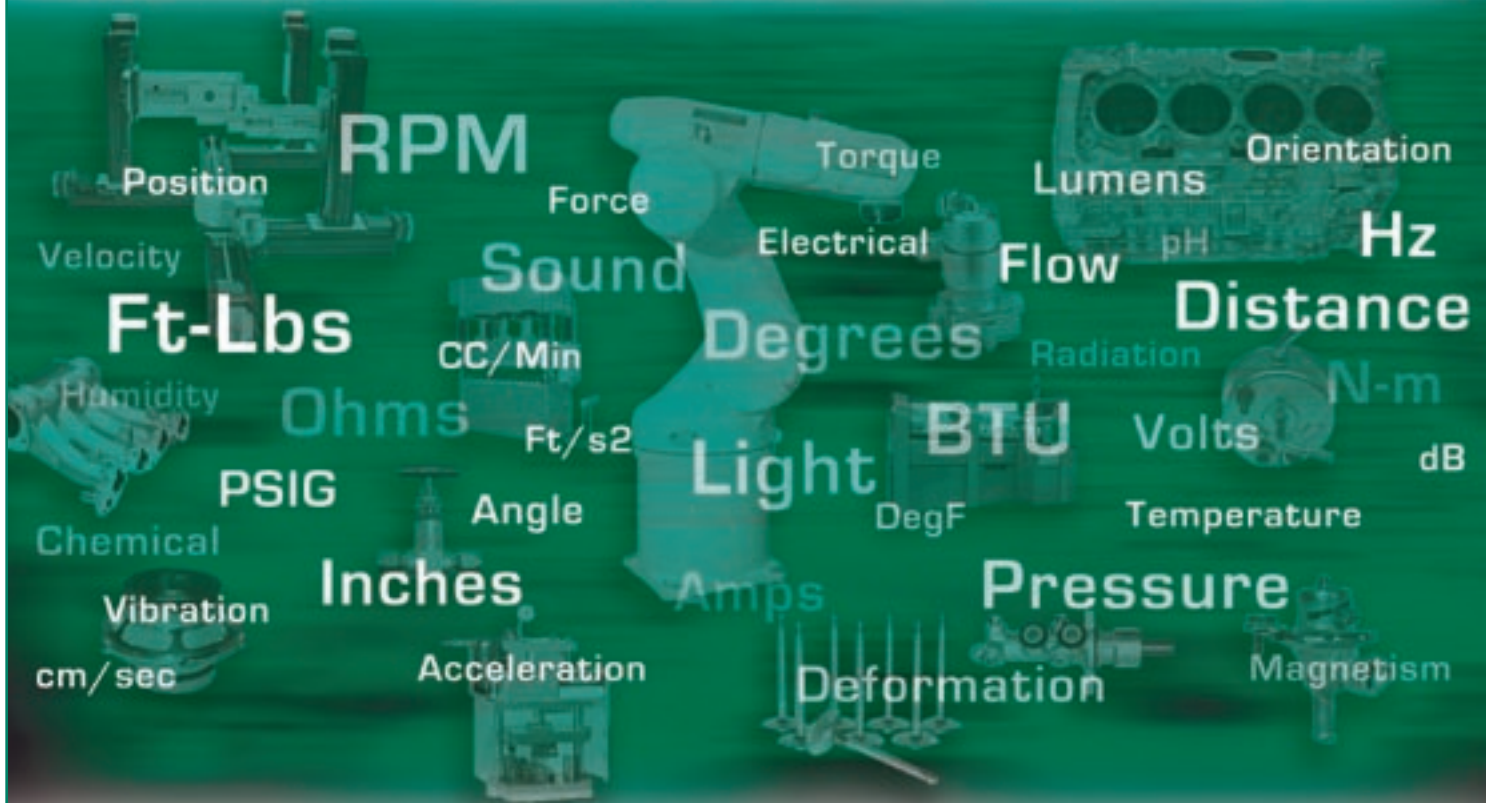




Vector Functional Tester



The Vector Functional Tester is a versatile testing platform for the manufacturing and assembly industries. Based on Uson's Vector Leak and Flow Tester, the Vector Functional Tester enables testing of virtually any product application, from press fit to electrical motors to torque to turn and leak and flow.

The benefits of using the Vector Functional Tester (VFT) are improved product quality, lower warranty costs, higher process uptime and increased customer satisfaction. The fastest tester available, the VFT helps to lower operation costs, increase productivity and create higher throughput.

Its intuitive user interface and advanced setup features also require less training and engineering, freeing up valuable resources for more important requirements.

The Vector Functional Tester's Windows® XP operating system makes it powerful yet very simple to use. Its unique modular design lets you choose only the features needed for the current application, but allows for easy and economical expansion with the simple addition of hardware and software modules. A single VFT can perform up to 10 independent or concurrent tests.

The VFT is built on a universal platform using common hardware and software across the entire family, which increases reliability, reduces downtime and significantly

lowers overall ownership costs. Each version of the VFT consists of three main sub-systems: operator panel, electronics and test sensors. These sub-systems can be mounted together or separately.

All VFT *operator panels* feature high visibility accept and reject lights, tactile responsive alpha

numeric keypad, software-defined function keys, start and stop push buttons, mouse and lock-out key.



VFT *electronics* are in the form of plug-in modules that are inserted into an electronics cPCI chassis. Every VFT will have a **Master Control Unit (MCU)**. The MCU has a CPU, hard drive, two serial communication ports, multiple USB connectors, Ethernet connector, VGA connector and connectors for an external mouse and keyboard.



The **Test Control Unit (TCU)** is the core of the VFT's power and flexibility. Each TCU features a 1.36 GFlop RISC microprocessor. The TCU is available as a single-channel or a dual-channel module. Each channel can accept up to six sensor inputs with scan times as fast as 260 usec or resolutions as high as 24 bits. Each channel has up to eight discrete outputs, four discrete inputs and one analog output.

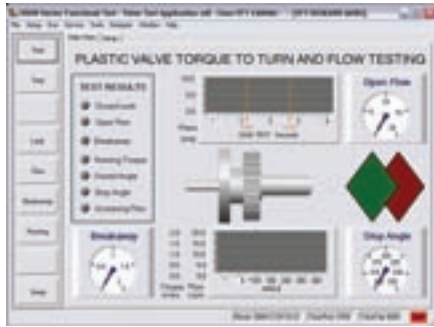
The VFT can accept inputs from virtually any type of sensor. In addition to the Vector's standard pressure and flow transducers used for leak and flow testing, the VFT also supports strain gauges, load cells, torque transducers, angle encoders, electric current properties, etc. Analog sensor inputs are typically 0 – 5 VDC, 0 – 100 mV, and 4 – 20 mA. Digital encoder inputs are typically pulse stream or quadrature (optically isolated 5 to 24 VDC).

The VFT is Flexible and Easy to Use. It is structured around a wide range of ready to run, pre-formatted test applications, with user configurable accept/reject limits. These test applications can then be factory customized for each user's exact test requirements. Starting with a previously verified application template allows for reduced design, configuration, and certification testing, resulting in shorter delivery times and lower engineering costs.

Every pre-configured application has graphic screens built specifically for the test being performed. All displays are designed to be intuitive and simple to use. Operators enjoy working with the VFT because it doesn't have the hassles associated with standard display objects that have no relevance to the test

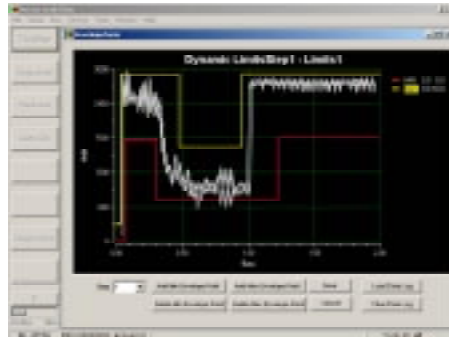
APPLICATION EXAMPLES

A few examples of the many different types of tests that can be performed with the Vector Functional Tester:



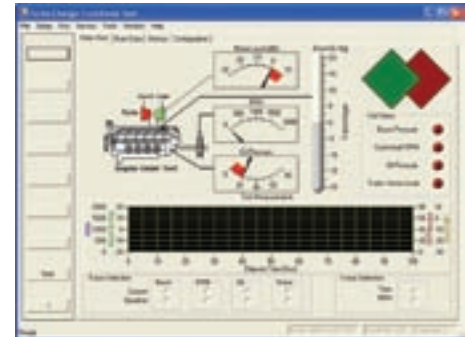
Valve Torque-to-Turn and Flow Testing.

The test apparatus consists of torque, angle, pressure and flow sensors and motor control for turning the valve. Monitored parameters are flow versus angle and torque versus angle, which are used to verify the flow in relation to valve angle, breakaway force and the smooth operation and stop position of the valve.



Electric Current for Manifold Actuators.

Monitor at millisecond scan times and verify that the values fall within expected bounds. Because the current draw fluctuates significantly during the actuator operation cycle, limits change dynamically multiple times during the 1/2 second test step. Some test limit levels apply for less than 10 milliseconds.



Turbocharger Functional Monitoring.

Monitor Boost Pressure versus RPM and turbocharger "noise". The test apparatus consists of a motor and controller for turning the engine, an oil pressure monitor, a boost pressure transducer, a hall effect RPM signal generator and a sensor for monitoring the noise frequencies of the turbocharger during the test.

Please see the Vector Functional Tester application notes on the above subjects for more details.

Applications

A/C Compressors
Automatic Transmissions
Ball Joint Assembly
Bearing Race Insertion
Catheter Balloons
Cylinder Head Assembly
Electrical Motor Test
Engine block with crank
Engine compression test
Engine Missing Bearings
Fasteners, Bolt Tightening
Fuel Injector
Gear Quality
Heading Cam Assembly
IV Bag Stopper
Plastic Valves
Press Operations
Seat Track Monitor
Valve Guide Insertion
Valve Seat Insertion
Wheel Hub Assembly

Test Types

Torque to Turn
Breakaway Torque
Running Torque
Flow
Mass Flow
Backpressure Flow
Flow to Position
Force to Distance
Leak
Pressure Decay
Differential Pressure
Position to Height
Pressure to Position
Noise-Vibration-Harshness

Sensor Types

Acceleration (Linear, Angular)
Chemical (Concentration, Acidity)
Distance (Lasers, LVDT)
Electrical (Resistance, Current, Voltage, Amps)
Flow (Gas, Fluid)
Force (Linear, Angular) (Load)
Frequency
Humidity
Light (Intensity, Frequency, Polarization)
Magnetism
Mechanical Deformation
Pressure (Absolute, Gauge, Differential)
Radiation
Sound
Temperature
Torque
Velocity (Linear, Angular)
Vibration

VFT Specifications

Operating System:

Windows® XP

Number of Programs:

Runs up to 8 multi-step programs per channel.

No restrictions on the number of programs that can be stored on the hard disk.

Communications Protocols

Available:

Ethernet/TCP/IP

Profibus

Mobus

Interbus/S

Bar Code Interface

Advanced Features:

On-Board Help

On-Board Diagnostics

Data Logging

Hard Drive

Memory Stick

LAN

Advanced Test Sequencing

Advanced Leak Detection.

Optional Electronic Modules:

Input/Output Modules

Communication Modules

Data Storage Modules.

TCU Specifications		TCU-6	TCU-12
Processor		1.36 GFLOP RISC Processor	
Sensors	Analog Sensors: 0 – 5 VDC, 0 – 100 mV, and 4 – 20 mA	6	12
	Digital Encoders: Pulse Stream or Quadrature; 10,000 pulses/sec	1	2
Inputs	Serial Input Ports	1	2
	Digital Control Signals (optically isolated, 5 to 24 VDC) <small>*Some of these will be unavailable if a digital sensor is used</small>	4*	8*
Outputs	Analog Outputs (12bit, 0-10 VDC, 130 mA)	1	2
	Digital Signals (Optically Isolated, 24 VDC)	8	16
Data Rates	Configurable Sampling Rates	0.260 ms to 100 ms	



Products	Size	Bench Top	3U NEMA	6U NEMA	19" Rack
Color Flat Panel LCD Display	Standard	7"	7"	7"	7"
	Option			12.1"	12.1"
Electronic Chassis Card Slots	Standard	4	7	7	7
	Option	5	12/15	12/15	12/15
Electronic Chassis Mounting	Standard	Internal	Internal	Internal	Internal
	Option				Remote

Due to a program of continuous development, specifications may be changed without notice.

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