

ADAM

Traffic Control Systems

MULTILATERATION SYSTEMS

ADAM (ADaptive Multilateration) is a Multilateration system providing a high performance and accurate all-weather Surveillance for Airport and Wide Area applications.

ADAM is the best solution to meet the operational performance requirements, to provide an intrinsic level of modularity meeting the advanced requirements of a modern Air Traffic Control system. It supports any future capability that the Customer might need to be integrated.

ADAM exploits outstanding advanced sensors design and innovative target processing in a flexible and redundant architecture to identify co-operative detection of targets on the airport surface or on TMA/en-route airspace.

ADAM is compliant to the latest standard documents such as EUROCAE ED-117 MOPS, ED-129 TS, WG-70 Technical Specification and RTCS DO-260/260A MOPS.

ADAM consists of:

- Network of receivers and/or receivers-interrogators (Sensors), positioned in strategic locations and providing the required coverage, accuracy and continuity of service
- Central Processing Facility (CPF) which collect technical monitoring.

ADAM uses the spontaneous Mode-S “squitter” transmission and asynchronous transponder replies as well as the responses to interrogations elicited by the system themselves. It also manages DF17/DF18 ADS-B Extended Squitter messages from targets as an integrated independent surveillance data flow.

The sensor design is particularly performing, allowing a very accurate Time of Arrival computation at receiver level. The sensor hardware design is completely modular, allowing the local/remote monitoring (through resident built-in-tests) of each module and their replacement in case of failure without power supply interruption.



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BENEFITS

Airport

- Improved accuracy and update rate
- Supports Surface Movement Applications
- Supports Runway Incursion Monitoring
- Improves Situational Awareness through aircraft derived data
- Supports Extended Arrival and Departure Procedures
- Expands Closely Spaced Parallel Runway Operations
- Increases routing efficiency.

Wide Area

- Complements or in alternative to radar surveillance
- Fully adaptable to specific environment suitable to
- Optimize the performances
- Low and easy maintenance
- Reduces infrastructure costs in airspace
- Supports advanced/complex approach.

The ADAM CPF performs the following functions:

- Target Location and Plot Extraction
- System Time Synchronization and Check
- Interrogation scheduling and Target Identification
- Target Tracking
- ADS-B Data Extraction
- ADS-B Data Integrity Check
- Output Data Formats Handling: ASTERIX CAT10,19,20 and 21.



SYSTEM ARCHITECTURE

The multilateration principle requires a distributed system in order to enable the simultaneous reception of signals at different locations on the airport and in TMA/ En-Route.

Time Synchronization is fundamental in TDOA multilateration system, and various synchronization technologies can be used. ADAM can exploit two different time synchronization methods to meet the most stringent requirements, depending on the coverage volume which has to be surveyed:

Airport

The Squitter Transponder Based synchronization method, that uses reference transmissions from a Squitter Generator Unit to tie up the clocks at each of the Receiver unit sites.

Wide Area

Extended Area Time Based synchronization method, that exploits a GNSS timing receiver or ad-hoc equipment embedded in each Receiver unit to have a common timing reference for the In Field section.

