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Using Cellular to Make Smart, Connective Remote Devices

Learn why cellular is the one of the most economical ways to transmit signals for M2M remote monitoring.

please see page 14



SCADA
Page 10



Security
Page 24

Using Cellular to Make Smart, Connective Remote Devices

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Has your electric company installed a smart meter at your home? Does your rental truck agent know where and how fast you've driven? Does your car insurance company offer you a discount on your premium based on your actual driving habits? This kind of information is readily available and represents a fountain of business opportunities and revenue drivers that companies are just starting to tap into.

What are the best solutions for accessing and managing information about remote assets today, and how can your company embrace one of the fastest growing technological changes happening across the globe? The answer lies within the monitoring solutions

enabled by M2M technology. The M2M refers to machine-to-machine, because human interaction is not required for remote monitoring and tracking, and cellular service is used to transmit the information to a central location.

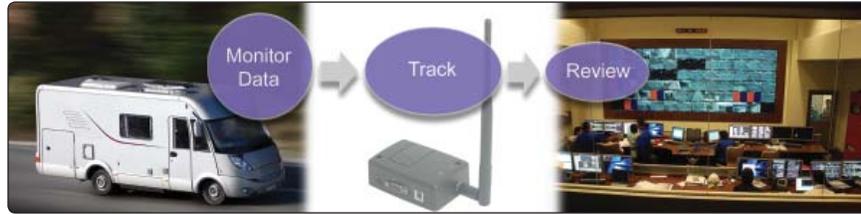
Why cellular? Because when it comes to remote monitoring, cellular is the most economical and universal way to transmit signals. Fleet managers can easily retrieve information about the location and status of a vehicle; insurance companies and police or even parents can be alerted immediately to reckless driving behavior; all in real time, without any delays.

Benefits of M2M

At its core, machine-to-machine technology is defined by enabling the instantaneous data transmission between remote devices and local management applications via wireless networks, ultimately enhancing the value of the remote device. Once equipped with a tiny wireless module, any asset can both send and receive data securely and without delay via GSM, CDMA or UTMS cellular networks. The connectivity and capabilities of M2M provide maximize productivity and competitiveness by increasing efficiency, cutting cost and improving levels of service for the end user.

The integration of an embedded M2M module within remote assets

provides unmatched monitoring and management benefits to control and record assets as well as access real-time information. The reliability and optimized information offered by M2M make way for significant security improvements in asset



management, and cost of ownership can reach new lows by minimizing the costs associated with maintenance and intervention delays.

The possibilities are limitless in terms of enabling the information exchange between devices and their central control applications that previously required human intervention. Businesses within diverse and disparate vertical sectors have already adopted the technology and leveraged its benefits, with applications ranging from fleet management and pay-as-you-drive car insurance options to utility meter reading and home security monitoring.

In addition to the functional benefits of M2M, the value-added services that set connected devices apart from traditional monitoring and maintenance solutions result in product differentiation and competition within the marketplace, simultaneously meeting customer needs while driving innovation.

The Role of Wireless Carriers

One set of industry players with interest in the development and advancement of M2M technology are wireless carriers (AT&T, Verizon, Sprint, T-Mobile and others), providing network service through which M2M applications are deployed. The nationwide rollouts of 2G wireless networks as well as the emergence of 3G further extend the reach and potential for M2M. But these service providers also hold the potential to steadily fuel growth within the M2M market, driven by their own interests in new revenue streams by expanding data service offerings to the M2M segment.

Beyond network deployment, many operators have embraced M2M technology and established themselves as creative partners for application developers, offering guidance and know-how in what can be a complicated integration process. Since 2008, Verizon has supported M2M growth through their Open Development Initiative (ODI) by streamlining the process by which embedded devices undergo testing and achieve certification on the carrier's network. Likewise, AT&T established the Emerging Devices Organization (EDO) with the goal of supporting innovation and bringing new M2M products to market.

M2M Application Challenges

The M2M market comes with its own set of unique challenges, many of which are centered on the complexity of and developers' unfamiliarity with the technology. Among potential application developers, knowledge is limited and a high level of investment in education and customer support falls on module and terminal suppliers. The complexity of M2M technology can also be an obstacle for development and deployment, especially when a company's core business and target market is traditionally non-technical.

Regardless of the type of application, the development of M2M wireless-enabled devices calls for a significant dedication of time, resources and consideration of logistics to bring a product to market. Integrating cellular capabilities into any product relies upon not only the physical

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embedded design and wireless connectivity but also certification from a network operator. As is the case with mobile phones, M2M devices must achieve carrier-specific certification in order to run on that service provider's cellular network, and the testing involved in earning these and other industry-specific certifications can substantially elongate time to market for chipset-based designs.

Developers can significantly cut down on this time and associated cost by building their application around a pre-certified wireless module from a reputable hardware provider like Telit Wireless Solutions. All of Telit's modules, for example, in addition to extensive testing, are also built with consistent form factors, guaranteeing that as new technology develops, the size of the module won't change for the application. While the end device will still be held to a final certification requirement, the testing and certification process is greatly simplified by the initial use of a pre-certified module.

Module vendors can also provide more than just hardware, with the expertise to guide developers through both the design and certification process. Especially for companies for which cellular design is foreign and intangible, this customer support can be the decisive factor in a successful entry into a new market. As each M2M application comes with a unique set of requirements, depending upon factors such as size, volume and bandwidth needs, among others, the path to achieving wireless connectivity can take many forms and employ one of many available hardware options, some of which already incorporate embedded modules.

Always ask the essential questions for your application, what is your anticipated demand? What features do you require? What form factor do you require? Do you have RF design experience? When do you need to be to market? And, question your potential suppliers, are your devices certified? Do you have design engineers available for support? How easily can I integrate your product into ours? The answers to these questions should help you solve your M2M requirements.

Selecting Your Hardware

The size of the deployment might be the single most important determining factor when choosing the appropriate cellular hardware solution for any M2M application. Cellular modules are generally the most cost-effective solutions for medium and large volume M2M application deployments, perhaps above 5,000 or 10,000 units to be deployed. For small to medium application requirements, embedded modems, terminals or intelligent terminals could be a more appropriate M2M product solution.

An embedded cellular modem with "end product" PTCRB and carrier certifications allow the user to quickly and cost-effectively incorporate a robust wireless solution into their existing or new product designs. These board-level "plug-in" devices build upon cellular modules to provide power management circuitry, easy antenna integration, and SIM holder, if required. Smart cellular modems have the added benefit of being footprint compatible for wireless network interchangeability. The user can easily configure their end product for operation on the GSM/GPRS, CDMA, UMTS, HSPA and other available cellular networks, or even across different technologies such as Wi-Fi or WiMax.

These embedded plug-in modems are specifically designed to integrate onto the user's PC board. The through-hole DIP pin configuration allows for standard manufacturing processes to be used in their integration. Once the PCB layout is complete, the user simply needs to choose the network technology required for their end products. As a board level component, embedded modems are a cost-effective solution, only slightly more expensive than cellular modules.

M2M applications with lower volume demands might benefit from a cellular terminal device. Also, companies with little or no RF design experience will likely find terminal solutions more appealing. Cellular terminals are a step up the integration scale from embedded modems. They are generally found in plastic or metal enclosures with simple connections for power and data, such as serial, USB or ethernet. They are also available as open frame devices designed to easily attach to applications within or outside the user's enclosure.

Standard cellular terminal devices are used across the vertical market spectrum. They are used widely in monitoring the health and status of remote machines and equipment, in any M2M data transmission/reception

application. Combined with GPS capabilities, they are used as solutions in a variety of vehicle and asset tracking applications and are often used with sensors in a host of different utility related applications, such as meter monitoring and reporting.

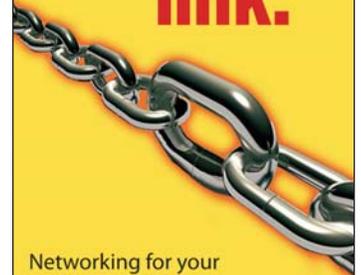
Standard terminals come in a variety of shapes, sizes, configurations and price ranges, offered with vertical specific features and functions down to very generic set-up features with a subset of functions for more cost sensitive situations. The best M2M terminal solutions give the user the ability to connect to their devices in a number of different ways, with an array of network and power choices. These features allow the user to incorporate the device in diverse applications with relative ease.

Intelligent terminals again move up the cellular integration scale, offering users features and functionality beyond those of standard terminals as well as the ability to locate complex applications within the device. These intelligent terminals include micro-controllers and expanded memory in concert with cellular connectivity. They are able not only to monitor and report but to control the devices with which they are connected. Intelligent terminals are basically remote computers with cellular capabilities and are used across vertical markets, most often integrated where complex application solutions with cellular connectivity are required.

Embedded modems, terminals, and intelligent terminals give users immediate and easy access to cellular M2M solutions. They comprise a wide array of product offerings that provide a range of features and functions, allowing users to choose precise solutions for their applications. With power and antenna circuitry already designed and appropriate certifications complete, there is an integrated M2M product available for literally any application. Terminals and modems are the perfect solution for price sensitive markets, low to medium volume demand and a quick time to market requirement, considered an off-the-shelf M2M option for those seeking reliable remote monitoring solutions.

For more information visit please visit Janus Remote Communications at www.janus-rc.com and Telit Wireless Solutions at www.telit.com.

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