

# *telematics*

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MAGAZINE

## **In this issue:**

### ***Big Challenge, Huge Rewards***

*Selling telematics products and solutions in Asia requires more than business savvy*

### ***Bigger, Better Faster***

*M2M solutions are delivering tangible business value and breakthrough results*

### ***Clear and Present Danger***

*Heightened security risks pave the way for more automated and reliable container tracking solutions from established automotive telematics companies*

**Plus** M2M Section: Focus on remote monitoring and Orange

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# News in Brief

US → EUROPE → WORLD

## America News: Sprint Nextel to acquire Alamosa Holdings for \$4.3bn

Sprint Nextel is to acquire Alamosa Holdings for approximately \$4.3 billion, including the assumption of approximately \$900 million of net debt.

The acquisition will significantly expand Sprint Nextel's direct customer base and territory. Approximately 1.48 million PCS wireless users will become direct subscribers of Sprint Nextel, and the company's direct service territory will be extended to an additional 20 million people in 19 states.

On August 8, 2005, Alamosa filed a complaint against Sprint regarding certain exclusivity covenants Sprint had with Alamosa's subsidiary AirGate. As part of the agreement, Sprint Nextel and AirGate will seek an immediate stay of litigation pending in the Delaware Court of Chancery with a final resolution to become effective upon closing of the acquisition.

## America News: MHF Logistical Solutions to offer "smart" railcars for hazmat shipments

MHF Logistical Solutions announced that it will offer "smart" railcars equipped with remote monitoring and diagnostic systems to manage shipments of sensitive cargo, from around early 2006.

The new service will feature long-life, battery-operated wireless devices and monitoring equipment that track the exact location and operating status of railcars in use across North America, as well as the condition of their contents. Shippers can access detailed data about their shipments anytime through a secure, protected system, and can be alerted if railcars have been tampered with or have encountered an unusual event.

Add-on features – such as monitoring internal or external temperatures, pressure, impact and other variables – can also be added to the basic unit.

## America News: GM develops vehicles with a sixth sense

General Motors demonstrated a fleet of cars that have a sixth sense. Using vehicle-to-vehicle (V2V) communication, a vehicle can detect the position and movement of other vehicles up to a quarter of a mile away.

The vehicles can anticipate and react to changing driving situations and then instantly warn the drivers with chimes, visual icons and seat vibrations. If the driver doesn't respond to the alerts, the car can bring itself to a safe stop, avoiding a collision.

GM has the ability to replace multiple safety sensors with one advisory sensor that will provide all-around, instantaneous traffic intelligence. While other vehicle manufacturers are developing similar technology, GM's advantage is in its ability to leverage or enhance existing systems such as OnStar and StabiliTrak systems to deliver this solution more quickly and cost effectively.

## America News: 100,000 sign up for OnStar's Vehicle Diagnostics in first month

Within a month of OnStar launching its monthly e-mail vehicle diagnostic service, enrollment has surpassed 100,000 customers.

OnStar Vehicle Diagnostics automatically performs hundreds of diagnostic checks on four key GM vehicle operating systems — the engine/transmission, anti-lock brakes, airbag and OnStar. The vehicle is automatically programmed to send the results via e-mail to the owner each month. The unique e-mail report also provides maintenance reminders based on the vehicle's current odometer reading, remaining engine oil-life and other relevant vehicle ownership and OnStar subscription information.

"As we had expected, our subscribers have enthusiastically embraced OnStar Vehicle Diagnostics," said Chet Huber, OnStar president. "Now, over 100,000 vehicles are sending their owners monthly e-mails to tell them how they are doing."



### America News: DaimlerChrysler and SIRIUS extend exclusive relationship

Sirius Satellite Radio and DaimlerChrysler extended their exclusive relationship until 2012. The agreement includes all Chrysler Group and Mercedes-Benz vehicles as well as Freightliner trucks. For the model year 2006, the Chrysler Group is expected to generate more than 750,000 subscribers, with volumes estimated to increase significantly in the future.

Mercedes-Benz USA plans to offer Sirius satellite radio as a standard feature on all 2007 model year SL-Class and CL-Class vehicles, and all AMG and 600 model vehicles. Mercedes-Benz also plans to extend the number of models with Sirius as a standard feature in the future. Mercedes-Benz-Sirius volumes are expected to hit 250,000 vehicles over the next two years, a figure representing approximately 50% of Mercedes-Benz sales.

### America News: California has "lost" 43% of its state-owned vehicles

According to an audit of state-owned property ordered by Gov. Arnold Schwarzenegger, California's state agencies appear to have no idea where 43% of their vehicles are.

On August 8, 2005, KPIX reporter Jeffrey Schaub reported that an examination of California's state-held inventory has determined that almost of half of that state's cars and trucks are unaccounted for. The study concluded that 30,000 of California's 70,000 vehicles are missing - everything from Caltrans trucks and CHP cars to fire rigs and prison vehicles.

"Fleet management is not just a problem in California," said former presidential adviser Spencer Geissenger. "U.S. taxpayers are flipping the bill for missing vehicles across the country." He added that since vehicle tracking systems are affordable, there is no excuse for the government to "lose" its vehicles.

### Europe News: Legislation calling for digital tachos on all new vehicles set for May - maybe

The Freight Transport Association warns trucking company operators that it could be a while before the legislative process governing the introduction of digital tachographs is resolved. It also urges that orders for new vehicles must clearly specify requirements for either an analog or a digital tachograph.

The timeline for the EU legislative process is complicated. The consultation procedure regarding amended drivers' hours rules ends on December 6, and the European Parliament and the Council of Ministers are likely to ratify decisions in January. The legislation will likely go into effect in late April/early May, pushing the mandatory date for digital tachographs to be fitted to all new vehicles to around the middle to end of May.

Therefore, the FTA urges operators to start planning now to get systems in place to download and store data. The FTA has made it clear to U.K. ministers that the road transport industry needs sufficient time to prepare and believes that the European Commission's threat that member states must enforce the new tachograph rules from January 1, 2006 can be discounted, at least for U.K. operations.

### Europe News: Majority of new Fords to offer voice control & wireless connectivity

Ford of Europe says it will to introduce voice control of onboard systems and wireless connectivity to the majority of its vehicle lines by early 2006.

Bluetooth® wireless technology for mobile phones is an essential element of this



advanced voice control system, and will be offered as an optional extra on audio systems across the majority of models in the Ford portfolio, from the Ford Fiesta to the Ford Transit, the company says.

Unlike aftermarket kits, the Ford solution is fully integrated into the vehicle's existing electrical control systems, which allows full use of the familiar remote radio controls. Ford offers systems based on the feature-rich second generation of Bluetooth® technology that supports a large number of mobile phones from Nokia and other manufacturers.

### Europe News: GPS Industries files European patent infringement suit

GPS Industries issued court proceedings in London, alleging infringement of European Patent 0617794B1 against ProLink Solutions, Elumina Iberica SA, and Elumina Iberica Ltd.

This legal move was made by the company to ensure that the patented golf GPS technology the company controls worldwide is properly licensed, the company says.

Robert Silzer Sr., GPS Industries CEO and president, says that the company is willing to sell licenses on reasonable commercial terms to all those who wish to offer the technology covered by its patents.

"Repeated attempts to put licenses in place with these particular companies have failed, and so we are now forced to seek remedies through the legal system to stop them from using our patented technology," he says.

# News in Brief

## Europe News: Volvo On Call – the first SOS system with pan-European coverage

Volvo Cars will launch Volvo On Call in seven European countries, although the service will be supported in fourteen countries.

In the UK, Sweden, France, Italy, The Netherlands, Belgium and Luxemburg, the infrastructure will be fully installed and running by early 2006. The service will also be available in another seven countries (Germany, Switzerland, Austria, Denmark, Norway, Spain and Portugal), although they will be supported via an international service centre. Over the next few years, Volvo will offer the Volvo On Call service to other markets as well.

Volvo On Call consists of two service packages – one that focuses on safety and one that focuses on security.

The safety package includes Volvo's integrated GSM phone and a GPS receiver, plus a five-year subscription to the services which migrates with the car to any new owner(s) during the subscription period. It features an automatic alarm, triggered by activation of airbags or seat belt pre-tensioners, and an SOS button for a manual alarm.

The security package features an automatic notification to Volvo On Call's customer service when the car alarm is activated, plus stolen car tracking, and remote door unlocking.

## Europe News: Trakm8 announces intention to list on AIM

Trakm8 is seeking admission of its ordinary shares to trading on AIM in order to allow the company to fully exploit the opportunities that exist in the Vehicle Placement sector.

Admission to AIM is primarily intended to enhance the group's profile and to enable the group to access equity finance, which may be required in the future to allow the group to expand both organically and through selective acquisitions.

The group supplies its licensed GPRS-based GPS vehicle placement hardware, enabling software and information management platforms for the end user through selected distribution partners.

With recent contracts with two subsidiaries of FTSE 100 companies now in place to supply the group's technology into the U.K. market, Trakm8 is now seeking to expand its focus to Europe as the next priority, followed by North America..

## World News: Legislation changes drive AFS growth, says Strategy Analytics

Strategy Analytics released: "Adaptive Front Lighting Systems," from its Automotive Electronics Service, predicting a strong 64% average annual growth rate for adaptive front lighting systems over the period 2005 to 2010.

Adaptive front lighting systems (AFS) are beginning to appear in near-luxury models, and are also becoming available in mass-market models. Strategy Analytics thus expects the adaptive front lighting market to grow rapidly to a market of 9.6 million system units by 2010.

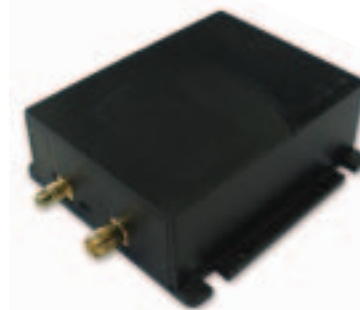
"The relaxation of legislation governing vehicle lighting systems, together with the consumer's desire for the improved safety that these systems can offer, is helping to drive this market," notes Ian Riches, director, Automotive Electronics Service at Strategy Analytics.



## New partnership: AirIQ announces agreement with Cingular Wireless for digital LBS

AirIQ launched its digital wireless solution for location-based services, enabled by a data resale agreement with Cingular Wireless.

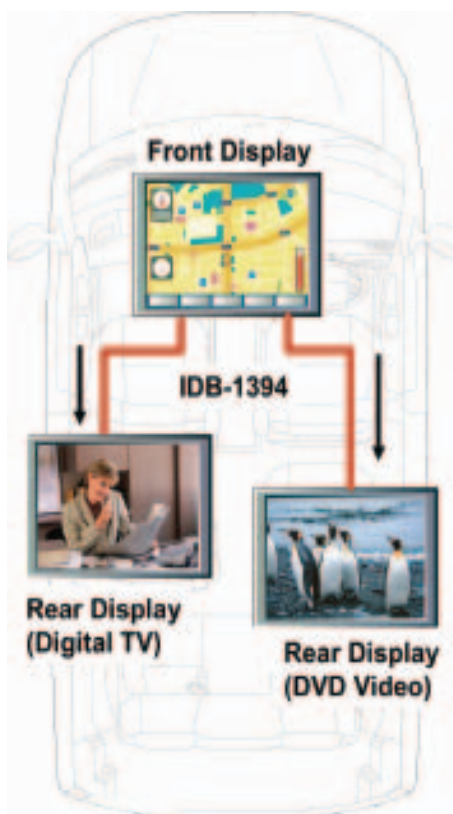
Certain versions of AirIQ products and services are available now, with all further terrestrial products to be available by the start of 2006 on the Cingular nationwide GSM/GPRS network.



According to AirIQ's president and CEO, Donald Simmonds, the agreement with Cingular adds the GSM platform in the U.S., in addition to AirIQ's previously announced deployment plans in Mexico.

### New product: Fujitsu introduces world's first fully integrated IDB-1394-compliant controller for vehicle audio-video systems

Fujitsu's new MB88387 connects top-quality video and audio to vehicle displays from their head unit, DVD player, navigation, camera, amplifier or other devices. The MB88387 incorporates both the 1394b PHY and Link in a single chip, along with the digital transmission content protection (DTCP) stan-



dard that prohibits unauthorized copying or transmission of protected A/V content.

The controller supports IEC61883 AV protocols for smooth audio and video stream playback. The chip supports data transfer rates up to 400Mbps. The PHY layer supports two 1394b/S400 ports, and the integrated DTCP function allows encryption or decryption of two data streams at the same time.

### New product: Traffic info and location finder available on Verizon Wireless subscribers' mobile phones

Verizon Wireless's three new map-based applications - MobileGates Traffic, FuelFinder and StoreFinder - are now available to Verizon Wireless Mobile Web 2.0SM customers.

MobileGates' technology enables Verizon Wireless Mobile Web subscribers to receive up-to-date information about current traffic conditions as well as the location and price of fuel in their region or along their route. In addition, the new VZW StoreFinder, developed for Verizon Wireless by MobileGates, provides subscribers with interactive maps detailing the location and directions to Verizon Wireless stores in their area.

### New product: QNX safeguards embedded systems against critical data loss

QNX Software Systems announced that it is the first RTOS vendor to offer a fault-tolerant, embedded transactional file system (ETFS) for NAND flash memory devices.

ETFS for the QNX® Neutrino® RTOS uses a transactional update model that provides complete integrity across unexpected loss of power, eliminating data corruptions that plague embedded systems when power failures and other catastrophic events occur. ETFS offers a solution tailor-made for harsh environments such as the automobile, where unexpected power fluctuations can easily corrupt a conventional file system, or for any application where data corruption can result in loss of service, revenue or user safety. Moreover, it is optimized to provide fast system restarts should a power failure occur.

### New partnership: SAT Systems named exclusive distributor of Parrot's telematics solution

SAT Systems was named the exclusive North American distributor of Parrot's telematics-based consumer/fleet management solution. The SAT3500 system will be marketed exclusively through the SAT distribution channel, which is focused on automotive dealerships, consumer/fleet and 12-volt outlets. Rollout is targeted for early 2006.

The SAT3500 system's features include personal online access for secure vehicle tracking, responsive concierge service, ignition on/off controls, multiple geo-fencing, speed alerts, door lock and engine disable functions via remote PC, and hands free wireless phone operation as well as Internet/e-mail access via a Bluetooth-enabled smartphone, PDA or laptop.

### New business: Harman finalizes \$250m contract with PSA Peugeot Citroen

Harman International is finalizing a contract with PSA Peugeot Citroen for the development and supply of all their next generation infotainment systems.

The contract will cover systems ranging from entry level to high end, and represents approximately \$250 million in incremental annual sales.



Bringing the leaders of consumer electronics and in-vehicle telematics together!

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# Consumer Telematics 2006

January 4, 2006, The Rio Hotel, Las Vegas, Nevada

ONE DAY BEFORE THE INTERNATIONAL CONSUMER ELECTRONICS SHOW

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- **STAY ONE STEP AHEAD:** Take an early look into the telematics applications being supported with HD Radio
- **HOW BIG IS THE OPPORTUNITY** for transfer of home entertainment to the vehicle? Where's the money?
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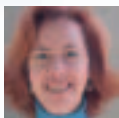


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# The Digital Transformation of the Car



Hard disk drives enable a new generation of infotainment on the road says **Amy Dalphy**, Product Marketing Manager, Toshiba Storage Device Division

**THE EXPLOSION OF MOBILE DIGITAL** information and entertainment devices such as MP3 players, mobile phones, PDAs, GPS systems and digital cameras among others, has led consumers to expect and depend on the digital experience anywhere, anytime. In the new digital world, mobility is key.

The automobile is the next frontier in this expanding universe of “infotainment” on the go. Consumers want to stay entertained and informed from home to work and back again, especially in the automobile, which is often like a second home.

Automobile manufacturers clearly recognize that the profusion of digital programming is in high demand and that replicating the digital experience in the car adds value and differentiation to their offerings. Aftermarket and dealer options for devices like GPS, video playback and digital music represent the beginning of the car’s digital transformation. While these are the “early-adopter” digital applications in the car, incorporation of high-capacity, storage-based media systems open the door to a host of possibilities for in-car infotainment.

## The New Digital Living Room: A Glimpse at What the Future Holds

Today, satellite radio complements commercial broadcasts – imagine the possibilities when this content can be time-shifted using recording and playback from a high-capacity system in the car. In addition, rear-seat entertainment featuring children’s programming and gaming is a popular application. In the future, can we expand to a fuller range of content using an embedded solution

capable of downloading content from our regular cable or satellite programming? Likewise, our MP3 collections are proliferating – how can we easily and appropriately house this precious content in our car? Each of these entertainment options is possible with storage-based systems that have enough capacity to house and run these sophisticated digital applications.

In the area of in-car information, imagine even more sophisticated GPS navigation that offers better trip optimization by graphically displaying 3D pictures of road segments or points of interest (such as the nearest gas station, restroom or latte). These types of 3D GPS systems are already the norm in Japan and require 12 to 14GB of capacity for this richer content. Finally, a new arena for information in the car is in the area of recording parametric data, such as engine temperature or mixtures, to assist in problem diagnostics and even to prevent severe performance problems.

## The Mechanics of Creating the Digital Experience: Robust Storage

To create a system capable of simultaneously running all of this digital information and entertainment programming in the car, automobile and head unit manufacturers need robust storage solutions. Among the myriad possibilities, hard disk drives (HDDs) are clearly best-positioned to make this digital experience a reality in the car.

Only the HDD can solve the quintessential question for many consumers interested in these solutions: “How can we keep the kids from short circuiting in

the back seat on a 12-hour car trip to see the grandparents, while we keep our wits about us with our own front-seat necessities?”

With HDD technology, automobile manufacturers get the right combination of robust capacity, temperature and vibration specifications and efficient content writing and retrieval capabilities to bring mobile digital living essentials into the car. With HDD technology, infotainment systems can house and run multiple offerings such as navigation, video and music simultaneously. According to research firm IDC, the number of HDDs consumed for automotive applications will grow from 2.4 million in 2005 to 8.5 million in 2009, as automotive manufacturers, car dealers and aftermarket suppliers continuously introduce new digital devices.

## It’s Not Your Father’s (or Your PC’s) Hard Disk Drive

A new generation of HDDs has been designed specifically with the car in mind. Automotive-class HDDs are not typical PC drives – they offer the right specifications and longer design cycles to meet the needs of the automobile industry.

The baseline requirement for automobile applications is high capacity. Current automobile-class HDDs offer 30GB of storage, with planned increases in the near term. With this capacity, entertainment systems can store up to 7,500 songs or 22 hours of video content at cable/DVR quality, while holding a virtual world map of navigational data for GPS applications.

Another essential criterion is the

ability to perform in extreme operating conditions. Today's automotive-grade HDDs have been designed to withstand temperature ranges from the desert to the mountains, while also controlling the humidity within the drive. Constant vibration and potential shock are also significant challenges to overcome when designing HDDs for the car.

In addition, HDD suppliers have taken into consideration the design life-cycle of an automobile and have extended HDD product lifecycles to meet manufacturer requirements, which is typically a three-year period. In the past, HDDs reached end of life in just six months.

### Capacity Is King

Today, automotive manufacturers are using 30GB HDDs to meet the capacity draw of applications such as mapping, MP3 storage and video. Mapping and navigation programs consume in excess of 15GB. To have it all, all at once can require up to 40GB or more of storage.

### The Future: PMR Gives HDDs More Gas for Storage in the Car

In 2005, HDD manufacturers introduced a breakthrough recording technology that will have great impact on the ability to increase storage capacity for automotive applications. Known as perpendicular magnetic recording (PMR), this technology enables HDDs to overcome the inherent limits to increasing capacity under the current longitudinal recording platform.

Conventional longitudinal recording stores data on a magnetic disk as microscopic magnetic bits aligned on a plane. Although advances in magnetic coatings continue to improve data recording densities on the HDD, the magnetic bits repulse each other when the densities become too extreme. Squeezing more bits onto a disk will eventually result in crowding that degrades recorded bit

quality. As such, HDD manufacturers face fast-approaching limits on storage capacities.

By standing the magnetic bits on end, perpendicular recording reinforces magnetic coupling between neighboring bits, achieving higher and more stable recording densities and improved storage capacity.

PMR has the potential to increase HDD storage capacity up to 10 times greater than current capacity limits. This capability is extremely important to developing automotive-class HDDs, because HDD manufacturers achieve the



Robust storage solutions like the 2.5" HDD provide capacity to run vehicle infotainment systems

temperature specifications required by the automotive industry by relaxing the areal density in a traditional HDD. Without PMR, increases in capacity to accommodate future expansion of multimedia applications in the car would not be possible.

### Automotive HDDs Drive Digital Entertainment Today

Toshiba Storage Device Division has worked with automotive manufacturers for more than eight years to develop and design automotive-grade HDDs, and currently commands more than 80 percent of the automotive HDD market, according to TSR. To date, Toshiba has shipped more than two million units to automotive and head-unit manufac-

turers for OEM and aftermarket products. These fourth-generation automotive HDDs feature improved capacity and provide significantly expanded temperature ranges to assist automobile manufacturers and aftermarket suppliers in designing robust digital devices for the car.

Toshiba's 30GB 2.5-inch HDDs are currently shipping to OEMs and support temperature ranges from -160 to 700 Celsius (MK3029GACE), and -200 to 850 Celsius (MK3029GAC). Measuring 69.84 mm wide, 100 mm deep and 9.5mm high, these HDDs weigh in at 96 grams and can withstand operational shock of 200g and non-operational shock of 800g, providing a rugged and dependable option for cars and SUVs as they travel through extreme temperatures and terrains across the globe.

### In Conclusion: The Digital Car Hits the Road

Beginning in model year 2005, the first OEM installed, HDD-based head unit solutions began shipping in Japan. These units have navigation as the primary application, with MP3 and other functionality as secondary priorities. In the United States and Europe, the first solid wave of automobiles featuring OEM installed, HDD-based digital solutions including entertainment and navigation will hit the road in model year 2007. Almost every major car manufacturer is working to design HDD-based systems into their 2007 offerings.

While these are major milestones, the automobile industry has only just begun to discover the value that HDD-based entertainment and information systems will deliver to consumers. Using HDD technology, automobile manufacturers have a virtual open slate to create exciting applications that differentiate the car and keep pace with the consumer appetite for digital programming. ■

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# Making Vehicle Monitoring and Diagnostics a No-Brainer



Software complexity is increasing at an exponential rate, replacing hardware as the dominant factor in overall product development cost. From telecom switching systems and smart cell phones, to automobiles and medical instruments, consumer products and industrial systems are running millions of lines of code, spread across a growing number of processors and operating systems. Against this backdrop middleware is increasingly the key to managing that complexity, making it possible for companies to develop, deploy, configure, service, and upgrade multiprocessor software. **Ven Pedro** spoke with Anders Flodin, Director of Strategic Alliances at Enea, a provider of real-time technology and services for embedded systems applications headquartered in Sweden, about “Element,” a breakthrough middleware solution designed to slash product development costs for automotive and telecoms equipment manufactures

**Ven Pedro:** Please tell me about your company and the introduction of Element.



**Anders Flodin:** Traditionally we are an automotive company, but in reality, we have stretched beyond what you would normally expect from a company in that space. For quite some time we have had an offering that includes support for multiple processors, effectively conducting transparent communication between processors and which allows application components to migrate between different hardware configurations.

In this vein, we’ve built in functionality to make our solutions robust, fully tolerant and highly available. We have also concentrated on providing an efficient development environment. So, for us it is natural to grow in that direction and Element is a product that bundles this knowledge into real technology. That is the how we arrived at Element.

**VP:** What does Element do and what are its main benefits to the telematics industry?

**AF:** It does several things depending on your needs. All in all, it is an application

development framework. It has two main features. One, it is designed to improve the productivity of the developers. Second, it also contains the high availability framework that allows customers to reach 99.99 percent availability.

From a telematics and automotive perspective there are a number of things that are applicable right away. Element contains a pretty sophisticated application and debugging monitoring system. This allows the customer to very easily create a small webpage that captures information about the application. Put simply, this allows the user to debug the applications and the application’s characteristics rather than its source code or how it interacts with the operating system. As a result, it can be used to gather relevant statistics and monitor vehicle diagnostics – for example, how effectively the ignition has been controlled.

You can also monitor the number of incoming calls or the number of lost packets in the communication channel, for example. Element also contains a logging facility. Each node, each individual CPU, has an interface where it does logging. You can apply intelligent

dynamic filters to these logs and aggregate them into one central log. That gives you an overview of the whole system.

The main benefit to the auto industry is the fact that that Element is going to drastically reduce debugging time and development time.

Another innovative part of Element is the way you can add extensions to the operating system, such as a reliable messaging event notification system. Traditional messaging it is point to point – one entity talks to another entity directly. An event notification service is basically one to many. What you have is a server or servers in a system where different players can subscribe to events. So if you have an event failure in a node,



Middleware is the way to manage complex car systems



Element can be used to gather relevant statistics and monitor vehicle diagnostics

that is replicated and delivered to anyone that has subscribed to notifications about that failure. It is a very efficient and dynamic way to build in control and knowledge about the system. And the real advantage: it means every single node doesn't need to know about the topology of the rest of the system and have that hard-coded into its applications.

Finally, Element provides a high availability framework. In the automotive industry this is more applicable to new system designs that are coming up - probably still in research stages - where the idea is to have processor farms rather than having each and every function having a processor next to it. Instead, you would have multi-function processors that would come in different kinds of clusters, and where you want to have a full tolerance system.

**VP:** How does Element compare to other middleware solutions?

**AF:** The interesting thing is that the main competition for Element is not other commercial off-the-shelf products. It is the traditional do-it-yourself method. Put another way, it really is a make vs. buy issue. Element lets equipment manufacturers outsource this complex middleware function, saving

millions in development costs, and enabling in-house engineers to focus on more profitable value-added services and application software.

**VP:** What are some details regarding future upgrades of components or software?

**AF:** Element is easy to port to new platforms and has high upgradeability. A field upgrade of a component in Element is handled in a similar way as a failure. The upgrade management system uses the fault management system.

Let's say you have one CPU fail. You want to take the state of that CPU - it may have some important diagnostic stats you want to keep - and you need to take that data over to the new CPU. When you start that application on the new CPU you also want to make that every CPU that has some kind of interaction, and knows to talk to the new CPU and not the old one.

When you upgrade a system that uses processor farms you would load the new software on the redundant processor and then introduce a fault and use the same notification mechanism to redirect interactions to the new processor.

**VP:** Will future compatibility with

Element require certain standards or protocols?

**AF:** Yes, in this kind of framework you would have to apply it to at least a subset of the whole design in the car. That way you don't have to have it for every individual processor. But you would have to create a cluster with a number of processors in it that are compatible with the framework. The framework is agnostic when it comes to communication standards and build sets, for example.

Then there is a component that is related to upgrade management that is more concerned with configuration management, mapping the different pieces of software and its capability onto versions of the hardware and its capabilities. Imagine a scenario where you want to do a field upgrade of a certain component from version 1.3 to version 1.4 - a version that might only work if you are in a certain revision of a communications protocol or hardware version. It (the Element framework) keeps track of that what is possible to upgrade and how to configure when you have done the upgrade. It basically maintains a kind of database over the different combinations of hardware and software you have for your system.

**VP:** This is quite a breakthrough. What is the response?

**AF:** We are talking to different customers who are looking into this and who have research programmes running. This cluster mentality is a smart way to reduce both manufacturing costs and system complexity. The more software in a system, the more prone to failure it will be because each and every one is running in its own environment on its own processor. If one of them fails, what happens - maybe the brakes go out and all just because you had a simple CPU failure! But you don't want to build a redundant system for each and every processor out there if it's dedicated to any functionality. ■



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# New Venture Automates Complete Tracking Capability



Savi Technology, a provider of RFID solutions that deliver value through real-time supply chain visibility and security, recently teamed up with Hutchison Port Holdings to form a new company with the intention to deploy automated tracking and security capabilities throughout the international container shipping networks. **Thomas Hallauer** spoke with Lani Fritts, Chief Operating Officer of Savi Networks, about the new company and its take on market opportunities moving forward

**TU:** Savi has over 15 years' experience providing RFID solutions for the management and security of supply chain assets, shipments and consignments. What does it bring to the table in this new venture?



**Lani Fritts:** Savi has focused on providing integrated RFID hardware and software solutions to drive business value, such as reducing supply-chain assets, inventory and operational costs. This new company combines our (relative) strengths to provide shippers with a comprehensive, real-time information system about their container and cargo status - from source -to destination.

Historically, Savi Technology has deployed what we call close-loop systems, where one company or one entity controls the overall process (and) so the assets, making the process and the people all part of one organization. In doing this we also identified a challenge: There are so many different people that have to work together to move goods from origin to the end destination that single systems simply don't work. Put another way, it's not a close-loop problem; it's an open-loop problem.

Savi Networks was formed to address this. What we're saying is we're deploying a network - we're deploying capital, investing capital in the network

backbone - and the data provisioning capability so that all companies are using these transportation networks. It's then the job of logistics to decide what kind of tracking capability they want on their device, on their asset or on their goods, and apply that tag. They get visibility (of tracking) through our network as it moves through port networks and the transportation networks.

**TU:** So Savi then functions much like a telecommunications network provider?

**LF:** Yes. We are deploying a backbone infrastructure in the largest ports around the world. We are also providing our customers key services. First, we provide basic tracking capability using technology like RFID. We focus mostly on active RFID in this market because passive simply doesn't work in the environments in which these containers travel.

Some small segments of the cargo require true in-transit tracking capability or continuous tracking, most often because of the high-value nature or high-risk nature of the cargo. In these cases we integrate to satellite and GPS and GSM systems to provide that precise in-transit (tracking) capability.

All of that information - information services on a per container trip basis - is available in a service we provide called SaviTrak. We provide that data in three ways. First, we provide it through a basic

Web portal. Customers go to the site and, based on their user name, log in to the page pre-configured for them where they can access the views of the information they require.

Second, we configure our platform with business rules and business logic, and provide alerts based on that. We're monitoring for things like the estimated time of arrival and the routes. We also monitor (the cargo's) physical status, security-related activity and other factors including environmental temperature, humidity, shock and vibration. Based on this we can then provide basic alerts out to our customers as their goods are moving.

Third, we enable the integration of data directly into their back-end operating systems, such as warehouse management systems, transportation management systems or ERP systems.



Only few cargo require continuous tracking



Savi aims more at the mass market of goods

We can do data integration off the network backbone (we provide).

So, you're right. You can think of us as a telecommunications company that deploys a network and provides various levels of data services, similar to the way a mobile phone operator would provide data services.

**TU:** Savi Networks owns and operates the network. It will also sell active RFID-related hardware and services?

**LF:** Yes, we don't make hardware, we sell it. Obviously, because we're close in line with Savi Technology, we sell the hardware that Savi Technology builds, engineers and produces.

We also work with other partners to provide customer with whatever type of tag they require. For example, we work with EJ Brooks, a seal tag manufacturer. It (EJ Brooks) provides us with a basic single-use electronic seal. We also work with Qualcomm and Contec Mobile Data Systems for satellite and GPS communications components, and in some cases GPRS and GSM components.

Most of what we're doing is active RFID. This is linked to our heritage but



The way the network data is provided to customers needs to be consistent

most traction with regard to containers and security devices.

**TU:** What is the business case for continuous real-time monitoring?

**LF:** It's more a chain of custody control hand-off points. These are the points where you hand the goods to the land carrier, where the land carrier hands the goods to the ocean terminal operator, and where the ocean terminal operator hands it to the ocean carrier. At these choke points is where we typically collect information. Of course, the devices are monitoring throughout (the trip), so if a breach or if an out-of-tolerance temperature situation arises, the tag itself will record the time and time stamp that.

While the customer doesn't get that alert at the exact time the event happens, the customer will get it at the next choke point. For most cargo, that's an appropriate alerting and reporting capability because ultimately most companies are not going to dispatch a police officer or anything like that out to track down the goods. They're going to take action at the next choke point.

It makes sense to explore the in-transit continuous monitoring if the goods are so valuable or so risky that you would want to immediately respond to a problem. I think that's still to be worked out in the market as to how valuable that is and what percentage of (the total) cargo that is.

**TU:** Please elaborate. As you know, many players, including IBM have sharpened their focus on continuous in-transit monitoring.

**LF:** We are aimed more at the mass market of goods where the need is for tracking and security monitoring and reporting from key points along the journey.

I think these are complementary approaches because many companies have both low-value and high-value or

high-risk cargo. They have general cargo that they just want choke-point traced. And they may also have some segment of their cargo where they need full in-transit visibility.

Some customers have risky goods, dangerous goods, and therefore it's much more of a security issue. Where the goods are high-value then the focus is much more on tracking as an anti-theft precaution. In the end, the business case is really dependent on the customer's business process and the type of cargo they're moving. Against this backdrop, the network and the way the network data is provided to customers should be consistent and complementary. The network has to be architected in a way to accommodate a range of capabilities, depending on the user case and the business case for the customer.

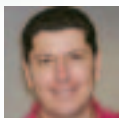
**TU:** What are the key drivers for your business moving forward?

**LF:** The drivers are proposed legislation such as the recent requirement for a bolt seal rather than just a loop seal. The U.S. Customs authorities are going to require that at specific points the transportation companies verify the seal number is the original and still intact. Another driver is the whole concept of green lanes, and legislation geared to providing incentives to shippers to use those technologies to give them green lanes.

The challenge is the public debate and the continuing regulatory debate. They have actually been a hindrance to deployment of these technologies.

The regulatory issue has been somewhat fuzzy and people are not sure exactly what the requirements are going to be. The discussion drags on and that's caused companies to be a little bit cautious about making the necessary investments (in tracking and monitoring). Certainly, the political debate will ultimately play into the favor of these technologies and drive adoption of these technologies forward. ■

# Telematics Takes to the Waves



Concerns about international security are driving growth in the container tracking market. Sensing a business opportunity, an increasing number of automotive telematics vendors are gearing up to make their move. **Robin Meczes** reports

## IN A WORLD ON HIGH ALERT

following repeated terrorist attacks, heightened security has become a top most item on the global agenda. This new focus on security has resulted in a raft of measures intended to beef up controls at airports and ports, including better container screening at arrival points.

An example of this is the United States' Container Security Initiative (CSI), a program introduced in 2002 that enlists the cooperation of major ports worldwide to help screen all containers before they arrive in the U.S. and identify those that are high-risk.

Another initiative out of the U.S. – the Customs Trade Partnership Against Terrorism (C-TPAT) – has been established to close security gaps and protect American homeland. C-TPAT is a voluntary scheme that allows faster freight shipping across U.S. borders to businesses that meet strict approval criteria.

The European Union is moving in a similar direction. Member states will soon be required to implement the new Regulation (EC) No 648/2005, which is intended to tighten security around goods crossing international borders. It will require traders to provide customs authorities with advance information about any goods entering or leaving European Union territory. Member states are discussing the details of the new regulation, which contains several amendments to the existing Community Customs Code, and are expected to implement the new

rules across the EU before end-2006.

Improving security is imperative. But ensuring the integrity of goods from origin to destination is a tall order -- particularly since more than 90% of all cargo moves in containers and less than 2% of all containers are checked to verify the contents. The current procedure of sending unaccompanied and unmonitored containers around the world is far too lax and opens the door to disaster. Indeed, terrorists could use such containers to smuggle explosive,



More than 90% of all cargo moves in containers and less than 2% of all containers are checked to verify the contents

radioactive or biologically malignant materials – all of which could be all too easily disguised as part of legitimate shipments of foods, pharmaceuticals or even clothing. As a result, interest in container tracking has never been higher.

However, tracking containers requires a different approach than tracking vehicles, for example. Unlike

vehicles, containers usually have no built-in power supply that could run a tracking system. What's more, containers must take a good deal of wear and tear along the way. Typical handling means the containers are bashed on the way, and often stacked on top of one another when they arrive.

## Tracking security and efficiency

These rather extreme conditions present both a challenge and an opportunity. Several companies have announced systems suited to container tracking. One such company is Finland's Mobintelecom. Its SECURED By CargoTrax system integrates radio frequency identification (RFID) technology with GPS location and GPRS, GSM or GSM-via-satellite communications to provide an anywhere, anytime live tracking service. The service can report not just container location but also internal temperature, air pressure, speed and any door openings.

The system, which has already been tested in Germany, is just recently being actively deployed, according to Mobintelecom CEO Stephen Lowe. Potential customers include the food, pharmaceuticals and clothing sectors.

The solution can be pricey, depending on what customers require. A base price of 10 per day per container covers one standard SMS message a day and access to container positions via a Web site. But this cost is an insignificant sum, considering a container can transport cargo worth more than \$10 million, Lowe says.

In addition, there is also the possibility at some point of reduced insurance premiums – something Lowe says his firm is talking about with several insurance firms. “If you’re moving \$1 million worth of cargo and your insurance premium is a typical 5%-8% of the value, a 3%-5% discount on that would be a significant reduction,” he points out.

The use of such tracking systems can also shed light on the shipping process and what companies do with the containers entrusted to them, Lowe says. “Quite often, there is a lot of transferring of containers between different ships the customer doesn’t know about, or unspecified stops taking place.”

### Solutions in the pipeline

IBM is another company that has sharpened its focus on container tracking. It recently announced an initiative with Maersk Logistics to provide a tracking system based on what IBM terms a “Tamper-Resistant Embedded Controller.” This technology is designed to collect and communicate information on containers in real time, including GPS location data, temperature and humidity readings and door openings.

According to Derek Moore, a transport and logistics consultant at IBM Consulting Services, the system will have sufficient intelligence for around eight different sensors to be fitted to it. Following field tests, this system is slated to be commercially available during 2006.

One reason behind the increased interest is security, Moore says. “Since 9/11, there’s been an obvious public interest in raising the bar on containers being disguised and used for the movement of weapons of mass destruction. The jury is currently out on just where the public will set that bar.”

Another driver is increased demand for supply-chain efficiency. “As you enhance visibility in the supply chain, there’s a payoff in terms of reducing

inventory,” Moore explains. “The more you can tie down where something is in the pipeline, the greater your ability to refine your safety stock calculations and manage the supply chain more tightly.”

Moore also agrees with Lowe that a further benefit to container tracking is the insight it provides companies into how their shipping partners operate – visibility that could result in much better service for their customers. “Shipping lines are forced to consider asset utilization, rather than time-dependence, so they will load vessels to maximize utilization,” he explains. “There’s a gap there ripe for closing.”

### Sensible solutions

However, not all companies require the ability to track containers in real time at sea. This segment of users demands continual monitoring but only requires reporting when the container reaches port. Systems tailored to meet these needs can report on deep-sea movements only historically, rather than in real time. Moreover, they avoid the need for potentially expensive satellite communications by relying on standard GSM or GPRS networks to send data about the sea journey as a container arrives within the coverage area.

Oxloc Ltd. – a U.K.-based provider of battery-powered data collection products to provide asset management solutions – focuses on serving the sector of the market where there is no or limited access to a power source. According to the company, using autonomous battery-powered GPS/GSM hardware and Web-based data access means assets can be monitored for location and condition for up to three years without the need to replace or recharge the battery.

Often, this approach is all many customers need, according to Anthony Godec, Oxloc sales and marketing manager. “Once your container is on a ship, it’s generally well-defined how long it will take and just where it is,” he

says. “If you want visibility on the ocean, you can look at satellite communications but the trade-off is the cost. It’s about three to four times the cost of GSM.”

Another company specialized in GSM/GPRS-based tracking systems is Ireland’s Celtrak. It offers two solutions: one features location information only; the other adds regular temperature readings to the capabilities mix.

Celtrak’s solutions are battery-powered, but the company is also investigating the use of solar power to top up battery life, notes Mike McEnnis, Celtrak international business development manager. “Solar power can be an issue, given how containers are typically stacked. But you can still trickle-charge a battery when the container is in light, though you’ve got to be careful where you place the solar panels.”

Like his peers, McEnnis is convinced the market for container tracking is poised to growth. He also believes that many automotive telematics firms will position themselves to be a part of it, if only to offset the gradual decline in the aftermarket for traditional automotive telematics systems.

“If you look at what’s happening in automotive telematics, things are gradually moving toward the vehicle OEMs, who are increasingly fitting telematics systems of their own,” McEnnis explains.

“For telematics companies, one of the options will be container tracking systems, which don’t lend themselves so easily to OE fitment.” In the next five to 10 years, he says, the advent of road tolling and pay-as-you-drive schemes may lead to more standardized automotive systems and a real danger for aftermarket suppliers. “This is an ideal opportunity for them (telematics companies) to look elsewhere.” ■

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# MI Shows Navigation Users Where to Go



Places to go and things to do. Navigation owners are demanding a greater depth of information tailored to their individual needs. **Dominic Tonner**, CEO, MI International, discusses the requirement for better POIs

## AS THE SATELLITE NAVIGATION

industry grows, so too does demand for points of interest (POI) data to be integrated in the digital map. Whether the satellite navigation systems are fitted in vehicles or accessible via mobile phones, personal navigation assistants (PNAs) or other portable devices, users can search the POI directory for a business or service near their current location, along the route, or at their destination, then reach it, guided by the navigation system. POIs like restaurants, hotels, shops and leisure facilities are now an integral part of the market leaders' offerings. Other popular requests include cinemas and nightclubs, as well as practical POIs, such as banks, ATMs and gas stations.

Typically, POIs are provided by satellite navigation suppliers as standard or as additional business or lifestyle packages that can be purchased as accessories. For instance, a business POI package might include hotels, restaurants, bars, gas stations, garages, major shops and a directory of the leading companies in the country concerned. A lifestyle package, on the other hand, would concentrate not only on eating, drinking and accommodation, but would also feature a comprehensive directory of shops, sports and leisure activities and perhaps places to visit like zoos, museums and amusement parks.

In a business package, the accommodation category might include hotels and motels; in a leisure package, it would also include guest houses/bed & breakfasts, youth hostels, camping grounds and caravan parks. POI packages could be even more tailored to the specific needs of the user. A transport

company with a fleet of trucks, for example, may want a limited number of POIs such as gas stations, weigh stations and truck stops as well as customer delivery details. If the POIs are aggregated into sufficiently detailed categories, packages can be designed to suit various industry sectors.

Even in the short time that POIs have been widely available, we have begun to detect changes in demand. Analysis of the most frequently requested POIs highlights the users' appetite for information and the increasing sophistication of the technology. While shops, restaurants, cafes and hotels remain the top searches, it is changing as users realize the opportunities available to them. What we are starting to see is a demand for greater depth of information tailored to the users' requirements.

Many sources of data can be brought together to satisfy this demand. But moving forward, POI data quality is an issue of vital importance if the market is to continue to grow. Put simply, POI data has to be as up-to-date, accurate and complete as possible.

Users will be unhappy if they are guided to a shop that has closed down, or forced to pass two or three gas stations on the way to the one highlighted by the satellite navigation system as the "nearest"!

To achieve this, it is necessary to combine more than one source of data. Data from many suppliers originates from official companies' registration sources and consequently contains mostly headquarters addresses. While this is essential information for the business user, it omits much of the local

branch and site data that is required for satellite navigation systems end users. Therefore, it must be combined with other data sources, such as yellow pages or other business directories, which are rich in local information. Further sources may be required for depth of data such as restaurant type, star rating or opening hours.

Bringing all this data together to form a coherent whole is no easy task. It requires a high degree of automation as well as manual intervention by people who are familiar with the culture and business brands within each country. Data from differing sources is, invariably, available in different formats and to different levels of detail and, as there are potentially multiple suppliers per country, there are many records to be de-duplicated and standardized. Aggregating data from many sources is a complex and time-consuming task and, multiplied across many countries, is not one that satellite navigation suppliers would, or could, readily undertake cost effectively in-house.

Only after it has been through rigorous processing is the data ready to be released to the customer. POIs need to be available categorized in local languages as well as geocoded to the required digital mapping.

Moreover, regular updates are essential to guarantee the quality of the data. However, because of the constantly changing nature of business data, it is impossible to achieve 100% accuracy. According to some of the world's leading suppliers of business data, a business fails every four minutes, a new business starts up every 15 minutes, a



Shops, restaurants, cafes and hotels remain the top searches, but there's also a growing demand for personalization.

company name changes every 60 seconds and a company address changes every 15 seconds.

By the time the POI data has been through the aggregation process and is delivered to the satellite navigation service provider it could be two or three months old. By the time it reaches the end user in the form of a CD/DVD, it will be older still.

Communications technology is constantly improving, and there are now systems on the market making satellite navigation data, including POIs, available "offboard." The data is not stored in any electronic format on the satellite navigation device itself, but is accessed in real time directly from a remote server, where the mapping and POI databases can be continually updated. The data will then be as up to date as it possibly can be.

Offboard navigation systems are not restricted by the capacity issues associated with the CDs, DVDs and memory cards used by most of the systems currently available. This means the systems can carry not only a greater number of POIs, but also more in-depth information on each POI, including graphical images.

Users would then be able to see a photograph of the hotel, restaurant or other POI for which they are searching.

In a golf package for example, the user could see photographs or a graphical representation of the course layout. Offboard systems - or a combination of off- and onboard systems - could also facilitate greater personalization of POI data. Server-based preferences could allow the user to specify the type of POI they wish to see, such as certain grades of hotel or restaurant cuisines, or the server could automatically display types of POI based on the user's historical POI choices.

The ability to display graphics and a greater depth of information then presents opportunities for businesses to advertise via the satellite navigation medium, perhaps attaching to their directory entry their corporate logo, latest special offer or other advertising message. They may also be able to pay for a priority listing that puts their entry ahead of their competition in the same area. The issue, yet to be resolved, is who benefits from the advertising revenue? Suppliers of POIs can collect the advertising data but cannot force the satellite navigation service provider to display it on its system!

The geographical areas for which POIs are available will follow closely the progress of digital mapping. POI data is readily available from MI International for Western Europe and North America. As

the digital map makers continue to plot more of the world, particularly Eastern Europe and Asia, more complete and accurate POIs for those areas will become available shortly thereafter, depending on demand from the marketplace.

However, it may not be a simple matter of replicating the same POI data aggregation approach in every territory. China, for example, presents a new set of challenges. Relatively little of China has been digitally mapped, mainly due to strict government control over map source data, and the explosion in new builds, new roads and new infrastructure in general makes it difficult to acquire up-to-date POIs. Moreover, the fact that a number of different regional dialects could influence spellings and pronunciation, as well as multiple character sets, must also be factored in.

To conclude, advances in technology coupled with increasingly sophisticated data aggregation techniques will make it possible to bring together millions of pieces of data from sources all over the world to form POI databases unrivalled in their accuracy, completeness and depth. Satellite navigation marketers will grasp the opportunity to develop their own bespoke POI solutions to extend their brands, differentiate their products and ensure greater added value for the customer. ■

# Cheaper Products Force RBS to Rethink Category 5 Position



**Steve Rogerson** looks at how a new wave of cheaper vehicle tracking systems is forcing Thatcham and the insurance industry to rethink its views on standards

**RBS INSURANCE HAS BEEN FORCED** to rethink its attitude to Thatcham Category 5 (Cat 5) vehicle tracking systems, just a month after shaking the industry with a letter distancing itself from the standard for most passenger cars.

The catalyst for this was the launch of lower-cost systems, such as the Trackit from BT, which open the market for after-theft recovery systems aimed at cheaper vehicles. Such systems forced Thatcham, backed by the insurance industry, to put on ice its plans for Cat 6 aimed at the bottom end of the market.

Cat 5 was launched in 2004 for after-theft tracking and recovery systems. These first appeared at a high price, which meant they were only likely to be accepted by users of high-value vehicles.

This prompted Dave Meader, a motor technical underwriter at RBS, to send a letter in October to all motor manufacturers distancing itself from Cat 5. The letter said the firm would still accept Thatcham Q-class across all brands, but did “not mandate a Category 5 device on any vehicle, nor is it likely to”.

RBS Insurance “believes that Cat 5 is more suitable to niche high-value commercial loads and does not fit with our passenger car/value for money offerings. Views have been expressed that the insurance industry and Thatcham support Cat 5 as the future of vehicle tracking in the UK. This does not represent the views of RBS Insurance.”

Many industry observers claim this came about because RBS’s Tracker base product could not meet Cat 5 without costly enhancement. They further allege

that RBS was pushing the lighter Cat 6 so its own product would meet insurance industry standards. But Meader from RBS said the reason they wanted a new category was they felt Cat 5 was too expensive and had not been promoted very well. “A lot of people didn’t really understand Cat 5,” he said. “And we wanted something cheaper.”

Starting prices for Tracker range from just under £200 to nearly £500 without installation.

In November, Meader admitted the situation had changed. “Since that letter has gone out, there has been a lot of to-ing and fro-ing between Thatcham and Tracker.” He said when the letter went out, all Cat 5 systems were in the £500 to £600 bracket and above, and he felt this put them in line for £75,000 cars and commercial vehicles. “My view was that Cat 5 was not viable for most of our customers,” he said. “The prices are now coming down, so our view may change.”

For example, BT’s Trackit has a starting price under £300. The system was certified to Cat 5, which BT called “the highest standard in vehicle security” and was “fully endorsed by leading insurance companies”.

Other insurers have defended Cat 5. A spokesperson at insurance company Zurich called Cat 5 “acceptable”, but said the company did not specify a specific device for standard vehicles but did call for certain levels of security for



**BT Trackit opens the market for Cat 5**

some higher-value vehicles. She said: “Depending on the type of vehicle, we may ask that they are fitted with tracking devices, but other similar levels of security may also be considered acceptable.”

Bill Pownell, motor risk manager at Norwich Union, added:

“People thought that Cat 5’s cost was prohibitive but that has been addressed with a couple of devices around £300 and £350.”

As a result, there is doubt over Cat 6, according to Andrew Miller, director of research at Thatcham: “Cat 6 was announced in July aimed at lower value vehicles, but its future is under discussion. We have no green light from the insurance industry to continue with it.”

Pownell shares his doubts. “We had two meetings with Thatcham on Cat 6. There was a consensus that Cat 6 didn’t bring anything new to the table and it would be better to develop Cat 5.”

This is bad news for fleets. Cat 5 only allows tracking and the box must not affect other systems or perform other functions, but many fleets have already installed telematics units to which tracking could be added. Miller admitted that Cat 5 was not aimed at fleets, but said it wasn’t out of the running yet. ■

**Steve Rogerson is a freelance technology journalist based in Nottingham, UK.**

# Pinpointing Telematics Growth Opportunities Across Asia



Asia is in the fast lane when it comes to telematics up-take, but **Siok Hui Tan** reveals not all countries are moving at the speed

## Asia's Ambitious Telematics Roadmap

While telematics is gaining popularity in Europe and the U.S., market development in Asia is fragmented. Developed countries such as Korea, Taiwan and Japan have telematics success stories, but elsewhere in Asia, telematics is struggling to develop from its nascent stage.

Complete telematics systems, where the technology is used to improve customer relations and satisfaction, such as Volvo Truck's Dynafleet and GM's Onstar, are rare in most Asian countries. The majority of Asian consumers put priority on safety and security. The extra comforts and advantages telematics offer are regarded as nice to have, but not necessary.

Stellar growth in Asia is stalled by a number of factors, including low average purchasing power, a lack of awareness of telematics systems and high prices for equipment.

Against this backdrop, the two biggest markets in Asia – China and India – which account for a combined vehicle sales of 6.5 million, each have a telematics penetration rate of less than 1%.



Many vendors have so far responded with partial telematics applications such as GPS tracking, anti-theft and navigation solutions. However, market participants need to identify and meet real, profound consumer needs so that telematics will be valued as a “must have” rather than a “nice to have” feature.

## Taiwan's active telematics push

In Taiwan, the distributor of Nissan vehicles, Yulon Motor Company is the pioneer in introducing telematics solutions. Yulon's TOBE Telematics Service (TOBE) is standard in most Nissan marques. Following Yulon's lead, competitors entered the market in 2003 offering partial telematics services such as GPS, navigation, auto PC and auto TV solutions in both OE and aftermarket.

In 2004, Frost & Sullivan estimated telematics sales were a total of 59,000 units, or 14% penetration, on new vehicle sales. Frost & Sullivan expects market revenues to reach \$50 million by 2010.

The Industrial Technology Research Institute (ITRI) was instrumental in developing a car PC telematics solution known as “VIA Eden Telematics” together with VIA Technologies Inc. at the end of 2003. Other more recent developments are expected to foster market development. Chief among these are a chain of mergers and acquisitions, including Antek Semiconductor Corp. (part of Yulon Group) and Lite-on Semiconductor Corp., as well as the acquisition of BCOM Electronics Inc. by UMC.

One of the major challenges is Taiwan's incomplete telematics infrastructure. Essential support services such as response centers, wireless communication network, content providers and integrators are still in the development stage.

To plug the gaps, the Taiwanese government has been pushing for the development of the Intelligent Transportation System (ITS). The Institute of Transportation (IOT) in 2001 unveiled a master plan to govern ITS development and deployment. This ambitious Master Plan includes other projects such as the M-Taiwan Program and Integrated Beyond 3rd Generation (iBG3), a government-funded project to harness technology and telecoms to improve telematics services.

Navigation is the most popular telematics feature in Taiwan. With market value worth \$17 million in 2004, the aftermarket accounted for 82% of total sales.

Companies in this space include Navtor Technology, a Taiwan-based company that designed the first standard ICNS equipment for Toyota and Mazda in Taiwan. But other Taiwanese companies are not so fortunate. Foreign competitors such as Panasonic and Xanavi dominate the market, and the strong tie-up between foreign system integrators and auto makers sets yet another barrier to entry for homegrown telematics providers.

To complicate matters, homegrown Taiwanese firms must also operate with

limited capital. They own little technology and IP and often lack skilled staff.

If Taiwanese companies are to prosper, they must partner with other players in the value chain, including government bodies and organizations. The telematics market, like the consumer electronics market, is expected to experience high demand for ever-more sophisticated technology solutions at ever-lower prices. Companies that can't keep pace with this change are likely to be crushed by it.

### South Korea's telecoms focus

Traffic congestion in major Korean metropolitan cities such as Seoul and Busan is a major problem – and an opportunity for telematics growth.

A two-hour drive to work is the norm for most city residents. Navigation could ease the problem by allowing consumers to choose an optimal route to work.

Indeed, improved traffic guidance and navigation are perceived as the key customer benefits these systems can

offer. What's more, traffic information coupled with consumer demand for anywhere, anytime Internet connectivity are likely to significantly increase demand.

Proof of this is in the numbers. As of January 2005, high-speed Internet subscribers had almost reached 12 million. For this reason, South Korea has chosen an approach focused on offering telematics solutions as an extension of the country's mobile communication network.

Daewoo Motors got a clear head start in this market. It introduced Dreamnet, South Korea's first OE market telematics service, in November 2001. In 2002, SK Corp. and Samsung Fire and Marine followed with the aftermarket services Entrac and Anynet.

In addition, the market supports six other providers: MOZEN (Hyundai/Kia Motor), INS-300 (Samsung Motors) and Ever-way (Ssangyong Motors) in OE market, and Nate Drive (SKT), K-Ways (KTF) and ez-Drive (LG Telecom) in the aftermarket. Mobile operators, including SK Telecom, LG Telecom and KTF, have proven their strength in the aftermarket.

MOZEN is determined to take over as number one in the OE market following Daewoo Motors' withdrawal from the telematics business.

Overall, South Korea's system and service market revenues were slated to reach \$400 million in 2004. The system market accounted for 75% of the total.

The Korea Electronics and Telecommunications Research Institute (ETRI) forecasts market revenue to reach \$2.9 billion by 2007. ETRI also expects strong revenue growth by 2007.

The South Korea government is certainly laying a groundwork that will enable healthy growth in the telematics market, creating the Telematics Information Center (TELIC) and the

Jeju Island Telematics Model City (2004-2007).

TELIC – which will provide traffic and weather reports - is expected to commence operation in 2007. The Jeju Telematics project calls for telematics systems to be installed in rental cars to provide tourists there with travel and transport information, emergency rescue, weather and entertainment functions. The project is expected to make South Korea the benchmark for telematics projects worldwide.

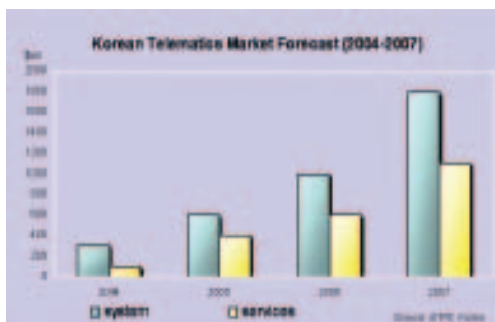
However, even these ambitious projects could be stalled by a lack of cooperation and standardization between the various industry participants and interoperability between the competing systems.

The Korean Telematics Business Association (KOTBA), the affiliate nonprofit organization under the Korean Ministry of Information and Communication (MIC), was formed in 2003 to solve this problem and standardize domestic telematics technologies and services.

### Japan's good example

Telematics is a way of life in Japan, where the first navigation systems made their debut some 20 years ago. The first navigation solution - based on gyros and dead-reckoning - was introduced by Honda in 1981. It was followed by a GPS-based navigation system in 1990. The market really took off in 1993 when Sony and Pioneer adopted a moderate pricing strategy to penetrate the market. As a result, the market grew almost five-fold from 600,000 units in 1996 to 2.83 million units in 2003.

Today statistics gathered by the Japan GPS Council (JGPSC) show in-car navigation systems account for some 75% of Japan's GPS application market. According to Japan Electronics and Information Technology Industries Association, navigation systems have achieved double-digit growth for the past eight consecutive years. The Japan



**The Jeju Island Telematics project: The first phase, involving 1,000 devices, kicked off on in April 2005.**

Automobile Research Institute estimates market penetration will hit 40%, or approximately 34.3 million units, by early 2008.

Digital map availability is the number one barrier to telematics growth across Asia. Japan, however, cleverly avoided this problem. The Ministry of Construction established the Japan Digital Road Map Association (JDRMA) to standardize the map format and share the high cost of updates among its 80 industry members. As a result, the availability of comprehensive digital road-map information has played a key role in the success of in-car navigation systems and contributed to the market's rapid growth.

Today the major players in Japan are primarily homegrown global brands including Sony, Pioneer, Alpine, Clarion, Panasonic, Fujitsu-Ten and Xanavi. In 2002, the market also saw the introduction of path-breaking new systems including G-Book (Toyota), CARWING (Nissan), Internavi Premium (Honda) and Air Navi (Pioneer). G-Book and CARWING cater to the OE market; Air Navi is available in the aftermarket segment.

### China's untapped potential

Predictably, China is expected to be the most exciting and competitive market place for telematics solutions and services

In 2004, GPS tracking and navigation were the only two telematics applications available; they had a combined market volume of 158,600 units. The market penetration rate in China was a low 5.7%, indicating a huge untapped opportunity. Indeed, the market is expected to grow to 765,600 units by 2007.

The market for GPS and navigation services is dominated by foreign companies. GPS is only offered in the aftermarket segment, where Huaqiang and Cyber-web are the leading domestic

competitors.

In the OE market, navigation systems are a standard feature in Toyota Vios, Toyota Corolla and Nissan Bluebird. These systems are supplied by Japanese system integrators. Other Japanese competitors include Fujitsu-Ten and Kenwood. Unistrong Beijing (a distributor of Garmin products) is one of the leading domestic competitors in aftermarket. Other homegrown competitors including Shenzhen Maxwell Technology and CityOnMap are in the early market-entry phase.

The popularity of Japanese brands has historical roots. Since the market reform in the early 80s, Chinese consumers have been exposed to Japanese brands in home electronics. Japanese brands enjoy mindshare and have gained a reputation for quality. While Chinese consumers have no loyalty to any particular Japanese brand, they are nonetheless more inclined to purchase Japanese brands in general.

Similar to the situation in other Asian countries, limited service network coverage across the provinces hampers telematics take-off. Moreover, a lack of connectivity between wireless networks means consumers cannot access services seamlessly as they travel from one city to another.

Against this backdrop, Frost & Sullivan does not expect telematics to gain traction in the OE market until 2008, when the country is likely to have developed a reliable and uniform service platform.

Moreover, Frost & Sullivan predicts telematics sales will reach 626,400 units by 2008. By this time the OE market will account for 23% of the total volume. Beijing Olympics 2008 and Shanghai Expo 2010 – and a subsequent rise in demand for ITS to manage the increase in traffic – will result in massive market



**Toyota Vios: China's first vehicle equipped with a navigation system**

growth.

In the medium term, demand for an in-car system is expected to be limited and to come from major cities such as Beijing, Shanghai and Guangzhou, where consumers have a larger

disposable income than their rural neighbors. In addition, the explosion in traffic congestion will result in a greater demand for telematics systems and services. Still, the widespread use of telematics will largely depend on government support and increased cooperation between Chinese mobile network operators and service providers to improve wireless services.

Again, brands based in Japan and South Korea are sure to take the lead in telematics innovation. However, low costs will make Taiwan and China leading locations for the sourcing and production of system components.

Overall, China is poised to be the growth market for telematics. Multinational companies including Delphi, Visteon, Denso and Fujitsu-Ten sense this opportunity and have established close ties with car makers. They enjoy an important first-mover advantage that's hard to follow. ■

This article was authored by Siok Hui Tan, Senior Research Analyst with the Automotive & Transportation Division at Frost & Sullivan Asia Pacific, based in Kuala Lumpur. Frost & Sullivan, a global growth consulting company, has been partnering with clients to support the development of innovative strategies for more than 40 years. The company serves an extensive clientele that includes Global 1000 companies, emerging companies and the investment community by providing comprehensive industry coverage that reflects a unique global perspective and combines ongoing analysis of markets, technologies, econometrics and demographics.

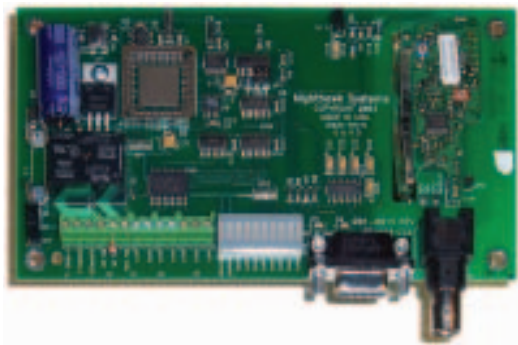
# M2M News in Brief

## Washington DOT wirelessly control road signs

The Washington State Department of Transportation has chosen a unit from Systems to wirelessly activate highway advisory signs on its roadways.

The PT-1000 remote control boards will be used to activate flashing roadside signs and associated radio transmissions that alert motorists to upcoming road hazards and other public safety situations. The system can also be used to display related messages on signs, and is used by several state transportation departments, including those in Colorado and Pennsylvania.

“Our units provide the most economical and reliable way for remote activation of these signs, and they have been counting on the performance of our products for years now,” commented H. Douglas Saathoff, Nighthawk’s CEO.



Nighthawk products are used in a number of industries, including electric utilities, traffic control, computer systems, commercial lighting and irrigation.

## Ember ships EmberZNet 2.0 ZigBee software

Ember Corporation, a provider of standards-based wireless mesh networking semi-conductors and software, has begun shipping its EmberZNet 2.0 ZigBee networking software, a second-generation protocol stack for self-organizing, self-healing wireless networks.

The company says the stack provides all the benefits inherent in the ZigBee specification, including high reliability, security, interoperability, low cost, long battery life and integrated network management.

For example, EmberZNet 2.0 supports application profiles for home controls as well as user-defined network applications. It also features an Ember transport layer to provide more reliable wireless communications between nodes and enable distributed bindings.

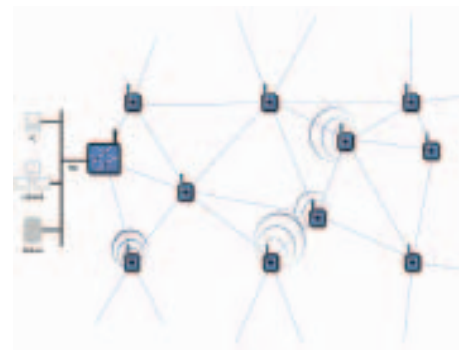
Customers can also accelerate EmberZNet application development using Ember WorkBench, an Eclipse-based integrated development environment. Ember WorkBench enables developers to develop and debug applications across an entire network, as opposed to debugging each node on the network as required by competitive development tools.

“The biggest challenge of deploying wireless sensing and control devices has been installing the network to connect them,” said Skip Ashton, Ember’s vice president of engineering. “EmberZNet was designed from the ground up to remove this barrier, shielding developers from the complexities of the networking layer.”

## Dust Networks introduces new smart solution for industrial monitoring and building automation applications

Dust Networks, a provider of enterprise-class, low-power wireless mesh networking systems, has introduced SmartMesh-XR, a low-power wireless networking product it claims delivers at least 99.9 percent end-to-end data reliability in real-world industrial and building environments.

The company estimates that SmartMesh-XR users can reduce energy



and operational costs by as much as 20%. The product also includes a host of new features including SmartMesh Vital Signs, a dashboard for monitoring network health and providing alerts when network reliability is at risk.

SmartMesh-XR uses a synchronized communication protocol to enable extremely deep duty-cycling and unmatched power efficiency. SmartMesh nodes consume as little as 25 $\mu$ A of current and even heavily-burdened routing nodes, handling traffic from dozens of neighbors, typically consume less than 200 $\mu$ A – over one hundred times less than other mesh networking solutions, the company says.

**Survey reveals growing industry interest in wireless sensor networks**

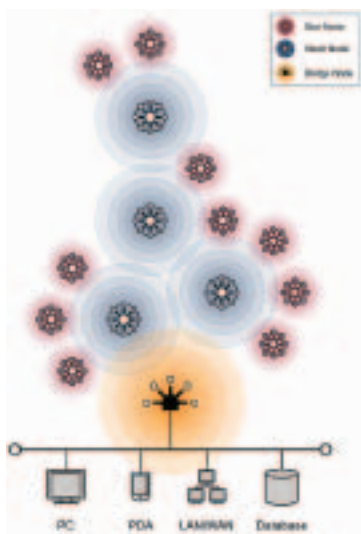
A recent online survey of end users and system integrators shows strong interest in wireless sensor networking technologies for industrial automation. The survey was conducted by Sensicast Systems and B&B Electronics, which manufacture wireless sensor and data communication products, respectively.

In the survey, more than half of all respondents (53%) said they are considering deploying a wireless sensor network in the next 12 months.

This is a 45% increase on those who responded positively in the survey conducted in January 2005.

Most respondents (73%) said that they are researching wireless sensors for use in industrial monitoring settings, up from 64% percent in the previous survey. Concern about the reliability of wireless sensor networks in such rugged environments was the primary reason respondents have not already deployed them. This factor was cited by 33% of those surveyed.

“Our latest survey clearly reveals the industrial sector’s growing interest in wireless sensor networks and monitoring capabilities that work well with challenging RF environments,” said Paul Sereiko, CEO of Sensicast.



The applications chosen by respondents as the most appropriate for wireless sensor networks included process, environmental and machine monitoring. Respondents indicated a preference for 2.4 GHz, with twice as many respondents selecting that frequency over 900 MHz applications in both surveys.

“This has been a year of learning and investment,” observed Don Wiecek, President of B&B Electronics. “We’ve deployed wireless sensing products in field trials and gained knowledge about the technology and how to implement it in a product. Our field experience has proven the robustness of the technology. Now the survey results show that our customers are increasingly eager to use wireless sensing in their projects.”

**Siemens introduces first wireless building automation system**

Siemens Building Technologies, Inc. has taken the wraps off what it says is the industry’s first wireless building automation system.

The APOGEE wireless field-level network is based on proven mesh topology and provides developers, owners and managers flexibility and better control of heating, ventilation and air-conditioning (HVAC) systems.

The company says its system ensures network integrity by creating multiple redundant paths of communication and the mesh topology field-level network is inherently self-healing.

As a result, users won’t have to worry about losing communication with control devices across the building automation system, according to Jay Hendrix, Siemens manager responsible for Wireless Solutions. “Simply put, the network can’t be compromised because the signal is automatically able to circumvent obstructions and find its target.”

**Patent issued for breakthrough in wireless tracking**

Q-Track Corporation says it has received a patent, from the U.S. Patent and Trademark Office, on its new Near Field Electromagnetic Ranging (NFER) technology, a low-frequency, wireless indoor tracking solution.

The NFER technology takes advantage of a simple rule of physics that radio waves consist of two types of energy: electric and magnetic. As early as 1889 the famous physicist, Heinrich Hertz, observed peculiarities between electric and magnetic energy in radio waves. NFER technology exploits these peculiarities to allow a highly accurate way of performing indoor tracking.

Although NFER technology has



numerous potential applications, Q-Track is pursuing real time locating capability for supply chain management as its first commercial product.

Because NFER technology uses low frequencies, it is able to operate in locations such as warehouses where existing wireless tracking technologies cannot effectively function. Tracking high value assets in hospitals is another application for NFER technology that Q-Track has targeted.

### New report outlines M2M opportunities for cellular carriers

While machines that could use intelligent peer-based communication are said to far outnumber the world's human cellular-user population, financial markets still judge cellular carriers by revenue-per-user.

Typical monthly revenue for a mobile phone service subscriber might be US\$50 or more; the equivalent M2M charge might be only \$10.

How can carriers present a business case to the markets? ABI Research's Cellular Machine to Machine (M2M) Networks study dissects how communications networks and technologies are intersecting with software and systems integration to create new business cases across the globe.

One strategy, says Erik Michielsen, ABI Research's director of RFID & ubiquitous networks, is to own a gateway. "In the UK, Orange has built its foundation by owning both a gateway and the complementary secure connection to manage customers' transmissions. By combining the gateway, bandwidth, and commercially branded services, Orange can offer 'The Orange M2M solution'."

A second strategy available to carriers is to sell raw bandwidth to MVNOs. The M2M business structure represents a business opportunity for mobile operators and Mobile Virtual Network Operators to cooperate.

ABI Research wireless principal analyst, Ken Hyers, says: "By securing preferred pricing for pooled data transport from mobile operators, M2M MVNOs can help businesses reduce complexities, reduce the costs of managing extensive M2M data networks and improve efficiencies for these businesses. This creates a win-win-win for businesses, mobile operators, and MVNOs."

Michielsen believes that if more carriers opt for an Orange-style model, the world will change for developers. "You won't see many 'mom-and-pop' developers counting a Verizon or a Sprint or AT&T among their customers," he says. "But if carriers are shy of those big-company commitments, that will leave more room for MVNO aggregators, creating niche development opportunities that complement larger M2M business."



### Washing machine maker offers new laundry status capabilities

The manufacturer of Speed Queen washing machines is now offering USA Technologies' e-Suds laundry status capabilities, for new and existing laundry equipment.

The e-Suds System, developed by USA Technologies, enables users to go online to see if there are washers or dryers available in the laundry room and be notified via email to their computer, PDA or cell phone when the cycles are complete.

The capabilities are proving especially popular on college campuses, where the system interfaces with credit card and other paperless payment systems, allowing students to use their student ID to pay for their laundry services.

Speed Queen and Huebsch commercial laundry equipment, both manufactured by Alliance Laundry Systems, are both widely used in college residence hall laundry rooms throughout North America. The tie-up with USA Technologies allows Alliance to expand its online laundry services, currently available only on its NetMaster models, to all of its new and existing lines.

### Pivotal partnership develops contactless payment to target the micro-payments segment

ViVOtech, a supplier of contactless payment solutions, and USA Technologies, a company specialized in the networking of wireless non-cash transactions for financial services and energy management, have teamed up to deliver the first radio frequency cashless credit card transaction technology to the micro-payments segment.

To this end, the companies have integrated USA's e-Port cashless transaction technology with ViVOtech's ViVOpay contactless readers and software services.

The integrated technology platform enables vending machines to accept contactless payments, allowing vending operators to increase the average dollar amount spent per machine at peak hours, while reducing cash handling costs. Earlier this month, vending machines in Atlanta and New York City were equipped with the companies' integrated solutions.

The contactless credit card initiative is targeting the micro-payments segment



that is defined by transactions of \$5.00 dollars or less. Analysts estimate the U.S. market for purchases valued at \$5 or less accounted for \$1.32 trillion in consumer spending in 2003, representing more than 400 billion transactions.

# M2M Transforms Business Decision-Making



The phenomenal growth and awareness of the term M2M – machine-to-machine, machine-to-man, machine-to-mobile communication – coupled with the benefits to business of wireless automation and the increased need for monitoring and control, have resulted in an increasing sophistication of this technology in the marketplace.

**Lisa Wilkinson**, Business Development Director of t-mac Technologies Ltd, the company behind the creation and development of the M2M remote Internet monitoring device t-mac, gives an overview of the benefits and capabilities of the new generation of M2M technology

## THE RISE OF M2M TECHNOLOGY IS

an industry response to increasing business demand for technology to assist with and even replace the time-intensive task of monitoring assets and controlling equipment.

Indeed, M2M is a technology that has applications in a broad range of industry sectors. In the building and facilities management industry, for example, M2M can be used for building temperature control and to assist with the management of assets, such as HVAC equipment. In the industrial sector, it can be used for individual machine condition monitoring and control.

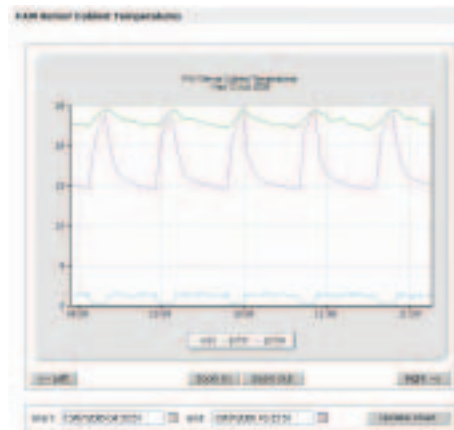
M2M can also be used for security and tracking. Already many Internet-enabled monitoring systems have the ability to track individuals using RFID and track movable assets using GPS. The opportunities are endless; flexibility is the key.

These communications capabilities also usher in a new generation of M2M products and services offering always-on connection. The advance of GPRS makes it possible for M2M systems to automatically upload collected data to a central server, thus removing the need for human interaction and the old-style “dial-in” method of data access. Users can view data from many devices in one place. There is no need for additional and expensive PC software packages, because users simply take advantage of the readily available Internet.

An example of this new breed of M2M

devices is t-mac, which can monitor and report on any variable that can be collected electronically, such as temperature, pressure, volume, energy and flow.

Moreover, the t-mac device allows remote automation of machines and assets, freeing personnel from the need to be on-site to turn a machine on or off or to find out how a machine or asset is running. Staff can do this remotely through any Internet connection. For remote control requirements, t-mac can be pre-set to automatically turn on air conditioning systems or remotely shut-down machinery should temperature levels become critical for example. Via the Web page, users can also carry out remote diagnostics on the equipment, department or site and request, through t-mac, to trigger a control application.



The t-mac device can monitor and report on any variable that can be collected electronically, such as temperature, pressure energy and flow

While a data logging and reporting device is not a new concept, it is t-mac's ability to automatically transmit remotely monitored and controlled information and allow users to access and easily analyze data via any Internet enabled PC at any time, that is.

## Making Data Count

T-mac remote monitoring technology operates by being integrated within or installed close to critical assets and equipment collecting real-time status data on an asset, environmental conditions or power outages. This information is gathered via analog or digital inputs and transmitted automatically over the Internet via a GPRS wireless network connection, Ethernet or telephone line at regular intervals to a central server. Live and historic information can then be accessed via any Internet connection.

Initially the user sets operational and conditional parameters on the M2M device, relating to the functional operations of a piece of equipment. Thereafter should any parameter fluctuate outside the pre-determined/desired limits set by the user, the device detects these deviations and acts as an early warning alert, sending accurate, detailed information about these fluctuations and requesting action to be taken.

The key benefit is that users will know the true nature of a fault before arriving on-site. This significantly reduces unnecessary call-outs and asso-

ciated costs. One piece of recent research found that one in eight respondents put their annual loss of production due to equipment down time at over £250,000 – much of which could have been avoided through an intelligent early warning system.

Alert notifications can be sent via SMS or email in human language, enabling personnel to respond promptly - on many occasions in advance of the fault potentially becoming a costly hazard. Precise status information allows appropriate response actions to be taken more rapidly and effectively, ensuring that the optimum performance is gained from all assets.

Internet-enabled M2M devices like t-mac enable users to access data through the Internet. Users can log on to a central server to view live and historic data relating to individual machines or multiple sites. Using a dedicated and secure Web page, the user can view asset information gathered by many t-mac devices in one central place.

Users can also view up-to-date information on equipment conditions, associated wastage, energy and asset inefficiencies and costs in the form of interactive graphs, tables and gauges. They can then determine and measure where and how much energy is being used over a specific period and compare it to annual targets.

Armed with this understanding users can

identify opportunities to shave a significant amount from their running costs. Lowering a typical-duty 22kw fan from 50 Hz to 40 Hz can reap average savings up to a whopping £8,000 per year.

In addition, the t-mac system is listed on the Carbon Trusts Energy Technology List for Automatic Monitoring and Targeting, which means that by installing a t-mac users benefit from 100% capital allowance on their first year of expenditure. The basic t-mac system starts at less than £2,000.

### Choosing devices

M2M devices can also help prove that sites are both energy efficient and managed responsibly, and even assist with undertaking energy audits to help identify energy-saving opportunities.

According to a recent study from the Energy Saving Trust, monitoring energy consumption has an average payback of less than six months and an average return on investment (ROI) of 200%. M2M devices can monitor and account for the energy consumption of equipment. They can measure electricity and oil consumed within the building; measure heating/cooling energy supplied to the building; monitor run efficiency of the water heater; measure the run-hours of equipment that operates at a constant load; and log meter and sub-meter total

gas.

There are a number of systems in the marketplace, with varying specification and installation costs. Demand is growing for products using Bluetooth, Zigbee and other wireless protocol.

Remote monitoring systems, such as t-mac, which communicate

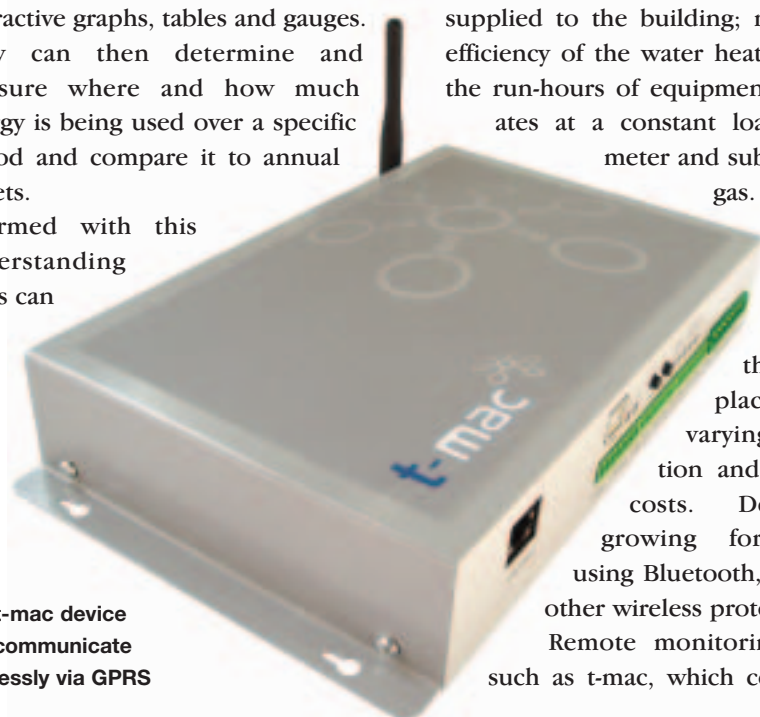
wirelessly via GPRS networks, require no connection to a fixed-line network and exist completely remote from existing IT infrastructure.

Users looking to purchase this kind of equipment should pay particular attention to the data logging and historical record facilities of the equipment as well as the scalability of the system. Ask yourself: Can it grow to meet your needs without having to purchase additional units? Does the device come with all necessary software and peripherals? Keep in mind that some devices use costly PC software, which have restrictive licenses.

Additional features to look for are the flexibility of alarm notification routes – auto-dial out, fax, alphanumeric paging and e-mail. The number of dial outs available on the system should also be considered in line with requirements.

Once installed, an M2M device provides a considerable cost advantage though preventive maintenance of equipment and systems. Such systems also deliver a range of other benefits including a reduction in site downtime as faults are identified and corrected in near real-time.

Because M2M devices deliver huge cost and time savings, immediate ROI and greater control and flexibility of business processes, the decision is not whether or not to install an M2M device but to decide which one will best service the business's needs. These business benefits of early warning alerts and analysis and reporting capabilities can be found with an M2M system such as t-mac which also allows users to calculate and plan valuable cost-saving or energy management activities on actual evidence. Businesses are now in a position where they no longer need to rely on time-intensive labor of monitoring and control and can entrust this activity to the new generation of total asset management technology. The M2M revolution has begun. ■



The t-mac device can communicate wirelessly via GPRS

# M2M Market Gains Momentum



M2M solutions appeal to an increasing number of vertical industries. **Anthony Keyworth**, who heads M2M at Orange, discusses this trend and its impact on the next wave of M2M solutions and systems

**THE JURY IS NO LONGER OUT ON** the prospective role of M2M technology in the enterprise. Early adopters have completed their pilots and built their ROI models. Network operators and systems integrators are working more closely together than ever before to deliver standards-based platforms, replacing complexity of mobile integration with freedom to focus on the business imperative.

The days of telemetry as a black, niche art are gone. From security and transport to utilities, vending pharmaceuticals and insurance, it is now virtually impossible to think of a vertical market that won't benefit in some way from M2M implementation. And in many cases it is no longer simply a "nice-to-have" option.

External forces are driving adoption. In addition to commercial pressures to differentiate, new stringent legislation is requiring companies in many sectors to be accountable for product tracking and management. The European pharmaceutical industry is one such example. In January, a new EU directive comes into force, making pharmaceutical suppliers more accountable for the whereabouts of their products. Combined with this, analysts suggest that the increased ease of M2M deployment and collaborative technology developments has brought the market to the brink of explosion.

According to Frost & Sullivan, there are 13 billion devices in Europe that could potentially be M2M-enabled. Ranging from vending machines to photocopiers, home medical devices, CCTV cameras and truck fleets, they represent a vast untapped source of data

with the power to make owners, suppliers and customers more compliant, efficient and competitive. Today, the European market is worth a relatively modest £56 million, estimates Strategic Analytics. By 2010, says Focal-Point Group, enterprises worldwide will be spending \$250 billion on M2M solutions.

This growth will be fuelled by the new generation of platforms like Orange M2M Connect, which can combine an unlimited number of M2M-enabled devices with a SIM card, data gateway and simple network tariff on an Internet interface on which vertical applications can be quickly and easily developed, implemented and supported. This can provide businesses with limitless scope, enabling the access, exchange and management of data that responds to remote equipment and products in real time. For the telecoms manager, it is an opportunity to provide and support new strategic applications to a new level of sophistication, focusing on the content itself rather than complex delivery methods.

There is boundless potential for the exploitation of data gathered in this way. In practical terms, automated, real-time asset and supply chain management is now possible over a mobile network. Take vending machines or office equipment as an example. They can alert the supplier or manufacturer to faults, breakdowns, unauthorized tampering or theft, then identify and call out the nearest engineer. Machines can let the supplier know when products need replenishing. Beyond that, they can provide essential marketing data,

ranging from a machine's performance at a particular location to customer demands for specific products. Consequently, M2M can instantly activate promotions and special prices to bring the product to a customer's attention.

M2M is already generating this degree of interaction in the retail-vending sector, which has exhibited enormous potential. In the future, consumers will no longer need coins, but will be able to pay by text message - receiving discounts as their phone number is recognized by a customer loyalty program. Even 3G can play a part, enabling vending suppliers to download video clips to machines to advertise for products not selling well.

Elsewhere, early adopters have equally compelling stories to tell. Insurance companies have successfully tested pay-as-you-go applications that reward customers with reduced premiums for careful driving or low mileage. In transport, Bombardier Transportation, the global leader in the rail equipment, manufacturing and servicing industry, has strategically used telemetry systems to monitor every aspect of the trains and machinery under its care for the past four years. It recently decided to implement Orange M2M Connect across 20% of its U.K. systems and has already achieved a 20% improvement in its connectivity rate for those systems. The data is used to generate daily maintenance schedules, identify problems on individual rail cars and provide information that can be passed on to train operating companies to improve customer service. This is evidence that no matter where M2M is introduced in a supply

chain, its benefits are shared throughout the partnership, from product and service provider to the end user.

Where transport has paved the way, the hospitality sector has quickly followed. At Harlequins Rugby Club in the U.K., every aspect of the beer supply line is monitored to guarantee optimum quality. This includes ability to meet peak demand, temperature control, equipment and gaming machine performance and even footfall – the volume of customers who pass through the bar. As a result, downtime of revenue-generating machinery is kept to a minimum and as much as 45 minutes per venue, per day are saved in automated stock taking.

The security and utility sectors offer further examples of the business benefits of M2M technology available today. In France, Swedish security specialist Securitas has developed a telesurveillance application that provides customers with instant access to images from its CCTV cameras. It then generates alerts for security breaches and triggers appropriate action without encroaching on the traditional PSTN system. In the U.K., police forces have successfully used similar applications for crowd monitoring at major events, collecting images of suspected troublemakers and sending them for cross-reference to a central database of known offenders, again without interrupting airtime on their PSTN system.

In the utilities sector, British advanced metering provider Bglobal Metering has recently implemented an M2M-based strategy to streamline data collection among the industrial and commercial energy customers, including SMEs, which form its client base. The immediate benefit – more accurate billing – will help to eliminate readings based on estimated rather than actual energy usage, leading to improved customer satisfaction and energy management. In the long term, this can

allow Bglobal Metering to work with energy suppliers to offer diverse packages based on collected data.

Important as these examples are, they are only the foundation for what is to come over the next 12 months as the market gathers momentum. From customer-focused applications such as m-payments, to RFID applications that allow the tracking of specific items and products, we are on the verge of a wave of exciting, fully integrated solutions.

This is to be further facilitated by industry requirements, such as the 2005 EU directive to legislate product tracking in the pharmaceutical industry, which will require M2M-based tracking applications. At the more human face of the medical sector, M2M will also start to play a key role in patient care: alerting hospitals or doctors to the worsening heart condition of a patient at home, for example, or monitoring the state of patients with specific conditions such as diabetes.

Thanks to development alliances between network operators and companies such as Alcatel, Sony Ericsson and Wavecom, proven applications are emerging with increasing speed. The latest development, a partnership between Orange and Siemens, illustrates this point. From February 2005, the new partnership will deliver integrated and scalable solutions for a diverse range of customers, providing business with unprecedented control of its remote assets and products.

Critical mass has been achieved, and the market has amassed a reservoir of trust in M2M across a full range of vertical sectors. The strength of M2M development across these sectors is effectively transforming it into a horizontal technology, viable for customization in a multitude of business cases. This is, in part, due to M2M applications developed by pioneering operator-module maker partnerships, combined



**Metroline, one of the largest independent bus operators in the UK, teamed up with Orange to deliver passengers real-time travel information on digital timetables**

with the expertise of existing system integrators.

The more interaction there is between business and its assets, the more possibilities there are for services to take advantage of the information those assets deliver. The cost savings, improved efficiency and customer service enabled by M2M gives business a competitive edge. For telecommunications managers, the promise of centrally controlled, seamless applications with standardized service levels and tariffs across borders is already compelling.

The complexity of the telemetry proposition held back M2M's potential. Standardized platforms and integrated solutions are now bringing immeasurable value to a variety of sectors, proving mobile data is a true business enabler. When you consider that there are 13 billion devices across Europe that have the potential to communicate with each other, the future of M2M in business is infinite. ■

**Anthony Keyworth, Director of M2M, Orange Business Solutions, is responsible for delivering M2M solutions for both Orange and France Telecom. Orange launched M2M Connect—the only combined network and data platform on the market – in April 2004 in the UK, France and Belgium. Orange estimates it has a 30% market share of the total machine-to-machine market.**



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