DTC
DynaTronic Corporation

》Aerospace

》Energy

VENZO 800 *Series*
Vibration Controller

》Automotive

》Defense 》Maritime

DynaTronic Corporation Limited

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DynaTronic Corporation Ltd.
Professional and Innovative Team in Vibration Control

Automotive

Aerospace

Defense

Energy

Maritime

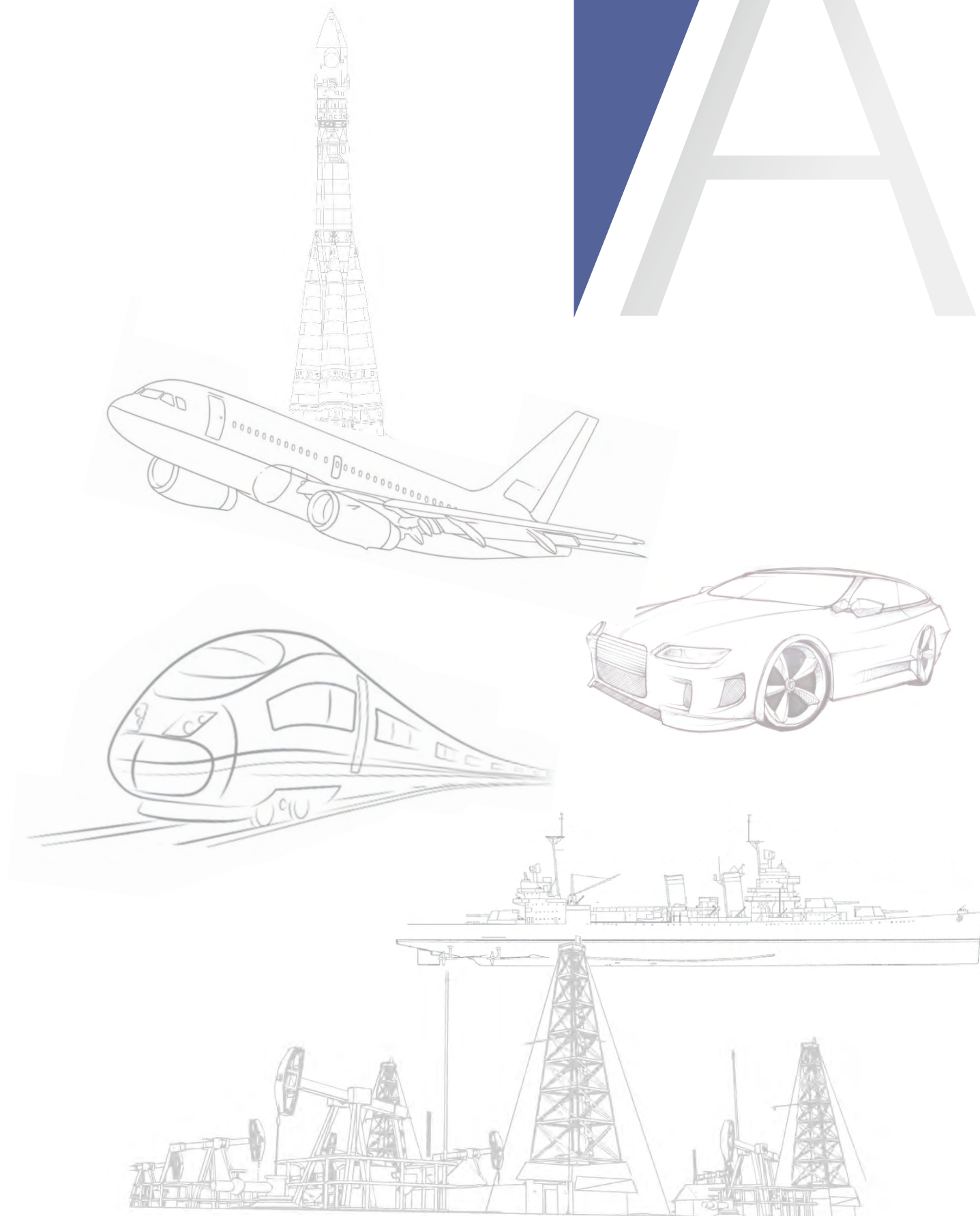Education

Electronics

and more

About Us

DynaTronic Corporation was formed by an innovative and professional team, who are dedicating to vibration test and measurement fields.

DynaTronic Corporation provides leading edge instrumentation for vibration testing and measurement, e.g., VENZO 800 vibration controller can provide you with the most comprehensive vibration control software modules, including: random, sine, classical shock, RSTD, SRS, SoR, SoS, RoR, SRoR, TTH and FDR and other auxiliary applications. Each module provides basic functions and optional functions, so you can customize the desired system. The great characteristics which contain simple operation, rich control functions, improved analysis and reporting features, easy-to-upgrade hardware and software, and high reliability and quality contributes the high cost-effective for VENZO 800 series vibration controller.

Now we are enlarging the global team for supporting customers with worldwide network of sales offices and field technical engineers. Based on the customers' support, we continue to focus on the improvement of current products and the development of new product.

DynaTronic Corporation will devote ourselves to make a well-known reputation of reliable system, good quality and excellent performance.

State-of-the-art Hardware

- 2~16 Analog Input Channels
- 1~2 Drive Channel (can be adopted in dual-axis control application)
- 450MHz DSP Processing
- 100 Mbps Ethernet Port Connecting to PC
- -30~70℃ Working Temperature
- Fanless Structure to Reduce the Background Noise

- 160 dB / Octave Anti-aliasing Filter
- AUX Channel
- 24-bit ADC/DAC, 135dB Dynamic Range
- 204.8 kHz Sampling Rate, 80kHz Frequency Range
- 1GB Internal Flash Memory Stores Test Configuration
- Floating Ground Design Reduces Ground Loop Problems

Full and Innovative Control Functions

- Random
- Sine, Step Sine, Resonance Search and Tracked Dwell
- Classic Shock, Transient Time History, SRS
- Sine-on-Random
- Sine-on-Sine

- Random-on-Random
- Sine and Random-on-Random
- Field Data Replication
- Kurtosis Control
- Limiting and Notching
- Multivariable Control

Analysis Capabilities and Auxiliary Functions

- THD Detection
- Data Recorder
- FFT Analysis
- SRS Analysis
- FRF
- Waterfall View
- Signal Calculation

- Signal Cache
- Signal Editor
- Word/PDF Test Report
- Email Report
- Off-line Viewer
- Transient Capture, Force/Deflection Analysis, Shock Response Analysis

Inputs

Input: 2~16 channels

Input Interface: BNC Connector

Input Resolution: 24-bit ADC

Coupling: AC Gnd, AC Dif, DC Gnd, DC Dif, Charge, IEPE

TEDS: IEEE 1451.4 compliant, automatic-reading

Anti-aliasing Filter: analog and digital anti-aliasing low-pass filters

Input Dynamic Range: 135dB

SNR: >100dB

Input Voltage Ranges: ±10, ±1 or ±0.1 VPEAK

Input Impedance: 1MΩ（single-ended）2MΩ（differential）

Input Protection Voltage: ± 36VPEAK without damage

Input Channel Crosstalk: <-100dB@1kHz

Amplitude Channel Match: 0.1 dB

Channel Phase Match: better than ±1.0 degree, up to 20 kHz

Input Signal Type: Charge, Voltage, High-integrated

Input / Output Channel Crosstalk: <-100dB

Total Harmonic Distortion: <-100dB

Frequency Accuracy: as fine as 0.000001Hz

Outputs

Output: 1~2 Drive Channels

1 AUX Channel: can be configured as drive channel in dual-axis control

Output Interface: BNC Connector

Output Resolution: 24-bit DAC

Max. Sampling Rate: 204.8 kHz

Frequency Range: 80 kHz

Output Dynamic Range: ≥ 108 dB

Output Voltage Range: 10VF.S

Max. Output Current: 20 mA

Total Harmonic Distortion: <-100dB@1kHz

Anti-aliasing Filter: 160 dB/Oct digital and analog filters

PC

PC Configuration: Windows XP/Vista/ 7/ 8 OS and an Ethernet port. Microsoft Word / Excel and PDF are recommended.

Main Chassis

- **Dimension (mm):** 290*210*60 (VENZO 820); 390*280*60 (VENZO 880); 430*280*60   (VENZO 8160)
- **Weight:** 2.6 kg (VENZO 820); 4.2 kg (VENZO 880); 5.0 kg (VENZO 8160)
- **Front Panel:** three LED lights indicate the status of "Power", "Ready" and "Control". The red Abort button is for emergency stop of the vibration test system.
- **Rear Panel:** connectors include 2/8/16 Analog Input Channels, a Drive Channel, a 100 BASE-T Network Port, an AUX channel (for VENZO 880 and VENZO 8160 can be adjusted to dual-axis drive control channel), a grounding-end, an External Emergency Abort Jack and a terminal block of digital I/O lines.
- **Working Temperature:** -30~70℃
- **Humidity:** 5%~95% RH
- **Consumption:** 10W (VENZO 820), 20W (VENZO 880); 20W (VENZO 8160)
- **Power:** 100~240VAC (50~60Hz)
- **Enclosure Rating:** IP43
- **PC Connection:** high-speed standard Ethernet interface
- **Anti-vibration Performance:** 10-60 Hz @ 0.15 mm peak, 60-150 Hz @ 2gn, conform to IEC-60068-2-6;
- **Anti-impact Performance:** 10 gn for 16 ms, conform to IEC-60068-2-27
- **EMC Standards:** EN61326-1:2006, EN61000-3-2:2006 +A1:2009+A2:2009, EN 61000-3-3:2008
- **Safety:** EN 61010-1:2001
- **Compliance:** CE Marking

Random

Random performs real-time closed loop control of PSD profiles.
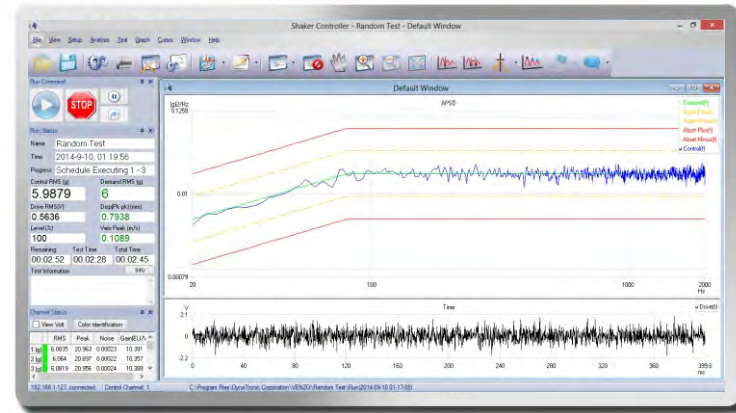
Performances

Frequency Range: DC to 5,000 Hz, extendable to 40,000 Hz

Sampling Rate: 51.2 kHz, high frequency option extends to 102.4 kHz

Spectral Resolution: 6400 lines, optional up to 25,600 lines

Control Dynamic Range: 100 dB

Typical Loop Time: 10ms

Control Accuracy: ±1dB at 90% confidence within 120 DOF

Drive Clipping: 1 to 100 sigma

Kurtosis: 3 to 100 sigma

Test Parameters

Control Strategy: Weighted Average, Minimum, and Maximum

Degrees of Freedom: 4 to 12,736 DOF

Shutdown Rate: defines the rate of drive signal reduce to zero.

Loop Gain: compensation gain for the system transfer function

FRF Slew Rate: the maximum changing rate of the frequency response function.

Startup Mode: Measure online or Last Measure

Safety Parameters

Open Loop Check Grade: selectable of standard, Loose and strict three choices.

Channel Maximum Noise: set the maximum allowable channel noise.

Max. System Gain Check: check the system maximum gain value in equalization and running stage.

Options

Sine on Random

Perform up to 16 sine tones superimposed on the background random spectrum.

Random on Random

Perform up to 16 narrow spectral bands superimposed on the broad random background spectrum.

Sine on Sine

Perform up to 16 sine tones superimposed on each other.

Sine and Random on Random

Perform up to 16 sine tones and 16 narrow spectral bands superimposed on the broad random background.

High Frequency for Random

Extend the frequency range for random from 5 kHz up to 40 kHz.

High Line Resolution

Increase the number of FFT spectral lines from 6,400 up to 25,600.

Kurtosis

Kurtosis control allows a none-Gaussian distribution to be used in random test.

Sine

Sine performs closed swept sine vibration, to determine resonant frequencies and damping factors, overall peak G response of the structure.
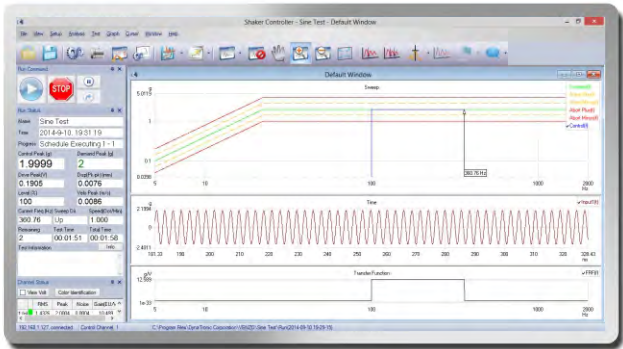
Performances

Frequency range: 1Hz to 5,000 Hz, high frequency option extends to 51,200Hz and low frequency option starts from 0.01Hz

Sampling Rate: 51.2 kHz, high frequency option extends to 204.8 kHz

Spectral Resolution: 512 ~ 8192 points

Control Dynamic range: up to 150 dB

Loop time: typical 5 ms

Control accuracy: ±1dB through a peak-notch with a Q of 50, at 1 octave/min

Frequency Resolution: as fine as 0.000001Hz

Sine dwell: user specified dwell frequency with duration in cycles or time

Total Harmonic Distortion Detection: calculate harmonic distortion of all analysis frequencies, accurate as each order.

Test Parameters

Control strategy: Weighted Averaging, Minimum and Maximum

Digital tracking filter: fractional band is selectable 1% to 100% of output frequency, or fixed 1 Hz to 1,000 Hz

Min Response Time: selectable from 0.25 to 50 cycles

Startup Mode: optional Smooth or Fast

Sweep type and rate: linear from 0 to 6,000 Hz/min or logarithmic from 0 to 100 octaves/min

Compression factor: compression factor from 1~1000 for different frequency segment

Safety Parameters

Box-Tolerance: adjust the tolerance bands near an amplitude discontinuity

Open Loop Check Grade: selectable of Standard, Loose and Strict three choices.

Channel Maximum Noise: set the maximum allowable channel noise.

Max. System Gain Check: check system maximum gain value in equalization and running stage.

Options

Step Sine

Sweep on a sequence of discrete frequencies at linear or logarithmic frequency step rates.

Resonance Search Track & Dwell

Based on the transfer function of UUT, track and dwell near to the resonance frequency point.

Resonance Search

Use Q or amplitude of transmissibility to automatically search the resonances within certain range.

Phase Tracking

Feedback Gain: 0.01~1

Frequency Max Drift: 0~1000%

Max Sweep Speed: 0~10 x Normal Speed

Dwell

Duration: Time or Cycles

Dwell Type: Frequency locked dwell or Resonance tracked dwell

Sine Frequency Extension Low to 0.01Hz

## Sine Frequency Extension Up to 51.2KHz

AUX Channel

COLA; differential output; reference frequency output(stroboscopes)

THD Detection

Check the Total Harmonic Distortion of the vibration test system.

Classical Shock

Classical Shock performs closed loop control of transient waveforms. The entire transient period is sampled simultaneously and gap free. All of the classical types are supported. There are several displacement optimising methods.
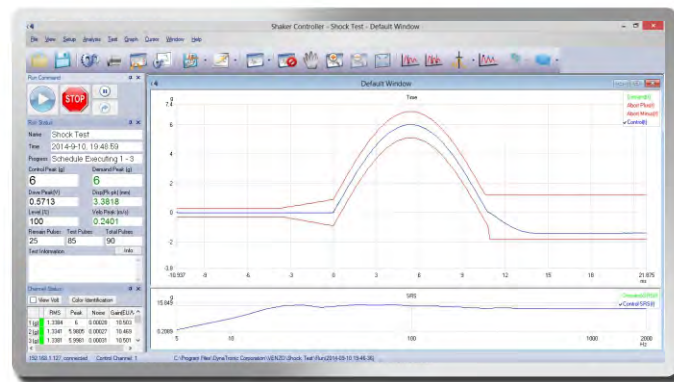
Performances

Block Size: 256 to 16,384 points, extendable to 65,536 points

Sampling Rate: 20 Hz to 51.2 kHz, high frequency option extends to 204.8 kHz

Loop Transfer Function: automatic calculation during system equalization or recall FRF from disk.

Filtering: user defined desired frequency for low pass filtering.

Delay Between Pulses: user set unlimited >0

Waveforms

Wave Types: Half-sine, Haversine, Initial and final Peak Saw Tooth, Triangle, Rectangle and Trapezoid.

Negative Pulse: pulses can be in negative direction

Averaging: pulses can be averaged for the control.

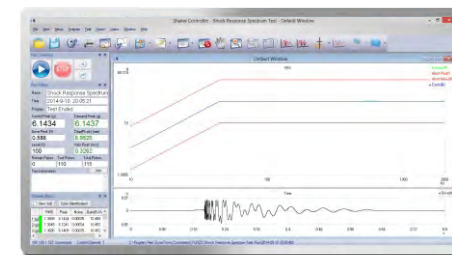**Pulse Duration**: from 0.05 ms to 100,000 ms.

Compensation Waves: choices of Harmonic Rectangular, Rectangular and Half Sine compensation pulses.

Types: Pre-post, Pre or post position.

Criterion: ISO, MIL-STD 810G requirements, User defined

Limits: automatic calculation of maximum expected acceleration, velocity and displacement, check against shaker limits
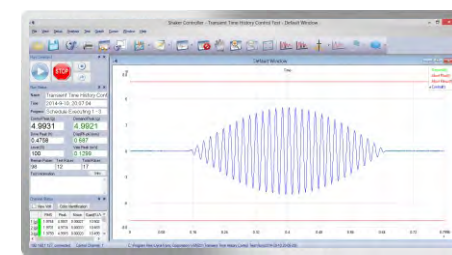
Options

Shock Response Spectrum

Generate a waveform by specifying the G levels in the frequency domain.

Synthesis Type: PosMax, NegMax and AbsMax Fractional
Fractional Octave Number (1/N): 1~48
Damping Ratio: 0.1%~100%
Wavelet Initialize: specify half cycles, specify max duration
Compensation: DC Remove, High pass filter

Transient Time History

Seismic or crash test
Data Formats: Binary, UFF Binary, UFF Text, Text (x-y), Text (y)
Waveform Type: Sine, Sine Beat, Chirp, White Noise, Imported Wave
Sampling Rate: 20 Hz to 51.2 kHz, high frequency option extends to 204.8 kHz
Block Size: 256, 512, 1024, 4098, 8192, 16384 points, extendable to 65,536 points
Data Process: Remove DC, Low Pass Filter, High Pass Filter

SRS Analysis

SRS Type: AbsMax, PosMax, NegMax
Fractional Octave Number (1/N): 1~48
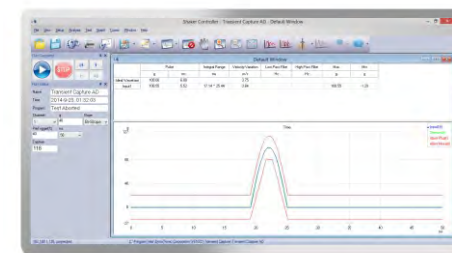
Transient Capture

Sampling Rate: up to 204.8 kHz
Acceleration range: up to 100,000gn
Capture Duration: from 1ms to 10,000ms.
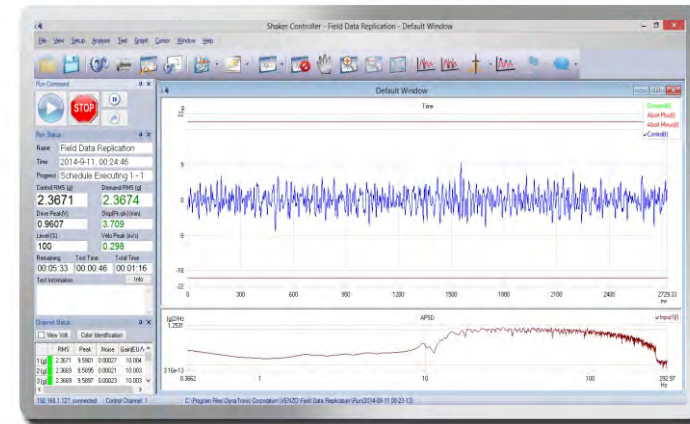**Trigger Slope:** Rising, Falling and Bi-slope.
Analysis Functions: Force/Deflection Analysis, Shock Response Analysis, SRS Analysis

High Frequency for Shock

Extend the frequency range for shock from 20 kHz up to 80 kHz.

FDR is used to replicate the measured field data by importing the vibration elements such as acceleration.


Performance

Block Size: 1,024 to 4,096 points, extendable to 16,384 points

Sampling Rate: 20 Hz to 51.2 kHz, high frequency option extends to 102.4 kHz

Data Import: import waveforms from Signal Editor with measured analog time domain data.

**Data Format:** Binary, UFF Binary, UFF Text, Text (x-y), Text (y)

Signal Editor

Pre-stored Profiles: band-limited random, white noise, sine and chirp

Compensation: high-pass filter, low-pass filter, velocity DC removal, acceleration DC removal

Profile Rescale: magnitude or polarity adjustment by applying a profile scale factor to each data point of the profile

Test & Level Scheduling: the test can be set to reproduce the waveform for a specified duration.
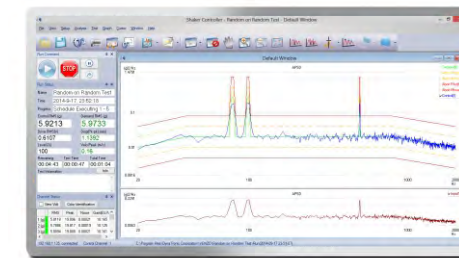
Random on Random (RoR)

RoR performs up to 16 narrow spectral bands superimposed on the broad random background.

Random Tones: 1 to 16 independent narrow spectral bands.
Frequency Range: 20 kHz, optional up to 40 kHz
Lines: 3200 lines, extendable to 25,600 lines
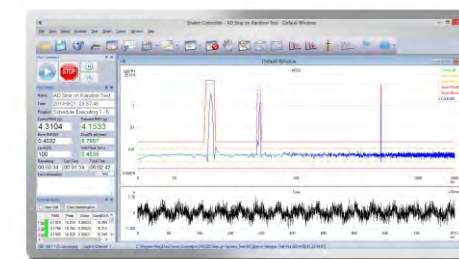
Sine on Random (SoR)

SoR performs up to 16 sine tones superimposed on the random background.

Sine Tones: 1 to 16 sine tones configurable independently
Frequency Range: 20 kHz, optional up to 40 kHz
Lines: 3200 lines, extendable to 25,600 lines
Frequency of Sine Tone: can be in or out of broad band random
Independent Resolution in Sine Tones: 2048 lines, optional up to 8192 lines
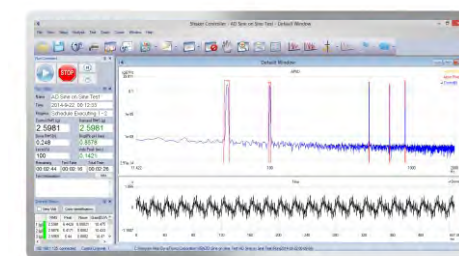
Sine on Sine (SoS)

SoS performs up to 16 sine tones superimposed on a sine background.

Sine Tones: 1 to 16 sine tones configurable independently
Frequency Range: 20 kHz, optional up to 40 kHz
Lines: 3200 lines, extendable to 25,600 lines
Independent Resolution in Sine Tones: 2048 lines, optional up to 8192 lines
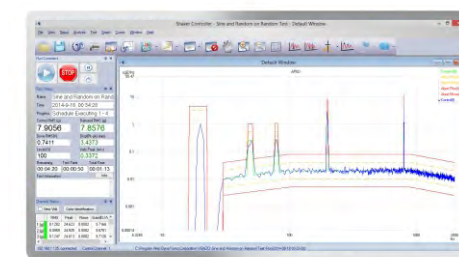

Sine and Random on Random (SRoR)

Analog sine sweeps and narrow band Gaussian random dwells/sweeps on wide band Gaussian random distribution.

Tones: 1 to 16 sine tones and 1 to 16 narrow bands
Frequency Range: 20 kHz, optional up to 40 kHz
Lines: 3200 lines, extendable to 25,600 lines
Independent Resolution in Sine Tones: 2048 lines, optional up to 8192 lines

Software Options

Kurtosis Control

Usually in random test we adopt Gaussian distribution however, Kurtosis Control allows a none-Gaussian distribution to be used. In probability theory and statistics, kurtosis is any measure of the "peakedness" of the probability distribution of a real-valued random variable. A high kurtosis distribution has a sharper peak and longer, fatter tails, while a low kurtosis distribution has a more rounded peak and shorter, thinner tails.
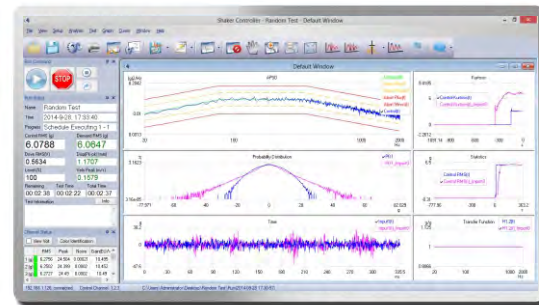
Notching and Limiting Control

Assign limiting/notching parameters to measurement channels, the drive output will be limited to keep the response of limiting/notching channel below the defined profile, to protect UUT from over excitation. Each measurement channel can be assigned independently.
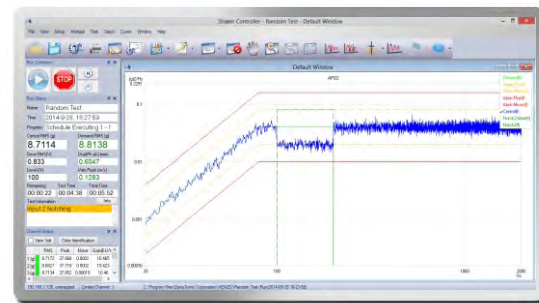
Multivariable Control

Multivariable control is adopting displacement control in low frequencies while acceleration control in high frequencies. This method is outstandingly expanding the frequency control range, VENZO vibration controller can realize continuous sine sweep test from 0.01Hz to 51.2 kHz, the control dynamic range is up to 150 dB. Especially for hydraulic shaker, join with the displacement control channel is greatly improving the low frequency control precision.
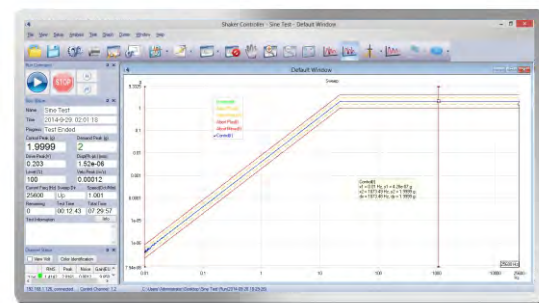
THD Detection

Check the Total Harmonic Distortion of the vibration test system.

Signal Editor

Signal Editor allows you to import and edit time-domain signals. This function is standard with FDR.

AUX Options

AUX provides outputs including Sine Constant Output Level Amplitude (COLA), differential output, and reference frequency point.

Test Report Generation

Easy one-click-generation of WORD/PDF report, report layout can be customised to suit user requirements.

Email Report

Wherever you are in the world, Email Report can automatically send you a report upon test completion.

Off-line Viewer

Standard with all control applications

Analysis Functions

Provides FFT Analysis (random), FRF Analysis(random & sine), Historic Signal Analysis, Signal Calculation, Waterfall Analysis, Off-line View, In addition, it is optional for SRS analysis function in Classical shock and Transient Time History test modes.

Hardware Calibration

Automatic hardware calibration can be completed using the calibration software with full calibration report, includes permanent licence. (Requires calibration equipment package which includes, BNC cables and converters)

3 Years Warranty & Free Software Updating!

As we all know vibration test belongs to reliability test, therefore, the reliability of vibration test equipments is very important. DTC provides 3 years warranty on Hardware and 3 years free software updating, we firmly believe that you should never worry about the reliability and performance of VENZO controller, just enjoy the vibration test with the convenient software. The visual impact that VENZO control software brings to you, give you a totally fresh new environment, testing work will never be boring.

DTC will never stop dedicating to improving vibration controller, especially for software, we will add new features to it continuously, to solve questions encountered in the field and meet white papers addressing real world applications.

Service

DTC provide a full set of service from pre-sales to after sales, including solution proposal, manufacture, installation, training and maintenance.

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