

Seat Durability Test System

Flexible, Accurate, and Powerful Lifecycle Testing Software

RANGE-OF-MOTION AND POWER TRACK FUNCTIONAL TEST SYSTEM

V I Engineering Inc. has developed a flexible and accurate Seat Durability Test System that's already in place at a leading international automotive parts manufacturer. The system utilizes precisely controlled linear actuators to simulate the force and movement that the DUT would experience during a normal lifecycle. It also uses advanced optical distance sensors to precisely measure the performance and motion (travel) of the various power track functions (up down, forward, back ... etc). Data acquisition and control are handled by National Instruments hardware and a custom designed software application created by V I Engineering. In order for the system to be flexible enough to accommodate various seat types, testing schedules and future products, a simple yet thorough test editor/scheduler was implemented.

POWER TRACK VALIDATION

All power track operations (seat travel) can be programmed into a repeating cycle by the test operator via the system GUI. The motor current, motor voltage, travel, load, acceleration and the number of cycles completed are then monitored for the required number of cycles and the precise stop and start points are recorded. The software also provides utilities for editing of the tests schedules. The schedule editor allows the user to define which functions are cycled how many cycles will occur, how often data should be saved to file, the tolerance, and the alarm limits for this schedule.



RANGE OF MOTION AND DURABILITY TESTING

Concurrent with the power track tests, the range of motion and Durability test sequences control linear actuators that apply force to the DUT in four (4) axis of motion. Three of the motions are governed by independently programmable waveforms capable of functioning in displacement, force, or acceleration modes. A separate actuator presses a simulation form against the seat at variable forces up to 1500N, accurately following the preset waveforms at speeds up to 6Hz. The displays are broken up into force, acceleration, and displacement graphs with a list of channel options to the right. This lets the operator choose the channels they want to view on any graph. As in the power track test, the schedule editor allows the user to define the waveform pattern, the number cycles, the frequency data should be saved to file and the alarm limits for the selected schedule. The editor can be accessed via menu on the main screen.

ALARM LIMITS

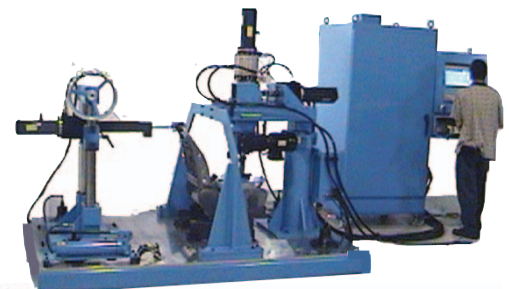
To avoid damage to the seat or the data acquisition equipment, alarm limits are fully configurable for each individual seat being tested. If any alarm limits are breached, for any of the four axes, the test will stop. There is also a hardware EStop on the test stand to cut power to the machine for user safety.

**For more information,
visit the new V I Engineering
web site at viengineering.com**



KEY BENEFITS

- ◆ A proven, configuration-ready application, available on a "fast track" delivery schedule.
- ◆ Highly accurate electronic linear actuators and optical position sensors deliver greater precision.
- ◆ Dependable control application allows unattended operation for greater test department productivity.
- ◆ Advanced GUI eliminates the need for special operator training and makes test set-up and sequencing easy.
- ◆ Test results can be displayed graphically, in real time or recorded in a variety of formats.



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VI ENGINEERING, INC.
VALUE • INTEGRITY

Complete Test and Measurement Solutions that Exceed Expectations

V I Engineering

COTS Software and Instrumentation

Description	Product Name
System Development Software	LabVIEW
Data Acquisition Driver	NI-DAQ
4 Slot PXI Chassis	PXI-1002
1.26 GHz PXI Embedded Controller with 15 GB Fast Ultra ATA100 hard drive and 256 Ram Upgrade	PXI-8176 NI-8176
Analog Output	PXI-6711
Terminal Block for PXI-6711	TB-2705
Multifunction DAQ	PXI-6071E
Digital I/O Module	PXI-6508
Shielded Terminal Block	SCB-100

Signal Specifications

No.	Process I/O Description	Location (PCI-16E-1)	Range (V)	Gain	Range (EU's)
Analog Inputs					
0-1	Load Achieved	PXI-6071E	10-10v	1	-2224-2224N
4-7	LASER range finders	PXI-6071E	10-0v	1	100-600mm
16	Power Track current	PXI-6071E	0-5v	1	0-50A
17	Power Track voltage	PXI-6071E	0-5v	1	0-50A
18-22	K Thermocouples	PXI-6071E	6.9-55mv	1	-200-137 °C
23,32,33	Position Achieved	PXI-6071E	10-10v	1	-101-101mm
48-50	Position Desired	PXI-6071E	10-10v	1	-101-101mm
51	Torsional Frequency Desired	PXI-6071E	10-0v	1	0-1.13Hz
Analog Outputs					
0	Horizontal Actuator Load/Pos.	PXI-6711	10-10v	1	-1343-1343N -101-101mm
1	Vertical Actuator Load/Pos.	PXI-6711	10-10v	1	-2224-2224N -101-101mm
2	Longitudinal Actuator Pos.	PXI-6711	10-10v	1	-101-101mm
3	Torsional Frequency	PXI-6711	0-10v	1	0-1.13Hz
Digital Outputs					
0-7	Power Relay Control	PXI-6071E & PXI-6711	0-5v TTL		

V I Engineering is an experienced systems integrator that provides automated test and measurement systems, engineering information management, and LabVIEW productivity tools to Fortune 500 customers in the automotive, life sciences, manufacturing, and aerospace industries. We are also a leading Select Integrator in National Instrument's Alliance program.

VISTA

VISTA is V I Engineering's branded line of software tools, process consulting, and advanced design training that improves programming productivity and quality through the implementation of software engineering best practices for the development, management, and release of LabVIEW and TestStand applications of any size.

ENGINEERING INFORMATION MANAGEMENT

The EIM team provides software solutions that improve the efficiency of Test Planning, Execution, Analysis, and Document Management. Clients gain productivity through automated reporting, and fast, easy access to all their engineering intelligence.

CUSTOM FABRICATED TEST HARDWARE

With the addition of experienced hardware engineers, V I Engineering now designs and fabricates a wide range of PCBs and fixtures. Plus, our new 3,000 sq. ft. build area allows us to fully assemble and validate almost all types of automated testing equipment in-house.

Locations

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