



## **Broadband M2M: A new category**

**Larry Zibrik**  
**Director of Marketing and Product Management**  
**Sierra Wireless Embedded Modules**  
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## M2M Today

Approximately 14 million wireless modules were deployed in 2005<sup>1</sup> to serve the machine-to-machine (M2M) market. The market is growing at a 25 percent compound annual growth rate and includes a wide variety of applications.

Typically used for low-bandwidth applications such as exception-based reporting or scheduled system monitoring, M2M equipment deployments to date have been characterized by:

- Low data transfer requirements (typically less than 100 KB per report or transaction)
- Significant focus on hardware costs
- Simple interfaces to the remote site equipment.

To meet the needs of this market, wireless module vendors have focused on providing reliable solutions that minimize hardware deployment costs. A key feature developed in modules is the ability to run a simple M2M application on the module itself, thereby reducing the requirements to additional hardware and software at the remote site.

Low-bandwidth M2M solutions often prove themselves out based on an ROI (Return on Investment) related to deploying the system. A classic example of this would be remote data collection. The cost of deploying the wireless system is weighted against the ongoing costs of manually collecting the data with a workforce.

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<sup>1</sup> ABI M2M report July 2006

## Broadband M2M

While existing M2M solutions have been well served by 2G wireless networks, the recent advent of wireless wide area networks operating at broadband data speeds offers new possibilities. M2M applications designed to take advantage of these newer, faster networks are expected to form a subset of the existing M2M market, defined by its ability to utilize or monetize higher throughput. Examples of these markets include:

- Remote information displays (e.g., roadside signs with richer content, such as video)
- In vehicle camera systems (e.g., security cameras in taxi cabs)
- Point of Sale content delivery (e.g., video to a vending machine)
- Fixed Security (For exception based video on demand – when an alarm is tripped)
- LAN network consolidation (an example of this would be multiple point of sale terminals at a temporary site, all networking through a single wireless broadband connection point)

Because 3G networks have the ability to deliver data at rates up to 1 megabit per second (Mbps), the remote end solutions will be designed with different criteria in mind. Unlike 2G M2M where low data rates and cost sensitivity drive the design, 3G wireless engines can deliver data to the remote end or in some cases collect data from the remote end at up to 1MB/S. Because of this, the remote end equipment needs to have the capability to manage the data flow delivered by the broadband connection.

## Deployment Decision Drivers

Typically, if a large vending company, for example, is considering deploying wireless telemetry in their remote vending machines, they would weigh the solution costs against the cost savings realized by better managing their route services personnel while restocking the machines.

With a 3G network connection, the machine becomes a marketing tool. Brand managers are able to target market each location with specific content that could change at their command or even be interactive if they wish. The investment decision is no longer a simple ROI on route service, but a new opportunity to promote the brand and even collect information from target customers.

## 2G and 3G Deployment Factors

Technology	Design Priorities	Economic Drivers
2G	Cost, reliability, low throughput.	Varies. ROI on route services, data collection or remote maintenance. Saving manpower.
3G	Throughput, flexibility, expandability.	Branding, content delivery and monetization.

### **M2M2P**

Although the Broadband M2M application examples discussed are technically a remote machine talking to a host machine (fitting the generally accepted definition of M2M), Broadband M2M scenarios do share a unique common theme. The enriched 3G broadband content delivered or received from the remote end is typically viewed or considered by a person – an employee, a customer, or an even wider audience. Unlike lower bandwidth M2M applications, which usually enter a database for later consumption or analysis, Broadband M2M is usually presented to a person in real time or a defined period of time.

Application	Interaction with 3G data payload
Vending / Remote Info Displays	Customers view video or interact with a video display. Content is controlled by a remote site and will be active for a pre-determined time before it is updated.
Security	Real time video is fed to a monitoring station for immediate action.
LAN network consolidation	User typically has a input/output device connected to the Broadband M2M system to fulfill transactions.

### **The beginning of leveraged standards**

2G M2M device solutions are built around wireless module interfaces that are proprietary to the module provider. One of the challenges M2M faces today is the lack of interface standards, whether in the remote hardware or software, the network layer or the host site.

3G modules were initially developed for laptop computers. Because of this, multiple vendors build 3G modules to the PCI Express Mini Card specification. The modules have a simple USB interface and can be mounted into a host device for ruggedized environments. Most modules offer extended operating temperature ranges and support both 3G and 2G airlink protocols to maximize coverage.

Standardized modules allow remote site device designers to produce a single hardware platform and leverage it for multiple 3G module implementations supporting various network operator services. 3G modules are available today that support:

- CDMA EV-DO Rev 0 with 1xRTT
- CDMA EV-DO Rev A with 1xRTT
- HSDPA with UMTS, EDGE and GSM/GPRS

### **2G and Broadband M2M module comparisons.**

<b>Parameter</b>	<b>2G Modules</b>	<b>3G Modules</b>
Extended Operating Temperature (-30 to +60 degrees C)	✓	✓
Ruggedized Mechanical mounts	✓	✓
2G Wireless Service	✓	✓
3G Wireless Service		✓
Industry Standard Physical Form Factor and Electrical Interface		✓
Cost (Relative)	\$	\$\$ - \$\$\$

## **2007: The year of Broadband M2M**

With 3G wireless modules now readily available and a definition of the Broadband M2M concept beginning to take shape, the industry can expect to see Broadband M2M solution trials and application spaces develop in 2007.

For this ecosystem to form, it is important for the industry to recognize that Broadband M2M is a unique market and apply a different set of rules when setting expectations for solutions and market adoption. As discussed in this paper, Broadband M2M is unique from today's 2G M2M environment in many ways. Understanding these unique attributes up front will accelerate industry adoption.