MicroSearch Wireless Sensors

MicroSearch:

The Evolution of Human Presence Detection to Meet Today's Perimeter Security Needs

Challenge

Perimeter security is of paramount importance for preventing inmate escapes from walled facilities. Millions of dollars are spent every year equipping prisons with state-of-the-art perimeter detection systems. Fencing, surveillance cameras, microwave, taut wire, and ground sensors are commonly used to fortify the perimeter and alert staff to breaches. Perimeter and vehicle sally ports are the weakest links in prison infrastructure. It's estimated that vehicles ingress and egress tens of thousands of times daily in the U.S., seriously compromising the perimeter.

Over the years, prisoners have come up with all manner of attempts to escape in vehicles, including laundry trucks, garbage trucks, prison industries vehicles, official and private vehicles, etc. It's easier than one might think for an inmate to hide inside a truck, and prisoners have been found hiding in boxes, garbage, laundry, or concealing themselves on the roof, in the trunk, and even the frame or engine of the vehicle.

Any escape is one too many when it comes to public safety. Although policy may require vehicle searches, it's exceedingly labor intensive and the margin for error is high. Visual inspections alone don't ensure the vehicle doesn't have a person inside.

MicroSearch Human Presence Detection

For decades, the industry standard for technology-based human presence detection has been MicroSearch, which detects human beings by sensing the vibrations caused by the heartbeat of humans hiding in vehicles or containers that are loaded on vehicles. MicroSearch technology vastly improves the accuracy and reliability of human presence detection. The system uses seismic sensors to detect the subtle vibrations of the human heartbeat that are transmitted through the vehicle's surface. The system is sensitive enough to identify human presence even inside a heavily loaded truck. In less than a minute, it detects and alerts if there is a person inside.

MicroSearch is easily used in existing prison infrastructure and settings, and requires little training for operators. Inspection personnel simply place magnetic sensors on a vehicle or a container, and MicroSearch can determine whether a human is inside without the time-consuming and expensive task of unloading and inspecting the entire vehicle or container and all the contents.

MicroSearch is now used extensively for critical infrastructure, military, cargo, border control, and prison security. Today, there are more than 500 prison installations worldwide.

Origins

The first iteration of MicroSearch was developed in the early 1980s and was a standalone battery-operated unit that incorporated sensors and was placed on top of a vehicle that incorporated sensors to make MicroSearch "intelligent."

Investments and Evolution

In subsequent years, MicroSearch has evolved to meet the changing needs of the prison industry. The second release, MicroSearch G2, added a ground sensor to mitigate ground vibrations that might, sometimes, affect the results. G2 also incorporated a laptop computer, software database, and 50 foot sensor cables for use on any size vehicle. MicroSearch G3 added two additional ground sensors to mitigate very noisy environments. Additionally, MicroSearch employed more-intuitive user interfaces to make operation easier for officers. Management features, reports and biometrics were also added for greater accountability.

In 2016, MicroSearch G4.0 was released, which offered improved accuracy and a better user experience, including individual live signal traces, a wind sensor, and a still camera. The same year, a travelling service vehicle that housed MicroSearch was introduced for moveable demonstrations and tests and as a model for mobile applications where a fixed location was not feasible or convenient.

More recently, MicroSearch was equipped with the most revolutionary advancement in heartbeat detection to date. Responding to concerns that environmental anomalies occasionally caused false positives, wireless sensors were engineered. These wireless sensors virtually eliminate the problem and offer the same reliability and accuracy as wired sensors, with the improved flexibility and convenience of no cabling. All the wireless upgrades were engineered to be backward compatible to any MicroSearch G3 or newer system. This upgrade was well-received both in the United States and abroad. The first wireless system in the U.S. was installed at a Florida Department of Corrections facility in 2018.

Future Enhancements

Today, investments continue to be made to improve MicroSearch functionality and ease of use. Most notably, funds are being invested to develop totally standoff sensors that will be even more convenient for users. The intent is to have a series of sensors embedded in the ground. Vehicles would simply drive over the sensor locations to perform the test. Currently in the prototype stage, a commercial launch is expected in late 2019 or early 2020. Like all previous technical improvements, these enhancements will be backward compatible with existing systems to allow customers the opportunity to upgrade rather than purchase all new equipment.

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