Burried cable perimetric security system HF500R

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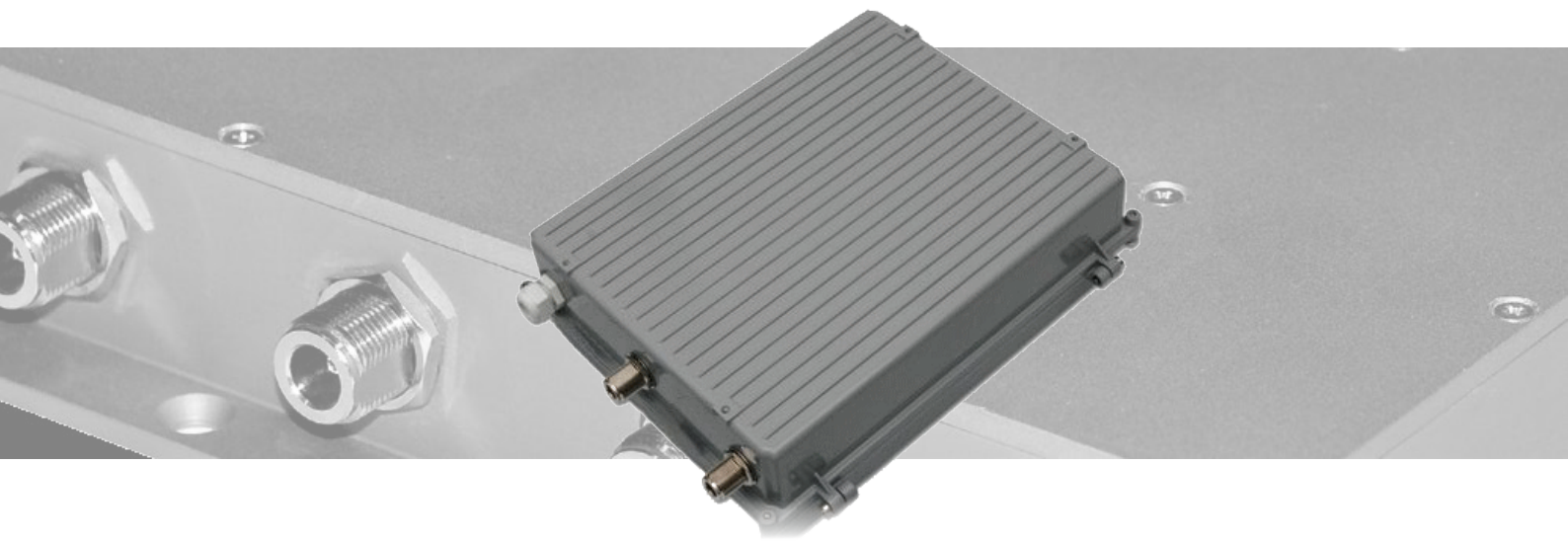


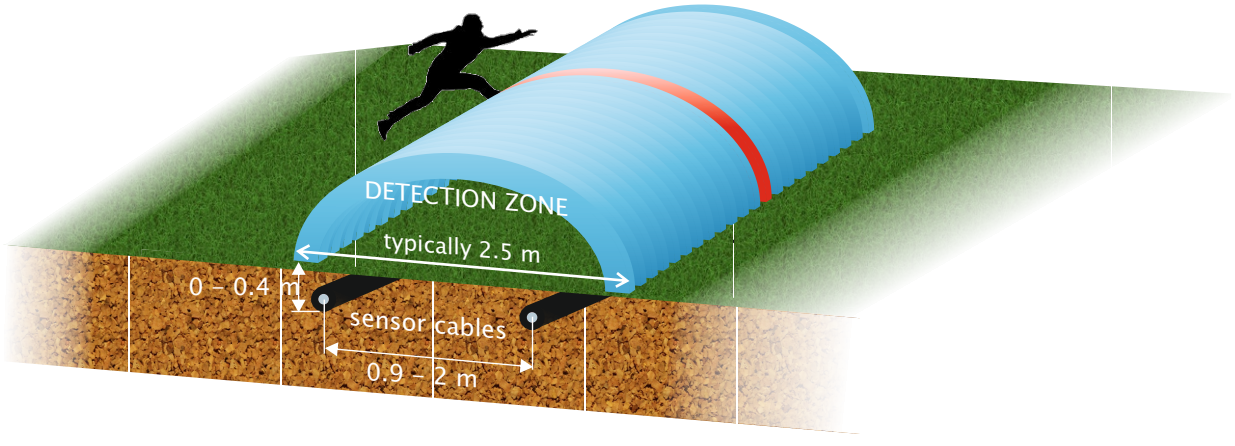
HF500R sensor has been designed for perimetric site protection. It is particularly suitable for protection of large area sites such as airports, military installations, industrial sites, water intake areas, storage areas and state borders.

Its principle of operation is detection and analysis of intrusion provoked distortions of electromagnetic field generated by a transmitting cable and received by a parallel sensory cable. Both cables are placed on the perimeter of the protected area up to 40 cm below ground, separated by a distance of 0.9 – 2.0 m and generate an invisible, spatial detection zone. Its trespassing by an intruder is detected, localized and triggers an alarm. The HF500R system uses special coaxial cables which are designed to emit outside electromagnetic field. These are so called “leaky cables”. Contrary to other commercial perimetric protection systems which use special dedicated sensor cables with fixed lengths, the HF500R sensor uses standard universally employed leaky cables. These cables are offered in lengths of 500 m, on standard spools and can be deployed easily on installation site and cut into required lengths. A single HF500R sensor module can protect one segment of a perimetric protection system up to 500 m, achieving intruder localization resolution not worse than 3 m.

Contrary to surface and fence-mounted systems, an active HF500R system is completely invisible. Because of low level signal emitted by the transmitting cable, the detection of a HF500R system through radio frequency bands scanning is difficult and subsurface sensor installation naturally enhances its resistance to accidental damages and tamper attempts. System cable damages do not require its replacement and can be easily on-site repaired.

Depending on its version, the HF500R sensor can be operated in two topologies: stand-alone or networked. In the stand-alone topology, the HF500R sensor controls one segment of sensor cables of a total length up to 500 m, which forms 166 detection sections of 3 m length each. These sections can be freely defined into maximally 4 independent alarm zones with programmable relay outputs, which can be connected to a standard alarm control unit. This enables creation of deactivated exit/passage zones and enhances the precision of intrusion localization in the protected area. In this topology, the HF500R sensor can be used to protect small sites, such as water intake areas, radio relay stations, storage areas, residences etc..

In networked topology, the HF500R sensors can be operated autonomously or in big networks, creating perimetric protection systems of many kilometers of total length. For operation in this mode, used to protect airport perimeters, military storage sites, industrial and logistic complexes, the manufacturer supplies on request double sensor units of the HF500RS version which enable creation of protection segments of up to 1000 m of total length. The HF500RS units can be networked using RS485 interfaces, which are integrated into every control unit. For very big security systems, the HF500RS units can be equipped with a fiber-optic converter, enabling the sensor to support fiber-optic communications networks in ring and star topologies of up to 20 km of total length. Employing fiber-optic networks ensures galvanic separation of devices which enhances the system’s reliability in a context of atmospheric electrical discharges, occurring frequently in Central Europe. Network connections can be implemented using standard copper and fiber-optic cables and standard components used to build communications network. Moreover the HF500R system employing fiber-optic networks offers users additional functionality such as central control communications and CCTV cameras

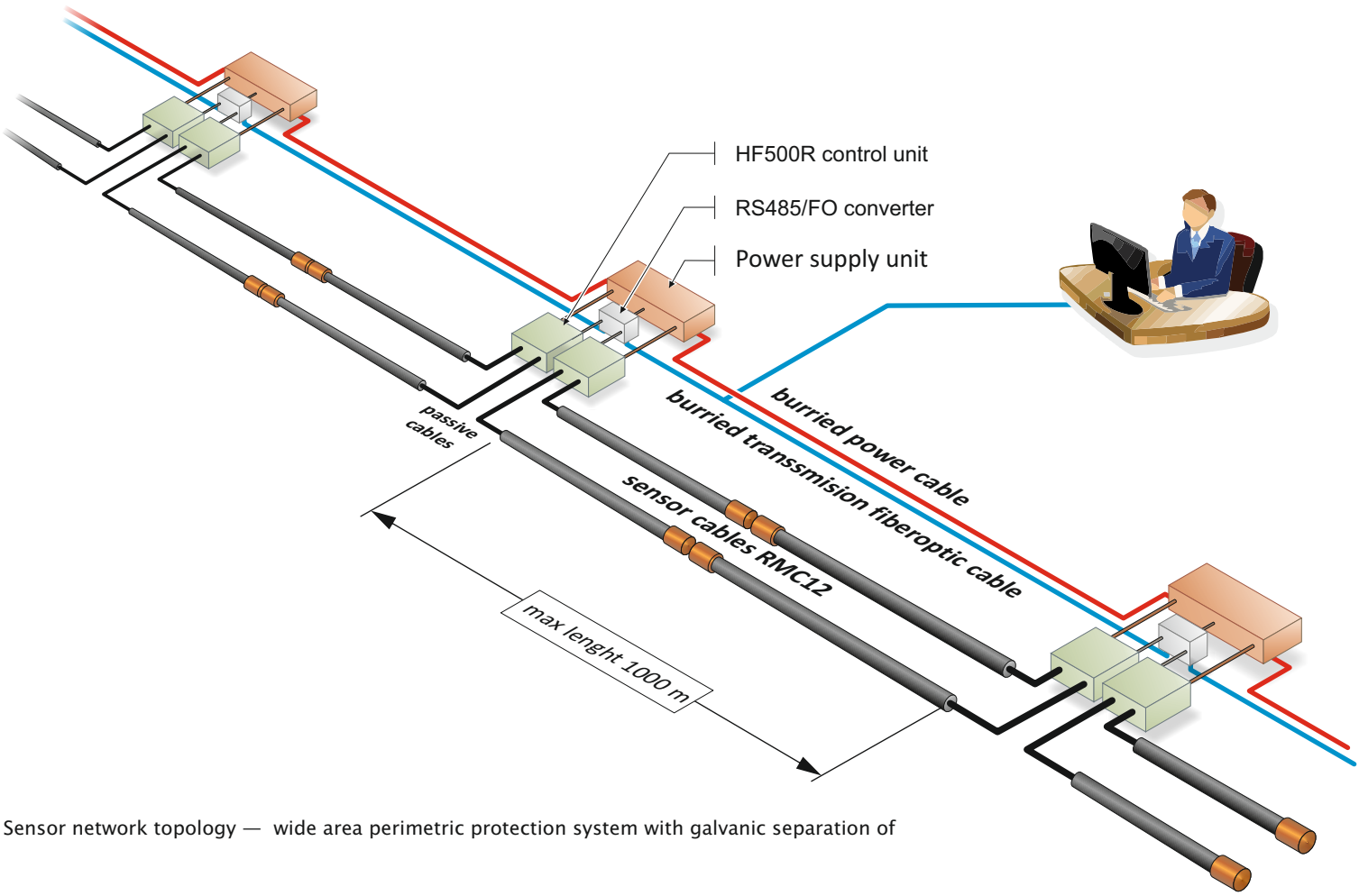


The HF500RS system is normally powered from a low voltage ~230V/50Hz power grid. In such a case the HF500RS is equipped with a buffer power supply unit with a rechargable battery ensuring the required time period of backup power supply in a case of a power failure. Optionally, on a special request, it is possible to supply a HF500RS system adapted to power a cascade of HF500R sensors, using sensor cables. This mode of supplying power is not recommended by the manufacturer because of higher installation costs and lower reliability (Note 4)).

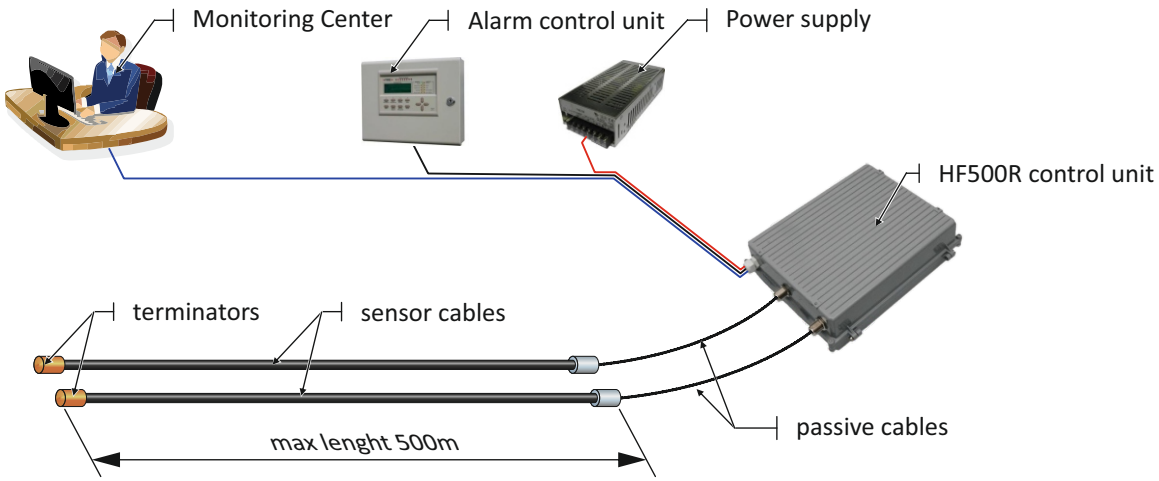
The HF500R sensor processes the signal digitally. This approach ensures high reliability of intrusion detection while minimizing the possibility of generating by the HF500R sensor so called false alarms provoked by environmental factors. Digital signal processing algorithms implemented in the HF500R sensor's software enable detection of intruders with a body mass higher than 20 kg, moving at speeds between 0,12 m/s and 20 m/s. Minimal detected intruder body mass and his minimal and maximal speed are programmed into the sensor during its installation and calibration.

During its operation the HF500R sensor automatically adjusts to environmental conditions perturbations such as rainfall or soil humidity variations. The system's adaptability is so good that it can operate in soil completely soaked with water.

Installation, commissioning, calibration and monitoring of the HF500R sensor are extremely easy thanks to the HFView dedicated software running on MS Windows operating system. Sensor calibration is easy and intuitive. It involves making a series of passes along the sensor cables while recording activation signal level of each detection zone by the HFView software and then setting



Sensor network topology — wide area perimetric protection system with galvanic separation of



Sensor HF500R stand-alone topology — perimetric protection of up to 500 m

Basic technical data of the HF500R sensor

The system components control unit, sensor cables, passive cables, terminators, dedicated software, optionally fiber-optic cable1)

Number of sensor cable segments	2
Sensor cable segment maximal length:	max. 1000 m. (2 x 500m)
Sensor cable laying maximal depth:	max. 40 cm
Sensor cable laying spacing:	od 0.9 m do 2.0 m
Detection zone width:	typically 2.5 m (W) x 1,0m (H)
Number of alarm zones:	max. 332 zones / 2 segment
Alarm zone controlling:	independent
Alarm triggering criteria:	signal amplitude, signal duration
Single intruder localization precision2).	better than 3 m
Speed of detected intruder:	from 0.12 m/s to 20 m/s
Simultaneous detection of several intruders:	yes
Detection of alarm zone failure:	yes
Sensor cable continuity monitoring	yes
Event log capacity:	max. 2GB
Real-time clock	yes
Tamper protection:	cabinet open switch
General purpose inputs:	8 inputs (programmable logic: NC / NO and type: bistable / parametric 2EOL)
Outputs:.	4 relay outputs NC/NO, 1A @ 30VDC (programmable)
Communication interfaces:	
- basic	RS485 with galvanic isloation (speed/data format: 115.2kbit/s /8N1)
- auxiliary	USB
Power supply:	
- voltage range	from +10.6 VDC to +48.0 VDC

Notes:
1. Exact HF500RS sensor specifications based on a custom order.
2. Intruder localization precision depends on sensor cables' spacing and depth.
3. Delivery of systems with cascade power supply based on a custom project and on custom order.
4. Cascade topology power supply requires 24VDC or 48VDC voltages delivered by a single buffer power supply unit. The manufacturer has to modify the communications components of the HF500RS system to the designed power supply. The maximal length of a protection system designed as a sensor cascade powered from one point depends on the total power required by all the control units operating in a cascade topology. Cascade power supply usually requires decreasing power consumption of the control units by laying cables more shallow (max. 25 cm), which increases their vulnerability to mechanical damage, and/or by decreasing cable spacing, which reduces the width of detection zone. Furthermore atmospheric electrical discharges occurring frequently in Central Europe expose a cascade system to risk of damage to the whole cascade in a case of lightning. The cascade topology is not recommended by the manufacturer because of higher installation costs and lower reliability.

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