



SELEX Sistemi Integrati

# MASTER ZONE

Unattended Ground Sensors  
for  
Border Protection System



**MasterZone from Selex Sistemi Integrati** is a *cutting-edge* monitoring system based on a set of **ground sensors** able to organize themselves into an ad-hoc wireless network, and to send alerts to a **Central Monitoring Station**, responsible of collecting and displaying information gathered from the sensor network

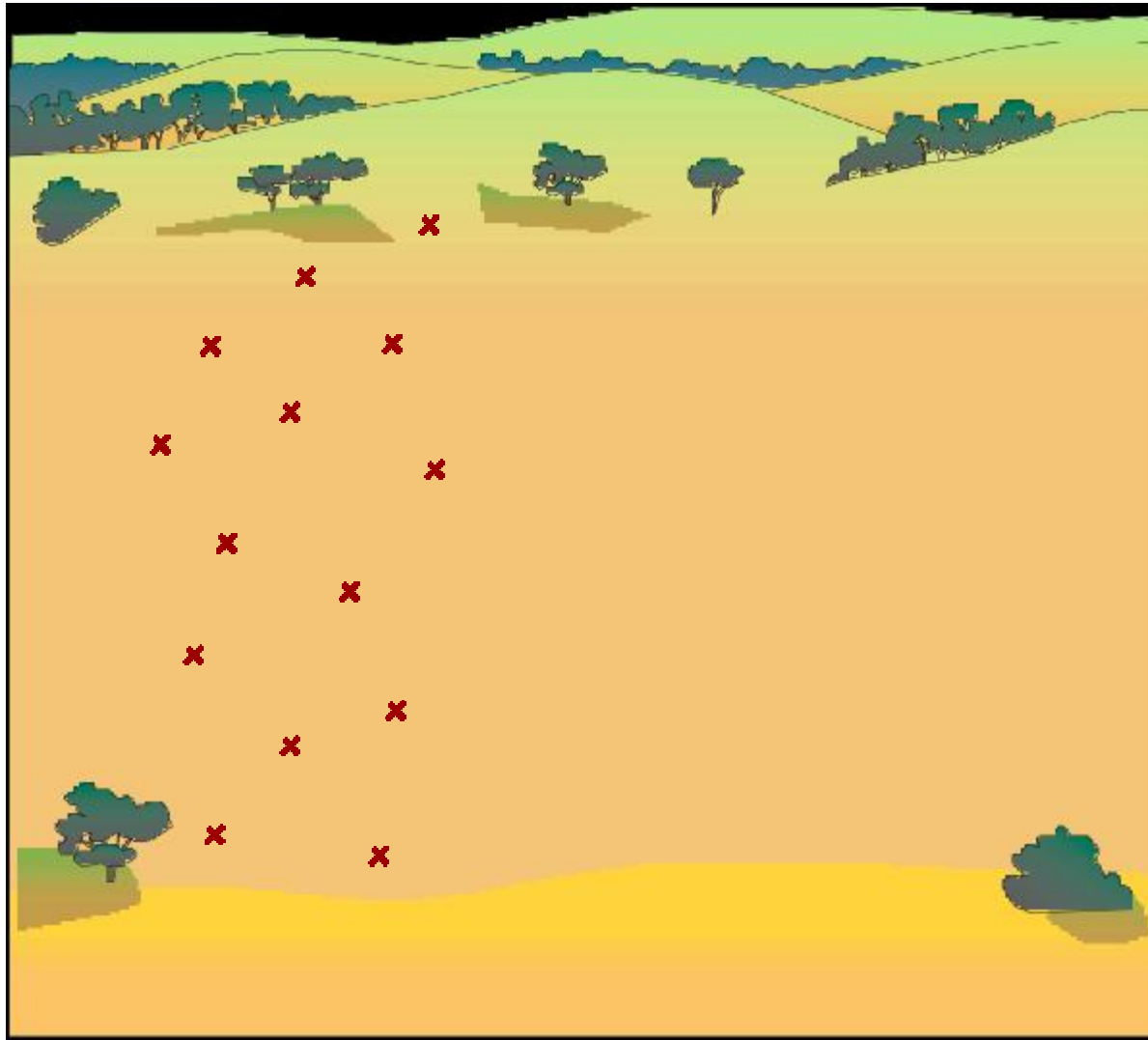
UGS solution covers both **surveillance** (motion detection, scanning, sniffing rumours) and **security** (access control, intrusion control) capabilities, for :

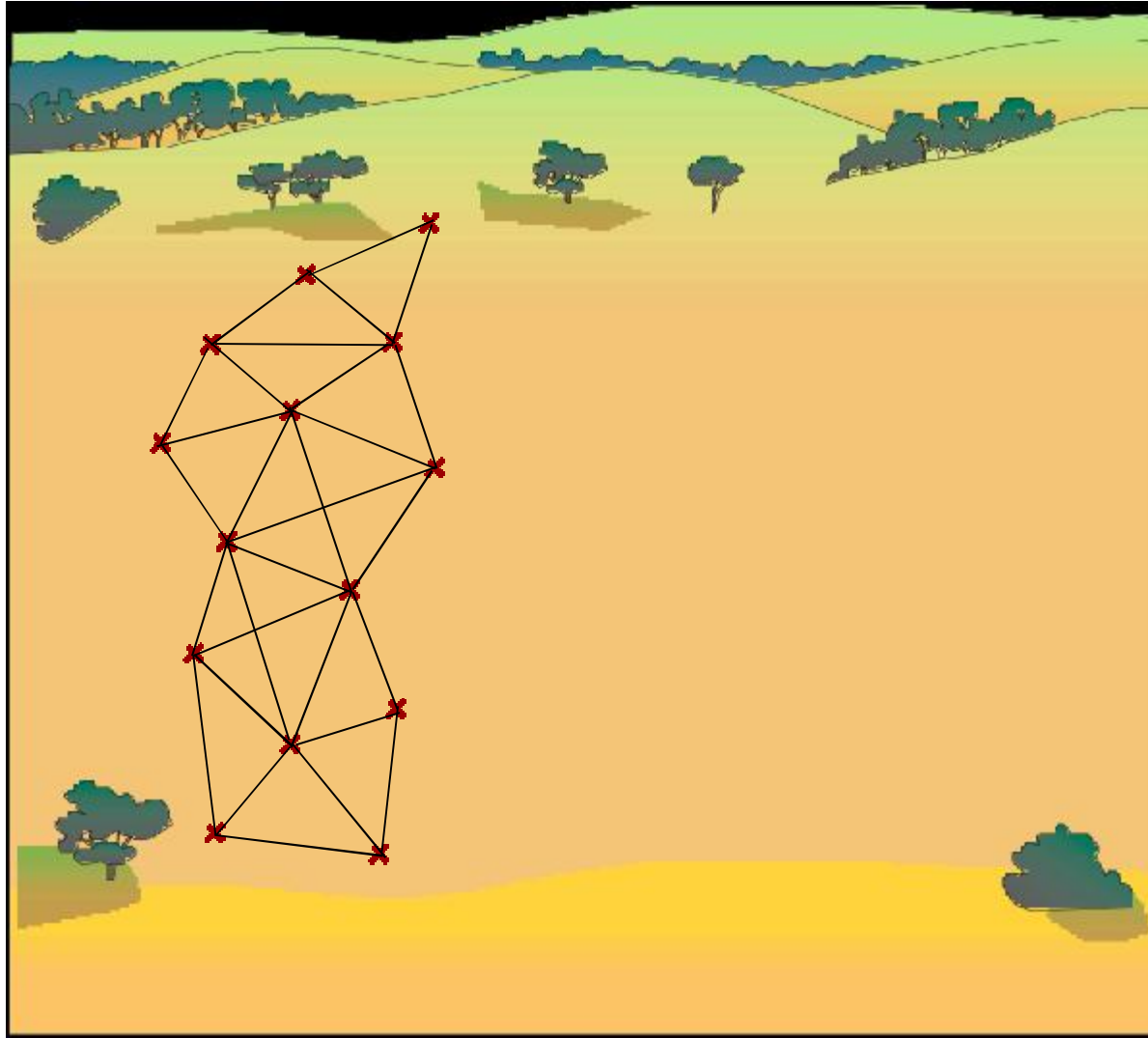
- ü **Critical Infrastructure Protection** (e.g. airports and runways, defence sites, industrial sites, utility companies)
- ü **Access Control**
- ü **Border and Wide Area Protection** (e.g. border security, natural reserve surveillance, archaeological sites and historical landmarks)
- ü **Special Events Monitoring** (e.g. sport events, exhibitions, conferences, parades)
- ü **Illegal Activities Monitoring** (e.g. illegal immigration, drugs trade, goods smuggling)
- ü **Battlefield Monitoring and Force Protection**

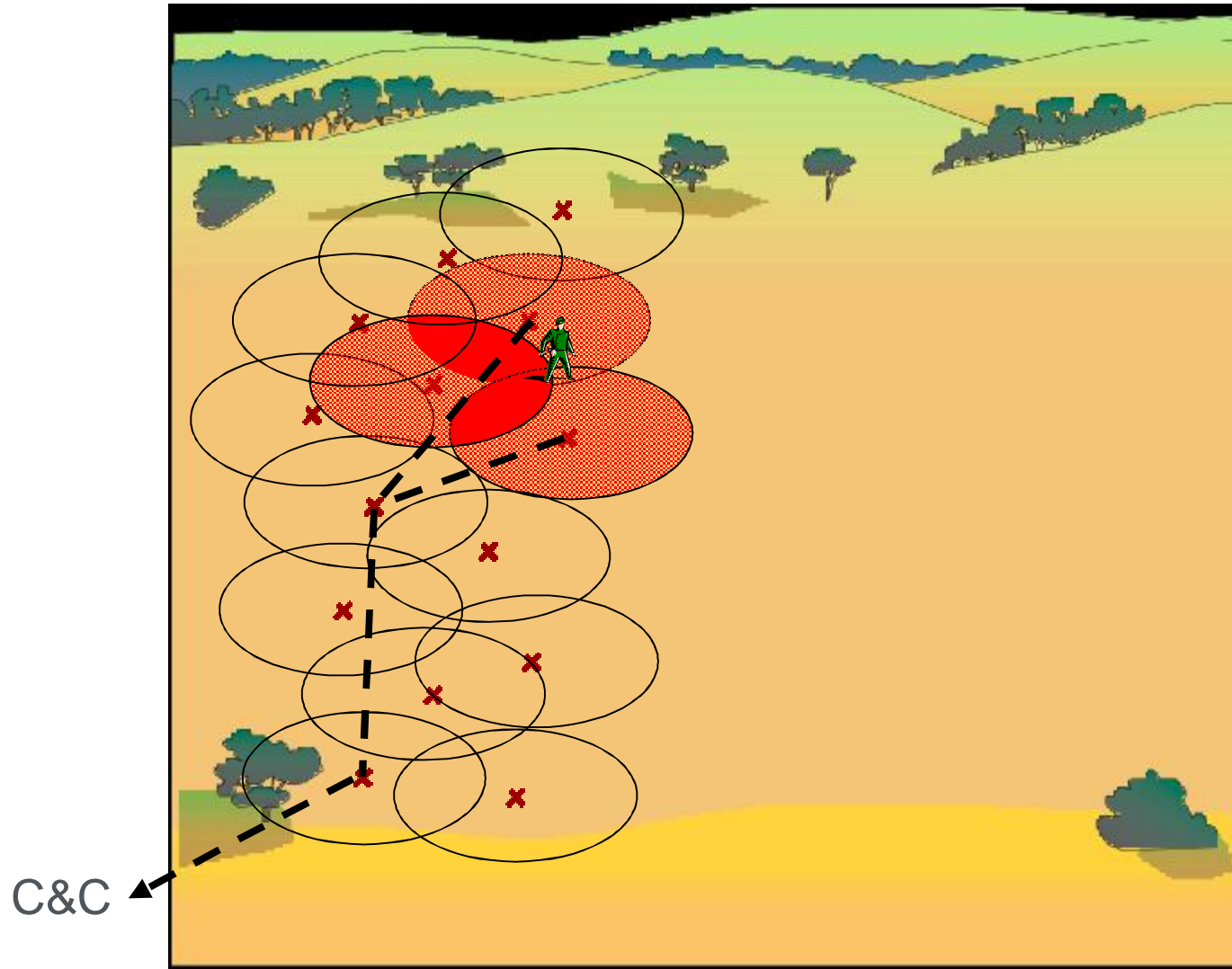


## **Solution needs to:**

- Enable security within wide unattended areas
- Provide realtime information about border violation
- Detect and prevent illegal activities (smuggling, etc.)
- Easy to deploy, “fire and forget”
- Integrable with higher class, more sophisticated sensor systems
- Nearly invisible
- Fail safe (no single point of failure)
- No maintenance needed
- Cost friendly solution with low lifecycle cost





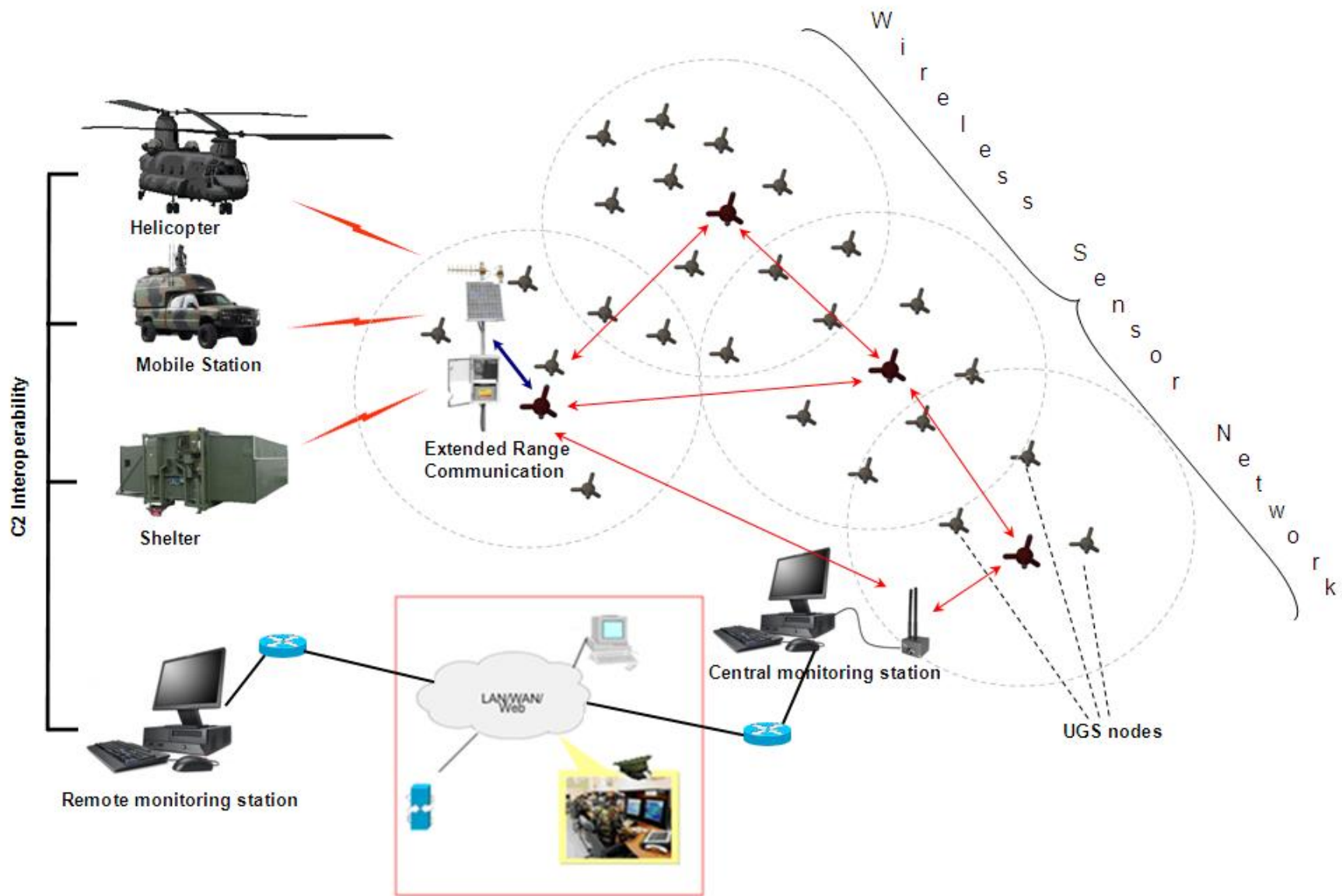




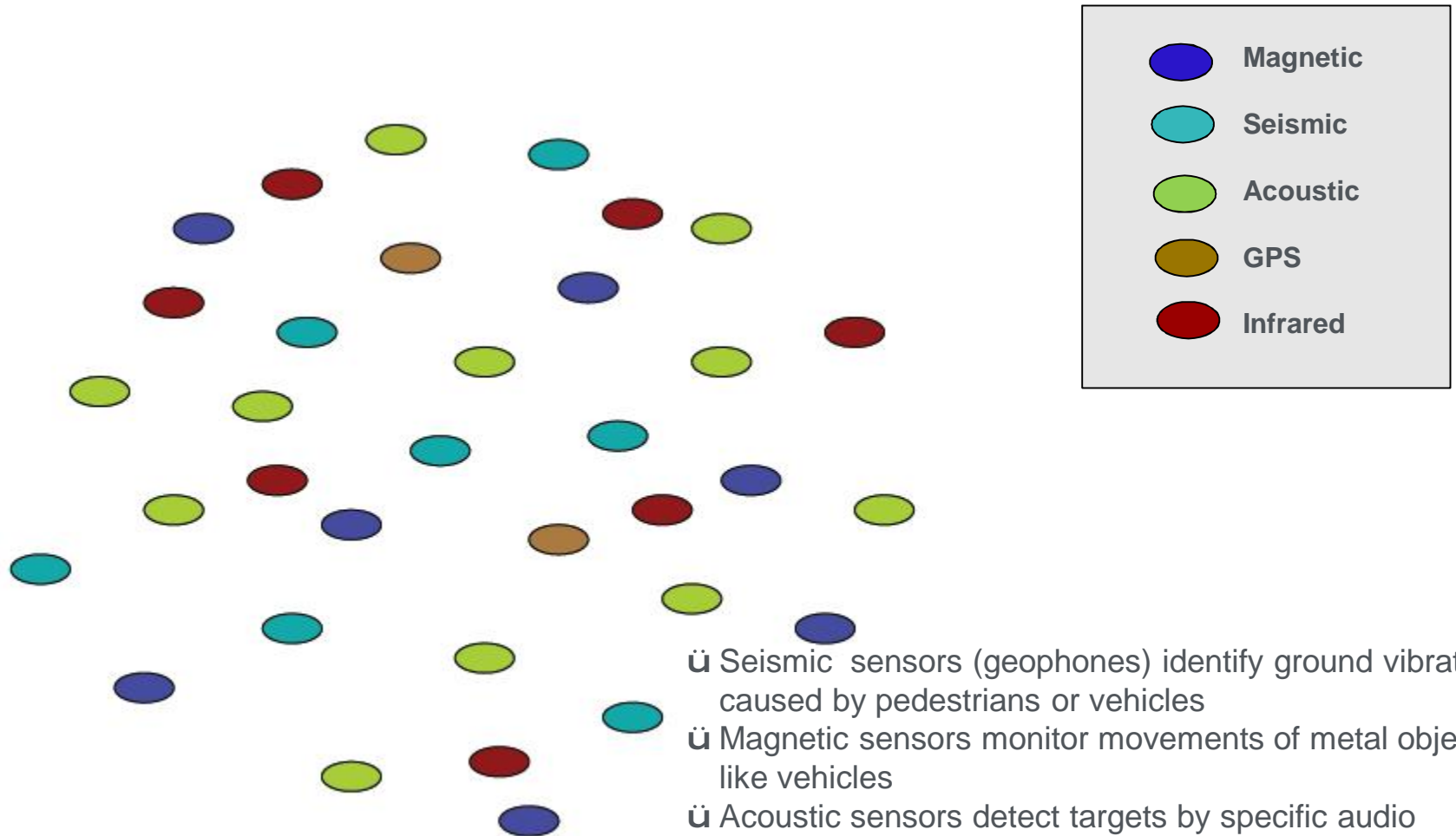
MasterZone is available in two configurations, to fit different application requirements:

§ box: a 5 cm square configuration, making the sensor nodes suitable for civil security applications, where deployment can be done manually

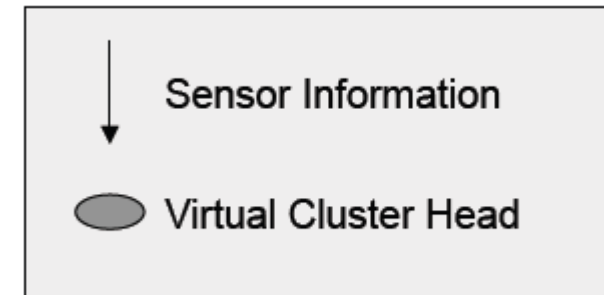
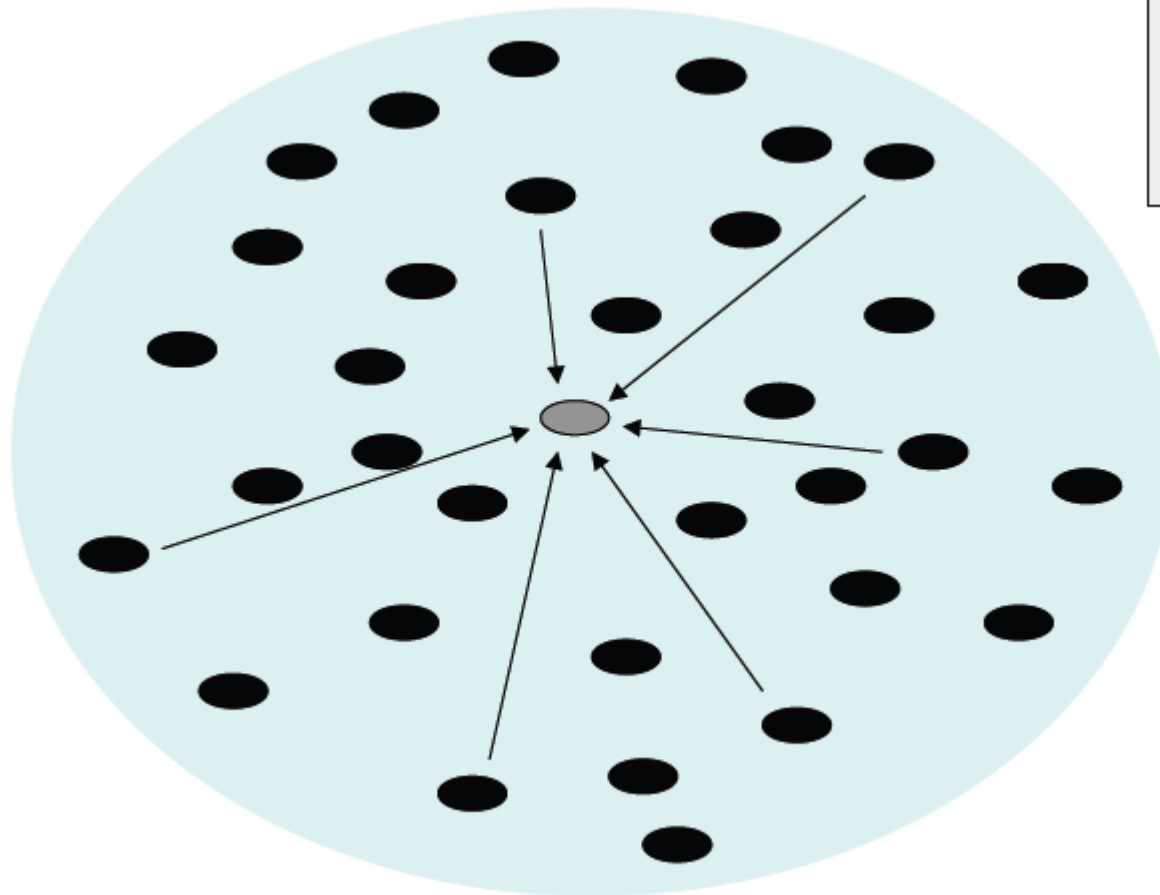
§ tetrahedral: a 10 cm, or even less, four legs configuration, allowing the sensor nodes drop from aircraft, drones or vehicles in hostile or green areas.

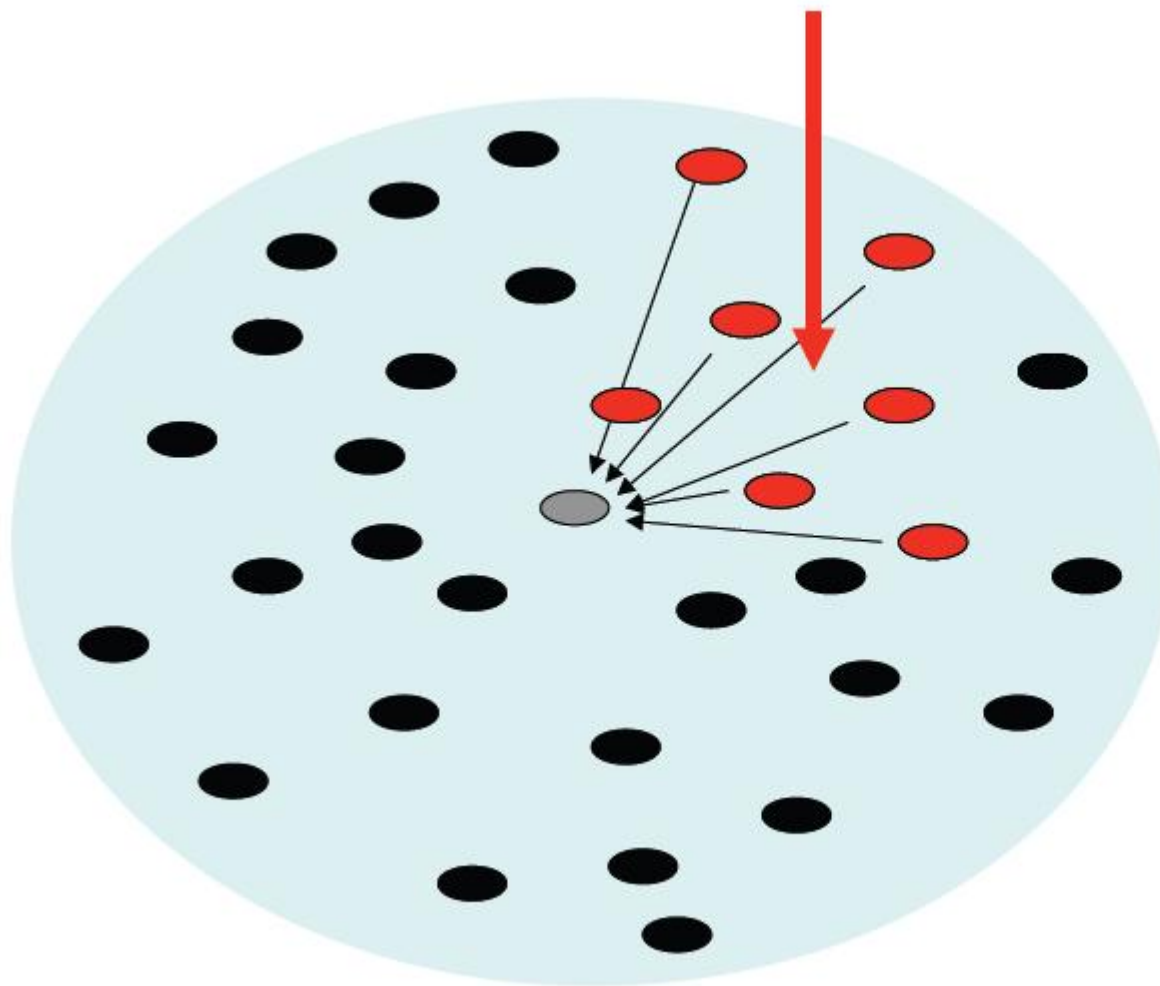






- ü Seismic sensors (geophones) identify ground vibrations caused by pedestrians or vehicles
- ü Magnetic sensors monitor movements of metal objects like vehicles
- ü Acoustic sensors detect targets by specific audio signatures (noise of engines, tracks, etc.)
- ü Passive Infrared (PIR) detect movements of objects in a narrow field of view
- ü GPS receivers provide network geo-positioning



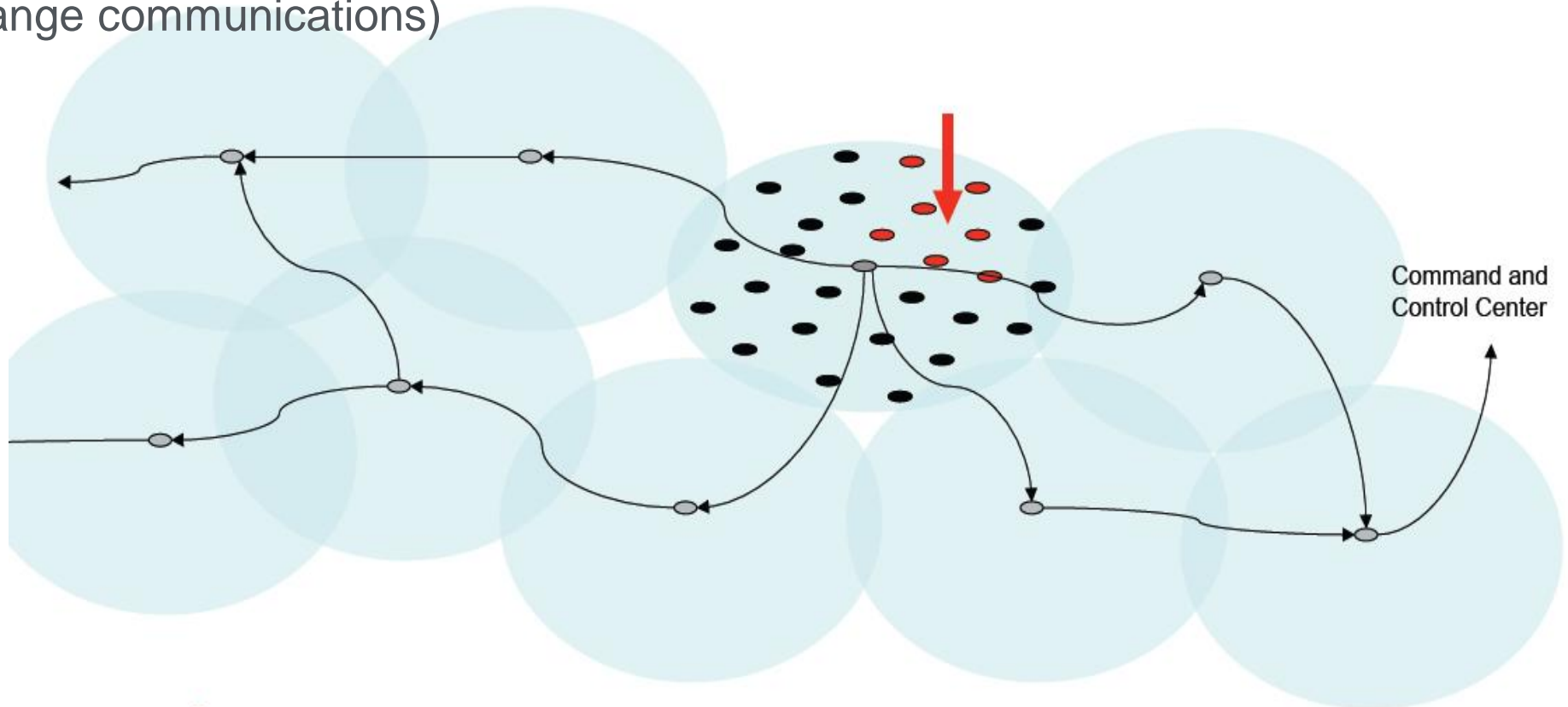


Intrusion

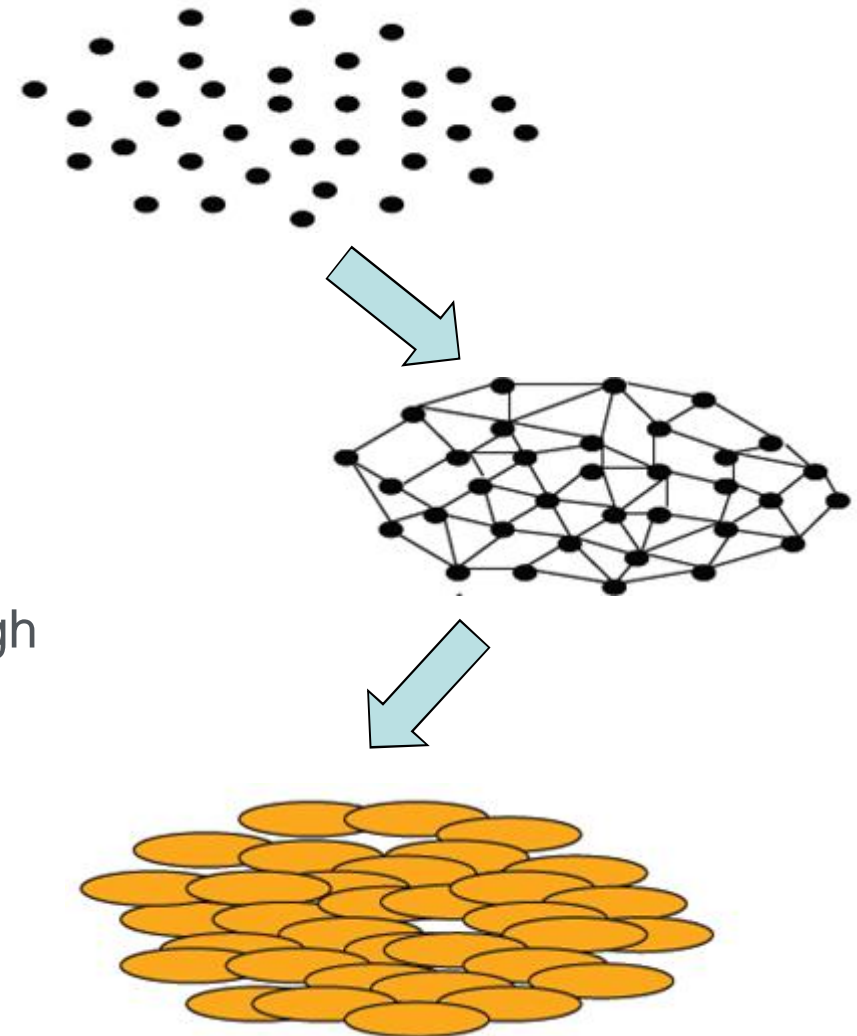


Triggered sensor nodes

The UGS wireless sensor network is composed by a number of short range sensor nodes, able to interact each other. These nodes are able to organize automatically their topology in order to aggregate groups of them into clusters (short range communications), and groups of clusters into the network (medium range communications)



- § Deployment of nodes (personnel, UAV, helicopter, aircraft)
- § Ad-hoc setup and initialization of meshed network
- § Wireless communications among nodes
- § Event information propagation, either through the network or using long-range communications
- § Real time information
- § Operational interface through GIS



- q Sensor types:
  - § Magnetic (detection range = 5-20 m)
  - § Seismic/vibration (detection range = 5-20 m)
  - § Acoustic (detection range 25-100 m)
  - § GPS (12 channels)
  - § Passive Infrared (detection range = 5-50 m)
  
- q Wireless communications: 434 MHz
  
- q Maximum distance between nodes: 15-40 m
  
- q Communications range for a single node: up to 100 m

- q Data rate: up to 153.6 kbps
- q Payload: 25%
- q Communications error rate: less than 1/100
- q Waterproof
- q Lifetime: up to 3 years
- q Long range cluster management
  - § VHF/UHF or WiMax
  - § Power supply from batteries integrated with solar cells

MasterZone brings valuable benefits to a wide range of dual-use applications:

- ü ***Ease of portability and deployment:*** sensor nodes can be disseminated on the ground without any specific manual intervention.
- ü ***Flexibility:*** MasterZone can operate in a wide range of operational contexts demanding for enhanced protection and situational awareness.
- ü ***Scalability:*** the open architecture and the sensor networks enable different sizes of solutions.
- ü ***Ease of integration:*** MasterZone can operate both as a standalone solution and together with other systems for surveillance and reconnaissance (e.g. CCTV, UAVs).
- ü ***Reliability:*** elaboration of integrated data fusion algorithms avoid false alarms from sensors.
- ü ***Robustness:*** the fault-tolerant configuration guarantees continuity of service.