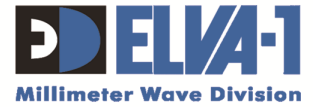


Hi-Resolution FOD Detection 76 GHz Radar Sensor



200° Scanning Radar Sensor for Foreign Object Debris Detection

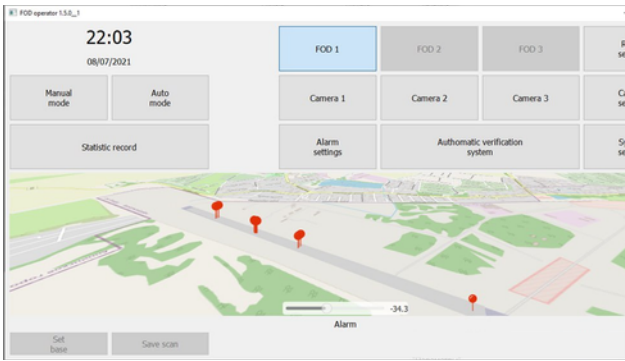


HIGHLIGHTS

- Up to 1200 m radius
- Cover area up to 2400 m
- 30 cm resolution
- Motorised radar positioner
- Digital output
- Ultra low emission

The European Commission estimates the annual damage to global aviation from debris on runways at close to 13 billion dollars. These losses include flight delays and damage to aircraft tyres, each of which can cost up to \$5,000 and must be replaced after damage. With the heavy utilisation of airports, timely detection and removal of foreign objects (FOD) on runways become critically important for ensuring flight safety and reducing financial losses.

The ELVA-1 FOD radar operates at 76 GHz (3.9 mm wavelength) in frequency-modulated continuous-wave (FMCW) mode. This radar determines the distance to the target (FOD object) by detecting the frequency difference between the received and emitted signals. The advantages of the ELVA-1 radar include very low emitted power, which does not harm airport personnel or people inside aircraft when exposed to the beam. Other benefits include market-leading range distance, a motorised radar positioner with a 200-degree search area, and relatively small radar size. This radar easily detects the reference metal cylinder, 38 mm in diameter and 31 mm high, on the runway at distances of up to 1 km, meeting international testing standards set by the Federal Aviation Administration (FAA). For complete specifications of airport foreign object detection equipment, refer to [AC 150 5220-24 \(faa.gov\)](https://www.faa.gov/airports/airport-safety/150-5220-24).



The FOD operator software displays target marks on the electronic map of the airfield. A log is generated with a description of the target, including detection time, signal levels, and GPS coordinates. The radar provides target coordinates for the PTZ HD Multispectral Camera system. The specifications of the electronic optical video monitoring system are configured for a specific runway. An integrated control system remotely monitors radar serviceability 24/7.

Optional AI-based auto-detection software can be developed to assist the operator. The software can be tailored to specific airport and runways.

FOD Radar Sensor Technical Specifications

	FOD radar SCRW-76 (FMCW-76/600/100)
Operating Frequency	76.5 GHz
Operating Range	50 to 1000 m (50-1200 m optional)
Range Resolution	0.30 m
Minimum Target RCS	-14.4 dBsm for reference cylinder (Ø38 x 31 mm)
Operation mode	FMCW
Field of View	200° / 3 min for a loop
Tilt rotation	Up to -20° to +45°
Angle resolution Azimuth / Elevation	0.1°/ 0.1°
Update Rate (Rotation Speed)	Pan: 24 deg/s, Tilt: 12 deg/s
Runway Complete Scan Trajectory	Two 160° azimuth sweeps with an altitude shift of 0.4°
Data Connection	Gigabit Ethernet (RJ-45 connector)
Data transfer rate	Position of radar + FFT, 4096 points@16 bits
Power Consumption / Power Supply	500 Watts 54 V DC, optionally 110/230V AC
Weight	80 Kg
Mounting Height Safe Working	8 m (recommended) 8 m
Ambient temperature	-30°C to + 60°C
Relative humidity at 25°C	95%
Max atmospheric pressure	84.0 to 106.7 kPa (630 to 800 Torr)
Max antenna Wind Load	150 km/h or 0.3 kN
Environmental protection	IP 67

One FOD Detection Radar Kit includes

- 2x 76 GHz FMCW radar modules (Tx and Rx) in IP-67 cases with sealed cables for DC power and Ethernet
- 2x 60 cm antennas with radomes
- 1x Positioner (rotation device) with control electronics
- PTZ HD Multispectral Camera (optional)
- FOD operator software



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