Getting Your Alarm Transmission in Gear

The emergence of alternative alarm transmission methods and introduction of new primary communication paths are expanding systems’ functionality and features. Gain a solid foundation in the basics of available options to make wise choices for customers’ safety and your business. By the Editors of Security Sales & Integration

Effective security requires a response. Without one, security is but a name only. In order to invoke a response on the part of police, firefighters, paramedics or a private security force, the transmission of information from protected premise to a central monitoring station is required.

There are five alarm signaling methods used by security dealers to transmit to central stations: 1) dedicated lease lines; 2) traditional telephone lines (POTS); 3) long-range radio; 4) cellular; and 5) network/Internet.

“POTS [plain old telephone service] is still least expensive, provided it is already installed. Next would be Internet, again provided that it is already installed,” says Mark Hillenburg, executive director of marketing for Springfield, Mo.-based DMP. “Cellular, although it has a small monthly cost, it has a fairly low creation cost and because it’s virtually available everywhere, it’s easy to standardize on. Long-range radio, although it has no actual monthly fees, has a steep creation cost and the cost of maintaining the network can’t be discounted.”

In this article, we’ll explain the most prevalent types of alarm signaling systems, examine the pros and cons of each method, and discuss how they’re being applied. Just as importantly, we’ll explore the opportunities available to installing security contractors to generate both more business and recurring monthly revenue (RMR) associated with upgrades and alternative communication paths.

**ALARM BUSINESS BUILT ON POTS**

Dedicated lines were once the only way alarm signals could travel from an alarm system to a central station. In the beginning it was Edwin Holmes, a visionary and entrepreneur, who pioneered the manufacture of alarm systems as well as alarm monitoring. He began sending alarm signals across dedicated lines in 1866.

Shift way forward to the utilization of POTS for the transmission of alarm signals involving the use of digital communicators (digital dialers). Early on, these devices were designed to send two, three or four general signals to central station operators, such as burglar, hold-up, medical and fire.

The first digital dialers were add-on modules that the alarm dealer placed inside the alarm panels they installed. Standalone slave dialers are still available where relay and/or voltage outputs on the alarm panel motherboard connect to channel inputs on the dialer. Most slave dialers in use today are for fire alarm applications.

Although the use of add-on digital dialers over POTS was an improvement over dedicated lines, it did not address the need for more detailed information (i.e. room, hallway, floor, or as is the case today, the exact device). Information is critical if first responders are to be effective. For example, because seconds count when there’s a fire, it’s important firefighters know where a fire began and where it has migrated to — all before they arrive on the scene.

In due time, the digital dialer migrated directly onto the alarm panel motherboard. This direct connection with the central processor enables the digital dialer to transmit zones and points to central station operators, which provides for a better informed response. This includes a variety of trouble codes, such as low battery, AC power failure, keypad tamper, missing device, failure to communicate and others.

In brief, the most utilized form of alarm signaling to this day involves the use of traditional telephone lines using POTS in conjunction with the public switched telephone network (PSTN).

“The primary reason is because POTS was such a ubiquitous form of person-to-person communication for so many years, that it simply takes a long time to go away,” says Dave Roberts, vice president of engineering for DMP. “Combine that with consumers already paying for this technology for their own use, and the alarm dealer could essentially use it for free to transport alarm signals. A free-to-use service that generates recurring monthly revenue is hard to give up for an alarm dealer.”

POTS is probably the most fault-tolerant signal transport method in existence where it comes to alarm signaling. Not only is it free to alarm dealers to use when it’s already in place, most telephone carriers are able to provide a dial tone more than 99% of the time. That is another reason the alarm industry has fought to keep it. It’s hard to replace free and reliable.

**WHY POTS IS LOSING GROUND**

There are several disadvantages associated with POTS that give ample cause to con-
Consider a cellular or IP-related solution. The first is the relatively slow data transmission rates (bandwidth) experienced using POTS for sending alarm signals. The second is a general lack of mobile applications. The third is the speed in which POTS lines in homes are going away for a generation of people that opt for cellphones only.

For example, panels using POTS lines for communication typically do not communicate faster than 300bps, while today panels on cell or network communicate at broadband Internet speed. The greater the bandwidth, the better that data transmission rate and the faster response the client will realize.

But wait, there’s more.

Metallic lines also are susceptible to an assortment of other problems worth noting. First, data sent along metallic phone lines can be corrupted or destroyed by electromagnetic (EM) sources, such as lightning, nearby high-voltage lines and sunspot activity. There’s also the possibility of deliberate sabotage, either on a local or catastrophic scale. Possible sources include the deliberate introduction of intense EM through an electromagnetic pulse (EMP) weapon. In addition, there could be someone armed with a pair of wire-cutters outside the premises (line-cut) or even a motor vehicle striking a nearby utility pole/pedestal.

Besides these issues, POTS is on the wane for two additional reasons. First, more and more households are switching exclusively to cellular or broadband VoIP. Second, POTS is gradually disappearing as telephone carriers work to retire their metallic cable infrastructure, replacing it with fiber or some other type of transmission media. Communication carriers are constantly working to convince the FCC that the public’s interest is best served by the development of an all-digital communication infrastructure. In fact, if AT&T had anything to do with it, obsolescence would have been declared long ago.

**LONG-RANGE RADIO CAN BE RELIABLE**

Alarm dealers continue to use long-range radio to send alarm and trouble signals from alarm control panels to their central station destinations.

**DON’T LET THE 2G CELLULAR SUNSET GO DOWN ON YOU**

There are those in the alarm industry who, no matter how close to obsolescence a product or service gets, will wait until the very last minute to assure their clients’ position. This is especially troubling where it comes to critical signaling technologies, in this case cellular. It’s not as if the alarm industry just received word that there’s only 30 days until cellular carriers intend to turn 2G off.

Currently, the obsolescence date is January 2017. However, no matter what that date might be, your 2G cellular systems are on borrowed time. Even now, 2G access is limited as cellular carriers provide more bandwidth to their 3G and 4G communication path. In other words, 2G access is being waned out a little at a time. One day, you’ll wake up and all your 2G-based systems will not work.

Manufacturers such as DMP are offering discounts, rebates, and other incentives designed to prompt you to make the switch now, rather than later when the task of changeover will likely be more involved and troublesome. For more information, go to dmp.com/2gsunset.
though it has decreased in recent years, this is still a viable technology for the time being that continues to provide quality communications with generally reliable data transmission.

Long-range radio operates using radio signals to send alarm signals through the air. A radio transmitter tuned to a specific frequency is used to send signals to an opposing receiver. Once installed and fine-tuned, this technology is reliable as it depends on a single point of reception that is under the control of a single entity, unlike cellular, PTSN and other transmission options.

There are two general types of long-range radio systems in use by alarm dealers. One uses repeaters composed of antennas on large towers, which, in turn, must be placed at specific intervals (typically every 10 to 25 miles). By comparison, cell towers must be placed every one to three miles to assure coverage. The second type uses a mesh radio technology where each subscriber location is equipped with a radio transceiver (receiver/transmitter). In this case, there’s no repeater necessary as each subscriber transceiver acts to convey alarm data from other subscriber units. The system uses call routing to determine the best path to take for the purpose of reaching the head-end.

One of the drawbacks associated with long-range radio is the same as POTS; there is no mobile application that integrates it with the client’s smartphone, alarm system, cameras or home control platform. The other disadvantage relates to the extreme start-up costs, such as towers, antennas, and other equipment that must be in place and continually maintained for the system to work.

Long-range radio also requires the need for FCC frequency allocations. The use of specific radio frequencies hinges on an application process whereby those who own the system must pay for the use of multiple frequencies. There is the potential that as the FCC is looking for additional spectrum, that these bands used by these systems may be reclaimed or severely limited, as they are not used at all in large parts of the country.

**CELLULAR RADIO AVERS LINE CUTS**

Hardline telephone may enjoy a significant portion of the alarm signaling traffic in the United States, but cellular is on a fast track and has been for years. The DMP CellComSLC cellular alarm communicator, for example, provides a fully supervised communication path over the CDMA network. Hardline telephone may enjoy a significant portion of the alarm signaling traffic in the United States, but cellular is on a fast track and has been for years. The DMP CellComSLC cellular alarm communicator, for example, provides a fully supervised communication path over the CDMA network.

The use of the Internet as a means of conveying alarm signals is another option, whether it entails broadband, a private WAN or cellular. Because of the Internet’s ubiquity, this method is becoming more popular with each passing day.

Since the advent of the Web in 1991, the world at large has found a new and economically inexpensive way to communicate. This is true whether it involves telemetry data between remote sensors and a central processing center, video images from a traffic camera halfway around the world, a computer located at a remote office in another part of town, or alarm signals from a residential alarm system sent to a central station five states away. For clients that already have broadband, it makes perfect sense to use it to send alarm signals.

The use of the Internet as a means of sending alarm and trouble signals is increasing by leaps and bounds as the industry seeks new and innovative ways to transmit alarm data to central monitoring centers. In addition to its low cost, there is an abundance of wireless access points and hardline connections available, both of which connect to LANs that additional RMR. For example, DMP’s virtual keypad app allows iPhone and iPad users to login to their alarm panel. The business or homeowner can arm, disarm and view the status of their alarm system anytime from anywhere. It also allows them to turn lights and appliances on/off, dim lights, adjust HVAC, as well as view surveillance cameras.

**GO IP OR GET OFF THE POTS**

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move data over the Internet.

Internet broadband connectivity begins with the Internet service provider’s (ISP) WAN, which in many cases means the use of a fiber backbone. High-speed concentrators/hubs are set in each neighborhood or locale to distribute service to multiple users in the vicinity. By combining Internet connectivity with a number of other signal transmission media, there is no limit to the combination of primary and secondary connections that can be established between net-monitored alarm panels and central station receivers.

For example, DMP has developed adaptive technology where if the primary communication path is blocked in some manner, the system will transparently transition from one communication media to another. According to the manufacturer, the transition is fast enough that supervision and signals are not dropped or lost. “This allows a system to be fully supervised when one communication path is bad,” says Roberts. “In that manner, when sending signals via cellular, expensive cell traffic is minimized when all paths are good.”

The Internet also provides additional RMR opportunities alarm dealers should take advantage of, such as “cloud”-based video surveillance data storage now being offered from some manufacturers. What makes this service exciting is that customers do not have to purchase a DVR but can instead store their cameras’ video in a hosted service for a reasonable monthly fee, and they can view the images from anywhere through most Web-connected devices.

Ultimately, alarm dealers need to decide for themselves what alarm communication is best for their own business. However, keeping a keen eye on the future and the ability to tie RMR to mobile apps is going to be of ever-increasing importance. Consumers have proven that they are willing to pay for convenience and mobile control. Alarm companies need to plan how to transition to charging more for these additional services.

Ubiquitous and inexpensive, use of the Internet to send alarm and trouble signals is increasing by leaps and bounds.