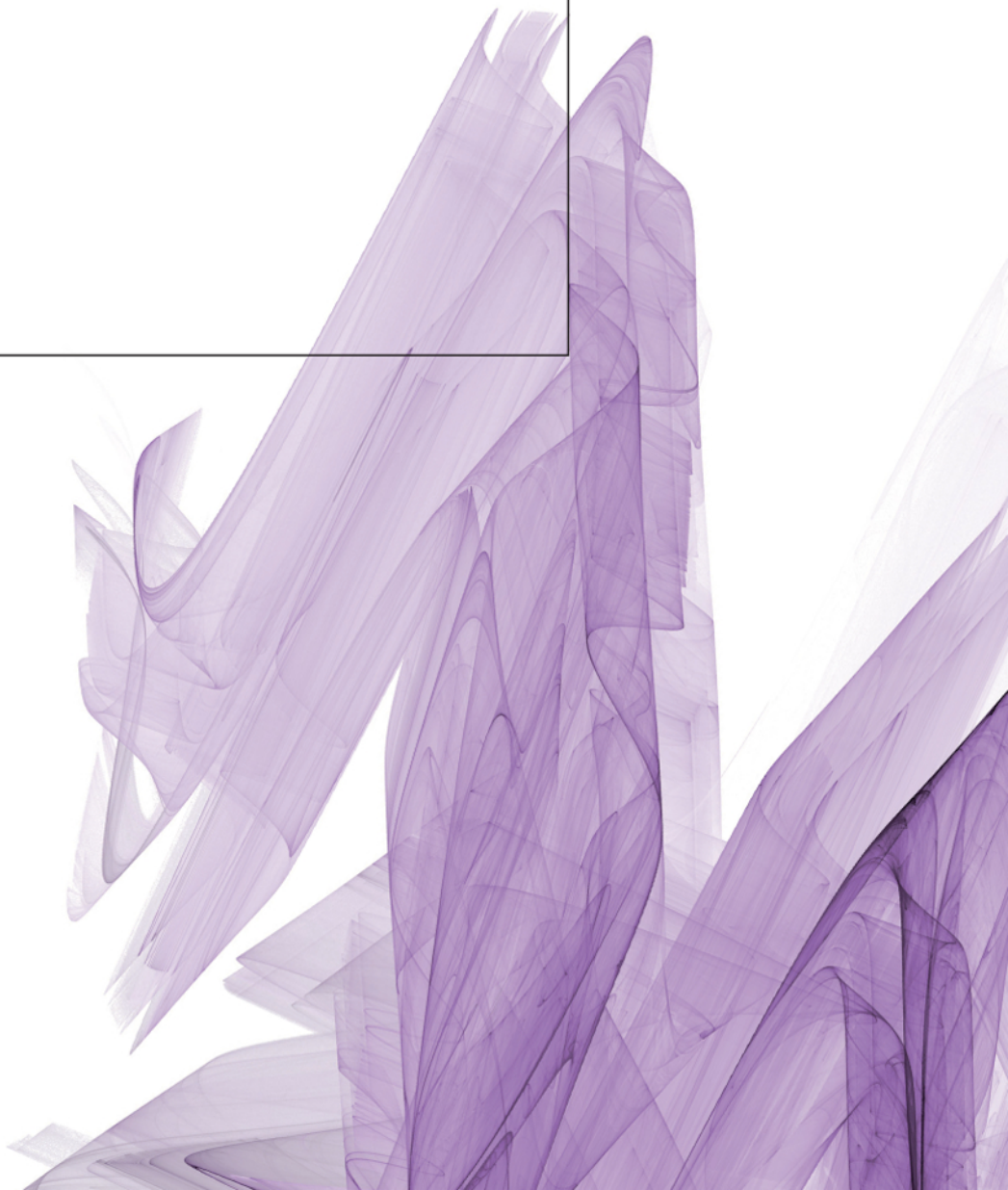
AIR TRAFFIC MANAGEMENT

SURFACE MOVEMENT RADAR

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SURFACE MOVEMENT RADAR



Continous wave technology to improve highly reliable airport manoeuvres

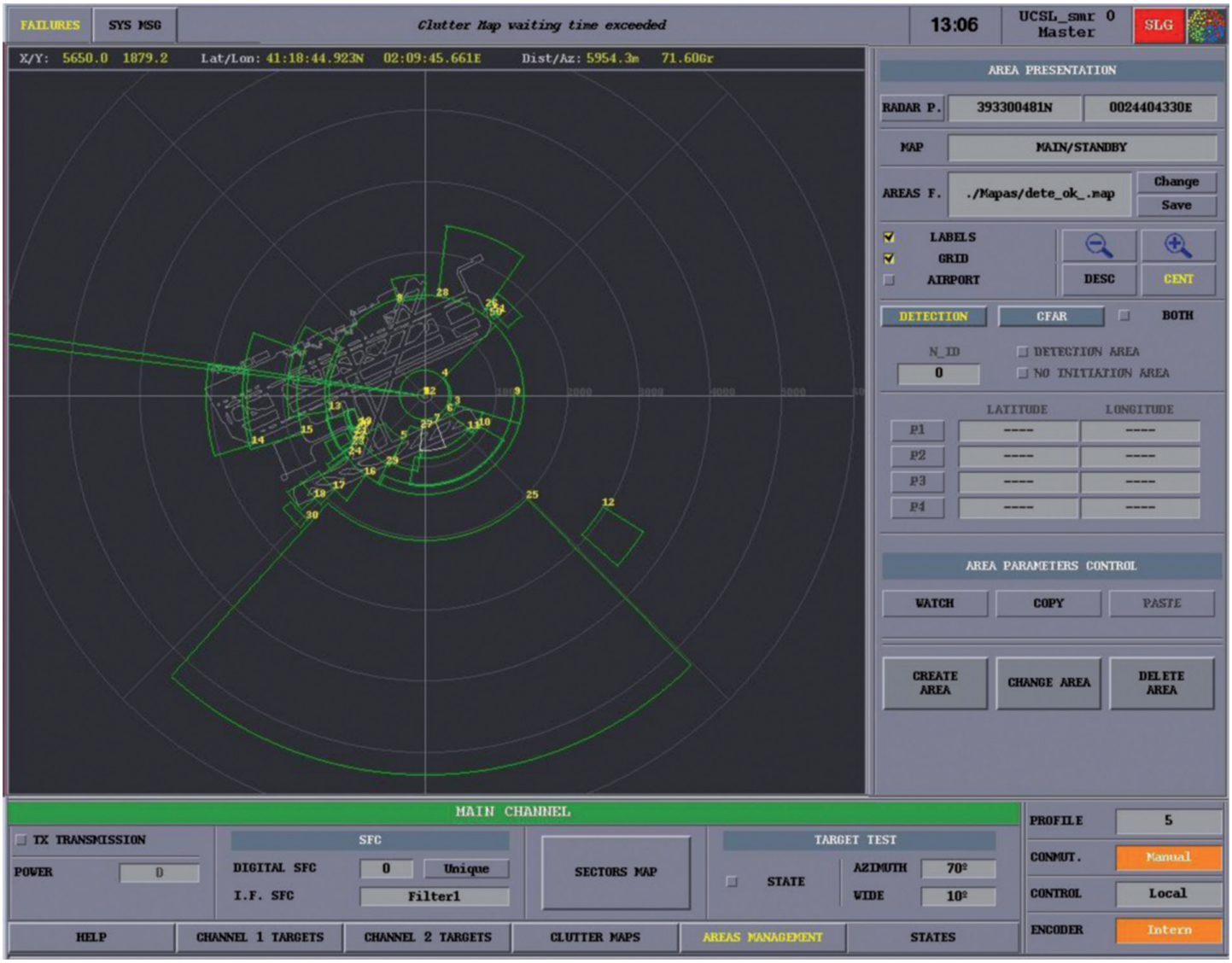
Introduction

Indra's SMR is a continuous wave radar, state-of-the-art due to it is fully manufactured in solid-state technology which offers great flexibility to adapt to customer needs.

The radar is designed to detect and locate stationary, moving, individual and multiple targets located in airport manoeuvre and ramp areas at extended range even in low visibility conditions caused by fog or rain. Its solid-state low power design allows highly reliable operation with very simple maintenance.

Indra's SMR system provides a high resolution compared with other SMR. The continuous wave waveform together to the system processing techniques allows the system obtaining excellent performances.

This SMR is characterised by the high level of integration. The modular double channel system composed by redundant transmitters, receivers and processors is integrated in a single rack. The SMR is designed to be deployed as a standalone system or integrated as part of an A-SMGCS system.



Friendly user interface to manage all configuration parameters



Able to detect even the worst weather conditions

System description

The SMR radar consists of a linear array antenna and pedestal subsystem mounted on the top of a building or tower, and the electronic equipment assembled in dual channel for reception, transmission, process, extraction, tracking and formatting targets in Eurocontrol Asterix format. The system is equipped with two redundant and fast speed Local Area Networks (LAN).

All of these are housed in a single 19" cabinet, which also includes two GPS units for time synchronization, as well as the system diagnostic and supervision equipment by means of a powerful BITE (Built In Test Equipment) feature.

The local and remote control and monitoring system are based on COTS products. CMS stores all relevant data regarding events, alarms and user actions in files.

The radar site contains a local display where radar data are displayed to support maintenance, supervision and adjustment tasks.

Friendly parameters configuration display

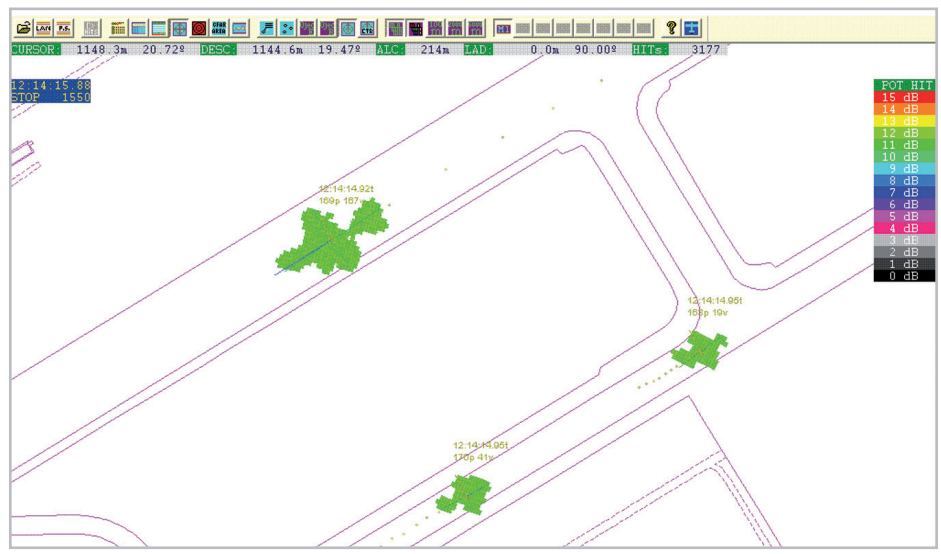
- Graphic tool to define CFAR and detection areas
- The information displayed in the airport map is used to adjust and improve the performance of the tracking system
- Specific areas are defined to initiate, filter and adjust the system parameters
- System parameters configuration
- Blanking sectors configuration
- Channels status configuration
- Clutter maps management
- Manual/automatic map backups
- Test target configuration
- User profiles configuration
- STC configuration
- Help window
- Configuration of switches
- Configuration of NTP clocks

System features

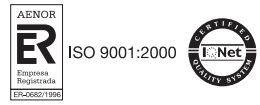
- Solid-state transmitter fault resistant
- Very low transmitter output power
- High level of integration. Fully modular
- Very high resolution
- Dual redundant channel for the transmitter/receiver/processor with automatic reconfiguration
- Continuous wave radar with linear frequency modulation (CW-LFM)
- Frequency diversity. Operation with frequency diversity in each channel, improving detection of targets in rain clutter
- Waveform generation using DDS technology (Direct Digital Synthesis)
- High gain antenna with an inverted square cosecant radiation diagram
- Antenna with circular polarization, favouring suppression of clutter
- Use of latest-generation signal and data processors
- Digital extraction of I and Q signals from the baseband signal
- Automatic tracking capability of a high number of targets
- Local and remote control and monitoring system with maximum efficiency and friendly human machine interface
- Intelligent BITE (Built In Test Equipment). Maintenance staff supervises the system status from both local and remote control and monitoring system
- Availability, reliability and maintainability: Solid-state technology provides high MTBCF and MTBF values that simplify maintenance, adjustment tasks and costs

Main technical features

Min/max oblique range coverage	100 / 6000 m
Range coverage with 16 mm/h rainfall	> 4600 m
Azimuth accuracy	< 0.044°
Range resolution, 1 m2 target	< 6 m
Azimuth resolution at 2 Km	<15 m
Target processing capability (60 rpm)	> 300
Maximum processing delay	< 0.25 s
Frequency band	X Band (9.0 to 9.5 GHz)
Waveform	Linear Frequency Modulation Continuous Wave (LFM-CW)
Frequency diversity	4 frequencies
Transmiter output power	5 watts, continuous wave
LFM sweep	> 200 MHz
Receiver noise figure	< 4.5 dB
Video bandwidth	7.5 MHz
A/D converter	12 bits
FFT length	2048 points complex
Clutter suppression and CFAR	Based on clutter map
Antenna:	
Gain	>35 dBi minimum
Beam width, azimuth	< 0.4°
Elevation beam form	Inverse cosecant squared
Polarization	Circular
Antenna revolutions	60 rpm
System availability	99,99%



Radar high resolution enables observation and obtain shape of aircrafts





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Indra reserves the right to modify these specifications without prior notice.

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