The Sage Advisor

SCADA, SECURITY & AUTOMATION NEWSLETTER

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Using DNP3 to Solve Oil & Gas and Water Remote SCADA Communication Challenges

Originally developed for the electrical power industry, the DNP3 protocol has expanded over the last two decades into industries such as Oil & Gas, Water & Wastewater and Transportation, among others. It has evolved over time with functionalities and capabilities added as the demands of the industries changed and developed with new technologies and requirements. In many areas it has been adopted as a standard.

Standardization and Interoperability

Since it is an open, standards-based protocol, devices using DNP3 are required to use common data types and a very organized data structure, ensuring that all devices handle and present data in the same way. As a multi-layered protocol, each layer is responsible for a specific function so that when communicating with a partner device the interoperability of the two devices is guaranteed.

DNP3 also uses subsets that define a device's minimum requirement for functionality. Four subset levels are defined for a range of device capabilities from small instruments, such as fixed function devices, to large multi-purpose RTUs. The result is that vendors' devices conform to one or more of the four subset levels, allowing them to communicate with other devices on at least one of the levels. This interoperability supports many types of network architectures and can accommodate a mixture of legacy, new and future equipment.

Flexible Communications

The flexibility of DNP3 is based on the timestamping and meta-data capabilities of the protocol. Data that is timestamped allows the user to determine the sequence of events and the time of actual process events, such as the start and stop times of equipment. Reliable data transmission is achieved through the use of timestamping, since data can be stored in an RTU in the event of a network problem and re-transmitted once the system is operational.

Meta-data carries additional and meaningful information with the data. For example, DNP3 can be used to report not only a value and timestamp, but also the quality of the data being reported. Data can also be classified into different priority groups known as 'Classes'.

Not all data needs to be collected on a continuous basis. The use of timestamping and meta-data allows operators to optimize the throughput limits of their communication channels by defining thresholds and rules for data transfer.

The resulting reduction in bandwidth is not only particularly important for slow communication links, but is also relevant for the freeing up of bandwidth to extend network expansion, or for other system functions such as peer-to-peer communications, maintenance access, or remote configuration. Time synchronization throughout the communication network allows for greater scheduling accuracy and the potential for energy optimization when correctly aligned with a high power-consuming event.

Critical data and alarms can be sent immediately using a mechanism known as unsolicited reporting, regardless of other pre-scheduled or standard data transfer streams. This allows fast response from upstream or downstream operations.

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Schneider Electric

Telemetry & Remote SCADA Solutions

New Features of WIN-911 & Mobile-911

With the release of WIN-911™ Version 7.13, Specter Instruments introduced version 2.0 of Mobile-911 for Apple™, Android™ and BlackBerry™ smart phones. Mobile -911 Version™ 2 leverages secure cloud based technologies to alert users of critical alarms, utilizing limited bandwidth and secure encrypted HTTPS protocol.

The Mobile-911 app is designed to allow your team to view alarms on a dedicated summary screen. It also offers you the ability to easily acknowledge alarms, view the status of any active alarm, request WIN-411® Reports from a list of pre-configured reports and monitor the health of WIN-911®, all from your smart phone and with a single key press!

The City of Victorville, California has used WIN-911 for a number of years and has recently upgraded to the new Mobile-911. This is what Mr. Jeff Zizzi, Telemetry Coordinator for the Water District, had to say:

"We have found WIN-911 to be an invaluable tool for monitoring our system. With more than 40 wells, 4 treatment plants, three booster pump stations and 12 tank sites, it has proven itself many times to be a time and personnel saver. We can run the entire system on weekends with little more than 4 people. The alarms are sent directly to the person responsible and with the ClearSCADA being available on the internet, the operators can quickly resolve most problems without even leaving their homes in the middle of the night. We have been able to save 5-15% on overtime."

The addition of Mobile-911Version 2 to the suite of notification methods, currently offered with WIN-911, enhances the ability to get critical alarm and process information to personnel in the field, eliminating down time and saving money.

Please contact Sage Designs or visit www.specterinstruments.com for more information.

Inside This Issue

Advanced ClearSCADA Training in California

Rarely scheduled in California, Sage Designs is co-hosting the Advanced ClearSCADA (Level 2) Training Course with Schneider Electric Telemetry & Remote SCADA Solutions (SETRSS) from November 6-8 in Fresno, CA . Asim Farooq, Host Software Application Specialist, will teach this 3-day course. On-line registration through SETRSS/ ClearSCADA website.

See page 3 for more details.

ClearSCADA Applets

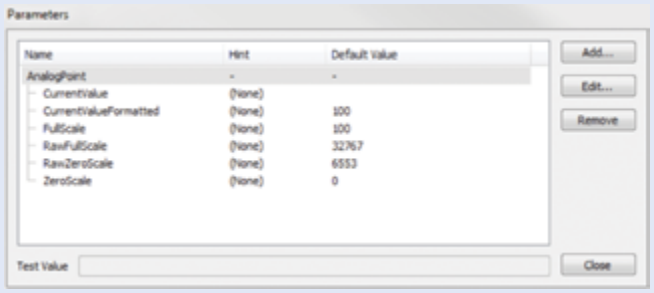
Display Formatted Value with Raw Counts Tooltip

A customer recently asked me how he could display the raw counts from a PLC's analog input point in a tooltip. I was a bit surprised to find that, despite there being upwards of 400 meta-tags in the OPC browser for a single analog input, the unscaled raw input was not among them. The best alternative was to create an animated symbol that back-calculates the value using the scaling and current value. The formula is fairly straightforward:

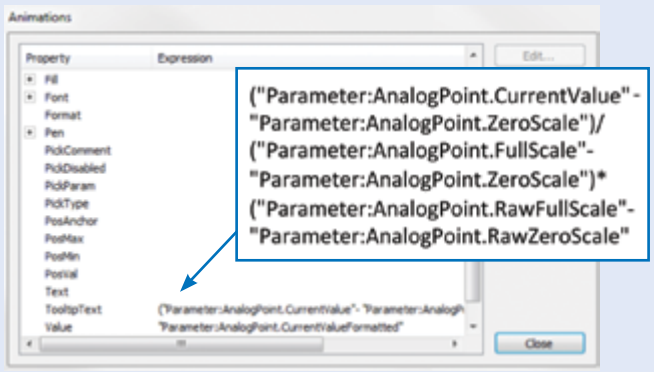
$$\left(\frac{\text{CurrentValue} - \text{ZeroScale}}{\text{FullScale} - \text{ZeroScale}}\right) * (\text{FullScale} - \text{ZeroScale}) + \text{ZeroScale}$$

The process from beginning to end would be:

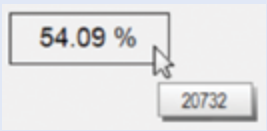
1. Create a new Mimic (probably in your "My Animated Symbols" group).
2. Create a Text Box with color, font and formatting that you like.
3. With the Mimic still in focus, select **Edit -> Parameters** and add as shown below:



4. Notice the Default Values which prevent a divide by zero error when you save.
5. Animate the Tooltip properties with the expression:



Once this has been saved, you can repeatedly drag and drop this symbol wherever needed, and drag a scaled analog value and drop it onto the selected symbol. In the Run mode, hover over the symbol and the raw counts from the analog point will be displayed in a tooltip:



Here's another tip: you can concatenate text with numerical values with the STR() command and have a more descriptive tooltip like :

'The raw analog input value is: ' + STR(("Parameter:AnalogPoint.CurrentValue"-"Parameter:AnalogPoint.ZeroScale") / ("Parameter:AnalogPoint.FullScale" - "Parameter:AnalogPoint.ZeroScale") * ("Parameter:AnalogPoint.RawFullScale" - "Parameter:AnalogPoint.RawZeroScale") + "Parameter:AnalogPoint.RawZeroScale").

For a copy of this applet, email your request to info@sagedesignsinc.com.

East Bay MUD Settles Into SCADAPack

Now that we have been working with Schneider Electric's SCADAPacks from Control Microsystems for over two years, we have learned a great deal about the hardware, DNP3 Protocol, and the service and support that comes with using these products. Our first exposure to Control Microsystems' SCADA products dates back to 1993, when we used several of the SMARTWire communications and expansion IO modules in end-to-end telemetry applications. Our early exposure to this product line, while a positive one, weighed little in our product evaluation for our RTU replacement project. Our decision to use the SCADAPack was purely a technical one, with the RTU Replacement Project team, consisting of staff from Operations, Maintenance, and Engineering, evaluating several products from different manufacturers. Once the evaluation was complete and the team members voted, we entered into a contract with Sage Designs to supply the 300+ SCADAPack 350/357 RTUs needed for the project over a period of 7 years. Since the first purchase over two years ago, we have tested the products, training, service and support many times and have found them to be positive.

SCADApacks have performed well in many demanding installations where environmental conditions are harsh, such as unconditioned enclosures out in the environment. On rare occasions, there have been hardware problems, but we have found the warranty service to be prompt and simple to navigate. The Telepace Studio programming software is simple and straightforward to work with and has many SCADA-friendly features built into the software. The SCADAPack's DNP3 protocol support has proven to be easy to configure, with enough flexibility to work with our Op/Net system's "work in progress" implementation of DNP3, which has allowed us to see the value inherent in the implementation of the DNP3 protocol. When we have had difficulties with the interface, Sage Designs has always been more than willing to provide on-site troubleshooting and configuration support to help us through the problems at no cost. In addition, we have also found the technical support at Control Microsystems to be quick to respond, complete in their answers and without a hand extended for a credit card or PO for each issue.

All in all, we have found both the local and factory support to be of incomparable quality and have proven to be invaluable partners to East Bay MUD in our ongoing projects.

— Andes Tang, P.E., Senior Electrical Engineer Program Manager East Bay MUD

SAGE DESIGNS, INC.
SCADA & Security Products

Earn Contact Hours

Schneider Electric
Telemetry & Remote SCADA Solutions

SCADAWise™ Training Classes

ClearSCADA

SCADAPack

ClearSCADA Level 1 Training Course

October 22-25, 2012 - Mill Valley, CA (TBA)
March 18-21, 2013 - Ontario, 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)

Telepace Studio Training Course

October 16-18, 2012 - Mill Valley, CA
March 5-7, 2013 - Ontario, 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)

ClearSCADA Level 2 Training Course

November 6-8 - Fresno, CA

Day 1 (8AM– 4PM)	Installation, Understanding the Architecture of ClearSCADA, Application Design Considerations, Server Automation Interface, ClearSCADA Logic Engine, Using ODBC and SQL with ClearSCADA
Day 2 (8AM - 4PM)	Advanced Mimic Design and Techniques, Data Grids and Data Tables.
Day 3 (8AM - 1PM)	Accessing Historical Data, Ad Hoc trends, Archiving

Prerequisite: ClearSCADA Level 1 Training Course

Cost: ClearSCADA Level 2 Training Course $1,420

Instructor: Schneider Electric Telemetry & Remote SCADA Solutions factory trainer.
On-line Registration: https://www.clearscada.com/forms/training/advanced-training-registration/

Instructors: ClearSCADA Level 1 & Telepace classes will be taught by Tony Sannellla, Sage Designs, a Factory-Certified Instructor. The ClearSCADA Level 2 class will be taught by a SETRSS training 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.*

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

SAGE DESIGNS, INC.
SCADA & Security Products

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

*** * * Registration Deadline: 4 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.

Using DNP3 to Solve Oil & Gas and Water Remote SCADA Communication Challenges

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Security

DNP3 achieves security through the use of both encryption and authentication. Security is provided for data transmission through the use of the AGA12 standard, where the original data is combined with a security key to encrypt the message and make it unintelligible to anyone without access to the original key. Authentication provides security for critical actions such as controls and configuration changes by preventing unauthorized users from making changes to the system through the use of a request-challenge-response sequence.

Strong User Support

Since its establishment in 1993, the DNP Users Group has grown to include hundreds of members from both the vendor and user community. This mix of users and vendors increases the level of awareness of DNP3 and allows for more rapid development and acceptance of new extensions to the protocol. It also ensures that developers are working toward enhancements that are meaningful to end-users. With such a broad base of users supporting industry standards and the trend away from proprietary solutions, DNP3 will have continued growth and success.

Customer Challenges in Remote SCADA Communications Data Integrity and Reliability

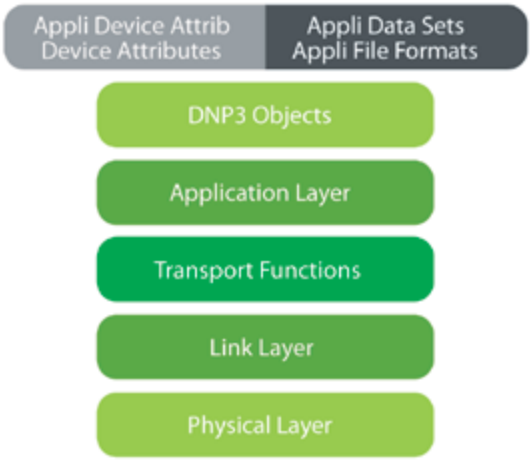
Historically, there have been challenges in guaranteeing the reliability and integrity of data across remote communication networks due to lost messages, occasional communication outages and uncertain operations in the face of adverse weather conditions. This problem is particularly relevant in the oil and gas industry, where remote data accessibility and maximum data availability are critical for maintaining a clear picture of how individual assets such as well heads, pads, and rod pumps are operating. Similar advantages are provided in the water and wastewater industry for assets such as pumping stations, tanks, zone pressure control, and so on.

Through the use of meta-data, information about the data other than a simple value, such as alarm status or the data quality parameters, can be transmitted. When combined with data quality indicators and the ability to timestamp an event, it is no longer a problem if a remote communication system loses messages or goes down. Data can be stored in the RTU until the communication system is available with the timestamp information accurately placing the event in time and sequence. When used with a suitable remote SCADA master station, all events can be properly back-filled in the event audit and historical trending databases. The data is dealt with using the information contained not only in the value, but also in the meta-data attached to it.

Since a remote SCADA system is not able to communicate with all devices at once, the use of traditional protocols often required the systems to wait until it was a device's turn to 'speak' before the central SCADA would be aware of a problem. In larger systems, including wastewater systems with networks that support dozens to thousands of remote stations, a significant time could pass before a specific station got its turn to 'speak'. Using unsolicited messaging, fault alerts, or other event data collected by the RTU can be sent immediately to the central SCADA system, ensuring the relevant information is received in a timely manner and operations personnel have a complete, accurate picture of the problem that has occurred.

Dynamic Systems Environment

Managing a dynamic system is an essential aspect of modern asset optimization: dealing with, anticipating and accommodating the ongoing changes and upgrades that continually occur. This is particularly true in oil and gas production, which thrives on continual improvement and achieving the highest level of production efficiency. Similarly, water & wastewater systems



expand in size with growing population, are upgraded for better operational performance, and are renewed in rolling asset replacement programs.

Whether migrating to a new central monitoring and control system or adding new devices or processes to an existing system, the strength of the DNP3 protocol is its flexibility and scalability. DNP3 is extensible, which allows configuration to be easily extended to new devices and have all systems running and communicating when migrating from the old system to the new. Files, configurations and control logic program changes can all be transferred to RTUs for a great deal of flexibility within a secure and reliable framework.

Amalgamation of Previously Separate Systems

Before the advent of standardized protocols, system managers often struggled with having multiple devices that were unable to communicate with each other due to proprietary protocols developed by individual vendors. It was often impossible to communicate with legacy equipment, have older and newer equipment interact, or support old and new devices in a unified system. Through the use of the multi-layered protocol architecture and functional subsets that define the minimum functionality level that a device is required to provide, systems deploying DNP3 have successfully addressed these challenges.

Vendors' devices conform to one or more of the four DNP3 subset levels that allows them to communicate with other devices on at least one level. This is a key enabler for interoperability when integrating new equipment during system expansions and upgrades. The open DNP3 protocol drastically reduces the cost of installing a new system and extending or upgrading an existing system when devices are able to communicate, regardless of their age and feature set.

Standardizing the Transmission of Time-Series Data

Taking gas production or pipeline gas transportation as an example, in order to facilitate the transmission of time-based records, Modbus protocols were often significantly customized to allow for the transport of required historic and audit data over the network. Legislative requirements for audit and time-series data, in particular through API standards, often resulted in a solution of complex proprietary extensions to existing industrial control system protocols.

One of the early motivators in developing the DNP3 protocol was a market need for standardization. In the example of time-series data, the standardization of DNP3 brings significant benefits by avoiding individual vendors drastically customizing protocols. Standardizing the way that time-series data is transmitted mediates some of the problems associated with delivering the data required by legislation. The time-stamping capability of DNP3 provides a big step towards realizing a standard way for the increasing industry requirements for performance and audit data.

Control Integrity

When controlling a remote process from a central location, it can be difficult to determine if or when a desired control command has been carried out. Historically, when remote locations were

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How can I efficiently manage and operate my remote assets?

ClearSCADA is an open, scalable and integrated SCADA software for telemetry applications

High performance SCADA at lower cost

Dedicated to measuring, controlling, monitoring and collecting data across geographically dispersed field operations, ClearSCADA is recognized as one of the most innovative, flexible and complete SCADA host platforms available today. From a built in historian to alarm redirection, from object-based templates to multi-developer environments, ClearSCADA is designed to control operational costs through quick deployment and reduced down time, all in a secure, easy to use environment.

Operate a reliable and secure system in chall;enging environments

Whether it is in critical infrastructure such as oil and gas, water and waste water, or renewable energy, ClearSCADA ensures continuous operations and data flow in the event of infrastructure failure. Reliable and secure data is ensured through redundant communication paths, seamless backfilling of buffered RTU data, server redundancy and communication encryption. System access is monitored and controlled down to the object level and the built-in event log provides a complete audit trail of operational actions, alarms, and events.

Powerful Feature Set for Telemetry & Remote SCADA Solutions

Open	Easily integrates to 3rd-party infrastructure, business and IT systems
Scalable	Facilitates SCADA system expansion with flexible point counts, server redundancy and client licenses
Reliable	Ensures continuous operations and data flow in the event of infrastructure failure
Secure	Provides scalable security permissions to individual users and groups, physical assets and system commands

Make the most of your energy℠

Try the free ClearSCADA Demo
Visit **www.clearscada.com**

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FCC Narrow-band License Changes Coming Soon

25 kHz to 12.5 kHz Bandwidth Re-farming is a Fact

On January 1, 2013, all public safety and business industrial land mobile radio systems operating in the 150-512 MHz radio bands must cease operating using 25 kHz efficiency technology and begin operating using at least 12.5 kHz efficiency technology. This deadline is the result of an FCC effort that began almost two decades ago to ensure more efficient use of the spectrum and greater spectrum access for public safety and non-public safety users. Migration to 12.5 kHz efficiency technology (once referred to as Refarming, but now referred to as Narrowbanding) will allow the creation of additional channel capacity within the same radio spectrum and support more users.

After January 1, 2013, licensees not operating at 12.5 KHz efficiency will be in violation of the Commission's rules and could be subject to FCC enforcement action, which may include admonishment, monetary fines, or loss of license.

For further information, please visit: FCC Web Site

What you need to do

- Develop a migration timeline
- Select the migration path (license or license-free radios, Ethernet, serial, etc.).
- Complete a network design for installed devices with the new equipment.
- Complete a new path study.
- Calculate deployment costs/ budget for the migration
- Pilot the new technology
- Execute the migration plan

How We Can Help

- Replacement system recommendations
- Path Studies
- Field Studies
- Product Supply

Using DNP3 to Solve Oil & Gas and Water Remote SCADA Communication Challenges

Continued from page 4

strictly supplying monitoring data, loss of data was inconvenient. In today's remote systems, reliable control is critical for operational, financial and security reasons. The strength of DNP3 is that it has a high integrity control model for sending control commands.

An example is the instance of a gas wellhead using a sales valve. It is one thing to send a signal for the wellhead to close but having rapid feedback to indicate that the valve has operated as required is now necessary for functionality. By concise communication processes (such as Select Before Operate controls and output event reporting) between the central SCADA system and the remote field devices, accurate data is provided that reflects and verifies the correct delivery of controls. Further, precise indication on the correct process response is also provided through standard DNP3 mechanisms (input events with timestamping).

Remotely Monitoring Widely Distributed Equipment

The communication of data between field operations and the control room becomes critical when managing multiple remote sites.

The use of meta-data optimizes communication between RTUs and other intelligent system equipment with the RTU determining the priority and importance of the collected data it receives and sending alarm messages or prioritizing transmission based on that content. Prioritized data can be sent through to the master station using unsolicited messaging for rapid feedback. The self-describing feature of the meta-data gives operators a timely view of quality problems that may have occurred, with relevant details (for example, an instrument that is reading over-range or that has gone offline).

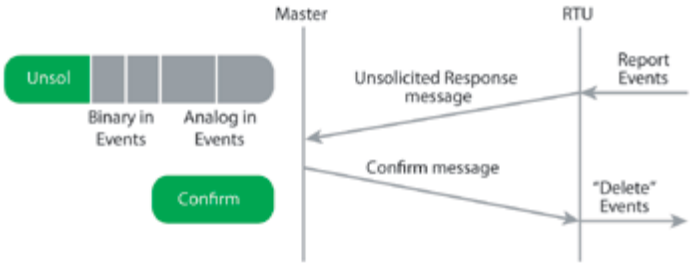
Communication optimization also occurs through bandwidth control. Source and destination device addressing supports multiple masters, peer-to-peer communication, routable and unsolicited messages. This can free up bandwidth, allowing communication capacity for additional devices and systems to be added without having to upgrade the entire communication network.

When combined with object-oriented remote SCADA, DNP3 facilitates the completion of operations on a mass scale that previously had to be done on an individual basis. Functions that can be coordinated remotely include logic applications, debugging, diagnostics and RTU configuration either through a dedicated development environment or through SCADA host software.

Schneider Electric

Telemetry & Remote SCADA Solutions

- Unsolicited event data
  - Field device initiated
  - Delivery Confirmed from Master Station
  - Ensures fastest notification of high priority data
  - Native Collision Avoidance mechanisms



Regulatory Compliance

Oil and natural gas production and distribution, the supply of potable water, and the handling of wastewater all have increasing requirements for operational safety, compliance with environmental regulations and the overall security of assets. Industry requirements for both performance and audit data require that data transmission be accurate, consistent and reliable. Timestamping of data and events, to ensure that there is no data loss, is critical when ensuring the correct data is available and calculated for compliance reporting. Smart RTUs, when used with the DNP3 protocol and remote SCADA software, offer automatic data back-filling in case the communications network to the host is interrupted. The added value in the data attributes sent in the meta-data allows for more detailed and comprehensive data.

Doing More With Less

Oil & gas production and transportation organizations, and water and wastewater organizations are continually under pressures to provide increased performance, at the same time as having decreasing manpower and a limited budget to accomplish their goals.

Reliable data, provided from the source at remote installations through to the control room and to the business through enterprise systems, can be used by nearly every part of the operations team to improve efficiency and reduce the overall cost of ownership. Operators have access to all assets from a single point. Maintenance staff has accurate reliable data to pin-point problems for expediting fast repairs. Automation technicians have access to control data and standardized communications for rapid deployment when required. Production supervisors can meet regulatory compliance and produce timely production data for delivery commitments and forecasting. Production analysts receive high resolution operational measurements. In gas production this can include detailed plunger arrival logs, accurate gas measurement, and so on. Asset managers can maximize production; for example, through new gas opportunities during flow-back periods with same day measurements.

Conclusion

Designed specifically for telemetry applications, the DNP3 protocol has features that provide:

- Standardization and Interoperability
- Flexible Communications
- Security
- Strong User Support

The communication challenges in the Oil & Gas and Water & Wastewater industries that these features specifically address include:

- Data Integrity and Reliability
- Dynamic Systems Environments
- Standardizing the Transmission of Time-Series Data
- Amalgamation of Previously Separate Systems
- Control Integrity
- Remotely Monitoring Widely Distributed Equipment
- Regulatory Compliance

— By Philip Aubin, Schneider Electric - Telemetry & Remote SCADA Solutions

8 CAMERA TIPS FOR PROTECTING WATER FACILITIES, PART 1

Water facilities manage essential resources. Protecting those resources and protecting against misuse of materials used in the related processes is critical. Many guidelines have been released about what security measures should be considered when protecting such facilities. However, the details involved with making these measures a reality are often missing. Whether you are security professional trying to secure the physical assets of your company, or a consultant / integrator helping a security professional, knowing a few key tips can go a long ways in ensuring that the implementation meets the objective. Here are 7 camera tips to consider as you begin to either roll out your new security measures or review your existing ones.

1. Understand the Camera Sensor you intend to use. – Several characteristics of the selected camera sensor have a major impact on the placement and resulting coverage:

a. Lens: This is where most people start. Do you want a wide lens? Not a problem; just remember that widening the view essentially dilutes your pixels. You only have so many pixels and by widening the field of view you are spreading the same number of pixels over a wider area. The net result is that widening the field of view reduces the achievable detection distance. Or perhaps you desire a real narrow lens to effectively increase the detection distance? Also not a problem; but don't forget to think about the intended target size and speed. A narrow field of view means that the intended intruder has a shorter span of video to get across before being out of the camera view. The worst case scenario occurs when the intruder is very close to the camera. For most applications, the lens choice should give you enough scene width to allow ample time to detect your intended intruder type at its maximum expected speed near the camera.

b. Resolution: Higher resolution cameras give you more pixels, which in turn provide the ability to "see" greater distances, both with an operator at the helm or through the aid of a video analytics product. However, higher resolution can be costly, as it can have a major impact on your network usage, storage costs, and processing requirements. The key is to understand what resolution you require. To do that, you need to know the smallest target you want to detect (human, car, etc), how far away you want to detect that object, and how many pixels of resolution are required by your video analytics software or the eyesight of your security folks to be able to "see" that object at the desired distance. Once you have that information, you can then go back to the camera specification and determine whether it can provide you enough pixels to accommodate. If not, you may consider going to a higher resolution camera, a larger lens, or decreasing your required distance.

c. Image Sensor Size: You've looked at the camera specification sheets and noticed some say ¼" CCD, and others say ½" CCD. Always super-size, right? Perhaps, but suffice it to say that the camera sensor size impacts the resulting image of the camera. Most camera range calculators will assume you are using a ¼" CCD sensor. If you are not, then you should probably touch base with your local camera layout expert to understand the effects of different size CCDs.

2. Consider the Terrain: In addition to obvious obstructions, such as trees and buildings, don't forget to consider terrain variations, such as rolling hills, that may impact your blind zone calculations. Ditches and culverts can also prove to be a problem (See Figure 1). Another obstruction that is often overlooked is the perimeter fence itself. Looking through the fence can be very problematic based on the angle of the view and the type of fence in question. Even a chain link fence can appear solid when viewed from particular angles at certain times of the day.

3. Don't Forget to Check your Blind Zone - Every camera has a blind zone. The size of that blind zone is determined by the camera lens, the mounting height of the camera and the mounting angle. Simple geometry will allow you to determine the effective blind zone of each camera. In simple terms, if you assume a human target, the blind zone begins at the mounting location of the camera. As the person walks away from the camera, the blind zone ends at the point where you can see their entire body in the video. This is a pretty straight forward concept when you have one camera following another camera along a fence line. Mistakes occur when the coverage takes a turn; for example, at the corner of a property. The next camera is often placed directly at the corner, making it very difficult for the previous camera to cover the blind zone of the previous camera. In these cases, the camera may need to be moved away from the fence corner to insure coverage.

To be continued next issue

PureTech SYSTEMS™

PureTech Systems Inc. is a manufacturer of wide-area perimeter surveillance software solutions including internally developed outdoor video analytics, PTZ Auto Follow, multi-sensor integration and a map-based (real object size) command and control. www.puretechsystems.com

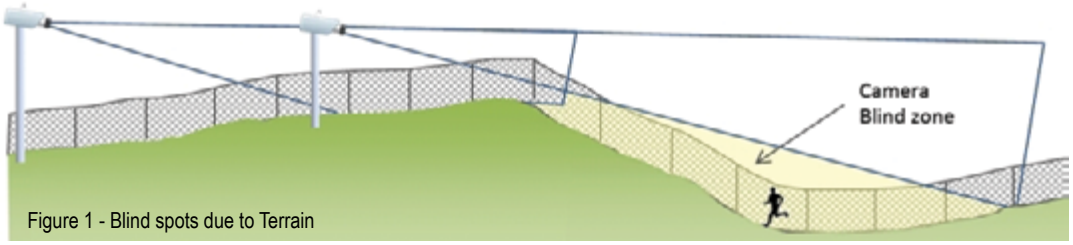


Figure 1 - Blind spots due to Terrain

Securing the data path from Source to Enterprise

Few industries require security more than those concerned with the protection of water resources and the treatment of water and wastewater. While the use of remote monitoring and control in critical processes continues to evolve, so does the need for enhanced security. Whether it is a measured value or control action at a field device or the data path to the host, informational integrity can only be realized through end-to-end data security.

Protection that Starts at the Source

Using the DNP3 protocol with AGA12-2 message encryption helps to ensure data is not tampered with over remote connections from the RTU to the SCADA host. Encryption is used to essentially randomize data, so that third parties cannot view the data in a useful way. Generally, RTUs that are monitoring-only stations do not require security unless the data monitored could be of value to competitors, or if the data contains billing or pricing information.

Schneider Electric offers AGA12 and full DNP3 level 4 support in its line of SCADAPack E Smart RTUs and the SCADAPack E may used in a mixed DNP3 SCADA network of both encrypted and non-encrypted RTUs as required by the application. About us: Schneider Electric, Telemetry & Remote SCADA Solutions, is a global supplier of remote automation solutions for SCADA systems in oil and gas, water and electrical utilities applications. Solution components include Accutech wireless instrumentation, SCADAPack Smart RTUs, Trio long-range data radios, and ClearSCADA enterprise software. All products are engineered to operate in harsh, unattended environments

delivering higher productivity and efficiency while reducing operational costs across a wide area infrastructure.

For more information visit: www.controlmicrosystems.com.

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SCADA, SECURITY & AUTOMATION NEWSLETTER

Calendar of Events

September 12-14, 2012	**CWEA Northern Regional Training**, Modesto, CA
September 25-27, 2012	**Tri-State Seminar on the River**, Primm, NV
Sept. 29 - Oct 3, 2012	**WEFTEC.12,** New Orleans, LA. Visit our manufacturers' exhibits.
October 8-11, 2012	**CA-NV AWWA 2012 Fall Conference**, San Diego, CA
October 16-18, 2012	**SCADAPack Telepace Studio Training Course***, Mill Valley, CA.
October 22-25, 2012	**ClearSCADA Level 1 Training Course***, Mill Valley, CA
October 30, 2012	**ISA Automation OC Expo & Oktoberfest**, Huntington Beach, CA
November 6-8, 2012	**ClearSCADA Level 2 Training Course***, Fresno, CA
November 13-16, 2012	**USCID Water Management Conference**, Reno, NV
March 5-7, 2013	**SCADAPack Telepace Studio Training Course***, Ontario, CA.
March 18-21, 2013	**ClearSCADA Level 1 Training Course***, Ontario, CA
March 22, 2013	**United Nations World Water Day**
March 25-28, 2013	**CA-NV/AWWA 2013 Spring Conference,** Las Vegas, NV
April 16-19, 2013	**CWEA Annual Conference 2013**, Palm Springs, CA

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