AIR TRAFFIC MANAGEMENT

MULTILATERATION SYSTEM

Supplying ATM systems around the world for more than 90 years

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For equipped targets, the system detection is based on the squitters received and only when necessary, it will interrogate them in order to produce replies to obtain the required information. The synchronization of the system and the different correction performed inside it results in a system that provides the best horizontal accuracy for targets in surface and in the vicinity of the airports installing minimum number of receivers.

Indra Multilateration system provides all advantages of multilateration technology and can be fully adapted to the customer needs. It can work alone or integrated with other surveillance systems as part of an A-SMGCS.

The system identifies all targets equipped with a Mode A/C or Mode S transponder, from the airport surface or in approach-departure procedures. In addition to position and identification, system also provides Mode S information. As well, Multilateration system is 2 in 1 solution, providing also ADS-B service for the equipped targets.

Investing in an Indra MLAT system will provide a cost-effective solution that is maintainable, scalable and flexible that can operate under the current and future air traffic needs.

The highest performance and accuracy
System description

MLAT system consists on a distribution of receiving and transmitting stations inside an airport that receive the squitters and replies from the targets and a redundant Central process station. This Central process station correlates all the replies received and with the timestamp information calculates the position of the targets.

The MLAT system is distributed. In this way and not as rotating radars, the system is receiving data all the time, so the update of the information is much faster than traditional surveillance systems. In addition, the effect of the shadows produced by the buildings can be reduced to the minimum in the design phase and the service is provided in all parts of the aerodrome.

With Mode S and ADS-B equipped targets, the MLAT system can operate in a pseudo passive way calculating the position of the targets from the spontaneous emissions transmitted by them (Squitters). When necessary the ECP orders the transmitting stations to interrogate in order to obtain the required information for the selected targets.

The system includes BITE which allows for diagnostic and supervision. The data obtained from the BITE units is sent to the new generation Control and Monitoring System, and the user has a real time picture of the situation of the system.

The MLAT CMS allows include web service, so access connection is possible from any PC with a Web client. This CMS stores all relevant data and when necessary will create reports or report events defined by the user.

Areas and volumes can be created, defined and modified from the CMS, so different detection parameters, track parameters can be set for the different areas of the airport.
Adapted to the customer necessities

Indra MLAT system offers a solution that can be adapted to all customer necessities. Transponder Synchronization of the receiving stations and internal algorithms contained in Central Process Station gives the system the possibility of extend the coverage up to 10NM outside the airport using only receivers located inside the airport. This is translated in a safer operation of the airport and also increases the economy in the deployment. Beside the receiving stations are ready for remote SW-FW reconfigurations, reducing maintenance time and costs.

Features
- Wider geographic coverage as needed around the airport without external receivers. This is translated in:
  - Reduced time and cost of site acquisition including: land leasing, power, communications and maintenance
  - Higher accuracy with improved performance
  - Higher reliability with minimum maintenance and downtime
- Lower through-life cost due to simple maintenance at remote sites
- Lower total life cycle cost
- Safety ensured due to high integrity and availability
- Minimal number of components
- Can be sited on existing infrastructure reducing total costs
- Rapid fault finding and diagnostics ensures maximum availability

### Surface Achieved Accuracy

<table>
<thead>
<tr>
<th>Areas</th>
<th>Reference</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manoeuvring Area</td>
<td>7.5 m</td>
<td>2.28 m</td>
</tr>
<tr>
<td>Runway</td>
<td>7.5 m</td>
<td>2.35 m</td>
</tr>
<tr>
<td>Parking and Stands</td>
<td>20 m</td>
<td>3.62 m</td>
</tr>
</tbody>
</table>
Technical characteristics

### SYSTEM

<table>
<thead>
<tr>
<th>Input data</th>
<th>Mode A/C, Mode S (DF 0, 4, 5, 11, 16, 17, 18, 20, 21)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output data</td>
<td>ASTERIX Cat 10, 19, 20, 21</td>
</tr>
<tr>
<td>Capacity</td>
<td>400 Mode S targets, 100 mode A/C</td>
</tr>
<tr>
<td>Maximum latency</td>
<td>250ms</td>
</tr>
<tr>
<td>Accuracy</td>
<td>Reference = 7.5m / Measured Standard Deviation = 3m</td>
</tr>
<tr>
<td></td>
<td>Reference = 7.5m / Measured Standard Deviation = 3m</td>
</tr>
<tr>
<td></td>
<td>Reference = 20m / Measured Standard Deviation = 4m</td>
</tr>
<tr>
<td><strong>Manoeuvring Area</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Runway</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Parking and Stands</strong></td>
<td></td>
</tr>
<tr>
<td>Coverage</td>
<td>Extendable to 10NM without any external station</td>
</tr>
<tr>
<td>Update rate</td>
<td>Data driven / periodic mode (reporting period configurable)</td>
</tr>
</tbody>
</table>

### RECEIVER

| Temperature    | -40°C to +55°C, plus 15°C sun loading                |
| Humidity       | 5% to 100% (non-condensing)                          |
| Ingress protection | IP67 receiver box and IP55 outdoor cabinet            |

### TRANSMITTER

| Output power   | ≥ 53 dBm                                              |
| Interrogation modes | 1, 2, 3/A, C, Intermodes and Mode S                  |
| Ingress Protection | IP67 internal box and IP55 outdoor cabinet           |

Applications

MLAT is a scalable solution that is designed to cost-effectively meet your specific requirements.

Applications range from small airport installations, for low cost operations monitoring, to the biggest airport, with hundred operations per day and plenty of buildings which give out undesired shadows to other systems.

The accuracy of the Indra MLAT system is adequate for noise monitoring applications as well as surveillance for terminal area, precision approach and parallel runway monitoring.

MLAT complements all existing secondary surveillance radar techniques.

Provides complementary ADS-B service for A-SMGCS use.