

Optimize & Analyze

with RSTune Pro

By Paul Moylan, Process Software Marketing

Rockwell Software announces the release of **RSTune Professional**[™] Edition, the most advanced, easy-to-use process optimization software available today. **RSTune Professional** includes all of the features of **RSTune**[™], Control Engineering's Reader's Choice Award winner two years running. It adds advanced statistical analysis tools, such as power spectral density analysis, process linearization tools, and correlation analysis.

Using **RSTune Professional** Edition, plant control engineers and technicians can optimize not only individual control loop performance, but also thoroughly analyze their entire process. With the tightly integrated reporting features of **RSTune Professional** Edition, the performance history of your entire process is quickly and easily kept up to date. **RSTune Professional** includes an extensive toolkit of data gathering and analysis tools as well as a real-time connection to your process. The advanced control specialist has all the tools necessary to achieve superior process control performance, with all the time saving and safety features you have come to expect with **RSTune**.

Optimizing your process means:

- ▶ improving the quality of your product
- ▶ reducing waste
- ▶ reducing energy usage
- ▶ enabling more efficient material consumption

The greatest benefit of process automation is increased profitability using existing process equipment.

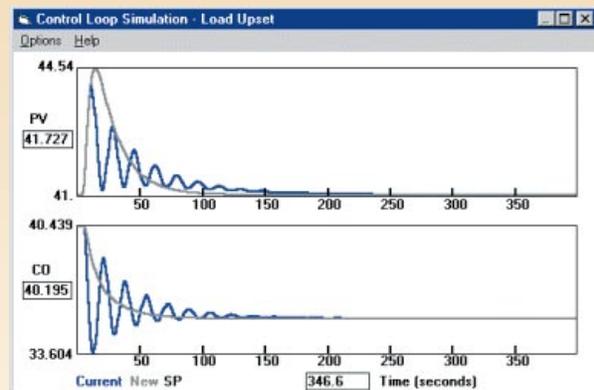
With **RSTune Professional** Edition, you can go beyond loop tuning and actually perform in-depth loop analysis, identifying potential process problems such as valve-seat wear or pump cavitation. You can effectively attenuate process disturbances, and you can also reduce unpredicted process downtime and reduce potential safety hazards throughout the plant.

RSTune covers the basics of adjusting PID loops

RSTune is Rockwell Software's PID loop tuning software package for Allen-Bradley PLC-5[®] and SLC 500[™] programmable controllers. RSTune lets you adjust your PID control loops quickly, easily, and accurately without additional ladder logic programming.

RSTune includes a software simulation file that you can use to learn to operate the software. It does not require an actual processor or WINTelligent[™] LINX to function. Using the software simulation file, you can perform all of the functions of RSTune, including filtering, editing, advanced analysis, and simulated downloading of new tuning parameters.

This plot shows the system response to a load upset or setpoint change. It graphs the response for both the current and new PID parameters so they can be compared before you download new tuning parameters. This is one of the most useful plots for analyzing the effects of different tuning parameters.



Tuning into process customers, RA moves RSTune

Control-loop tuning and overall process optimization are vital to plant operations. Recognizing the significance of RSTune as integral to delivering total solutions to our process control customers, RSTune is now a feature product of Rockwell Automation's Process Business Unit.

AB Parts

RSTune provides advanced analysis tools that you can use to test your tuning parameters before downloading them to the controller, including these analysis windows:

- ▶ process model
- ▶ process frequency response plot
- ▶ control loop simulation plot
- ▶ robustness plot

You can use these windows to perform "what if" analyses of your tuning parameters before you download them to the controller.

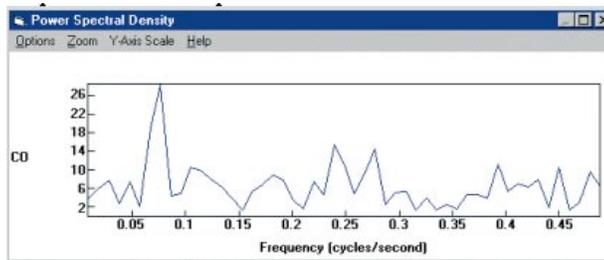
RSTune Professional also includes these tools:

- ▶ characterization
- ▶ power spectral density plots
- ▶ auto- and cross-correlation

With RSTune Professional, you can also use RSTune to help you design a setpoint filter. By using a setpoint filter, you can get good response to both setpoint changes and load upsets.

Characterizer for Non-Linear Control Loops

Many control loops are difficult to tune because they are non-linear. This means that the process gain changes as a function of the measurement or



A characterizer takes the output of the controller and transforms it to a value so that the control loop is linear over the entire range of control. You can maintain optimal tuning parameters anywhere over the CO range, even with non-linear loops. The characterizer outputs code for you in FORTRAN, Basic, C, or as X Y endpoints of lines.

Power Spectral Density

Power spectral density graphs are useful for seeing the potential improvement from better tuning. They show the relative power in the signal at various frequencies ranging from twice the sample rate to twice the data collection period.

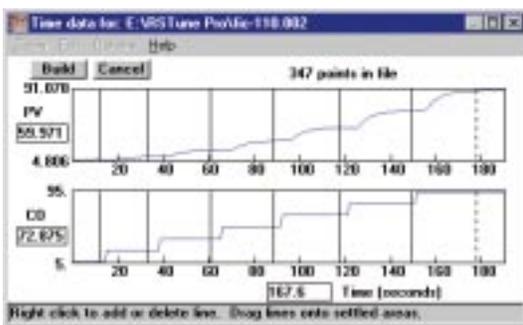
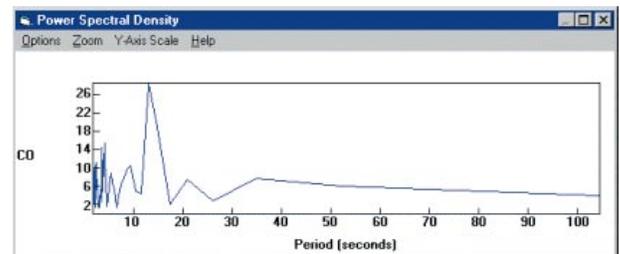
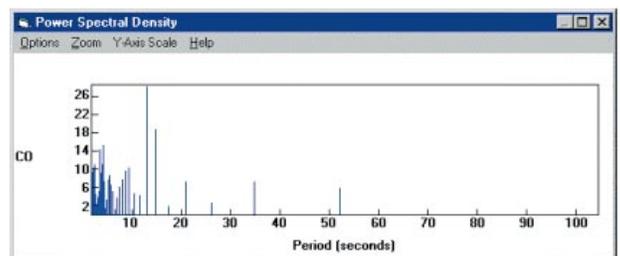
Options for Viewing Power Spectral Density Graphs

- ▶ Select either a linear or a logarithmic graph
- ▶ Display the frequency (x-axis) in either cycles/sec (or Hz), radians/sec, or seconds
- ▶ Scale the y-axis (Deviation, PV, or CO, depending on the graph you selected) as either power or the square root of power
- ▶ Select power or cumulative power to switch between the standard power spectral density graph and a cumulative power spectral density graph
- ▶ Draw the graph using lines or bars. Bars are useful for seeing the exact location of the points, the number of points, and the value for each point.

Correlation

A reduction in area under the curve on an auto correlation graph shows that your tuning has improved control. This is a useful tool for determining the effectiveness of tuning

over time relative to past performance. Variable dependencies and relationships over time are plotted and used to identify potential optimization opportunities as well as to track the effectiveness of the existing control system tuning.



controller output. With no linearization, the controller needs to be tuned for the condition where the process gain is the highest. This results in sluggish tuning everywhere else.

Where Can I Find More Information?

For more information about RSTune Professional Edition, visit the Rockwell Software web site at www.software.rockwell.com. You can also contact your local distributor or Rockwell Automation sales representative, or use the appropriate telephone/fax number at the end of this publication. **SC**