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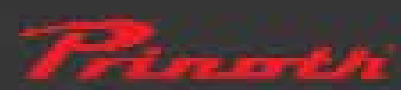
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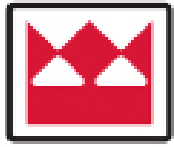


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For 70 years, utility professionals have used Terex® digger derricks on power grid construction and maintenance projects to quickly and efficiently bore holes and set poles in the ground. Established in 1945 with the advent of the Tel-E-lect digger derrick, today the company's state-of-the-art product line, includes the popular Terex Commander 4000, 5000 and 6000 digger derricks, as well as the reputable Terex General 65, 80 and 95 models. Terex digger derricks are ideal for use in electric, utility infrastructure (power line and transmission) and telecommunication applications, including digging holes, hoisting and setting utility poles and lifting other jobsite materials.

"We are truly honored to be celebrating Tel-E-lect's 70<sup>th</sup> anniversary this year," says Terex Utilities Vice President of Sales and Marketing, Jim Lohan. "Since 1945, the utility industry has seen its share of good and bad times, and through it all, Terex has been right there with its customers, providing the right equipment solutions for their utility jobsite challenges."

Tel-E-lect digger derricks were first engineered and built by Leroy C. Lindquist, owner of the Minnetonka Manufacturing Company which

manufactured parts for the Telephone and Electric (Tel-E-lect) utility markets in Hopkins, Minn. At the time, Lindquist worked with Northwestern Bell Telephone Company to develop a machine run by power take-off (PTO) on a truck's transmission to dig holes for telephone poles. The first Tel-E-lect trucks utilized the truck's differential to mechanically turn an auger, which was suspended from the end of an A-frame boom and was raised and lowered by the truck winch line to drill a hole.

The 1950's and 1960's saw three Tel-E-lect digger derrick product innovations introduced that are still in use today — the Rite-Way auger storage bracket, pole grabbing (PG) winch and the hydraulic collector block. With the hydraulic collector block, digger derricks could, for the first time, rotate continuously and without restriction making them a much more versatile machine. The Telecon (TELelect ECONomy) was introduced allowing a digger to be mounted on a smaller, lighter and more maneuverable chassis. The Commander I Series digger derrick was developed featuring strong box-constructed booms and powerful dual lift cylinders, a configuration so sturdy and reliable that it is still used as the standard today. Also, the company developed

and introduced the first fiberglass third section built to eliminate pin-on third sections.

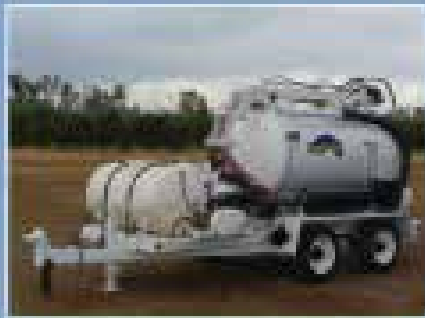
In the 1970's, Tel-E-lect opened manufacturing facilities in Watertown and Huron, S.D., and by the early 1980's, the company had established its corporate headquarters in Watertown. In 1988, Simon Engineering PLC purchased Tel-E-lect, and the company became known as Simon-Telelect, Inc. The company expanded its product offerings in 1992 with the acquisition of Hi-Ranger aerial devices from Waukesha, Wis. Terex purchased Tel-E-lect from Simon Engineering in 1997, which became the foundation for Terex Utilities, a business unit of Terex Corporation.

"We know that our customers' secret to being successful on any job is to equip crews with the right equipment to match the application. Our products are steeped in the traditions of the people who use our equipment to build the world's power and communication grid — hard-working and inventive," finishes Lohan. "The Terex approach continues to be focused on providing customers with state-of-the-art equipment solutions that help them get each and every project done safely, quickly and at the lowest cost of ownership."

For more information about Terex products and services, visit [www.terex.com/utilities](http://www.terex.com/utilities).

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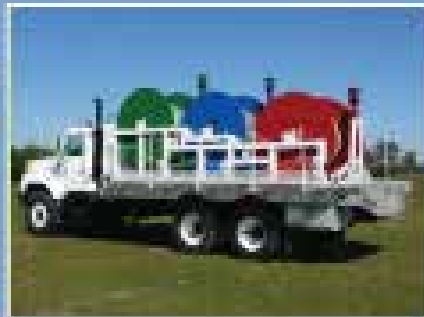
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W/2 Disk Brake Reel Carriers



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Owner Retiring & Considering Selling Business

# TUS INDUSTRY NEWS

The Association of Equipment Manufacturers (AEM) initiated the campaign as an industrywide collaborative effort to:

- Promote best practices for jobsite preparation and equipment operation.
- Demonstrate underground utility installation and repair as safe, efficient and effective.

The Underground Utility Damage Prevention Campaign seeks to:

- Dispel common myths and negative perceptions associated with underground utility installation.
- Provide tools for improved worker skills, knowledge, and awareness.

Machinery covered includes horizontal directional drills, vacuum excavators, trenchers and related underground equipment. Several AEM working committees of manufacturer members helped develop campaign ideas and scope.

"We want to involve the widest possible scope of industry groups and stakeholders and work together to educate and promote safe utility installation, repair and maintenance," stated William Bernhard, technical and safety services manager at AEM.

"Stay tuned for more information and content!" Bernhard added. For more information and to get involved, contact AEM's Bernhard (wbernhard@aem.org, tel: 414-298-4106). •

AEMC<sup>®</sup> Instruments announces the appointment of Chris Glowacki in the new position of Western District Sales Engineer. He will be responsible for sales covering the western territory (CA, WA, OR, ID, AK and western Canada). He will be based out of the Portland, Oregon area and will report directly to Tim Cowgill, Western Regional Sales Manager.

Chris joins AEMC<sup>®</sup> with over 30 years' technical experience as a Field Applications Engineer. He holds a Bachelor of Science degree in Electrical Engineering. AEMC<sup>®</sup> is excited to have Chris join their growing company.



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# Propane as a Motor Fuel

## Are you interested in reducing your operating costs?

Utilities and Contractors rely on a variety of vehicles in order to maintain services to their customers. Keeping those vehicles operating efficiently and reliably requires constant monitoring and staying ahead of the technology available.

One of the proven cost-effective strategies is to convert fleet vehicles from gasoline only, to gasoline and propane as an alternative fuel source. Propane has been used for a motor fuel since 1913 and today is used in over 14 million passenger vehicles worldwide.

## Reduced Costs

In most markets, the fuel cost savings ranges from \$.90 to \$ 2.00 per gallon – a significant immediate cost reduction. Using propane combined with gasoline reduces engine wear and extends the service life of vehicles thereby reducing capital cost.

When compared to gasoline vehicles, propane offers a similar range with equal fuel capacity, and the fuel economy is equivalent with gasoline averaging 300 to 500 miles per fill-up for most vehicles.

Inexpensive refueling stations can be built on-site and there are also federal tax credits available on

LPG motor fuel and the refueling infrastructure equipment should you decide to install it at your location. If you prefer to rely on existing refueling stations there are plenty of stations throughout the U.S. Generally, it only takes three to five minutes to fill a vehicle with propane which is comparable the time it takes to fill a vehicle with gasoline.

## Extremely Safe

Propane fueled vehicles are considered safer than gasoline powered vehicles by the EPA and the DOT. The LPG fuel tank is 20 times stronger than a standard gasoline tank and has a very narrow range of flammability because it is stored in a closed system under moderate pressure.

## Environmental Benefits and Energy Security

Propane fueled vehicles report significantly lower emissions than gasoline or diesel. Another advantage, especially in environmentally sensitive locations such as a protected wetlands, propane emissions will not contaminate ground water.

In addition over 90% of propane used in the U.S. is produced in the U.S. - the rest is from non-OPEC countries. The purchase of propane keeps U.S. dollars on U.S. soil which may be the strongest reason of all to convert. •



Propane bi-fuel Chevrolet Tahoe like many police departments across the nation are using right now. Propane can be used at less than half the cost of gasoline with no loss of performance.



Fleets like Pepsi Cola of Luverne, Alabama know the benefits of powering their fleet with propane.



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# FLEET



# MANAGEMENT



## Fleet Management Solutions by SignalTrack™

A well-run fleet is the backbone of the telecom and cable industries. Whether workers are installing cable systems in homes or servicing underground power lines, they need to transport themselves and their equipment by vehicle—and that's why fleet management is everything for these businesses.

How can you make sure you're getting the most out of your fleet and your other assets? Many telecom and cable providers are learning that fleet management and tracking solutions help them reach maximum efficiency. Integrated software allows you to utilize current technology to its fullest potential.

# SignalTrack™: Software & Hardware Working Together for Your Fleet

SignalTrack™ is both a physical device and a software solution. While other GPS trackers on the market consist of clunky and intrusive black boxes, the Smart Antenna® hardware is compact, discreet, and all in one piece. Once you've placed this little device in a vehicle, it begins collecting all the data a fleet manager needs to know. This information is then accessible via the web-based software, which you can log into anywhere you have an internet connection. You can also get updates on-the-go by installing an easy-to use app to your phone or mobile device.

Information about your vehicles is tracked in real time, and you receive updates about your vehicles whether the ignition is on or off. Meanwhile, your drivers can submit forms from their mobile phones while they are on the job alerting you of their progress. SignalTrack™ software allows you to:

- See exactly where your vehicles are at any time and generate detailed reports on driver activities
- Verify which employee is driving a vehicle using driver IDs

- Map out detailed routes and use multi-stop routing
- Set up alerts to be notified when your drivers are speeding or engaging in other unsafe behaviors
- Set vehicle maintenance reminders so problems can be addressed before it's too late
- Assign and dispatch drivers to jobs

There are many ways to use SignalTrack™ to improve your fleet's operations. Some of the most significant benefits include:

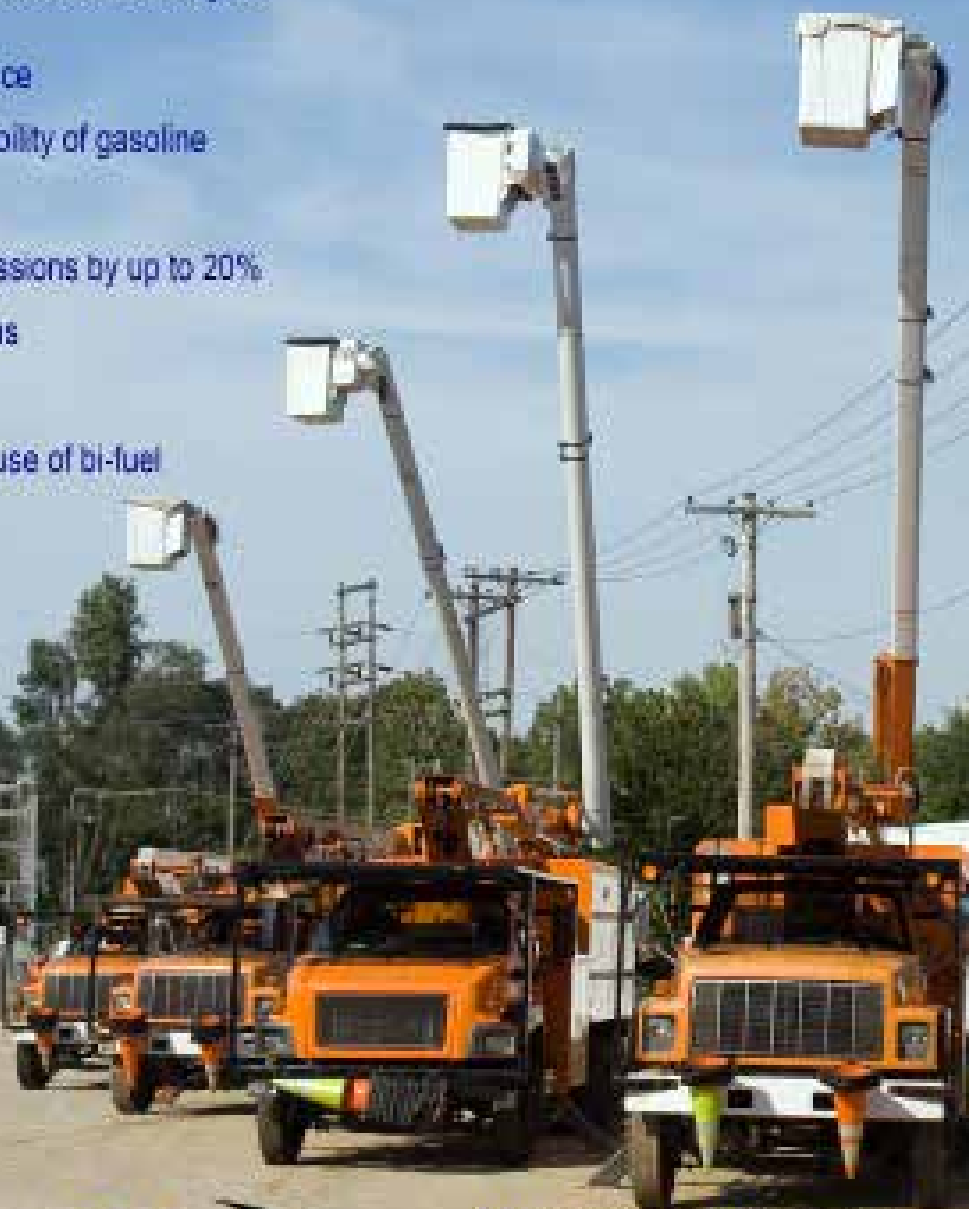
#### Enhanced Productivity

Productivity is an ongoing concern for every fleet manager. How can your business utilize its resources so work gets done efficiently and you turn a profit? GPS tracking allows you to see where all your drivers are at all times, so it is easy to dispatch the closest driver to a location where service

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is needed. No one has to waste time calling drivers to find out where they are. When you can't provide customers with immediate information about your availability, that's just an opportunity for them to call up another company instead.

You can also check the traffic on various routes and figure out the most efficient routes for your drivers, allowing them to get more jobs done in a day! By making sure your drivers are using their time productively, you'll be able to save money on overtime hours.

#### Reduction of Fuel Expenses

When you're not doing anything to track your drivers, there's no way to know whether they're sticking to their routes or joyriding and doing their errands. Some drivers may be taking the recently lowered fuel costs as an excuse to take liberties with their routes. However, when drivers know you can see where they are and how many miles they've driven, they become a lot more careful. With gas prices so cheap, your business should be saving money. This is one major way that SignalTrack™ users see a significant return on their investment: it costs you more not to use it!

#### Increased Driver Safety and Accident Reduction

SignalTrack™ knows when your drivers are speeding, and it can also detect when they are accelerating rapidly or braking harshly. All of these reckless behaviors put your drivers at greater risk of getting into accidents. Not only can harm come to your drivers and others on the road, but accidents are costly and also likely to inconvenience customers.

If certain drivers have unsafe driving behaviors, the fleet manager can generate a report summarizing their infractions and address it with them. Using SignalTrack™ encourages drivers to be a lot more careful. And, as a precaution for unavoidable emergencies or inappropriate driving behavior, the device does come with a Panic Button that allows drivers to send a signal when they are in distress.

#### Asset Tracking

GPS North America doesn't just help you to protect vehicles. After all, telecom and cable fleets need to track their trailers and other assets as well.

- The TLU 300 asset tracking solution prevents you from needing to manually check that your assets are safe in their lots—and tracking isn't the only service GPS North America provides.
- The AT-3100 GPS Solution acts a container locking device in addition to being a tracker.

When you have GPS tracking for your vehicles and assets, you never have to wonder where they are. You can simply log in to the software and find out.

#### It Costs You More Not to Have a Fleet Management System

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Sometimes, businesses are hesitant to invest in new technologies because they would rather keep doing what they've always done rather than spend money on something new or unfamiliar. However, when fleet managers implement SignalTrack™, businesses discover that they make significant returns on the investment. Fleet management solutions make your business more profitable by cutting overtime and fuel costs and improving your customer service.

#### When Your Fleet Is On Track, So Is Your Business

Good customer service is the byproduct of a well-managed fleet, and happier customers can only be good for your company's profits. Customers often take time off from their jobs to wait at home for cable or telecom service, and that means they want to give their money to a company that won't waste their time. Additionally, service to underground power lines can create inconveniences for surrounding homes and businesses, meaning you need to get the job done efficiently so you can be out of the way. Of course, there are plenty of valid reasons why service could be delayed—maybe another job took longer than expected, or maybe there was an accident that made traffic unusually heavy. Fleet management allows you to keep your fleet running smoothly even in the most difficult situations.

#### Stay Prepared with SignalTrack™

Problems are bound to occur, and your plans have to take into account that conditions won't always be optimal. That way, you don't end up with disgruntled customers or over-worked employees.

The benefits of fleet management systems are undeniable when you're working in cable or telecom. If you want your drivers to get to jobs on time and use their hours as efficiently as possible, there's no other way to be sure that they are, and there's no easier way to dispatch drivers where they are urgently needed.

GPS North America takes pride in helping fleets accomplish more. Once you've implemented a fleet management solution, you'll find that every function of the fleet benefits from the system. •



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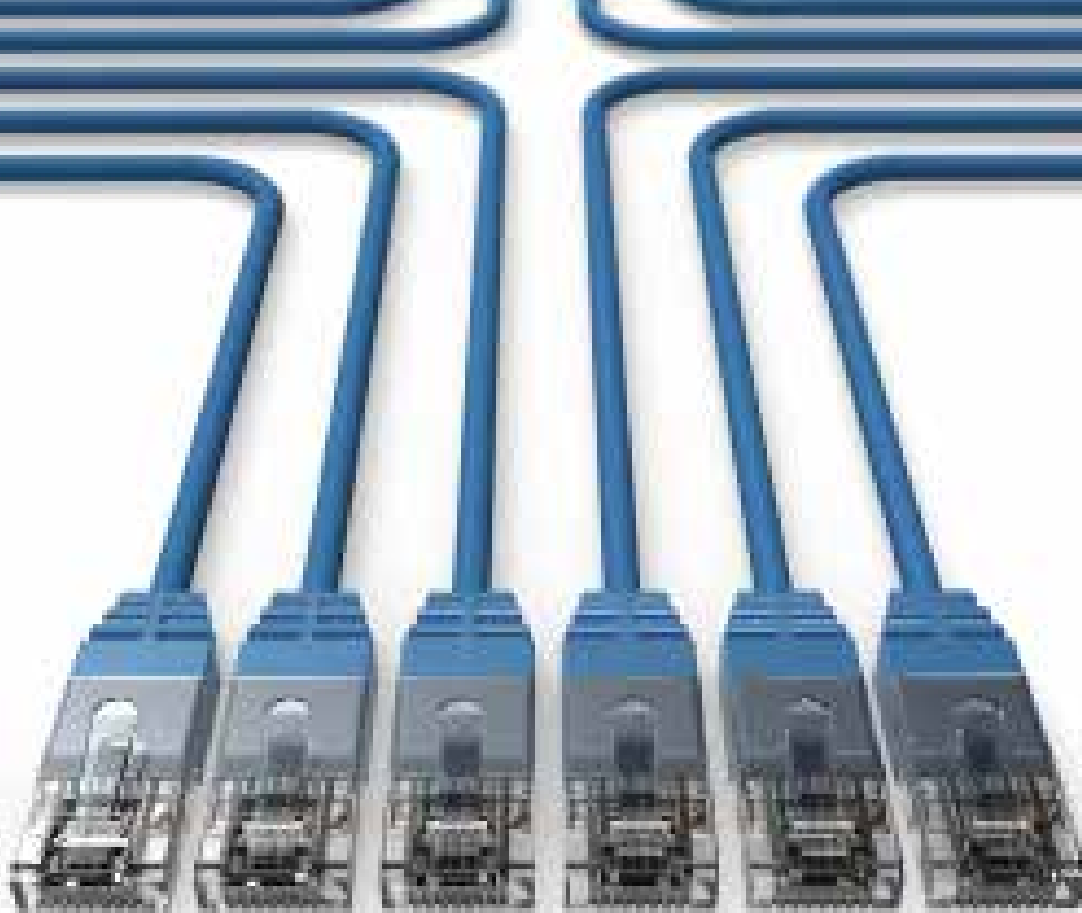
# Security & Resilience for Utility Network Communications

## White Paper

Communications networks represent a partial paradox. The very openness and ubiquity that make them powerful can also present a weakness. Worms, viruses, malware, hackers, disgruntled employees and innocent mistakes—all of the risks faced by enterprise networks and the Internet—could be considerations for utility networks as well.

As noted in a recent MIT study, *Future of the Electric Grid*, the highly interconnected grid communication networks of the future will have vulnerabilities that may not be present in today's grid. Vulnerabilities in electric utility networks come within the bulk electric system on the transmission side, as well as Advanced Metering Infrastructure (AMI) and related systems on the distribution side, both of which must manage, in spite of new cyber threats, to ensure continuous and reliable electric service. While the power industry has actively participated in numerous standards committees and avoided mandates in the past, the protection of utilities' cyber assets has changed from being taken for granted to being investigated thoroughly, upgraded and tested.





## New Expectations for Utility Communications

As utilities move forward with AMI deployments, they will find themselves responsible for two-way communication networks that reach every customer site and every monitoring point in the power distribution and metering architecture. This represents a far reaching network with many elements to be safeguarded, to ensure the integrity of the critical utility infrastructure.

There are no specific requirement documents or standards that apply directly to security for AMI systems. However, there are standards and documents that provide relevant guidance. For example, the National Institute of Standards and Technology (NIST) IR 7628 suite of standards and reference documents for interoperability and cyber security are considered to be broadly applicable to smart grid initiatives.

Even as standards evolve, utilities can take a lead from the enterprise network world and apply proven methods for multi-layered security, from physical controls to encryption to virtual private networking and more.

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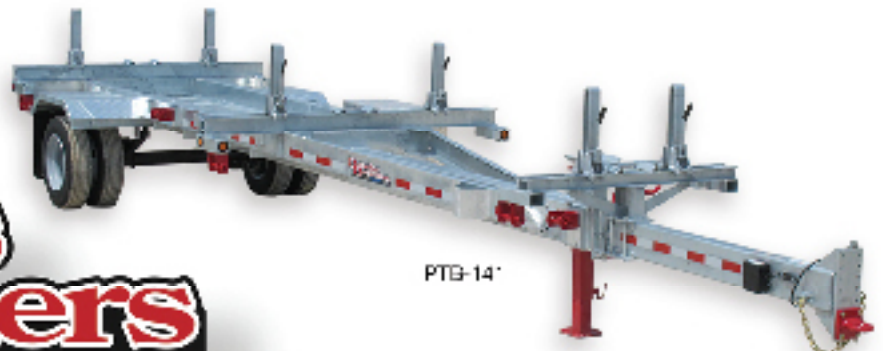


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New Expectations for Utility Communications

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Even as standards evolve, utilities can take a lead from the enterprise network world and apply proven methods for multi-layered security, from physical controls to encryption to virtual private networking and more.

Network Security 101—Multiple Tactics for Multi-layered Security

The goals of a security strategy are to protect all points of entry to the network, make reconnaissance difficult from the inside, limit points of vulnerability and thwart attempts to misuse or compromise the network and the data it transmits.

The good news is that network developers and operators have a broad range of techniques and best practices to apply to achieve these aims. Using multiple security approaches in tandem, organizations can create a multi-layered security scheme appropriate for the critical nature of AMI communications.

Here is a snapshot of some of the most prevalent methods used in the most critical enterprise networks, which are equally applicable for securing utility communications networks.

Firewall devices permit or deny data transmissions into a company's network based on rules and other criteria. All messages entering or leaving the controlled network—such as Regional Network Interface (RNI)—must pass through the firewall, which examines each message and blocks those that do not meet specified security criteria.

An intrusion detection system (IDS)

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monitors the events occurring in the network, identifies activities that are potentially malicious or in violation of security policy—such as an unauthorized attempt to alter smart meter firmware—and reports to a management station.

Intrusion prevention systems can also react in real-time to block or prevent certain activities, such as dropping unauthorized data packets while allowing legitimate traffic to pass through.

A demilitarized zone (DMZ) combines firewall and intrusion prevention system to tightly regulate traffic entering the company's servers, usually at the RNI and headend. When a DMZ is in use, there are no common communication ports between the outside world and the internal controlled zone.

Anti-virus software detects, prevent and removes damaging code from a computer, such as worms, viruses and Trojan horses. Servers that support utility applications—such as the Sensus FlexNet™ Network Controller, Web Server, Stats Server and Maps Server—should have anti-virus software for local protection from such threats.

Virtual private networks (VPNs) encapsulate the data being transmitted, much like a pipe within a pipe, and authenticate both endpoints of a communication to prevent unauthorized users from accessing or reading the data. In a FlexNet network, for instance, all backhaul network interactions from the base station to the RNI (the headend) are transmitted via VPN tunnels.

VPNs use Transport Layer Security (TLS) or its predecessor, Secure Socket Layer (SSL), to encrypt transmissions at the transport layer, and use the Secure Shell (SSH) network protocol to establish a secure channel between devices for data exchange.

Encryption is achieved by an algorithm that makes data unreadable except to a device that has the key to decrypt the message. Symmetric encryption uses the same key for both encryption and decryption. Asymmetric encryption uses a public key and a highly protected intended recipient can decrypt it.

The longer the encryption key, in general, the stronger the encryption. In symmetric encryption systems, 128-bit keys are commonly used and are considered very strong. Sensus goes beyond that, encrypting FlexNet communications with 256-bit keys. The encryption method changes dynamically over time based on time and packet sequencing, preventing packet replay and pattern detection.

Furthermore, the proprietary Sensus 7-FSK (frequency shift keying) modulation scheme is not public domain. This scheme is not commonly recognizable by a spectrum analyzer, and no off-the shelf equipment can be purchased to demodulate it.

Multi-layer encryption combines several encryption keys for even more robust protection. In a FlexNet system, for instance, each meter has a unique key that is assigned during manufacturing. The RNI can automatically distribute a shared key to all meters on the network.

The unique meter key and/or group key can be used in conjunction with the shared key to encrypt all meter-to-RNI traffic. The RNI automatically rotates shared keys. With this encryption scheme, a compromise to one meter cannot affect other meters or components in the network.

Strong encryption key management techniques keep these keys secret. In FlexNet systems, every endpoint has a unique key that is injected during manufacturing but can only be enabled by the customer. A central key server securely manages the system's encryption keys.

Even the keys themselves are encrypted with a master key before being stored in the key database. Access to the master key is securely managed to the strongest possible Federal Information Processing Standardization 140 (FIPS) standards by using Hardware Security Modules (HSM) from SafeNet. In addition, in future versions, RNIs will provide support for using IBM's Tivoli Key Lifecycle Manager (TKLM) for secure key management.

Asymmetric key architecture: Building on top of the multi-layer encryption that has been successfully deployed by several customers, Sensus is partnering with industry leader IBM for providing the advanced key management and asymmetric encryption capabilities.

A multi-year agreement has been signed with IBM to provide Sensus with the following technologies:

- Tivoli Key Lifecycle Manager (TKLM)
- ECC asymmetric encryption libraries on the RNI
- ECC asymmetric encryption libraries on the endpoints
- Manufacturing key injection
- Field tools support for asymmetric encryption

There are a variety of reasons for adding support for

asymmetric. These include: Secure messaging – Encrypted messages for confidentiality; Digitally signature – Signed messages for authentication, integrity protection and non-repudiation; Firmware download – Digitally signed firmware; Flexible security architecture – Allows for secure granular role based access based on positively identified endpoints; Ease of key management – Takes advantage of PKI for more secure key management; Competitive advantage – Allows for various security levels to meet the needs of large and small clients; Current and future standards – Provides support for currently defined standards as well as meeting future requirements without significant engineering resources and time; Authentication establishes or verifies a user or endpoint as authentic, such as through passwords entered by authorized users or digital signatures supplied by devices or computer programs. In the FlexNet system, both ends of the communication are authenticated.

Once the identity of a user or device has been validated, authorization processes grant access to network resources as permitted. For instance, under a sound security policy of separation of duties, an administrator may have permission to access certain utility network functions or commands but not others.

Tamper prevention and detection techniques protect against unauthorized physical access to devices, particularly those in remote/untrusted sites outside the utility's control. The endpoint device can have a lock, seal and other tamper resistant mechanisms. Tampering with the devices will trigger an alarm to the network management system.

A wireless network based on licensed spectrum provides intrinsic security advantages. For one, since this is not a technology that an individual can order through the Internet and plug in at home, it is not a target for casual intruders. Furthermore, by law only the authorized license holder can access the licensed channel. It is illegal to infringe on this channel either by sending or intercepting transmissions. In the U.S. this protection is enforced by the Federal Communications Commission.

Time-windowed commands add yet another layer of defense to limit the risk of replay attacks and other types of malicious activities. For critical actions, such as configuration changes or firmware updates to remote devices, the system first sends a "notification of action" message to the device. The subsequent "action" message must be received within a designated window of time, and it must contain elements that match those in the notification message, or else

the action is rejected.

In the network security context, entropy refers to a degree of built-in uncertainty in how security provisions are applied. When security features are less predictable, they are harder to crack. The FlexNet Security Architecture introduces random information elements into the methods by which it processes commands and other information, which makes it far more difficult to compromise the system.

Pass-through devices extend the connectivity of an AMI network without adding risk. For example, Sensus smart meters can operate in buddy mode to help an out-of-range endpoint reach the base station, and vice versa. In buddy mode, the meter simply forwards the encrypted communication; it does not have the means to decrypt or re-encrypt the messages. Behavior auditing monitors activity on the network, looking for suspicious activities or deviations from policy. For example, any attempt to tamper with a secured device or update its firmware would trigger an alarm, alert notifications to appropriate personnel and an audit log entry.

Naturally, these technology-based security tactics must be backed with strong organizational security policies such as division of responsibility, physical access control, secure storage of hardcopy information and disaster recovery plans.

## Security in the Network

Many existing utility communication networks have just one or two layers of security—insufficient for emerging AMI and smart grid requirements. Others rely on third-party security measures that are generic and not customized for each customer, particularly in fixed mesh networks utilizing public spectrum frequencies.

In contrast, a solution based on licensed spectrum provides its own built-in, multi-layered security shield—in which all layers are active all the time to protect data at rest and in transmission. Layering security, wrapping one security layer upon another, takes the licensed spectrum system to thresholds unattainable elsewhere.

A basic point-to-multipoint RF system can be hardened through multi-layered encryption methods with entropy and strengthened through access control, authorization and authentication. All are based on licensed spectrum for wireless communications and VPN tunnels for wired connections.

Ultimately, the utility has control over the final elements of



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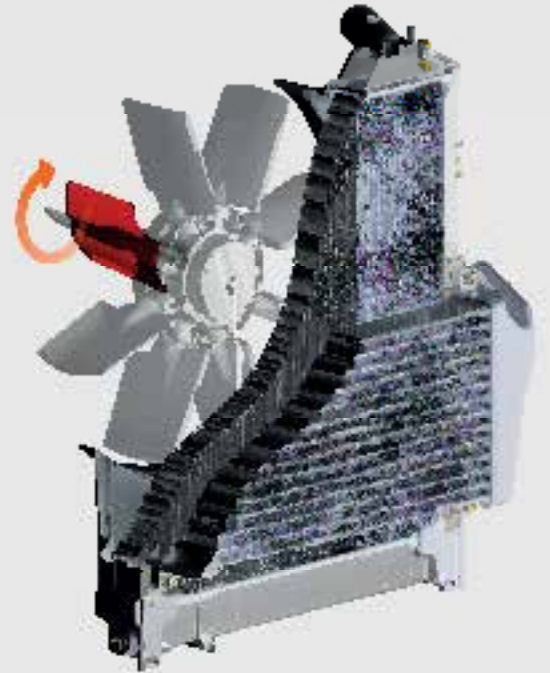
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network security— attributes such as which base station firewall filters to activate or how encryption keys are used. As a result, every security system is unique, which provides even further protection.

#### At the Customer Premise

As noted earlier, smart meters and other endpoint devices are equipped with locks, security tags and seals, and secure physical mounts (non-exposed fasteners, etc.). Attempted breaches trigger alert notifications.

A unique ECC key pair (asymmetric), along with certificates, are injected into the endpoint device during manufacture. Using the asymmetric keys and a modified Diffie-Hellman protocol developed by IBM, AES-256 keys that are unique to each meter is derived.

This key works with shared keys issued by the regional network interface to encrypt and decrypt all transmissions. Critical messages from the RNI, for example remote connect/disconnect commands, may be digitally signed using the RNI private key. Public-key encryption provides confidentiality and security of the data in transit and at rest while digital signatures provide the following features: Strong authentication – Entities (Messages, Firmware) can securely identify themselves to other devices and servers on a network without sending secret information over the network; Data integrity – The validity of a digital signature can easily determine whether or not digitally signed data has been altered since it was signed ;Support for non-repudiation – The entity who signed data cannot successfully deny signing that data.

If encryption is not used, at a minimum the transmissions are obfuscated via Viterbi optimization algorithms and FSK transmission.

#### At the Base Station

Additional security measures are applied at the base station. Data is stored for only the period of time needed to ensure accurate pass-through of data between endpoints and the regional network interface. All communications occur over secure, encrypted channels. Backhaul communications to the RNI travel over VPN tunnels. No data is ever sent over any network—public or private—in the clear. Encryption keys are never stored on the same device as the data at the base station.

Base stations also have a built-in firewall with preconfigured

filters. Customers can choose to turn on any or all of these filters to meet the needs of their enterprise security policy.

For physical security, base stations are generally installed in hardened facilities established for wireless telecom or paging. All equipment is located inside areas that have been highly secured by the primary owner of the tower site to protect all their customers' high value services.

For tower facilities with buildings, base station hardware sits in a locked, hardened, rack-mount enclosure. For tower sites without buildings, the base station can be locked in secure, hardened enclosures equipped with door switch sensors that generate an alarm.

As licensed wireless spectrum enables a range of 20 miles between network elements, the network does not require hundreds or thousands of home or pole-top mounted collectors. Instead, there are far fewer intermediate network nodes, and they are always located at highly secured tower sites.

#### At the Regional Network Interface

Additional security measures prevent unauthorized users from accessing private network servers: the Network Controller, Web Server, Stats Server and Maps Server.

Utilities have a broad range of security options for determining exactly which local operational and security practices are appropriate for each location.

Security measures can include additional hardening of the system, access control, secure VPN administrator access, time windowed commands, customized encryption key management, physical security and more.

Secure communications between servers and base stations are strongly recommended. If outside connectivity is required, the layered security of a DMZ is also recommended.

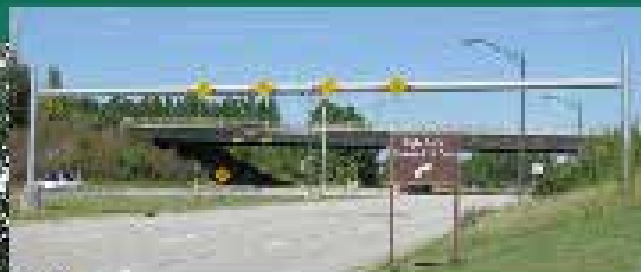
#### Benefits of Security Vigilance

As the security scheme can be customized and owned by the utility, security features in a private spectrum network effectively prevent the system from being compromised from within or outside. For example:

- Endpoint firmware and software cannot be modified without authorization
- Modifications are only accepted if they originate from the

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trusted headend system at the RNI

-Modifications must be transmitted by an authentic source that knows the unique key for the endpoint, or signed using the RNI private key, or the endpoint cannot decrypt or verify the commands or modifications

-All modifications are automatically monitored and logged by the system

-A compromise to any endpoint would not affect the network or other endpoints

-Transmission from endpoints cannot cause the headend to take any actions other than storage of data for analysis

- False data sent from potentially compromised endpoints would be identified by business logic within the headend system

- False or corrupted data or transmissions from any compromised endpoint could not spread to other endpoints, because the compromised endpoint would not know the unique or private key of any other uncompromised endpoints

-Data confidentiality, integrity and authenticity are preserved throughout the network

- Transmissions are all encrypted using strong AES-256 encryption with multiple keys and secure key management. With an incorrect key, the endpoint cannot decrypt the command and will not take action on the unauthorized command.

- In transmissions from RNI to endpoints, only the RNI and the endpoint know the unique key (or private key in an asymmetric model). If commands are encrypted with an incorrect key, the endpoint cannot decrypt the command (or verify in case of asymmetric encryption) and will not take action on the unauthorized command.

-Entropy and time windowing prevent replay attacks and pattern detection

-VPN tunneling further protects transmissions between the headend and base stations

Like any security system, another important layer for training involves the people who use the system. Protocols for how passwords and specific devices are handled are vital, as are procedures which must become systematic regarding files protection, and passwords and equipment from unauthorized access.

In a two-way AMI system, every deployed endpoint could potentially be used to try to exploit the network or other networks that use the same technology. Logically layered security for authentication, access control and data transmission address those risks, establishing multiple barriers against unauthorized or accidental misuse of the network.

Utilities need to keep pace with evolving security threats, especially as smart grid deployments place more critical data on communication networks. The industry must encourage continued development of security system standards among regulatory authorities and industry partners, as well as adherence to those system standards by the industry. •



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# TUS NEW PRODUCT NEWS

## The ArmLift Patriot



The ArmLift Patriot® aerial personnel lift accessory mounts on new or existing heavy duty utility vehicles to comfortably and safely replace dangerous ladders or scaffolding for above ground work. For overhead duties to include lighting, landscaping and tree trimming, gutter and awning, construction, paint and signage, The Patriot® provides the appropriate method resulting in time savings and efficiency. Its compact size makes it ideal for close quarters work or even interior building maintenance. The Patriot® is powered by a rechargeable deep cycle battery supplying a 12 volt electro-hydraulic power unit for quiet, clean and efficient operation. The walk through bucket is hydraulically leveled and provides an above ground working height of 23 feet with a side reach of 11 feet, 6 inches to accommodate tasks up and over landscaping or ground obstructions. Side outriggers provide solid stability and simple push button operation makes the Patriot® extremely easy to use for any operator at any experience level. The Patriot® detaches from the base utility vehicle literally in a matter of minutes and provides a unique self standing, drive away storage platform so your dump box, sprayer or other attachments may be quickly and easily switched to as needed. Designed to mount on a new or existing TORO Workman, John Deere

ProGator, Cushman Turf Truckster or Smithco TCV5000, The Patriot® is a high quality addition to your maintenance equipment fleet that's uniquely designed to save time and money while providing unparalleled operator safety and convenience.

[www.armlift.com](http://www.armlift.com)



Atlas Copco recently introduced two new rammers, replacing the LT5004 and LT6004. These new rammers feature ultra-slim bodies, ideal for getting closer to structures and through narrow spaces. Like all Atlas Copco rammers, the new LT5005 and LT6005 provide high centrifugal force and speed for deep and effective compaction.

Atlas Copco featured the rammers during World of Concrete in Las Vegas and The Rental Show (ARA) in New Orleans.

At a mere 6 inches wide, the LT5005 is 3 inches smaller than its predecessor and the LT6005 is 9 inches wide – 2 inches shorter than the previous model. These slim designs enable operators to easily compact cohesive and granular soils in confined spaces, such as small trenches, ditches, backfills and foundations. The smaller size also makes it easy for operators to work close to walls or posts.

Atlas Copco designed the rammers with a rubber isolator on each side of the handle to absorb vibrations that would otherwise be transmitted to the operator. This reduces the risk of injuries, such as carpal tunnel syndrome and hand-arm vibration syndrome. The rammers also feature a single lifting point that allows users to easily move them from hard-to-reach spaces with large machinery, such as a crane.

The rammers are equipped with a Honda GXR120 engine that features an overhead camshaft and timing belt that operate with minimal noise. The oil alert LED indicator on the rammers notifies operators when the oil level is too low for proper engine lubrication. The rammers also are equipped with a throttle control with three fixed positions, stop, idle and run. This feature eliminates the risk of leaving the throttle half open, which optimizes fuel use.

"The slimmer profile and reduced weight truly improve the machines' handling in tight spaces, allowing workers to get into areas they couldn't before," says Darrell Engle, product development specialist.

Atlas Copco also designed the LT5005 and LT6005 for easy onsite maintenance. Each unit is equipped with a large air filter that users can change without tools. An upgraded air filter indicator is available upon request. It is designed to alert the operator when a filter needs replacing. Users also can equip the units with hour meters to accurately track service intervals.

Operators can use Atlas Copco's optional trolley to quickly and safely lift and transport the rammers. During lifting and transportation the rammers activate an automatic integral lock, which prevents excessive wear on the shock absorbers. Plus, the fuel tank features an improved seal to prevent fluids from leaking during transportation.



The revolutionary AutoLink II OBD Distance Sensor allows for easy, plug-and-play installation of the RAC Plus I DMI in any vehicle with an On Board Diagnostic (OBD) interface. Simply plug the AutoLink II into the vehicle's OBD interface, and then use the included cable to connect the AutoLink II to the RAC Plus I's power port. The AutoLink II determines when the vehicle is moving and sends distance information to the RAC Plus I. The RAC Plus I features a light-weight, high-impact ABS plastic case (7.8"W x 2.3"H x 1.2"D); dual 6-digit LED displays; four brightness levels; a user-friendly menu; automatic calibration on all vehicles (stores four separate vehicle calibration numbers for multi-vehicle usage); distance measurements accurate to 1 foot per mile; pre-distance if starting at a known point; count up/down or add/subtract distance from current display; count and display hold function; display of distance intervals between points of interest; and distance conversion from feet to miles to kilometers. Includes RAC Plus I instrument, AutoLink II OBD sensor with brackets, and manual.

Visit the Forestry Suppliers web site at [www.forestry-suppliers.com](http://www.forestry-suppliers.com).

KH Industries, U.S. manufacturer of the popular NightRay and StarBeam remote control spotlights has introduced a new LED StarBeam Spotlight featuring low amperage draw and a focused high output light pattern.

The new LED StarBeam features 10 light emitting diodes (LEDs) per head, with each head providing a low 4-Amp power draw. The heads utilize the newest white LED technology, which provides a brighter, crisper, and whiter light output which is closer to the color temperature of daylight. The LED heads are resistant to damage from shock and vibration, and feature an impact resistant polycarbonate lens making them extremely durable.

"The new LED StarBeam uses the latest white LED technology," explains Craig Hefright, vice president of sales and business development at KH Industries. "Our customers will be impressed by the light output and projection distance, along with the fact that the heads are designed to withstand elevated levels of shock and vibration. These LED lamps are also sealed to reduce the harmful effects of moisture intrusion."

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Subaru Industrial Power Products has upgraded its line of commercial-grade SGX generators with larger fuel tanks, no-flat tires and larger mufflers. In addition, the generators feature a new blue and silver look to coordinate with the company's automotive division.

The SGX line, which includes the SGX3500, SGX5000 and the SGX7500E, is packed with high-quality components, uses durable construction, and features technologically advanced Subaru EX Series overhead cam engines. The reliable and rugged generators are suited for

# TUS NEW PRODUCT NEWS

anyone from homeowners to professional contractors.

Subaru continues to use 100 percent copper windings, which improve conduction and maximize surge capacities. Stators now come with a full varnish dip for a stronger bond than the previous dripped-on applications. This provides better coverage in all the crevices for better winding protection from movement, moisture and debris.

Subaru also modified its professional-grade control panel, adjusting both the hour meter and the placement of the engine switch.

The upgraded hour meter displays total operating hours even when the unit is not running. The engine on/off switch is now mounted on the control panel for easier access, and a protective cover over the switch protects it.

Low-tone mufflers on the SGX generators are nearly double the size of previous models, so the tonal quality of the unit during operation is smooth and clean. The mufflers also feature the U.S. Forest Service-approved spark arrestors.

Wheel kits with two no-flat tires offer enhanced portability and save operators time and money by eliminating checking, inflating, repairing or replacing tires.

The SGX line offers Occupational Safety and Health Administration-compliant ground fault circuit interrupter, or GFCI, receptacles, and twist-lock receptacles enhance safety.

All SGX models incorporate an automatic voltage regulator system that provides precise voltage control output for more sensitive equipment and electronics, a low-oil-level sensor with automatic shutoff to protect the engine from damage, and an easy-to-read fuel gauge.

The SGX3500 delivers a maximum

output of 3,500 watts, and it features Subaru's EX21 7-horsepower engine and a 4-gallon fuel tank for a total run time of 8 hours at the rated load. A 9.5-horsepower EX30 engine powers the SGX5000, which offers a maximum output of 4,900 watts. Subaru upgraded the SGX5000's fuel tank capacity to 8 gallons for a total continuous run time of 10.7 hours at the rated load. The SGX7500E features a 14-horsepower EX40 engine that provides a maximum output of 7,500 watts. Its 8-gallon fuel tank provides 7 hours of operation at the rated load. This SGX7500E also includes an electric starting system with recoil backup.

The SGX generators are CSA (Canadian Standards Association) certified to meet electrical safety standards. Generators are EPA Phase 3 compliant and are backed by Subaru's industry-leading 5-year warranty on the engine and a 3-year warranty on the generator.

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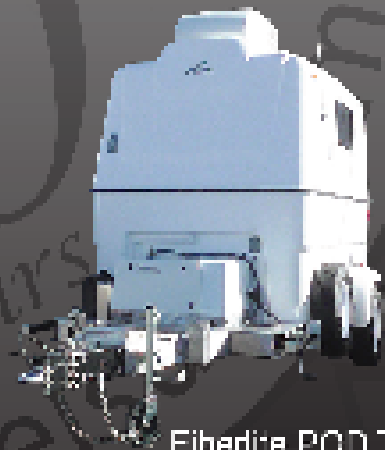
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