



## Intelligent E-scan Detection Radar

- Lightweight and low cost GSR suited to fixed installation on masts or towers
- Detects moving vehicles and persons
- Integrated Vortex fast-scan technology
- Unsurpassed ground clutter suppression with low false alarm rate
- Fully electronic scanning (E-scan) using PESA technology for ultra high reliability
- Simultaneous Doppler and FMCW processing whilst fast-scanning (no mode change required)

**SensorTec** Surveillance Systems addresses a broad range of security requirements in the defence, homeland security and civil/commercial markets. **SensorTec** radars are part of a range of advanced BSS technologies that provide class-leading protection against conventional and asymmetric/terrorist threats.

the **SensorTec** radar scans and detects moving vehicles and persons (including 'crawlers') over a wide area and provides exceptional detection performance out to 8 km.

Detected targets are reported via a standard Ethernet TCP/IP network connection, allowing target recognition and identification through the automatic slew-to-cue of optional cameras or thermal imagers. Accurate positional information is reported, including target lat/long co-ordinates, range and bearing. The data bandwidth required for target output and radar control is very low.

### Electronic-scanning (E-Scan)

The **SensorTec** ST-ESR138 is a low cost e-scan ground surveillance radar (GSR). **SensorTec** e-scan radars have no moving parts to wear out, maintain or replace and offer dramatic improvements in reliability over mechanically scanned radars. **SensorTec** radars are all-in-one fully integrated units comprising antennas, signal processing, plot extractor, GPS and compass. **SensorTec** radars are proven to withstand harsh environmental conditions and provide many years of maintenance free operation. The radar operates in all weather conditions and includes a built-in precipitation filter that suppresses false detections from rain or snow. Day/night 24-hour operation is fully supported.

### Low-power FMCW Doppler Technology

SensorTec radars incorporate a unique combination of FMCW and Doppler processing technology, ensuring unsurpassed ground clutter cancellation with the ability to detect incredibly slow movement. Radio transmission power is very low, making the radar safe for human operation and difficult to intercept (i.e. electronically covert). Power consumption is low, allowing operation from battery, vehicle or mains.

### Wide Elevation Beam

In order to maximise long range detection performance, radars are typically mounted high on a tower or on top of a hill. However, when mounted in this way, the narrow vertical elevation beam of traditional radars results in the problem of 'dead ground' close to the radar. SensorTec radars benefit from having a very wide vertical elevation beam, allowing them to detect targets in the distance as well as close-up simultaneously. In complex mountainous regions, the SensorTec radar's wide elevation beam also ensures that hill tops and valleys can be scanned simultaneously, without the need to physically tilt the radar.

Specification	
Architectural Overview	
Radar type	E-scan Frequency Modulated Continuous Wave (FMCW) Doppler Ground Surveillance Radar (GSR)
Frequency band	Ku band
Scan type	fully electronic scanning in azimuth ('e-scan') using a Passive Electronically Scanned Array (PESA)
Transmitter power (nominal)	1 Watt
Multi-radar operation	up to 16 radars in close proximity
Embedded software and firmware	field upgradeable via network connection

Target Detection Performance	
<b>Maximum detection ranges</b>	
Crawling person (RCS 0.1 m2)	1.5 km (0.9 mi.)
Walking person (RCS 1.0 m2)	3.3 km (2.1 mi.)
Moving vehicle (RCS 30.0 m2)	8.0 km (5.0 mi.)
Large moving vehicle	(RCS 100.0 m2): 8.0 km (5.0 mi.)
Maximum targets per scan	700
False Alarm Rate (FAR)	1 false alarm per day
Minimum detectable target radial velocity	0.37 km/h (0.23 mph)
Coverage	
Instrumented maximum range	5.0 km or 8.0 km (3.1 mi. or 5.0 mi.)
Instrumented minimum range	less than 10 m (33 ft.)
Azimuth scan angle	180° horizontal e-scan
Elevation beam	20° vertical beamwidth
Fastest scan time (for 180°)	1.3 s
Target Output & Identification	
Data format	QZ (custom, open- standard data format) over TCP/IP
Target output port	available for cueing of pan/tilt-mounted cameras and thermal imagers
Doppler audio modes	optional
Connectivity & Software	
Main I/O interface (for radar control and target data)	10/100 Ethernet network interface
Auxiliary I/O interfaces	RS-232 and RS-422 control lines, opto-isolated control/status inputs and isolated switched contact outputs
Software (SDK)	API software library (Windows) and generic Interface Control Document (ICD) are both available to System Integrators

Electrical	
Battery/regulated-PSU input range	from 12 V to 28 V (DC)
Vehicle supply input range	from 12 V to 24 V (DC)
Power consumption (from 12 V supply)	38 W (average)
Physical, Environmental & Reliability	
External dimensions (W x H x D)	645 mm x 490 mm x 410 mm (25.4 in. x 19.3 in. x 16.1 in.)
Weight of radar unit	approximately 22.0 kg (48.5 lb.)
Operating temperature	from -32° C to +60° C (from -25° F to +140° F) Note: extended operating temperature version available
IP rating	IP66 (dust tight and protected against powerful water jets)
MTBF	> 65,000 h (zero maintenance)

ST-ESR138 radar unit only (i.e. excluding lifting eye, mounting brackets, solar shield, etc.)

Errors and omissions excepted. SensorTec Surveillance Systems reserves the right to modify specifications without notice. SensorTec radars are protected by a number of international patents. The SensorTec name is an international registered trademark.