White Paper - Gas Distribution Line Testing and Digital Pressure Data Collection Hardware

Pressure testing natural gas distribution lines is typically done with air and analog gauges. These analog gauges are a good reference tool, however, need to be calibrated to ensure their accuracy and reliability. The company responsible for the testing must rely on the end user to report there were no leaks over the test time established by company operating procedure. A single faulty analog gauge or improper test could create a safety hazard if there happened to be a leak due to faulty pipe or improper fusion that was identified during installation.

Read this white paper, and learn how to document an accurate pressure test digitally with date/time stamp to ensure validity.

What does a typical gas distribution test consist of?
How does a digital pressure gauge work and how accurate is it?
How does it record the pressure data?
How do I upload the data and create a report?
Does it save me time and money over the long run?

Pressure testing is the practice of subjecting pipes or pipeline systems to pressure above operating pressure to confirm the integrity of pipe and fittings that make up the system. The concept is to pinpoint any weaknesses before something goes wrong. For most low-pressure gas lines, the preferred test medium is compressed air or nitrogen. For example, a two-inch service main may be tested around 100 psi for 10 to 15 minutes and must hold steady pressure. Increased regulations now require that all new transmission lines, distribution lines, or service line installations to be pressure tested before being placed into service.

Digital pressure gauges typically use piezo-resistive sensors that put out either voltage, current, or straight digital signal. That signal is read into a processor and the value is displayed. The pressure sensors are usually characterized over temperature to ensure accuracy during usage and come in a variety of accuracies from ±0.02% to 0.25% Full Scale or can be rated as percent of reading as well. They are usually four or more times accurate than most analog gauge and one digital gauge can replace several analog gauges due to the accuracy.

Data is recorded on the processor chip, usually in non-volatile memory. Data is typically uploaded via a serial or USB interface. Most manufacturers use the PC to track the time/date to ensure each pressure test is validated. Some manufacturers have a real time clock on the circuit board and the ability to broadcast the signal via Bluetooth as well which opens a variety of means to extract the data. This allows Data-logging sessions to be configured, started, and stopped using a phone or tablet via an app.

While company policies vary on what type of device is acceptable for testing, one thing is consistent. The results must be recorded and stored into the gas company's record system. So, whether the technician is using a pressure chart recorder, analog gauge, deadweight tester, or even a digital pressure data logger, they must ensure the results are scanned in and uploaded back in the office. This takes time and can be expensive if the test results are lost, not accepted, or have to be redone. With a digital interface the results can be uploaded with date/time and a summary report can be created in minutes with a trend graph for reference. Every single point is captured and displayed, based on the set interval time from one second to whatever the user prefers. Data is validated and a .pdf file can be printed or emailed to any regulatory body for review. The digital record becomes part of process with very little means of making an error.

Setup time is greatly reduced as well, there are no tables required, pens/charts, or additional correction factors to apply to the readings to ensure accuracy. There are saving in labor costs and the calibration costs as well. It is much less costly to maintain a single digital gauge than a deadweight, chart recorders, and analog gauge.