

# CORE MODULES

Flownex core modules include all modules that form the core simulation function of Flownex SE.

## FLOWNEX SIMULATION ENVIRONMENT INCLUDING BASIC THERMAL FLUID MODELS

This is the basic Flownex steady state version. This configuration includes the ability to deal with both liquids and gasses, the ability to deal with adiabatic flows, as well as flows with heat transfer. The network component models included in the standard version are reservoirs, pipes, ducts, pumps, fans, compressors, turbines, heat exchangers, valves and orifices. This configuration also includes visualization graphs, text outputs, result layers, data logger and result export to Excel, buttons, gauges, sliders, etc. of visualization is included as well as the ability to create compound components.

## ADVANCED FLUID THERMAL MODULE

This configuration includes advanced features such as gas mixtures, homogeneous two phase flow, coupled heat transfer through solid structures, special components used in the design of turbomachinery such as rotating pipes and annulus. It also includes combustion modeling, the Script element and the Excel component.

## DESIGN AND ANALYSIS MODULE

This configuration includes advanced features such as the designer routine, stochastic routines used in probabilistic analyzes (Sensitivity Analysis, Parametric Study). This capability can be applied to all libraries and on both steady state and transient modules.

## TRANSIENT MODULE

The dynamic (transient) simulation features of Flownex include the following: The ability to start the simulation from steady-state or specified initial conditions; Variable time-step sizes; Open loop events can be specified at different time steps (e.g. Varying or fixing of variables; Switching controllers on or off; etc.) and the plot values of multiple parameters are displayed on the screen.

## NUCLEAR MODULE

Nuclear models such as the Pebble bed reactor (Generation 2) and advanced pebble bed models (Generation 3).

# LIBRARY MODULES

Flownex library modules include all modules that include integrated libraries in Flownex SE.

## CONTROL MODULE

Control library configuration includes analog components (controllers, Filters, Inputs and outputs IO, math functions and switches ), digital components (Counters, IO's, Logic, Switches and Timers) and some converters (analog to digital, digital to analog, integer to double, etc.)

## ELECTRICAL MODULE

Electrical library configuration includes admittance components (generators, motors, transformers, etc.), auxiliary components (base power, base voltage, synchronizer, etc.), nodes (bus, fixed voltage node, infinite grid, etc.) and switches such as a breaker.

## EXTENDIBILITY

User extendibility allows users to write their own libraries consisting of components, editors, links, solvers, etc. that interface seamlessly with Flownex Simulation Environment. These user extendable libraries can then interact with existing or future Flownex Simulation Environment libraries such as the transient, design and analysis modules.

# INTEGRATION MODULES

Flownex integration modules allow users to easily integrate with external software

## EES MODULE

EES library configuration includes an EES (Engineering equation solver) component that gives Flownex the ability to communicate with EES and run co-simulations with EES. Please note that EES software is not included in the price.

## OPC MODULE

The Flownex OPC client is used to set up communication of Flownex inputs and results to and from tags in an OPC server.

## RELAP MODULE

Relap library configuration includes a Relap (Thermal-hydraulic safety analysis software) component that gives Flownex the ability to communicate with RELAP and run co-simulations with Relap. Please note that Relap software is not included in the price.

## MATHCAD MODULE

MathCad library configuration includes a MathCad (Engineering calculations software) component that gives Flownex the ability to communicate with MathCad and run co-simulations with MathCad. Please note that MathCad software is not included in the price.

## API MODULE

The Flownex SE automation (API) Application Programming Interface provides the functionality to integrate and automate Flownex SE from most existing Windows applications, e.g. Word, Excel, etc. Any application that allows scripting of Component Object Model (COM), Distributed Component Object Model (DCOM) or ActiveX components can now integrate with Flownex SE. The API is also accessible to any .Net aware application. The API module includes an integration to Simulink (Math Works).



