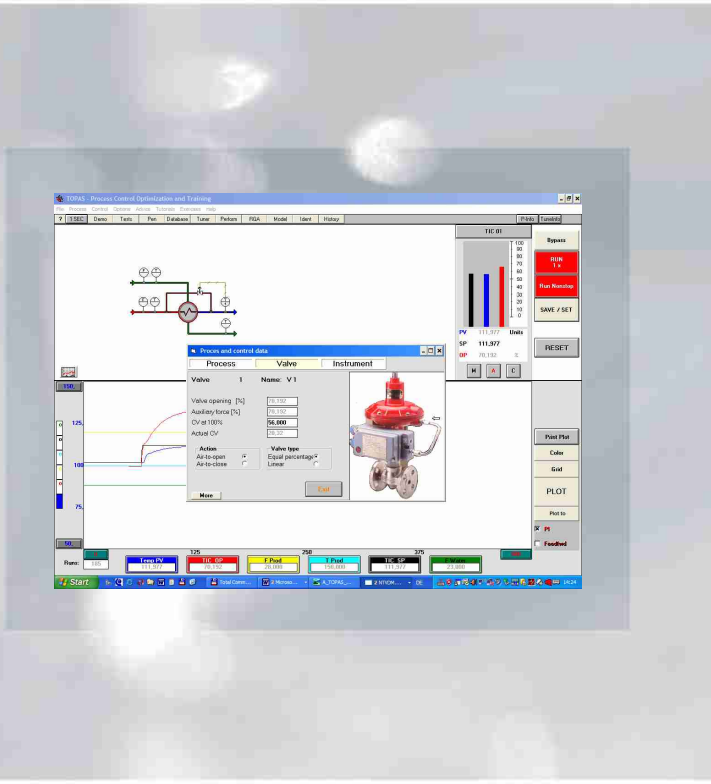
TOPAS



A unique, award winning PC based

Process Control Assistant and Know-how Resource

that benefits you throughout your career - from learning to development of complex advanced controls - following one simple goal: to achieve better performance in shorter time.

Fully practice oriented and with a wealth of powerful features not found in any other tool, TOPAS helps to

- develop better controls and improve operations
- cure troubled loops in shortest time
- widen your skills with special methods
- save time, effort and money, and
- present your achievements in a clear, convincing way.

TOPAS is also easy and fun to use and should be available to every process control and operations professional.

ACT

http://www.act-control.com

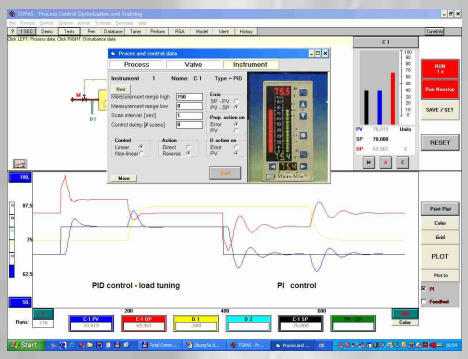
TOPAS allows better control solutions and saves time

Manufacturing means mastering the process dynamics. Tight yet smooth control allows to operate closer to targets and limits and thus to increase throughput, product quality and yield and to reduce utility cost and emission.

And optimizing control performance is the most cost and time effective way to increase profitability, provided suitable tools are used.

TOPAS is an outstanding aid for daily work and serves control and operations staff in delivering the needed performance better than any other tool: it is not just a PID tuner, but a unique combination of a toolkit, a simulation environment and a knowledge base.

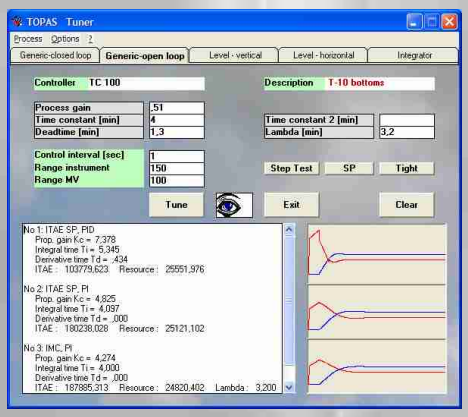
TOPAS offers the most comprehensive set of tools for PID tuning, process parameter estimation, performance analysis, incentive calculation, RGA etc. Many process examples and controller types allow you to simulate various situations and to select the best suited control strategy and technology. In addition, demos and advice provide outstanding practical know-how and guidance. You can:



Find the optimal PID controller configuration

Test the effect and performance of various options, examine e.g.

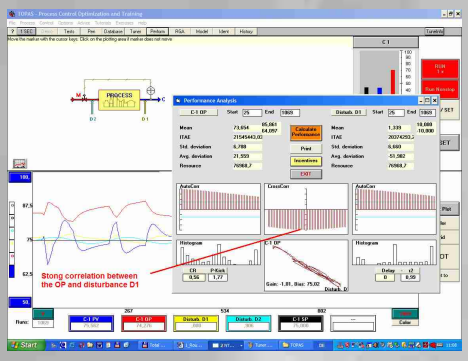
- the advantage of D-action
- the difference between P-action on the PV or on the error
- the behaviour and benefits of a non-linear PID.



Find the best PID tuning for the given situation

Many tuning methods exist but most work only well in a certain range. The **TOPAS** Tuner overcomes this problem: it evaluates 25 methods and presents the best results graphically. The simulation allows you to test and refine them for problems like noise, sticking valves etc. Based on test results or operations data, you can:

- choose specifically load or setpoint tuning, active or smooth control action, tight or average liquid level control
- find robust tuning even for difficult process dynamics like long deadtime, high controllability ratio or inverse response etc.
- Test the controller(s) for conditions you cannot provoke in the real plant like upsets, sticking valves, changes in dynamics, …



Select the most effective control strategy and technology

The advantages of a cascade, a disturbance compensator or Model Based Control (MBC) are seldom fully utilized due to uncertainty about the potential gain or lack of practical experience. With its powerful features, the range of available techniques plus graphical decision aids, **TOPAS** makes the selection easy and fast.

- Compare a single PID with a cascade and measure how much the effect of disturbances can be reduced
- Check if a feedforward is necessary and also useful (example: disturbance faster than feedback action)
- Quantify the strength of loop interactions and the need for multivariable control with the Relative Gain Analysis (RGA) for up to 4x4 systems. Find the right variable pairing to avoid inherent instability and the necessary PID tuning adjustments
- Explore special PID versions (non-linear, Smith), MBC (without prior knowledge!) or the potential of advanced techniques like constraint control and model free optimization (EVOP).

Answers are found in minutes and you can present the possible improvements and associated credits in a credible, convincing way - another unique feature of TOPAS.

TOPAS is an indispensable aid for trouble-shooting

TOPAS has proved that it can resolve even tough problems in the shortest time: Many loops have been brought back to sound performance, especially with the help of three key features:

1. Better visualization of the data gives you a clearer view on the problem and its source
2. Estimation of the process parameters provides a solid basis for controller type selection and tuning
3. Selective tuning calculations deliver the best results.

Some examples demonstrate this in an impressive way:

1. A customer far away needed urgent help with an oscillating loop. Data from a closed loop test were put into Excel and e-mailed to **ACT**. Just 10 minutes after receipt, new PID settings were sent back and after a short time the loop stabilized. Clearly, such a success would not have been possible without this tool.

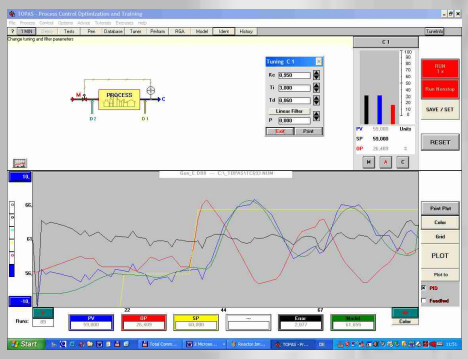
2. The temperature control of a batch reactor needed drastic improvement, even made a change from PID to our model based predictive controller **AMC** necessary. Tests were not possible, so data were taken when the temperature was ramped up, the process parameters identified and used in the MBC scheme.

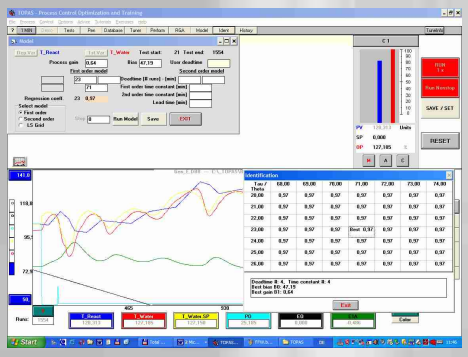
The entire application (feedback plus feedforward) was set up and tuned in 10 hours - unmatched!

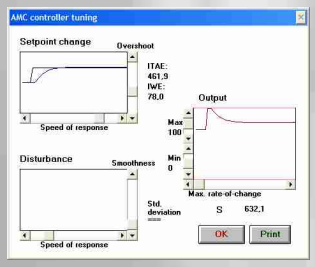
By the way: tuning the **AMC** controller was done in minutes, just by adjusting the scrollbars – as the picture below shows.

Plant audits often find many controllers inactive and only few outperforming manual operation.

Yet, poor control means economic loss, thus fast detection and correction is a must: for one, the longer the problem persists the higher the loss. And low staffing levels do not allow lengthy investigations, trials and guess work.







TOPAS *is also a powerful know-how resource*

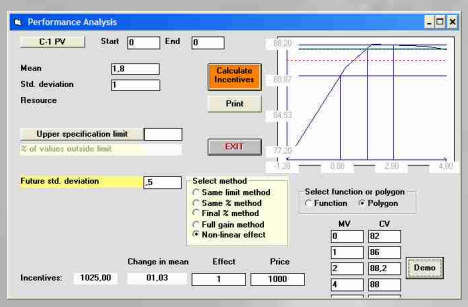
Your work is supported with know-how and specific guidance:

- Built-in **Demos** for most examples show the characteristics of the process and the specifics of closed loop control
- The **Advice** functions is another unique feature, guiding you in your work with a particular process type
- **Trouble-shooting guides** for PID and feedforwards help to resolve problems most effectively
- A **Glossary** explains the terminology clearly and concisely.

TOPAS *lets you present your success – clear and convincing*

Last, but not least, **TOPAS** not only lets you master technical challenges in shorter time but also helps to make your achievements visible and known: show the improvements in hard figures and even calculate the resulting credits- simply and easily!

The example shows how much the average value of a process variable can be shifted due to the reduction of its variation and how the associated incentives are determined.

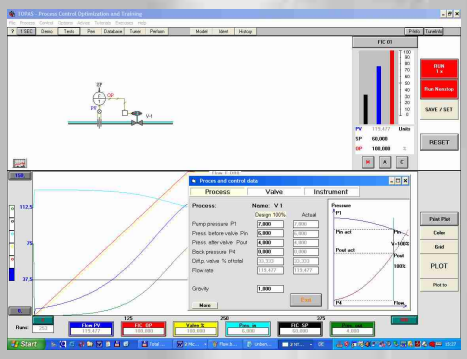


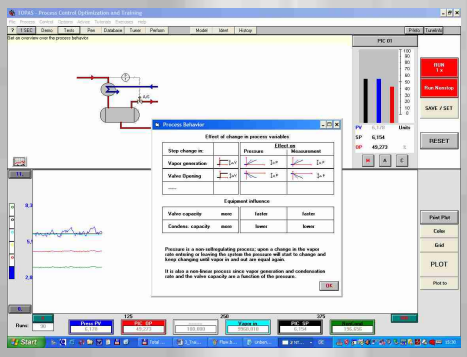
TOPAS is the most comprehensive toolset and enhanced with an integrated simulation environment and a knowledge base.

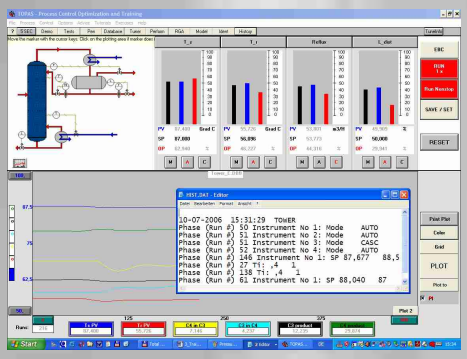
Yet, despite its unmatched wealth of features **TOPAS** is extremely easy and simple to use.

TOPAS makes learning more effective and less time consuming

TOPAS is an ideal training tool for control engineers, technicians and operators. It has proven that it cuts training time significantly and improves results at the same time.







TOPAS presents widely found process types - self-regulating and integrating, fast and slow, linear and non-linear - in a most realistic way and 'generic' examples let ***you*** specify the dynamic behaviour.

Built-in demos show the key influences and effects, closed and open loop. Many different scenarios can be covered in the shortest time and creating new situations is fast and easy: change stream properties, equipment dimensions, valve or controllers types, study their effect on control performance and save the new case for later repetition. Also, recovering from undesired conditions just takes a second - another important advantage over training on hardware.

- **Flow.** A simple process, ideal for studying the PID behaviour, the effect of sampling, noise and filtering, sticking valves etc., and for comparing different valve types or tuning approaches
- **Liquid level.** An integrating process. Compare tight vs. average, single loop vs. cascade control and find the minimum vessel dimensions needed for smooth control
- **Temperature,** a heat exchanger. A more difficult problem with open loop overshoot and inverse response respectively
- **Pressure**, a condenser system. A fast, nonlinear process
- **pH**, an effluent water treatment. A very non-linear process. Practice split range control or the use of a non-linear PID, test the effect of the base or acid concentration, the basin volume, ..
- **Ratio control.** Use an absolute, full position controller in a cascade configuration
- **A batch reactor.** The example has all necessary controllers and switches, and can be used to optimize control during heating, normal operation and cooling
- **A furnace.** It can be fired with gas or oil or both. Temperature control can be done by single loops or cascades and off-gas O2 control is provided as well
- **A distillation tower.** The most complex example so far focuses on the product yield and quality control and also allows you to compare energy balance and material balance control
- **A "generic" process.** It lets you determine the process behaviour by setting the dynamic parameters, e.g. identified from a plant test. The process can be self-regulating or integrating, with overshoot or inverse response, linear or non-linear: ideal for comparing different controller types and settings
- **Multivariable control**. Another "generic" process example to learn and practice the effect of interactions between loops on tuning and stability and to perform dynamic decoupling, either with PID's or with Model Based Predictive Control.

TOPAS is available in Dutch, English and German. For the different license types and their prices and for ordering please contact us.

ACT offers special services and products for operations optimization and process control. Outstanding experience and know-how allow us to give customers a unique advantage:

Higher plant profitability in the most cost and time effective way, the best benefit/cost ratio.

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