White Paper

Assure Voice over Internet Protocol (VoIP) Communications Compatibility for Your Next Alarm Panel Installation

Demand for lower-cost telecommunication services and ubiquitous broadband connectivity have driven the growth of emerging VoIP technologies. When considering VoIP deployment, alarm installing companies must keep in mind that the FCC does not regulate the Internet or VoIP phone services, and as a consequence providers are not aware of ways that VoIP can interfere with alarm signal transmissions.

Because VoIP technology is designed to carry digitized data packets over the Internet instead of electromagnetic sound waves over telephone lines, VoIP transmissions are more efficient and less costly—and thereby more attractive to homeowners and, increasingly, businesses.

But VoIP is still an emerging technology and some tone-based security transmission protocols are incompatible with VoIP. For alarm installing companies, the growing popularity of VoIP is an important issue because alarm transmission formats designed to transmit pulsed tones over telephone lines are incompatible with VoIP systems designed to send digital data over the Internet. Incompatible formats can compromise signal integrity.

For pulsed tone alarm signals to be transmitted properly via the Internet they must be converted into digital packets with a converter at the sending end and then back into pulsed tones at the receiving end. The pulsed tones and the spaces between them must be recreated exactly at the receiving end before the receiver will accept them.

In spite of the incompatibility of legacy tone-based (DTMF) protocols, alarm formats using true modems for converting digital packets into analog signals have proven to be the most effective solution for alarm panels communicating on VoIP networks. DMP Digital Dialer format uses synchronous data link control (SDLC) over a modem to provide continuous transmission at a rate that the receiver can read properly. Non-modem formats can experience difficulty with compression that garbles messages and interrupts signal transmission to the central station. Ongoing testing of alarm systems on any VoIP network is still essential, however, to ensure that alarm signals continue to be properly transmitted.

Preferred VoIP Service
Two types of systems are commonly used to provide VoIP services. The difference lies primarily in the installation and configuration of the equipment.

Non-facility based VoIP technology converts phone calls into digital VoIP packets. This service often requires existing broadband access and typically uses self-installed units that consumers purchase from electronics stores or order online. Self-installed non-facilities-based systems are the primary sources of problems when it comes to alarm signal transmissions that fail.

A facility-based VoIP service uses equipment installed, managed and serviced by the VoIP provider. The provider's control over the equipment generally makes for a more reliable network.

How VoIP Affects Alarm Systems

An alarm installer's first consideration is telephone line seizure—one of the alarm industry's most common installation practices. By installing an RJ31X jack between the incoming phone service and all local phone jacks, the alarm panel should seize the incoming phone line during an alarm. By seizing the line, the panel cannot be interrupted by a local phone going off-hook during an alarm transmission.

When VoIP is installed, the VoIP adapter is connected to a DSL or cable modem for Internet connectivity. The VoIP adapter is often incorrectly connected to the closest telephone jack. Digital phone service and dial-tone is back fed to all phone-jack wiring on the premises. This incorrect installation procedure by the installing VoIP provider defeats line seizure.
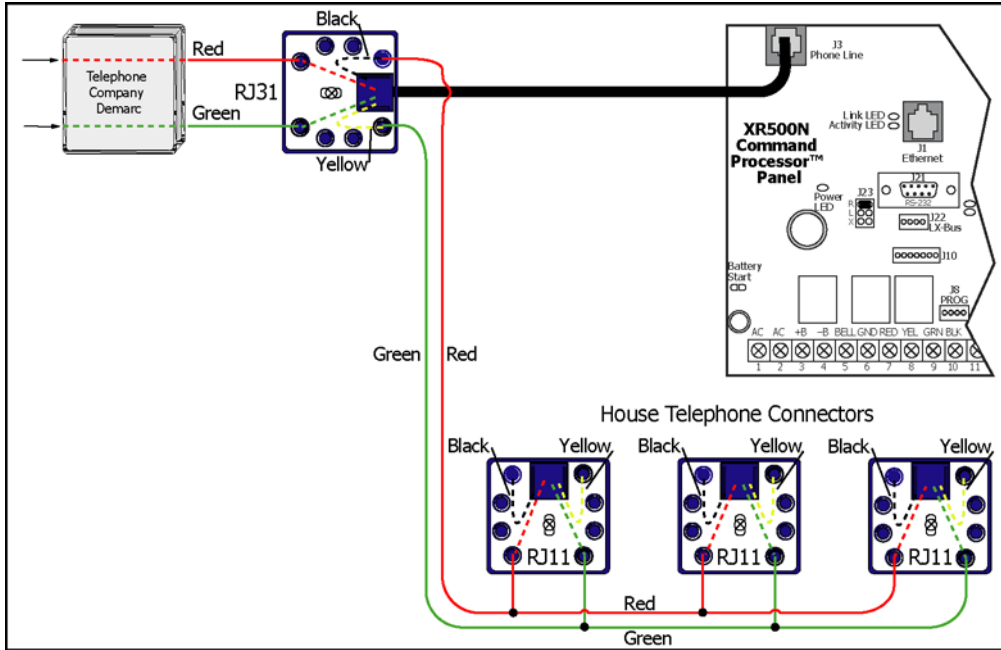
Correctly connecting the VoIP adapter directly to the RJ31X installed by the alarm company ensures phone line seizure for the alarm panel.

VoIP Compression Affects Alarm Communication

With a connection via POTS or circuit-switched phone service, a call from the caller's phone to the listener's phone provides the same amount of bandwidth whether callers are talking or there is a silent pause.

To save network bandwidth, the VoIP protocol strips the silence when the data is packaged, compressing the signal and making for a smaller file size. In the conversion process VoIP can change the timing of the pulsed tones and thereby garble the message. Modem-based formats such as SDLC are the preferred alarm panel format for success in VoIP transmissions because these formats do not have any silence for the VoIP to strip away.

To compound the problem, the compression ratio used by different VoIP providers varies greatly from one provider to another and can be set by the consumer when using a non-facility base offering. Even within the same provider's network, the compression ratio or bandwidth may change or be modified based on network capacity.

No regulations require careful testing of alarm formats to prove their dependability, so frequent testing by alarm dealers is required to ensure that signals are getting through to the monitoring facility. Sidestepping VoIP by using radio transmitters and cellular transmitters that do not rely on landline telephone service is one alternative, but these services add hardware costs and monthly fees to the installation.

Solutions for Alarm Communications

IP (Internet Protocol) transmitters designed to send alarm messages in a network environment are a solution to consider when faced with VoIP applications. IP networks are supervised, so if a signal failure should occur, the central station—and end-user—will be notified. Traditional phone lines are not similarly supervised and do not report signal interruptions automatically.

The DMP Digital Dialer Format is a digital data format and thereby provides superior signaling on VoIP networks through message verification and retransmission of bad data packets. If the message is received incorrectly, the receiver will ask the panel to resend the message. In addition, the Digital Dialer Format has a constant carrier on the line and is not critically dependent on the timing of silence between the tones, which is what goes out of sync in formats that use DTMF tones via VoIP. Even modem formats should be tested for reliability.

Best Practices for VOIP Installations

When installing alarm panels with VoIP communications, include the following features and procedures:

1) Telephone line seizure and correct installation of RJ31X and VoIP adapter.
2) Back-up power for DSL or cable modem and VoIP adapter.
3) Test the alarm format with each of your VoIP providers to ensure proper communication to the monitoring facility.
4) Program a periodical test message (supervised) from the subscriber's premise to the central monitoring facility.

DMP is a privately held independent manufacturer of advanced alarm products that are designed and made in the United States of America. DMP is the recognized leader of alarm communication over data networks, with products that are available through professional alarm installing companies worldwide. For more information about DMP visit www.dmp.com, or contact your local DMP representative.

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