



White paper

Wireless monitoring and intrusion detection in commercial facilities

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Wireless vs. Traditional Hardwired Approaches to Security

Whether we refer to a financial institution, a retail store, or other commercial building, the story is the same. Security executives' budgets are tight and getting tighter, and they have a short time frame to install and update their security systems. Wireless technology has become an invaluable tool. Due to the labor savings of not pulling wire from the security panel out to the sensors, installation of a wireless security system not only saves time, but money. Depending on the difficulty of the installation, these savings can be impressive, and there are some environments which simply can't be hard-wired at all. This paper discusses the time and cost savings provided by wireless technology. More importantly, it addresses the reliability and additional functional opportunities a wireless solution affords.

For the purpose of this white paper we'll define a commercial facility as a private or public office building, warehouse, distribution center, school, refinery, multi-tenant strip mall, or agricultural facility, as well as anything else that doesn't neatly fall into other classifications, such as retail or financial. We have addressed the retail and financial enterprises in their respective white papers.

The structures and features that make up these commercial businesses all have at least one thing in common: each is unique, and tailored to specific business needs. In all of these establishments, the protection of assets and life are essential parts of the business plan. Physical security systems are essential in creating a safe and secure environment. Without proper security systems, the safety of employees, business assets, and business investment is put at risk.

Commercial businesses have traditionally relied on an array of security sensors for their burglar alarm and intrusion detection systems. These sensors have been hardwired into security panels to monitor the physical space inside, and often around a portion of the area outside, the facilities. Sensors can include motion detectors, door and safe contacts, glassbreak detectors, and fixed-location panic buttons.

A wireless security approach provides the same sensor options of a hardwired system, without the expensive and cumbersome wiring costs, and can offer additional flexibility

The security panel used in traditional hardwired systems is typically the same panel used in a wireless approach. Wireless solutions have evolved to work with virtually any commercially available security panel.

and functionality. Wireless security systems have been used in commercial, retail, financial, and government institutions for decades.

As commercial enterprises have become convinced of the reliability, value and dependability of a wireless approach, they continue to expand the use of wireless to additional locations, facilities, and especially applications. Some of the most recognizable facilities in the world have adopted wireless security systems for their buildings, providing a testament to the maturity and proven performance of the underlying wireless technology.

Functional Advantages of Wireless Security

Security systems that rely solely on wired connections perform adequately in static locations, but fixing conduit and stringing wiring can be difficult in many commercial areas. Likewise, once the pipe is fixed in place, it is nearly impossible to easily and quickly adapt to changing site plans or seasonal adjustments. Similarly, when a facility is upgraded — during a warehouse expansion, for example — the installation cost of a wireless approach provides significant savings. The following sections will continue to highlight some of the benefits of a wireless approach.

Avoid Costly Installs

Hardwiring a security system can be cumbersome, time-consuming and costly, and some areas can be difficult, if not impossible, to wire. Take a distribution center with dozens of overhead doors, for example. Implementing a hard-wired solution would require pipe and conduit, the associated hangers, the wire carried inside the pipe, the labor to install the run of pipe and wire, and the equipment to lift the installers into position. Another example, could be if the enterprise needs to monitor the status of a set of entry gates. Installing wireless sensors in an existing wireless network is quick and easy, with no wires to run.

A wireless approach allows any commercial enterprise to easily adapt to facility adjustments, site plan changes, or new monitoring requirements. Hardwiring security devices in those hard-to-reach points of access drives up the cost of

installation, and makes job completions unpredictable. Moreover, older facilities can present additional wiring challenges, due to thick walls, high ceilings, and asbestos abatement issues. All of these wiring challenges add time and costs that can impact the financial success of the enterprise.

The wireless approach presents a superior alternative. Using a large warehouse with a small outbuilding as an example, let's suppose there's a new requirement to monitor the outbuilding for intrusion. Instead of having to pay thousands of dollars to trench from the main warehouse to the outbuilding, wireless devices are simply mounted where they are needed. Installation costs are reduced, a timely completion is ensured, and the necessary secure environment is maintained.

Reduce Maintenance

It is highly recommended that periodic manual testing, in addition to automatic supervision, be performed to ensure system reliability.

Supervision is the ability of a security system to monitor the health of the connection between the security sensor and the security panel. Wireless supervision automatically monitors the wireless link between the sensor and the security panel to ensure the devices are operational without manual intervention. Intelligent wireless systems monitor the integrity of the wireless link between the transmitter and the receiver, as well as the status of the transmitter, providing battery and tamper information.

Provide Additional Functionality

Wireless also offers additional functional advantages. The most obvious example is a wireless security pendant that gives key employees the ability to trigger an alarm from anywhere in the building or parking lot without the encumbrance of wiring.¹ Pendants are an ideal wireless application, as employees are mobile by nature. Pendants can also be used as safety buttons for workers alone in case of accident.

In addition to the wireless pendants being used for security applications, wireless sensors can be used in an almost infinite variety of ways to solve wired problems. We haven't found an application that a wireless solution would not be an appropriate alternative.

1. This requires careful management of supervision events and processes.

Economic Advantages of Wireless Security

The economic advantages of wireless security can be demonstrated by comparing a hardwired solution and a wireless solution in a series of examples. The examples were chosen to demonstrate wireless systems as cost effective for all sizes and shapes of commercial enterprises. The examples used are a distribution center, a multi-story office building and a municipal campus complex. In order to make the examples as real-life as possible we've presented both typical and complex wiring installation scenarios.

In each of the wireless examples a number of duress pendants proportional to the installation size are included. Obviously, they aren't included in the wired system because they aren't possible. For specific installations the number of pendants can easily be increased. The cost savings alone justify the use of a wireless system, but the addition of functionality afforded should convince a management team to explore the benefits of a wireless solution.

The following examples are based on real world scenarios, and may or may not reflect your specific experience. However, the general conclusions about the difference in labor cost should be applicable to any situation.

Although the following analysis focuses on specific examples, the conclusions are generally applicable to facilities of practically any size. As you would expect, the greater the number of monitored points, the greater the savings. While most locations have an existing security and/or monitoring system in place, successful enterprises are usually performing a number of upgrades somewhere in their facilities. This continuous renewal of the underlying security system presents an excellent opportunity to examine the merits of implementing a wireless security solution.

While the number and types of burglary and intrusion detection devices vary from location to location, the goal of each installation remains the same: to keep assets and employees safe and secure and to reduce losses from robberies and break-ins.

Economic Advantages for a Distribution Center

A typical distribution center building is characterized by a large number of overhead doors where stock is off-loaded from either trucks or railcars, and re-loaded onto freight vehicles for delivery. These facilities have very high ceilings, large open areas, and millions of dollars of inventory that must be monitored. Given the amount of inventory that must

be managed and tracked, these facilities are large by their nature, translating into multiple entry points that must be monitored. We will primarily focus on monitoring against intrusion, including the access gates, the roadways to and from the building, and the building itself.



Figure 1 Distribution center

Table 1: Breakdown of distribution center wireless savings

	Hardwired security system (125 points)				Wireless security system (130 points)			
	Equipment	Labor hours	Labor cost	Total	Equipment	Labor hours	Labor cost	Total
Complex	\$19,450	390	\$58,500	\$77,950	\$20,700	86	\$12,900	\$33,600
Typical	\$16,350	234	\$35,100	\$51,450	\$20,700	78	\$11,700	\$32,400

Table 2: Total distribution center wireless savings

	Labor hours	Dollars	Percentage
Complex	304	\$44,350	57%
Typical	156	\$19,050	37%

Economic Advantages for a Multi-Story Office Building

Multi-story office buildings come in all shapes and sizes. For the purpose of discussion, we'll use a private example that has five floors with 20 offices per floor. Our example includes an e-commerce company with a staff of 25 and an IT room with multiple servers running email applications, along with a number of legal and medical professionals.

The security system needs to monitor the lobby, the elevator, and each office and floor. The medical offices require a high degree of monitoring due to the expensive equipment contained in the offices. The IT room of the e-commerce company needs special monitoring; in addition to the security devices necessary to protect the room from intrusion, the temperature and humidity must be monitored to prevent any equipment from overheating and failing. The receptionist in the lobby will also need a wireless pendant for any problems that could arise.



Figure 2 Multi-story office building

Table 3: Breakdown of multi-story office building wireless savings

	Hardwired security system (135 points)				Wireless security system (137 points)			
	Equipment	Labor hours	Labor cost	Total	Equipment	Labor hours	Labor cost	Total
Complex	\$14,150	420	\$63,000	\$78,150	\$20,850	90	\$13,500	\$34,350

Table 3: Breakdown of multi-story office building wireless savings

	Hardwired security system (135 points)				Wireless security system (137 points)			
	Equipment	Labor hours	Labor cost	Total	Equipment	Labor hours	Labor cost	Total
Typical	\$14,150	251	\$37,650	\$51,800	\$20,850	82	\$12,300	\$33,150

Table 4: Total multi-story office building wireless savings

	Labor hours	Dollars	Percentage
Complex	330	\$43,800	56%
Typical	169	\$18,650	36%

Economic Advantages for a Municipal Campus Complex

A municipal campus complex typically contains government offices, police and fire department buildings, and a public works facility. In this example we're assuming that each door and window is monitored for intrusion, that emergency pendants are required for each building, and that the HVAC systems need to be monitored for temperature and humidity.

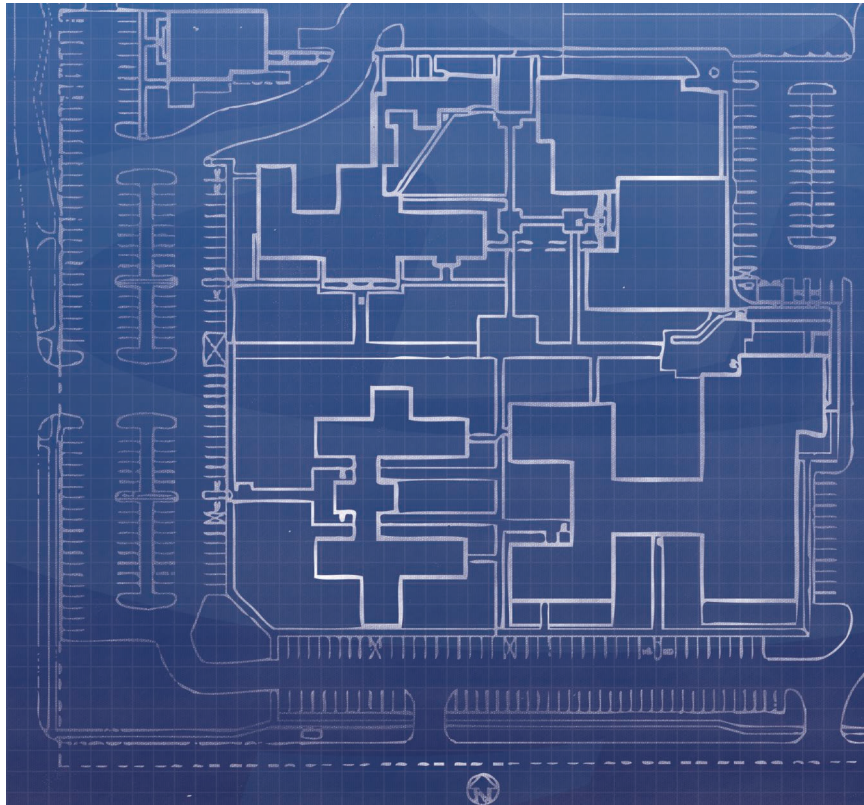


Figure 3 Municipal campus complex

Table 5: Breakdown of municipal campus complex wireless savings

	Hardwired security system (10 points)				Wireless security system (11 points)			
	Equipment	Labor hours	Labor cost	Total	Equipment	Labor hours	Labor cost	Total
Complex	\$19,250	309	\$46,350	\$65,600	\$19,700	72	\$10,800	\$30,500
Typical	\$14,600	187	\$28,050	\$42,650	\$19,700	65	\$9,750	\$29,450

Table 6: Total municipal campus complex wireless savings

	Labor hours	Dollars	Percentage
Complex	237	\$35,100	54%
Typical	122	\$13,200	31%

Reasons to Choose Inovonics as Your Wireless Security Provider

Wireless security solutions provide significant functional and economic advantages. Now consider some reasons why Inovonics is the wireless security provider of choice.

Market Leadership

For decades, Inovonics has been a pioneer and the market leader in the field of wireless sensor networks. Millions of Inovonics transmitters, repeaters, and receivers are installed in commercial installations throughout the world, including retail outlets, banks, hospitals, government buildings and other protected sites. Some of the most respected and well-known facilities in the world trust their safety and security to Inovonics.

Proven, Reliable Record

Inovonics offers the best range, reliability, sophisticated self-diagnostics, and scalability in the market today — all of which help to ensure reliable operation. The Inovonics system conducts periodic battery tests and provides a two-week advance notice if battery replacement is required. If a transmitter malfunctions, our system has the capability to provide an intelligent alert message so that security personnel can quickly and easily resolve the problem.

Solutions Known for Superior Performance

Inovonics security solutions use a 900 MHz, frequency-hopping, spread spectrum radio technology for superior reliability and performance. This is the same wireless technology approach adopted by the U.S. military due to its incomparable resistance to noise, interference and interception.

Flexibility

Inovonics security solutions are designed to provide maximum flexibility. They can be installed in conjunction with any major control panel from leading manufacturers such as

Honeywell, Bosch, Pacom, ICT and Sonitrol. Because Inovonics solutions can be deployed on virtually any security control panel, users are free to choose the security integrators with which they are most comfortable, including industry leaders like Johnson Controls, Everon, Securitas and Convergent.

Summary

Hardwired solutions present problems in the form of difficult or impossible deployments. The resulting cost of installation is the primary disadvantage of hardwired security systems.

The examples demonstrate that commercial facilities of any size can benefit from significant savings using a wireless security solution and receive additional functionality. The examples show savings of more than \$13,000 to more than \$44,000 per location, depending on the size of the facility and the number of monitored detection points. With labor and cable costs on the rise, these savings are likely to increase over time. The examples show that the Inovonics security systems are cost effective, and they can be used by any size retail enterprise.

Wireless security has existed in the commercial facilities for decades. Early adopters started with pendants and evolved their solutions over time. Commercial facility managers are finding that after they adopt the infrastructure to accommodate wireless sensors, they can easily scale or adjust the security system by adding additional monitored points to the existing platform and reap greater economic benefits.

As commercial enterprises install wireless systems and experience their value, reliability, and dependability, more and more are upgrading to Inovonics security solutions for all of their security system needs.

For more information, contact us at 800.782.2709, option 1 or at www.inovonics.com.