

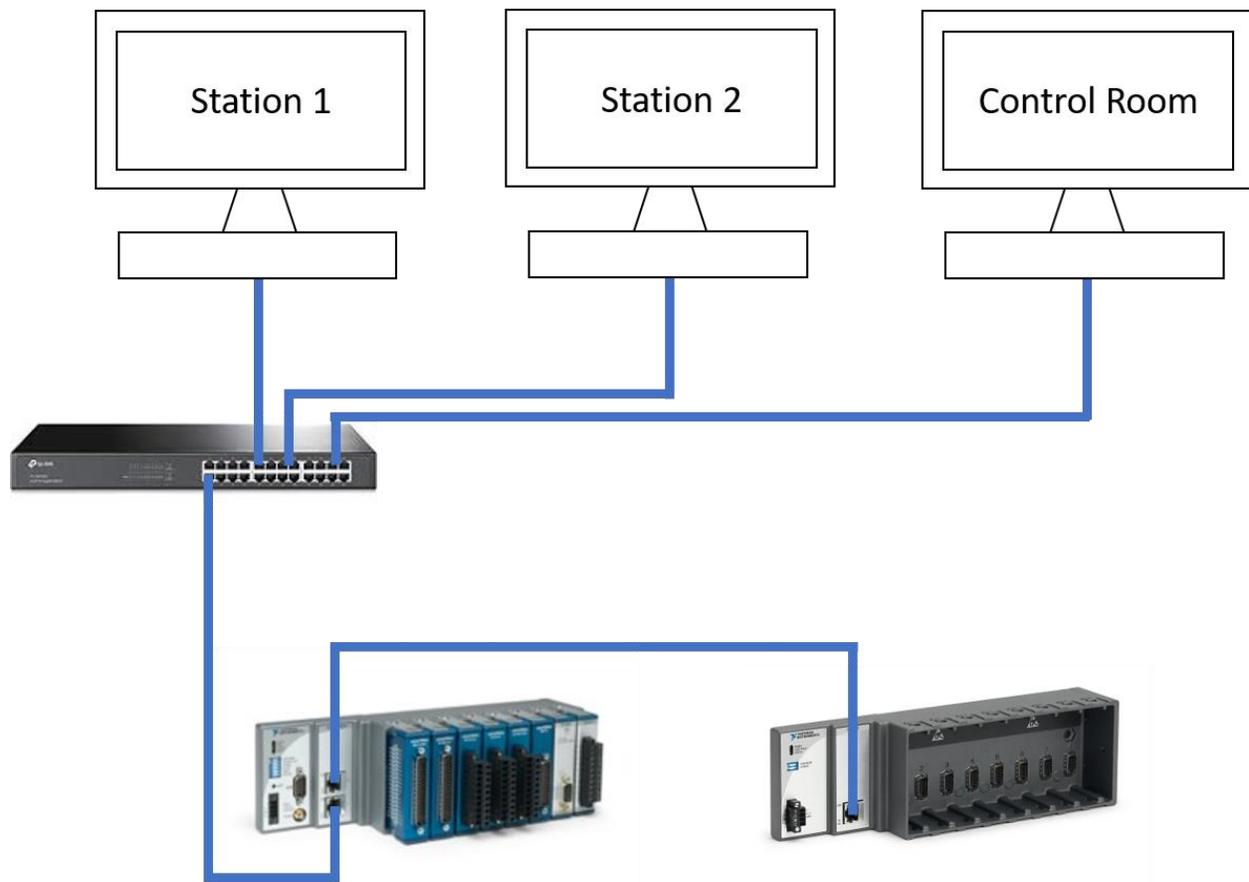
# Nanomaterial Manufacturing Control System

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## The Challenge

Create a system to monitor and control a large number of pumps, valves, and sensors in a plant that manufactures nanomaterials and allow the users to control the software from several computers in different locations at the plant.



## The Solution

Proximal Technologies' engineers used NI hardware and LabVIEW software to develop a flexible, maintainable system to provide accurate measurements and intuitive controls for operator use.

## Problem Background and Solution

The manufacturing facility had multiple tanks of various chemicals that were run through a variety of processes involving pumps, heaters, agitators, etc. Many of these processes were manually controlled and needed to be carefully monitored in case a tank pressure or fill level became too high. The factory also needed process and air quality monitoring for safety certifications.

We used an NI cRIO-9074 and an NI 9148 expansion chassis to take in a variety of pressure, temperature, fill level, and flow-rate inputs, and send out control signals for valves, agitators, and pump speeds, and log all values and states. Our system automated processes that were previously manual and implemented alarming and safety features to automatically stop processes when tanks were at dangerous levels. We created two user interfaces that could run on an arbitrary number of computers. One UI was used to monitor the cRIO, and the other included both monitoring and control. We also created a special administrator utility that could be used to edit setpoints and alarms.

Our user interface allowed operators to monitor the entire plant's operation easily from a single screen and set control signals to run automatically or to be manually controlled, though all controls were to be overridden when the program detected an unsafe state.

During development at the plant, the customer's processes required constant changes and updates, and our flexible architecture was able to quickly be updated and adapted to keep up with improvements to the system.

## Hardware

- NI cRIO-9074
- NI 9148

## Next Steps

Do you need a similar solution? If you have need for custom hardware and software integration, we at Proximal Technologies are ready to help!

### **Contact information:**

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