

EcosimPro/PROOSIS SIMULATION TOOL FACTS (October-2018)

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MODELLING LANGUAGE

Acausal & causal modelling of equations
Fully object oriented language
Components for modelling dynamic systems (converted to a special C++ class)
Ports for modelling the connections
Functions for classical functional programming (converted to C++ functions)
Classes for object-oriented programming (converted to C++ classes)
Differential Algebraic Equations (DAE) modelling in components and ports
1D,2D & 3D tables interpolation
Multidimensional arrays
Discrete and time events modelling
Enumerative types
Real,Integer,Boolean and String basic types
Advanced types can be programmed with classes
Containers(vectors,dictionaries,sets,etc.) based on STL C++ library
Advanced function pointers based on C++ power
Writing of derivatives in a natural way (eg. NH^i , v'') in components and ports
FORTRAN,C & C++ direct connection
Linear algebra based on Eigen C++ library
Root finder class
Inequalities for equations system
ASCII & XML parser classes
Class for producing random values
Map class for handling multiple tables
Include & macros files based on C preprocessor
Reuse any C/C++/FORTRAN library from the components, clases, ports and functions
Powerful experiment language for creating simple and complex simulations
Public & private parts for encapsulation
Powerful input/output functions
Libraries handling
Export/import of work spaces

PROGRAM

Use Microsoft Visual Studio C++ as debugging tool
Compatible with Windows using Microsoft C++ compilers
Compatible with Windows using GCC C++ compilers (this compiler is included in default installation)
Simulation plaforms in Linux using GCC C++ compilers
Installer is customizable
Prepared to work with thousands of equations
Windows 10 compatible
Linux available for run-time

GRAPHICAL EDITORS

Source code editors with coloured syntax, autocompletion,...
Graphical symbol editor
Intuitive schematics editor
Powerful graphical object editors in schematics
Browser for finding items, experiments, etc.
Handling of workspaces and libraries
SVN integrated in the tool
Graphical tool for plotting live simulations
Mini-scada capability to visualize results
Many graphical widgets available (plot, bars ,etc)
Table editor
Map editor
Inheritance editor
Histograms
Post-process file generation in HDF5 format
HDF5 editor for comparing binary files

TESTING TOOL

Automatic testing tool
User dialog to define items to be tested
Generation of references for simulation
Direct link to differences for easy debugging

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ODE solvers (eg. CVODE, Euler,RK4, RK45,etc)

DAE solvers (eg. IDAS, DASL,etc.)

Fixed and variable step solvers

Dense and sparse solvers (eg. IDAS_SPARSE, CVODE_SPARSE)

Automatic detection of sparse Jacobian

Real-time mechanism for acceleration

Steady solver for complex problems

Solvers settings available

MATH MODELS

Symbolic handling of equations

Multiple math partitions for the same schematic

Algorithms for producing robust models

Detection of algebraics

Detection of high index problems

Minimization of the final model size

Detection and selection of boundaries

Change data to unknowns

Wizard to analyze sensitivity and residues of models

Wizard to simplify the creation of the model

Summary of math model in HTML format with links for easy navigation

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Generation and compilation of C++

Generation of a DLL

Export simulation as a deck (black-box)

Export/Import with FMI 2.0 for co-simulation

Export as OPC DA standard

Export as OPC UA standard

Export as SAE-ARP4868 & AS4191 standard

Export to Matlab

Export to Simulink as S-Function

Reuse models from C, C++, Visual Basic, C# and VB.Net

Addin for Microsoft Excel to connect with models

ADVANCED WIZARDS

Wizard for transient calculations

Wizard for steady calculations

Wizard for sensitivity calculations

Wizard for multipoint design with constraints

Wizard for parametric studies

Wizard for parameter estimation

Wizard for optimisation

Wizard for co-simulation