Data acquisition systems have helped to increase quality control and cut costs in a wide range of manufacturing fields. One customer to discover this was a leading hydraulic tube and fitting manufacturer in India. Their company developed many different pipe-fitting systems and exported a full 90% of their products worldwide. With the use of a data acquisition system and its software monitoring a hydraulic pressure test, this company was able to optimize its rotary flex test procedures and guarantee a better product.

To ensure high product quality, it was necessary for the customer to perform both pressure and leakage tests on each production lot. The test engineers constantly performed a rotary flexure test of the hydraulic joints and fittings according to the ASTM F-1387 standard. The customer required a universal data acquisition system to monitor and automate this test bench application.
These tests were performed in a precise sequence: the hydraulic joints were first mounted to a 12mm-diameter tube which measured 6 inches long. This tube was then mounted to a support rest on one side and to a rotating spindle on the other side. The spindle was rotated at a speed of 1750 RPM. While the spindle was rotating, the pressure inside the tube was raised up to 25 BAR.

This test continued running for 10-15 minutes to measure the twisting forces of the tube and to measure the pressure level. If the pressure started declining, the test engineer knew there were leakages on the fitting seal rings.

**Installation**

For this test bench application, CAS DataLoggers recommended and installed a Delphin Expert Key 100L USB/Ethernet Data Acquisition System in combination with Delphin’s ProfiSignal Klicks software. ProfiSignal Klicks was installed on a workroom PC to enable data acquisition and test stand automation using either USB or Ethernet. The Expert Key system featured both analog and digital inputs and outputs in a compact unit inside a benchtop enclosure. Analog inputs support mV, volt, 20 mA signals, thermocouples, and RTD sensors. This high-speed system also had a maximum sample rate of 100 kHz with 18-bit measurement resolution.
**Usage**

In order to operate the test bench, the test engineer used a ProfiSignal Klicks application with the following user interface (main screen).

The engineer could specify the part number of the product currently undergoing testing. With the click of another button, he could then start the data logging and the test cycle. During the test, the live data consisting of speed (RPM), strain (torque), deflection and pressure were all displayed. When the test was finished, a report was automatically generated showing a strip chart of all test data, as well as a data table with all measurement values available.
**Benefits**

The system's built-in web and FTP server allowed for remote access to logged data, configuration and diagnostics. Communication features included Modbus slave and master functionality allowing connection to Modbus sensors and devices as well as to SCADA systems. The data logger also featured smart serial sensor channels capable of interfacing to RS232, RS485, RS422 devices and sensors. The DT80’s rugged design and construction ensured its reliable operation even under extreme conditions in the mill. USB memory stick support was included for easy data and program transfer, satisfying the customer’s data download needs.

For more information on Delphin Data Acquisition Systems, monitoring a hydraulic pressure test or to find the ideal solution for your application-specific needs, contact a CAS DataLogger Application Specialist at (800) 956-4437 or www.DataLoggerInc.com.