

e-TWR SUITE

A multi-purpose solution for Tower Operative Scenario



e-TWR SUITE

» MISSION

e-TWR SUITE is an ATC solution based on strictly integrated tools and provides high level of automation to air traffic control for safe and efficient procedures. It is scalable and flexible and, as such, ATC tools designed by Techno Sky can be easily harmonized to meet customer's operational needs, in all types of tower, small, medium or large.

Operational scenario:

e-TWR FDPS comes with a high level of modularity in terms of integration with fully developed Techno Sky ATCO HMIs, WSFDP - Workstation FDP, e-CWP - Controller Working Position, TWR EFPS - TWR Electronic Flight Progress Strips.

It can be enhanced with the **e-AWOS Suite** to provide airport meteorological information to ATCOs and pilots (e.g. QNH, Wind, etc.). Meteorological data can be integrated, by placing them onto an embedded window into e-CWP and EFPS to increase the situational awareness during the operations in normal and severe weather conditions

Key benefits:

- Fully integrated with Techno Sky **e-AWOS SUITE** to:
 - » Increase the situational awareness in normal and severe weather conditions
 - » Meteorological data embedded into CWP and EFPS
- **Technical Supervisor** Monitoring available:
- Maintenance tool **e-MAPS SUITE** fully developed by Techno Sky included to:
 - » Produce/Upgrade maps with graphic elements (e.g. Taxi-Route, Parking Stands, IHP/RHP, TMA, Airspace Boundaries)
 - » Generate ATC geography for e-TWR FDPS following EUROCONTROL AIRAC Amendments
- Third-Party Products easily supported thanks to EUROCONTROL ADEXP and FMTP standard
- Interface to Airport Ground Lights Suppliers thanks to XML

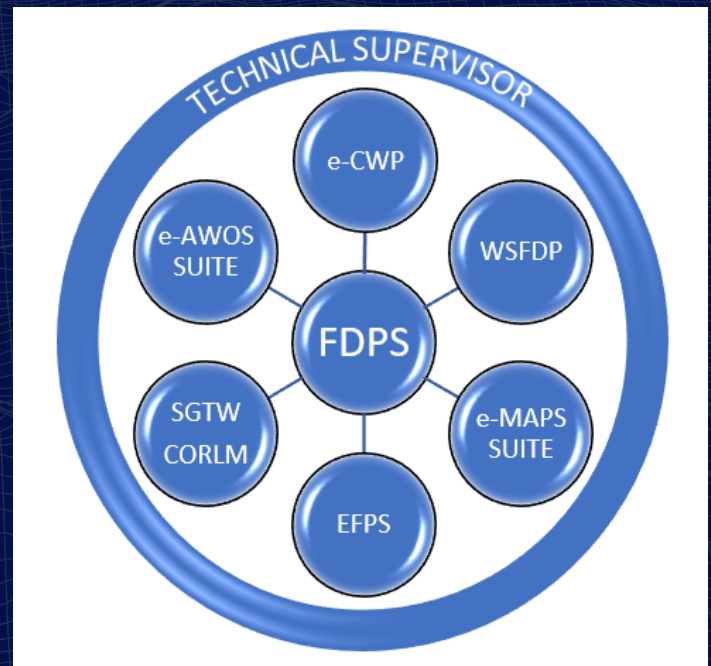
Main technical features and overview:

The suite comes with a minimum set of ATC tools:

- **TWR FDPS** (Tower – Flight Data Processing Systems);
- **WSFDP** (Workstation FDP)
- **CORLM** (Correlation Manager)
- **SGTW** (Surveillance Gateway)
- **TWR e-CWP** (TWR enav Controller Working Position)
- **TWR EFPS** (TWR Electronic Flight Progress Strips)

e-TWR FDPS is the core system in charge of the elaboration and processing of flight data used by the ATCOs for

- Departure, Arrival and Local Flight Plans Planning (IFR/VFR Rules, Route Decoding)
- SID/STAR Procedures
- Airport Runways Scenario
- 4D Trajectory Prediction and Progress Update (Estimated/Actual Times calculation)
- DCT Free Routes currently available in Italian Air Space
- IFPL/ICHG/IDLA elaboration, CTOT calculation on SAM/SRM Messages
- ATC Clearance and ATC ground-based operations



WSFDP - Workstation FDP is based on a long-lasting study dedicated to well arrange flights' lists into a monitor of whatever resolution according to users' HMI requirements. Layout, Colors, Fonts, Size, ATC Menu, Toolbars and Warning Functions, related to any flight data changes relevant to the ATCO operations, can be adapted on user's needs. Paper-strip printing is provided on request and when automatic events occur. Lists can be adapted in size and dimensions, order criteria of flights in each list are configurable.

e-CWP – enav Controller Working Position is designed to interface the **SGTW – Surveillance Gateway** in order to provide a radar presentation of air traffic tower on the ground and in the air. Significant Flight Data received from TWR FDPS (e.g. ARCID, ADEP, ADES, Wake turbulence) are represented on Radar Tracks that are interpreted from an ASTERIX radar flow. Radar Labels can be configured on one or two lines and they are geographically shown on overlapping layers of maps to identify aircraft tags in the local Area of Responsibility.

Flights can be also shown in a list placed into the e-CWP combined with a radar display. Data shown on radar labels are immediately accessible to the ATCO through mouse clicking, shortcuts to customized orders and functions can be properly configured on labels to make the operations seamless. Each e-CWP can have its ATC role with dedicated functions.

TWR EFPS - TWR Electronic Flight Progress Strips provides ATCO, for each role, with a realistic electronic representation of the paper-strips board. Its goal is to speed-up the operational flow of the strips by following the movement of the aircraft across its taxiing route before the takeoff and after landing clearance. Strips can be transferred between different roles. Colors can be modified, Panels and Bays arrangement are configurable and resizable according to airport runways scenario. All data shown on the HMIs depend on ATCOs' role and on the information they need to be aware of for the ATC operations.

Geographical data on each map, airports configuration and Aeronautical Information used by TWR SUITE are compliant with UE and ICAO rules. e-MAPS SUITE is included in the TWR SUITE package, it's an Integrated Aeronautical Package of tools able to produce geographical information. Maps are exported in standard SVG (Scalable Vector Graphics) format. Additional functions

are provided to add graphical elements like Taxi-Route, Parking Stands, IHP/RHP, TMA, Airspace Boundaries, Points and Routes in the airspace.

Each HMI is the result of many years of expertise and a strict collaboration with the Italian Air Navigation Service Provider (ENAV). All our HMIs are highly configurable.

- Layout, Colors, Fonts, Size, ATC Menu, Maps, Radar Labels, Toolbars and Warning Functions Highly customizable
- Paper-strip printing on request and when automatic events occur
- Flights List and Radar displays well-combined on e-CWP
- Shortcuts to customizable orders on radar labels can be built
- Overlapping Layers of maps to identify the right Area Of Responsibility on e-CWP
- Conflicting ATC Clearance safety net function
- ASTERIX Surveillance and Flight Data matched thanks to Techno Sky **SGTW – Surveillance Gateway** and **CORLM – Correlation Manager** components
- ADSB traffic information interpreter



Interfaces:

- Well-Integrated CDM Solution (Currently in Malpensa, Naples, Venice and Fiumicino Airport)
- AFTN/AMHS compliant (IFPL/EOBT update for Flow Restriction according to Slot Allocation Messaging)
- International ICAO and EUROCONTROL ADEXP and FMTP Standards compliant
- SSR ORCAM Originating Region Code Assignment Method Rules application with local SSR codes bank
- Mode-S compliant

Technical Specification:

- At least 1000 tracks and 1000 Flight Plans proven
- Network Redundancy and Master/Slave configuration (SNMP Protocol interfaced)
- Open-Source Database interfaced
- Linux OS based workstations for clients and servers
- Failover < 20secs

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