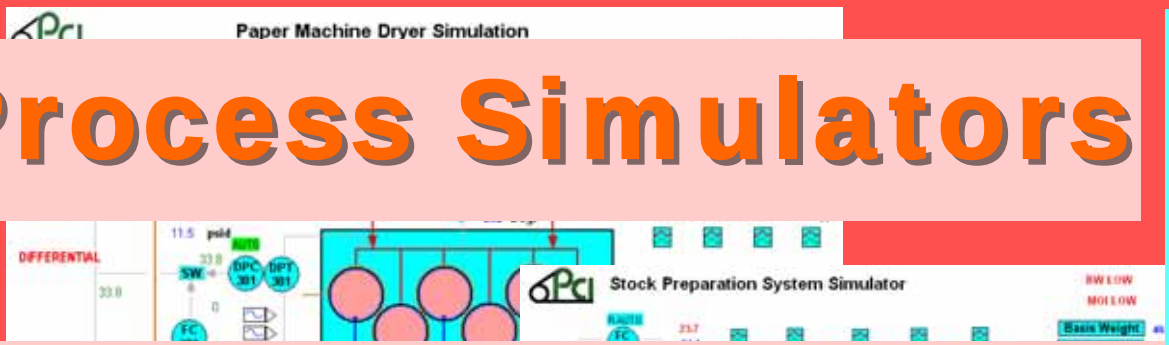
ProNamics Control Inc.

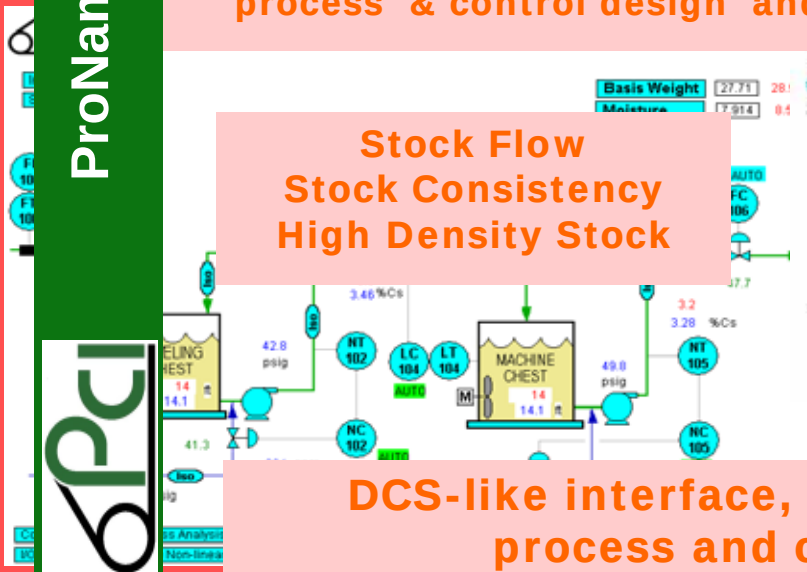
Process Simulators

Appita

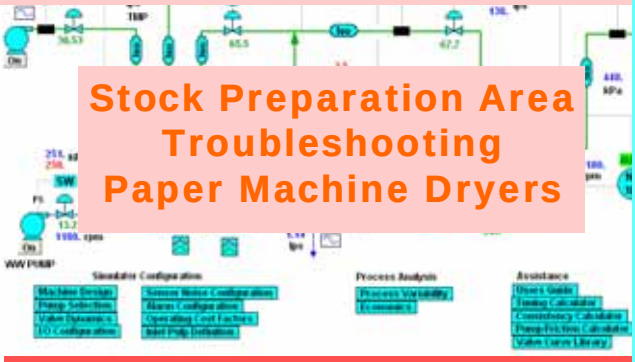
Now available from Appita!



Enhance mill training programs, process & control design and variability troubleshooting



Stock Flow
Stock Consistency
High Density Stock



Stock Preparation Area
Troubleshooting
Paper Machine Dryers

DCS-like interface, selectable / configurable process and control equipment

Design Features:

- Pre-packaged /ready to use
- DCS-like graphical interface
- Configurable process equipment
  - Pumps, Piping, Control Valves
  - Sizing of primary process equipment
- Selectable control strategies
- Adjustable controller tuning
- Configurable Sensor / DCS parameters
- Disturbance injection capabilities
- Configurable Equipment and control valve non-linearities

Use the Simulators to:

- Train operators and technical personnel
  - Improve process knowledge
  - Develop operator troubleshooting skills
  - Develop control loop optimization skills
- Troubleshoot process and control problems
  - Inject process disturbances
  - Introduce equipment non-linearities
  - Evaluate process equipment limitations
- Compare process and control design options
  - Identify process bottlenecks
  - Demonstrate impact of process changes on control performance and variability
  - Evaluate control loop & strategy designs

Pricing:

Stock Flow Loop Design	AUD 2000.00
High Density Stock, Stock Consistency, Paper Machine Dryers	AUD 3000.00
Troubleshooting Simulator (as used in course 'Process Control Troubleshooting')	AUD 4000.00

Prices for multiple-user licenses on request *(Plus 10% GST for Australian residents)*

A valuable learning tool for troubleshooting process and control problems

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New!
Now available: The **Troubleshooting Simulator** used in the ProNamics/Appita short course 'Process Control Troubleshooting'

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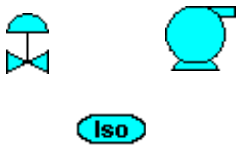
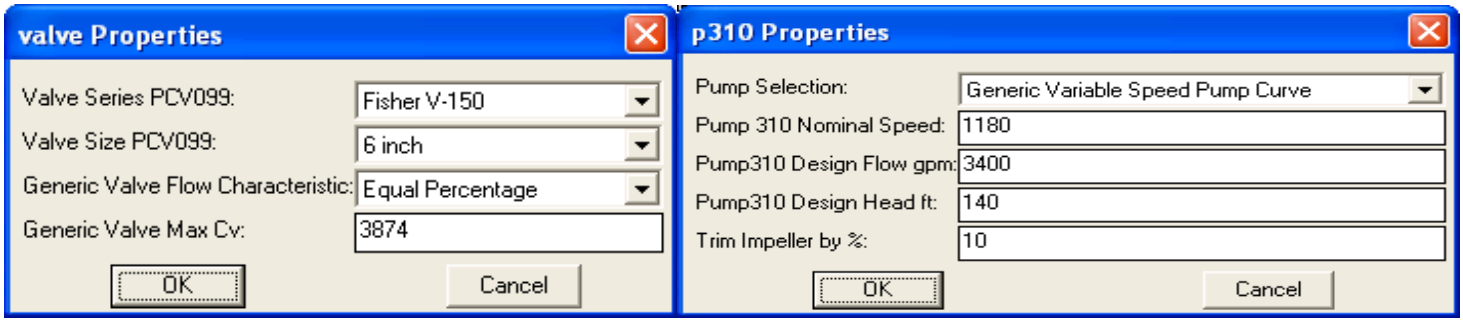
Simulator Operation

Process Equipment:

- Click on equipment icon to select pump/valve from drop down list
- Custom enter pump and valve curves
- Define piping isometrics, chest dimensions and other equipment

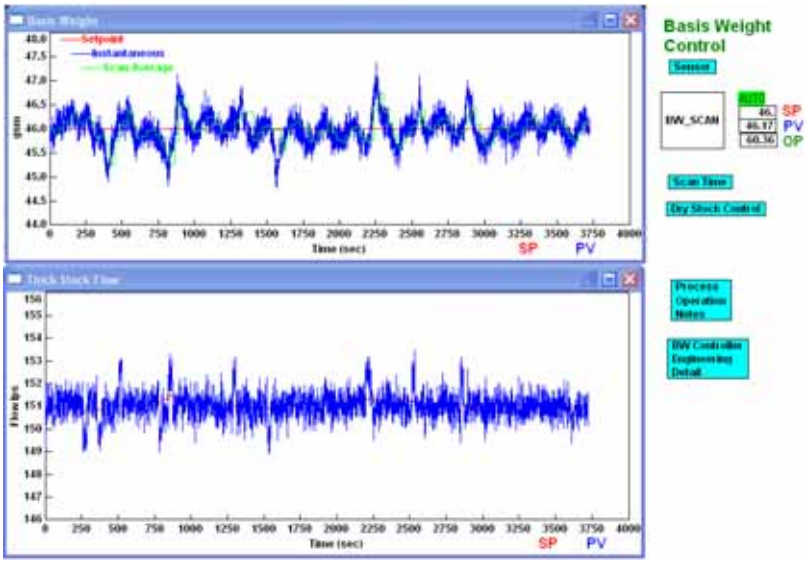




Process Operation:

- Turn Motors On/Off
- View process trends
  - Process variables (PV)
  - Controller output and setpoint
  - Calculated values
  - Zoom in/out and coordinates cursor
- Adjust the controller mode, setpoint & output
- Adjust the controller tuning constants
- Select PID controller type

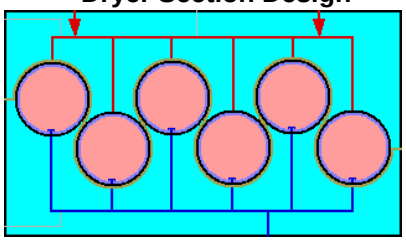
Control Loop Symbol

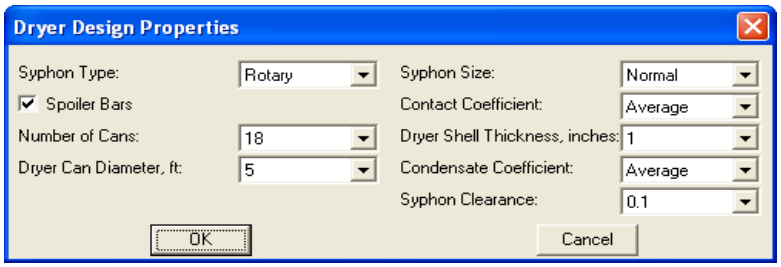


Primary Processing Equipment:

- Selecting the major process equipment symbol (outlined/filled with cyan) accesses the parameter data entry block

Dryer Section Design





Additional Design Information & Disturbances:

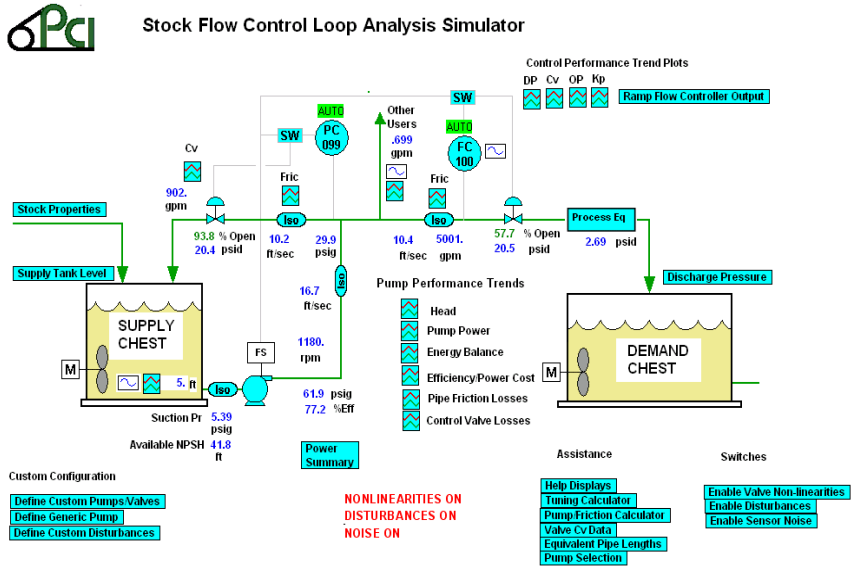
- Inject process disturbances and sensor noise
- Inject control valve non-linearities
- Switch to VFD control
- View trends to show the relationship between key variables
- Flow sheet can be modified by PCI to match your process

Disturbances

Switch

Trends

Simulator Description

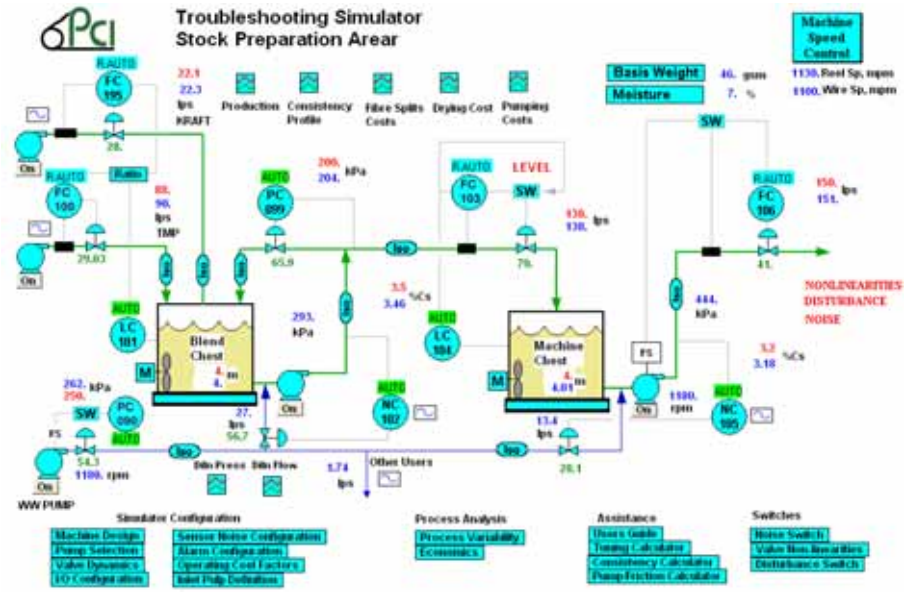


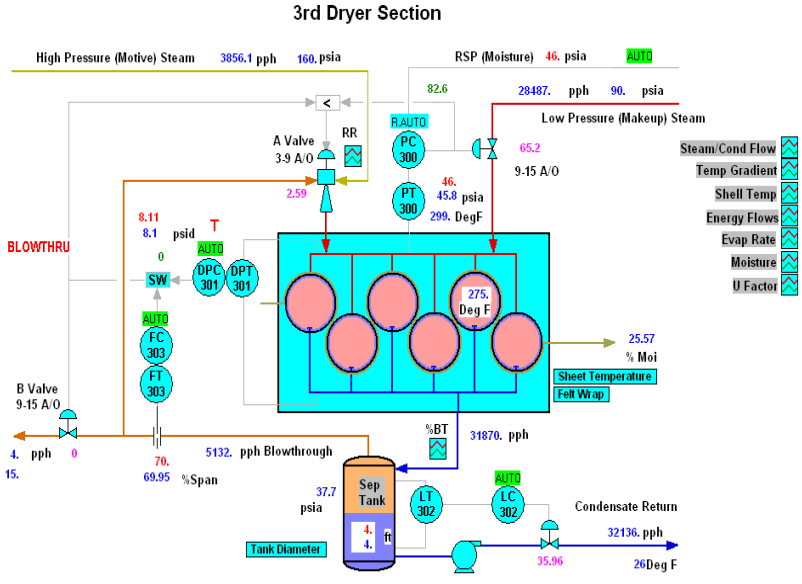
Stock Flow Simulator

- Select the best pump and valve combination
- Investigate the benefits of a VFD for flow control
- Evaluate the addition of a pressure control loop on control performance and energy consumption
- Evaluate control loop linearity using the ramp function
- Optimize the control performance and tuning strategy for the pressure and flow loops

Troubleshooting Simulator

- Improve process and control trouble-shooting and optimization skills
- Investigate variability propagation from the stock preparation system to the reel
- Investigate the impact of stock chest agitation performance on BW variation
- Optimize pump and valve selection to optimize control performance and mini-mize pumping costs
- Investigate the application of VFD's
- Evaluate controller tuning strategies to minimize variability in key processes
- Evaluate financial benefits of reduced Basis Weight and Moisture variability

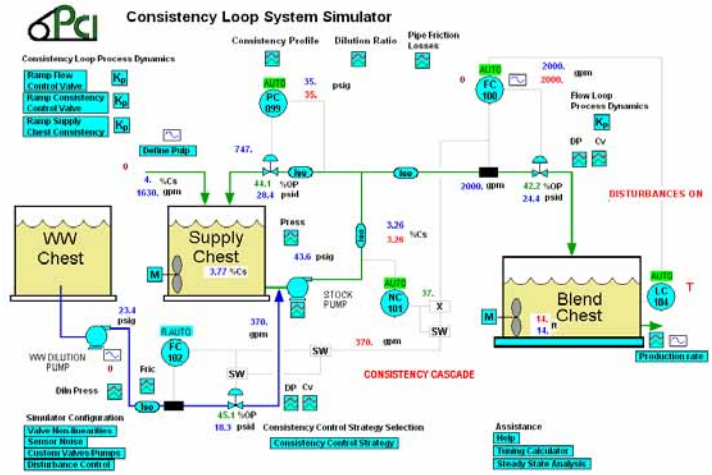




Paper Machine Dryer Simulator

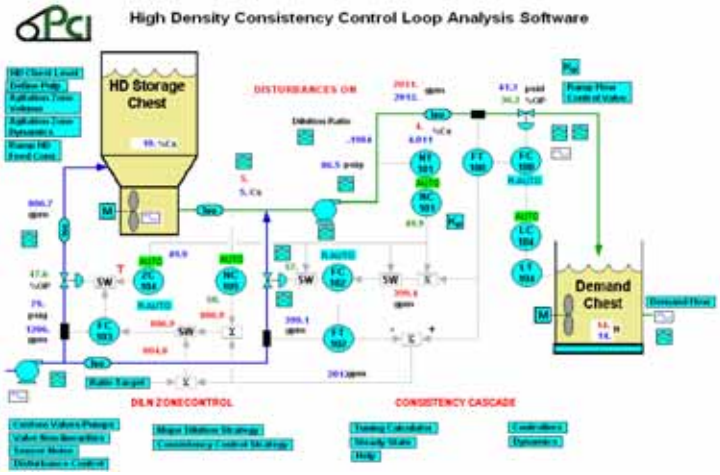
- Upgrade operator knowledge of dryer process
- Improve operator comfort level with complex dryer control strategies
- Improve operator troubleshooting skills
- Troubleshoot dryer control problems by in-jecting disturbances and process equipment flaws
- Identify thermocompressor and control valve performance problems
- Evaluate dryer design options
- Compare control strategy alternatives such as blowthrough versus differential
- Develop optimum tuning for with complex, non-linear dryer loops
- Improve sheet break logic
- Develop flooding detection logic

Simulator Description



Consistency Control Simulator

- Investigate the best consistency control design for a given set of disturbances
- Investigate the benefits of a VFD for dilution header pressure control
- Select the best dilution control valve for linear consistency loop dynamics
- Select the best flow and pressure control valves to linearize process dynamics
- Investigate the impact of poor stock tank mixing on consistency variability
- Optimize tuning to minimize variability



High Density Stock System Simulator

- Improve operator knowledge of High Density process and control strategy
- Evaluate alternate high density consistency control strategy designs
- Investigate the benefits of a VFD for dilution header pressure control
- Develop optimum controller tuning strategy to deal with severe consistency disturbances
- Investigate the impact of poor agitation zone mixing on consistency variability

ProNamics Control Inc.

ProNamics Control Inc is a Vancouver, BC based process and control optimization company. The company conducts **optimization surveys** to improve process efficiency and product quality, provides results oriented **process and control training** to the operations, engineering and maintenance groups and prepares **process simulations** to establish best practices. Each of the simulations incorporate ProNamics' extensive knowledge of process dynamics, process equipment, control strategy alternatives, control loop health issues and process variability.

ProNamics **Optimization Surveys** are designed to maximize the mill's economic returns. The surveys are focused on improving product uniformity, increasing process efficiency and reducing operating costs. ProNamics will recommend process design and process control improvements to achieve these goals.

ProNamics **Process and Control training** courses are designed to give the attendee the necessary knowledge to understand the impact of process variability as well as the skills to identify and either direct or implement a solution. The courses strengthen the attendees understanding of pulp and paper process dynamics and process control principles. The courses are a combination of lectures and computer based simulation labs. **Process Control Optimization (PCO)** is a one-week course primarily intended for pulp and paper mill instrumentation technicians who want to improve their ability to Lambda tune control loops and troubleshoot control loop problems. The course is also a good introductory course for process and instrumentation engineers. **Process Control Troubleshooting (PCT)** is a one-week course primarily intended for process engineers, instrumentation engineers and operations management personnel who want to improve their ability to troubleshoot process control

Note: Each simulator is USB plug protected. The listed pricing is the unit price for each simulator. Contact ProNamics for pricing of multiple copies or multiple simulators. Pricing subject to change without notice.