

ATRiCS Tower and Cockpit Simulator



The **ATRiCS** Tower and Cockpit Simulator (TOPSIM) is a high-end ATC tower simulator that provides a maximum degree of reality and meets the demanding requirements for the training of aerodrome controllers. In addition, it offers a unique combination of fully integrated and operationally proven ATM systems making TOPSIM an ideal out-of-the-box test and validation platform for advanced A-SMGCS and A-CDM projects.



ATRICS Tower and Cockpit Simulator

Functions

Simulation Server

The backbone of TOPSIM is a powerful simulation server that simulates the physical movement of aircraft and vehicles on the ground and in the terminal maneuvering area. In particular, the server...

...models different surveillance sensors such as SMR, MLAT or induction loops, including data noise and gaps in the coverage area

...acts as a flight plan data processing system (FDPS) or as an airport operations data base (AODB), respectively

...controls the movement of aircraft and vehicles to separate queuing or converging traffic and to stop traffic at runway holding positions or switched stop bars

Real Time Rendering Engine

To display a synthetic 3D view of the traffic situation, TOPSIM uses a world leading real time rendering engine which...

...supports any type of display such as a rear/front projectors or LCD displays with Full HD resolution to span a viewing angle of up to 360°

...features highly realistic ambient lighting conditions including shadow effects and fog to simulate airport operations at any time of the day and down to any desired runway visibility range

...displays aircraft lights, apron flood lights, building lights as well as dynamically switched airfield lights including stop bars, taxiway center line lights and runway status lights

Interactivity Module

The interactive control of aircraft and vehicles is based on electronic ATC clearances entered either by pseudo pilots or directly by controllers. For both methods, TOPSIM's interactivity module...

...provides an A-SMGCS touch HMI that supports a compact set of highly intuitive and simple gestures for extremely fast input of ATC clearances and individual taxi routes on a touch display

...synthesizes pilot requests and read-backs with different voices and characteristics using state of the art text-to-speech technology

Tower Automation Suite

In cooperation with our distinguished industry partners, TOPSIM offers a broad range of outstanding tower automation systems, including...

...Surface Manager (SMAN) for conflict detection, routing, guidance and control according to A-SMGCS implementation levels II - V

...Electronic Flight Progress Strips (EFPS) for visualizing flight plan data and improving situational awareness

...Queue Management Tools for arrival sequencing, pre-departure sequencing and take-off sequencing in full compliance with the A-CDM milestone approach



Benefits

▲ **Operating Costs:** Using TOPSIM's touch HMI and text-to-speech synthesis, only 1-2 pseudo pilots are required to handle high traffic volumes at very large hub airports. With direct input of ATC clearances from the controllers, no pseudo pilots are required at all.

▲ **Flexibility:** Starting with only 4.0 square meters for two controller working positions and an optical 3D viewing angle of 180°, TOPSIM can be installed virtually everywhere on-site to allow for a convenient and flexible access 24 hours a day.

▲ **Cost-Effectiveness:** Using TOPSIM's suite of operational ATM systems provided by our industry partners, no extra development or integration effort is required to set up the world's most advanced test and validation platform for new A-SMGCS or A-CDM systems and concepts.



References

Zurich Airport

DFS Deutsche Flugsicherung

Fraport

Honeywell Airport Systems

Diehl Aerospace

ADB Airfield Solutions

Technical University of Darmstadt

Technical University of Braunschweig
(Institute of Flight Guidance)





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