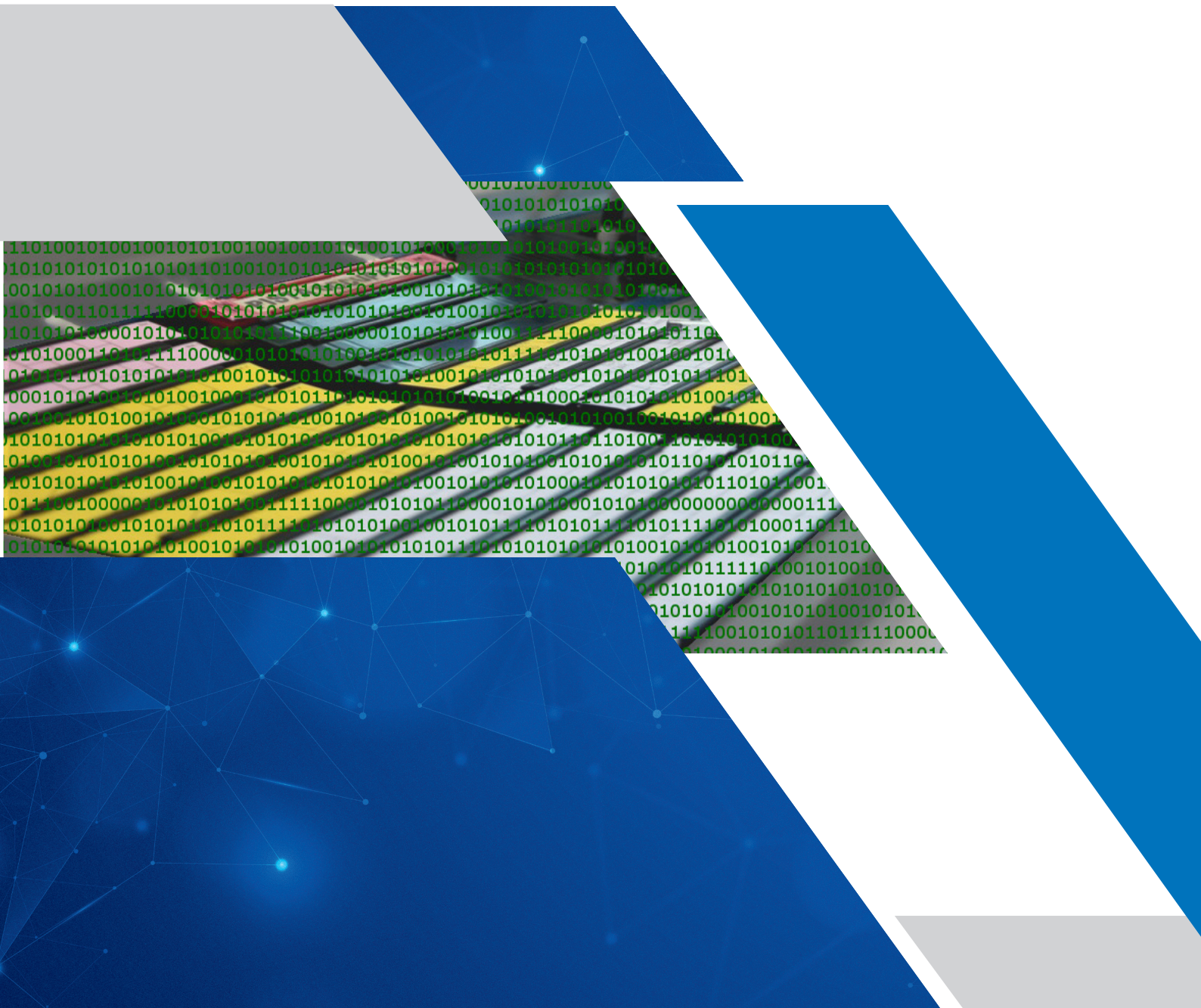


TWR EFPS

TWR Electronic Flight

Progress Strips

A comprehensive paperless system for the management of flight data in a TWR environment



TWR EFPS - TWR Electronic Flight Progress Strips

MISSION

The TWR EFPS system, developed by Techno Sky, provides a solution for the management of electronic strips in a Tower Environment implementing the optimized workflow related to different ATCO roles.

Operational scenario:

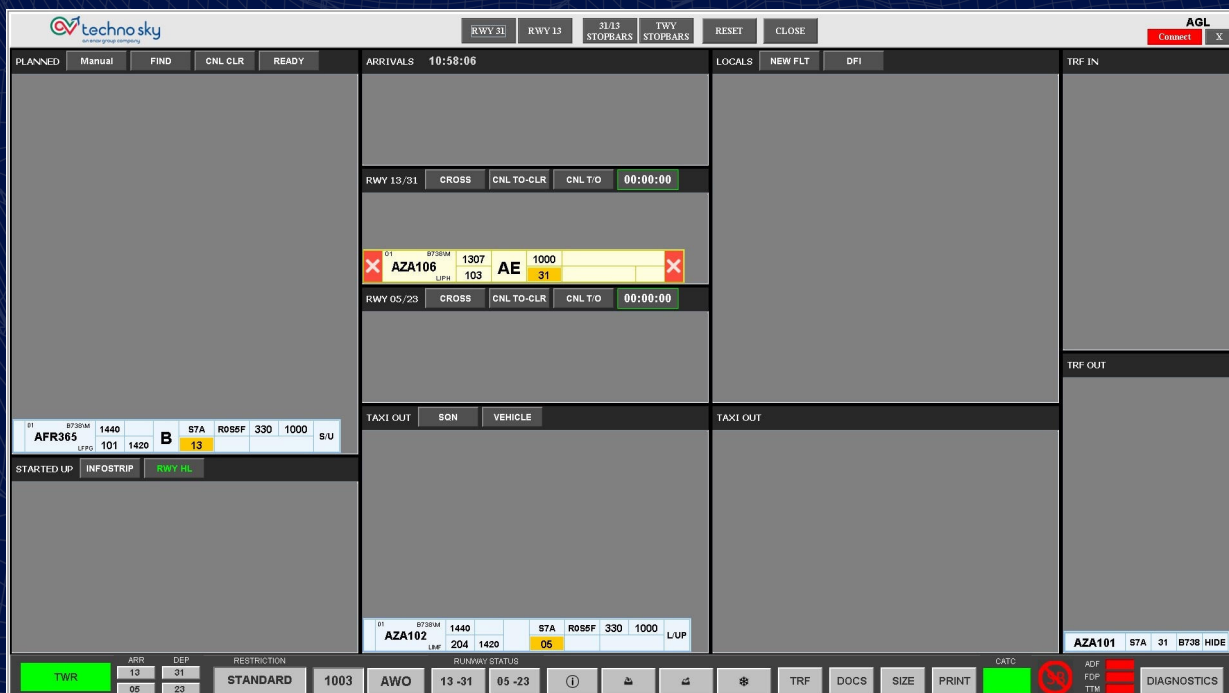
TWR EFPS is designed to be used either stand-alone or integrated in the TWR suite or third party's legacy ATM systems. It provides ATCOs with a paperless touch-based HMI enhancing the execution of operational workflows with modern and easy gestures such as drag-and-drop and touch.

The system is built considering different ATCOs profiles and providing an optimized presentation of the of the bays, containing electronic flight strips.

TWR EFPS is designed to allow the management of flight plans mainly for ground operations until take-off and after landing in a TWR environment. It offers a realistic representation of paper strips onto an electronic board in order to reproduce the real movement of an aircraft into the airport area across the bays from ground to tower ATC roles. It is flexible and scalable, so that it can come with small and large configuration in terms of number of ATC positions.

TWR EFPS is the result of a continuous and strict collaboration with the Italian Air Navigation Service Provider (ENAV). Significant Flight Data received from TWR FDPS (e.g. ARCID, ADEP, ADES, Wake turbulence) are represented on electronic strip.

- High Configuration of Electronic Strips layout, size and colours (data can be easily arranged into dedicated boxes or easily combined to other data to show an all-in-one information).
- Pop-ups and windows are highly configurable according to users' requests
- Panels and Bays arrangement are configurable and resizable according to airport runways scenario
- Each view on the board is built according to different ATC roles (Delivery, Ground, Tower, Administrator)
- Shortcuts through mouse-clicking on strips to ATC specific orders are customizable
- Airport Runways Scenario displayed and Integrated with meteorological data coming from AWOS System
- Integration with a wide set of ATC Orders.
- IFR/VFR management
- Warning Function on Flight Data changes on strips available (warning mode, text and colours can be adapted)
- Integration with the AGL system for runway lights and stop bars management.
- Integration of Conflict ATC clearance tool, a safety net with alert in case of out procedure ATCO clearances input



Key benefits:

EFPS is designed to be:

- Flexible with respect to specific operational requirements
- Easy of integration with existing legacy systems
- Cost/effettive Scalability
- Customizable to the Custom Airport Layout
- High portability thanks to Java Language
- Fully integration with Techno Sky TWR FDPS and e-AWOS SUITE to increase the situational awareness of ATCOs
- Operational Personnel Training Purposes through the integration with Techno Sky e-ATOMS SUITE
- High stability thanks to software modularity and thanks to the sharing of many software layers with systems that are currently in operational test

Main technical features and overview:

Specific layouts are customized for the following roles:

- **Ground:** it allows the management of ground movements, following the operational flow from the start-up to the taxi
- **Tower:** it allows the management of the departures and landings, allowing line-up and take-off commands for outbound flights and landing clearances for inbound flights.
- **Admin:** a supervisor that manages the control of the whole traffic

Each position provides a set of strip bays, whose layout reflects the natural procedural workflow of a flight. The migration of a strip from a bay to another occurs when an ATCO performs an action, such as a simple drag and drop or a click on a specific strip field.

A strip contains data related to the flight it describes and exposes different layouts according to the status of the flight and the bay it belongs to.

Simple actions on a strip allow to send orders such as DCL, DCR, LND, LCL, to central system for further processing.

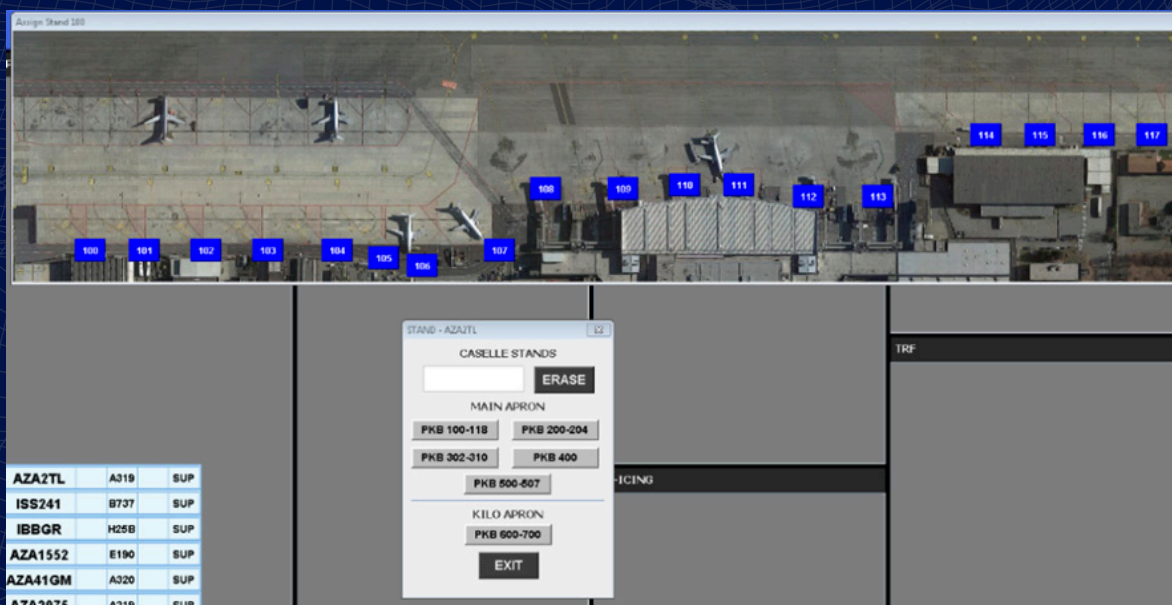
Integrability with external systems:

- **Airport Ground Lights:** the system can interact with lighting system to manage runway lights intensity and stop bars. A suitable toolbar provides easy and unified interaction
- **e-AWOS System:** a bidirectional communication with Techno Sky e-AWOS system allows visualization of weather info as well as runway in use and Low Visibility Procedures

Customizable airport Layout:

Parking bay: ATCO can select Parking Bay directly on an interactive airport image. This reduces error margins and increases situational awareness.

Runway holding point: The satellite view of runway and taxiway allows ATCO to select specific runway holding point for a flight.



Safety:

The system can ensure the timely detection of conflicting ATC clearances (predictive tool) by providing a prediction of situations that, if not corrected, would end in dangerous situations. In case of Conflicting Clearances, an alert is raised to the ATCo to inform about a potential unsafe situation.

EFPS applications:

- TWR Control: EFPS is suitable for the integration with any FDP system. It also provides a useful tool for the TWR control.
- Prototyping: leveraging its high configurability, it can be successfully used for studying different solutions for bays and EFPS distribution on the screen and different ways of interaction and integration.
- Training: EFPS is integrated in the e-ATOMS suite for operational personnel training. Anyway, it can be integrated with different simulation platforms for training.
- Testing: considering the high configurability and ease of use, the EFPS can be useful to build fast test beds for testing of different platforms.

Interfaces:

- Satellite Images for some ATC orders (e.g. Parking Stands Selection).

Technical Specification:

- Developed in Java Language
- Windows OS and Linux OS workstations

Regulations and certifications:

- Developed according to ENAV Safety Management System and Security Policy
- CMMI Compliant Development Cycle
- Developed according to the Software Assurance Level (SWAL) identified during the safety assessment process
- EATMN Constituents certified by DSU (Reg. (EU) 2018/1139)

Support:

- Skilled Train-the-Trainers human resources for maintenance scope