Instrumentation - Testing

Customer Various locations
Date 1999 - ongoing

Overview

Functional testing and developing testing procedures for a variety of sensors (pressure, flow, presence, induction, pneumatic, electro-pneumatic, etc.) when not enough technical documentation was available. Usually the sensors were part of a bigger system and incorporated with proprietary methods. Testing methodologies and instructions were not provided.

Testing of assemblies comprised of a set of sensors and mechanical devices.
Functional testing of assemblies and simulation of production environment in order to determine correct function or failure when the complete system was not available.

My direct involvement

I have developed testing procedures based on technical information gathered from the manufacturer but not present when the device / sensor was incorporated into a bigger functional system or machine.

In more than a few cases, the technical documentation was not available at all, therefore I had to devise methods and procedures in order to simulate a certain operational environment or conditions in order to determine the correct approach of testing and build various mechanical testing fixtures and components for mechanical testing.

For electromechanical / electronic testing I've simulated and built environments in order to measure voltage / current and I/O communication with different parts and assemblies I have built or purchased.

Tools used: Small PLC's, multi meters, oscilloscopes and single/multiple laboratory power supplies.

Examples of devices tested:

- Gear Flow Meters with Hall Effect Sensors (oscilloscope sensor test)
- Coriolis Flow Meters (functional test of meter and interface using multiple power supplies and flow control boards)
- PID cards (flow control cards. Tested by simulating operating environment and injecting analog signal in order to determine proper function of PID loop)
- Pressure sensors (as incorporated in assemblies impossible to test. Designed mechanical fixture to hold in place and electrical testing to measure voltage feedback)
- Air Flow sensors (designed mechanical fixture to hold in place and electrical test to measure feedback)

Technical Documentation

After establishing and running testing methodologies, I have developed Technical Documentation and Working Instructions for our customers in order to give them the necessary knowledge to test / troubleshoot components at their location.

This worked on everybody's advantage since the troubleshooting time was cut down dramatically and sometimes the replacement of the faulty part / assembly was done in a matter of minutes, therefore reducing production line downtime.