The Sage Advisor

SCADA, SECURITY & AUTOMATION NEWSLETTER

Video Analytics, Remote Storage & Stabilized Video in One NEMA3 Package

By: Eric Olson, Director - Product Management, ICx Vision Systems

The Scene Analyzer, designed by ICx Vision Systems, formerly PureTech Systems, is an environmentally rugged edge video device that turns existing cameras into intelligent vision sensors through the use of embedded video analytic algorithms. Now, in addition to controlling PTZ cameras and managing video data over bandwidth limited connections, it also possesses the ability to store multiple days of recorded video and alarm information at the remote site. This feature provides the user a way to keep video off the network until such time that it is needed for interrogation or review.

A typical example of where the Scene Analyzer might be used is at a remote site. Utilizing video analytics, the Scene Analyzer can independently monitor the site and capture video information of an alarm event. That alarm is then saved on the device until the user logs back onto the system or the alarm may be automatically sent to the PC-based client. After reviewing the alarm images, the operator now has the choice of downloading recorded video to further review footage surrounding the alarm. When video is selected for download, the Scene Analyzer will efficiently route the video to the client workstation for review.

Additionally, video stabilization has now been added to the device. This feature allows for clear video viewing of cameras that are subject to motion due to marginal installs, windy conditions or vibrations.

Using software algorithms, the Scene Analyzer stabilizes the shaky video for easier viewing by the user. The resulting stabilized video is then available in the live, recorded and alarm video. This same functionality can augment existing DVRs, stabilizing video before inputting to the DVR or other video device.

In addition to state-of-the-art video surveillance, the Scene Analyzer also offers many integrated capabilities. External I/O allows for the integration of devices such as fence detection systems, gates, locks, lights and local alarms. These devices can be used as additional input logic to minimize false alarms or can be activated by the identification of a threat. Similarly, the Scene Analyzer's open interface allows for integration into existing DVRs and other command and control systems.
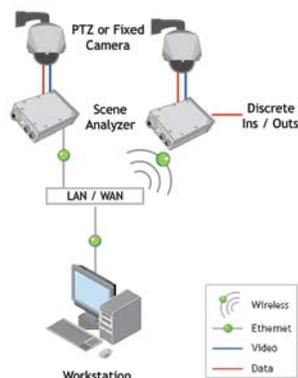
The SCADAWave J-Series Ethernet Spread Spectrum Radio Line

By: JL Betts, US SCADAWave Sales Manager, Control Microsystems

Control Microsystems is proud to announce another addition to its SCADAWave line of industrial radios — the SCADAWave J-Series Ethernet spread spectrum radio. Available in the ISM Band at both the 1-watt 902-928MHz Band (JR50), as well as the 0.5-watt 2.4GHz band (JR240), the J-Series radio allows for maximum flexibility and global compliance for today's demanding wireless Ethernet networks.

The SCADAWave J-Series combines class-leading performance while allowing cost-effective implementation of even the most complex wireless SCADA and Telemetry solutions.

Some of the many outstanding features which make the J-Series unique:

Highly Versatile Operational Capability

- Point to Point (PTP) and Point to Multi-Point (PTMP) operation
- Configurable personality: Access Point (Master)-Remote-Bridge-Repeater
- No restriction on the number of radios in any system
- Repeater and Bridge configurations support locally connected user devices
- ChannelShare™ collision avoidance for unsolicited remote transmissions allowing simultaneous polling and spontaneous reporting

Extended Radio/Modem Performance

- Configurable 512kbps/256kbps over-the-air data rate
- Robust Frequency Hopping Spread Spectrum technology
- Advanced error free data delivery with CRC plus selectable FEC and ARQ
- Multi-Master synchronization mode for interference reduction with co-located master radios
- High VSWR protection

CONTROL MICROSYSTEMS

Highly Adaptable Ethernet Interfacing, Control and Transmission

- 2 independent Ethernet ports (Auto MDI/MIDX)
- 10/100Mbps auto-detecting interface
- Supports UDP, TCP, DHCP (auto/manual), ARP, ICMP, STP, IGMP, SNTP and TFTP protocols
- IEEE 802.3 including Dual Port Ethernet Bridging
- 802.1Q VLAN Support
- Legacy RS-232 serial support via embedded terminal servers for both radio serial connections

MAY SEMINARS

Sage Designs is hosting three seminars in May which will feature some exciting new products from Control Microsystems, including the new TelePACE Studio software and the soon-to-be-released FlowStation Lift Station Pump Controller. We will also be offering a special seminar price for TelePACE Studio. Sign up for a seminar using the form inside or found on the Events page of our website.

Inside This Issue

Achieving Broadband Data and Video Rates with 900 MHz Wireless Mesh

SCADA applications can break through typical low-bandwidth boundaries, even without line-of-sight, using the latest wireless mesh network technologies.

By: *Jeff Butler, Firetide*

Every so often, a technology comes along that makes something seemingly old new again, and changes our thinking about how we might repurpose a substantial amount of existing assets. Los Gatos, Calif.-based Firetide Inc., for example, will soon introduce 900 MHz wireless mesh technology that practically redefines the use of the frequency band.

Ask virtually any wireless network integrator what bandwidth ceiling they expect from 900 MHz SCADA products and you'll likely hear something around the 100 Kbps (real) to 1 Mbps (in your dreams). But what if the frequency could not only break that ceiling, but also support broadband levels of up to 26 Mbps throughput for both video and data, even in NLOS (non line of sight) deployments?

Just a few years ago, if I said this kind of performance was just down the road, you might think I had been hitting the gin. In my view, we've become overly conditioned to accept the 900 MHz band as only capable of supporting applications with very low data rates. Let's take a look both at how Firetide is able to reinvigorate the band.

Bandwidth Boost: How 26 Mbps Is Possible

I can't give away the exact recipe of Firetide's secret sauce, but the company improves performance within the 900 MHz band (specifically 902- to 928 MHz) using a handful of innovative strategies. For one, the organization has spent quite a bit of development time fine-tuning 802.11 a/b/g radio drivers to specifically suit the 900 MHz spectrum. Secondly, since the band's radios are sensitive, Firetide has paid special attention to enhanced noise reduction. While these approaches provide significant performance boosts on their own, where Firetide really makes strides has to do with its highly optimized, radio-agnostic "Auto Mesh" routing algorithms.

I wrote about wireless mesh as it pertains to SCADA in the Fall 2008 issue (See *Wireless Mesh: New Approaches for SCADA Management, Security*), but just how mesh is relevant bears repeating briefly here. By definition, wireless mesh networks are self-healing, not to mention reliable experts of traffic management. If a network node fails or even momentarily drops off (when an antenna gets knocked out during a lightning storm, for example), mesh modes contain enough intelligence to reroute data over a different path to ensure it arrives at its final destination without delay.

Firetide's Ethernet-based wireless mesh solutions, in particular, include layers of built-in routing savvy that not only ensures data gets securely to where it's intended to go, but gets there as quickly as possible using advanced load-balancing techniques. Usually, the 900 MHz band is much better at dealing with geographical challenges (such as trees and hills) than the 2.4 and 5 GHz spectrums, but where even 900 MHz radios struggle, Firetide mesh makes LoS a non-issue. Even if two direct nodes can't "see" one another, no problem—mesh ensures the next quickest path is engaged.

Applications

In the 902- to 928 MHz range, Firetide mesh can segment sections to achieve up to 26 Mbps (for UDP), 14 Mbps each over up to two 10 MHz segments, and up to 7 Mbps for each for up to four 5 MHz segments. Where SCADA applications are concerned, enormous speed increases and the elimination of LoS requirements open up a whole new world of possibilities.

I touched on video security and network management in the aforementioned Fall 2008 article. Other applications that link site networks into larger LANs or WANs, that introduce voice communications (for security or emergency repair purposes, for example), or that retrieve video and data from remote sites and deliver it to central SCADA displays along multiple paths in case of a repeater failure, are just a few of the compelling new possibilities introduced not just by mesh, but by greater access to higher bandwidth.

The bottom line: The 900 MHz band remains a highly valuable frequency, especially for sites that need to "get out of the canopy." Adding wireless mesh and broadband data rates to the spectrum will not only help organizations leverage a large amount of existing assets, but will also bring new innovation to a radio frequency once known for its limited throughput.

SCADAPACK32 Donation to Bakersfield College

By: *Sean Caras, Associate Professor, Electronics Technology Bakersfield College*

Thanks to a generous donation from Control Microsystems and the efforts of Sage Designs, a new generation of trained automation technicians will utilize current SCADA technology. Bakersfield College, a community college of almost 17,000 students in Bakersfield California, is the recipient of six SCADAPack 32 RTU's, software, and instructor training.

Our Electronics, Instrumentation, and Automation program has an enrollment of approximately 170 students per semester, many of whom are seeking certification and degrees in Electronics Technology, or are industry professionals seeking to update their skills. While we are well-equipped in the areas of industrial electronics, motors and controls, instrumentation and process control, and radio/telecommunications, the SCADAPack controllers will meet an industry-critical need.

Our Instrumentation/Process Control Trainers are currently stand-alone systems, utilizing simple PID controllers. The SCADAPacks will be interfaced to the process control trainers, allowing more advanced process control functions to be simulated with our trainers in an advanced-level course. We hope to purchase radios for each of the donated SCADAPacks, and set up a SCADA system utilizing our five process control trainers to simulate an industrial environment. In addition, we are hoping to purchase additional SCADAPack RTU's and radios to interface to variable frequency drive units in our motor controls lab, allowing a wider range of devices to be included in the SCADA system.

Through industry surveys we have taken with members of our local ISA

(International Society of Automation) section, we found that three-fourths of the respondents believed that Bakersfield College should expose our students to several different manufacturers for PLCs and controllers. PLC's and controllers will eventually be deployed in most of our classes in some form or another. Our PLC stock was previously dominated by one manufacturer.

The ClearSCADA software from Control Microsystems was highly recommended to us by one of our industry advisors, because they felt that the software's learning curve and user features would allow students to implement more advanced functions in a quicker time frame.

An additional advantage of the SCADAPack product has been the I/O simulator board provided that we will be able to use with our students. With every other industrial product we have deployed in our labs, it has been necessary to build input and output simulators and other items necessary for students to work with the product. With the SCADAPacks, we were provided with a complete setup that a student could use right from the box.

We, at Bakersfield College, are excited to have this current technology available to our students! Thanks to the generosity of Control Microsystems, and the support of Sage Designs, our students will soon be able to set up and manage a simulated industrial environment within our electronics labs using SCADA RTUs and software.

 # Texting Brings Alarms Home

Specter Instruments' WIN-911 Version 7.09 now includes SMS 1-Way or SMS 2-Way text messaging. This provides the most secure, reliable and timely notification option. WIN-911 uses standard GSM modems, eliminating the uncertainties of using the internet or an email connection.

SMS 1-Way is featured with all WIN-911/Basic software installations. Using a standard cell phone, SMS Text alarm messaging can to be sent to all "on duty" users.

SMS 2-Way is available with all WIN-911/PRO installations. This feature includes the ability to acknowledge individual alarms and request alarm status reports,

The user also has access to other items such as health status and manual text messaging with the WIN-911 Alarm Monitor.

Introducing Mobile-911 for Windows Mobile 6 and Blackberry Smart phones

The increasing use of Smart Phones in the workplace has offered an opportunity to develop Mobile-911. This powerful application enhances the WIN-911/PRO Remote Notification Software featuring 2-way SMS. Mobile-911 is designed to allow users to view and organize alarms on a dedicated summary screen rather than deciphering the alarms randomly interspersed with other text messages on basic cell phone. It also offers the ability to easily acknowledge alarms, view status of any active alarm, monitor health of the system and send manual text messages to the WIN-911 Alarm Monitor.

Mobile SCADA

The Challenge

Quite often, the types of SCADA systems that industrial and utility entities implement are designed with the desk-bound plant user in mind. Certain industries might have some challenges, such as setting alarm points from a mobile platform, e.g. PDA. For instance, when an oilfield operator gets a message that one of their oil well temperatures has exceeded an alarm threshold value, their Win-911® alarm system sends them an alarm that the engineer cannot deal with until he returns to a fixed SCADA station. What they really need is a SCADA system that is designed for a user working out of a truck.

When designing a SCADA system based on wireless communication between a SCADA Master Control Center and an Operator SCADA Client's Software, system architects must review the unique requirements of that system before they specify the requirements of the selected network. Many of these remote sites have coverage from cellular systems, but few use these wireless networks because of their questionable performance for critical SCADA applications.

We know of one customer using an iPhone 3G that utilizes a remote desktop application called *WinAdmin*. The SCADA Server is remotely accessed using a VPN (Virtual Private Network) connection to a company network and the WinAdmin application. Although this works well, it has the disadvantage of taking over the remote SCADA server, so no local user has access.

Another option is GPRS Communication. GPRS is a packet-data-switched technology that uses the same infrastructure as the GSM (i.e. Cellular Voice) network. With GPRS, the data to be transmitted is divided into packets before going to a wireless modem and then over the air. Typical data applications over GPRS include picture file transfer, video, Voice-Over-IP, and a variety of other commercial/industrial data uses.

Due to the growing popularity of both wired and wireless IP networking, SCADA systems have begun a migration to the "universal IP" highway. Some differences with IP based solutions compared to traditional SCADA communications that can be important are:

- Larger bandwidth is available, but typically with much less efficient utilization
- Standard IP protocols and network applications are required, but may not always work well with less common and occasionally proprietary SCADA software

- Easier operability at the network level, but care must be taken when interfacing Operator SCADA Clients to the GPRS network so as not to lose performance.

GPRS service is offered worldwide and may initially seem attractive for some SCADA systems from a communication cost perspective. However, SCADA applications for these types of time-critical systems demand reliable networks and communication solutions.

While SCADA systems based on GPRS communication are technologically possible, this type of solution is more appropriate for systems that do not utilize time-critical applications. The GPRS communication structure will not work well for situations such as:

✔ Real-time SCADA applications for mission-critical systems

✔ Near-real-time operating SCADA applications with control requirements

✔ SCADA systems that require operation over hybrid (multiple media) networks or more than one GPRS network.

The concerns associated with the IP/Ethernet world when used for SCADA systems are:

- Non-determining network designs with unpredictable latency and
- Multiple network vulnerabilities (external to the SCADA system).

The Solution

In the past, it was not always cost-effective to provide notebook computers to field operators in order to access secure websites; however, considering that technology and prices for laptop PC's, cellular data cards and power supplies have dramatically improved over the last few years, they now deserve a closer look. Even though accessing SCADA databases using laptops remotely is slightly more expensive, it offers far better performance and functionality than cellular phones do.

Control Microsystems' ClearSCADA ViewX and WebX software can be installed on any laptop device that uses Windows XP. Combine that with a cellular phone card or a WiFi port, this would provide a roving operator or technician with all the communications and functionality that an operator has at a "desktop" server. Typically, a user could receive an alarm via e-mail onto his cell phone. He could then use his laptop to access the SCADA system to investigate the issue.

The Results

Since the various GPRS based communication systems do not deliver identical performance, remote access of SCADA type data is now far better achieved by using laptops computers in conjunction with cellular technology.

In researching the viability of using mobile hand-held devices for SCADA applications, we found the current technology lacking. There are too many different models that use different operating systems. This makes it difficult to provide a one-size-fits-all solution.

Furthermore, the display on remote devices are typically around 2 square inches and are not great for showing detailed data on graphics or trends. The best these types of displays could do

- Centralized RTU configuration with automatic distribution.
- RTU software version control.
- Automatic historian data upload and backfilling.
- Real-time clock synchronization.
- Remote diagnostics and restarts.
- Controller applications share server communication channels.
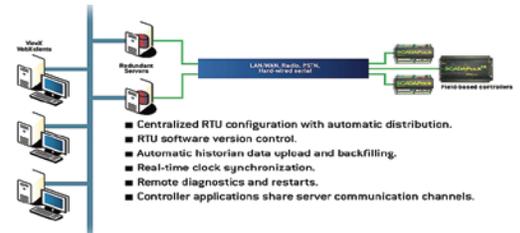
is to simply show HTML text pages of values and states. Hand-held devices are best suited for receiving e-mails associated with alarms or state changes on the system, a built-in feature on Control Microsystems' ClearSCADA software.

Executing controls on cell phone devices raises some concern. Showing alarm or data is easy enough, but control of a SCADA system from a cell phone could be dangerous, as mistakes could easily be made on the small control surfaces of such handheld devices.

SAGE ADVICE

SCADAWise

Why Not Satellite?

When should you consider using satellite communications for your SCADA system and how much will it cost? The answer to the first part of the question is fairly straight forward: when nothing else will work. There may be a number of reasons that nothing else will work for you, but the primary circumstance is one where you are unable to get a workable radio path. You may want to look into cellular telephone modem systems, but they are not nearly as reliable as the cellular providers would have you believe. So, if your driving issue is reliability, you may find that satellite is the answer to your problem.

That said, there is a wide range of satellite providers, each with a different solution which may or may not be the answer you are looking for. If you opt for one of the Direct Satellite providers in the business of internet and TV systems for consumers, you will find the price may look good but the reliability may not be what you would expect. If you are familiar with satellite television, you probably have seen your picture get static in a rainstorm. This may not prevent your system from presenting a picture to your television set, but if you consider that telemetry data must be perfect before your system will accept it, you must realize that every bit of static in the signal can potentially mean a retry of a communications packet and, under more severe conditions, a complete loss of your signal.

Another answer may be the Low Earth Orbit (LEO) systems which rely on a network of satellites that are much closer to Earth. The problem with these is that there aren't nearly enough satellites in the air to guarantee that there is one over your remote station and one over the provider's earth station when you wish to retrieve your data. For this reason, these are not transparent systems and your data must be buffered. This means that you never have a direct connection to your remote and must visit the remote site to do anything more than retrieve data from the provider's buffered system.

There are several providers that have systems linked to Geosynchronous Earth Orbit (GEO) satellites like the Direct Satellite systems but with larger, more sensitive transponders and antennas. Rather than the dinner-plate sized dishes you see on homes, these systems have a dish that is usually in the range of 1-2 meters in diameter. Additionally, these systems have more powerful transmitters to drive the signals through atmospheric conditions which may cause the consumer-type systems problems. Although these systems will cost a bit more to install and monthly rates will be from 2-10 times as expensive as other options, systems such as these are your only option if reliable communications are what you need. The monthly cost of these systems is generally based on either the total amount of data transferred per month or an unlimited data size and charge by bandwidth. If you want streaming high-definition video over satellite, all you need is money.

If you have a need to retrieve data and are unable to get a radio path, you may want to explore the use of a satellite-based solution. Call us if you would like more information.

New Ladder Logic Programming Environment for SCADAPacks

Control Microsystems is pleased to announce the launch of TelePACE Studio, their new SCADAPack programming environment for TelePACE Ladder Logic applications. TelePACE Studio is a completely re-worked version of TelePACE that's based on the latest Windows technology which maintains all the functionality of its predecessor, TelePACE 3.x. For customers, this means improved user productivity thanks to new innovative features. Here are just some of the highlights:

Customizable Workspace: SCADAPack settings like Register Assignment, Tag Management, and Serial Port Settings are no longer restricted to individual dialogs that must be viewed and closed before viewing another. With TelePACE Studio, any settings view may be placed on the workspace in combination with another. Views may be docked, layered, floating or setup to auto-hide. The size and layout of these views is also customizable, allowing you to control the look of the application. The resulting custom layout remains for all projects opened thereafter. At any time, however, the default factory layout of views may be restored with one button click.

The tool ribbon design makes it easy to find program features. Conveniently grouped by common tasks of editing, programming, and configuring, the tool ribbon helps keep the workspace uncluttered. Any combination of tool ribbon commands can also be added to a custom quick access tool bar.

Improved Ladder Logic Editing: New drag-and-drop logic elements and single-click access to element configuration make logic editing more efficient. Automatic suggestion of unused Modbus addresses is provided for element configuration blocks to prevent addressing conflicts. An unlimited Undo and Redo feature conveniently saves your editing history, giving you more confidence when editing.

More Program Validation: There is more program validation during editing to prevent errors before you download your application. In some cases, such as potential conflicts created during a controller type change, download is prevented until certain errors are corrected. With a new Diagnostic view, all warnings, errors and informational messages are logged with time stamp, color coding and sorting filters for convenient readability.

Improved Tag Editor: Tag names may be created and modified at any time without restrictions. There is no limit on the quantity of tags and a new automatic tag generation tool will create sequential tags based on a common root name.
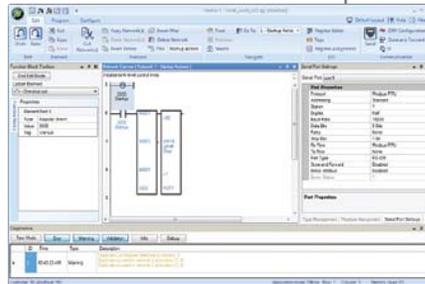
Improved On-line Editing: On-line editing is improved. Recall in TelePACE 3.x that each change was immediately written to the controller. This made some edits impossible as you needed to change more than one element before writing. Now on-line editing maintains a list of changes in memory. Changes (not the entire program) are written to the controller only when the Write button is clicked.

Multiple Instances of TelePACE Studio: When debugging multiple projects at

the same time, such as a master and slave application, multiple instances of TelePACE Studio may be run at the same time allowing each project to be debugged simultaneously.

XML Format for all Project Files: All project files are saved in XML text files. This allows changes between project versions to be more easily compared, and ensures better compatibility with version control software.

Seamless Import of Existing Programs: Simply open your TelePACE 3.x programs (*.LAD) with TelePACE Studio and save as a TelePACE Studio project. No changes are required to controller firmware, and you can run both TelePACE 3.x and TelePACE Studio on the same PC. This lets you upgrade to TelePACE Studio at your own pace.

To learn more about TelePACE Studio please visit our website www.controlmicrosystems.com.

Free SCADA Seminar

May 19, 2009	**May 20, 2009**	**May 21, 2009**
8AM - Noon	8AM – Noon	8AM - Noon
Holiday Inn Hotel & Conference Ctr.	Radisson Hotel & Conference Ctr.	Orchid Suites Hotel & Conference Ctr.
7000 Beach Blvd.	2233 Ventura Street	130 N Sunrise Avenue
Buena Park, CA 90620	Fresno, CA 93721	Roseville, CA 95661

8:00 – 8:15   Continental Breakfast & Introductions

8:15 - 9:00   **TelePACE Studio: The new SCADAPack Programming Environment**

Learn how to take advantage of Control Microsystems' TelePACE Studio. TelePACE Studio, launched TelePACE Studio, launched in February 2009, is a completely re-worked version of TelePACE Ladder version of TelePACE Ladder Logic Programming software.

9:00 – 10:00   **Data Logging with SCADAPacks**

Three basic methods of Data Logging in SCADAPacks will be presented: one which uses internal memory to create logged data retrievable with inexpensive software tools, one which uses internal and/or an external thumb drive and is retrievable with a off-the-shelf thumb drive, and one based on DNP3 protocol to store data that is automatically transferred to a DNP3 SCADA Master Station software package such as ClearSCADA.

10:00 - 10:15   Break

10:15 – 11:45   **Powerful New Pump Controller from Control Microsystems**

Jim Quist, Water/Wastewater Sales Manager for Control Microsystems, will present the new FlowStation from Control Microsystems. The FlowStation is an out-of-the-box pump station controller which can be configured for the most demanding lift station or other pumping control applications. The FlowStation includes support for up to three pumps with a variety of alternation schemes and offers an option for a cellular connection supporting alarm notification and acknowledgement through a web interface or SMS text messaging.

11:45 - Noon   Questions & Answers

Pre-registration Required

To Register: Call 1-888-275-7243 to reserve your seat. Then complete the information below and send to us via fax to 1-888-329-7243 or by email info@sagedesignsinc.com.   A confirmation will be emailed to you. Hotel Directions can be found on the Events Page of our website: http://www.sagedesignsinc.com/events.

Ask about our special seminar price for TelePACE Studio

❑ **Register me for the free seminar in Buena Park on May 19, 2009**

❑ **Register me for the free seminar in Fresno on May 20, 2009**

❑ **Register me for the free seminar in Roseville on May 21, 2009**

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

* * * Registration Deadline: May 12, 2009 * * *

There is no charge for this event, but we would appreciate notification if you must cancel your reservation.

SCADAWise™ Training Classes

ClearSCADA

SCADAPack

ClearSCADA Training Course

May 12-13-14-15, 2009 – Mill Valley, CA
November 2-3-4-5, 2009 - Mill Valley, CA
February/March 2010 - Buena Park (TBA)

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 $1,800

SCADAPack TelePACE Studio Training Course

May 6-7-8, 2009 – Mill Valley, CA
October 19-20-21, 2009 - Mill Valley, CA
February/March 2010 - Buena Park (TBA)

An option SCADAPack 350, SCADAPack 334 or SCADAPack 32 is available at a special price* with the course—an excellent way to get started using Control Microsystems' 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 $1,275

   * Optional SCADAPack 350 Training Kit – adds $990
   * Optional SCADAPack 334 Training Kit – adds $990
   * Optional SCADAPack 32 Training Kit – adds $1,060

Instructor: Tony Sannella, Sage Designs, a Control Microsystems' Factory-Certified Instructor.

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 of Win 2K or XP with 15mb free disk space, CD ROM, mouse with a scroll wheel, working serial port, and necessary permissions to install software on your computer.

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

*Optional SCADAPack Training Kits at special course pricing: <u>Limit one (1) for every two (2) students per organization</u>. 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

Sage Designs, Inc.
SCADA & Security Products

ClearSCADA: *4-Day Course*   ❑ **May 12-15, 2009**   ❑ **November 2-5, 2009**   ❑ **Feb/Mar 2010 (TBA)**

SCADAPack TelePACE: *3-Day Course*   ❑ **May 6-8, 2009**   ❑ **October 19-21, 2009**   ❑ **Feb/Mar 2010 (TBA)**

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

* * * Registration Deadline: 3 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.

Point-to-Multipoint Via KwikStream™ Repeater

Point-to-Multipoint with LinkXtend™ Bridge

CONTROL MICROSYSTEMS

Total Command of the Radio System with Embedded HTML Web Server
- Network Management and Remote Diagnostics with no software installation required
- Configurable via secure embedded HTML interface (HTTP and HTTPS)
- Network wide access from any radio in the network
- Over-the-air reconfiguration and firmware upgrading
- Powerful system commissioning and troubleshooting tools
- Support for SNMP V1/V2/V3 including RFC1213 and custom MIBs
- Compatible with SCADAWave Manager TVIEW+ Diagnostics

Secure and Trusted Access Control
- 256-bit AES data encryption
- Secure HTTPS password protection interface with automatic failed lockdown and SNMP traps
- 802.1x support including RADIUS server support (PAP, CHAP)
- Proprietary multi-level scrambled over-the-air protocol
- Optional Trusted Master/Remote checklist table in every radio

Although the above features give the user maximum flexibility in design and system configuration, the J-Series does not stop there. The J-Series has additional configurable options that truly sets this radio apart from its competitors.

Until now, when a standard license free spread spectrum radio system is implemented, the user has had to put up with reduced transmission range and limited coverage, largely due to the higher frequency band and limited output power mandated in the ISM band. To help counter these limitations, some spread spectrum radio manufacturers include a conventional Store-and-Forward (SAF) repeater feature technique that helps increase the operating range by repeating the data through designated radios in the network, but this results in a 50% reduction or greater in data-throughput with equivalent increase in data latency. These conventional repeaters also sacrifice antenna gain because only a single omni-directional antenna can be used to talk to both the Access Point (master radio) and all of the remote sites in the network. This is no longer

an inhibitor with the J-Series wireless Ethernet radios. The J-Series redefines the benchmark with a combination of its **KwikStream™** high speed, low-latency repeater and its **LinkXtend™** dual antenna network bridge.

The KwikStream™ repeater is used in Point-to-Multipoint (PTMP) systems where one repeater with a single omni antenna is sufficient to provide coverage to all remote sites, but where the sheer number of remote sites, or the user data necessitate high data throughput with the lowest possible latency. This is done by configuring the Access Point radio as a Repeater and then placing it at a location in the network that has adequate RF coverage to each of the remotes radios in the network. The Repeater still behaves as an Access Point to all of the Remotes as in any traditional PTMP network, but the KwikStream™ Repeater is configured to repeat data packets between remotes in its network. It, therefore, allows Peer-to-Peer communications to occur between remotes because the Access Point radio now needs to "Repeat" data, which usually makes data latency for messages from the Host Application to/from the Remotes longer. However, this Remote-to-Remote communication is done within a single hop through the Repeater instead of going all the way to the Host, as do other repeaters on the market. This ensures available bandwidth remains high and data latency is kept low within the entire network. The KwikStream™ feature is like having a virtual "loop-back" plug ensuring data is
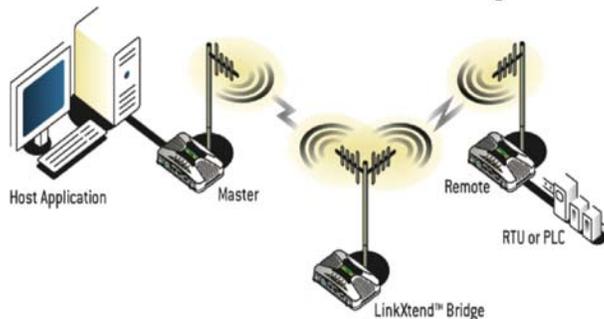
repeated quickly, and no user port with physical loop back plug is required. A key advantage is that a local RTU/PLC device can be located at the Repeater site and peer-to-peer communication is supported for this unit.

In situations where a repeater is needed to extend the range of a PTP link, but where a single omni antenna at the repeater does not provide adequate operating range, the SCADAWave LinkXtend™ dual antenna bridge will allow the user to utilize two directional (yagi) antennas that will provide higher directional gain while minimizing self-induced system noise that can be an inherent problem when using omni antennas at repeater locations within a single network. With LinkXtend™ the net result is that the repeater in your network has greater operating range because of its ability to use directional antennas that produce higher gain and greater selectivity while reducing system noise, all at an economical infrastructure cost.

If more than one repeater is required for wide area PTMP coverage, then the J-Series radios can be configured as bridges to optimize data throughput by ensuring that all radios in the network remain synchronized. Although you can use the conventional method of using a single omni antenna that usually does not provide adequate coverage (as with the example above), the ideal solution would be to configure the repeater using the dual antenna LinkXtend™ bridges equipped with one higher gain directional antenna for your uplink access, as well as an omni antenna for all downlink communications to all of the remote sites.

Although there are restrictions on maximum allowable signal levels in the ISM bands, the J-Series transmit output power for both of the radios antenna ports can be individually adjusted in line to give you two different antenna
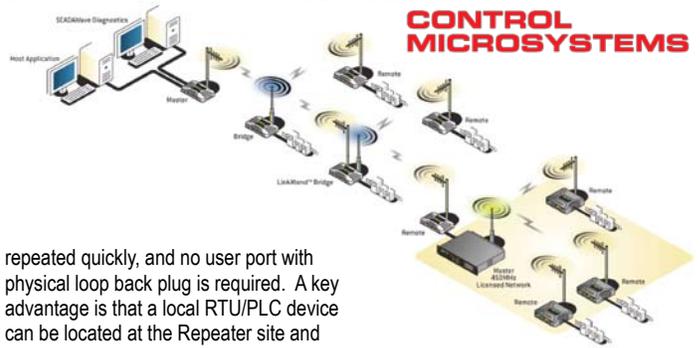
gain settings that allow you to tune your network for maximum performance. No other radio on the market today offers this kind of RF antenna port configurability.

You can program any J-Series radio to be configured using the KwikStream™ high-speed, low- latency Ethernet repeater, or as a LinkXtend™ network bridge option. These unique configuration options, coupled with other standard features like onboard dual Ethernet bridging ports, two serial ports and unparalleled system diagnostics that offer Trending, Date/Time Stamping and VSWR monitoring are a sample of the many features the J-Series has to offer that truly sets this Ethernet radio apart from the competition.

Have a drink on us

Due to the ever widening use of SCADAPack controllers by California water districts, odds are pretty good that a SCADAPack controller has had something to do with the water you drink. While most water districts use a variety of different brands of controllers in their systems, if you look at the water districts that use at least some SCADAPacks, well over half of California's population and agricultural customers get water from a system that has SCADAPack controllers in use today.

Our best estimate is that over 20 million of California's 38 million population, or over half of the people in this, the nation's most populous state, are our customers. Cheers.

Point-to-Point Link with LinkXtend™ Bridge

The Sage Advisor

SCADA, SECURITY & AUTOMATION NEWSLETTER

Calendar of Events

Date	Event
April 1-3, 2009	**ISC West,** Las Vegas, Nevada. (Visit our manufacturers' exhibits)
April 6 - 9, 2009	**CA-NV AWWA 2009 Spring Conference,** Santa Clara, CA. Exhibit #52
April 28-30, 2009	**California Rural Water Association (CRWA) 2009 Education & Exhibitor Expo,** Lake Tahoe, NV.
April 29-30, 2009	**CWEA Annual Conference,** Palm Springs, CA.
April 29 - May 1 , 2009	**Energy Telecommunications and Electrical Association (ENTELEC) Conference & Expo, Houston,** TX. Visit Control Microsystems' exhibit.
May 4 - 7, 2009	**Western Gas Measurement Short Course (WGMSC),** Salt Lake City, UT. Visit Control Microsystems' exhibit.
May 6-8, 2009	**SCADAPack - TelePACE Studio Ladder Logic Training Course*,** Mill Valley, CA.
May 12-15, 2009	**ClearSCADA Training Course*,** Mill Valley, CA.
May 12-13, 2009	**North American Unconventional Oil & Gas Conference and Exposition (NAU),** Denver, CO. Visit Control Microsystems' exhibit.
May 19 - 20, 2009	**American Gas Association Operations Conference & Biennial Exhibition (AGA),** Pittsburgh, PA. Visit Control Microsystems' exhibit.
May 19, 2009	**Free SCADA Seminar*,** Buena Park, CA.
May 20, 2009	**Free SCADA Seminar*,** Fresno, CA.
May 21, 2009	**Free SCADA Seminar*,** Roseville, CA.
June 3-6, 2009	**USCID Irrigation District Sustainability - Strategies to Meet the Challenges,** Reno, NV.
June 14-18, 2009	**ACE '09 Expo, American Water Works Association Annual Conference & Expo,** San Diego, CA. Visit our manufacturers' exhibits.
August 19, 2009	**CA-NV-AWWA Education Extravaganza & Exhibit,** Orange, CA.
September 16-18, 2009	**CWEA Northern Regional Training Conference,** Redding, CA.
September 22-24, 2009	**25th Annual Tri-State Seminar on the River,** Primm, NV.
October 5-8, 2009	**CA-NV AWWA 2009 Fall Conference,** Las Vegas, NV.
October 6-8, 2009	**ISA Expo 2009,** Houston, TX. Visit our manufacturers' exhibits.
October 19-21, 2009	**SCADAPack - TelePACE Studio Ladder Logic Training Course*,** Mill Valley, CA.
November 2-5, 2009	**ClearSCADA Training Course*,** Mill Valley, CA.

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

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