AIRPORTS | Use case

Safe Fences, Safe Runway

Three Major Airports in Italy chose the Sioux Mems Fence-Mounted System To Protect Their Perimeters

Perimeter protection has become an important part of security systems, since in recent years to protect large and crowded facilities with enhanced defense became more and more a priority. Among those critical infrastructures' perimeters there were airports, which were specifically addressed for protection by European Union regulations, topping the list among all public places for their size and for the large numbers of people moving through daily.

It's well-known that unwanted intrusion begins earlier than entering a facility, i.e. from the border of the property itself. A passive physical hindering measure, like a fence, can become more effective deterrent in combination with electronic systems, able to transform it into an active line of defense.

))) The Sight

In 2018, three of Italy's major Airports, Malpensa, Linate (near Milan) and Fiumicino (near Rome) chose CIAS' full IP solution with Sioux Mems 3.0 to provide intrusion protection to their secured perimeters,

achieving sound results in terms of detection performance and reliability. Totalling more than 47 miles (75 km) of perimeter coverage on fence, installation of Sioux Mems fence-mounted system proved to be of high quality and cost-effective, thanks to its unique analysis of the digital signal based on fuzzy logic, coupled with the simplicity of its design for a fast deployment on the fence line.

))) The technology

CIAS' Sioux Mems Pro2 is the latest release of the Sioux Mems 3.0 firstly introduced to the market in 2012. The

Detection of any climbing, cutting, lifting the fence or displacing of the sensors
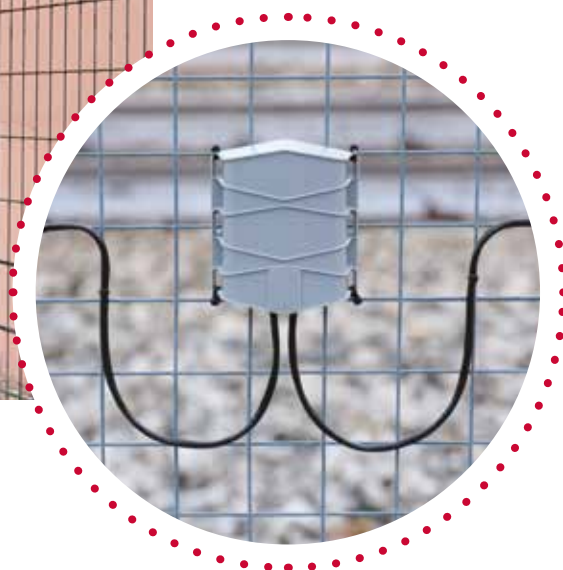
Sioux Mems Pro2

high-performance detection is based on self-addressing electromechanical micro sensors technology. The accelerometric sensors, structured in groups of 7, are distributed along the perimeter to analyze the vibration on the 3 spatial axes, and are connected to their Controller which continuously interpolates these data reporting the electrical noise perceived throughout the fence. The signal is finally analyzed with Fuzzy Logic algorithms, at a level which provides the exact intrusion point with ...an accuracy of 3.28ft (1m).

))) The Installation

With Mems sensors every 5 meters, deployed with easy plug and play RJ-45 connection, the system provides excellent detection of any climbing, cutting, lifting the fence or displacing of the sensors, giving utmost accuracy of alarm pinpoint. It therefore suits any kind of fence, from flexible woven or welded mesh to rigid mesh or palisade type, which can also present contemporarily in large perimeters.

Using the patented 'Touch & Zone' sensors' configuration method, alarm zones were simply and quickly defined. The Sioux Controller Unit, being natively IP, was enabled with PoE allowing for optimal cable saving installation.

The system at that time could provide up to 700 meters of perimeter coverage and was equipped with up to 20 zone-alarm relay contacts for simple and universal integration – whereas now it can reach up to 4600ft (1400m) per Control Unit and up to 80 alarm zones.

))) Alarms

Compliant to – but in fact exceeding – the strictest requirements of the airports' protection bidding, Sioux Mems offers extremely low nuisance alarm and false alarm rates (NAR/FAR), along with the highest probability of detection (PoD) available on the market, over 95 percent. Qualifying alarm events are reported as quickly as 500 ms, well below the typical requirement of 3 seconds not a standard performance!

High-level and accurate IP-based alarm integration was provided by IB-System-IP: communications gateway software. Last, by using the freely available SDK, the simple and open architecture protocol allowed for ready integration to any alarm or video management platforms – already functioning at that time, or to come in the airports' premises. Effectiveness and reliability of the system's IP alarm communications has been thoroughly and successfully tested and proven by the airports' authorities during all those years.

))) Development Highlights

In 2019, CIAS released the more powerful version Sioux Mems Pro2 which adds a series of advanced functions to the system, for example the extension up to 4600ft (1400m) per Control Unit. The number of alarm zones is increased to 80 zones, whether as a logical subdivision via the dedicated Sioux Test Pro sw or as a physical section via relays. The most evident novelty of this release is the new mechanics.

It is completely screwless and suitable for a practical fixing with ties on any type of fence. Depending on the fence being mesh, rigid or high-security, various presets helps the configuration, however freedom of fine calibration is granted. The IP66 increased rating, the inclinometric anti-removal embedded tool and the special bracket accessory complete the sensor innovation. At the level of analysis, the Enhanced Cut Fuzzy Logic provides even more sophisticated cut detection. It is up to now, the most difficult parameter to obtain in fence detection systems – together with the possibility of managing one cut per branch without loss of functionality of the whole system. A real advantage for high-risk sites is the redundancy function. It enables the system to be short circuit-proof even in the event of cable cutting.

Sioux Mems Pro2 enables the extension up to 4600ft (1400m) per Control Unit