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Functional Testing & Analysis

We've been providing turnkey Function Test Systems with Monitoring for over 25 years. From valve testing to seat slide exercise we have sensors to fit, cables to connect, controllers & data collection software for 100% inspection and traceability.

Integrated Solutions for End of Line Testing

The quality of assembled products is an important key to a manufacturer's success. We provide a number of solutions for "End of Line" testing. The measurement of product functionality is typically performed by measuring various physical characteristics. Measuring this functionality at the end of the assembly process ensures proper assembly, 100% quality checking and ensures that "bad" product does not get to the customer. The effort to move an arm on a hood hinge, the current a motor requires to move a component, the torque required to move a lever are all measures of the products assembled fit and functionality.

Information about the assembly process as well as the final quality and functionality of the product can be gathered through measuring various characteristics of an assembly. The integrity and tightness of a rivet will be revealed in the torque required to move an arm. The quality of an extruded roll formed seat rail will be seen in the ease and smoothness of the rollers running through the track. These measures not only ensure that the final product is functional but provides feedback for upstream processes.

Various types of sensors and instruments can be used for functional testing. The variety of sensors that we carry allow us to select the most appropriate sensor to perform a particular measurement. Understanding sensor theory and practical implementation principles benefit the proper selection of sensors such as load cells. Multi-function sensors such as the Burster 8661 with integrated quadrature encoder allow the measurement of torque and angle with the same sensor. Non-contact displacement sensors such as laser sensors allow for measurement of motion without interfering with the component under test.

A key element in functional testing is the ability to test the product in a state that most closely mimics its real world environment and conditions. Sensors can be chosen that can withstand harsh environments and extreme temperatures.

The wide variety of instrumentation allows for testing at different levels depending on the complexity of the test as well as the type of data to be gathered and reported. Many functional testers are used as a tool in product design, development and continuous improvement.

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Burster Digiforce 9307

The Burster Digiforce 9307 is a full featured analysis system that goes beyond standard X vs. Y signature analysis with tolerance bands and windows.

What makes it different?

A feature rich instrument that can accept multiple inputs is the *Burster Digiforce 9307*. This instrument accepts a wide range of sensor types and plots graphical information such as torque vs. Angle, Load vs travel, current vs. load, vibration vs. time. The instrument has many evaluation techniques such as windowing, tolerance bands and cross data calculations. It has the ability to run multiple programs and can switch from one test to the next very quickly. This instrument is an ideal end of line tester that gives quick immediate feedback of product functionality. Data can be serialized and stored for future reference or SPC analysis. We have integrated this system into many end of line scenarios, providing sensors, cables and commissioning assistance.

Inputs - Voltage, Strain gauge, Potentiometer, Encoder, Piezo, Milliohm

Evaluation - The 9307 features a number of Evaluation techniques including cross channel calculations and complex windowing .
Standard Windows, Trapezoids, Thresholds, Envelopes

Reporting - Data collection and control through USB, Ethernet, Profibus, Ethernet IP, Ethercat

Fast and Powerful - 10,000 samples per second, 10,000 data points, up to 128 programs, fast evaluation

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Burster Solution Delivered!

The following application used a Burster 9307 with Ethernet IP to monitor an End of Line tester. A Burster 8661 torque transducer along with a current shunt were used to measure the torque and current generated by the component. Encoder pulses, Time of actuation and Voltage were also measured.

Equipment Diagram
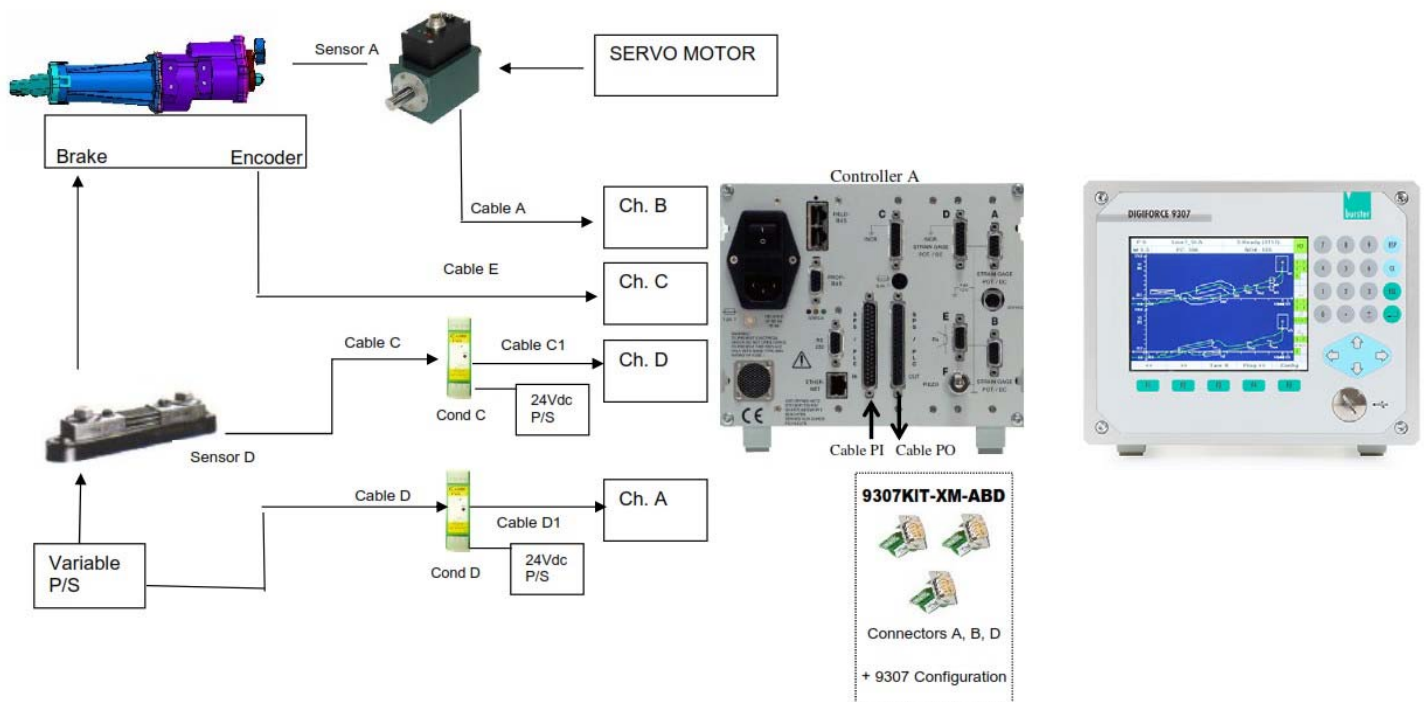
The unit under test was a motor/gearbox/brake assembly used as an automatic actuator in an automobile. The motor drove through a gearbox and brake to open and close a door. The brake is used as a stopping mechanism to hold the door at any desired location and as a safety stop. The system also has an integral encoder to monitor position.

The 9307 monitored all of these parameters as the system was taken through a number of test sequences. The entire End of Line tester relied on feedback from the Burster 9307 to determine the pass fail condition of the part. The station used a total of 6 programs (3 left hand, 3 right hand). Tests were selected through the PLC and switching form test to test occurs in Milliseconds. The data was also collected into the Burster DigiControl software so that data could be reviewed and analysed. Ethernet IP was used to collect specific data from the test so that it could be collected with other serialized information.

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Encoder Test

The encoder test checked the correct operation of the internal encoder. The Burster 9307 has an encoder input channel that measured this parameter directly. Collecting data on a time base allowed for a measurement of travel vs time.
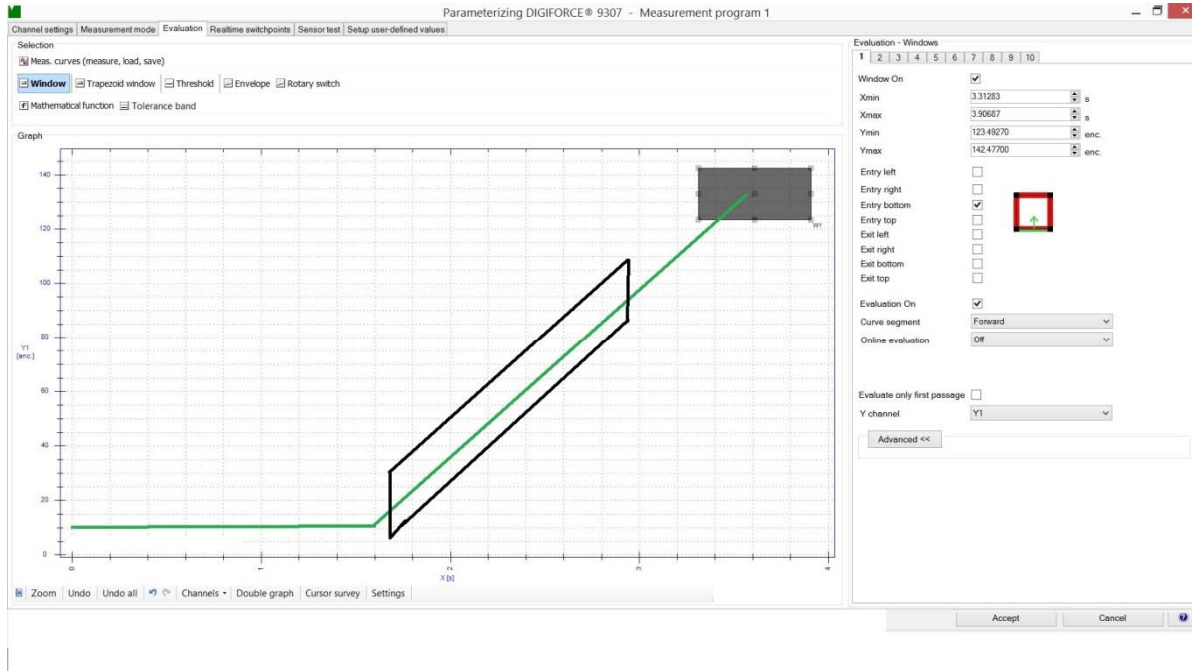

Encoder Test :   X - Time   Y1 - Encoder

1.   Encoder counts in correct direction to correct number of counts in 4.000 secs.
2.   Stable output (stays within trapezoid)
3.   Signal on Phase A and B if not counts will not be correct
4.   Correct phase shift or direction would be reversed

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Motor Test

The motor test checked that the motor functioned correctly under load. A servomotor was used to provide resistive load to the motor/gearbox assembly. The Burster 9307 has the capability to measure two Y axis simultaneously. In this case the first channel was used to measure torque vs positon, the second channel monitored Current vs positon.
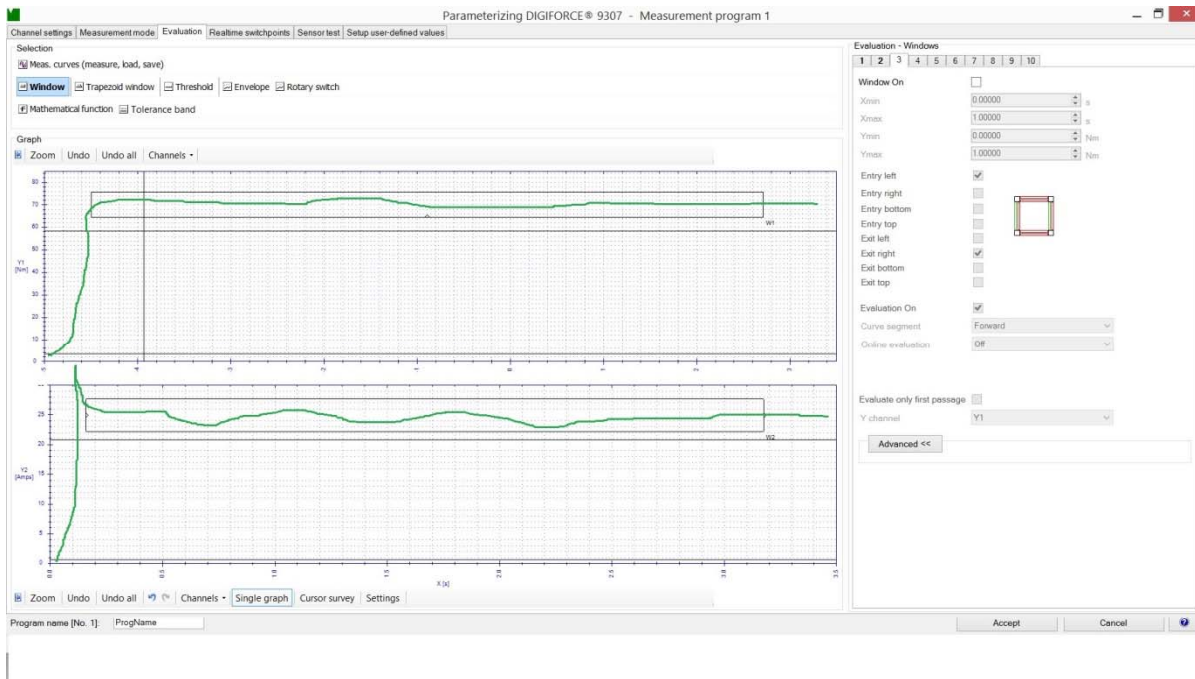

Motor Test : X - Displacement   Y1 - Torque   Y2 - Current

1.   Torque Indication is maintained within the window
2.   Current stays within tolerance
3.   Speed is derived as a function of distance traveled before test is stopped at 3secs
4.   Torque is measured and graphed

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Brake Test

The brake is a variable brake that uses a variable voltage to increase and decrease the amount of braking applied. This test used the torque sensor, a voltage input and current sensor to monitor Torque vs. Input voltage and Current vs. Input voltage.
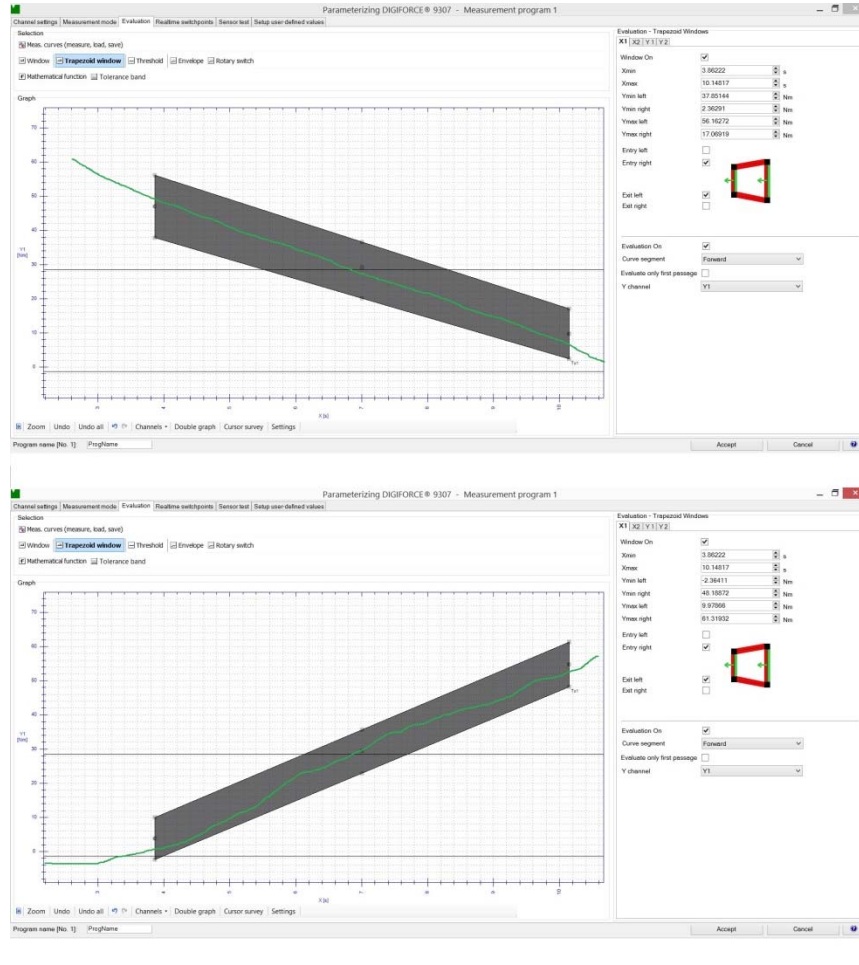
Motor Test : *X - Brake Volts   Y1 - Torque   T2 - Current*

The Burster 9307 system is an economical test platform that allows complex testing to be performed without the need for custom programming and complicated data acquisition systems.