

LEONARDO ELECTRONICS

E-SATR SMR

SOLID STATE X-BAND SURFACE MOVEMENT RADAR (SMR)



The SMR Enhanced Surface Airport Tracking Radar (E-SATR) is an X-Band, state-of-the-art, solid-state, high-resolution radar for complete ground movement control in A-SMGCS systems. It has been developed in accordance with EUROCAE MOPS and ICAO requirements for performance and integration purposes in A-SMGCS systems.

E-SATR includes an X-Band antenna based on an End Fed Slotted Array of either 19 or 21 feet. The radar combines outstanding detection performance with high range resolution. It provides high detection probability across the entire airport scenario, while minimizing false alarms, echoes, and ghosts even in the most complex airport environments.

E-SATR includes a dual channel transceiver and processor unit. It can be also provided in single channel configuration, such to match lower budget applications whilst maintaining very high reliability and superior system availability.

The transceiver and processor unit can be installed in either a single indoor rack unit, close to the antenna unit, or split across two rack units: one installed outdoor, near the antenna, the other indoor, potentially at large distance from the outdoor unit. This latter option turns to be useful in case of very high towers.

The system has a wide display and keyboard to facilitate local maintenance. Output plots and tracks are sent via

LAN in ASTERIX format. For superior performance and/or specific requirements, a 21-foot antenna is available.

The transceiver unit uses pulse compression that grants high resolution and longer detection ranges, even transmitting low peak RF power (optioned to achieve complete airport area coverage and optimise radar performances in bad weather conditions). The receiver has a double super-heterodyne design that provides very high dynamic range.

The processor includes a custom made, flexible, digital waveform generator with matched filter/detector. It includes a post processor software package to assure target detection, ghost rejection, false alarm rejection. In the event of heavy clutter, the processor can easily manage and resolve plot fusion, multi-path reflections, splitting, and data recovery.

A specific anti-reflection algorithm is fully integrated in the post processor to provide smart plot filtering. EditorMap SMR is employed as a user-friendly software tool to facilitate system set-up, and enable local control of E-SATR functionalities. EditorMap SMR allows E-SATR to easily adapt to any airport scenario, such as the initial definition of automatic tracking areas, and to support any specific end-user requirement.



TECHNICAL CHARACTERISTICS

ANTENNA

- Type End Fed Slotted Array Antenna
- Operation frequency 9300 MHz to 9550 MHz (optional 9000 MHz to 9200 MHz)
- Polarization Circular (RCP or LCP)
- Type of coverage Fan beam
- Azimuth beam width $< 0.4^\circ$
- Elevation beam width $< 20^\circ$
- Gain $> 36\text{dB}$
- Side lobe level $< -27\text{dB}$
- Azimuth encoder Optical, up to 16384 pulse
- Rotation rate 60 RPM

TRANSMITTER/RECEIVER

- Architecture Very high modular with FAIL slot capability
- Transceiver type Fully solid-state
- Frequency 9300 MHz to 9450 MHz diversity or agility up to 16 frequencies (optional 9400 MHz to 9550 MHz or 9025 MHz to 9175 MHz)
- Peak power 40 W or 80 W
- Transmitter Waveform Pulsed with digital pulse compression
- Transmitter resolution Up to 4 m
- PRF 8192 Hz stagger
- Noise figure 1.5 dB nominal (LNFE)
overall 3.7 dB nominal
- RF STC $> 40\text{ dB}$
- Dynamic range Up to 120 dB
- Cooling Forced air

DIGITAL SIGNAL PROCESSOR

- Data signal processing Clutter rejection, rain rejection, multipath rejection, antisquint
- Target capacity Up to 1000 targets for scan
- Track range Up to 6 km, fully ICAO compliant
- Protocol data output Ethernet, ASTERIX CAT10 for plots and tracks



For more information:
infomarketing@leonardo.com
Electronics Division
Via Tiburtina
Km 12.400
00131 Rome - Italy
T +39 06 41501
F +39 06 4131133



leonardo.com

This publication is issued to provide outline information only and is supplied without liability for errors or omissions.
No part of it may be reproduced or used unless authorised in writing.
We reserve the right to modify or revise all or part of this document without notice.

2023 © Leonardo S.p.A.

MM07840 02-24

