The Future of GSM Alarm Communications

There’s been much ink devoted recently to the topic of GSM alarm communication. What’s been written has generated considerable consternation and concern, generating quite a bit of heat but shedding relatively little light on the subject.

On one thing all agree: Both in new and existing systems, the use of GSM communication is growing at an unprecedented rate. Alarm companies are incorporating GSM in most new systems, and existing system owners are eliminating their POTS lines to gain the convenience, cost, and security benefits delivered by cellular communication.

The main question being raised is whether GSM will turn out to be a communications dead end, with the technology sunned within a few short years. Will the GMS-equipped systems being installed tomorrow end up as security islands with no communication link to the Central Station?

Let’s consider how we got to the current state of the art in panel communications, and what the true prospects are for GSM-equipped panels within the next few years.

The Evolution of Cellular Technology

Billboards and TV ads hawking the latest cell phone capabilities make frequent, glowing references to their “4G network” capabilities. While many buyers are eager for the latest and greatest technology, the average cell phone user doesn’t even know what the “G” stands for (generation), and knows even less about what the standard promises.

Even for the more technically astute, the practical differences in the generations of cellular communication technology aren’t well known.

1G (AMPS*): Deployed in 1973 and used primarily for analog voice communications. The alarm industry did not make use of 1G cellular technology until 1992 (using the control channel side). While the 1G technology was used by consumers for 35 years, the security industry only used it for the last 16. The 1G standard was sunned in 2008.

2G (GSM): Deployed around 1990, with an expected life of 25 years. The 2G technology represented the switch from the 1G analog system to digital, and opened the door to using cellular communications for data. Increased performance was achieved in part by allowing multiple users on a single channel.

2.5G (GSM) Arriving in 2002, it was a software upgrade to the GSM standard that provided a moderate boost in data transfer speed by using unused TDMA, supporting limited cell phone web browsing. Both 2G and 2.5G will be turned off at the same time, although when that will happen isn’t known. Most agree it will occur in 5 to 10 years.

3G (UMTS): The technology requires totally different hardware from 1G or 2G. It increases cellular multimedia and streaming video capabilities, and allows transmission across different device types (phones, PDA’s, etc.). Widely deployed in 2005, it has an expected life of 25 years. Also called HSPA.

4G (LTE): Being deployed as two different technologies: LTE (700Mhz) from AT&T, Verizon, and T-Mobile, and the Clearwire “Wi-Max” technology from Sprint. Sprint may move to LTE in the future. 4G is true digital broadband and will become more widely available in 2011.

* See the Glossary for an explanation of all acronyms

Digital Monitoring Products
2G and 3G on CDMA Network
Recently the CDMA rates have become commensurate with GSM because of other M2M and telemetry applications moving into the CDMA network. To date no other security providers have communicators using this technology. CDMA has certain advantages over GSM, mainly that Verizon’s network is bigger and less crowded on the data side. The other interesting thing is that because CDMA is late to mature for M2M applications, the cellular modules now becoming available are both 2G and 3G modules, so any future alarm communicators would likely already be designed as 3G, with an expected life extending to 2030.

Sprint has said publicly that it will maintain the 2G (1XRTT) and 3G (EVDO) network (both permutations of the CDMA standard) until at least 2020. Verizon has said it will maintain the 1XRTT for at least five 5 years and EVDO for another 10.

Broad Adoption Follows Price Drop
Today DMP, like all security providers, relies on 2G technology for cellular communication because it’s only recently that 3G modules were even available. Not surprisingly, mobile communication technology is driven by the demands of cell phone users. Hardware manufacturers focus on building handsets for the first two to four years of a new signal carrier technology’s deployment, wanting to quickly cash in on a market that typically has a lifespan of 18 months.

Once most of the profit is squeezed out of that space, they then design and begin to deploy modules for use in M2M or telemetry applications. While 3G modules are now starting to become available, we are still in the early adopter phase of the technology lifecycle, which equates to prohibitively high hardware costs.

Security device manufacturers could build 3G modules into their cellular communicators today, but dealers will pay a triple-cost premium compared to the widely used 2G devices. As with all technology, that premium will evaporate as the volume of the 3G modules increase and module manufacturers repay their initial investment. In as little as 18 to 24 months, we could see the cost of 3G modules approach the same prices as 2G technology.

When the price of 3G becomes reasonable, panel manufacturers will be able to offer cellular products that operate on 3G, with a life expectancy that could extend as far as 2030. As far as 4G, the telcos have purchased large blocks of spectrum from the FCC in anticipation of the 2011 deployment. Revisiting the technology lifecycle, that means we can expect to see affordable 4G communicators available for security applications in four to five years. Those modules will have a life expectancy that could extend to 2040.

Why GSM (2G & 2.5G) may last longer than you think.
A key point to consider as we try to predict the life of our current GSM solution; 3G & 4G networks do not support voice or SMS nearly as well as the older technology. Both the new 3G & 4G technologies are designed to IP packet DATA thru put. 4G (LTE) does not even have a voice or SMS component to it. However, obviously, the carriers create significant revenue from the voice and SMS that they are not going to want to soon give up. That coupled with the fact that in a IP data environment, a VOIP offering is easily and cheaply (or free) offered by folks like Google, Skype etc. This significant amount of revenue is put at risk, if the carriers turn off GSM. A decision they will not hastily consider. These two facts may mean that GSM (2G & 2.5G) voice, SMS & data networks may be maintained for longer than we currently think.

Looking Over the Horizon
While some facts about the future of cellular communications are known, there’s also much we don’t know. Still, it’s possible to make some well-educated guesses.

As a general rule, IP will continue to dominate commercial alarm communication and cellular will be the choice for residential. A few manufacturers now have UL864/NFPA72 approved GSM Fire Communication with no other technologies required as backup. As that approach matures and the authorities having jurisdiction increasingly accept it, the trend for commercial will move more toward cellular.

There’s no reason to expect any shift of residential towards IP, with the exception of very large homes that include home automation systems or managed networks. The other exception would be Managed Facilities-based Voice Network (MFVN) and Fiber Optic Services (FiOS) being brought to the curb in large housing developments. As that is deployed, IP for alarm communication would be an obvious choice.
With each successive generation of cellular technology, from 1G to 2G to 3G and so on, the cost the transmitting the data is reported to be 50% of the previous generation. Bear in mind that the cost of the data is not the total per-month cost; it’s just a small piece. However if that prediction holds true, cellular will continue to become more affordable, and will continue to be the product of choice for alarm communications. That will be true even with alarm companies having to change out communicators every 10 to 15 years.

Choose Your Supplier Well
System dealers and installers may need to adopt a new mindset, and help their customers to share this new perspective. Panels of the past could be counted on to give decades of service with routine maintenance and regular upgrades. The days of a customer using the same old panel for 15-20 years is over, a fact that security system dealers may have to get comfortable with. The technology lifecycle today is much shorter than in the past. Watches, cameras, phones are all routinely replaced, not because they wore out, but so that the user can take advantage of the new features made possible by the latest technology.

The key to successfully managing the more rapidly evolving technology, and the uncertainty in communication standards, is selecting systems with a modular design that allows upgrading panels to incorporate the latest and greatest features. It is also important that the panel manufacturer has a good track record for maintaining solid backwards and forwards compatibility with its devices. Modular design is useless if the new modules won’t talk to the existing hardware.

Don’t rely on manufacturers who plan obsolescence into their product. Partner with manufacturers that give you an easy pathway to accommodate communication and other technology shifts. Find out how readily their panels upgraded when prior enhancements became available. If it isn’t clear that the manufacturer provides for painless, seamless updates to installed products, start the search for a new supplier.

Stay Close to Customers
Help your customers to understand the new world order of security systems. Most should be technically savvy and will accept the idea that the panel that completely meets their needs today will need regular upgrades and enhancements to meet their future needs.

If you’ve chosen your technology suppliers well and are confident that the systems you install are flexible and updateable, you will be able to comfort customers with the fact that they won’t be left at a technology dead end. Because the technology landscape constantly changes and evolves, you need to keep your customers close by keeping them informed. Remind them why they made a wise choice, and alert them to the ways you can maintain and upgrade their system so that they can realize the longest life and highest ROI.

Fail to hold your customers close and well informed, and they are more likely to be lured away by door knockers and cold callers telling convincing stories about how their system offers superior security at a lower price.

Cellular-enabled panels provide many benefits to the customer, including much-valued features like the ability to monitor and manage their systems via SMS messages. For the dealer, cellular-enabled panels provide new RMR potential and increased “stickiness” that binds you more closely to the customer.

Despite the uncertainty regarding evolving cellular standards, customers are eager for the benefits that a cellular connection provides. Dealers who allow themselves to be paralyzed by this uncertainty will find themselves losing sales to others who have embraced cellular. Select technology that you can feel confident will provide an upgrade path, prepare your customers for the inevitable upgrades, and maintain an ongoing dialogue with those customers about how you can keep their system cutting edge.
Glossary

AHJ: Authority Having Jurisdiction.

AMPS: Advanced Mobile Phone System, an analog mobile phone system standard developed by Bell Labs and officially introduced in the Americas in 1983, but now sunsetted.

CDMA: Code Division Multiple Access, a 2G/3G standard that allows several users to share the same channel by assigning users different “codes.” Only users associated with a particular code can communicate with one another.

EDGE: Enhanced Data for GSM Evolution, the 2.5G technology that enabled data to be sent over a GSM TDMA system at higher speeds.

GPRS: General Packet Radio Service, used in 2G and 3G systems.

GSM: Global System for Mobile Communications, the 2G system and the most widely used global standard for mobile telephony.

M2M: Machine-to-Machine, referring to technologies that allow both wireless and wired systems to communicate with other devices of the same ability. SMS is widely used for M2M.

MFVN: Managed Facilities-based Voice Network, a physical network that is owned and operated by a voice service provider to deliver traditional telephone service via an analog telephone interface.

SMS: Short Message Service, the text communication service component of phone, web or mobile communication systems.

TDMA: Time Division Multiple Access, which allows several users to share the same channel by dividing the signal into different time slots, improving utilization of the channel.

UMTS: Universal Mobile Telecommunications System, a 3G/4G mobile telecommunications technology, that relies on CDMA.

Wi-Fi: A telecommunications protocol used in local area networks to provide wireless broadband services, usually reaching no more than a few hundred feet.

WiMAX: Worldwide Interoperability for Microwave Access, a telecommunications protocol that provides wireless broadband services similar to Wi-Fi, but on a much larger scales.