MONITORING OF TESTING INSIDE ENVIRONMENTAL CHAMBERS

Requirement

Our customer required a system that would replace manual charting of tests performed inside various environmental chambers. Viewpoint designed an automated solution which notifies the technician when the test chamber requires attention and reports chamber utilization for planning and scheduling purposes.

Application

This application was designed for a group that provides long-term thermal and environmental testing to a large number of internal customers at its facility. The group is responsible for approximately 80 environmental chambers which are used for a variety of tests for electronic circuit boards and modules. These tests typically last between 100 and 4000 hours, with the environmental chambers cycling temperatures according to an externally programmed profile.

This system was developed to automatically monitor and provide oversight to the various test chambers under the department's control. On an individual chamber basis, the system can verify that the chamber is performing to the test expectations, provide an audit mechanism and generate alarms when the chamber is not operating correctly. The software also is flexible enough to add and edit individual chambers and the tests inside them. The data collected is compared to set limits and, where appropriate, alarms are generated and events are logged to keep a history of what occurred during a test.

The test system is capable of running many tests simultaneously. The system is scalable and more thermal chambers can be added as needed. The operator can view the status of any given test by selecting the test to be viewed and observing the trend. The server software running on the server PC is tolerant of user logins and logoffs as it is running as an NT or Win2000 service.

Technical Highlights

The software was written in LabVIEW as a client/server style application. Using LabVIEW and a small stub of "C" code, the server portion of the software was built into a Windows NT Service. There is no interface to the server other than the client. The client uses the LabVIEW VI Server technology to communicate with the server. This configuration allows the technicians to check the status of any test from their desk or a remote location.

Test configuration allows the operator to be notified when alarm conditions occur or for a regularly scheduled check of the chamber. The system notifies the operator by sending an email and/or by sending a message to their pager. All test status information is persistent in an MS Access database so if a power failure occurs, or the system goes down, the tests in progress are not lost. When the system is powered up again, the system will restart any tests that were in progress. Two days of history data is kept in memory for each test so trends can be identified.

FieldPoint provides the hardware I/O. It was used for several reasons: cost, scalability, and flexibility. As more chambers are added to the system, more I/O modules can be added without bringing the system down. The Ethernet protocol also made it easy to configure, install and communicate with the modules.

The system can generate a number of reports, such as job status, journal events, chamber status, completed test results, and chamber utilization. For each type of report, the technicians can pick from a list of criteria to filter the requested information.