



Remote Management White Paper

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Executive Summary

The widespread adoption of wireless networks and the introduction of innovative technologies has made Machine-to-Machine (M2M) communications accessible to a virtually limitless range of business and industry applications across the globe. Remote assets such as: manufacturing, mining and farming equipment; utility metres; vehicles; kiosks; CCTV cameras; medical devices; water and power systems can transmit real time data relating to a range of conditions including: temperature; location; fuel levels; pressure; performance, functionality; usage; blood pressure and operating condition.

M2M, also known as telemetry, involves the networking of remote assets to a central system for review. Field data is automatically transferred over broadband networks from fixed or mobile machines, equipment, devices or systems to back-end IT infrastructure without the need for human intervention – making M2M communications the ideal remote management tool.

While M2M solutions can incorporate wired (ADSL/cable/fibre) networks, wireless technologies (GSM; 3G/4G) offer distinct practical and economic advantages for remote applications; particularly for those which are mobile, unmanned, located in hostile environments or too isolated to transmit and control data over a distance using wired infrastructure.

This paper explores the role of wireless M2M devices in supporting the real time monitoring and management of remote assets; and discusses the considerations involved in selecting a device capable of achieving a reliable and consistent wireless connection to multiple physical assets and resources in harsh and often isolated conditions.



The rise of wireless M2M

1 Visiongain, 2011: Opportunities and Challenges with Connected Devices.

2 Berg Insight: The Global Wireless M2M Market - 4th Edition, April 2012.

The extensive growth of ubiquitous wireless networks worldwide has facilitated a system that allows for M2M on a drastically larger scale, enabling M2M communication at greater speeds using less power and resources – thereby opening up a huge arena of potential opportunities spanning diverse industries and applications. Network service providers began increasing their commitment to M2M in 2009, so an increasing range of both national and multinational M2M service options has become available in growing markets.¹

Carriers are driving M2M through the development of new business models which make it easier for product developers to design new network compatible technologies. According to a new research report by Berg Insight, the global wireless M2M market has exhibited growth in all major regions and vertical segments worldwide. The global number of mobile network connections used for wireless M2M communication increased by 37 per cent to reach 108.0 million in 2011; and will continue to rise at a compound annual growth rate (CAGR) of 27.2 per cent to 359.3 million connections in 2016. It is also estimated that in 2011 shipments of wireless M2M devices increased by 35.3 per cent to a new record level of 50.8 million units. Asia-Pacific was the strongest regional market, recording a year-on-year growth rate of 64% reaching 34.5 million connections at the year-end. Europe and North America grew by around 27% each to 32.3 million and 29.3 million connections respectively. In the coming years millions of motor vehicles, utility metres, consumer electronics, security alarms and other machines will become networked.²

The introduction of 4G networks that equal or surpass fixed line broadband connections will further fuel this growth trend.

The need

³ Harbor Research. Next Generation Platform Innovation
In M2M White Paper, January 2011.

Remote monitoring and control

Using M2M communications, companies can establish a centralised monitoring system to view the status of remote equipment in real time, from anywhere at any time. Without this capability, companies must rely on costly and often inefficient manual processes, and are unable to achieve real time observation from a central location.

The benefits of M2M communication extend beyond observational capabilities to include the remote management and control of connected assets. This enables companies to perform functions such as: restarting remote systems; adjusting temperature; regulating pressure and facilitating firmware and other upgrades from a computer or laptop. Before the availability of M2M communication, companies would have to send a technician to the device location to achieve these functions. In the case that a device at an unmanned location experiences a malfunction, companies can now immediately diagnose and resolve the issue from a remote computer over a 3G / 4G network without incurring the cost of deploying a technician to the site to troubleshoot processes.

The need is for:

- Real time monitoring and control of remote assets
- Immediate response to malfunction alerts
- Freedom from fixed line limitations
- Elimination of manual maintenance costs
- Operational efficiency and streamlined logistics
- Instant progress updates accessible by all interested parties from any location

Companies are increasingly learning that more automation is required to increase visibility into how their systems are performing. With real time connectivity, substantial improvements in equipment uptime, resource scheduling and deployment and supply chain efficiencies are within reach. The potential impacts on businesses, as well as the economy overall, are significant.³



Borderless networks

The ability to monitor and control connected devices and equipment situated in hard to reach and temporary locations offers the potential to transform countless industries. Whether it be for the utility, mining, agricultural, infrastructure, health care or automotive sectors, the extended reach of wireless 3G / 4G networks is liberating remote and multifaceted infrastructure from the geographical limitations, impracticality and high line leasing costs of fixed line infrastructure.

Wireless technology enables data from isolated field devices such as tsunami warning systems to be collected from various monitoring and control points and transmitted to a central control centre over mobile broadband networks to protect assets, alleviate risks, maintain business continuity and ensure productivity and efficiency.

In the past, for example, it was not possible to effectively monitor vast and remote coastlines for sea level changes. Today, governments worldwide are implementing tsunami warning systems with the capacity to upload and collate a full collection of data every minute of every day across multiple locations. By mounting a wireless M2M device to offshore and onshore stations, it is now possible to transmit tidal measurements, seismic readings and other sea level data from ocean sensors to headquarters over a 3G network.

Connecting legacy equipment to advanced networks

Replacing or upgrading legacy equipment and systems to enable access to higher bandwidth IP networks is costly, and in many cases, unfeasible. To preserve any investment in existing assets or systems, a reliable connection between old and new technology can be achieved using an industrial wireless M2M device that features a Serial port to connect legacy devices such as emergency and manufacturing equipment to advanced 3G or 4G networks.

An M2M access device should feature both a Serial and Ethernet (LAN) port to interface with equipment that requires either a LAN or a legacy serial port to connect to the network. Digital signs, CCTVs, smart meters, climate control systems and other wired devices can be connected to Ethernet ports for reliable wired access to high-speed wireless broadband; and the Serial port supports legacy serial applications.

Smart meters are one of the many applications that enable two-way communication between the asset and a central system using a 3G M2M Serial Modem to transmit data from the Serial port. Using the embedded IP stack, the device sends the data over a 3G network to any IP network enabled device such as a computer, tablet or smart phone; while also supporting an extended AT command set for quick and efficient device programming and configuration.

In this case, the data gathered for remote reporting benefits the utility company by reducing the cost of manual meter reading while also benefiting customers through the provision of accurate bills, eliminating the potential for estimated charge bill shock. Detailed utility usage information can also offer financial savings to customers choosing to move consumption to lower-prices periods.

Increasing productivity and profitability

The M2M market is evolving from its emergent phase as the productivity and profitability benefits of wireless M2M communications are realised across diverse vertical industries. While the productivity gains and revenue sources that justify the financial viability of wireless M2M communications vary in line with individual business or industry interests, the following benefits apply to most users:

- The remote monitoring of site equipment enables scheduled and predictive maintenance
- Business processes are automated and enhanced
- Automatic malfunction warnings ensure a fast and effective response to issues
- The automated transfer of data reduces transportation and site visit costs
- Wireless M2M costs are far lower than fixed line expenses which include line rental
- Business intelligence is based on relevant and accurate real time data
- Live visibility of key performance indicators
- Streamlines and improves processes
- Enables value-added services



Fundamental features

An Industrial 3G M2M Modem / Router can be used to create a wide-area-network for reliable point-to-point or point-to-multi-point communications virtually anywhere with the flexibility of 3G. Key advantages include the ability to connect devices in multiple settings (i.e. industrial, infrastructure, retail, transport etc) as well as the ability to connect multiple locally networked devices to a broadband connection.

The following wireless M2M Modem / Router features are critical to achieving a reliable and consistent wireless connection to multiple remote assets and resources.

Remote management and control with TR-069

TR-069 gives service providers, their customers and businesses a number of economical and practical benefits with the primary advantage being the ability to remotely manage and control connected devices. Businesses using M2M to connect equipment such as utility meters, medical devices and climate control systems can achieve large operational cost savings by remotely managing and monitoring the data obtained from equipment such as temperature sensors and other metering devices to upgrade software or firmware, download data, check settings or install upgrades from a central office.

Customisation

With a diverse range of applications to which M2M communications can be applied, it is essential that commercial grade 3G wireless broadband products and services have the capacity to be uniquely customised to complement virtually any remote M2M communication and business continuity (disaster recovery) application. Important features include: integrated software customisation capabilities (SDK); browser based device management; multiple routing protocols and the development of hardware, custom firmware and project management solutions to meet specific requirements.

An embedded Software Development Kit (SDK) offers the capability to install custom firmware to the onboard flash memory via the programming interface. This open management platform provides a real point of difference to customers who require custom application integration into their own system.

'Always-on' connectivity

Support for multi-system monitoring ensures communication lines will remain open in any conditions. To ensure a reliable and consistent connection for business continuity, the device should have the capacity to periodically check the full status of the network connection, ensure that the strongest possible signal is achieved, and reconnect automatically.

Easy installation in harsh isolated and unmanned locations

Remotely managed industrial grade wireless M2M devices must be designed for easy installation, reliable backup and integration into existing enclosures. Simple setup is critical for mobile, temporary or hard to reach locations which may not have on-site IT support. Durable metal casing and industrial strength components are important for deployments in unmanned and hazardous locations; and devices should be appropriately temperature rated.

End-to-end control

The ability to select an appropriate service provider is essential for reducing costs, increasing flexibility and for the overall control of remote monitoring, management, reporting, and real time connectivity. The device should have the ability to interoperate with a variety of devices and network applications with support for open standards and common industry protocols.



Conclusion

There is a growing understanding of the cost, convenience, efficiency and productivity benefits of wireless M2M communications, particularly for the monitoring and control of remote assets which are often mobile or located in temporary or geographically isolated areas. NetComm Wireless' industrial-grade wireless M2M products use 3G networks to provide cost-effective high performance data communication capabilities for virtually any resource hungry application. Products are developed to meet the latest requirements of modern telemetry, M2M communication, WAN and legacy serial applications to effectively address a range of SCADA solutions across countless industries.

About NetComm Wireless

NetComm Wireless Limited (ASX: NTC) is a leading developer of innovative broadband products sold globally to major telecommunications carriers, core network providers and system integrators. For 30 years NetComm has developed a portfolio of world first data communication products, and is a respected global provider of 3G and 4G wireless devices servicing the major telecommunications carrier, Machine-to-Machine (M2M) and Rural Broadband markets. NetComm's products are designed to meet the growing needs of today's data-intensive home, business and industrial broadband applications and customized to optimize performance in line with global network advancements. Headquartered in Sydney, Australia, NetComm has offices in New Zealand, North America and the Middle East.

For more information about NetComm visit:
www.netcommwireless.com