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SALES UPDATE

INTREPID MicroPoint Fence Disturbance Sensor
Key Feature Comparison to Past-Generation Sensors

Past-Generation Fence Disturbance Sensors

Prior to embarking on MicroPoint development, Southwest Microwave, Inc. (SMI) surveyed a broad base of military, government and industrial users of fence disturbance sensors. The problems these users encountered with fence sensors became part of the design criteria for MicroPoint, and are summarized below. Figure 1 illustrates typical characteristics of past-generation fence sensors.

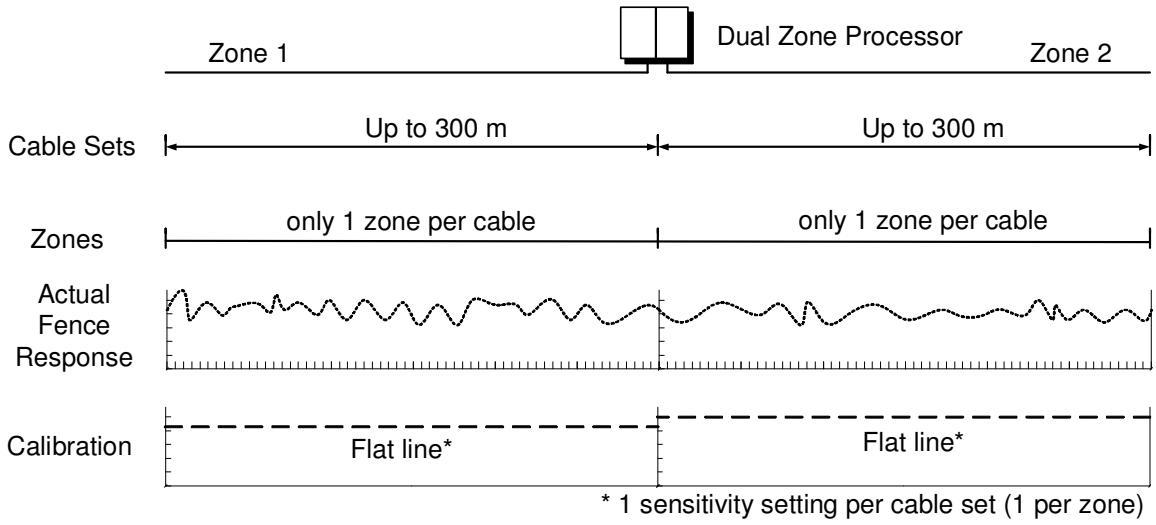

Figure 1. Typical Past-Generation Fence Disturbance Sensor Characteristics

- *Sensitivity and Probability of Detection (Pd)* – all fences have significant variations in sensitivity response from panel to panel – some are tight and others loose. Past-generation fence sensors could not be easily adapted to fences of varying tension, resulting in wide variations in detection sensitivity and Pd along a sensor zone of fixed length. Fences required uniform tensioning, numerous cable adjustments and often the use of extra sensor cable.
- *Nuisance Alarm Rate (NAR)* – these same significant variations in panel to panel sensitivity produced a high NAR since the number of event counts were additive for an entire zone of fixed length (equal to cable set length). The only way to alleviate high NAR was to increase the number of counts which consequently reduced Pd. There was no way to isolate a problem area to compensate for high NAR without compromising Pd for the entire zone since there was only one detection threshold per zone, i.e., only one sensitivity setting per zone. The sensitivity of the past generation sensors was adjusted to provide detection at the weakest point along the zone. As a consequence, this same sensitivity setting was too high for much of the remainder of the zone, resulting in unwanted nuisance alarms. With the ability to locate, we can now have a separate threshold at each meter along the cable.
- *Location* – no fence sensor could locate the exact point of an intrusion within a cable set. This prevented the identification of variations in fence response. It also adversely affected alarm assessment and response time, as well as Pd and NAR.
- *Cost* – users were penalized when short zones, 100 m or less, were required for high security sites because more processor electronics were required for each zone. Each processor also required a separate, i.e., independent power and data communications network.

MicroPoint's Unique System Design

MicroPoint was designed to be the first smart sensor for fence applications. The design was intended to account for the principal concerns of many users. An outline of MicroPoint's unique characteristics is provided below and illustrated in Figure 2.

MicroPoint incorporates sensing technology that is unique for fence disturbance sensors. It not only detects intrusions but locates them to within three (3) meters, but it has several other features which are unique and enable adaptation to a wide variety of fences and environmental conditions. These are:

- *Time Domain Reflectometry (TDR) Technology* – pulses are sent from the processor at a constant rate down the center conductor of the cable, creating an electric field within the cable. When the fence is disturbed, sense wires in the cable move through the electric field inducing a pulse at the point of intrusion. The pulse reflects back to the processor, and using TDR, the time delay is calculated to precisely locate the intrusion.
- *Point Impact (Spatial) Discrimination* – MicroPoint can discriminate between a fence disturbance caused by a cut or climb and distributed fence noise caused by wind, rain, and nearby vehicles. MicroPoint accomplishes this by dividing each cable set into 190 subcells (each 1.1 m long) and simultaneously comparing the events in each subcell with events in adjacent subcells. This approach ensures rejection of NAR sources (e.g., wind, rain, vibration) which occur in many subcells at the same time without compromising Pd.
- *Fence Characteristics* – chain link fences do not require retensioning with MicroPoint, and it works equally well on welded mesh and expanded metal fencing.
- *Sensitivity Leveling* – is the technique MicroPoint uses to account for the actual meter by meter response of the fence. Control parameters can be adjusted for each control segment (group of subcells) to optimize MicroPoint for the actual fence conditions. Once a "sensitivity profile" is established (i.e., the actual fence response), a calibrated threshold is set to uniformly account for sensitivity variations along the entire sensor cable. Thus, Pd and NAR are also consistent along the entire sensor cable. For each Processor Module (PM), up to 20 control segments can be created and set to different thresholds, detection levels and detection windows. Segments can also be setup to avoid detection in certain areas, if required. The calibration technique is automated and done in software, and no physical cable adjustments are required.

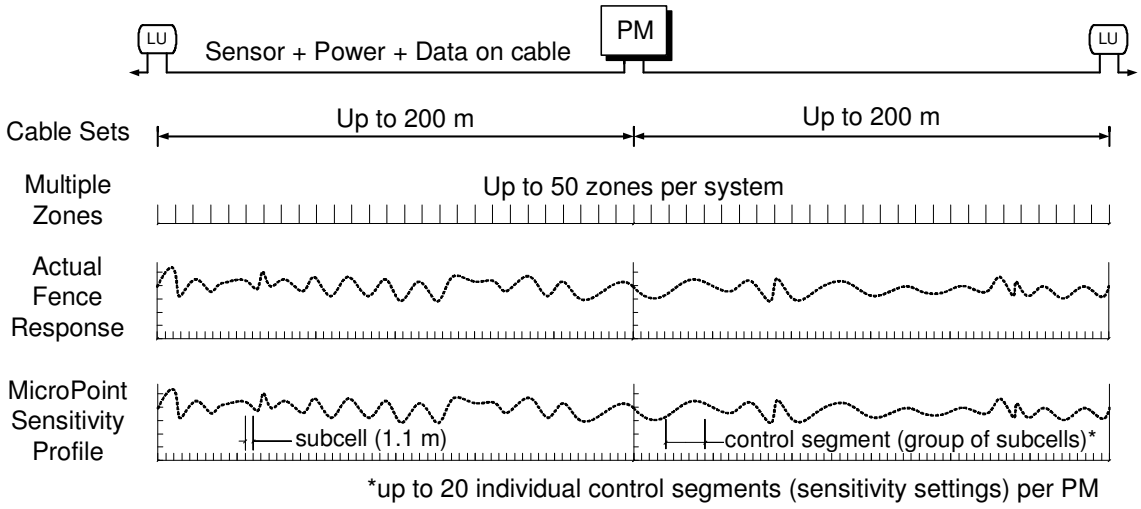

Figure 2. MicroPoint Smart Sensor Characteristics

- *Free Format Zoning* – this enables detection zones to be set anywhere along the sensor cable through software. Therefore, detection zones are independent of the physical cable set(s) and electronics. Up to 50 zones of various lengths can be created for each system of up to eight PM's. Thus, zones can be setup to match site conditions, optimum camera positions, gates, corners and buildings.
- *Power and Data Communications* – the sensor cable doubles as a power and data network for up to eight PM units creating a perimeter up to two miles in length. For larger sites more systems can be added. This network can also be used for auxiliary sensors, such as, microwaves at a gate areas.

- *Auxiliary Devices* – the MicroPoint system allows auxiliary sensors (e.g., microwave, PIR beams) to be connected for DC power and alarm communications. This eliminates the need for additional costly wiring, power and infrastructure and provides a complete perimeter system.

Parameter	***Past-Generation***	***MicroPoint***
Pd: NAR	Moderate: High	High: Very Low
Detection zones per processor	1	Up to 50
Threshold settings per processor	1	20
Ability to compensate for fence variations	No (flat line)	Yes (matches fence response)
Operates on un-tensioned fence	No	Yes
Integral power & data	No	Yes
Remote diagnostics	Minimal	Full control
Cost of ownership	High	Low

Figure 3. Comparison of MicroPoint to Past-Generation Fence Sensors