THE ULTIMATE PERIMETER PROTECTION SENSOR

VibraTek® Plus

Welded mesh fence
Expanded metal fence
Chain link fence
Palisade fence
Doors and gates
Walls, floors and ceilings
The fourth generation vibration-sensitive linear sensor was specifically designed to provide high performance intruder detection capability when deployed on fences or other barriers used to define the perimeter of a secure site.

The development of VibraTek® Plus draws on knowledge gained over more than 25 years operational experience of intrusion detection system design, and in particular, from the highly specialised external perimeter market sector where vibration sensing technology applied to fence structures constitutes by far the most widely used and cost-effective method of intrusion detection.

VibraTek® Plus is a sophisticated, yet easy to install sensing device, based on well established engineering principles carefully chosen to ensure maximum detection performance allied with an enviable low false alarm rate. Considerable design effort has been expended to ensure that the mechanical characteristics of the sensor cable closely match that of the range of fences it is designed to protect, thereby ensuring optimum performance.

VibraTek® Plus is manufactured as a cable form allowing easy installation and commissioning by any competent electrical technician.

**Theory of Operation**

The VibraTek® Plus sensor operates as a linear induction generator whereby precision made concentric conductors within the sensor are arranged to vibrate within a static magnetic field generated by flexible ceramic magnetic profiles.

Mechanical vibrations resulting from intrusion activity are coupled into the sensor through direct contact between the sensor and the protected structure (fence, wall, railing, etc). The mechanical energy of vibration is converted to an electrical signal by the sensor by induction of electrical currents into the active conductors within the sensor.

VibraTek® Plus differs from other linear magnetic sensors in that it incorporates mechanical damping designed to eliminate spurious responses that occur with undamped sensors of similar design. This key difference in the design of the sensor is fundamental in achieving significant improvement in detection performance without degrading the inherent resilience of the sensor to environmentally generated alarms.

The electrical signal created by the sensor is an accurate representation of the mechanical energy which created the signal. This enables the signal analyser module to which the sensor is connected to reliably classify the signals as either hostile, intrusion related signals, or non-hostile signals such as those caused by wind, rain, hail, or other environmentally related activity.
Technical Advantages

Unsurpassed Signal To Noise Performance
The smallest intrusion related mechanical activity detected by the sensor will generate a signal level typically 1000 times greater than the background electrical noise level generated by the sensor itself. This unsurpassed audio performance ensures that minute levels of intrusion related activity can be easily extracted and identified by Detection Technologies signal analyser systems without risk of losing such critical information within the high background noise levels that characterise many low performance sensors.

Audio Alarm Verification
The low impedance design of the sensor ensures high quality audio signals which, in turn, allows accurate and unambiguous verification of hostile activity by security personnel.

Unaffected By Moisture Penetration
The low impedance design characteristics of the sensor ensure that the performance of the sensor is unaffected by water ingress resulting from cable sheath damage or poorly sealed terminations or joints.

Immune To Electromagnetic Interference (EMI)
The sensor is configured as a twisted pair of conductors which are balanced with respect to ground thereby ensuring rejection of externally generated electromagnetic interference sources.

Resilient To Lightning Induced Damage
The sensor cable design allows electrical isolation of the sensor from the signal analyser system using custom made transformers to ensure maximum resilience to lightning strikes in the vicinity of the sensor.

Simple Termination And Repair Procedures
Since the sensor relies on only two copper wires for its operation, terminating and splicing the cable is a simple task readily accomplished by any competent electrical service technician using readily available, non-specialist tools. A typical Mean Time To Repair (MTTR) figure of 15 minutes is easily achievable.

UV Resistant Sheathing Material
The sensor cable is sheathed in a low density polyethylene polymer which is heavily loaded with carbon powder to provide the highest possible protection against sheath degradation by the ultra-violet radiation present in sunlight.

Highly Reliable
The sensor cable components are carefully chosen to ensure the highest reliability possible so that a typical Mean Time Between Failure (MTBF) figure in excess of 80,000 hours is achievable. Subject to correct installation, the performance of the sensor will not degrade over time, even in extremes of heat and cold.

Armoured Sensor Version
VibraTek® Plus sensor cable is also available with an integral stainless steel armouring which provides protection against cutting the cable with edged tools as well as an additional layer of electrical shielding.
Physical Specification

- **Cable Diameter:** 8.0 mm
- **Sheathing Colour:** Black
- **Sheathing Material:** Low Density Polyethylene (LDPE)
- **Sheathing Material UV Lifespan:** Greater than 15 years (equatorial exposure)
- **Active Elements:** Concentrically constructed tinned copper conductors
- **Active Element Sheathing:** High molecular weight fluoro-polymer
- **Two Precision Tubes:** High Density Polyethylene (HDPE)
- **Electrostatic Shield:** Aluminium/mylar composite tape
- **Longitudinal Strength Elements:** 1 multi-strand tinned copper wire ( uninsulated)

**Operating Temperature Range:**
- -40°C - +90°C
- 100% condensing

**Relative Humidity Tolerance:**
- 0°C - +40°C
- 93 g/metre

**Installation Temperature Range:**
- -40°C - +90°C
- 100% condensing

**Weight:**
- 95 mm
- 93 g/metre

**Ultimate Tensile Strength:**
- 1kN

**Minimum Bend Radius:**
- 95 mm

**Maximum Applicable Tensile Force:**
- 60 Newtons (6kgf)

**Electrical Specification**

- **Bandwidth (-3dB):** 10Hz – 5.2 kHz
- **Typical Signal Voltage Level:** 1mV
- **Active Element Impedance:** 8 ohms per 100 metres
- **Static Magnetic Field Strength:** 250 Gauss (0.025 Tesla) minimum
- **Electrostatic Shielding Factor:** 100%
- **Mean Time To Repair (MTTR):** 15 minutes
- **Mean Time Between Failure (MTBF):** Greater than 80,000 hours

**Typical Maximum Zone Length vs Fence Type 4**

- **Chain Link Fencing (plastic coated):** 150 metres
- **Chain Link Fencing (galvanised):** 200 metres
- **Welded Mesh Fencing:** 275 metres
- **Expanded Metal Fencing:** 275 metres
- **Palisade Fencing:** 300 metres

1. OEM test procedure
2. Using OEM approved/supplied repair kit
3. Subject to OEM approved maintenance schedule
4. Subject to fence condition