

Zone Ranger™ Interrogation Unit



The intrusion detection system Zone Ranger™ is a security system based on the fiber optic sensing technology and is designed for short and medium perimeter applications with up to sixteen detection zones per one detection unit - capable of sensing simultaneous multiple-point intrusion attempts. It is easy to combine more units (including Long Ranger™ and Short Ranger™ units) into one security system. When your property or infrastructure requires the best protection available, Zone Ranger™ offers low nuisance alarm rates and a very high reliability. This all fiber-optic intrusion detection system is capable of detecting simultaneous intrusion attempts on all zones along a perimeter. You'll know instantly when an intruder – or a group of intruders – is attempting to breach your perimeter.

How It Works

The Zone Ranger™ system uses extremely sensitive principles of the modal interference in optical fibers, where a laser beam is transmitted along the fiber optic cable and the returned signal is automatically monitored and analyzed for disturbances. This returned signal is also digitally processed to identify and eliminate environmental nuisance alarms. The Zone Ranger™ intrusion detection system consists of three main components: the inactive cable leading to the sensor zone, the special sensor structure designed for different applications and the heart of the system, the intelligent Zone Ranger™ Interrogation Unit. Simple and intuitive to use, capable to differentiate many types of attacks, Zone Ranger™ delivers precise information that your security staff need. Combined with the ability to interface and activate CCTV camera systems, lighting, gates, email, plus a broad range of external devices and systems. Moreover, the unit can be operated through the web interface from any place in the world, giving you the ability to watch the intruders directly on your tablet, mobile phone etc.

This setup can be used as a buried, fence, asphalt, and wall or roof installation. The fiber optic sensor system does not contain any metal parts and as a result it cannot be detected when buried or embedded in the wall. The whole setup is passive and immune to EMI/RFI.

Features

- » No power supply required in the field - passive sensing element
- » Designed for 24/7 operation
- » True detection of simultaneous events
- » High reliability - simple to install - minimum maintenance
- » Remote access (web and SSH)
- » Cannot be detected – buried underground, embedded wall applications
- » Large area coverage using one system
- » No bypass possible because of optical signal – EMI and lightning immunity
- » Ideal for industrial and commercial environments
- » Ideal for critical infrastructure and high security sites (with multiple zones)
- » Continuous perimeter protection
- » Multi-channel operation – several zones covered by one unit
- » Zero tolerance to sensor deactivation attempts
- » Difficult to defeat – very high performance
- » Enables preventive actions
- » Enables several types and levels of protection
- » Multiple I/O options for system integration



Applications

- » Facility protection (against thefts, vandalism, intrusion)
- » Commercial and private area
- » Electrical/telecom stations
- » Hazardous area
- » Fence perimeter – chain link, ornamental, anti-climb
- » Underground perimeter – buried in gravel, sand, sod and other materials
- » Wall – concrete, ceiling, drywall, plaster, flooring
- » Protects large perimeter and critical infrastructure
- » Homeland security
- » VIP residences
- » Customization of solution according to customer application

Identification

- » Intrusion detection
- » Cutting by grinder
- » Hammer
- » Force open
- » Walking on the hatch
- » Likelihood of the event identification



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Item-Code: Zone Ranger™ -X (X = Number of Channels: 2, 4, 6, 8, 10, 12, 14, 16)

Specification Hardware

Optical	
Maximal number of channels (zones)	16
Maximal output power per channel	0 dBm
Maximal input power per channel	-4 dBm
Dynamic range (DC coupled input)	53 dB (SNR=0 dB)
Sensitivity (DC coupled input)	-57 dB (sinus 1 Hz, SNR=0 dB)
Dynamic range when using max AC gain	31 dB (SNR=0 dB)
Sensitivity when using max AC post-gain	-67 dB (sinus 1 Hz, SNR=0 dB)
Sampling frequency	24-bit: 1kHz, 2kHz, 4kHz, 8kHz, 16kHz (16 channels) 16-bit: 32 kHz (16 channels)
Bandwidth (DC coupling)	DC – 500 Hz, DC – 16 kHz ¹
Bandwidth (AC coupling, -3 dB corner at LF)	10 Hz – 500 Hz, 20 Hz – 16 kHz ¹
Multiplex	CWDM*
Optical fiber connector	FC/APC
Electrical, Environmental and Mechanical	
Power supply	12 V (adaptor to 230 V included)
Power consumption	< 80 W
Operating temperature	0 °C to 40 °C
Operating humidity	< 80 % , non-condensing
Dimensions	19" rack 3U; 436 (front panel 483) x 415 (with handles) x 133 mm; (mind the space for connectors and air ventilation - 50 mm)
Weight	9,3 kg
Interfaces	
Communication protocol	TCP/IP, MODBUS*
Remote control	Web GUI, SSH
Interface	Ethernet, 2x USB 3.0, 1x HDMI, RS-485*, 4x Relay - alarm level 1 (any channel) + alarm level 2 (any channel) + datalog + fault, RS-232 for external relay unit*
Alarm output	2x LED Indication, 2x Alarm Relays, Email, Web GUI, Alarm Table, Alarm History Log, 16-Channel Relay Unit* (separate alarm indication for each sensor)
Alarm level	Programmable with FFT analysis
Other features	
Manufacturer	Fibersonics Inc. in collaboration with Safibra s.r.o.
Software	Zone Ranger™ Configuration Interface, Zone Ranger™ Processor* (advanced signal
Hard disk	SSD 120 GB (4 days record of 2 channels)



Sensor mechanical specification table²

Max. length of insensitive lead-in (and lead-out) cables	2 x 25 km (2 x 15.5 mi)
Max. length of sensitive cable	10 km (6.2 mi)

fence sensor

Temperature range	-25 °C to 70 °C
Max. length of fence of single zone	Up to 1 km (depending on fence type) (0.6 mi)
Tube material	Stainless steel
Nominal tube outer diameter	2.1 mm (0.08 in)
Min. bend diameter	40 cm (15.7 in)
Outer diameter of fiber cladding ³	125 µm
Max. optical attenuation	1 dB/km

ground sensor

Temperature range	-25 °C to 70 °C
Max. size of buried single zone	Up to 2000 m² – 2 km length of sensing strip (zone width 1 m) Up to 4000 m² – 1 km length of sensing strip (zone width 4 m)
Zone width	1 m, 2 m, 3 m, 4 m (and everything in between) (3.3 ft, 6.6 ft, 9.8 ft, 13.1 ft)
Max. length of strip in packaging	100 m (328 ft)
Outer diameter of fiber cladding ³	125 µm

Max. optical attenuation	1 dB/100 m²
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² Proprietary construction of optical sensing cable for fence perimeter installation or sensing strip for buried perimeter applications

³ Fiber can be spliced using standard telecommunication methods