SkyMAX is a new-generation flight scheduling optimization system that maximizes an airline’s total network profitability by determining the right flight at the right place at the right time.
Deciding where and when to fly determines the revenue potential and success of your airline. Due to the complexity involved in developing flight schedules, however, your planners often have to focus on individual flights, which can create missed optimization opportunities across your entire network. With our advanced scheduling software, you can optimize all aspects of your planning simultaneously to make full use of your aircraft capacity and other resources. By improving the way you schedule your flights, you will maximize the efficiency and profitability of your airline network and be able to better meet the demands of a growing world.

Network planning and scheduling at any airline, regardless of its size, is a very complex task as you need to optimize multiple objectives at the same time:

- **Competitive Effects**
  Model the effect of competitive actions and responses.

- **Fleet Optimization**
  Maximize network profit by matching the right capacity to demand.

- **Schedule Robustness**
  Simulate operational rules in the planning process.

- **Network Design**
  Build different schedules by month and day of week to maximize total network profitability and satisfy multiple operational rules.

- **Time Optimization**
  Maximize passenger revenue based on ideal flight timings for both non-stop and connecting flights.
Amadeus SkyMAX by Optym is a new-generation flight scheduling optimization system that maximizes an airline’s total network profitability by determining the best flight times and fleet types while satisfying all operational constraints.

- Solve for flight times, fleet types and aircraft routings all at the same time.
- Automatically build a new schedule from scratch (clean-sheet mode).
- Improve an existing schedule (in terms of profit and/or feasibility).
- Automatic/interactive infeasibility detection and correction.

Depending on your network structure, studies show that the SkyMAX solution can improve airline profits by as much as 10 percent.

How does it work?

The algorithms at the core of SkyMAX utilize a time-space network, in which each node denotes a specific location at a specific time.

Flights, ground times and connections will be represented as arcs in this network. Our algorithms optimize the flow through this network to maximize profitability while honoring all constraints.
The system balances network profitability and operational constraints to find the best times (for both non-stop and connecting traffic) and allocate the right aircraft to each flight in the schedule.

Maximized Profitability

The system optimizes schedules for peak travel days, such as holidays and special events, while also incorporating starting and ending transition schedules.

Optimize Holidays and Special Events

Planners use the system to perform a variety of strategic analyses to evaluate different fleet types or network structures.

Enhanced Strategic Planning

Planners can develop profitable schedules that improve the aircraft utilization by simultaneously adding a combination of fleeting and timing changes to the schedule.

Improved Aircraft Utilization

The system detects conflicts that make a schedule infeasible with respect to operational constraints and automatically corrects input rules. The system also evaluates the cost of operational constraints relative to total profitability.

Sensitivity Analysis/Infeasibility Finder

The system automatically builds flight schedules that satisfy all operational constraints, so that manual efforts are minimized.

Faster Schedule Generation

Key Benefits
SkyMAX is a multi-user, multi-scenario system that facilitates collaborative decision making. Multiple optimization scenarios can be analyzed through highly graphical user interfaces including tables, charts and maps. A scenario stores all of the relevant information needed for any optimization run in one place.

SkyMAX automatically corrects inconsistent constraints and displays reports to highlight the adjusted inputs. It also monitors all active optimization jobs across all users of the system.

SkyMAX also offers infeasibility detection which honors various business and operating constraints while generating clean-sheet schedules. If some constraints make schedules infeasible, then SkyMAX finds and relaxes them to generate feasible schedules. This automatic process reduces the time network planners need to generate an implementable schedule. Constraints include:

- Aircraft Inventory
- Operational Constraints (Airport Curfews, Gates, Slots, Restricted Equipment, Simultaneous Departures, RONs)
- Minimum Ground Times (Standard Ground Times, Pre- and Post-Minimum Turn Requirements)
- Maintenance (Ground Time Duration and Maintenance Route Restrictions)
- Marketing (Preferred Flight Times, Fleet Types and Connection Banks)
PREPARE OPTIMIZATION RUNS

Specify constraints and run-time parameters from a single screen (support for viewing and easily reverting to defaults).

Automatically run referential integrity checks to ensure consistency across constraint files.

Ability to run an in-depth series of business rules to identify issues of varying severity in a scenario.

SKYMAX IS A MULTI-PURPOSE SYSTEM THAT PROVIDES SEVERAL OPTIONS FOR OPTIMIZATION TO SUPPORT A VARIETY OF OBJECTIVES

**OBJECTIVES**

**Operability**
Runs the optimizer to fix constraint violations (i.e. Fix Turn, Fix Gate, etc.) to improve schedule operability.

**On-Time Performance**
Runs the optimizer to improve schedule robustness.

**Connectivity**
Runs the optimizer to maximize the total number of itineraries, thereby maximizing connectivity.

**Profitability**
Runs the optimizer to improve the desired profit objective.
STAY IN CONTROL OF OPTIMIZATION RUNS WITH ADVANCED INTERACTIVE KPI VIEWS

Compare KPIs across different scenarios.

Toggle between Chart and Table views.

Plot the KPI progress of any optimization job.

AUTOMATICALLY DETECT INFEASIBILITIES AND AUTO-ADJUST INPUTS DURING OPTIMIZATION

Users can view relaxations in a Summary Report view or various Schedule Analyzer views.

Users can interactively reject any relaxations made to the inputs.

Whenever a user rejects a relaxation, the system highlights the latest possible point so it can be used as a re-starting point for optimization.
SKYMAX FEATURES THE MOST ADVANCED USER INTERFACE TO ANALYZE OPTIMIZATION RESULTS

Synchronized navigation across views minimizes clicks and keyboard strokes when analyzing a schedule.

**The Station View** displays inbound and outbound flight legs and aircraft turns for a specific station. Smart selection overlays itinerary information on top of the inbound and outbound flight legs.

**The Market View** displays all passenger itineraries in a specified market. A set of toggles allows the user to easily filter itineraries based on their type (Non-Stop, Direct or Connecting).

**The Marketing Day View** displays non-stop demand curve, marketing day earliest and latest departure times and flights for a specified market. A hover functionality on flight points offers additional details about each flight.

**The Route View** displays aircraft rotations across the optimization horizon. This view offers visual cues for highlighting short turns, overlaying input constraint information, along with the ability to quickly filter, sort and pivot around certain flights at certain stations.
Amadeus SKY Suite by Optym

Maximizing Your Network’s Profitability

The Amadeus SKY Suite by Optym provides airlines with the most innovative set of network planning solutions to help them optimize their flight schedules relative to their full potential and unlock millions of dollars in additional revenue.

Each product focuses on optimizing a crucial part of the network, including breakthrough capabilities for schedule optimization, fleet optimization, demand forecasting, schedule reliability and route frequency planning.

SKY Suite’s leading technology provides airlines with the most effective ways to develop their flight schedules. For instance, SkyMAX’s revolutionary clean-sheet scheduling mode builds a schedule from scratch – a task once thought to be impossible. These SKY Suite products help airlines maximize profitability, enable superior strategic planning and flexibility, create reliable schedules capable of absorbing operational disruption, minimize manual scheduling efforts, reduce operational costs and boost customer satisfaction.

SKY Suite

Amadeus SkyMAX by Optym
Schedule Optimization System

SkyMAX determines the best times for each flight, matches each flight with an optimal fleet type to minimize spill and honors various constraints to generate an implementable schedule.

Amadeus SkySYM by Optym
Flight Schedule Simulation System

SkySYM tests a schedule’s robustness against real-world disruptions and operational constraints. The system acts as a highly accurate testing lab to evaluate the reliability of flight schedules before they are implemented; its simulations achieve over 95% accuracy in modeling most KPIs.

Amadeus SkyPLAN by Optym
Frequency Plan Optimization System

SkyPLAN determines the optimal routes of an airline consistent with its maximum revenue. SkyPLAN will produce results specifically customized to each airline’s unique objectives. The system’s output can then be used on a stand-alone basis or serve as input for SkyMAX.

Amadeus SkyCAST by Optym
Flight Forecasting System

SkyCAST is a system that forecasts total network profitability and evaluates proposed flight schedules. By simulating passenger choice behavior, SkyCAST explores different what-if scenarios including new destinations, flight timings, hub structures, alliances, code-shares and competitive responses.

Amadeus SkyWORKS by Optym
Flight Schedule Development Platform

SkyWORKS allows users to view, develop and edit flight schedules in an intuitive manner. SkyWORKS enables large scale or single day changes, depending on the airline’s needs. The system provides numerous schedule alternatives to evaluate different business scenarios, and offers a central repository for all schedule-related information.

optym.com/sky
Complete Schedule Optimization with Amadeus SKY Suite by Optym

- **SkyWORKS**: end-to-end schedule development
- **SkySYM**: simulates the schedule and optimizes for robustness
- **SkyCAST**: forecasts a schedule's profitability
- **SkyMAX**: optimizes schedule for maximum profitability
- **SkyPLAN**: generates the frequency plan
What makes us different

We are a highly innovative company, working at the leading edge of technology and bringing the latest advances from the disciplines of operations research, computer science and human computer interactions to the transportation industry.

At Optym, we create applications in an agile development mode. Using pre-existing intellectual property and modular pre-built components, we can deliver sophisticated applications quickly.

We realize that each client is unique, and this uniqueness makes them successful in business. We are willing to customize our solutions to meet our clients’ unique business needs.

We are a client-focused company. We treat our clients as partners and collaborate with them to design solutions to meet the challenges they face. Transparency, flexibility, honesty and integrity are at the foundation of our relationships with them.

“They are adaptive and agile and highly committed to our projects.”

Our Clients

From the ground to the sky, we’ve worked with some of the biggest names in transportation and logistics.