

# REMOTE

## Site & Equipment Management

February/March 2009

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### OSI Introduces a Configurable Logic Control Function For its OSIRIS RTU

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### Security

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### Applications of FreeWave Radios for Seismic and Volcanic Monitoring in Ecuador

Since 1983, the Instituto Geofísico (Institute of Geophysics of Ecuador) has been responsible for seismic and volcanic monitoring throughout the country. The institute's mission is to improve disaster preparedness and lessen the impact of seismic and volcanic phenomena throughout Ecuador via constant monitoring, scientific research and technology that promotes the creation of a precautionary culture. Thanks to the Red Nacional de Sismógrafos, National Seismograph Network, and the Red de Observatorios Volcánicos, National Volcano Observatories, the Institute is able to issue early warnings so that authorities and citizens have enough time to take the appropriate precautionary measures, based on risk maps produced by scientists. In the case of the recent eruptions of the Tungurahua Volcano in July and August 2006, this helped warn hundreds of thousands of people early, got them out of harm's way and saved countless lives.



ed equipment and trained personnel. However, this rapid progress also gave rise to new problems and challenges for which the Institute has been trying to find immediate solutions.

The primary challenge was to build a real-time telemetry network highly capable of transmitting data. Previously, no adequate data collection equipment for seismic and volcanic monitoring, much less digital technology, had ever been installed in the country. The existing equipment could not transmit information and only collected local data. This meant time and money to periodically visit remote sites to collect the data.

To start with, digital telemetry was used for applications that did not require continuous transmission in real time, but the data are transmitted with regular intervals of time, as is the case with lahars and deformation networks. With this new technology in place, fairly ideal results were achieved. There were no interference problems, but the equipment used was not robust enough for the climate conditions in which it needed to operate.

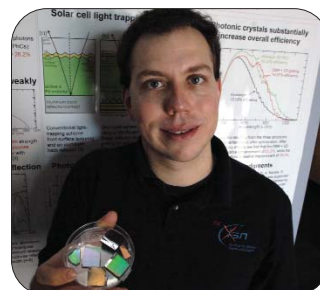
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### Italian Utility Hera and GE Energy Inaugurate Model Sewage Gas-to-Energy Cogeneration Project



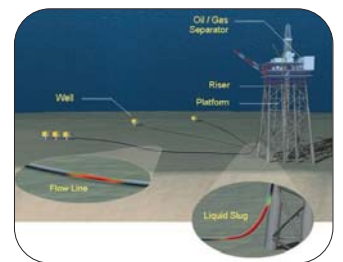
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### Onsite Power: MIT Finds Ways to Boost Solar Cell Efficiency

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### Integrated Data Acquisition And Control Trends in Oil and Gas Pipelines

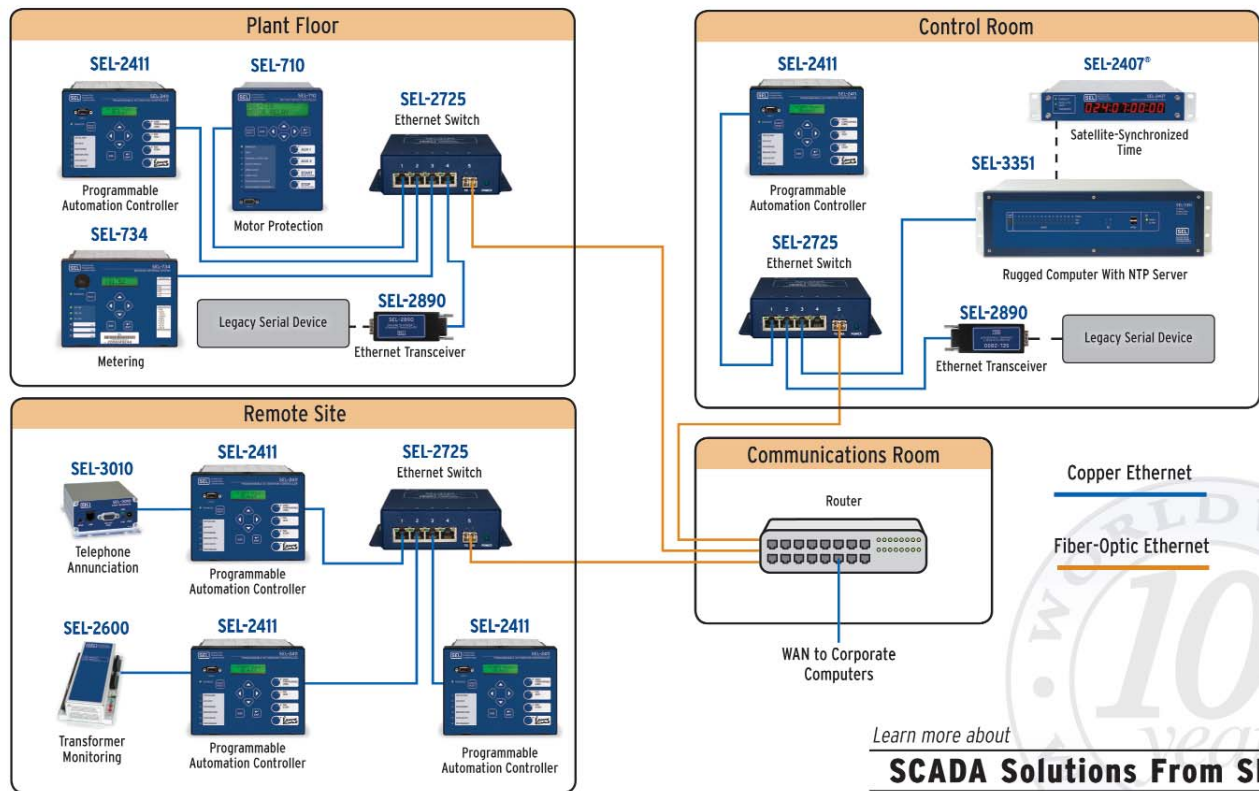


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Site & Equipment Management

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## Editor's Note

The reality of the world-wide recession has a lot of companies tightening budgets and lowering sales expectations for the coming year. However dire it may seem, there could be some great opportunities for everyone in the Remote marketplace in 2009. President Obama has lofty plans to jump start the American economy with his infrastructure and stimulus plan, which could lead to new sales.

While much of the new funding is slated for roads and bridges, millions of dollars will also be spent in the "green" sector. Buzz words aside, much of what this industry does is infrastructure, and many companies providing remote monitoring equipment, as well as the networking devices that enable them, are

poised for growth in the coming year, not chapter 11.

In an effort to help you tap into these new revenue streams, the staff and I have put together another great issue. Inside you'll find articles on trends in oil & gas pipeline control and data acquisition, information on end-to-end security for the always energy efficient smart grid, as well as new products and industry news.

Also check out the Remote 2009 Conference & Expo ad on page 19. It contains important information about our call for papers deadline. (April 27<sup>th</sup>) Don't miss out!

Nick Depperschmidt  
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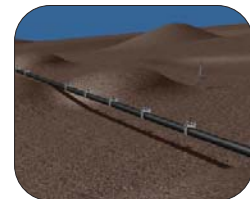
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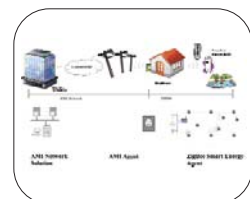
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### New GSM Thermometer with E-mail and Data Logging

HW Group s.r.o., a Czech Republic based manufacturer, has introduced a new product to the market, the HWg-Tg11. This GSM thermometer with temperature logging into its internal flash memory is intended for temperature monitoring in remote locations. A unique feature of the product is the transmission of alert messages as well as of measured data by e-mail over GPRS.



The Tg11 store temperature readings in a central system and is designed to send a SMS or dial a call to the responsible manager if the temperature exceeds a set range. The HW Group supplies the Tg11 as a complete solution, and it can be purchased with either a Windows based data collection application (CapTemp) or a Web-based service (SensDesk portal). Typical applications include small plants, warehouses, surveillance and others.

### Control Microsystems Expands SCADARange Wireless Process Instruments Product Line

Control Microsystems has expanded its SCADARange product line with a new multi-input field unit and the addition of a high-gain antenna option and remote sensor mounting on selected SCADARange field units. Designed for use in applications where traditional wired sensor connections are not physically or financially feasible, SCADARange products are easily deployed to wirelessly transmit data through a centralized base radio station, over a secure 900 MHz license-free connection. With the capability to scale up to as many as 16 wireless instrumentation LANs, each with 50 instruments, SCADARange accommodates future expansion without difficulty.



The SCADARange AI10 and AV10 wireless multi-input field units provide dual analog inputs in either current (4 to 20 mA) or voltage (0 to 10 V) configurations. Each unit is comprised of an integrated input

module, signal conditioner, RF transceiver and antenna and also includes two discrete contact closure inputs for simple apparatus.

"With their limitless applications and unique ability to last up to five years on a battery, the SCADARange product line has experienced strong initial sales," said Dale Symington, vice president of product strategy. "The multi-input field unit with explosion-proof housing is just the first of many expansions planned for these cost-effective products."

The high-gain YAGI antenna option is available on the AI10 and AV10 multi-input field units, the GL10 gauge level field unit and the GP10 gauge pressure field unit. The remote sensor option is available on the RT10 RTD temperature field unit, TC10 thermocouple field unit and the GP10 gauge pressure field unit. SCADARange Manager, a Windows-based services management software that provides a user friendly environment for field unit configuration and diagnostics, is also included with all SCADARange products. Each unit has a LCD/keypad for local configuration and monitoring.

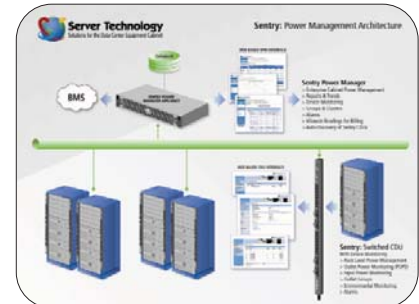
### Server Technology Releases Sentry Power Manager Software For Cabinet PDU Management

Server Technology has introduced the Sentry Power Manager (SPM). The SPM allows IT managers to manage thousands of Sentry cabinet power distribution units (PDUs) in multiple locations, providing one central interface for conditions including power, temperature and humidity. Status and alarm notification are in real time and can be viewed by status, current load, power, temperature, humidity and capacity. Quick and simple drill down from a global view to the rack level makes alarm acknowledgement and management of multiple PDUs a simple process.

Accessed through a standard Web browser the SPM is capable of automatically discovering all PDUs. Multiple user-access levels and permissions ensure secure access with each user given specific access to the devices or locations that they are responsible for. Trending of critical parameters by start and end date such as temperature, humidity, in-feed load, in-feed power, system watts/unit area, kW, kW Hr and system total power allow the user to create custom graphs based on any one or all of these parameters. Logging by specific start and end dates provides the user information on when a discovery was last performed, the last time a specific user logged in, all user actions and alarm status.

SPM combined with the new Sentry POPS (per outlet power sensing) product provides power monitoring per individual outlet to monitor current, voltage, power (kW), apparent power, crest factor and power factor.

Though individual outlet information is important the real value to the data center manager is to use this technology to provide kW and kW Hr information per device, groups of devices (application), an individual PDU or cabinet.



Utilizing SPMs clustering technology also allows the user power monitoring across individual IP addresses providing kW and kW Hr power information across multiple cabinets or across the whole data center. This information can be used to calculate power efficiency metrics like PUE and DCIE, or SI-POM and H-POM metrics. Beyond calculating efficiency metrics this technology also allows the data center manager the ability to bill for power usage based on an individual outlet, device, groups of devices (application), cabinet, groups of cabinets or the whole location.

Custom configuration allows the user to download their own images to represent data center locations or actual data center floor space. These images are used within the view screens to help quickly and easily drill down from a global view down to the PDU level. A simple color legend gives at-a-glance indication of the PDU status for each view.

Integrated remote management of Sentry cabinet PDUs allows the user to turn on, off or reboot specific devices from the SPMs user interface. Outlets can be grouped across both an A and B in-feed to reboot specific devices or applications under one single PDU IP address. Clustering of outlets allows to user to turn on, off or reboot devices across multiple IPs addresses allowing the user control of multiple cabinets or rows of cabinets.

The SPM is compatible with all Sentry Switched PDUs with firmware 5.3x or later. Sentry Switched PDUs provide local current monitoring, two temperature and humidity measurements, branch circuit protection, power distribution of single and three phase power and a serial connection in case the network is down and communications to the PDU is required. Both email alerts and SNMP traps can be sent to multiple locations ensuring notification of all alarm conditions.

### OSI Introduces a Configurable Logic Control Function for its OSIRIS RTU

Open Systems International, Inc. (OSI) has released configurable logic control capabilities for its OSIRIS remote telemetry unit (RTU). OSI's versatile Linux-based secure RTU, the OSIRIS (OSI Remote Information System) now provides full IEC61131-compliant programmable logic functionality.

The automation control platform (ACP) option is designed to process data and events from/to any connected device. When combined with current protocol conversion/data concentrator functions, communications capabilities and direct-wired analog, status and control I/O points, OSIRIS provides control and monitoring functionality and value in a compact, hardened remote unit.

Highlighting the ACP is an intuitive application development environment. Sophisticated logic can be programmed to interact with any of the points on the unit and perform all desired calculations, from simple control logic to very sophisticated algorithms.

The ACP for OSIRIS provides tools to support five logic language forms: ladder

diagram, function block diagram, sequential function chart, structured text and instruction list plus flow chart. Programming and configuration tools were developed for ease of use and application flexibility.



assist utilities in delivering secure communications and control for critical operations now and in the future."

Included in the ACP are powerful editing and debugging tools. Validation of entire programs can be completed offline during development. Once deployed, applications can be monitored in real-time. Through the development interface application program, execution can be traced and the state of the program variables can be inspected.

"Constant innovation driven by customer input has made OSIRIS the flexible and Secure RTU it is today," said Brian Rasefške, OSI's vice president of Engineering and Development. "With powerful programming capabilities now available, OSIRIS will continue to serve as a next-generation RTU with functionality and features that will

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### Anybus RemoteCom Simplifies Remote Device Management and Control

With Anybus RemoteCom, HMS Industrial Networks introduces a new product family for remote management and control of automation devices. Anybus RemoteCom is equipped with an internal Web server for remote access of device data including logged data and trend graphs. The integrated alarm and status handler automatically notifies remote supervisors via SMS or e-mail or SNMP if pre-defined events are triggered. Typical applications include remote management and supervision of factory and process automation devices, power generation equipment, as well as heating and ventilation systems in building automation.

As an additional service, a secure central Web server expands the functionality of Anybus RemoteCom. The central server collects and stores logged data in one central location. Storing the data centrally makes it easier to browse through the data from several devices without the need to establish an individual remote connection for each.

Anybus RemoteCom connects locally to any automation device that is equipped with a standard serial Modbus-RTU interface or an Ethernet Modbus-TCP interface. It features RS-232 and RS-485 serial ports. The remote connection is made through the Internet/Intranet via the integrated Ethernet interface. Alternatively, an optional GSM/GPRS network interface can also be used. The RemoteCom can also be connected to an external GPS receiver for geo-tracking of mobile equipment. The device is set up through the built-in Web interface that can be easily accessed from any standard Web browser with no additional software licenses.



### Semaphore Adds POP3 Client Capability to SCADA RTU Line

Semaphore, a CSE Global company, has introduced POP3 (Post Office Protocol version 3) client functionality to its T-BOX line of SCADA system products. The POP3 capability is compatible with T-Box LT, Semaphore's single-module SCADA remote terminal unit (RTU) and the T-Box MS modular system.

POP3 enhances the "push" messaging capabilities provided by T-Box, which allows users to access site information, anytime, anywhere, using a cellular phone, PDA or laptop computer. The T-Box alarm management system can keep multiple recipients informed of conditions via e-mail, FTP and SMS text messaging.

In the US, access to a POP3 server allows these users to acknowledge alarms via their handheld devices. In the rest of the world, similar capabilities are provided by GPRS. In addition to alarm acknowledgement, users can send messages to the RTU, via e-mail or SMS text, to perform remote monitoring functions. Now, using a device such as a BlackBerry, users have complete access to all remote locations.

T-Box is an IP-based telemetry solution that enables the complete integration of SCADA, control and communications functionality in one package. It leverages Web technologies and inexpensive public networks for decentralized monitoring and control systems. T-Box products offer up to 50 percent less total installed cost per point versus traditional SCADA/PLC systems and permit greater organizational access to data through automated reporting and browser software.



### New Ethernet-Based Energy Monitoring System

Onset Computer Corp. has unveiled the Hobo U30/ETH remote monitoring system, an industrial-grade energy monitoring system that provides real-time, remote access to energy and environmental data over any Ethernet network.

The Hobo U30/ETH allows users to easily implement facility-wide, networked monitoring solutions for tracking energy usage, HVAC/R systems performance and building efficiency. Users can simply plug in their choice of sensors, connect an Ethernet cable and remotely access and manage Hobo U30 systems distributed throughout their facility. This, in turn, enables users to optimize data collection efficiency while generating long-term, facility-wide energy profiles at lower costs.

The Hobo U30/ETH enables users to set up alarm conditions for any connected sensors and receive automatic notification via email or cell phone text messages when monitored conditions exceed user-defined limits. The system also features a NEMA 6-rated enclosure for years of dependable operation in harsh environments. With a full suite of sensors, users have access to a wide selection of sensors for measuring a range of parameters including temperature, relative humidity, kW, kWh, AC voltage, AC amps, DC amps, gauge and differential pressure and CO2.



### New Web Browser Based Sensor Appliance Released

MAMAC Systems, Inc. has introduced a compact, simple and inexpensive sensor appliance, the Maverick IP sensor appliance. This device puts remote building sensing, alarming and control within reach of every building owner.

Monitoring and control can be done from any device utilizing a Web browser. The Maverick displays an easy to navigate Web page. Because of the Maverick's unique ability to send email alerts to any computer, PDA or cell phone, it can also be used to send instant alarms to owners upon deviations from preset conditions. The Maverick incorporates a Web server, analog/digital inputs, and relay outputs and can be powered with any 24 VAC transformer. The device is notable for its compact design, which is about the size of a programmable thermostat.

The Maverick can log the data of each input in a standard CSV file, which can be reviewed with Word, Excel or comparable software. The CSV file can be attached to the email alerts to show log history. The appliance can also display the logged data as an adjustable graph.

The unit is simply plugged into a hub or router and it is ready to relay information or accept control signals. A site connection through a computer is not required. The Maverick has its own on-board server and is ready to connect directly to the Internet. Access is through the default IP address provided. No custom software is required.

Users can set up and utilize the Maverick appliance without training in less than five minutes. It is designed as a low-cost solution for light commercial, residential and remote monitoring applications. The Maverick is available in two configurations: one with four sensor inputs and four relay outputs, and one with eight sensor inputs. The relay outputs can be used for applications including pump operation, starting standby heating or cooling equipment, or any other operation that can be initiated with a relay.



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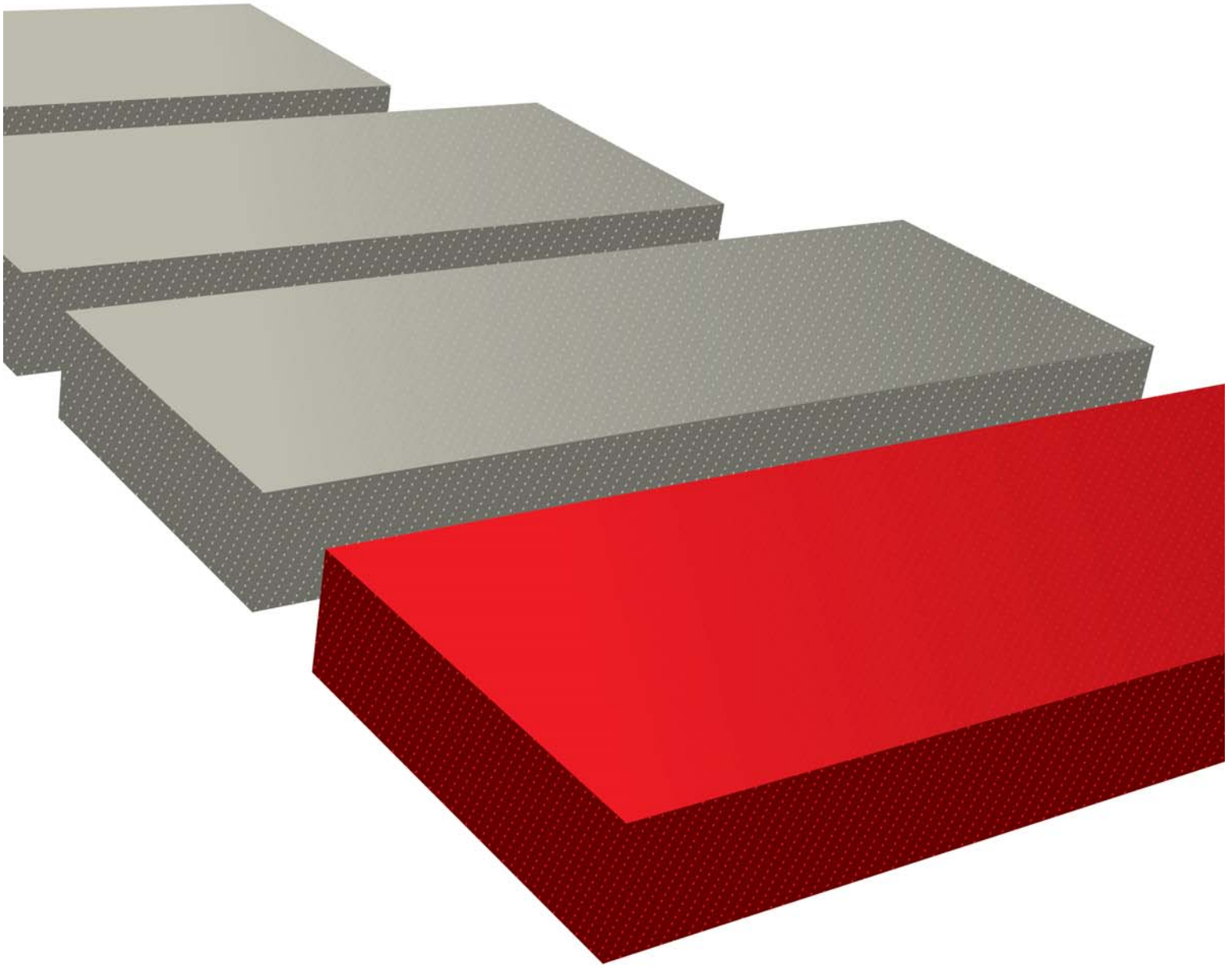


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### DX99, a New Battery Powered, Intrinsically Safe Wireless Transceiver

Banner Engineering has introduced an entirely new way to collect analog, digital and temperature information in hazardous areas. The system is a combination of wireless communication, battery technology and intrinsically safe electronics.

Hazardous areas pose unique sensing challenges. There are two main methods used today when collecting signals within a hazardous area: explosion-proof and intrinsically safe. Traditional explosion-proof methods work well and have been used reliably for decades, but they are expensive and the installation is time consuming. In the last 20 years, intrinsically safe barriers have reduced some of the cost and complexity. But, both methods still add a significant level of complexity and expense when compared to similar efforts in non-hazardous areas. Now, Banner has taken the next step to make sensing within the hazardous area as easy as possible. This new method moves the intrinsically safe power supply from the control room to the wireless transceiver.

The DX99 battery-powered node is a combination of three key state-of-the-art technologies combined in a single housing. These include a battery-based power supply, robust wireless technology for mission critical data and intrinsically safe operation.

The DX99 battery-powered node uses a liquid lithium battery to produce an intrinsically safe power source for the transceiver and an external third party sensor. When combined with low-power consumption sampling electronics, the standalone unit that can operate for up to 10 years on a single battery.

The DX99 wireless technology is a tuned subsystem designed with industrial process applications in mind. It was designed to be reliable, secure and provide diagnostic information about the status of the wireless link. It has also been designed to transmit and receive up to three miles (150 mw with 2 dBi antenna) while consuming very little power. Every DX99 has a built-in site survey mode that allows the installer to quickly and easily determine the quality of the wireless link.

The DX99 uses a sampling technology to reduce power consumption. The system can be configured to sample each second. However, if you sample every 16 seconds instead,



the battery will last 16 times as long. The DX99 can also be configured to report on change of sensor-state or only in an alarm condition. This further conserves power and extends battery life. Proper sampling will provide 10-year battery life. Because the DX99 is battery powered, it works best in applications that have low sensor power requirements, including thermocouple, digital and RTD, loop powered sensors.

### Eaton Extends Branch Circuit Monitoring Capabilities With the Eaton Energy Management System Upgrade Kit

Eaton Corp. has introduced its Eaton Energy Management System (EMS) upgrade kit for facilities managers to extend branch circuit monitoring capabilities to legacy and third-party power distribution equipment. The EMS upgrade kit allows for power conditions to be monitored on individual breakers, breaker panels or at the equipment level, providing three tiers of visibility within a single unit.



“Many data centers and other mission critical facilities have a mix of older equipment and infrastructure from different vendors,” said Ed Komoski, vice president and general manager, Eaton’s Power Quality Division. “The EMS Upgrade Kit makes it possible to unify the management of a diverse, multi-vendor power distribution system by adding an extra layer of visibility and control to distribution equipment that was never designed to include these capabilities.”

With the additional insight provided by the EMS upgrade kit through measurements, analysis and notifications, data center and facilities managers can proactively manage energy consumption to prevent overload conditions, optimize power distribution and, when applicable, allocate energy costs among internal departments.

The EMS upgrade kit is a pre-tested, stand-alone solution that includes a wall-mounted enclosure with supporting hardware for one or two panels. A single-panel unit monitors up to 42 circuits and a two-panel unit monitors up to 84 circuits in a standard, three-phase panel board. Split-core current transformers (CTs) monitor electrical input mains and branch circuits in connected panel boards to measure and store energy parameters for each individual circuit, making it possible to manage power with greater precision.

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Additional features of the EMS upgrade kit include remote monitoring via the Power Xpert gateway card, which links equipment to the local area network or Internet using Modbus TCP or SNMP, and the ability to access real time and historical information for analysis, troubleshooting, power management, billing and energy planning.

### Enfora Introduces a Low Power Wireless Platform for Asset Monitoring and Management

Enfora has introduced its Spider AT asset monitoring and management platform, which is designed around low power technology and is powered by a long lasting battery pack that makes it possible to track and monitor assets for up to three years.

Many companies are faced with the challenge of locating and managing their corporate assets in real time. Often, such assets cannot be located due to theft or misplacement. The Spider AT is a wireless IP platform that combines global wide-area GSM/GPRS wireless connectivity and GPS location capability, allowing the user to retrieve critical information based on user-defined alerts, specific events or geofences, while optimizing power management and minimizing maintenance.

"Misplaced or missing assets are, unfortunately, too common for many companies," said Jeff Newman, chief strategy officer, Enfora. "Many of these assets are untethered from the network and stay in the field for a long period of time. The Spider AT was specifically developed to fill the need for a low power platform that can monitor and locate these assets."

Configured to work with the Spider AT platform, Enfora's Services Gateway 2.0 provides a user-friendly environment to directly connect, manage and provision wireless devices from existing enterprise applications. Users are provided with a detailed view of their assets, enabling proactive management and systematic upgrades when needed. The latest release of the Services Gateway supports browser-based administration, command pooling and firmware-over-the-air (FOTA) support. The Spider AT platform and Service Gateway 2.0 middle bring together the key hardware and software elements required to enhance the deployment of business applications while providing a tie-in to existing IT infrastructure.



*Freewave continued from cover*

Later, however, the demand for continuous and real time applications increased. New projects were undertaken and the need to find equipment that met monitoring conditions and requirements grew so that the Institute could fulfill its commitment to the community.

Given the problem of implementing an affordable, real-time telemetry system that is simple and sturdy, new options were considered and, for first time, an international organization installed FreeWave radios DGR series to transmit data of the deformation of the Cotopaxi Volcano and the Galapagos Islands. Although the mechanics, features, advantages and cost of these radios were not known at the time, very good results were obtained, reducing maintenance of monitoring stations to zero. Later, one of the institute's engineers set up a photographic camera with serial transmission using FreeWave for the Reventador Volcano.

These changes took place around 2002 and the institute began to gain more experience in using FreeWave radios. It also became familiar with programming. The system's connections have proven reliable, as well as its performance in extreme conditions. This gave the Institute the idea that it was on to a solution for solving its real-time, digital transmission problem.

Currently, the Institute has added FreeWave radios to many of its monitoring networks and used them in various monitoring applications and implementation activities. Among the primary monitoring applications are: real-time broadband seismic stations in the Imbabura and Tungurahua Volcanoes, meteorological stations, stations to monitor volcanic gases, deformation stations using GPS technology and borehole sensors, remote digital cameras and soon stations to quantify mud flow.

Over the past six years, the work with FreeWave radios has met the Institute's expectations. Connections at different distances have proven reliable and stable. Performance in extreme conditions has met its needs, as evidenced by a radio that transmits images from the top of the highest active volcano in the world, which operates at below 0°C temperatures from a height of 5,947 m above sea level.



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### Integrated Data Acquisition and Control Trends in Oil and Gas Pipelines

Robert Jackson, Senior Product Manager – Energy  
National Instruments

Discovering and extracting oil is becoming increasingly challenging, and technology is rapidly evolving so engineers can better address the challenges of drilling, transporting and producing oil. Currently, two important trends are occurring: PC-based data acquisition and PLC-based control systems are merging, resulting in hardware systems commonly referred to as programmable automation controllers (PACs), and new graphical system design software languages are allowing control engineers to target real-time operating systems and embedded hardware. Graphical system design languages and PACs combine high-speed measurements with real time deterministic control while simplifying the programming of these new advanced systems. The benefit for control engineers is they can now make better measurements and perform tighter control.

Engineers and control system experts are using these new technologies in a wide range of applications from drilling control systems, to pipeline monitoring systems like ones deployed at Shell and the Ormen Lange pipeline in North Sea, to tank farm monitoring for 43 percent of oil produced in Mexico with PEMEX.

#### PACs Used in Managed Pressure Drilling

Managed pressure drilling is a technique that tracks the complete pressure profile of a well during the drilling process while dynamically adapting to well conditions to meet desired drilling parameters. Impact Solutions Group developed a patented managed pressure drilling technology called Secure Drilling based on LabVIEW and National Instruments PACs.



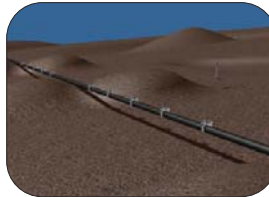
The Secure Drilling method is a managed pressure drilling system based on the patented Micro-Flux Control method that monitors the dynamic flow rates in and out of the well. With high-speed monitoring and adaptive control technologies, the Secure Drilling system can automatically control the back pressure at the surface to maintain well control.

System designers implemented the adaptive and flexible control algorithms at the center of the Secure Drilling system. A state machine architecture was developed using the LabVIEW Real-Time Module to monitor six process variables and perform real-time data trending. The system functions in two modes, user controlled, with automatic alarm generation, or active control. In active control mode, the program uses one of three control algorithms:

- LabVIEW PID control algorithms with gain scheduling
- LabVIEW implementation of the Cybosoft Model Free Adaptive (MFA) control software
- LabVIEW fuzzy logic control algorithms

#### Monitoring Ormen Lange Pipeline in the North Sea

The Ormen Lange is the largest natural gas field under development on the Norwegian continental shelf. The pipeline traverses the Storegga rock slide off the coast of Norway, which is one of the longest rock slides to exist on a continental shelf. A massive mound of rubble has accumulated over thousands of years, causing an extremely rough seabed for laying natural gas pipelines. The installation of a real-time vibration monitoring system on the subsea pipeline is required to predict and quickly react to any damage.



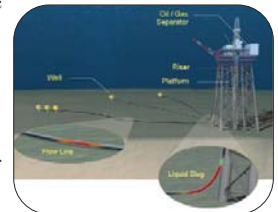
The Norwegian firm of Bjørge AS, which specializes in intelligent underwater instrumentation and condition monitoring, has developed a long-term monitoring system entirely in LabVIEW for installation at the

Ormen Lange. Assisting in hardware development is Schmid Engineering, a Swiss system integrator that offers solutions for mechatronics applications and embedded systems.

The monitoring system must survive extreme sub-sea conditions including strong underwater currents, low visibility, limited power, Gulf Stream currents, water turbulence due to the uneven seabed and changes in internal pipeline flow. In addition to these extreme conditions, the project required a tight development timeline to meet production targets, a very low power off-the-shelf hardware deployment platform, and a highly reliable system with built-in logging capabilities.

#### Slug Flow Monitoring and Control at Shell

Pipelines or flowline/riser systems transport liquid hydrocarbons, gas and water from satellite wells to a central production platform. Shell often selects a single pipeline for economic reasons. Ideally, a pipeline would produce a constant amount of gas and liquid. In a single pipeline, however, segregated flow of liquid and gas may cause problems.



To prevent this segregated or slug flow, Shell Global Solutions developed the Slug Suppression System, S3 and licensed it to Drill-Quip for marketing, sales and manufacture. The S3 consists of a miniseparator positioned between the riser top and the normal first-stage separator. The miniseparator has two outlets, one for the gas flow and one for the liquid flow. Valves control both outlet flows, which receive their signals from a control system. This control system uses LabVIEW Real-Time software and NI Compact FieldPoint distributed I/O. The control strategy suppresses severe slugging and controls transient slugs without gas surges.

The S3 control system relies on two redundant FieldPoint PACs. The PACs provide information for gathering and control. With this redundancy built in, the availability of the

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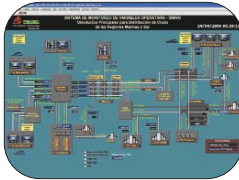
system is 99.95 percent, assuming a four hour repair period for any downtime.

The control system is programmed with LabVIEW using standard PID control toolset blocks, plus additional algorithms to ensure correct and fast control of the slug suppression system when modes of control are changing. Implementation in existing PLC and DCS tools is not straightforward because of the complexity of these additional control algorithms, but LabVIEW provided the correct set of tools and abstractions.

### PEMEX Monitors Oil Production

PEMEX Exploration and Production (PEP) oversees the exploration, production, transportation and commercialization of oil extracted in Mexico. PEP's Southern Region Transportation and Distribution Management is responsible for transporting and distributing Olmeca, Istmo and Maya crude oil. PEP transports and distributes approximately 1.52 million barrels of this oil daily, which represents 43 percent of national production. This volume is equivalent to 3 billion dollars in crude oil.

To determine precisely the oil volume PEP transports and distributes, PEP relied on electronic measurement systems installed in the field. Previously, coordination between the different management teams and separate measurement systems was done by phone and e-mail. PEP needed an integrated monitoring system that would enhance coordination between these teams and take advantage of existing measurement systems for the transportation and distribution of crude oil.



The crude oil monitoring and management system, known as Sistema de Monitoreo de Variables Operativas (SIMVO), had to meet the following requirements:

- **Easy Communication** - The system had to link the different communication networks through industrial protocols and standards. For this application, PEP chose OLE for Process Control (OPC) to communicate with different stations.
- **Low Cost** - To reduce the total cost of the project, the internal engineering team needed to be able to develop the application.
- **Reuse of Existing Infrastructure** - Because measurement and control systems and an Intranet were already installed, SIMVO had to be able to use the existing field equipment.
- **Network Security** - PEP needed an additional industrial network to protect the system from virus attacks, unauthorized personnel access and version incompatibility.

After evaluating software options on the market, NI LabVIEW and the LabVIEW Datalogging and Supervisory Control (DSC) Module were chosen. The development environment includes several features that met the project needs. LabVIEW is compatible with the OPC specification, which means it works both as a client and as a server, making it possible to communicate with the different measurement instruments in the field and between the different monitoring stations. Additionally, the graphical programming environment made it easy for the PEP engineering group to develop the entire application in-house, from communication between measurement systems to the user interface to the report generation.

### Graphical System Design and PACs Deliver Flexibility

A wide range of applications across multiple industries can benefit from graphical system design approach and the hardware capabilities of PACs. In the oil and gas industry a wide range of drilling, monitoring and production companies

are using These type of software programs to address the challenges they face and develop new innovative solutions.

**References:** *Deploying a Managed Pressure Drilling System based on NI LabVIEW and Compact FieldPoint* <http://sine.ni.com/cs/app/doc/pid/cs-11281>

*Shell Stabilizes Long Pipeline-Riser Gas/Liquid Flow* <http://sine.ni.com/cs/app/doc/pid/cs-230>  
*Deploying LabVIEW to Monitor Pipelines at the Ormen Lange in the North Sea* <http://sine.ni.com/cs/app/doc/pid/cs-10512>

*PEMEX Uses NI LabVIEW to Implement a Crude Oil Distribution System* <http://sine.ni.com/cs/app/doc/pid/cs-786>

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### End-to-End Security: The Smart Grid and Advanced Metering Infrastructure for the 21<sup>st</sup> Century Utility Industry

By Jim Alfred, Director of Product Management  
Certicom Corp.

A range of global forces are coming together that are leading to the mass deployment of new “smart” infrastructure in the utility industry. Often called Smart Grid and Advanced Metering Infrastructure (AMI), the concepts have been the topics of conferences and technology pilots for more than a decade. But a renewed emphasis on energy conservation and efficiency and calls for dramatically increased investment in infrastructure as a key component of government-led fiscal stimulus are giving dramatic new impetus to the desire to invest and deploy now.

From New Zealand to the U.K. and from Hawaii to Ontario, utilities around the world are launching demand response and dynamic pricing programs designed to reduce or shift energy consumption to non-peak periods. Studies by the utility industry show that improving energy efficiency is the single most cost-effective way to make more power available, rather than building expensive new generating plant capacity.

An added benefit is that this strategy reduces carbon emissions. Energy production and energy use account for approximately 40 percent of all CO2 emissions. Early pilots of Smart Grid and AMI have shown that end-users can be up to 25 percent more efficient by providing them the information and tools to intelligently manage energy use.

A key component in this drive for greater energy efficiency is mass deployment of AMI, two-way communication between the meter and meter data management system. AMI enables utilities to remotely manage their metering assets and to reach inside the consumer’s home through wireless sensor networks to display pricing information, collect hourly or more frequent usage information, and potentially to manage home appliances.

Utilities benefit from a managed power load that requires less investment in expensive new power generation capacity or spot market energy procurement. Consumers benefit by using real-time energy monitoring and dynamic energy pricing to lower their energy spending.

#### AMI: On Demand and in Real-Time

Automatic Meter Reading systems deployed in the 1990s supported remote meter reads with walk-by and drive-by data collection. New AMI systems provide two-way communication between a meter data management system and customer electric meters. They read data periodically or on-demand, allowing hourly or more frequent collection of detailed usage data and system information in all shapes and sizes.

In addition to the metering aspect, a smart grid facilitates remote asset management, monitoring voltage event logs, phase information, outage logs and tamper notification. In addition, many smart meters can meter energy that consumers add to the grid from alternative energy distribution such as solar. The smart grid enables these interconnections to be constantly monitored.

Enhanced communications and data management software allows utilities to

remotely manage their metering assets in near real-time, allowing for improved operations and customer management. Remote service connect/disconnect, fast final billing and responding to outages are a few examples of savings in eliminating the costly truck roll, allowing utilities to deploy operating capital elsewhere.

Communication bridges extend utility data networks into the home, allowing AMI systems to provide dynamic pricing and usage information to consumers to help them understand their energy consumption profiles, reduce or shift their energy consumption and lower their electricity bills.

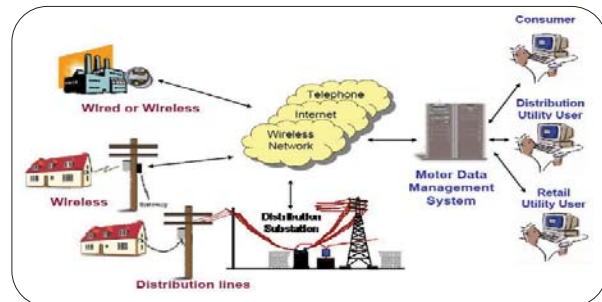
Communication also facilitates innovative demand response and load management schemes, such as modulating loads from power hungry systems such as air conditioning compressor circuits during critical peak energy events. Distributed load shedding can be quite effective for removing power demand from the network with often imperceptible impact to customer comfort.

Eventually enhanced connectivity will provide utilities an opportunity to offer new services such as property monitoring. With AMI-enabled home area energy networks, power consumption data can be collected even at the appliance level and used for detecting maintenance problems.

#### Technical Challenges: An Evolving Network Environment

The AMI and Smart Grid physical networks are evolving, with all manner of technology – from old-fashioned POTS to proprietary 900 MHz and 2.4 GHz wireless radios to standardized wireless mesh networks such as ZigBee to BPL to cellular. At the network layer, vendors employ TCP/IP or other protocols. Deployments mix networking technologies to provide the right balance of bandwidth, throughput and latency and cost. Given this network diversity, end-to-end security must be transparent to the network.

As Smart Grid applications and protocols evolve, utilities will evaluate which is suitable for their network. Each application has a benefit but also a cost in terms of reserve bandwidth. Devices are typically constrained and work best when sending small packets that don’t require fragmentation and reassembly and don’t eat up reserve bandwidth. Security should not add a significant amount of network overhead or require fragmentation and reassembly of authenticated messages or acknowledgements.



In the endpoints, embedded microprocessors, 8 or 16-bit microcontrollers (MCUs), are quite common. These devices have limited amounts of RAM or flash memory, typically challenging devices to make both open and secure. To preserve existing investment, security should not require a wholesale change to a new meter computing platform.

Once installed, devices might be expected to be deployed for 20 years or more. Rework and redeployment can be prohibitively expensive. The security scheme needs to be robust enough to withstand the test of time.

#### The Need for Security

The network’s openness and two-way communication capabilities add new risks to what has traditionally been an isolated transmission and distribution system. As smart energy homes with demand response capabilities and smart grid infrastructure are deployed, hundreds of millions of devices will be connected in one way or another to utility networks and the public Internet. Information about energy consumption will flow out of homes and offices, remote command and control signals will flow in.

Once these devices are on a network, they benefit from remote management and firmware upgrade capability. Allowing firmware updates creates potential vulnerabilities – places a hacker can attack.

A malevolent attacker or unwitting hacker could harm someone connected to in-home medical equipment, cripple a business or cause a wide-scale blackout and hundreds of millions of dollars in economic damage.

Given the risks, the utility must consider NERC Critical Infrastructure Protection (CIP) requirements when automating their distribution networks.

Consumers with a Home Energy Network will want protection as well. Smart energy devices on the network must be controlled by a customer-approved utility demand-

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response program. Information transmitted between the energy service portal, such as an in-home gateway or smart meter, is private.

The UCAIUG's Utility AMI security working group (AMI-SEC), an industry consortium, recognized that security is a critical market enabler. They aim to establish baseline AMI security requirements at the outset and are drafting a specification, which serves as a useful guide for utilities evaluating vendor offerings.

Numerous AMI-SEC stakeholders have been identified, from the billing system to installation, operations and maintenance and on to the consumer. Each has unique concerns depending on the processes they are involved in.

Baseline security requirements can be classified by high-level functionality. These include confidentiality and privacy, integrity, availability, identification, authentication and authorization, non-repudiation and accounting/logging services.

The foundation of much of this functionality is based on cryptographic services including cryptographic key management and cryptographic operations for a number of purposes, including to:

- Authenticate and integrity check of system commands to ensure they are authorized and haven't been tampered
- Guard against replay attacks to prevent denial of service attacks or load shedding and ensure availability of system resources
- Cryptographically authenticate metering assets to the network to ensure that only known, trusted devices participate in the network.
- Encrypt meter data to protect consumer privacy
- Provide a means of non-repudiation for consumer demand response programs
- Provide integrity protection and origin authentication of meter data
- Authenticate and integrity check meter firmware and configuration images when updates are provisioned

Beyond baseline cryptographic services, systems need to manage assets in a secure fashion. For instance, system keys must be protected from disclosure through physical and policy-based mechanisms. Role based access controls should authenticate personnel authorized to manage the system and provide a secure audit trail when system management or maintenance tasks, such as updating keys, is performed.

An important step in building a strong security foundation is to establish a root of trust for every device. This enables each device to validate its operating environment, including any modifiable software or configuration files. It is when firmware is being reprogrammed that devices can be most vulnerable.

To ensure image code integrity and authenticity, the core boot loader should be stored in protected (read only) memory. Signatures should be authenticated on firmware and sensitive configuration data. Verification keys should also be protected from unauthorized modification – preferably stored in one-time-programmable (OTP) memory. Configuration data should be bound to the device identity, such as a unique MAC address.

### A Secure AMI Solution

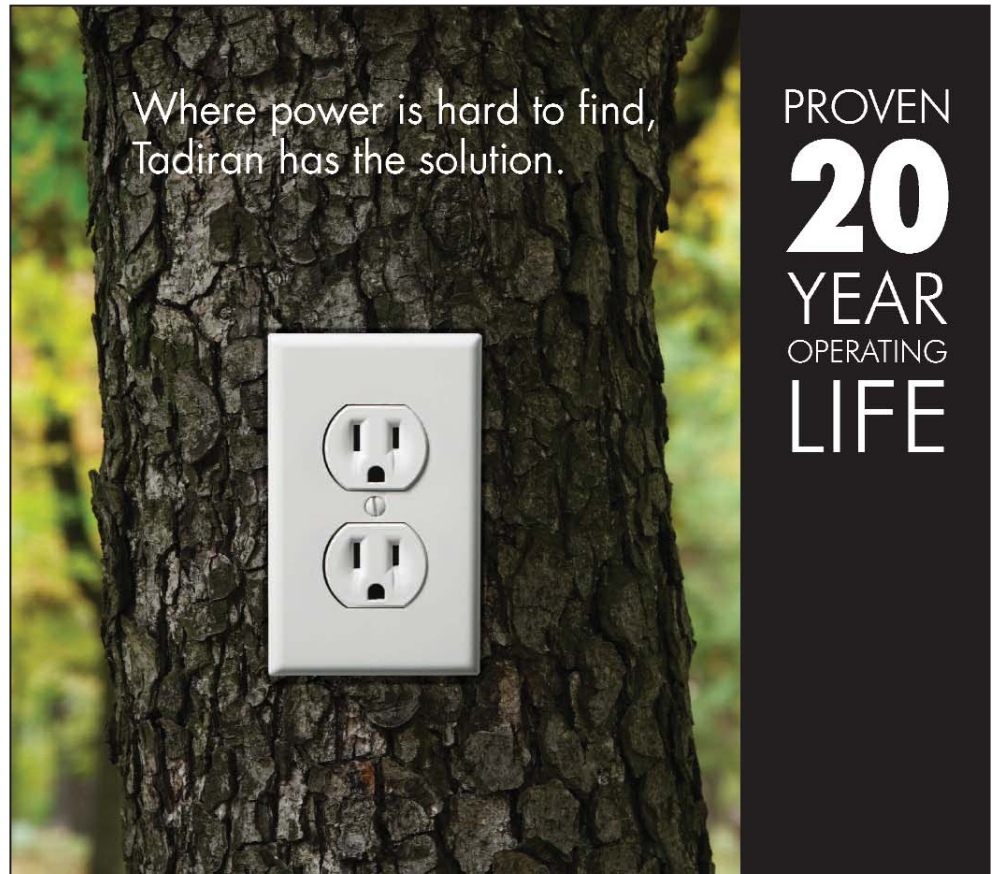
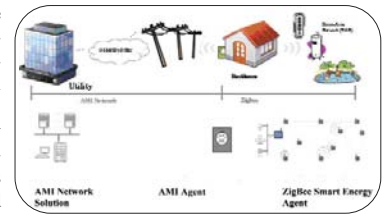
An AMI security solution needs to be a highly scalable turnkey security platform that provides an automated, end-to-end security between advanced utility meters and utility companies' back-end IT infrastructure. The security solution needs to support millions of meters, multiple reads/hour and run on low-power microcontrollers (MCUs).

For example, Certicom offers AMI 7000 Series Security Appliances and a Certicom AMI Meter Agent. The AMI 7000 appliances are hardened rack mountable security appliances designed to help utilities meet NERC Critical Infrastructure Protection (CIP) requirements for AMI deploy-

ments. They support large-scale deployments where security performance and robustness are vital and provide turnkey management of critical system keys.

This system was specifically designed to support emerging AMI-SEC requirements and work in today's low-bandwidth, resource constrained metering environments with ANSI C12.22 compliant devices. It can be deployed with any network topology, from today's heterogeneous environments to tomorrow's all-IP network. Certicom achieves these requirements by employing strong, efficient Elliptic Curve Cryptography (ECC) based public algorithms and enforcing robust key management practices from start to finish.

Please see Certicom continued on page 30



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### Cermetek Introduces New Internet Enabled GPRS/GSM RF Cellular Radio Modem

Cermetek Microelectronics, Inc. has introduced the CH2168, an external, Internet enabled, GPRS/GSM wireless modem. The CH2168 provides TCP/IP cellular radio communications for autonomous or semi-autonomous M2M applications, and is pre-approved on AT&T and T-Mobile networks in the US and GCF approval for the European Union.

Typical applications for the GPRS/GSM external wireless modem include remote data transmission/reception systems, such as those found in the chemical production and bulk transportation industries, energy production market segment, and scientific research where robust, reliable communication is a must. The CH2168 is housed in a rugged aluminum enclosure and comes complete with numerous Industry Standard interfaces, including: TCP/IP stack,  $\mu$ Linux OS, BSD socket API and all necessary protocols to conduct multiple and simultaneous Internet operations.

The CH2168 delivers a convenient, reliable wireless data solution for remote systems. It can be controlled by an external host via an RS232 serial interface or can run C, C++ or C# user applications on the onboard Coldfire processor. By hosting the user



application, the modem allows the system to employ a less powerful host controller or even eliminate the need for an external host controller.

The RS232 serial interface simplifies integration of the CH2168 into existing systems. Operation can be controlled by issuing simple, intuitive commands through the serial interface. Two watts of output power insure reliable communications even in remote locations.

The CH2168 is the first in a family of GPRS/GSM modems planned for introduction by Cermetek incorporating a multi-network approved GPRS/GSM dual band radio and Coldfire processor. The internal 2 watt GPRS/GSM radio handles encoding, transmission and reception of the data signal. The Coldfire processor runs the TCP/IP stack, manages the data stream, executes both system and user supplied API and monitors/controls the data/Internet link(s). When required by the user application, operation of CH2168 can be controlled by the user by issuing simple intuitive commands to the CH2168 via its RS232 interface.

### High Power Ethernet Radios Offer Long-Distance Communication in a Mesh Network

Phoenix Contact's new high power industrial radios provide secure wireless communication over a long-distance, wireless mesh network of up to 40 radios. The RAD-80211-XD/HP and RAD-80211XD/HP-BUS feature 400 mW (26 dBm) transmit power and 128-bit AES encryption.



A unique auto-bridge mesh mode allows the network to self-form and heal if a radio drops out of the network. This results in an uninterrupted flow of data even if other bridge devices or network segments in the data's path fail.

Like the other radios in the RAD-80211-XD series, the high power radios also support access point, client and bridge/repeater modes. They conform to standards 802.11b/g and operate in the 2.4 GHz band.

With the radios' simple, IT-friendly embedded software, any network PC with a web browser can configure the devices. Built-in RS-232 and RS-422/485 device servers allow the integration of serial devices onto the wireless Ethernet network.

With the RAD-80211-XD/HP-BUS radio, up to 64 digital, analog and pulse I/O points can be interfaced directly to the radio by connecting the RAD-Line expandable I/O modules. The I/O modules can be addressed via Modbus TCP or legacy serial Modbus RTU over the 802.11 network. This provides a standard solution for facilities undergoing incremental upgrades. Multiple wireless communications streams allow simultaneous Ethernet, I/O control and serial ASCII device communications - all from a single radio without external gateways or additional serial wireless converters.

Both the RAD-80211-XD/HP and RAD-80211-XD/HP-BUS units are approved for use in Class I, Division 2 hazardous locations.

### Rabbit Releases New Family of Wireless Single Board Computers

Rabbit has introduced the BL4S100 and BL4S200 single board computers(SBCs) that feature either Wi-Fi or ZigBee connectivity, a microprocessor, memory and abundant I/O that allow easy deployment of wireless nodes for industrial, commercial and medical applications. This combination of control, I/O and connectivity makes it easy for engineers to add wireless connectivity and control to devices like vision systems, wireless industrial control systems, automatic meter reading devices, industrial ventilation systems and HVAC systems. They also allow design engineers to gather and control data from ZigBee nodes and uplink the data to a server via Ethernet providing an easy to deploy ZigBee-to-Ethernet gateway.



The BL4S100 series offers both ZigBee and Ethernet connectivity and provides embedded design engineers a straightforward approach for machine control and data acquisition without the burden of cables and wiring harnesses. It allows design engineers to deploy ZigBee nodes at various control points and connect those nodes wirelessly to the BL4S100 board. The BL4S100 SBC can then gather and collate the data from the ZigBee nodes and uplink it to a server via Ethernet.

The BL4S200 series delivers higher clock speeds and twice the I/O as the BL4S100 series and offers a choice of Wi-Fi or ZigBee connectivity. It is well suited for applications that require significant digital and analog I/O such as data logging, instrument reading, and controlling motors, relays and solenoids.

Based on the Rabbit 4000 microprocessor, the BL4S100 series features analog inputs, general purpose I/O, serial ports, and ZigBee and 10 Base-T Ethernet connectivity to provide design resources for commercial and industrial applications. Digi's Xbee ZB RF modules are also compatible with other manufacturers' ZigBee PRO compliant devices providing additional node choice flexibility. Based on the Rabbit 4000 and Rabbit 5000 microprocessors, the BL4S200 series features Wi-Fi, ZigBee and Ethernet networking options. It also includes a broad range of configurable I/O resources, I/O expansion using Rabbit's RIO chip, and multi-channel analog inputs and outputs.

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### Laird's New LT2510 Proprietary RF Modules Push the Limits with 2.4 GHz Radio Performance

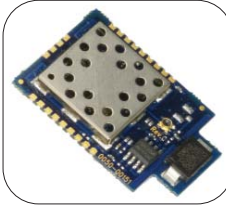
Laird Technologies, Inc. has introduced a range of proprietary RF modules, providing a new standard of performance for 2.4 GHz radios. The LT2510 is a fifth generation 2.4 GHz FHSS module that is designed for industrial RF communication. Based on its established proprietary FlexRF technology and operating in the globally available 2.4 GHz spectrum, the LT2510 is optimized to outperform conventional wireless standards.

"Wireless standards always involve a degree of compromise in that they have difficulty meeting extreme levels of performance requirements," said Nick Hunn, advanced technology director, Laird Technologies. "The LT2510 is optimized to deliver outstanding performance in terms of range or power consumption, taking it beyond the bounds of the standards-based offerings, while maintaining a competitive cost."

Embedded with Laird Technologies' server-client protocol, the LT2510 permits each module to communicate with any other in-range module for true peer-to-peer operation. Out of range modules can be reached via a meshing topology. The configuration and test software enables OEMs to structure and optimize networks to suit their application.

Enhanced API commands provide packet routing control and network intelligence. With its field-proven FHSS air interface protocol, the LT2510 rejects RF noise, excels against multi-path scenarios, allows for co-located systems, and provides a reliable communication link.

With over 150 Kb/s throughput in half-duplex mode, the LT2510 delivers speedy data rates. In addition, variable output power options, up to one watt, enable communication over distances that are not achievable with competing technologies. A range of ultra-low power modes, plus low TX/RX power consumption, make the LT2510 well suited for power-restrictive or battery-operated applications.



ly modeling not only the portion of the Fresnel zone that lies below the actual path line-of-sight, but also on both sides of the exact path, where additional path losses are created. Up to now this degradation would have been undetected. With this newly designed RF modeling tool developed by SoftWright and integrated with Google Earth, the engineer can fly down an entire path and look at the areas that would cause signal deterioration down the entire path including the side lobes of the protected Fresnel zone. Only when one knows precisely where these obstructed locations are, can an engineer proceed with strategic solutions to seek to eliminate locations where the signal is unreliable.

The example (image) shows that terrain severely blocked the reception on this path. The Terrain Analysis Package Software allows the designer to know in advance if these problems will be present and also to make design adjustments to eliminate or minimize these types of problems. If radio coverage is problematic the Terrain Analysis is Package (TAP) software can evaluate many proposed solutions so system reliability can be greatly improved.



### New Integration of Radio Path Analysis with Google Earth

SoftWright, LLC is now providing the capability to visually see the details of a radio path analysis or RF coverage map using Google Earth.

In the past radio system designers have relied heavily upon a predictive technique developed by a French physicist, Augustine-Jean Fresnel. His modeling predicted an invisible envelope of transmitted energy that surrounds the line-of-sight on the entire path between a transmitter and a repeater. When any obstruction penetrates this envelope, the received signal level is reduced, sometimes causing degradation so severe that the path was not usable for radio or data links.

Up to now this modeling was a simplified, two-dimensional graphic, where the engineer looked at the terrain profile of the path. If the entire portion of the Fresnel zone to be protected was above the elevation of the ground and obstructions along the path, then the receiver had the maximum possible signal.

SoftWright has developed a way of graphical-



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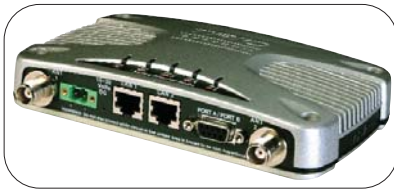
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### New Extended Range Antenna Expands the Reach of Smart Wireless Networks

Emerson Process Management has expanded its Smart Wireless solutions with the release of the Extended Range Antenna, available on Rosemount 3051S, 64, and 702 transmitters with WirelessHART output. Oil and gas industry users and others operate facilities where measurement points are separated by long distances, making wiring and powering of measurement points expensive. As a result, users are not able to monitor the performance of these points. The extended range antenna option provides a cost-effective way to access this information by increasing the distance between self-organizing points up to 2,600 ft.



Fully compatible with any WirelessHART network, the Extended Range Antenna provides the same rich HART diagnostic data, seven to 15 year SmartPower power module life and reliable and secure performance as other devices in the Smart Wireless family.



### Trio Datacom Releases J Series Ethernet Industrial Data Radio

Trio Datacom has introduced its J series frequency hopping data radio for industrial Ethernet communications in the 900 MHz and 2.4 GHz license free ISM band. Designed around a 1 watt transmitter output power (900 MHz version) and ultra sensitive receiver, these radios are suitable for the large distances required to be covered in SCADA systems for both point to point and

point to multipoint (MAS) applications. Maximum range is achieved with the combination of virtually unlimited system coverage due to its LinkXtend network bridging with dual antenna ports and KwikStream high speed repeater network bridging capabilities.

Each radio includes a wide range of features such as dual independent Ethernet ports and support for legacy RS-232 serial communications. They are suitable for Ethernet/IP protocols (including UDP, TCP, DHCP, ARP, ICMP, STP, IGMP, SNTP and TFPT) and includes a 10/100 auto-detecting interface with MDS/MIDX auto sensing.

Users of license-free wireless communications are no longer constrained by previously limited operating ranges. The versatile J series data radio can be configured as an access point, remote, bridge or repeater, and there are no limits to the number of repeaters in Point-to-Multipoint and Point-to-Point systems. Other features include a high throughput low latency repeating mode and the ability to use dual high gain directional antennas where a single omni-directional antenna at the repeater cannot provide the desired range.

Either Ethernet port can be used for diagnostics and re-programming. Network management includes all configuration via embedded HTML interface and diagnostics compatibility with Trio Datacom TVIEW+ for stand alone network management. Network Management and remote diagnostics are available using an embedded HTML interface, which requires no software other than a standard Web browser.

### WAAV Introduces the AirBox X2 Slide Cellular Router

WAAV has introduced the second generation AirBox X2, the AirBox X2 Slide. The AirBox X2 Slide incorporates new features never before seen in a cellular router and can route traffic over multiple 3G cellular connections simultaneously. This gives users more bandwidth as well as multiple network redundancy. Most cellular routers offer only one EVDO or HSPA connection, but the AirBox X2 Slide offers two. This is for mobile applications where more bandwidth is needed.

With the AirBox Slide X2 Multiple devices and users can access a single network name with Internet traffic balanced over multiple 3G connections. Users don't need

to manually change connections to another cellular router if a carrier drops or if there is not adequate bandwidth from a single connection. In addition to the regular load balancing that the AirBox X2 performs, an optional UDP load balancing is available for streaming video over two cellular uplinks. The UDP packets are split over both cellular connections; certain IP video encoders and decoders can then combine the two streams into one. Additional features for the AirBox X2 include remote diagnostic and management, which allows users to securely manage and change settings from any location, and the ability to choose the best suited cellular carrier based on the users geographical needs.



In addition, the AirBox X2 Slide features a tough exterior, the ability for users to insert (or slide in) their own modems while maintaining an external antenna connector for best signal strength and a refined remote user interface. With the slide in feature, users can use the cellular router with various carrier networks worldwide.

Recommended remote industry applications for the AirBox X2 Slide includes remote video surveillance. Users can deploy cameras in remote locations with no infrastructure costs to monitor utility site vandalism, traffic cameras and construction site copper theft. Enable in-vehicle surveillance for police, ambulances, armored trucks and prisoner transportation.

### Cinterion Launches Second Generation Scalable GSM Modules

Cinterion Wireless Modules has released its new scalable platform modules, named the TC63i, TC65i and MC75i. The scalable platform has a broad range of technologies and offers added improvements including expanded features, a smaller footprint and backward compatibility with the existing scalable platform products.



"The scalable platform allows our customer to find the optimal product for their current demands with the ability to easily upgrade to higher functionality in the future - or even to develop several varying solutions ranging from basic to complex functionality," said Norbert Muhrer, CEO, Cinterion Wireless Modules.

The new technological core features the ARM9 processor in 65 nm structure combined with the field proven and reliable Cinterion M2M software stack. The cutting-edge platform meets high standards of quality and offers a wide operational temperature range with temperature management for module protection. Another powerful M2M feature, RLS monitoring, enables monitoring of a multitude of connection and signal strength parameters to implement features such as customized jamming detection for increased security. The module also features an improved power management system, which leads to increased efficiency of the end solution.

Individually, the MC75i is one of the smallest EDGE modules in the world. EDGE (Enhanced Data Rates for GSM Evolution), represents the fastest transmission standard in GSM. The MC75i features a TCP/IP stack, serial and USB ports and

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RIL driver for Microsoft Windows Mobile based devices. The TC65i offers embedded JAVA processing based on a state-of-the-art ARM 9 processor architecture. Other features are GPRS, an integrated TCP/IP stack, and an array of industrial interfaces such as SPI, I2C bus, USB, AD/DA converter and multiple GPIOs. Lastly, the TC63i offers reliable M2M connectivity with GPRS functionality, integrated TCP/IP stack as well as industrial interfaces SPI, I2C and USB.

### GE Fanuc Intelligent Platforms Adds Profibus to 8000 Process I/O

GE Fanuc Intelligent Platforms has introduced a new Profibus-DP bus interface module (BIM) for its line of 8000 general purpose and intrinsically safe I/O.

"GE Fanuc believes that process customers should have the freedom to choose their fieldbus," said Jim Leatherby, product manager, GE Fanuc Intelligent Platforms. "The new Profibus bus interface module provides the interface between a Profibus-DP master and up to 32 8000 process I/O modules. It is designed to the Profibus DPv1 standard, which supports both cyclic and acyclic communications, and a pair of BIMs can be used in a redundant configuration providing for increased reliability and uptime."

The new Profibus BIM supports the pass through of HART variable and status data with eight-channel HART AI or AO modules. Communications to popular instrument management software, including AMS and FDT-based packages, is over Ethernet. The FDT applications are supported through DTM software provided by GE Fanuc. Through this interface, access to all of the smart features of HART devices, calibration and maintenance history for individually addressable devices, and an instrument database, are available to instrument management software packages.



### Advantech Extends Device Server Family with 802.11b/g Wireless Models

The Industrial Automation Group of Advantech has introduced the EKI-1351 (one-port) and EKI-1352 (two-port) 802.11b/g device servers. These new models allow most any RS-232/422/485 serial device to be remotely monitored, managed and controlled wirelessly, eliminating the need for hardwired cable connections.

Device servers are a drop-in solution to add network connectivity to non-networked devices and equipment. With one connection for the network, and the other for attached RS-232/422/485 serial devices, device servers encapsulate serial data for transport over IP networks. Used together in pairs as an extension cable for serial devices, or separately with a host computer or PC, device servers are well suited to overcome



the inherent distance limitations and point-to-point nature of serial devices.

For easy integration with COM-port based Windows applications, COM-port redirection software allows virtual COM-port access to remote serial devices, as if they were onboard COM-ports. With this tool, integration with PC-based systems takes just a few minutes, and it's transparent to the host application software and connected equipment.

In addition to Virtual COM-port operation, the EKI-1351 and EKI-1352 support TCP/IP and UDP/IP aware applications like OPC Servers and HMI systems that support serial encapsulation. For simple applications, these units can be used in a peer-to-peer manner, where there's no need for wireless infrastructure or access points. For advanced applications, both client and server modes support serial device

initiated or host initiated communications.

Where one-to-many or many-to-one connections are required, multi-access mode allows a single RS-232/422/485 serial device to send or receive data to multiple remote hosts. This is particularly important in applications where multiple PC-based system need access to a single serial device for shared access, or where replacing systems that rely on a hardwired serial bus-type architecture.

Like other EKI industrial ethernet family products, these 802.11b/g wireless device servers are packaged in a compact and thin, DIN-rail mount chassis. Ruggedized for demanding industrial applications, these units offer 4,000 VDC Ethernet ESD protection, dual 12 to 48 VDC power inputs to maximize uptime, and power line surge (EFT) protection of 3,000 VDC.

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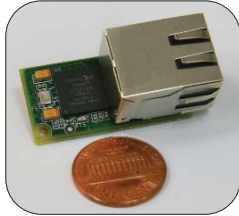
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### iChip-Based Implementations Enable Sub- $\$10$ Embedded Serial-LAN Solution

Connect One has released its Nano LANReach, an embedded LAN module that connects any embedded device to 10/100BaseT LANs with minimal programming. Measuring 2.5 by 3.5 cm including a built-in RJ45 connector, the Nano LANReach's firmware functionality makes it an affordable and versatile LAN solution for embedded devices.



Based on Connect One's CO2144 chip, Nano LANReach offers plug and play serial-to-LAN functionality enabling immediate and full-featured LAN connectivity by connecting an Ethernet cable to the onboard RJ45 connector. In addition, Nano LANReach includes a full suite of Internet protocols, applications and security engines.

As part of the Nano Reach product family, the Nano LANReach uses the same pin-out as the Nano WiReach WiFi module. This enhances customer flexibility in production planning, allowing for a single PCB design which supports either LAN or WiFi connectivity, depending on the module added during assembly.

Large-volume customers can build a sub- $\$10$  embedded serial-to-LAN solution identical to the Nano LANReach functionality by using Connect One's iChip. By adding an iChip CO2144/2128/2064 and any MII/RMII PHY to the main PCB, companies can migrate current applications while making significant design cost savings. Reference designs outlining the transition can be downloaded from Connect One's website.

Nano LANReach's firmware supports several modes of operation including serial to LAN bridging and a full internet controller mode. Serial to LAN enables transparent bridging of serial data over LAN using the module's high-speed UART. The module supports TCP, UDP or SSL tunneling of serial data. Full Internet controller mode allows simple microcontrollers to use the Nano

LANReach's rich protocol and application capabilities to perform complex Internet operations such as e-mail, FTP, SSL, embedded web server and others. Internet controller mode can be used with any hardware interface.

Nano LANReach also offers an advanced level of Internet security, including the latest Internet SSL encryption algorithms. In addition, it serves as an inherent firewall, protecting the embedded application from attacks originating from the Internet.

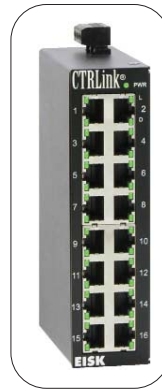
Nano LANReach includes USB, SPI and fast UART interfaces for easy integration into existing or new designs. In addition to SerialNET, it supports 10 simultaneous TCP/UDP sockets, two listening TCP sockets, SMTP, MIME, POP3, FTP, Telnet and HTTP/HTTPS clients, an HTTP/HTTPS embedded web server with a website for the host application and one for configuring the module. Nano LANReach also supports AES-128/256, SHA-128/192/256, 3DES, the SSL3/TLS1 protocol for a secure client socket session, and a secure FTP session.

### Contemporary Controls Debuts New EISK16 Ethernet Switch

With 16 copper 10/100 Mbps ports, Contemporary Control's new plug and play EISK16-100T switch is designed to increase the functionality of networks. This compact switch occupies 41 mm of DIN-rail space, making it well suited for areas with limited space. Housed in a metal enclosure, it provides reliable connectivity for industrial and building automation systems in a cost-effective manner.

The EISK16-100T expands the CTRLink family of Ethernet 5 and 8-port switches. Just power it up, and this unit will auto-configure each port for data rates at 10 or 100 Mbps and cable requirements.

These ports support half-duplex operation with backpressure flow control or full-duplex operation with pause control. This device does not require any configuration or



software, making installation simple. With Auto-MDIX support, there is no need for crossover cables when connecting to another switch.

Convenient mounting is available with the attached DIN-rail clip. Low-voltage 10 to 36 VDC or 24 VAC ( $\pm 10$  percent) 47 to 63 Hz powers the unit. It is designed to operate in  $0^{\circ}\text{C}$  to  $60^{\circ}\text{C}$  industrial temperatures. The auto-negotiation protocol allows this switch to link with any compatible 10BASE-T or 100BASE-TX device. It will function with any application layer that works with Ethernet including Modbus/TCP, BACnet/IP or EtherNet/IP.

### New ABB SREA-01 Ethernet Adapter Provides Web Browser-Based, Remote Access to Drives

ABB Low Voltage Drives has released its SREA-01 Ethernet Adapter for the company's low voltage AC drive line. The din rail-mounted SREA-01 enables access remotely to drives. If a process alarm or fault occurs, the internal web server of the SREA-01 provides an easy-to-use user interface for accessing the drives and other process variables.

With drives increasingly being installed in remote locations (windmill farms, water and waste water pumping stations, irrigation pumps, oil fields, and mining applications), operational data from the process needs to be acquired and sent to a central location for process monitoring and analysis.

"If no qualified service personnel are onsite, it is vital to be able to monitor and configure the drive or process variables remotely," said Greg Semrow, product manager for ABB Low Voltage Drives. "This makes the SREA-01 a valuable tool for plant engineers and managers, system integrators, OEM's and service personnel who demand to be connected to the process no matter if they are on-site or across the globe."

ABB's SREA-01 Ethernet adapter performs all these remote access tasks. Designed to optimize the remote interface to ABB AC drives that have a Modbus-RTU port, the SREA-01 can send process data, data logs and event messages independently, without a PLC or a dedicated on-site computer. The SREA-01 Ethernet adapter has a built-in internal web server for configuration and drive access.

The adapter can connect a maximum of 10 drives to an Ethernet or GPRS network. The SREA-01 comes equipped with an Ethernet port and a serial port for connecting to a standard GSM/GPRS(1) modem for internet connectivity in isolated places. The modem connection can be used for sending e-mail or SMS, messages, uploading data files via FTP, or accessing the web pages of the module.

The SREA-01 can be connected to the panel port of ABB ACS350, ACS550, ACH550 or, alternatively, to the Modbus interface of a drive. A maximum of 10 drives can be connected to a single SREA-01 module, although an additional RS-485 converter is needed for each drive, if several drives are connected by their RS-232 panel port interface.

Via the adapter, users also can receive event messages, alarms and access the drive remotely. The SREA-01 adapter can be used to monitor situations such as out-of-tolerance process flow, pressure, motor torque or any number of drive or process variables and then send alarm messages to support personnel. The event and alarm messages can be sent as SMS messages or by e-mail. The



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event conditions and messages can be configured by the user to make them suitable for a number of applications.

Users can collect data logs and integrated drive data in SCADA applications, via the interface, as well. For collecting data from the drive for process monitoring or further analysis, the SREA-01 has a fully configurable data logger that can store values from the drives to a file, with sample intervals from 10 seconds to one hour. The files are stored in a standard Comma Separated Values (CSV) format that can be imported to applications such as Microsoft Excel for processing.

The collected data logs can be sent by e-mail or FTP, either through a local area network or the internet. The sending interval also can be configured by the user, with logs being sent, for example, every hour or once a week. In addition to providing data logging functionality, the SREA-01 also has an internal Modbus-TCP gateway, providing a standard interface that can be used by SCADA applications to display drive information in real-time.



### Rack-Mount Managed Ethernet Switches from Sixnet

Sixnet has introduced the new EK series of rack-mount industrial Ethernet managed switches offered in 26-port (EK26) and 32-port (EK32) models. These switches are industrial rated and designed to meet the requirements of power substations (IEC 61850 / IEEE 1613), traffic control (NEMA TS2), railway applications (EN 50121-4), maritime (ABS/DNV/GL) and more. The rugged and compact 1U rack-mount packaging fits into standard EIA, WECA and ETSI racks from 19 to 24 inches.

The EK26 and EK32 switches are configurable and offer a wide range of Ethernet port options. They feature up to eight Gigabit ports for 10/100/1000 RJ45 Ethernet links including four that are combination ports that also accept industry standard 100 Mb or 1000 Mb SFP fiber optic transceivers. There are up to 16 fast Ethernet ports that can be either 10/100 RJ45 or fiber optic for noise immune links up to 120 km. Plus there are 10 more 10/100 RJ45 ports of which eight can optionally support advanced PoE (Power over Ethernet) per IEEE 802.3af.

The EK switches are loaded with added software features for real-time secure performance. This includes Rapid Spanning Tree Protocol (RSTP) for fast redundant rings, IGMP for multicast filtering, VLAN for traffic segregation, security and much more. Plus firmware upgrades are free. These features are easily configured through Sixnet's user friendly web interface with online help, SNMP or CLI (Command Line Interface).

The EK switches are offered with numerous power input options from 24 VDC to universal VAC including dual inputs for true redundancy. An alarm output signals when a power input fails or other critical events.

The ruggedness and reliability of the new EK switches come from their corrosion-resistant case and wide temperature operation (-40°C to 85°C). A sealed IP50 option keeps out dust, dirt and debris. These switches will be fully UL/CSA (cUL), CE, FCC and RoHS rated.

### Mobile Satellite Ventures Awarded Multiple Patents for its New Satellite-Terrestrial Communications Network

Mobile Satellite Ventures (MSV) has been awarded multiple patents by the US Patent and Trademark Office. US Patent 7,421,342 B2 entitled "Network-Assisted Global Positioning Systems, Methods and Terminals including Doppler Shift and Code Phase Estimates," improves the efficiency of global positioning system (GPS) capabilities when using future hybrid satellite-terrestrial phones and devices.

According to the patent's inventor, Gary G. Churan,

director of Systems analysis and optimization for MSV, "This technique will reduce the computing complexity and processing time it takes to receive an accurate GPS location when using a satellite-terrestrial phone, similar to the devices that will use MSV's emerging ancillary terrestrial component (ATC) technology."

In a related technology approval, the US Patent and Trademark Office also awarded to MSV US Patent 7,418,263 B2, "Systems and Methods for Handover Between Space Based and Terrestrial Radioterminal Communications." This patent entails methods of monitoring and measuring transmission power and signals that enable communications over integrated satellite-terrestrial networks, thus reducing or eliminating co-frequency interference.

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### Italian Utility Hera and GE Energy Inaugurate Model Sewage Gas-to-Energy Cogeneration Project

Hera Forli-Cesena, one of Italy's leading multi-utilities, has selected GE Energy's Jenbacher gas engine technology for its newest cogeneration plant. The plant will utilize sewage gas to generate electricity and thermal power at a wastewater treatment facility in the northern city of Forli.

The Forli project, in the province of Forli-Cesena, is one of only a few sewage gas-to-energy plants of its kind in Italy, making Emilia Romagna one of Italy's leading regions in this innovative energy application. GE's expertise in specialty gas technology and the performance of the Savignano and Cesena cogeneration plants resulted in Hera selecting the Jenbacher engine for the Forli plant as well.

The project is designed to help reduce the treatment facility's energy costs by utilizing an available renewable energy source in support of Italy's energy and environmental priorities. As a result, the project is eligible to participate in Italy's Certificati Verdi (green certificate) trading system, which supports the production of renewable energy.

The new Forli cogeneration plant features one of GE Energy's Jenbacher JMS 208 GS-L.L engines, which will use sewage gas to generate an output of 330 kWel and 400 kWth to support the wastewater treatment plant's operations. The engine is similar to the Jenbacher units operating in Hera's other sewage gas-to-energy plants in Savignano and Cesena, which are also within the Forli-Cesena system.

Sewage sludge is created as a waste product in the mechanical/biological process

stages of sewage treatment plants. The sludge is dried and then transferred to a digester where the anaerobic fermentation process takes place. The fermentation produces biogas, so called sewage gas, consisting of 60 to 70 percent methane and 30 to 40 percent carbon dioxide.

The sewage gas then is sent to GE's Jenbacher engine to produce electricity, which is utilized for the operation of the whole facility. The thermal energy is used for heating the sewage sludge (37°C). The engine will supply up to 50 percent of the water treatment facility's onsite power needs, thereby reducing their need for grid power.

"Our enduring collaboration with Hera is important to us and we are pleased to provide solutions that meet their needs in terms of energy savings, environmental benefits, operating flexibility and efficiency," said Mario Artoni, general manager for GE Energy's Jenbacher gas engine business in Italy. "Over the years, GE's Jenbacher engines have been selected by Hera not only for its other treatment plants in Savignano and Cesena, but also for different applications, such as a district heating project in Bologna and several waste-based power generation projects in Bologna, Forli and Ravenna."

Like the Savignano and Cesena plants, the engines at the Forli plant were installed by CPL Concordia, the company that, within the scope of a global service agreement with Hera, also will be providing maintenance and replacement spare parts to keep the plant running at optimal levels.



### EnerSys Adds 800 WPC Model to Its DataSafe 16 V Front Terminal UPS Battery Line

EnerSys has added a new product to its DataSafe 16 V Front Terminal UPS Battery line, the 16HX800F-FR. The DataSafe16HX800F-FR is a valve-regulated lead acid (VRLA) battery that produces 800 WPC for 15 minutes to 1.67 volts per cell at 77°F. DataSafe 16 V are VRLA batteries that provide more power than 12 V batteries and use less space. They are specially designed to back up the primary power system for UPS applications and supply power for 15 min-



utes until the backup generator is fully operational.

The DataSafe16HX800F-FR can produce the necessary power to handle the runtime for large UPS systems without having to use smaller 12 V batteries that require more strings and therefore drives up the system cost. They have up to 50 percent fewer connections which simplify wiring and helps reduce costs. The high power rating of the 16 V batteries also give users a more economical and space efficient option to large single cell VRLA batteries in high power rated UPS systems.

With the addition of the DataSafe16HX800F-FR, EnerSys offers the 16 V VRLA batteries in three sizes: 500 watts per cell (WPC), 800 WPC and 925 WPC. They require only 44 sq. ft. to support a typical 750 kVA UPS system with a full 15 minutes of runtime.

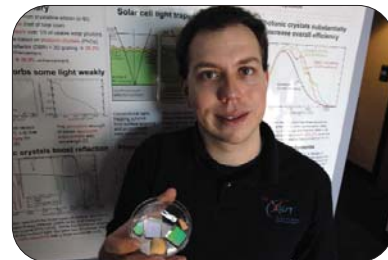
"Now, UPS systems are no longer limited to top terminated 12 V batteries or bulky 2 V cells. Expanding the line to three sizes gives our customers the tools they need to maximize their power density and footprint savings,"

said Steve Vechy, director, UPS and Utility Marketing, EnerSys. "A well-rounded line of 16 V offers efficiencies for better productivity and bottom lines."

With the same dimensions (27.2 by 7.0 inches) and 20 pounds lighter (220 lbs.), the DataSafe 16HX800F-FR fits in the same rack system as the 925 DataSafe 16 V batteries. Cabinets are available in gray or black to match other data center equipment. Complete front access in the 16 V front-terminated DataSafe models makes access and maintenance easier than top-terminated 12 V batteries.

### MIT Finds Ways to Boost Solar Cell Efficiency

New ways of squeezing out greater efficiency from solar photovoltaic cells are emerging from computer simulations and lab tests conducted by a team of physicists and engineers at MIT. Using computer modeling and a variety of advanced chip-manufacturing techniques, they have applied an anti-reflection coating to the front, and a novel combination of multi-layered reflective coatings and a tightly spaced array of lines, called a diffraction grating, to the backs of ultrathin silicon films to boost the cells' output by as much as 50 percent.



The carefully designed layers deposited on the back of the cell cause the light to bounce around longer inside the thin silicon layer, giving it time to deposit its energy and produce an electric current. Without these coatings, light would just be reflected back out into the surrounding air.

"It's critical to ensure that any light that enters the layer travels through a long path in the silicon," said Peter Bermel, a postdoctoral researcher in MIT's physics department. "The issue is how far does light have to travel, in the

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silicon, before there's a high probability of being absorbed, and knocking loose electrons to produce an electric current."

The team began by running thousands of computer simulations in which they tried out variations in the spacing of lines in the grid, the thickness of the silicon and the number and thicknesses of reflective layers deposited on the back surface.

"The simulated performance was remarkably better than any other structure, promising, for 2-micrometer-thick films, a 50 percent efficiency increase in conversion of sunlight to electricity," said Lionel Kimerling, the Thomas Lord professor of Materials Science and Engineering, who directed the project.

The simulations were then validated by actual lab-scale tests. "The final and most important ingredient was the relentless dedication of graduate student Lirong Zeng, in the Department of Materials Science and Engineering, to refining the structure and making it," Kimerling said. "The experiments confirmed the predictions, and the results have drawn considerable industry interest."

The work is just a first step toward actually producing a commercially viable, improved solar cell. That will require additional fine-tuning through continuing simulations and lab tests, and then more work on the manufacturing processes and materials. If the solar business stays strong, researchers expect implementation within the next three years.

The MIT Deshpande Center selected the project for an "i-team" study to evaluate its business potential. The team analyzed the potential impact of this efficient thin solar cell technology and found significant benefits in both manufacturing and electrical power delivery, for applications ranging from remote off-grid to dedicated clean power. The potential for savings is great, because the high-quality silicon crystal substrates used in conventional solar cells represent about half the cost, and the thin films in this version use only about 1 percent as much silicon.

### Caterpillar Introduces XQ45 And XQ60 Diesel Generator Sets with ACERT Technology

Caterpillar, Inc. has introduced two new mobile diesel rental generator sets, the XQ45 and XQ60, which both feature A C E R T Technology to meet new Environmental



Protection Agency (EPA) emissions requirements without sacrificing performance. These generator sets are well suited for small business owners and other customers who need prime or standby power support in a complete package.

Combining maximum performance and ease of use, the XQ45 and XQ60 generator set packages are designed specifically for the rental market. They feature NEMA 1 steel, sound-attenuated, weatherproof enclosures that feature an internally mounted exhaust silencer and corrosion-resistant, rugged construction, including Class H insulation with coastal insulation protection. Security is built in, with lockable access doors to the safety glass control panel viewing window, fuel fill and Cat maintenance-free battery.

Located on a single side, the large doors and access panels to controls also ease usability for

renters. The XQ45 and XQ60 feature an analog control panel, providing a simple-to-operate interface with full function instrumentation and safety features. The control panel centralizes gauges for oil pressure, engine temperature, voltage, amperage, frequency, fuel level and battery voltage. Indicators alert customers to low coolant level, low fuel level or fuel leak, low oil pressure, overspeed and emergency shutdown. Safety is further enhanced by three-pole UL/CSA-listed molded case circuit breakers.

Through advanced fuel delivery strategies, air management and highly developed electronic systems, the generator sets' turbocharged Cat C4.4 engines with ACERT Technology meet EPA Tier 3 non-road mobile applications emissions regulations without compromising fuel consump-

tion or increasing the weight of the unit. Both the XQ45 and XQ60 feature an ADEMT A4 engine control module.

The XQ45 is rated at 45 kW (standby)/41 kW (prime) at 60 Hz, while the XQ60 is rated at 60 kW (standby)/53 kW (prime) at 60 Hz. Both generator sets offer switchable voltage output: 480/277 V and 208/120 V at three-phase and 240/120 V at one-phase. The generator sets are permanent magnet excited and feature an R438 voltage regulator.

The XQ45 and XQ60 are both packaged with an integrated single-wall fuel tank and allow for an optional UL-listed double-walled fuel tank base. The tanks hold a minimum of 24 hours worth of fuel. These generator sets are soft-mounted to a heavy-duty steel base with lifting points that can be placed on an optional tandem axle trailer.

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### Falcon Electric Solves UPS/Generator Compatibility Problems in Belize

Belize is a small nation on the eastern coast of Central America on the Caribbean Sea. The only English-speaking country in Central America, Belize was a British colony for more than a century and became an independent nation in 1981.

Serving the radio and wireless network communications needs of the country since 1988 is Belize Communication and Security (BCSL). As the oldest existing land-mobile radio service center in Belize, BCSL is an authorized Motorola service center.

BCSL offers and services alternative energy products, such as Falcon Electric's UPS, weather stations and security vision equipment. Additionally, as a US Government Contractor for Central and parts of South America, BCSL installs and services 300 Mbps high speed wireless connectivity equipment.

Back in the late 80's, communication services were only available in the urban areas of Belize. People living in remote areas were not served and did not have any way of communicating with the rest of the world. To solve this problem in these rural areas, systems were established and have contributed to the continued economic development of rural Belize.

"Because of the small population in Belize, revenue from our local customers was not enough to support the financial needs of the company," said Rick Simpson, president of BCSL. "We had to go outside the borders of the country to market our services in order to afford to support the level of service needed in Belize. We found that the talents of those in our organization were formidable not only in Belize but worldwide."

BCSL's communication services do not stop at just radio and telephone. Their staff provides local and regional "dispatch" and "repeater" service, e-mail services to those living in remote areas, network services for large multi-national organizations and substantial computer list servers for international companies.

BCSL's remote location is both a blessing and an obstacle when it comes to building reliable computer and communication networks in Belize.

"As one would expect, the power from the local utility company is sometimes

unstable. During a typical week, we have to transfer to our on-site generator at least once," said Cryer. "This used to cause problems to the UPSs that protect our computers, Internet working gear and other sensitive electronics we rely on to power our networks and communications systems."

The UPSs that BCSL used were a popular brand with an on-line topology, meaning that the UPS would change the incoming main's AC from the utility line, to DC charge

for internal batteries, then regenerate a new AC power source by inverting the DC back to AC. In spite of this mode of power conversion, the UPS itself was not rugged enough to operate from the generator.

"When we went to generator power, the UPS would detect an emergency condition and stay on its internal batteries. After a short period of time, the UPS would shut down and we would lose power," said Cryer.

"We knew we had to find a UPS that was not only on-line but robust enough to accept the unstable power from the generator and convert that power into a clean, regulated sinewave without utilizing its internal batteries, said Cryer. "During my UPS research, I looked at several UPS companies and was pleased to find that Falcon Electric had a

sales and engineering staff that could answer our questions accurately and quickly. In addition, I was impressed with the amount of detailed information on their web site and it became clear that the SG series UPS Plus rackmount line would solve our power regulation problem. The icing on the cake was the fact that the Falcon SG series gave me the flexibility of communicating remotely via an SNMP/HTTP-based internal interface card option, which is a critical function since we have a lot of remote nodes that we need to stay in contact with on a continual basis."

Installation was simple and after using Falcon's SG 3kVA UPS, model SG3KRM-1TU, with the internal SNMP/HTTP communications interface, BCSL has solved their power problems. The Falcon unit also provides another benefit that they didn't expect, the SG series is so precise that it sends out an alarm when the power source changes from the utility line to its diesel generator. This information is used for their internal record keeping.



### Raritan's Intelligent Power Strip Supports IBM's Systems Director Active Energy Manager V4.1

Raritan's Dominion PX intelligent power distribution units (PDUs) now support IBM Systems Director Active Energy Manager (AEM) V4.1. A key component of the IBM Cool Blue portfolio within Project Big Green, IBM Active Energy Manager provides clients

with a view of the actual power used, as opposed to benchmarked power consumption, and can effectively allocate, match and cap power and thermal limits in the data center - at the system, chassis or rack level. To help customers monitor data center power usage, AEM uses autonomic capabilities to track energy consumption across multiple platforms.

The new release of AEM energy management software provides a number of new features including

power-trending support for older systems, low and midrange storage devices and non-IBM systems through the use of intelligent power distribution units. By plugging systems into a supported intelligent PDU, such as IBM's or Raritan's Dominion PX PDUs, AEM is able to collect power information for each device, thereby presenting a more complete view of energy usage within the data center.

Raritan's intelligent PDU gathers outlet-level metering information on servers and other equipment plugged into its power strip. With built-in intelligence, connectivity and security technologies, Raritan's Dominion PX PDU can determine the actual power usage of individual servers, a rack's capacity and environmental information, such as temperature and humidity at the rack. It also can be used to power sequence IT equipment from anywhere.



By having accurate, detailed information on power usage, IT and facility managers are able to manage data center workloads for optimal energy efficiency. Customers, for example, can migrate workloads to eliminate hot spots, or move work off underutilized systems to conserve energy. AEM is enabling IBM's own data centers to experiment in moving workloads from one data center to another in order to chase the sun and take advantage of lower utility rates offered at night time in certain parts of the world.

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### The Alpha Group Extends Power For Mission Critical Applications

Alpha Energy has introduced a next generation solar power hybrid AC/DC power plant, designed to extend power to remote mission critical applications.

"We are bridging the gap between traditional solar power and remote mission critical powering applications," said Dave Frankenfield, vice president, Alpha Energy. "Our systems



are modular and scalable up to 1,200 amps, with fully integrated PV inputs for off-grid telecommunications grade applications, such as telecommunications, security, military, SCADA and pipeline companies."

Alpha stocks a 200 amp DC system featuring a Cordex DC controller, 1.8 kW Cordex rectifiers designed for 120/240 VAC input, one battery string with 100 Ah of energy storage and an Apollo T80 MPPT charge controller. This system accepts 4 kW of PV input power on the single charge controller. With 120 VAC input, the rectifier bank can be powered by a small, energy efficient generator with no loss of charging capability.

"An advanced powering system of this design and capability allows our customers to extend their reach into new frontiers of critical remote applications," said Iain Selkirk, technical support services manager, Argus Technologies. "Our power-efficient DC Solar Plant features integrated Web, SNMP and MODBUS remote monitoring capabilities combined with system status monitoring and control for environmental and generator systems. Additional features of the plant include redundancy provisions for 5 nines reliability and the capacity to scale and customize the configuration for a variety of applications."

This custom configurable DC system is a joint effort between Alpha Group members, Alpha Energy and Argus Technologies. Each group brought their expertise to create this hybrid powering solution featuring a remote monitoring computer interface that can be used locally or remotely. Additionally, Cordex rectifiers can be hot-swapped, and rectifiers and inverters capacity can be expanded if the load requirements increase.

### Saft and ABB Develop High Voltage Li-Ion Battery System For Power Distribution Grids

Saft and ABB have developed the a high voltage lithium-ion (Li-ion) battery system designed to improve the stability of power distribution grids. The new system combines dynamic energy storage provided by Saft's 5.2 kV battery, which will help respond to disruptions in the grid, with ABB's SVC (Static Var Compensation) Light technology for dynamic voltage control. Potential applications include industries with high short term power demands as well as utility grids fed by a high percentage of variable renewable energy sources, especially wind power.

The SVC Light with dynamic energy storage extends ABB's FACTS (Flexible AC Transmission Systems) portfolio covering a number of technologies that enhance the security, capacity and flexibility of power transmission and

distribution systems, as well as improving productivity and power quality in industrial applications. While current FACTS technology is focused primarily on stabilizing grid voltage, the addition of energy storage now broadens its scope to covering short term load or supply variations.

"The key aim of this project is to demonstrate the feasibility and added value of incorporating Li-ion energy storage within a FACTS system," said Per Eckemark, head of ABB's FACTS System Group. "It could play a vital role in ensuring the stability of utility grids as the penetration of wind power increases."

Li-ion battery technology offers a number of important features in this application, such as added cycling capability, long calendar life, high energy density, short response time, high power capability both in charge and discharge, and maintenance-free design. Furthermore, Saft's Li-ion technology provides the system with precise information on the state of charge, which is a vital function in a dynamically operating energy storage system. The battery system comprises eight individual units based on Saft's Intensium Flex modular, rack-mounted Li-ion modules. The units, rated at 646 V and 41 Ah, are connected in series to achieve a nominal voltage of 5.2 kV and the system can deliver 200 kW for an hour and 600 kW for more than 15 minutes.

Saft is also supplying the control and management devices for the battery, as well as a CAN-based optical communication interface with ABB's MACH-2 controller that will monitor the battery continuously and optimize its operation.

ABB's SVC Light is a unique power semiconductor technology based on a high power IGBT (Insulated Gate Bipolar Transistor), a compact switching device, which allows high frequency switching. In combination with dynamic energy storage it will enable simultaneous volt-



age control and control of active power flow in the grid. The 11 kV pilot system can deliver 600 kVAr reactive power and 600 kW active power.

In addition to the development and supply of the battery system, Saft is partnering with ABB in qualification and field testing of the complete system. The battery system has already completed commissioning and bench testing at ABB's facilities in Sweden, where its performance to specification was confirmed.

### UCLA Researchers Create Polymer Solar Cells with Higher Efficiency Levels

Currently, solar cells are difficult to handle, expensive to purchase and complicated to install. The hope is that consumers will one day be able to buy solar cells from their local hardware store and simply hang them like posters on a wall.

A new study by researchers at the UCLA Henry Samueli School of Engineering and Applied Science has shown that the dream is one step closer to reality. Yang Yang, a professor of materials science and engineering, and colleagues have designed and synthesized of a new polymer, or plastic, for use in solar cells that has significantly greater sunlight absorption and conversion capabilities than previous polymers.

The research team found that substituting a silicon atom for carbon atom in the backbone of the polymer markedly improved the material's photovoltaic properties. This silole-containing polymer can also be crystalline, giving it great potential as an ingredient for high-efficiency solar cells.

But while polymer solar cells have been around for several years, their efficiency has, until recently, been low. The new polymer created by Yang's team reached 5.1 percent efficiency but has in a few months improved to 5.6 percent in the lab. Yang and his team have proven that the photovoltaic material they use on their solar cells is one of the most efficient based on a single-layer, low-band-gap polymer.

At a lower band gap, the polymer solar cell can better utilize the solar spectrum, thereby absorbing more sunlight. At a higher band gap, light is not easily absorbed and can be wasted.



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### Extreme CCTV's MIC1-440 Explosion-Protected PTZ Camera Now UL / CSA Certified

Extreme CCTV has released that its MIC1-440 explosion-protected PTZ camera is now UL / CSA certified, allowing the unit to fulfill an added level of explosion-protected qualification and meet stringent regional requirements for hazardous locations. A 320° tilt enables viewing above and below the camera for comprehensive site surveillance, while IP68 / NEMA 4X ratings ensure high performance imaging in harsh environmental conditions.



The MIC1-440 Explosion-Protected PTZ camera delivers safe, reliable performance at locations such as oil and gas sites, chemical processing plants and petrochemical refineries.

### Protect Critical Cyber Assets With CyberLock

Videx's CyberLock, is an access control solution for utilities and electric transmission companies that need to protect cyber assets that are critical under CIP reliability standards. CyberLock brings intelligent access control to existing lock hardware simply by replacing each lock's mechanical cylinder with a CyberLock electronic cylinder. No wiring is required for installation. CyberLocks install in lock hardware on TMedic boxes, RTU cabinets, control houses, substations and perimeter fence gates.



CyberLock gives management the ability to track con-

tractors and employees that go into sensitive locations. The electronic locks and keys record openings and exceptions such as unauthorized attempts to gain access.

Each CyberKey can be programmed to open selected locks and padlocks on specific days and only during certain times on those days. The key contains the access privileges each employee needs to do their particular job. Keys can be set with a date to begin operation as well as an expiration date. The CyberLock system eliminates worries about lost keys because the electronic key cannot be duplicated and a missing key can be quickly deactivated.

With more than 200 cylinder designs, each CyberLock cylinder is built to the exact dimensional standards of the mechanical cylinder it is replacing. In addition to CyberLock cylinders, Videx offers a full line of padlocks with the same auditing capability and access control features.



### Phihong's PoE Switch Powers Four IP Cameras and Extends Ethernet's Reach

Phihong has developed a Power-over-Ethernet (PoE) switch that extends PoE and Ethernet up to 200 meters and can power four IP cameras from a single Cat5 cable. Designated the POE60S-4AF, the 10/100baseT switch extends the capability of Ethernet and PoE from a current limit 100-meter reach to double the distance, and with the power to run four security cameras from a single Cat5 cable.

"Power-over-Ethernet saves users money primarily because it allows them to easily run power to locations that would otherwise require extensive wiring and high labor costs," said Keith Hopwood, vice president of marketing, Phihong USA. "This new PoE switch further eases implementation and increases the power delivered by extending the Ethernet further distances and by pow-

ering multiple devices from a single cable."

The PoE switch can operate under temperatures from 0°C to 55°C. It works with either an Ultra PoE midspan (providing IEEE802.3af outputs) or an AC adapter, and is UNH-tested.

### VK-64/VK-16 Version 2.0 Network Video Monitoring and Recording Software

Canon has released version 2.0 of its VK-64 and VK-16 network video recording software. In addition to being able to store, manage, archive and access security video, this software offers new features, including enhanced camera control, multiple recording options/modes including MPEG-4, support for audio recording and full compatibility with all Canon network cameras.

The VK-64 version 2.0 network video monitoring and recording software has a suggested list price of \$2,499, and the VK-16 version 2.0 network video monitoring and recording software has a suggested list price of \$999.

### New Auto Lockdown Security for DeltaV Digital Automation System

Security made easy is how Emerson Process Management is to its newest addition to DeltaV security functionality. Built into the new family of DeltaV smart switches, Emerson has added auto-lockdown security capabilities that allow a DeltaV user to automatically lock and unlock the port access of all the switches in the network. This lockdown will disable all unused network connections (ports) on the switch.



One of the biggest security vulnerabilities in a control system is that network devices, such as Ethernet-based network switches, are located in insecure locations out in the process, easily accessible to everyone. Locking down switch ports will prevent accidental connection and virtually prevent the deliberate connection of an unauthorized device to the switch.

"The recommended security practice disables unused connections on network devices," said Bob Huba, product manager, DeltaV security. "This is usually done using third party IT software which creates risk of simply not doing it at all or accidentally disabling a used port. Our DeltaV one-click lockdown function makes managing network security much easier. Even a maintenance person can use the utility as part of their troubleshooting work practices."

The one-click lockdown application automatically scans the DeltaV network to find the DeltaV switches and then allows the user the choice to automatically unlock or lock the switches. Unlocking also enables an auto-relock of the switches in 60 minutes if the user does not perform a manual relock before then.

These smart switches are zero configuration, plug-and-play devices in a DeltaV network. They make the system easier to use and more reliable. This helps in cases of users making a mistake,

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thus not shutting down operations.

DeltaV switches are available in DIN rail and rack mount versions and in fixed port and modular configurations. They provide Megabit and Gigabit speeds over wired and fiber communications.

Performing a system risk assessment and then implementing the appropriate security practices will allow the user to provide adequate and cost-effective security for the DeltaV system. If further help is required with site-specific DeltaV security, implementation personnel in Emerson's SureService group can be contacted to provide this service.

### Swann's MovieStick Simplifies Shooting and Sharing Videos On-the-Go

Swann Communications has released its MovieStick camera and recorder. One of the world's smallest digital video recorders, the MovieStick is an alternative to the camcorder as it allows people to shoot video and easily distribute it.



Weighing less than an ounce and slightly larger than a pack of gum, the MovieStick easily fits into a pocket and can be taken anywhere. All footage is recorded on a removable Micro SD card that allows for easy transfer to a computer for viewing or storage. With a 2 GB Micro SD card, the MovieStick can record up to 2.5 hours of video. The device's built-in lithium battery that regains its charge via a USB port located on the bottom of the MovieStick.

"The MovieStick is a bit of a departure from Swann's standard DVR and cameras," said Guy Pithie, Swann Communication's vice president, North America. "We thought our customers would like a product that enabled them to easily capture video and upload it to websites. This is especially true for cell phone and PDA users whose devices do not feature cameras that can capture video."

### nCircle Enables Critical Utilities Infrastructure Compliance with NERC CIP Configuration Auditing

nCircle has released new security and configuration policies designed to help electric utilities comply with the North American Electric Reliability Corp. (NERC) Critical Infrastructure Protection (CIP) standards. Mapped directly to the NERC CIP standards, these policies help utilities with critical infrastructure, to automate previously manual and time consuming audit tasks, reduce security risk and achieve compliance with the NERC CIP standards.

Reliability is the number one concern for the electric utility industry, and the effect of Internet connectivity on the security of our critical infrastructure has created additional complexity and

challenges. NERC addressed these challenges by creating the Critical Infrastructure Protection (CIP) cyber security standards, providing a way to consistently audit electric utility organizations for cyber security weaknesses. nCircle's solutions deliver automated, agentless configuration and policy auditing, vulnerability assessment and actionable reporting for NERC CIP compliance. The new policies enable utilities to continuously audit the configurations of their critical infrastructure and easily identify deviations from the NERC CIP standards.

"nCircle continues to develop new solutions enabling our customers to audit their IT assets automatically, continuously and consistently," said Tim Keanini, CTO, nCircle. "Our new NERC CIP policies expand on

nCircle's coverage, simplifying NERC CIP compliance processes and ensuring the reliability of the critical utility infrastructure."

The new policies are delivered in nCircle Configuration Compliance Manager, nCircle's agentless configuration auditing solution that automates configuration auditing, change monitoring and compliance processes. In addition to the new NERC CIP policies, Configuration Compliance Manager also supports a port scanning mode specifically for highly sensitive devices, such as Supervisory Control and Data Acquisition (SCADA) systems. This unique, non-intrusive and lightweight approach is well suited for these critical utility systems.



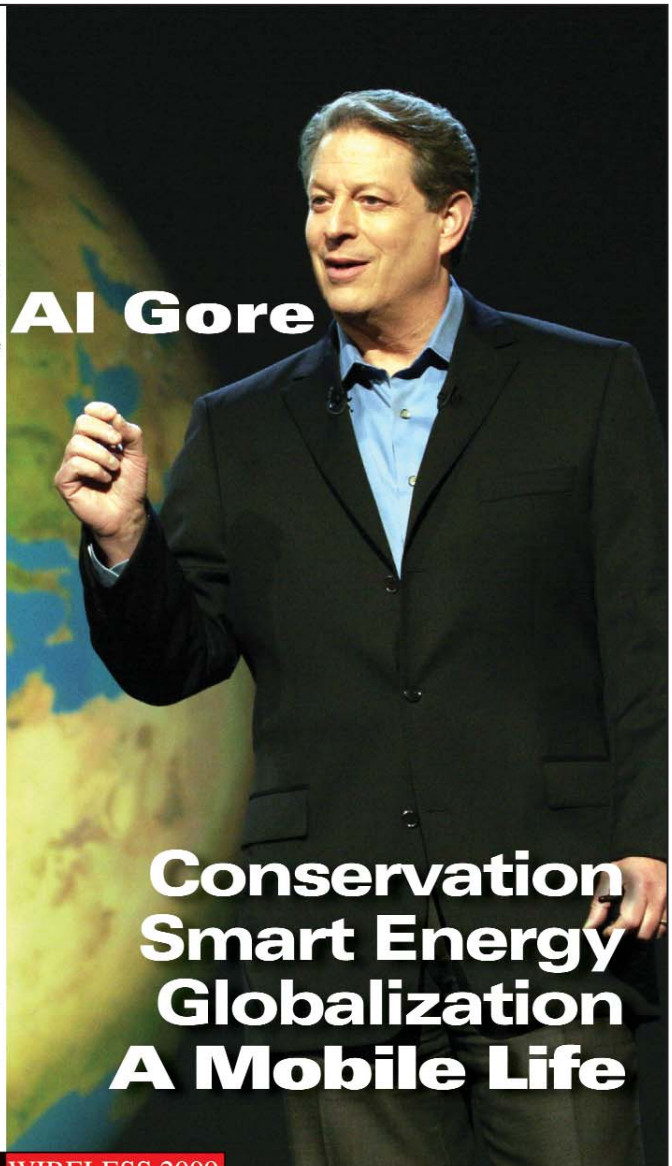
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### GridWise Alliance Releases Smart Grid Jobs Report: 280,000 New US Jobs Tied Directly to Smart Grid

In a Smart Grid Jobs Report released by the GridWise Alliance, it is estimated that up to 280,000 new jobs can be created directly from the deployment of smart grid technologies. The report explains that Federal investment in a smart grid could act as a catalyst for these planned and immediate direct jobs as well as spawn many indirect jobs.

The Smart Grid Jobs Report was written by GridWise member company, KEMA, Inc. In addition to the 280,000 direct jobs, the report notes that a smart grid will drive a substantial number of indirect jobs as it enables the deployment of new technologies such as plug-in hybrid electric vehicles, distributed renewable energy resources such as solar, smart appliances, home automation software and hardware and wind energy generation. The report does not quantify the number of these indirect jobs.

"Increasingly a smart grid is seen as a key enabler for the new energy economy and as such, is foundational for the millions of 'green collar jobs' President-Elect Obama is aiming for," said Guido Bartels, chairman of the GridWise Alliance and General Manager Global Energy & Utilities Industry at IBM.

The report projects that a \$16 billion Federal investment in smart incentives over the next four years would drive \$64 billion in smart grid related projects resulting in approximately 280,000 new direct positions across various categories.

"Over 150,000 of these jobs would be created by the end of 2009 and nearly 140,000 newly created high-value positions would become permanent after a smart grid deployment," said Ralph Masiello, senior VP, Energy Systems Consulting, KEMA, Inc.

"We know first-hand that a smart grid allows our electric infrastructure to be more reliable, resilient and secure. There is also a growing consensus that a smart grid is one of the critical and necessary enablers for optimizing renewable resources, maximizing energy efficiency, and unleashing the potential of distributed energy storage technologies," said Katherine Hamilton, president, GridWise Alliance.

### Cooper Acquires Cyme International

Cooper Industries, Ltd. has acquired Cyme International, a power engineering software and services provider that enables utility engineers to design, analyze and optimize their networks. Additionally, Cyme's products allow utilities to manage power outages, leverage advanced metering infrastructure (AMI) data, integrate and manage distributed generation assets such as renewable sources of electricity and maximize the productivity of their networks. Cyme will become part of the Energy Automation Solutions (EAS) group within Cooper Power Systems. Terms of the acquisition were not disclosed.

"This acquisition complements Cooper Power Systems' ability to provide utility customers with comprehensive smartgrid solutions to improve power quality, reliability and efficiency in their transmission and distribution networks," said Cooper Industries chairman and CEO Kirk S. Hachigian. "Cyme's capabilities in power systems engineering and software development, coupled with our recent acquisitions of Cannon and Cybectec, enable Cooper to provide automation solutions and 'smart' products that

offer enhanced value to our utility customers."

"This is a natural integration of two companies who know that the smart grid is a business driver for utilities," said Marc Coursol, president and CEO of Cyme. "We look forward to seeing our solutions and engineering services integrated into the Cooper Power Systems offering to better serve our mutual customers the world over."

### Mobile Satellite Ventures Changes Name to SkyTerra

Mobile Satellite Ventures (MSV) has changed its name to SkyTerra. SkyTerra, presently the name of MSV's parent company (SkyTerra Communications, Inc.) has become the name for all MSV-named entities operating in the US and Canada.

"Over the course of the past several years we have worked diligently to simplify MSV's ownership structure, resulting in SkyTerra Communications now owning 99.3 percent of the company," said Alexander H. Good, chairman, CEO and president of SkyTerra. "We are very pleased with this accomplishment and with our singular company name that reflects this simplification."

MSV's Canadian joint venture partner Mobile Satellite Ventures, (Canada) Inc. is also changing its name to SkyTerra, (Canada) Inc. to coincide with this change. Since the partners provide mobile satellite services on a North American-wide basis, this will facilitate a harmonized approach to the provisioning and branding of services on both sides of the border.

### HART 7 Test Specifications Provide Compliance Verification for New HART Products

The HART Communication Protocol Slave test specifications updated to the HART 7 standard provide standardized test plans to verify the compliance of HART products, to assist developers in producing a quality product and to ensure that the product will meet HCF compliance registration requirements. Developed by member company experts and the HART Communication Foundation staff, the HART 7 test specifications have been approved by HCF member companies.

"The HCF device testing and registration process requires each HART-enabled device to undergo comprehensive, independent testing before receiving the HART Registered mark," said Ed. Ladd, HCF director of Technology Programs. "Through this rigorous testing program, compliance with HART Protocol requirements is verified so users can purchase and install with confidence any device that carries the HART registered mark."

HART 7 enables many new capabilities for communication with intelligent field devices, and moves this field-proven technology into the world of wireless communication with the new WirelessHART standard. HART 7 protects the globally installed base of an estimated 26 million HART devices and supports the entire range of HART-enabled measurement, control and automation systems products, both wired and wireless. It enhances HART functionality and preserves the viability of the technology's future indefinitely.

### Axeda Acquires Qestra

Axeda has acquired the technology and related assets of Qestra Corp. The combination of Axeda and Qestra creates the one of the largest software companies dedicated to delivering remote service solutions.

Today, more than 100 of the world's leading product manufacturers rely on Axeda and Qestra to power their remote service initiatives. This critical mass of customers is indicative of the trend away from costly break / fix service toward delivering products with smart services built-in.

"The Qestra team has a proven history of enabling customers to integrate remote service into their business processes," said Dale Calder, president and CEO, Axeda. "Qestra innovations such as a flexible SOA (service oriented architecture), and highly extensible Service Agent combined with Axeda innovations including On-Demand delivery, industry leading security and deep-featured applications will accelerate our customers' ability to provide the next generation of service to their customers."

The acquisition also brings together an extensive array of strategic partnerships developed by both companies, highlighted by Oracle and SAP. Axeda's partnership with Oracle and Qestra's partnership with SAP demonstrates the importance of enterprise applications as part of a complete remote service solution.

### GE Fanuc to Deliver Kepware Communications Protocols with Proficy HMI/SCADA Software

Kepware Technologies and GE Fanuc Intelligent Platforms have entered into a resale agreement to expand Kepware's drivers and OPC servers offering for the Proficy HMI/SCADA – iFIX and Proficy HMI/SCADA – Simplicity products. The agreement allows GE Fanuc's customers an added option of using all of Kepware's protocols for their HMI/SCADA solutions. In addition, GE Fanuc will be a Kepware VEP (Vendor Endorsed Protocol) Partner.

While GE Fanuc is currently offering their own communication drivers along with

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## Market Information

their HMI/SCADA solutions, this new relationship with Kepware will both expand the GE Fanuc driver offering and enable GE Fanuc to focus development on areas that will deliver greater value to its customers.

"This is a significant expansion of a relationship we have had in place for several years," said Roy Kok, vice president of Sales and Marketing, Kepware. "GE Fanuc has worked closely with Kepware for quite some time, reselling our Allen Bradley ControlLogix driver with its Proficy HMI/SCADA – iFIX product. Earlier this year we announced the use of Kepware communications in the Proficy View and QuickPanel products."

"Kepware offers support for GE Fanuc hardware products today," said Claire Cerrato, general manager, Automation Software, GE Fanuc. "We look forward to working with them on GE Fanuc protocols and leveraging their expertise with other protocols in the industry. This collaboration will deliver industry-leading communications, with a tight integration to GE Fanuc HMI/SCADA solutions."

### Sierra Wireless and ProSoft Technology Discuss Joint Initiative to Provide Cellular Solutions

Sierra Wireless and ProSoft Technology are moving towards an initiative to offer industrial automation and control solutions through ProSoft Technology's global sales channels consisting of more than 600 distributors.

Certified for use in hazardous environments, Sierra Wireless Mobile and M2M devices have been used in the utilities and automation industries for more than a decade. ALEOS embedded intelligence simplifies integration and enables the devices to maintain an always-on, always-aware network connection, critical for real-time remote monitoring, configuration and logging. Remote management, via the AceWare software suite, ultimately lowers total cost of ownership by enabling customers to minimize field service calls.

ProSoft Technology offers more than 600 products supporting more than 60 different industrial communication protocols, providing the expertise for customers looking to integrate and leverage cellular with their automation and control applications. Deployment-ready options and integrated industrial protocol support make it easy for end users to use RadioLinx Industrial Cellular products for remote process or OEM equipment monitoring, for non-time-critical control for municipal and oil/gas SCADA, and for M2M applications. The products are expected to be commercially available in the first quarter of 2009.

"We're looking forward to working with ProSoft Technology to provide a robust automation and control solution," said Justin Schmid, vice president of Marketing and Business Development for the Sierra Wireless Mobile and M2M group. "By coupling the intelligence of ALEOS with ProSoft Technology's expertise in serving the automation market, we believe we can create a very compelling product offering."

"Our customers are asking ProSoft Technology for easy to deploy cellular connectivity. Combining industrial cellular technology from Sierra Wireless, deployment ready options through our data service partners, and industrial protocol pre-configuration, ProSoft Technology simplifies industrial cellular" said Kevin Zamzow, strategic product marketing manager for ProSoft Technology. "ALEOS intelligence, rugged design and Class 1 Div 2 certification make these devices perfectly suited for the industrial automation market."

### Poudre Valley REA Selects Landis+Gyr for Advanced Metering Solution

Poudre Valley Rural Electric Association has selected Landis+Gyr for an advanced metering solution covering its northern Colorado service territory. Over the next three years Poudre Valley will deploy a two-way network combining RF Mesh and TS2 power line carrier (PLC) systems operating on a single software platform.

This unique solution provides optimal coverage for meters in the utility's suburban centers, as well as the mountainous and remote areas better suited to PLC technology. Myles Jensen, Poudre Valley's Member Services Manager, said the utility's 14-year relationship with Landis+Gyr was one of the deciding factors in the selection process, as was the company's ability to deliver a blend of proven advanced metering technologies to provide reliable coverage of all of its member accounts.

"Our past experience with Landis+Gyr was a big factor," said Jensen. "The product has been

good for us and we've had excellent service. We also had the desire to use proven technologies, and the ability to visit other utilities and learn from their experience was a benefit for us."

Based in Fort Collins, Colo., Poudre Valley provides electric service to an area covering 5,760 square miles between Boulder, Colo. and the Wyoming border. While portions of Poudre Valley's territory are already equipped with the Landis+Gyr TS1 PLC system for automatic meter reading, the installation of an advanced two-way communications network will allow them to move forward with load management and power quality initiatives, including time-based pricing, load control and outage detection. As distributed generation becomes more prevalent, the solution will also provide net metering capabilities and help the utility offset rising power costs by reducing peak loads. Landis+Gyr's RF Mesh infrastructure also provides a communications backbone for distribution automation and home area networks.

### Leaf River Energy Center LLC Receives FERC's Certificate of Necessity for Natural Gas Storage Facility

Leaf River Energy Center LLC, a wholly owned subsidiary of Westport, CT based NGS Energy LP, has been issued a Certificate of Public Convenience and Necessity by the Federal Energy Regulatory Commission (FERC) to develop and operate a salt dome natural gas storage facility and the associated pipeline infrastructure.

Leaf River is expecting to file for Authorization to Commence Construction with the FERC and start building the facility immediately after that authorization is granted.

The storage facility will consist of caverns that will be created in two salt domes situated on over 400 acres in Smith and Jasper Counties, Mississippi and when completed, will provide up to 32 Bcf of working gas capacity. The 43 mile pipeline header system associated with the facility will stretch between Smith, Jasper and Clarke counties in Mississippi and interconnect with Southern Natural, Gulf South, Transco, Tennessee, Destin and the proposed Kinder Morgan Express Pipelines.

This highly deliverable and flexible storage facility will be able to inject up to 1 Bcf/d and withdraw up to 2.5 Bcf/d across the facility and is expected to be in service by the summer of 2010.

"We are very excited to receive this order and enter the next phase of development of this necessary and well positioned gas storage facility," said Laura Luce, president of Leaf River Energy Center.

"The amount of interest and contracted capacity for this project has really demonstrated the market's desire for a natural gas storage facility that can take or place gas in high volumes to multiple pipelines in an economical manner. Also, like our last project that was brought in operation on time and on budget, the Leaf River Energy Center will provide hundreds of construction jobs and high paying operating positions that will benefit the local area."

Besides the multiple turn firm and interruptible storage services, Leaf River will provide park and loan and hourly balancing services and interruptible wheeling services at market based rates.



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### IdaTech Receives Order for 35 Units

IdaTech plc has received an order for 35 of its ElectraGen XTi systems from a major national US mobile telecommunications company. The 35 unit order follows successful field trials of IdaTech's XTi within the customer's network over the last six months. The systems, which will be deployed in Florida, will provide extended duration backup power in this storm prone state.

The XTi systems will provide backup to the cellular base station network during times of power outage from the electricity grid. The use of IdaTech's XTi provides the customer with long backup times, enabling the base stations to remain operational for days rather than hours. This is particularly important given the US Federal Communication Commission's ruling that may require telecommunication companies to provide at least eight hours of backup for such sites. The 35 systems were shipped before the end of 2008.

The ElectraGen XTi backup power fuel cell systems are fully integrated units incorporating

IdaTech's fuel cell system for power generation and its proprietary fuel reforming capability which converts liquid fuel into high-purity hydrogen onsite as needed. These systems overcome the hydrogen barrier by avoiding the need to store or refuel compressed hydrogen gas. This has previously been one of the key factors which have deterred the mass adoption of fuel cells. Liquid fuel enables almost unlimited backup time, which is practically not possible using compressed hydrogen gas.

### Globecomm Systems Awarded Satellite Ground Terminals Contract for \$27 Million

Globecomm Systems Inc., a provider of satellite-based communications infrastructure solutions and services, has been awarded a contract from a multi-national organization for satellite ground terminals, valued at approximately \$27 million. The company does not anticipate recognizing any significant revenue in the current

fiscal year related to this contract.

The contract includes the design and development of the system as well as production and integration of new ground terminals and upgrade kits for existing terminals, management of the project, testing and hand-over of systems. Additional terms include supply of tools and test equipment, documentation and training.

"This is an important new project for Globecomm that extends the relationship with one of our key customers," said David Hershberg, CEO and chairman, Globecomm Systems, Inc. "The contract includes options for follow-on systems and we are looking forward to continuing to increase our business base with this customer."

### New Report Details Policy Actions On Demand Response and Smart Grid Technologies Since 2005

The Demand Response Coordinating Committee (DRCC) has made a new report available on state and federal policies that have been enacted or are under development in recent years in the area of demand response, smart meters and smart grid technologies. The report was produced by the DRCC for the National Council on Electricity Policy, a coalition of several organizations representing policy makers, including the National Association of Regulatory Utility Commissioners (NARUC), the National Governors Association and the National Conference of State Legislatures.

The Report is a snapshot of State and Federal demand response and smart grid technology policy actions that have taken place in the period between 2005 and September 1, 2008. It represents an attempt to catalogue information on policy developments in both the legislative and regulatory arenas and at both the federal and state levels. The report includes a special focus on state implementation of the demand response and smart metering provisions, Section 1252, of the Energy Policy Act of 2005 (EPACT).

According to Dan Delurey, Executive Director of the DRCC, the Report, "Demand Response and Smart

Metering Policy Actions Since the Energy Policy Act of 2005: A Summary for State Officials," shows that a substantial amount of policy making in support of demand response, smart metering, and the smart grid has happened recently or is presently underway. Importantly, it also demonstrates that there are many different approaches that can be taken by state policy makers in this area. This report will hopefully help state officials to become more aware of what others have done and are doing and possibly find models to consider as they move forward with their efforts."

### GarrettCom Books \$1 Million in Ethernet Switches for Brazilian Power Company

GarrettCom, Inc. has booked a \$1 million order from a leading power company in Brazil, which is the largest purchase order that GarrettCom has booked in South America. The order includes networking hardware, software and professional services.

Brazil is South American's leading economic power and a regional leader. With more than \$200 billion in reserves and a diversified foreign trade, Brazil is investing in its power infrastructure for dependable electricity in order to further expand its industry and commerce.

"This order represents a significant milestone in GarrettCom's global growth strategy," said Frank Madren, president, GarrettCom. "With the growth of global demand for industrial networking solutions, GarrettCom is leveraging our expertise in the electric power market and our core industrial switch and router technology platforms into an expanded number of geographic markets. Brazil and other South American countries is a targeted region for us."

The order consists of several configurations of substation-hardened Magnum 6K Ethernet managed switches running the company's MNS-6K-Secure premium network management software with enhanced security features, in addition to professional services.

Key selection criteria required to win this order included IEEE 61850 compliance, IEC 1613 compliance, network management software, secure GUI web management, PoE ports, availability of 100 Mb and Gigabit

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fiber ports and industry-standard RSTP for fast recovery from network faults. GarrettCom offers a modular, 61850-compliant substation-hardened line of switches and routers that are easily configured to meet the application requirements of the customer, with extensive support of security standards in the MNS-6K-Secure network management software package, and outstanding service and support.

### WBF Releases New Integrated Version of B2MML and BatchML

WBF has released version V0401 of B2MML and BatchML, which combines the two markup languages into a single related set of standards useful to the general process industries.

B2MML (business to manufacturing markup language) is an XML (eXtensible markup language) implementation of the ISA95 family of standards, known internationally as IEC/ISO 62264. BatchML (batch markup language) is an XML implementation of the ISA88 family of standards. B2MML and BatchML consist of sets of XML schemas written using the World Wide Web Consortium's XML Schema language, and implement data models for ISA95 and ISA88 respectively.

The most significant functional expansion in this release is the BatchML support for ISA 88 General Recipes. This will facilitate standards based implementation and exchange of corporate level product definitions in the process industries. This includes support for UN/CEFACT core components in BatchML that matches existing support in B2MML. UN/CEFACT core components define specific terminology for cross-business information exchanges such as quantity, currency, amount and identifier. BatchML has been updated to support B2MML style business transactions, schema extension methodology, and common ISA88 & 95 data definitions. These XML schema level enhancements will enable easier integration of applications by processing companies and their system vendors.

"This version of BatchML includes support for B2MML/OAGIS format transactions," said Dennis Brandl, chairman of the WBF XML Technical Working Group. "This now supports business to manufacturing

transactions dealing with recipes, equipment, batch lists and product definitions. The process industries have requested this functionality from WBF. The WBF XML Technical Working Group has been able to develop and validate the new BatchML standard."

### Echelon Wins Smart Metering Project in France

Echelon Corporation has announced that the Group of Electricity Distributors in France (GAELD), a consortium of electricity distributors, has chosen Echelon's Networked Energy Services (NES) system for up to 90,000 homes. The project, awarded to Echelon partner Alter Way, is expected to begin within the next few months and to be completed by 2013. In the past two months the NES system has gained momentum across Europe, including projects in Germany, Denmark and now France.

One of the utilities in the GAELD consortium, Régie d'électricité de Loos, is allowing homeowners to sell back solar produced electricity to the utility. They are doing so using the ability of NES meters to measure the amount of electricity produced separately from the energy consumed, as opposed to simple "net metering" in which the details of production versus consumption are lost, making this the first instance of Echelon's meter to be used in an alternative energy application in France.

"We are excited to increase our position in the French market, which has traditionally been difficult to enter due to strong local competition. We believe our success here, and recently in other countries such as Germany and Denmark, is a reflection of the growing awareness among utilities of the benefits that the NES system, together with smart grid applications, bring to their operations," said Frits Bruggink, Echelon's senior vice-president and general manager, service provider group.

Echelon's NES advanced metering infrastructure consists of a family of highly integrated electronic electricity meters, accessed via a web services based network operating system over an IP networking infrastructure. Unlike systems with a dedicated radio per metering point, multiple NES meters can share a single IP connection through the use of Echelon's proven standards-based power line

networking technology. This decreases the per-point connection cost, enabling the system to easily and cost-effectively incorporate new wide area networking technologies over the life of the system. Echelon's open system interfaces allow the system to be cost-effectively expanded, adapted, and customized in numerous ways.

The NES system's powerful web services based network operating system provides a standards-based platform for enterprise applications that enables quick and cost-effective integration. Open interfaces within NES meters enable a market for third-party add-ons that can expand and enhance the functionality of the meters, much as open interfaces in personal computers have led to an explosion of plug-in and external devices that transform the functionality of PCs.

### Perpetual Energy Systems Launches 422 kW DC Solar Energy Project In Northern California

Perpetual Energy Systems (PES) has launched its newest project hosted at the City of Willits Water Treatment Plant. The project guarantees a reduction in energy costs and has the capacity to generate approximately 530,000 kilowatt hours AC (kWh) per year to meet 100 percent of the plant's current power needs.

PES financed the development and installation of the Willits systems, at no cost to the city, utilizing conventional financing and equity raised through the federal renewable energy tax credit. This custom financial program not only meets the city's water treatment plant energy and budgetary needs, but offers of the city of Willits reduced utility costs by purchasing electricity generated by the renewable and perpetual solar energy system at the Willits Water Treatment Plant.

"We are honored to work with an innovative and forward-thinking city committed to sustainable energy," said Laurance Friedman, co-chair of Perpetual Energy Systems. "This public-private partnership is a true testament to how a privately-held company and a municipality can work together to reduce a city's impact on the environment."

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Certicom continued from page 13

The AMI 7100 Signing and Encryption Server is designed to sign AMI system messages with strongly protected signing keys. It enables high speed signing of system commands, while maintaining a high security posture, and provides strongly authenticated command and control that prevent replay attacks and fake commands.

This signing appliance is fast enough for even the largest scale AMI deployments, and can authorize commands for a single meter or an entire network. The meters, which have the public key portion of the key pair, verify system command signatures and perform integrity checks to ensure that only authentic commands are processed.

System commands are digitally signed using private keys based on NIST-approved ECC binary curves. These keys have AES 128-bit equivalent strength and create a formidable cryptographic impediment to message forgery.

As an additional precaution, signing keys are protected in tamper-resistant hardware. Access requires multiple security officers to authorize a new key. Security policies and procedures are used to enroll and authorize new system operators, applying safeguards to establish who has access to which keys and what parts of the system.

Secure log files are updated whenever any management activity is performed to reduce the likelihood that utility personnel perpetrate an attack from the inside. Signed outbound messages are also protected against replay attack. This ensures that the AMI system does not fall victim to a denial of service induced by a replayed load shed, remote disconnect or pricing signal message.

Optional message encryption allows new meter symmetric keys or other sensitive data to be sent over the air with confidence. Device authentication ensures that only trusted devices receive key updates.

Symmetric and public keys deployed in the meters themselves are generated using FIPS-approved random number generation techniques to ensure that the system isn't vulnerable to a basic security flaw. These aspects are easily overlooked by designers unfamiliar with how such a flaw could undermine system security.

The 7200 Key Management and Decryption Server performs high-speed meter

data validation, offloading integrity checking for the data management system. In order to protect the confidentiality and integrity of metering data, data sent from the meter is encrypted with 128-bit level AES encryption using unique keys stored in each individual meter. This keeps customer interval data and personal profiles confidential and reduces any legal liability that utilities may have in collecting usage data.

Given the sheer volume of potential messages performance issues are minimized by using an efficient message authentication scheme and a high-performance decryption engine. As a result, throughput can be maintained even for the largest metering deployments.

Key management and key updates are treated as sensitive operations, both in the meter and in the meter data management system. The AMI 7200 can manage millions of meters using multiple meter keys each, rotating keys to ensure that a strong security posture is maintained.

Meter IDs and associated metadata (AES keys, random challenge and meter ECC public keys) are stored along with the security state of individual meters. Provisioning facilities allow meters to be commissioned as a deployment unfolds.

### Creating Trusted Devices

The Certicom Security Builder AMI Agent provides the cryptographic primitives required to secure fielded devices. The library supports the cryptographic algorithms and protocols which, when coupled with the AMI 7000 series appliances, provide end-to-end security.

Optimized for resource-constrained MCUs, the library supports AES encryption, decryption, digital signature signing and verification, and keyed hashing for message authentication.

A secure boot process ensures that the system maintains its integrity even when metering assets are deployed in the field. This enables the device to validate its operating environment, including any modifiable software or configuration files.

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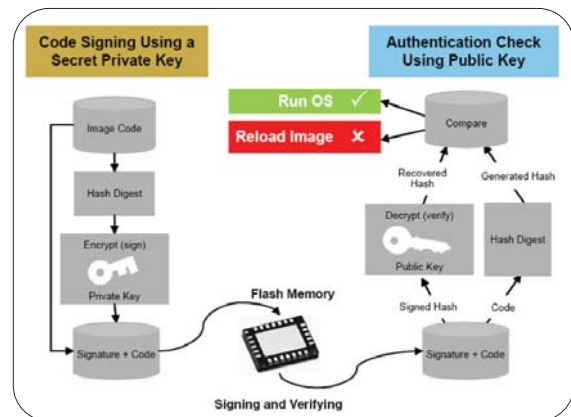


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### Conclusion

The utility market is embracing the convergence of electricity metering, communication and information technology, investing in a smart grid vision that is poised to deliver lasting cost and environmental benefits. But creating the world's largest distributed command and control systems has its risks. Utilities can protect their significant investments in AMI by choosing secure solutions that are robust and resilient and meet today and tomorrow's energy needs.

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3-5, Utility Products Conference and Expo, San Diego, Calif. Contact [www.utilityproductsexpo.com](http://www.utilityproductsexpo.com)

3-5, DistribuTech 2009, San Deigo Calif. Contact [dt09.events.pennnet.com/fl/index.cfm](http://dt09.events.pennnet.com/fl/index.cfm)

23-26, NATE 2009, Nashville, TN. Contact [www.natehome.com](http://www.natehome.com)

23-24, World Meter Design Congress 2009, San Francisco, Calif. Contact [www.spintelligent-events.com/wmdc09/en/index.php](http://www.spintelligent-events.com/wmdc09/en/index.php)

#### March

4-5, Fieldbus Foundation General Assembly, Yokohama, Japan, Contact [www.fieldbusfoundation.org](http://www.fieldbusfoundation.org)

9-12, Power Test 2009, San Antonio, Texas Contact [www.powertest.org](http://www.powertest.org)

15-18, IEEE PES/PSCE, Seattle, Wash. Contact [www.pscexpo.com](http://www.pscexpo.com)

17-19, Transmission and Distribution Europe, Barcelona, Spain, Contact [www.td-europe.eu](http://www.td-europe.eu)

18-20, IWCE, Las Vegas, Nev. Contact [www.iwceexpo.com](http://www.iwceexpo.com)

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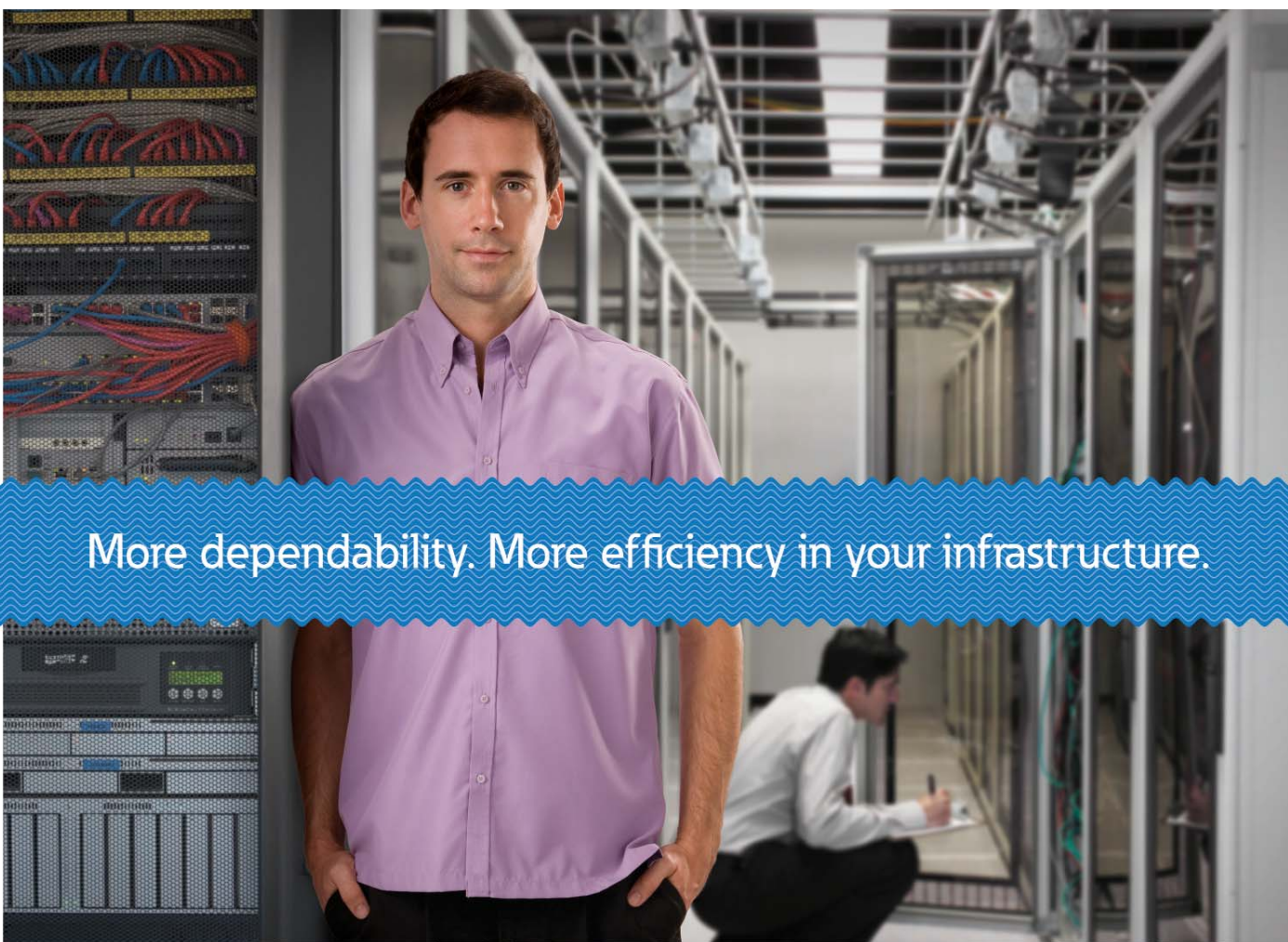
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