

SIMple® is a powerful library of computational components designed for Altair Activate for modeling and simulation of accurate and high performance physical and logical dynamic systems. It has been used in the last decade to develop high-fidelity simulators of thermal powerplants for large multinational companies, such as Électricité de France and Petrobras, and individual components for a military vessel simulator for the Brazilian Navy. One SIMple® component can be used either as a single model or connected to other components to carry out modeling, calibration and real time simulation of systems, from single equipment to large plants. It is divided in three libraries for different scopes of simulation: SIMple® Thermal, SIMple® Control Systems and SIMple® Power Systems.

## Meet SIMple® Control Systems

SIMple® Control Systems is a library developed from an extensive base knowledge of industrial controllers, focused on thermal power plant controllers, but easily extensible and highly scalable to any other controller setup. The library was created to meet the needed requirements to emulate large industrial block diagram control loops with high visual and physical accuracy and then be used within SIMple's Operators Training Simulators (OTS) to reproduce logic from various manufacturers.

Ready to use logic and controllers	Real time simulation	32 components – and growing!
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SIMple® Control Systems was built in compliance with the same standard of SIMple® Thermal and has already been used by SIMple® team to develop large thermal powerplant simulators systems with high accuracy. Now, it's been made available for **everyone** through Altair Activate, a multi-disciplinary system simulation software that offers great usability and a large set of features to the final user. Within Altair Activate, SIMple® Control Systems is as easy as a drag and drop to build any system in block diagram format. With currently 32 components, there's a wide range of lightweight models from trivial logic functions to complex sequencers, controllers, non-linear e time dependent functions – all of them ready to use. Typical controllers – as P, PI and PID – are also included.

**Dynamical**

**Time functions**

**Logical**

**Non-Linear**

**Misc**



Every component in SIMple® Control Systems library is developed to make it suitable to be used for even the most demanding applications – where accuracy and precision are mandatory. It's also extensively parameterizable to fit the user needs to model, calibrate and simulate. If the standard blocks and parameters are not enough, the user can still develop their own controller with the basic logic blocks included in the library.

The image shows a screenshot of the SIMple Control Systems software interface. At the top, there are five folder icons representing different components: a blue 'M' logo, a clock, two curved arrows, a graph, and a 2x2 grid of squares. Below these icons is a paragraph of text describing the library's flexibility. The main part of the screenshot shows a PID control block and its configuration dialog.

The PID block is a rectangular box with the following inputs and outputs:

- Setpoint (Input)
- Process Variable (Input)
- Feedforward (Input)
- Track (Input)
- Track Value (Input)
- OUT (Output)
- High Lim (Output)
- Low Lim (Output)

The PID block is labeled "PID" in the center. Below the block is a configuration dialog box titled "PID". The dialog box contains the following parameters and options:

- Proportion Gain (K): 1
- Integral Gain (Ki): 0.1
- Derivative Gain (Kd): 0
- Filter parameter (alpha): 0.01
- Anti Windup
- Output Limitation
- Upper Limit: 100
- Lower Limit: 0

At the bottom of the dialog box are three buttons: "Apply", "OK", and "Cancel".

## Do you want to know more?

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**Talk with our specialists about the library and get to know it in more detail!  
Feel free to contact us and we will be happy to help you.**

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**Next story:** stay tuned to our publications and get to know **SIMple® Power Systems** in the sequence! Following us will also make you eligible to have access to demos, use cases developed by our team and special offers!



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