



Military Air Traffic Control (MATC)

Integrated solutions for airbases

indra

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The trend of air traffic management is heading towards a more secure and effective use of airspace combined with an increasing control of air threats within it. Therefore, it is necessary a greater interoperability and integration between civilian and military air surveillance, control and navigation systems.



3D Primary Surveillance Radar (3D PSR)

Indra has an experience of over 90 years supplying ATM equipment and systems in more than 140 countries with a state-of-the-art technology offer. This has positioned the company as a leader in the sector of Air Traffic Management.

Indra is also a reference in the Defence and Security field as supplier of proprietary technology based solutions for Armed and Security Forces throughout the five continents, highlighting its offer in Surveillance and Air Defence systems.



2D Primary Surveillance Radar (2D PSR)

The experience and knowledge of Indra in both sectors generate synergies that place it as the ideal technology partner to solve the growing needs of Military Air Traffic Control.

Indra provides integrated solutions that cover all the needs of an airbase. This includes Surveillance, Automation, Communications and Nav aids systems, and an extensive international project management experience focused on providing the best service to its customers.

Surveillance

3D Primary Surveillance Radar (3D PSR)

The 3D PSR radar belongs to the mature family of 3D L-Band radars called LANZA. Indra has supplied more than 40 LANZA 3D radars worldwide, such as early warning radars operated by NATO. The Indra 3D PSR is a solid state primary radar that incorporates the latest technologies for the detection and monitoring of non-cooperative aircrafts for medium and long ranges during En-route and Approach phases. It operates under extreme weather conditions, with surface clutter or interference, maintaining the reliability and availability required by ICAO.



Secondary Surveillance Radar / IFF

2D Primary Surveillance Radar (2D PSR)

Indra 2D PSR radar, with more than 20 years of continuous evolution, is one of the most advanced and reliable surveillance systems for airbases available in the market thanks to a fully redundant dual channel configuration. The solid state S-Band radar PSR 2D allows the controller to monitor all non-cooperative aircrafts in the airspace clearly and without interference, by the implementation of MTD and processing techniques to reduce clutter such as produced by wind farms, and also providing a weather map through a separate channel.

Monopulse Secondary Surveillance Radar Mode S (MSSR-S)

The secondary radar MSSR-S, in their stand-alone configuration or co-assembled with a primary radar (e.g. Indra 2D PSR), is a solution of exceptional performance for cooperative aircraft control. The Indra MSSR-S radar incorporates the enhanced Mode-S and data link for selective interrogations, fully compliant with the demanding requirements of ICAO and EUROCONTROL. Indra has supplied more than 200 of these radar systems worldwide.

Interrogator Identification Friend or Foe (IFF)

The Indra IFF is a Mark XII system that provides an effective identification of aircraft operating in both civil and military modes, 1, 2, 3/A, C, S including encrypted modes 4 and 5. Fully integrated solution with primary surveillance radars and compatible with airspace management systems.

Multilateration and Wide Area Multilateration (MLAT / WAM)

Indra MLAT/WAM is a high accurate solution for air surveillance as well as surface surveillance during runway monitoring. The system is composed of a series of distributed stations that collect the time difference of arrival of SIF / SSR signals received from the aircrafts to determine their 3D position. Indra MLAT sensors are the most accurate in the market with a synchronization accuracy better than 1 ns. In addition, the distribution of the stations provide surveillance in areas where radar coverage is limited due to the terrain, and is a scalable solution for a flexible and efficient upgrade.

Nav aids

Doppler VHF Omnidirectional Range (DVOR)

Indra DVOR is a ground radio aid that allows aircraft to determine their bearing in azimuth relative to the location of the beacon and magnetic north. This system offers high reliability under the most severe conditions for both civil and military use thanks to its modular design, solid-state components and self-diagnostic system BITE.

Distance Measuring Equipment (DME)

The Indra DME is a ground radio aid that allows the aircraft to determine its distance from the beacon, often co-mounted with the DVOR for a 2D location in range and

azimuth, and is used as an aid for airways navigation and for precision maneuvers in the approach path to the airbases.

NORMARC Instrumented Landing System (ILS)

The NORMARC ILS system is the flagship solution, installed in more than 1,200 runways around the world. This navaid provides information to the aircraft about its horizontal and vertical bearing relative to the runway during final approach and landing, and it can be configured for Categories I, II and III according to requirements of ICAO, Annex 10.

NORMARC 8100 Ground Based Augmentation System (GBAS)

Indra has designed the 8100 NORMARC landing system requirements under CAT II / III based on the use of augmented signals from the Global Navigation Satellite System (GNSS) sent by VHF to the aircraft for a reliable and accurate final approach and landing. The GBAS NORMARC 8100 presents a number of advantages compared with traditional ILS as service to multiple runways and landing patterns with a single system, curve approach operations, or increased air traffic capacity.



Doppler VHF Omnidirectional Range (DVOR)



NORMARC Instrumented Landing System (ILS)



ATC Automation Systems

Automation and Communications Systems

ATC Automation Systems

The Indra Air Traffic Control system is one of the most advanced, safe and reliable in the world. It features an intuitive and friendly interface for the En-route, Approach and Tower controller, which integrates the information of surveillance sensors, flight plans, aeronautical and meteorological information, ground/air data links and internal and external coordination including liaison with civil ATC centers.

Digital Voice Communications Control System (VCCS)

Designed specifically for the control of civil and military air traffic, and integrated in the ATC system for sectorization functions. The VCCS system is based on VoIP technology in compliance with EUROCAE ED-137 standard, and enables integration and interoperability of analog and digital G/G and A/G/A communications links, integrating both new and legacy equipment. The HMI user interface allows a friendly access to Radio and Telephony via touch screens.

Simulators for ACC, APP and TWR

Indra combines its experience in the field of Virtual Simulation, where it is a leading supplier of civil and military flight simulators, with its expertise in the training of Air Traffic Controllers, to offer integrated simulation systems for air route control (ACC), approach (APP) and tower (TWR), the latter using 2D and 3D configurations (180° and 360° visual systems). These simulators work in standalone mode or in combination with a real ATC system acting as backup and/or contingency.

Neptuno. Voice Recorder and Player

The Indra Neptuno solution is a modular system that records and replays communications at the controller positions, as well all audio communications of the airbase. Indra developed the Neptuno recorder specifically for air traffic management, and today it is operating in more than 200 locations on the five continents.

Supply of entire ATC Systems for Airbases

Integration of airbases systems

Indra has an extensive experience as supplier and integrator of all type of ATC systems. Indra manages projects for the provision of an entire integrated solution, composed by Indra systems as well as third party systems such as new and legacy sensors, Automatic Weather Observation Systems (AWOS), runway lights and approach lighting, communications infrastructure, Auxiliary Equipment, or even Civil Works.

Security Systems

Indra's experience in critical infrastructure protection can provide to the airbases a solution that integrates different elements into one system for intrusion monitoring, perimeter protection, CCTV, access control, alarm management or other special systems, incorporating own and third party equipment.

Envisioning a safer tomorrow

Indra reserves the
right to modify these
specifications without
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