

The Challenge

A major pharmaceutical company desired an updated data acquisition system for a FDA-approved consumer product. The original system was an internally developed system that used a variety of off the shelf software packages to test the product. The customer desired a more unified database driven system to provide a simpler and more efficient user experience. The system needed to acquire voltage data from custom sensors and from over 128 thermocouple sensors. The test system would also be used to validate methods, as well as final product quality control testing. The new system needed to integrate with, and provide the acquired data to other computers within the laboratory.

The Solution

The customer had a significant investment in NI's SCXI data acquisition platform and wished to reuse it, if possible. Based upon the customer's wishes, PVI Systems designed the data acquisition portion of the software to handle both the then obsolete SCXI hardware, as well as PXI-based hardware to ensure a forward path as the older systems started to degrade. PVI custom designed Server and Client Software, which used a SQL Server database to store configuration and test results, acquire data from the thermocouples, and the various parameters involved in its acquisition.

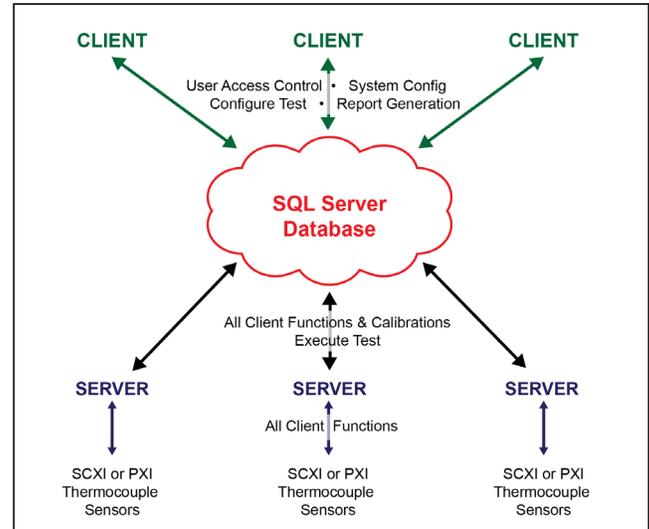
The Server Software contains hardware configuration and calibration functions. Multiple serial ports were used on the computer to interface with several pieces of lab equipment used for the experiments.

The Client Software includes:

- Batch Creation to define from which product samples will be tested
- Test Designs to define test parameters including, but not limited to, sensors to use, data reporting frequency, and SKU for which the test is designed
- Software Configuration to set various options for the other screens and functions of the client software
- Channel Diagnostics to perform system check out prior to starting a multi hour test
- Test Execution to perform a test on sample products from a Batch and using a Test Design
- Test reporting with pass / fail criteria analysis
- Database-driven configuration, test criteria, and test results
- Ability to perform these tasks from multiple remote laptops

The Server Software includes:

- Ability to perform multipoint calibration of sensors
- Ability to perform periodic sensor calibration checks
- Ability to track calibration status of the NI modules used in the system
- Ability to run the Data Acquisition Server, which acquired the data from the system and could server the data to clients, running up to 10 tests asynchronously



The DAQ system reduced sensor calibration time from 8 hours to under 2 hours. Centralized data storage improved report generation. Originally developed in 2010, the system is still in use today and has been upgraded from Windows 7, to 8, to 10 without any issues. It has also undergone multiple LabVIEW version and feature upgrades.

System Features

- SQL Server Database for configuration, pass / fail criteria, and data storage
- 21 CFR Part 11 validated audit trail of system configuration and data
- Database drive user functionality based on user level and the computer being used
- PXI and SCXI hardware capability
- Designed for both production and research, as well as development use