



White Paper

The Future of Cell Alarm Communications

There's been much ink devoted over the years to the topic of cell alarm communication. And it's become widely adopted over the last decade or so.

On one thing all agree: Both in new and existing systems, the use of cell communication continues to grow at an unprecedented rate. Alarm companies are incorporating cell 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.

Let's consider how we got to the current state of the art in panel communications, and what the true prospects are for cell-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 network capabilities of 4G, 5G, 6G and so on. 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 sunsetted 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 (HSPA)** 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, PDAs, etc.). Widely deployed in 2005, it has an expected life of 25 years. Also called UMTS. As you may know, this is currently being phased out. Click [here](#) for details.
- 4G (LTE)** Being deployed as two different technologies: LTE (700 MHz) from AT&T, Verizon and T-Mobile. 4G is true digital broadband and became more widely available in 2011 with a life expectancy through 2030.

** See the Glossary for an explanation of all acronyms*

5G (LTE) Began deploying worldwide in 2019. 5G brings three new aspects to the table: bigger channels (to speed up data), lower latency (to be more responsive) and the ability to connect a lot more devices at once (for sensors and smart devices). Currently, there are no 5G alarm communicators on the market.

Broad Adoption Follows Price Drop

Today DMP, like all security providers, relies on LTE technology for cellular communication.

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 5G 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 potentially build 5G modules into their cellular communicators today, but dealers will pay a triple-cost premium or more compared to the widely used LTE devices. As with all technology, that premium will evaporate as the volume of the 5G modules increase and module manufacturers repay their initial investment.

When the price of 5G becomes reasonable, panel manufacturers will be able to offer cellular products that operate on that network. However, the 4G LTE sunset announcements aren't expected until at least 2030 or later with the help of Dynamic Spectrum Sharing (DSS), which shares available spectrum between 4G and 5G devices. As such, there will be a long period of time when the two will co-exist, providing improved coverage for 5G devices plus greater longevity for 4G LTE devices.

CAT M1

Now, with the widespread deployment of LTE systems, communicators designed with Cat-M1 technology including Coverage Enhancement Mode A is making a big difference in providing reliable service, wherever you are.

In fact, in "fringe areas" where there's poor connectivity due to high interference or poor coverage, the Coverage Enhancement feature can effectively provide up to a 10 dBm gain in cell reception over traditional LTE in the same geographic space. That's because Coverage Enhancement Mode A actually changes how frequently the module attempts to communicate. For instance, if a device normally tries to communicate one time, with Coverage Enhancement Mode A it can try up to 32 times that.

Communicators designed with Cat-M1 technology also ensure a much greater delivery probability over traditional communicators, especially in areas with degraded coverage. In short, this modulation does a better job of penetrating interference and walls and reaching cell towers. In addition to greater performance through buildings, external walls and other interferences, Cat-M1 offers other important advantages, like maximum network lifespan and affordable module pricing. DMP communicators use Cat-M1 technology with Coverage Enhancement Mode A.

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 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.

With each successive generation of cellular technology, from 1G to 2G to 3G and so on, the cost of transmitting the data is reported to be less than 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 15 to 20 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 to 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 the user can take advantage of the new features made possible by the latest technology.

Digital Monitoring Products

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 backward and forward 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 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 systems so 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, and prepare your customers for the inevitable upgrades as you continue to 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.

Cat-M1: Functions on a 1.4 MHz (reduced from 20 MHz) spectrum, has a transmit power of 20 Bm and provides average upload speeds between 200 kbps and 400 kbps, on average. This technology can extend battery life, potentially by up to 10 years.

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.

LTE: Long-Term Evolution is a standard for wireless broadband communication for mobile devices and data terminals, based on the GSM/EDGE and UMTS/HSPA technologies. It increases the capacity and speed using a different radio interface together with core network improvements.

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.

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.

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