



**ST-ESR360**

# Features

- Detects a moving vehicle at 16 km and a walking person at more than 7 km
- 360° surveillance with PESA e-scan performance
- Long life, maintenance-free positioner
- Wide 20° continuous elevation coverage
- (40° coverage via mechanical elevation control)
- Non-rotational central post for mast-top camera mounting
- Supports both continuous 'scan & pan' and 'stare' surveillance modes
- Full 360° 'scan in just 20 seconds'
- Ultra-high reliability positioner
- High performance servo motor

The ST-ESR360 Radar is fitted with W20S wide elevation beam antennas. This configuration offers maximum performance in the most compact size, with the 20° wide elevation beam being ideal for mobile deployment in hilly and mountainous areas. The radar can detect a single walking person at distances of up to 7.4 km, over 360° (in four 90° quadrants). However, in typical deployments faster scanning modes may be used to

reduce the target revisit time to a minimum.

SensorTec ST-ESR360 can achieve a full 360° 'scan & pan' surveillance in just 20 seconds. SensorTec's coactive FMCW Doppler fast-scan processing detects small and slow moving targets in a single 90° electronic-sweep, meaning that it can then immediately move onto the next 90° quadrant.

The cable-drive positioner uses a compact yet high performance servo motor allowing the positioner and radar to be optimally accelerated and decelerated between surveillance quadrants. The positioner has four precisely defined set positions, each at 90° to one another so that the radar is precisely pointed in each one of its 90° 'scan & pan' surveillance quadrants. For surveillance over a narrow sector of less than 90°, the positioner is made to stare at any azimuth angle so that the radar's PESA escan beam is centred about the area of interest.

# Architectural Overview

- Radar type: E-scan Frequency Modulated Continuous Wave (FMCW)  
Doppler Ground Surveillance Radar Frequency band: Ku band Spectrum occupancy:
  - \* Wide-band (WB): 15.7 to 17.2 GHz
  - \* Narrow-band (NB): 16.2 to 17.2 GHz
- Scan type: electronic scanning in azimuth ('e-scan') using a Passive Electronically Scanned Array (PESA)
- Pan type: fully integrated cable drive positioner allowing 360° surveillance
- Transmitter power (nominal): 1 Watt (standard power transmitter version) or 4 Watt (high power transmitter version)
- Multi-radar operation: supported and unlimited
- Embedded software and firmware: field upgradeable via network connection

# Target Detection Performance

- Maximum targets per scan: 700
- Maximum detection ranges:
  - \* Crawling person (RCS 0.1 m<sup>2</sup>): 3.2 km (2.0 mi.)\*
  - \* Walking person (RCS 1 m<sup>2</sup>): 7.4 km (4.6 mi.)\*
  - \* Moving RIB (RCS 5 m<sup>2</sup>): 14.2 km (8.9 mi.)\*
  - \* Moving vehicle (RCS 30 m<sup>2</sup>): 16.0 km (9.9 mi.)\*
  - \* Large moving vehicle (RCS 100 m<sup>2</sup>): 22.1 km (13.7 mi.)
  - \* Large moving vessel (RCS 1000 m<sup>2</sup>): 32.0 km (19.9 mi.)
- 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: 2, 5, 8, 16 or 32 km (1.2, 3.1, 5.0, 9.9 or 19.9 mi.)
- Instrumented minimum range: less than 10 m (33 ft.)
- Azimuth scan angle: 90° horizontal e-scan; 360° via integrated positioner
- Elevation beam: 20° vertical elevation beamwidth
- Elevation adjustment: +10° to -10° (manual)
- Fastest scan time (for 90°): 1 s
- Fastest 'scan & pan' time (for 360°): 20 s

# Target Output & Identification

- Data format: QZ (custom, open standard data format)
- 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 24 V to 28 V (DC)
- Vehicle supply input: 24 V (DC)
- Power consumption (from 28 V regulated PSU)\*: 70 W (average)
- Endurance\*: 10 to 14 hours continuous operation from quad BB-2590 batteries
- SP version (HP version consumes 135 W)

# Physical, Environmental & Reliability

- External dimensions of radar unit (W x H x D)\*: 666 mm x 503 mm x 128 mm\*\* (26.2 in. x 19.8 in. x 5.0 in.)

- Weight SensorTec ST-ESR360 radar system (approx.):

- \* Wide-band (WB): 50 kg (110 lb.)

- \* Narrow-band (NB): 52 kg (115 lb.)

- Operating temperature: from -32° C to +65° C

Note: extended operating temperature version available

- IP rating: IP66 (dust tight and protected against powerful water jets)

- MTBF: > 65,000 h (zero maintenance)



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