

Cost: SCADAPack Telepace Studio Course \$1,340

- * Optional SCADAPack 350 Training Kit – adds \$1040
- * Optional SCADAPack 334 Training Kit – adds \$1040
- * Optional SCADAPack 32 Training Kit – adds \$1,100

(20 Contact Hours)



Schedule Your Own

ClearSCADA Test Drive



Free Hands-On Test Drive

Call to Schedule a Test Drive

Call 1-888-ASK-SAGE

email: info@sagedesignsinc.com

Instructors: ClearSCADA & SCADAPack Telepace classes will be taught by Tony Sannella, Sage Designs, a Factory-Certified Instructor. The ClearSCADA Test drives will be conducted by Sage Designs or a factory representative.

Location: See individual course registration form. Those requiring overnight accommodations should call the hotel directly for reservations.

What should I bring? Laptop computer with minimum requirements as shown on the specific course registration forms, plus necessary permissions to install software on your computer.

What is provided? Lunch and coffee, soft drinks and snacks each day.

***Optional Training Kits at special course pricing (Telepace class only): Limit one (1) for every two (2) students per organization.** Training Kits will be shipped N/C to training facility, provided your registration is received approximately 4 weeks before the first day of the course, or shipped to you after the course when available. Training kits include a SCADAPack 350, SCADAPack 334 or SCADAPack 32 Controller, Telepace Studio Software, Hardware Manual (on CD-ROM), I/O Simulator board, AC/2 Transformer, & programming cable. Prices do not include applicable California sales taxes.

Download the Registration form at: <http://www.sagedesignsinc.com/events/index.htm>

Please send me the Registration Form

ClearSCADA: October 24-27, 2011 – Mill Valley, CA

March 5-8, 2012 – Visalia, CA

SCADAPack Telepace: November 1-3, 2011 – Mill Valley, CA

February 7-9, 2012 – Visalia, CA

Name (please print):	Title:
Company:	Phone:
Address:	Fax:
	Email:
City/State/Zip:	

*** * * Registration Deadline: 2 weeks before 1st day of course * * ***

All registrations are subject to cancellation fees. A confirmation notice will be sent to all registrants on or before the deadline date.

Victorville Water District Builds SCADA System One Step at a Time

Victorville Water District, established in 1931, has had several SCADA monitoring systems over the years, from simple tone system employing telephone lines for communication to the present SCADAPack 357's now being deployed using Firetide radios. The system consists of over 60 sites including wells, booster pump stations, 70 Mg of storage tanks and 4 treatment plants. With the ample storage, we are able to do a majority of our pumping from midnight to 6AM which saves over \$500,000/year in energy costs, more than paying for the Telemetry Department budget.

In 1995, I came to the District and was quickly charged with the job of upgrading the aging Aquitrol system with Wonderware HMI software and MDS 2300 Radios. As I evaluated the existing system, it became clear that the system was extremely slow and cumbersome. It had a single repeater site located on top of a mountain some 7 miles away from the main office which was needed to reach some of the stations located in some difficult to reach sites within the District's 54 square mile area. This system used a 1200 baud Bell 202 modem serial communications system that, on a good day, took 5 to 10 minutes to contact each of the District's 40 sites. Another problem was that the Repeater site was located on a site occupied by no less than 50 other repeaters, TV stations and telephone communications systems, all adding up to a major communications nightmare.

The first time I looked at the existing repeater, I noticed that there was a 40db attenuator attached to the 5 watt radio and was told that was due to the extreme amount of noise on the site. The first order of business was

to remove the attenuator and install a cavity filter to remove the unwanted noise and restore the system to full capacity. We later increased the baud rate to 9600 by replacing the Aquitrol PLCs and their Bell 202 modems with the SCADAPack Micro16s, which reduced the system poll time down to 3 minutes. Then, we replaced the Wonderware system with Lookout HMI and decreased the polling time to less than 2 minutes, even with an additional 10 new sites in the system. With the replacement of the MDS 2300's with iNET 900 Spread Spectrum radios, we were able to increase Baud rate to 256k, and by replacing the SCADAPack Micro16s with SCADAPack 32s were able to move the entire system to an IP-based system.

Problems started to mount for this system, as the single site for the repeater was plagued with power outages and interferences from neighboring sites and access problems in bad weather. We also started having problems with IP addresses. In some cases, we had as many as 5 IP addresses at a site: the radio, RTU, VFD, power monitors and local site computers. We also found out that our centralized control system was prone to failure if the main HMI control were to go down or if the repeater was disabled. In our case, a lot of the well sites were not able to communicate directly with the tank sites in order to know when to operate.

We started looking for a better solution to the single site repeater system, and an end to the dependency of the single mountain site. Several options came to mind: a multi-repeater system using several of the Districts 6 tank storage



sites; a peer-to-peer store-and-forward system utilizing report-by-exception; and a new system we had been hearing about utilizing what was called a MESH topology system.

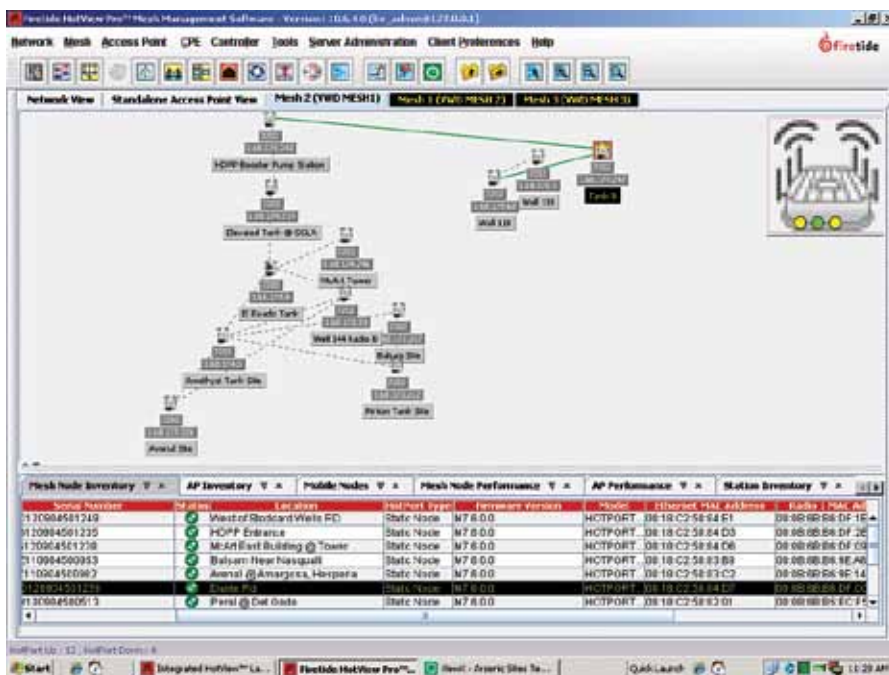
We started to see that the MESH system looked like the best solution for the District, and prepared a list of minimum requirements for the system. We had reviewed several manufacturers' products for the system and wanted to come up with a solution that would not only meet our needs, but would be easy to maintain. The District originally used outside consultants for the integration and maintenance of the system, but since 1999 had moved those responsibilities to District personnel. We had been successful in re-programming the HMI from Wonderware to Lookout and then to ClearSCADA in 2005. With background in UHF and VHF radios, District personnel installed and maintained the iNET 900 radios at all the sites. As the economy turned down and funding dropped, it became clear that the cost of the system would

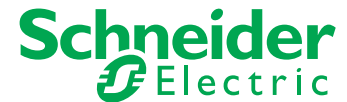
need to be such that replacement could be done as the funding was available. So, it was a logical move to make sure the new system could be installed by the District. Our first hurdle was to come up with a minimum list of requirements and submit them to several vendors for bids. These included minimum throughput, ease of installation, maintenance requirements and technical assistance. We looked at the overall District and decided that the minimum throughput should be determined by the vendor who would be in the best position to give us an idea of what to expect. It was also suggested that the minimum throughput be 1.5 Mbps. Installation needed to be addressed and a certain expertise was required, so training of District personnel was added to the requirements. We stipulated that the vendor provide a minimum warrantee period, technical support for the term of the installation period plus one year, and ongoing product and technical support. We had also wanted a system that would be self-healing, able to re-route if a single or multiple systems were disabled, allowing us to decentralize our system and have the wells run autonomously if the central control were disabled.

Several Vendors were contacted, including Firetide through Sage Designs. Firetide's bid was accepted due to the low cost and ability to provide the equipment and training needed for District personnel to install the system. Firetide also agreed to help us with the site analysis and design of the system and technical support. During the design phase, we provided them with a list of sites including Lat-Long and elevation from the District's recent GIS survey information, and Firetide then provided site analysis based information including antenna height requirements and suggested radios and antennas.

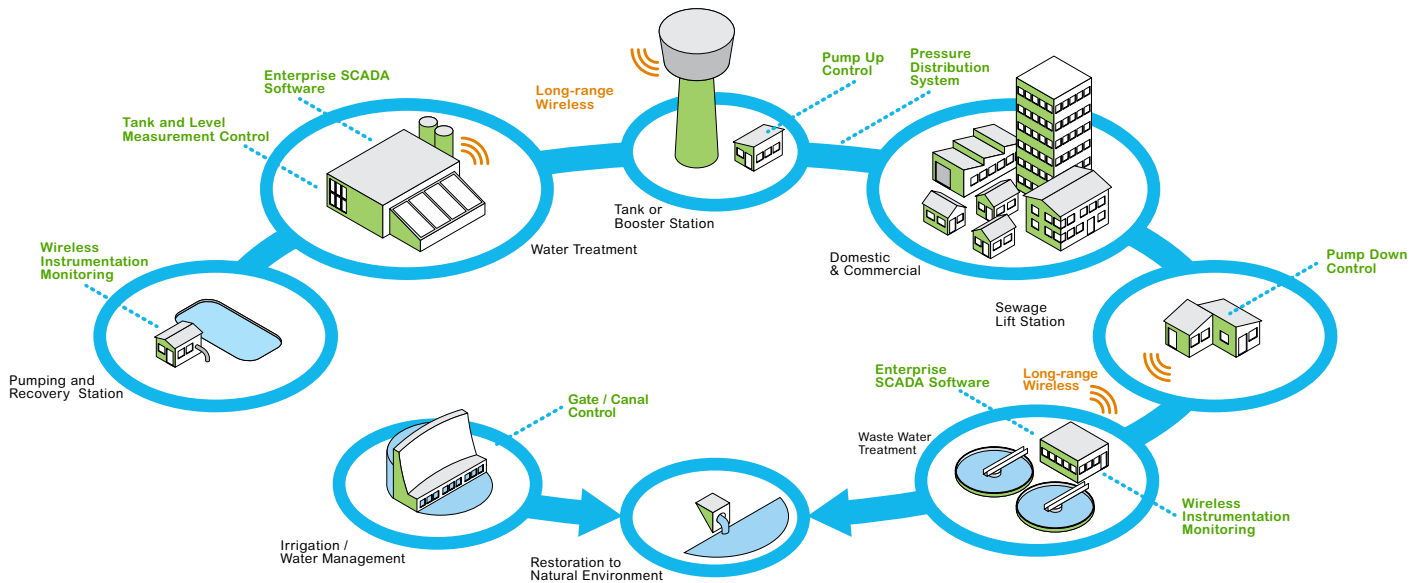
In 2009, the project was given approval by the City for implementation, and in 2010 the first of the Firetide radios were installed. Although the system is only 25% complete as of this printing, we feel that it is a success. The backbone system has been completed and we have throughput exceeding 7 Mbps, with some sites seeing speeds of 200+Mbps. With the entire system using only 3 IP addresses for the communications, we have reduced our IP addresses by 40%. We have grown to 79 sites and have found the system performs well.

By Jeff Zizzi
SCADA & Telemetry Coordinator,
Victorville Water District





Efficiently manage your remote sites with secure and reliable field-to-enterprise solutions



Smart Grid implementation, the need for energy reduction is paramount.

Studies have shown that increased electrical monitoring of pumping systems and trending of historical performance over an extended period of time to evaluate energy use and identify unacceptable variances could help in realizing a cost savings of 10-20%. Intelligent field controllers communicating with the main SCADA system can be used to automatically monitor and optimize demand during electricity on-peak time and coordinate load shedding through the utilization of on-site generation. Since these intelligent field controllers support extensive data logging with milliseconds time stamp, real-time data and historical trends can be analyzed by the plant manager to optimize energy reduction across the infrastructure.

Intelligent field controllers can also gather and log critical data from Variable Frequency Drives (VFD), which adjust the speed of an electric motor by modulating the power being delivered. VFDs provide continuous control, allowing the motor speed to be matched to the specific demands. VFD applications are increasing rapidly in the water and wastewater industries. A study by the American Council for an Energy-Efficient Economy (ACEEE) showed that there are approximately 88,000 motors (>50 hp) operating in the water and wastewater industry, 24% of which

have variable load and are typically used in aeration equipment, and 48% which utilize VFD control.

The extensive sequence-of-event logging capability featured in advanced intelligent field controllers allows the development of curves representing the actual flow at hourly time increments during a typical day. A daily time-weighted energy usage for the pump can then be established using the pump efficiency at each hourly flow rate.

2. Reducing Water Losses

It is estimated that around 14% of all water production in the US is lost. This amounts to around 6 billion gallons of water per day, enough to satisfy the delivery needs of the ten largest cities in the US. In other counties, as much as half the water produced is unaccounted for water losses and is attributed to storage evaporation, distribution network leakage, inaccurate metering, illegal irrigation use and illegal water connections.

Management of water leaks can save a significant volume of water and reduce the energy needed to produce it. By continuously monitoring and optimizing pressures in the water distribution system, energy savings could be realized especially during off-peak periods. Flow and pressure management in district meter areas (DMA) also minimizes the impact of both undetected system leaks.

Battery-powered, wireless pressure and flow instruments could be deployed as

part of the SCADA system to provide continuous remote data monitoring across the distribution system. Battery-powered, long-range wireless units offer significant advantages in reducing the cost of monitoring the distribution network, and provide access to hard to reach areas for better water accountability.

3. Improving Compliance

The EPA requires public water systems in the US to monitor drinking water regularly for contaminants, some of which include lead, copper and nitrates. If contaminants are detected above the drinking water standards, water systems are required to correct the problem through treatment. Fines are issued if water systems do not report information to consumers about the source and quality of the drinking water they provide.

Fines could be expensive, especially on small and medium size drinking water systems. However, advanced, cost-effective, SCADA systems can play a pivotal role in helping water operators manage and consolidate water quality data in one centralized location. The intelligent field controller can log data from water quality sensors, analyzers and pumps and maintain a sequence of events which could be used by the operator to analyze system performance and generate regulatory reports. The integrated SCADA host software allows the operator to generate reports quickly, and easily meet ever-demanding regulatory requirements.

Data consolidation from various sources, including electronic lab reports, manual logs, SCADA real-time and historical data, can be done with an integrated historian in the SCADA host software. Since intelligent field controllers are capable of logging and reporting a large number of data points and events, data gathering should be easy and cost effective.

For the past 30 years, Control Microsystems, a Schneider Electric company, has been the leader in developing intelligent field controllers for telemetry, SCADA, and remote asset monitoring. The Control Microsystems SCADAPack Series of rugged, cost-effective, programmable field controllers is designed specifically for water and wastewater systems to allow superintendents and operators to manage their remote assets efficiently and at a much lower total cost of ownership than traditional controllers. Control Microsystems' offering also includes ClearSCADA, an advanced SCADA host software platform and the Accutech line of self-contained, battery powered wireless pressure and flow instrumentation. Even though the SCADAPack controllers, Accutech wireless instruments and ClearSCADA software can be integrated with a variety of third-party devices, an integrated solution combining the three products drives substantial cost savings and dramatically increases system efficiency.

The SCADAPack E-Series is a line of remote field controllers that has an embedded historian allowing time-stamped event logging for extended periods of time. Events can be logged in the unit's internal memory and are easily accessible to the user. With multiple serial and Ethernet ports on-board, the SCADAPack E-Series is well-suited for concurrent communications with multiple field devices. It can simultaneously report to several master servers based on user preferences. Additionally, it can share information with other peer units in the field, thereby reducing network traffic to the main server and increasing the system's overall reliability. Control algorithms are developed using an IEC 61131-compliant programming package and downloaded to the field controller remotely over any communication link.

The SCADAPack E-Series uses a secure, standard communication protocol and data transfer mechanism that transfers the data based on priority and event changes. This frees up communication links to be used for other demanding services, such as remote asset video surveillance. Data values include data quality flags, a time stamp with millisecond resolution to indicate when the event occurred, and a class/priority to indicate how it should be handled by the SCADA host.

For pressure and flow measurement across water distribution networks, Control Microsystems offers Accutech wireless instruments. The units are typically installed 1500 to 2500ft (460 to 760m) from the base radio or at a shorter distance if obstructions exist. Utilizing low frequency, license-free, military-grade secure radios, Accutech wireless instruments offer excellent propagation through obstruction and foliage, resulting in a solid and reliable communication link throughout the operational life-cycle of the network.

Accutech wireless instruments have been designed with the focus on simplifying network deployment. Each instrument is equipped with an LCD that reports radio signal strength (RSSI). Operators can setup and deploy the network in minutes, without incurring the cost of extensive engineering design and network analysis. Advanced power management algorithms built into the Accutech instrument optimizes battery use to ensure uninterrupted operation for up to 5 years. Wireless instruments are available to provide flow and pressure management in district meter areas.

ClearSCADA is an integrated host software that was designed from the ground up to manage small and large Wide Area SCADA systems and address critical issues such as unreliable communication links, security,

data integrity, and ease of deployment. The product is optimized for low and high bandwidth communication links over public networks, such as dial-up landlines, mobile networks, and WiMAX. It is also well-suited for private serial and Ethernet radio networks. Extensive diagnostic features are available for monitoring the performance of the communication network. ClearSCADA supports main and standby communication links to remote devices for uninterrupted monitoring and control.

Data integrity is maintained across the system as a result of its inherent ability to synchronize historical events in its database after a communication loss with intelligent field controllers, such as SCADAPack E-Series. Since all data is time stamped in the intelligent field controller, less important data can be buffered by the controller until it is convenient for the SCADA host to receive it. In addition, time-stamped data allows the system to tolerate failure of communication links. Eliminating gaps in data helps users to comply with regulatory requirements by providing accurate reporting and maintaining a high level of data availability.

Multiple security models are available in ClearSCADA. Security is configured to the object level where a wide range of permissions are applied to discrete system points. For example, depending on the permission policies, a group of users may see details on a screen that are not available to another group that has a lower level of security permissions. This level of intelligence and flexibility allows users to offer access to a much larger group of internal and external stakeholders without compromising system security and integrity.

Furthermore, to reduce deployment time and ongoing maintenance, ClearSCADA offers a zero-configuration web client that is ideal for monitoring and controlling the SCADA system through a standard web browser. All features, including full mimic display support (SCADA system screens), control and trending capabilities, and alarms and reporting are made accessible through a secure SSL connection that is managed by security login privileges.

For more information on Control Microsystems' products, please visit www.controlmicrosystems.com

About the author:

Hany Fouda is the Director, Business Development-Americas at Schneider Electric, Telemetry & Remote SCADA Solutions. He holds a Masters degree in Engineering from Carleton University, Ottawa, Canada and has over 20 years of experience in industrial automation, SCADA, and telecommunications.

The Future of ClearSCADA

Some of our customers have been asking questions about Schneider Electric's future plans and commitment to ClearSCADA. All of the assurances in the world are of little real value, as sometimes the actions of a company contradict the rhetoric.

We are pleased to report that Schneider Electric is committed to the advancement of ClearSCADA through ongoing investments in product development initiatives. These engineering efforts will provide new features, improvements to existing features and tighter integration with the SCADAPack and Trio product lines. Schneider Electric recognizes the power of ClearSCADA as an integrated platform with real-time database, OPC Client/Server, built-in redundancy and alarm and trend engines. This platform provides the opportunity to be an industry leader in the remote SCADA arena. Further, since Control Microsystems has been integrated within Schneider Electric as a new entity under the name Telemetry & Remote SCADA Solutions, it is clear that Schneider Electric understands that the SCADA market has a bright and expanding future and that Control Microsystems

has been setting an aggressive pace for the development of technologies for our competitors to try to match.

If you have been reluctant to consider ClearSCADA as the host application for your SCADA system due to concerns about the product's future, set those concerns aside and take a look at the future of SCADA today. Test drive our latest release of ClearSCADA 2010R2 with Exciting New Features and Enhancements:

- Significant improvements to server performance
- Max database size increased to 900,000 objects
- Worked with security partners to identify and improve security
- DNP Slave driver is conformance tested - The Triangle Microworks DNP3 test harness has been used to improve the conformance of the DNP3 slave driver
- SCADAPack E driver is updated to support new features in the 7.82 firmware version
- Importing SVG text elements improved - The SVG import now supports elements, which significantly improves the appearance of imported text elements.

Telemetry & Remote SCADA Solutions

ClearSCADA

Enterprise Software



Remote Management of Critical Infrastructure

Schneider
Electric

STANDARD MAIL
 US POSTAGE PAID
 PERMIT 191
 SANTA ROSA CA

SAVE A TREE
 Return Service Requested

The Sage Advisor






SCADA, SECURITY & AUTOMATION NEWSLETTER

Calendar of Events

- September 21-22, 2011 **CWEA Northern Regional Training**, Redding, NV
- September 27-28, 2011 **Tri-State Seminar on the River**, Primm, NV
- October 17-19, 2011 **WEFTEC.11**, Los Angeles, CA. *See us at the Schneider Electric booth.*
- October 18-19, 2011 **CA-NV AWWA 2011 Fall Conference**, Reno, NV
- October 24-27, 2011 **ClearSCADA Training Course***, Mill Valley, CA. 
- November 1-3, 2011 **SCADAPack - Telepace Studio Ladder Logic Training Course***
Mill Valley, CA. 
- November 9, 2011 **SCADAWise Basics 1/2-Day Course**, Roseville, CA 
- November 9, 2011 **SCADAPack Basics 1/2-Day Course**, Roseville, CA 
- November 15-18, 2011 **USCID Sixth International Conference on Irrigation & Drainage**
San Diego, CA
- December 7, 2011 **SCADAWise Basics 1/2 Day Course**, Visalia, CA 
- December 7, 2011 **SCADAPack Basics 1/2 Day Course**, Visalia, CA 
- February 7-9, 2012 **SCADAPack - Telepace Studio Ladder Logic Training Course***
Visalia, CA. 
- March 5-8, 2012 **ClearSCADA Training Course***, Visalia, CA 
- Apr 2-5, 2012 **CA-NV AWWA 2012 Spring Conference**, Santa Clara, CA
- April 17-20, 2012 **CWEA AC 2012 Annual Conference**, Sacramento, CA

* Download the registration form from our website or call for more information.

SAGE DESIGNS, INC.
SCADA & Security Products

 <small>Scada & Security Solutions</small>         	<p>SCADA ClearSCADA Enterprise Software SCADAPack RTU/PLC Controllers FlowStation Pump Controllers WIN-911 Alarm Notification Software</p> <p>WIRELESS TRIO Spread Spectrum & Licensed Radios Firetide Broad-Band Mesh Network Teledesign Systems VHF & UHF Licensed FreeWave Spread Spectrum Serial & Ethernet</p> <p>SECURITY Analog & IP Cameras, Video Surveillance Hardware & Software PureActiv Video Analytics & Camera Management</p> <p>MS4 PERMITTING SOFTWARE CBI Systems, Ltd MS4 Permit Manager™ & MS4web™ software</p>
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