



Multi-role **3D radar** for the detection  
and tracking of ground  
and low-flying targets

## ReGUARD

ReGUARD radar is a multi-role 3D radar which simultaneously detects and tracks ground targets and slow low-flying targets with a small radar cross section (LSS). Radar ReGUARD searches space by utilizing electronic beam steering and mechanical rotation of the radar head.

- Instrumental range 18 km, altitude coverage 3 km for LSS targets
- Instrumental range 18 km for ground targets
- Deployment time under 10 min.
- Provides Early Anti-Drone Warning

## Technology

- 3D AESA with steering in both elevation and azimuth
- Rapid space searching using multiple received beams
- Full solid-state technology

- Monopulse processing in both azimuth and elevation for accurate evaluation of coordinates
- Advanced signal and data processing for clutter suppression (including birds and cars)
- Networking capability (ASTERIX output, remote control, etc.)
- Built-in test equipment for automatic system diagnostics
- 24/7 Operation capability

## Key features

- Easy integration on masts, rooftops, poles, stands, vehicles
- Multi - role utilization - broad variety of detectable objects, simultaneous tracking of ground and air targets
- Compact size and low weight
- Passive cooling without fans
- Simple maintenance
- Long term support as part of the product life cycle

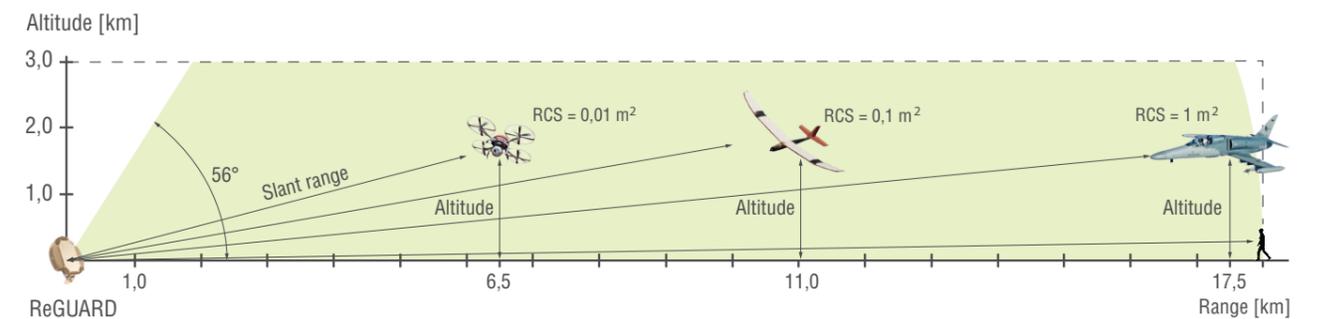


## Operational modes

ReGUARD operates in sector or rotational mode. Each mode utilizes different method of scanning the space in azimuth. When the radar scans in sector mode, its beam is steered only electronically both in azimuth and elevation. While scanning rotationally the radar sensor head revolves on a turntable and the electronic steering of the

beam is primarily used in elevation. Steering in azimuth provides rapid confirmation of detection when initiating track and enhances the quality of tracking while scanning (TWS). The ReGUARD is configurable in each operational mode according to individual deployment requirements.

## Visualisation of ReGUARD detection performance

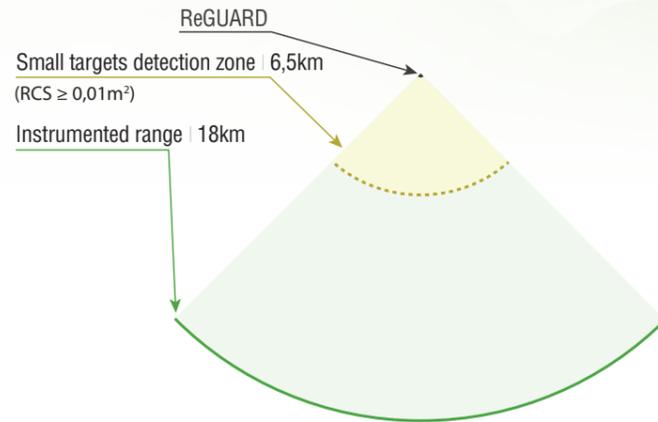


## ReGUARD radar utilization

ReGUARD radar is designed for two primary applications: either as a standalone sensor or as an integral part of a complex system. It can be adapted per customer's requests and the nature of the object that requires safeguarding. Therefore it is more than suitable for the following tasks.

### Border control

While protecting borders, ReGUARD ensures that no person, vehicle or drone crosses the border without the radar operator's knowledge. It provides early warning and gives valuable reaction time for an effective response, while protecting a wide strip of territory. When ReGUARD is suitably located, its range covers up to 22 km of border in the horizontal plane and it also provides the detection of possible threats up to 8 km behind it.

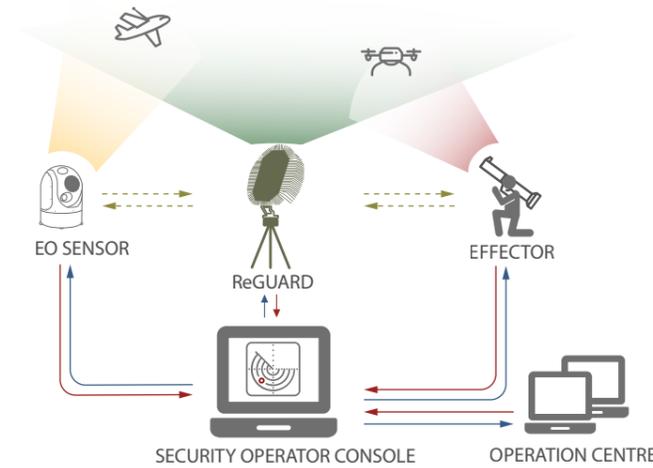


### Securing critical infrastructure

Intrusions by UAV's into critical infrastructure areas such as nuclear power plants and other industrial or technological sites are ever increasing. They are already showing us the fact that protection against this type of threat is currently very inadequate. Effective detection provides a window of opportunity to respond in a timely manner thus preventing material and human losses. As an example, ReGUARD can detect a commercial drone at a distance of 6 km, which at top speed is their maximum flight range. This gives the user a valuable reaction time of 15 minutes before the drone reaches its destination.

### In an anti-drone system

ReGUARD can also serve as part of a comprehensive anti-drone system in which it acts as a radar sensor for LSS detection with a range up to 18 km. Due to its outstanding parameters it provides the system with drone 'early warning' information. The anti-drone system then uses high-precision target positioning data generated by ReGUARD to guide the anti-drone action. No anti-drone solution can provide complete protection without a type of radar sensor such as ReGUARD.



Radar's parameters make the RGD ideal part of a comprehensive anti-drone solution.

### As a part of air defence solution

ReGUARD provides high-precision radar data thanks to its cutting-edge innovative radar technology. This data can then help create a very effective air-defence system via integration with a powerful weapon system coupled with a system for the data efficient transmission between all the parts of the whole air-defence system.

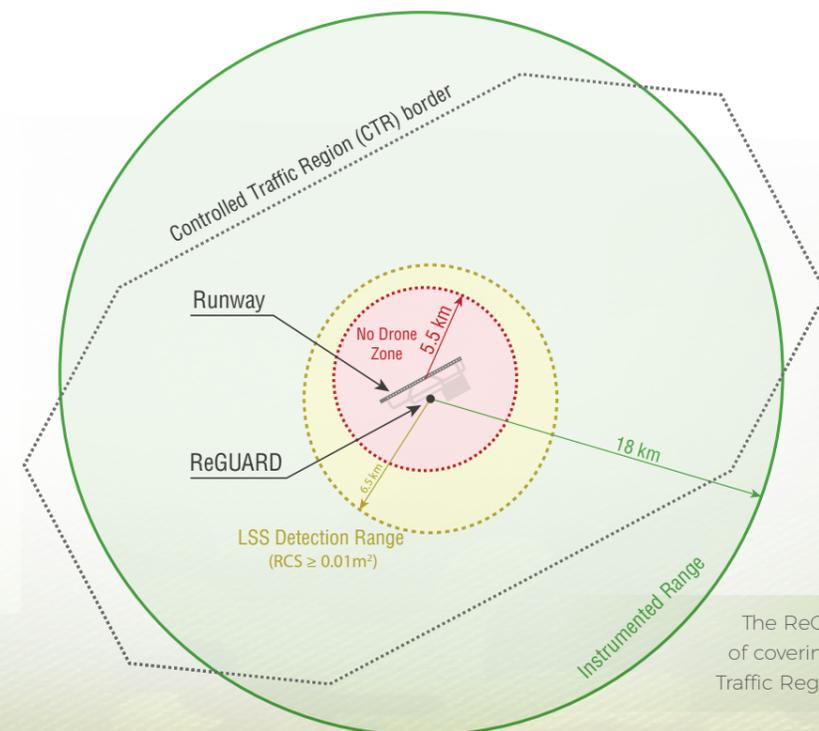
### Airport drone detection

Airports are very vulnerable to threats posed by small UAVs. Even their unintentional presence in the area of the airport, where drones are prohibited, interferes with the airport's operation and leads at least to considerable economic losses. Unfortunately, economic losses are not the only clear threats posed by UAV's, e.g. the idea of a drone deliberately flying into the engine of an aircraft is truly terrifying. However, when ReGUARD is permanently deployed at the airport it allows the airport security to prevent both minor and major damage by UAV's. Additionally, ReGUARD records the complete flight paths of all drones in its range, thus greatly easing the investigation of any drone incident and finding its operator. Last, but not least, ReGUARD's exceptional range enables it to cover almost the whole CTR of an airport with just one sensor.

A single ReGUARD radar is capable of covers up to 22 km of the border.



ReGUARD tracks and records drone's entire flightpath.



The ReGUARD radar is capable of covering the entire Controlled Traffic Region (CTR) of the airport.

## Configuration

### PORTABLE CONFIGURATION

The radar head is mounted on a tripod making it convenient for temporary deployment. This configuration, which allows for an easy location change, is appropriate for the temporary securing of important geographical points or border control.



### STATIONARY CONFIGURATION

Being fixed at a stationary location like a building or on a pole makes this configuration suitable for sustaining long term security of valuable assets such as power plants, airports, chemical factories, industrial facilities etc.



### MOBILE CONFIGURATION

A highly mobile configuration since the radar head can be fitted on a vehicle or any other customer-designed platform. Facilitates the rapid patrolling of designated areas like large gatherings, concerts, VIP zones.



## Technical specification

| Parameter                      | Parameter, Feature                          |             | Note  |
|--------------------------------|---|-------------|---|
|                                | Rotational mode                             | Sector mode |   |
| <b>Make and Type</b>           | 3D phased array mobile radar                |             | Fully coherent digital radar                            |
| <b>Operating Frequency</b>     | X Band                                      |             | All solid state technology                              |
| <b>Instrumental Range</b>      | 0,2 ÷ 18 km                                 |             |   |
| <b>Elevation Coverage</b>      | up to 56°                                   |             |   |
| <b>Altitude Coverage</b>       | 3 km  | 3 km        | RCS = 0,1 sqm   |
| <b>Detection Range</b>         | 10,5 km                                     | 11,5 km     | RCS = 0,1 sqm   |
| <b>Detection Range</b>         | 6 km  | 6,5 km      | RCS = 0,01 sqm  |
| <b>Rotation Speed</b>          | 15 rpm                                      | fixed       |   |
| <b>Antenna Type</b>            | Active phased array                         |             | Pencil beams  |
| <b>Antenna Feed</b>            | TR module front-end on each antenna element |             |   |
| <b>Antenna Dimensions</b>      | w = 0,65 m; h = 0,75 m; t = 0,235 m         |             |   |
| <b>Radar head weight</b>       | 66 kg                                       |             |   |
| <b>Cooling</b>                 | Passive (conduction)                        |             | clima-pack (optional)                                   |
| <b>Total Power Consumption</b> | up to 1 kW                                  |             |   |
| <b>Temperature Range</b>       | -32 °C ÷ +49 °C<br>(passive cooling)        |             | -32 °C ÷ +55 °C<br>(with desert environment clima-pack) |
| <b>Humidity</b>                | 95 %  |             | at 35 °C  |

\*adjustable according to customer's specifications



ReGUARD climatic limits can be extended by using one of clima-pack options. It includes pre-heating for arctic environment or sun-shield with fans for extremely hot environment operation.



RETIA, a.s.

Pražská 341 | 530 02 Pardubice | Czech Republic  
phone: +420 466 852 531 | e-mail: [military@retia.cz](mailto:military@retia.cz)  
[retia.eu](http://retia.eu)

MEMBER  
OF \ CSG  
aerospace