SCADA System for a Rohm & Haas Chemical Process Reactor

The Challenge: Providing an easy-to-use, reliable, low-cost, scalable, and distributed SCADA system for a batch chemical process that is also capable of doing complex process calculations and algorithms.

The Solution: Using the versatile and powerful combination of National Instruments FieldPoint distributed I/O hardware and Lookout HMI/SCADA software.

Rohm & Haas (formerly Morton International) is a manufacturer of premium-grade adhesives used primarily in food packaging. Rohm & Haas wanted to install a DAQ system on one of its many process reaction kettles for better analysis of the heat flux, heat of reaction, and cooling loads. Users were logging the data using circular paper chart recorders and by manually entering data into batch log sheets. On an as-needed basis, the data collected was then consolidated and entered into a spreadsheet program to obtain the required calculated parameters. This process was not only tedious and time-consuming, but also lent itself to errors and omissions. After looking at various options, Rohm & Haas decided to use the FieldPoint distributed I/O system in conjunction with Lookout HMI/SCADA software.

Monitoring and Measuring with FieldPoint

Rohm & Haas chose Vista Technology Inc. to configure and install the SCADA system. The system has eight analog inputs, six

user on the plant floor can reset all the calculated parameters at the start of each batch. The digital output, connected to a pilot light also located on the reactor panel, signals to the user that the requested reset has occurred. We chose to use the FieldPoint FP-1001 network module in conjunction with one each of FP-AI-110, FP-DI-330, FP-DO-400, and FP-RTD-122 modules. A Pentium-based PC with Windows 95 is used to run Lookout. Because the distance between the FieldPoint node and the PC is greater than 50 ft, we equipped the PC with a National Instruments RS-485 serial interface card for connecting to FieldPoint.

Using Flexible Lookout

We configured Lookout to provide the user with an overview screen that displays most of the acquired data and calculated parameters. Although Lookout comes with an extensive graphics library, it readily provides for importation and use of external graphics. We developed custom 3D graphics for the overview screen to make it visually relate to the actual equipment. All data is logged to the Citadel™ database. The user can
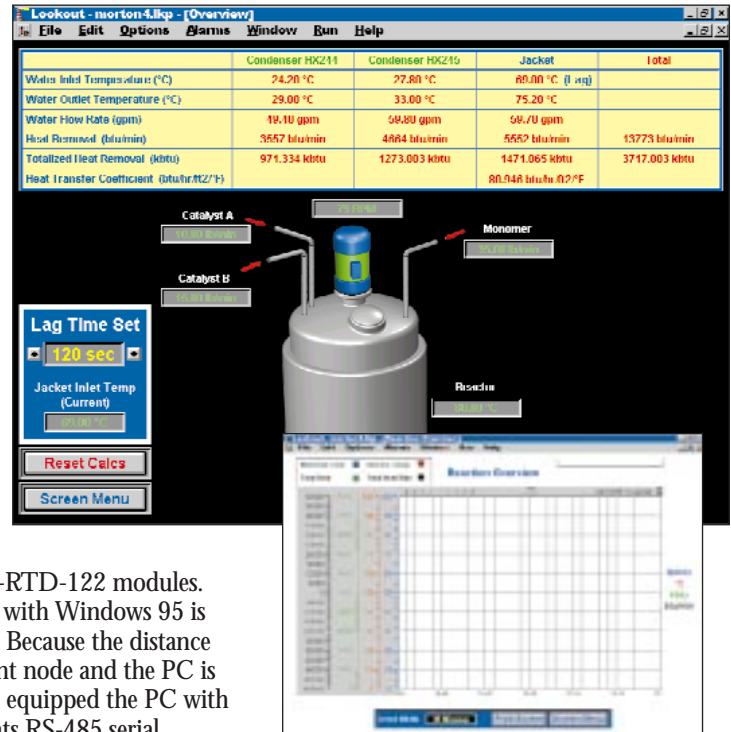
With Lookout, you can save and view data easily.

Conclusion

We have installed the SCADA system and it is operating robustly and error-free, providing Rohm & Haas with all the data required. To ensure accuracy and to provide a training and testing tool, we incorporated a simulator into the application with which the user can test the various functionalities of the system with simulated values. With the use of the simulator, we virtually eliminated the need for onsite debugging.

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RTD inputs, and a few digital I/O. The analog inputs monitor parameters such as condenser and reactor jacket cooling water flow rates, raw material feed rates to the reactor, and reactor agitator RPM. The RTD inputs measure the various temperatures, such as condenser inlet/outlet, jacket inlet/outlet, and reactor. With the digital input connected to a push-button switch located on the reactor panel, the

also access the data in spreadsheet format for analysis. We provided trending screens with features such as user-changeable time scales and print capability. We use the monitored process variables in complex algorithms for calculating parameters such as heat flux, totalized heat, and heat transfer coefficients, which are also displayed and logged.

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