

Safe management of  
Air traffic in Approach  
and En-Route with  
**Surveillance  
Solutions**



# Improving traffic conflicts in a congested apron area

## Air traffic increase requires full control of the location of aircraft

The continuous growth of air traffic makes it increasingly difficult to guarantee a safe and efficient air traffic flow. Therefore, it is essential for all air traffic controllers to have an overview of the position of aircraft en-route and in the terminal maneuvering area. However, many approach and en-route systems are very complex, taking a lot of resources and time to put into operation and often bringing unnecessary overhead.

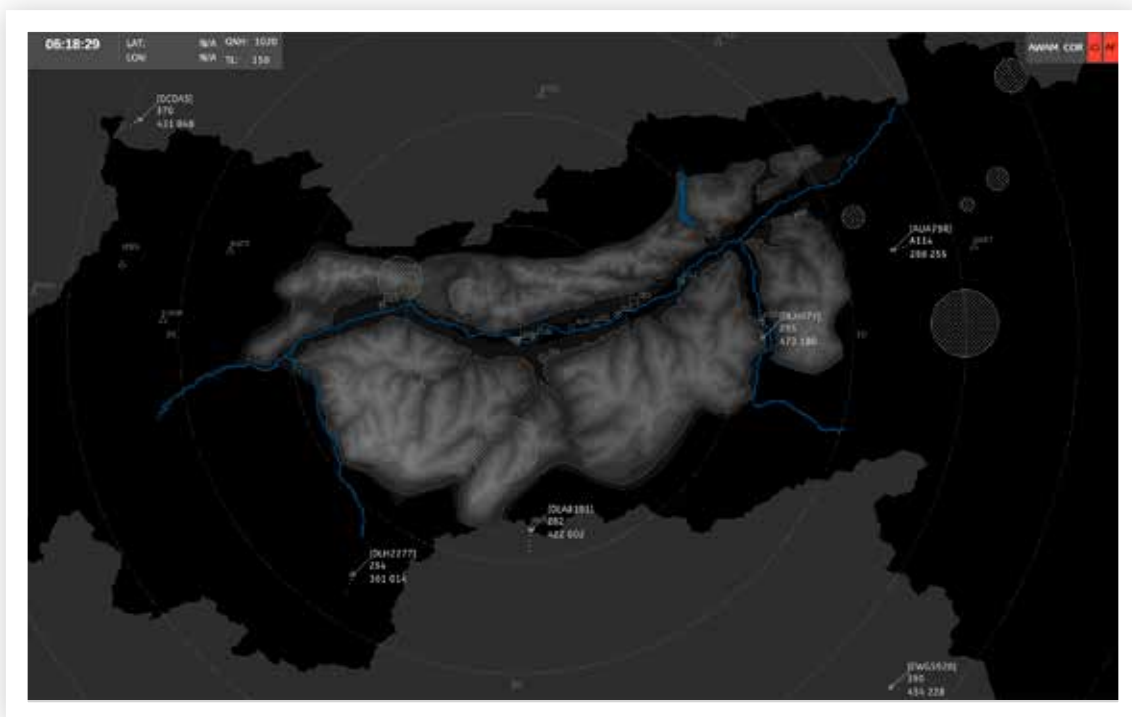
## The ADB SAFEGATE solution

**AIRMAX**, part of ADB SAFEGATE's tower solutions, is a highly configurable and scalable air situation display, providing all the surveillance, flight plan and safety functionality that air traffic controllers need in their daily work. Moreover, it can easily be integrated into towers and smaller approach and en-route centers without major technical and operational investments, either as a standalone system, combined with our electronic flight strip system **DIFLIS**, or as part of our integrated Controller Working Position **OneControl**.

The AIRMAX system is composed of four major units:

- ▶ The Multi-Sensor Data Fusion and Tracking module processes surveillance data received from various sources such as PSR(s), SSR(s), (Wide Area) Multilateration Systems or ADS-B.
- ▶ The Flight Data Processor connects to external ATM systems or gets data via AFTN and correlates the flight data with the surveillance data.
- ▶ The Safety Net Module observes the traffic situation and alerts the air traffic controller if a safety violation is detected, e.g. MSAW, STCA, APM, APW.
- ▶ All the information is presented on a highly configurable HMI, providing the functionality needed by controllers in their daily work.

The system runs in a fully redundant setup guaranteeing no single point of failure. It is supported by configuration tools for technical staff, as well as monitoring & control and recording & replay solutions, meeting all regulatory requirements.



### The heart of the system: Multi-Sensor Data Fusion

The Multi-Sensor Data Fusion receives the surveillance data either in standard ASTERIX or in a customer-specific format and processes the data on source level. It then fuses all position and movement information into unique target positions using sophisticated proven algorithms such as Joint Probabilistic Data Association, Multiple Hypothesis Techniques or Systematic Error Correction.

### The safety part: Alert Checker Module

The alert checker module uses the surveillance information provided by the data fusion and checks that flights don't violate any safety requirements. The controller will be immediately alerted if a safety infringement is detected. Depending on the operational requirements, the module checks that aircraft:

- ▶ Keep a certain distance (Short Term Conflict Alert – STCA)
- ▶ Don't descend below a minimum altitude (Minimum Safe Altitude Warning - MSAW)
- ▶ Don't violate a closed airspace volume (Area Proximity Warning – APW)
- ▶ Don't leave the approach funnel (Approach Path Monitoring – APM)

### Connecting the flight information: Flight Data Processor

The flight data processor connects to external ATM or AFTN systems and stores the flight data internally. The correlation process connects track and flight plan data based on

different criteria (transponder code, downlinked call sign or MODE-S address), so that the users can see both position and identification on the user interface. The system supports coordination with adjacent units using data exchange formats such as OLDI, which becomes even more beneficial if linked with ADB SAFEGATE's electronic flight strip system DIFLIS or integrated in OneControl.

### The visible part: Human Machine Interface

The HMI has been designed in close cooperation with air traffic controllers to guarantee a high acceptance by the operational users. It provides an intuitive user interface that is highly configurable. Different filters based on track data (e.g. area, transponder code or flight level) or on responsibility allow the user to concentrate on the relevant traffic. Standard functionality, such as manual correlation, display of different maps and PSR video or distance measuring between aircraft or between aircraft and points, is also available, making AIRMAX a viable cost-effective alternative to handle en-route and approach traffic.



### Key Features

- Open and modular architecture
- Scalable to support all types of ATC units – ACC, APP and tower units
- Data fusion and tracking module, including sophisticated algorithms for high-quality surveillance performance
- Flight data exchange with external ATM system or via AFTN
- State-of-the-art safety net features including STCA, MSAW, APM and APW
- Highly configurable user interface to meet the demands of different user groups
- Can be integrated with other ADB SAFEGATE solutions, for example connected to DIFLIS or as a part of OneControl.

### Benefits

- Meets all requirements of small to medium sized approach and en-route centers as well as tower units
- Limited local dependency allows for cost-effective and timely installation
- Links via standard data exchange to external units allow coordination independently of the neighbor's infrastructure
- Intuitive user interface reduces the need for training.



Our knowledge of Tower solutions is based on installations in more than 260 towers. Would you like to know how AIRMAX can benefit your operations? Contact us at [marketing@adbsafegate.com](mailto:marketing@adbsafegate.com) or find your right contact partner at [adbsafegate.com](http://adbsafegate.com).

**ADB SAFEGATE** is a leading provider of intelligent solutions that deliver superior airport performance from approach to departure. We partner with airports and airlines to analyze their current structures and operations, and jointly identify and solve bottlenecks. Our consultative approach enables airports to improve efficiency, enhance safety and environmental sustainability, as well as reduce operational costs. Our portfolio includes solutions and services that harmonize airport performance, tackling every aspect of traffic handling and guidance, from approach, runway and taxiway lighting, to tower-based traffic control systems and intelligent gate and docking automation.

ADB SAFEGATE has 900+ employees in more than 20 countries and serves some 2,500+ airports in more than 175 countries.

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The logo for ADB SAFEGATE, featuring a stylized orange and yellow starburst icon above the text "ADB SAFEGATE" in a bold, dark blue font.

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