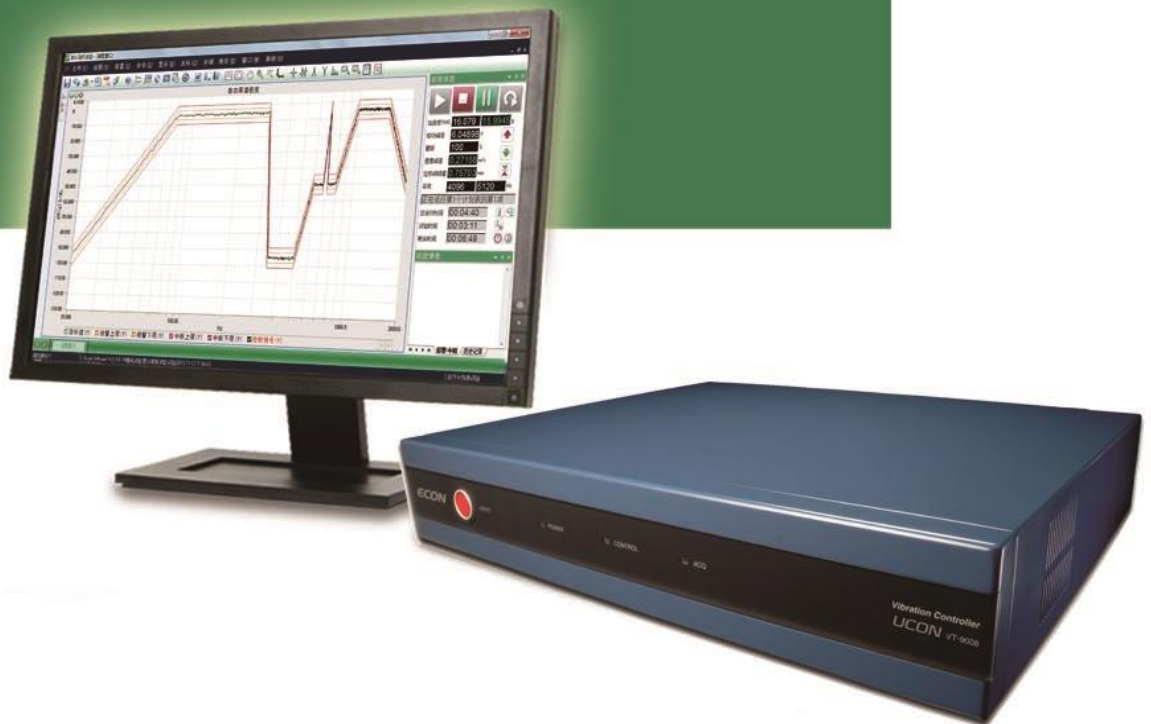# ECON

Vibration Controller

Technical Specifications

UCON® series

Econ Technologies Co., Ltd.

Overview

UCON is a state-of-art vibration control system for electro-dynamic and servo-hydraulic shakers. It integrates the most advanced technologies of DSP computation, low noise hardware design, vibration control algorithms and data transmission.

UCON is also a multi-tasking system with the control loop independent from the PC, and focuses on fast responses, high performance and reliability, and powerful functions. Also it brings test engineers user-friendly software at their conveniences.

Features

✧ Close- loop control handled by a DSP processor independent from the PC to ensure real-time and efficiency of the system

✧ Dynamic range > 110 dB, 24-bit ADC and DAC, 32-bit float point DSP, land ow noise hardware design

✧ Random control dynamic range > 90 dB

✧ Sine control frequency range up to 10000 Hz, random control frequency range up to 18750 Hz

✧ Random resolution up to 6,400 Lines

✧ More than 20 safety checks and interlocks to ensure the safety of the personnel, test articles, and shaker equipments

✧ PC software based on Windows OS with multiple graphical interface, and cursor type, fonts, colors, etc. can be easily modified

✧ Professional test reports (supports Word/PDF format) can be automatically generated and printed after the test

System Specifications

Model	UCON VT-9002	UCON VT-9008	UCON VT-9016
Input	2 Voltage/ICP/Charge channels	8 Voltage/ICP/channels	16 Voltage/ICP channels
Drive	1	1	1
COLA Output	No	1	1
Digital I/O	No	Yes	
Dimensions			
Dimension (mm / in)	362×278×79 / 14.3×10.9×3.1	455×355×92 / 17.9×14.0×3.6	455×355×92 / 17.9×14.0×3.6
Weight (kg / lb)	2.9 / 6.4	4.6 / 10.1	4.7 / 10.4
Electrical Parameters			
Voltage	88 to 264 Volts, 47 to 63 Hz, auto sensing		
Power	40W	45W	60W
EMC	CE Compliance		
Environmental Parameters			
Temperature	41 to 113 ℉ / -10 to 50 ℃		
Humidity	20% to 90% RH non-condensing (40 ℃ / 104 ℉)		
PC Connections			
OS	Microsoft Windows XP / 7		
Interface	USB 2.0		

I / O Specifications

Output

Output Channels	1 Drive and 1 COLA (VT-9002 without COLA)
Output Connectors	BNC
Voltage Range	±10 V_{PEAK}
Resolution	24-bit DAC
Output Impedance	30 Ω
Output load	Max.30 mA $_{PEAK}$
Dynamic Range	100 dB
Reconstruction Filter	160 dB / Oct digital and analog filters
Amplitude accuracy	0.1 % (@1 kHz, 1 V_{input})
Frequency accuracy	0.001 %
Harmonic Distortion	<-95 dB (@1 kHz, Fifth harmonic)

Input

Input Channels	2 to 16
Input Connectors	BNC
Input Range	± 10 V_{PEAK}
Max. input	± 36 V_{PEAK}
Resolution	24-bit ADC
Input Impedance	220 kΩ
Dynamic Range	110 dB
Anti-aliasing Filter	Analog Anti-aliasing Filter and digital filter, Stop band attenuation greater than160 dB / Oct
Coupling	AC, DC, IEPE, TEDS (optional), charge(VT-9002, VT-9008)
IEPE power supply	+24 V / +4 mA
Amplitude accuracy	0.5 % (@1 kHz, 1 V_{input})
Frequency Accuracy	0.001 %
Harmonic Distortion	< -100dB (@1 kHz, Fifth harmonic)
Channel match	
Amplitude	±0.05 dB (DC ~ 20 kHz)
Phase	±0.5 Degree (DC ~ 20 kHz)
SNR	100 dB (@1 kHz, 1 V_{input}) typical
Channel Crosstalk	< -105dB

System Applications

VT-9002

Random

Sine

Shock

RSTD

VT-9008 and VT-9016

Random

Sine

Shock

Resonance Search Track & Dwell (RSTD)

Sine on Random (SoR)

Random on Random (RoR)

Sine and Random on Random (SRoR)

Shock Response Spectrum (SRS)

Transient Time History (TTH)

Long Time History for Road Simulation (LTH)

Vibro-Shock

Other applications (optional)

Waveform Editor

Channel Limit Spectrum Control

COLA Output

Multi-channel Control

Kurtosis Control（Random / ROR)

Step Test（Sine / RSTD)

Harmonic Distortion Detection (Sine / RSTD)

SRS Analysis (Shock / TTH)

Higher Analysis Frequency of Random Test (Up to 18.75 kHz, SOR and ROR up to 9375 Hz)

Higher Analysis Lines of Random Test (Up to 6400 Lines)

Higher Frequency of Sine Test (Sine / RSTD Up to 10 kHz)

Lower Frequency of Sine Test (Sine / RSTD Low to 0.01Hz)

Digital I/O interface

Automatically Obtain TEDS Information

Self-calibration

Offline View

MATLAB Interface

Random

Control Methods

Control loop	PSD control method of Gaussian random signal, patented adaptive control algorithm with frequency response equalization and updating. System can accurately and quickly compensate for non-linear and time varying changes in the dynamic load.
Drive signal	Continuous Gaussian random signal

Performance

Dynamic Range	> 90 dB
Control accuracy	Within ±1 dB
Loop time	Equal to the linear average of the frame time, typical 100 ms
Security Checks	Each frame

Parameters

Frequency ranges	DC to 4680 Hz, up to 18750 Hz
Frequency resolution	100, 200, 400, 800, 1600, 3200, up to 6400 lines
Control strategy	Single channel control, multi-channel control (Weighted Average, Minimum, Maximum)
Degrees of freedom	4 to 1200
Drive clipping	2 to 6 Sigma
FRF	Obtain from pre-test or import the pre-stored FRF

Random

Profiles

Breakpoint	Breakpoint table with unlimited combination of PSD levels with slope (dB / octave) at user-defined frequencies
Calculation	Auto-calculates the value of crossover frequency, auto-check the validity of defined Breakpoint
Alarm/Abort	High and low profile limits specified at each breakpoint in dB with respect to reference. RMS high and low limits calculated automatically from profile or defined by user Auto-calculated or manual set
Profile view	Profile graphics are shown and updated after created. Automatic listing of RMS acceleration and displacement values for profile. Profile operating levels are compared to the shaker parameter table

Commands

Control commands	Start, Stop, Pause, Continue
Level commands	Set Level, Increase Level, Decrease Level, Resume Schedule Level
Process commands	Next Event, Next Profile
Other commands	Start/Stop Preview, Open/Close Control Loop, Enable/Disable Abort Check, Continue/Pause Schedule Clock

Schedule

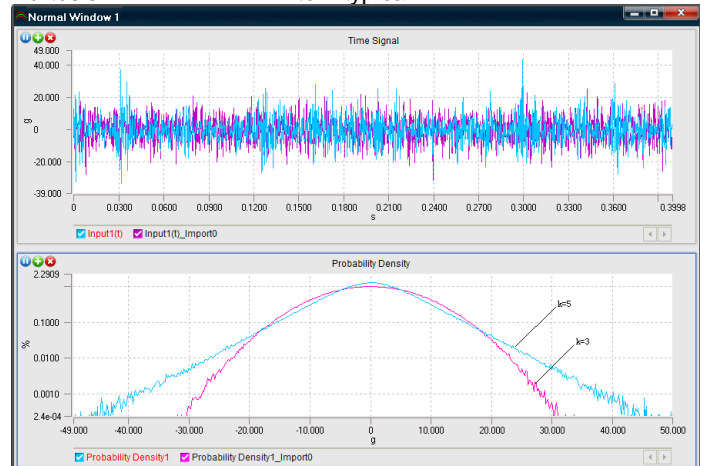|	
Level Test	Set Level and time
Start/End Loop	Set Loop time and Loop Start/Stop
Abort Check	Enable and Disable Abort Check
Loop Control	Open/Close Loop
Pause	Set the condition of Continue
Test Report	Automatically generate reports based on user-defined
Save	Auto-save Pane, Screen, or Signals
Run Flow Chart	Support up to 6 Profiles

Safety

Shaker Limit	Max. Acceleration, Velocity, Displacement and Force limit
Channel Limit	Notching, RMS limit
RMS Abort	Each channel can set abort value
Input channel	Auto-check Open-loop and Overload
Over-limit Check	Line Alarm/Abort check, Line Alarm/Abort ratio range: 0 to 100%
Drive Limit	User-defined Drive Limit Voltage
Abort Rate	User-defined
Abort	User Stop command, Abort button

New Features

Kurtosis control (optional)

Adjust random signal amplitude distribution, support for super-Gaussian or sub-Gaussian stochastic control.
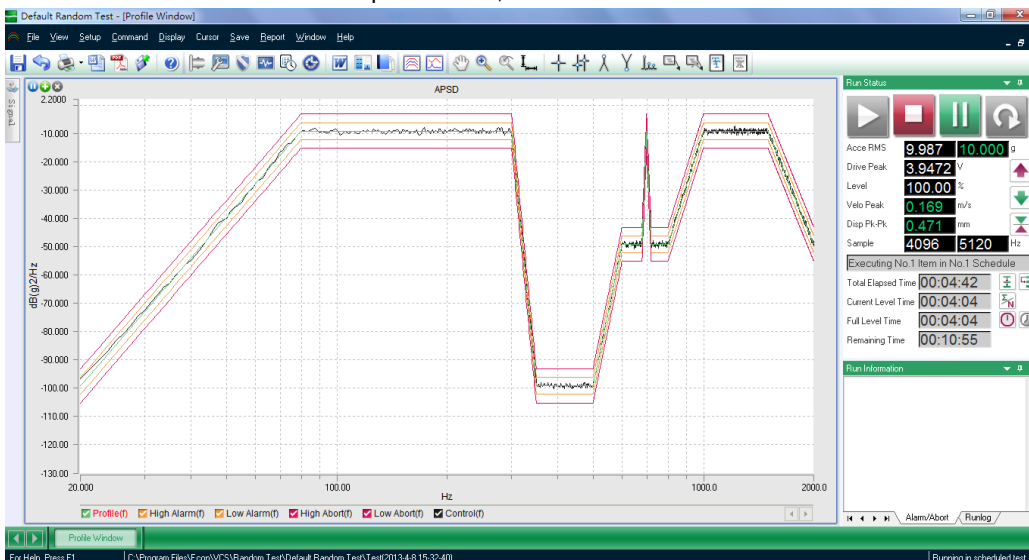
Kurtosis   2 to 7 typical

Channel RMS Abort

Each channel can set RMS Abort value to protect the article.

Sine on Random

Test Parameters
Parameters of the Sine on Random are the same with Random.

Frequency ranges	0 to 4680 Hz (DC), up to 9375 Hz
Frequency resolution	400, 800, 1600, 3200
Drive signal	Continuous Gaussian random signal plus Sine Tone

Schedule

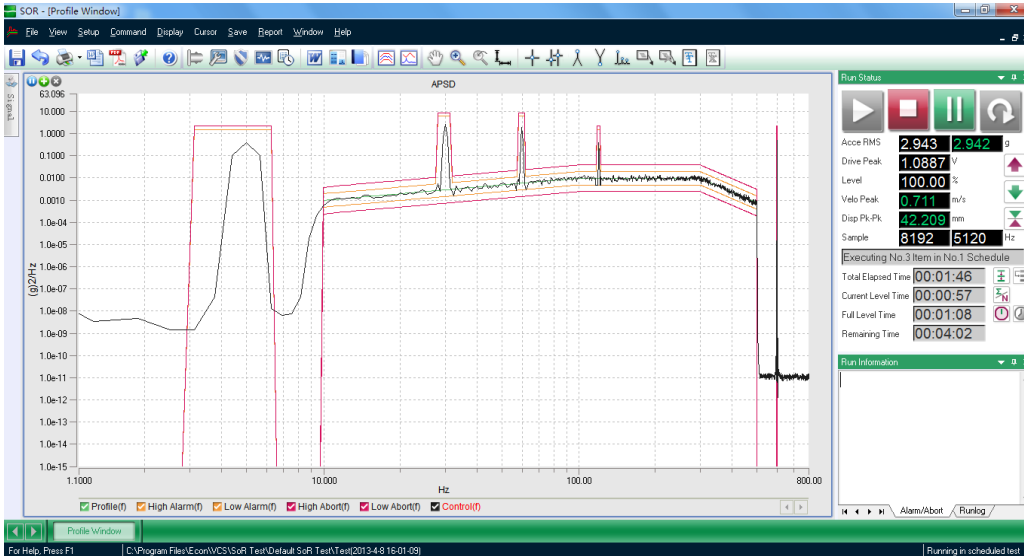|	
Sine Signal	up to 12, each one is independent and can be turned on / off
Random Broadband	Can be turned on / off

Safety

Shaker Limit	Max. Acceleration, Velocity, Displacement and Force limit
Channel Limit	Notching, user defined profile

Sine Tone

Type	Dwell, Sweep, up to 12 sine signals
Level	Constant A, V, D or user-defined profile
Frequency ranges	Frequency of Sweep and Dwell can be defined within the defined Max. frequency
Sweep Mode	Linear or Log
Sweep Direction	Up / Down
Burst	On / Off, user defined time
Alarm/Abort	Specified in dB with respect to reference
Harmonic Sweep	Other Sine signal' frequency are integer multiples of Sine signal No.1

New Features
Within defined Max. Frequency, Sine Tone's frequency can beyond Random Broadband.

Random on Random

Test Parameters
Parameters of the Random on Random are the same with Random.

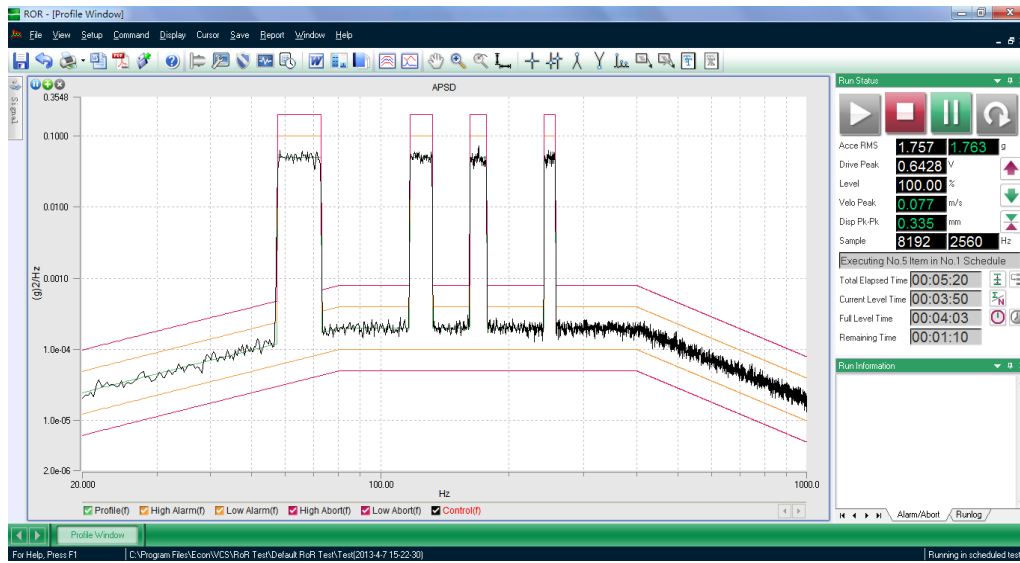|	
Frequency ranges	0 to 4680 Hz (DC), up to 9375 Hz
Frequency resolution	400, 800, 1600, 3200
Drive signal	Continuous Gaussian random signal plus Narrowbands

Schedule

Narrowband	up to 12, each one is independent and can be turned on / off
Broadband Random	Can be turned on / off

Safety

Shaker Limit	Max. Acceleration, Velocity, Displacement and Force limit
Channel Limit	Notching or RMS Limit

Narrowbands

Type	Dwell, Sweep
Level	Constant APSD or user-defined profile
Frequency ranges	Frequency of Sweep and Dwell can be defined within the Broadband's Frequency
Bandwidth	User defined
Sweep Mode	Linear or Log
Sweep Direction	Up/Down
Alarm/Abort	Specified in dB with respect to reference
Harmonic Sweep	Other Narrowbands' frequency are integer multiples of Narrowband No.1
Summation	Sum or The Maximal Value

Sine and Random on Random

Test Parameters
Parameters of the Sine and Random on Random are the same with Random.

Frequency ranges	0 to 4680 Hz (DC), up to 9375 Hz
Frequency resolution	400, 800, 1600, 3200
Drive signal	Continuous Gaussian random signal plus Sine Tone and Narrowbands

Schedule

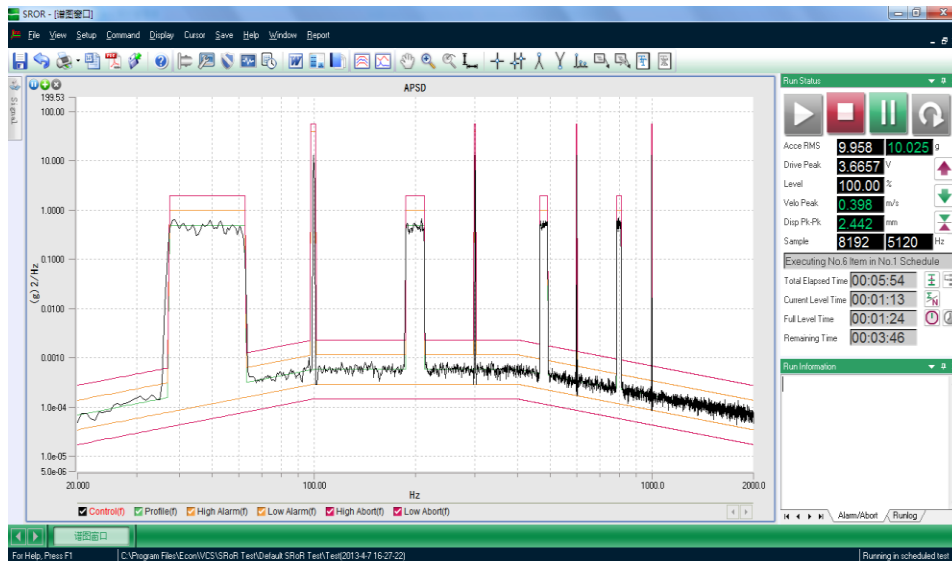|	
Sine Tone	up to 12, each one is independent and can be turned on / off
Narrowband	up to 12, each one is independent and can be turned on / off
Broadband Random	Can be turned on / off

Safety

Shaker Limit	Max. Acceleration, Velocity, Displacement and Force limit
Channel Limit	Notching

Sine Tone
The same with Sine on Random.

Narrowbands
The same with Random on Random.

Sine

Control Methods

Control method	Sine waveform amplitude control, adaptive control based on sine signal amplitude updating, can accurately and quickly compensate for non-linear and time varying changes in the dynamic load.
Drive	Analog sine signal

Control Performance

Dynamic Range	> 95 dB
Control accuracy	Within ±1 dB
Loop time	5ms typically
Frequency accuracy	0.01%

Control Parameters

Frequency ranges	1 Hz to 5000 Hz, up to10000Hz, Low frequency extension to 0.01Hz
Frequency resolution	512, 1024, 2048, 4096 lines
Control strategy	Single channel control, multi-channel control (Weighted Average, Minimum, Maximum)
Sweep Mode	Linear/Log
Tracking filters	Proportional Bandwidth (7 to 100%) or Fixed Bandwidth
Box Tolerance	Threshold and Alarm / Abort Width can be defined
THD	Calculate total harmonic distortion between analysis frequency, and the order of the THD can be defined (optional)

Profile

Breakpoint	Breakpoint table with unlimited combination of A, V, D levels with slope (dB / octave) at user defined frequencies
Calculated	Auto-calculates the value of crossover frequency, auto-check the validity of defined Breakpoint
Alarm / Abort	High and low profile limits specified at each breakpoint in dB with respect to reference.
Profile view	Profile graphics are shown and updated after created. Automatic listing of RMS acceleration and displacement values for profile. Profile operating levels are compared to the shaker parameter table
Compression rate	Define different compression rate for different frequency bands
Sweep rate	Define different sweep rate for different frequency bands

COLA output

Waveform Type	Constant amplitude sine or DC amplitude variation with frequency

Commands

Control commands	Start, Stop, Pause, Continue
Level commands	Set Level, Increase Level, Decrease Level, Resume Schedule Level
Frequency command	Set frequency
Sweep commands	Up/Down/Hold/Release, Set Sweep Rate, Resume Schedule Sweep Rate, Set Compress Rate, Resume Schedule Compress Rate
Process commands	Next Event, Next Profile
Other commands	Start/Stop Preview, Open/Close Control Loop, Enable/Disable Abort Check, Continue/Pause Schedule Clock

Schedule

Sweep Event	Set Level, Frequency, Sweep rate, Compression rate, Sweep Direction and time
Resume Sweep	Follow previous Sweep Event, Level, Low/High Frequency, Sweep rate, Compression rate, and time can be defined
Step Test	Step sine dwell, the Step Size can be Linear/Log defined, and Sine turned on/off time also can be defined
Dwell	Set Level, Frequency, Compression rate, and time
Resume Dwell	Follow previous Dwell event, Level, Compression rate, and time can be defined
Start/End Loop	Set Loop time and Loop Start/Stop
Abort Check	Enable and Disable Abort Check
Loop Control	Open/Close Loop
Pause	Set the condition of Continue
Test Report	Automatically generate reports based on user-defined
Save	Auto-save Pane, Screen, or Signals
Run Flow Chart	Support up to 6 Profiles

Safety

|	
Shaker Limit	Max. Acceleration, Velocity, Displacement and Force limit
Channel Limit	Notching, user defined profile
Peak Abort	Each channel can set abort value
Input channel	Auto-check Open-loop and Overload
Over-limit Check	Line Alarm/Abort check, Line Alarm/Abort ratio range: 0 to 100%
Drive Limit	User-defined Drive Limit Voltage
Abort Rate	User-defined
Abort	User Stop command, Abort button

New Features

THD(Optional)	User-defined harmonic order between 1 to 20 or all harmonics
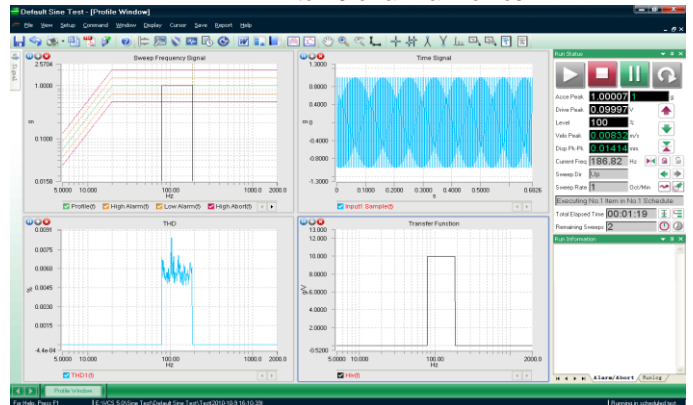
Step Sine(Option)	The Step Size can be Linear/Log defined, and Sine turned on/off time also can be defined

Sine

New Features
Improved timing   Time, Sweeps, Cycles

Box-Tolerance   Allow you to modify the tolerance bands near a discontinuity segment that defined in Profile

Full-band defined Compression Ratio and Sweep Rate

Peak Abort   Each channel can set abort value

Resonance Search Track & Dwell (RSTD)

Test Parameters
Parameters of the RSTD are the same with Sine.

Resonance Search

Search object	Transfer function between a pair of input channels or between input channel and control signal
Search range	Between user-defined Low Frequency and High Frequency
Sweep Mode	Linear / Log
Resonance identify	Based on Q (Quality factor) value or Amplitude Ratio of Transfer function

Signal Display

Curve display	Amplitude-frequency curve and Phase-frequency curve of transfer function
RSTD Note	Record RSTD information
RSTD Window	Dwell table list the resonance point's frequency, Amplitude, Phase, Q value, Planned Dwell time and Dwell duration

Dwell

Search Mode	Dwell when Search for a resonant frequency or Dwell after finished Search
Dwell Mode	Frequency Locked Dwell/Resonance Track Dwell/Phase Track Dwell
Stop Dwell Conditions	Dwell Time, Dwell Sine Cycles, Amplitude Ratio Changing (dB), Resonant Frequency Changing, Phase Difference (Degree)
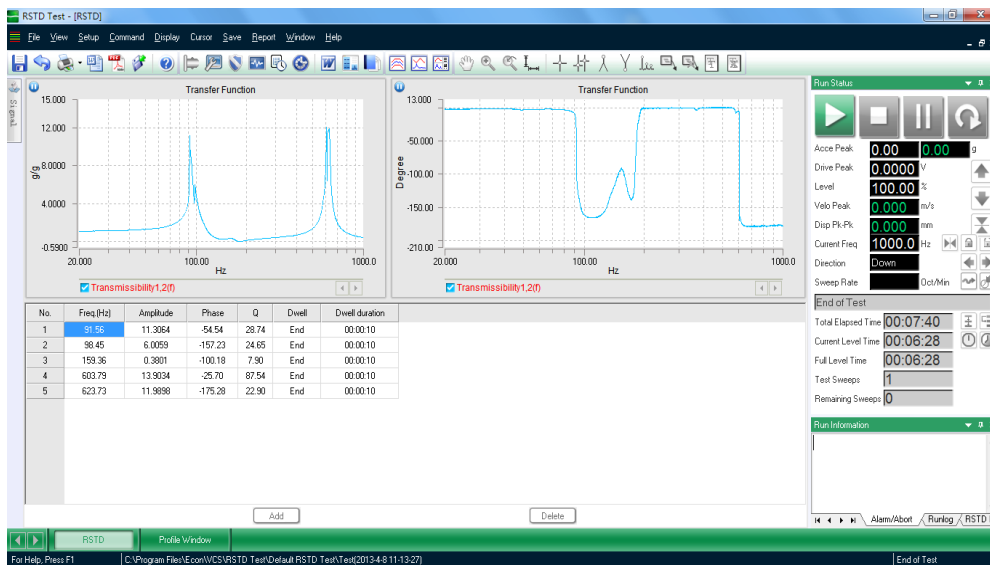
Classical Shock

Control Parameters

Pulse Interval	Define the time interval between two pulses
Average Number	1 to 10
Low-pass Filter	User-defined Cutoff Frequency
FRF	Obtain from pre-test or import the pre-stored FRF
Block Size	256 to 16384

Profile

Pulse Types	Half Sine, Initial Peak Saw-tooth, Final Peak Saw-tooth, Triangular, Rectangular, Trapezoid, Haversine
Pulse Duration	0.5ms to 3,000ms
Pulse Amplitude	User-defined
Test Standard	MIL-STD-810, ISO, User-defined

Pulse Compensation

Pulse Compensation	Pre- and post-pulse, post-pulse only or pre-pulse only; single or double sides for minimum acceleration and fully use of shaker stroke
Pre- and Post- Amp.	specified in % with respect to reference

Commands

Control commands	Start, Stop, Pause, Continue
Level commands	Set Level, Increase Level, Decrease Level, Resume Schedule Level
Pulse commands	Single/Positive/Negative Pulse
Process command	Next Event
Other commands	Open/Close Control Loop, Enable/Disable Abort Check, Auto/Manual Mode

Schedule

Level Test	Set Level and Pulses
Start/End Loop	Set Loop time and Loop Start/Stop
Abort Check	Enable and Disable Abort Check
Loop Control	Open/Close Loop
Reverse Pulse	Invert Pulse in shape
Run Mode	Auto/Manual Mode
Test Report	Automatically generate reports based on user-defined
Save	Auto-save Pane, Screen, or Signals

Safety

Shaker Limit	Max. Acceleration, Velocity, Displacement and Force limit
RMS Abort	Each channel can set abort value
Input channel	Auto-check Open-loop and Overload
Over-limit Check	Line Alarm/Abort check, Point Alarm/Abort ratio range: 0 to 100%
Drive Limit	User-defined Drive Limit Voltage
Abort Rate	User-defined
Abort	User Stop command, Abort button

New Features

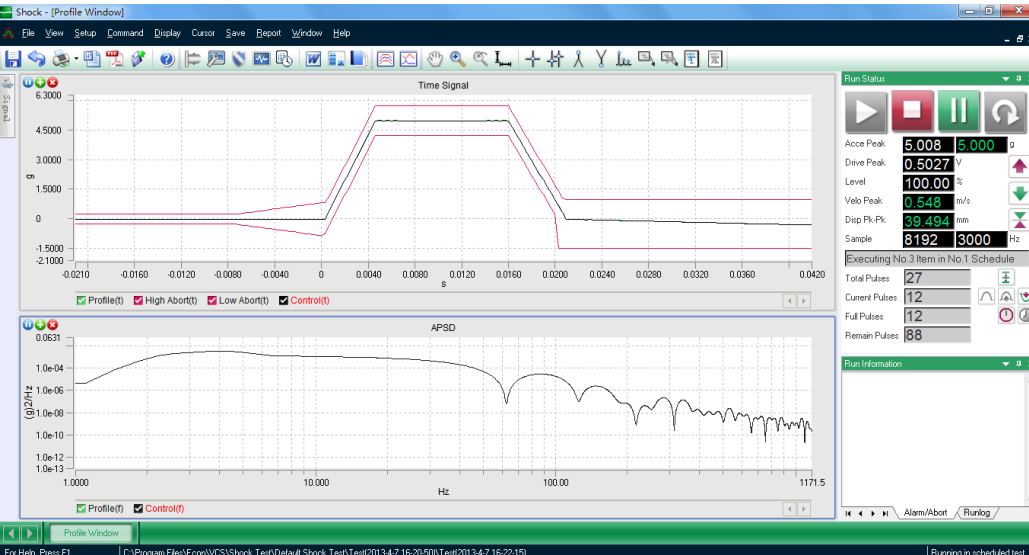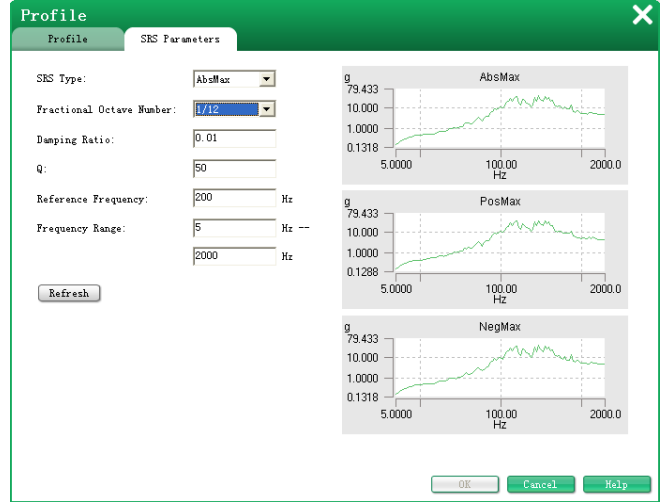### SRS Analysis (optional)

SRS Type	Max. Absolute, Max. Positive, Max. Negative
Frequency Range	User defined Frequency Range and Reference Frequency
Fractional Octave	1/1, 1/3, 1/6, 1/12, 1/24, 1/48
Q Value	User-defined, relate with Damping Ratio
Damping Ratio	User-defined, relate with Q Value

Shock Response Spectrum

Control Parameters

Pulse Interval	Define the time interval between two pulses
Average Number	1 to 10
FRF	Obtain from pre-test or import the pre-stored FRF
Block Size	Up to 16384
Sampling Frequency	up to 48000 Hz

Profile

Break point	Breakpoint table with unlimited combination of Acceleration levels with slope (dB/octave) at user defined frequencies
Calculated	Auto-calculates the value of crossover frequency, auto-check the validity of defined Break point
Alarm/Abort	High and low profile limits specified at each breakpoint in dB with respect to reference.
Profile view	Profile graphics shown and updated as profile is created. Automatic listing of RMS acceleration and displacement values for profile. Profile operating levels are compared to the shaker parameter table

Analysis Parameters

SRS Type	Max. Absolute, Max. Positive, Max. Negative
Fractional Octave	1/1, 1/3, 1/6, 1/12, 1/24, 1/48
Damping Ratio	0.001 to 0.999999
Pulse Compensation	DC Remove, High Pass Filter

Waveform Synthesis

|	
Wavelet Window	Sine, Exponential, Hanning, Rectangle
Reduce Factor	1, 2, 4, 8, 12
Synthesis Type	Auto, User Defined Duration
Wavelet Parameters	Frequency, Amplitude, Delay, Half Cycles, Demand Amplitude, Synthesized Amplitude
Wavelet Optimize	One Step, Auto Optimize
Signal View	Profile, SRS, Error, Acceleration, Velocity, Displacement

Commands

Control commands	Start, Stop, Pause, Continue
Level commands	Set Level, Increase Level, Decrease Level, Resume Schedule Level
Pulse command	Single Pulse
Process command	Next Event
Other commands	Open/Close Control Loop, Enable/Disable Abort Check, Auto/Manual Mode

Schedule

Level Test	Set Level and Pulses
Start/End Loop	Set Loop time and Loop Start/Stop
Abort Check	Enable and Disable Abort Check
Loop Control	Open/Close Loop
Run Mode	Auto/Manual Mode
Test Report	Automatically generate reports based on user-defined
Save	Auto-save Pane, Screen, or Signals

Safety

Shaker Limit	Max. Acceleration, Velocity, Displacement and Force limit
RMS Abort	Each channel can set abort value
Input channel	Auto-check Open-loop and Overload
Over-limit Check	Line Alarm/Abort check, Point Alarm/Abort ratio range: 0 to 100%
Drive Limit	User-defined Drive Limit Voltage
Abort Rate	User-defined
Abort	User Stop command, Abort button
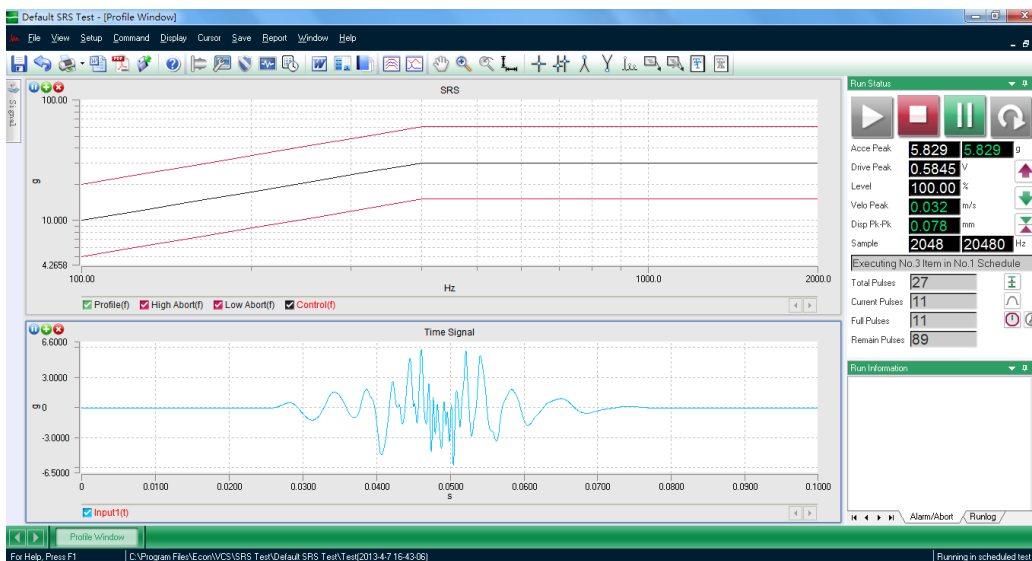
Transient Time History

Control Parameters

Pulse Interval	Define the time interval between two pulses
Average Number	1 to 10
Low-pass Filter	User-defined Cutoff Frequency
FRF	Obtain from pre-test or import the pre-stored FRF
Block Size	Up to 16384

Profile

Profile waveforms	Sine, Beat, Chirp, White Noise, Test Data
Pre-stored Data	Bellcore1, Bellcore2, Bellcore3
Import data format	Support Binary, txt, UFF, Excel, Waveform Editor generated road data files (. cps)
Re-Sampling	Sampling frequency up to 48 kHz
Modify Data	Modify scale factor to adjust the amplitude or modify polarity of the waveform, or modify some of the data points values, or waveform interception
Window	Hanning, ant the Front/Back Length can be defined
Pulse Compensation	DC Remove, High Pass Filter
Abort Limit	High / Low Abort Limit specified in acceleration
Profile view	Profile graphics are shown and updated after created. Automatic listing of acceleration velocity and displacement values for profile. Profile operating levels are compared to the shaker parameter table

Commands

Control commands	Start, Stop, Pause, Continue
Level commands	Set Level, Increase Level, Decrease Level, Resume Schedule Level
Pulse commands	Single/Positive/Negative Pulse
Process command	Next Event
Other commands	Open/Close Control Loop, Enable/Disable Abort Check, Auto/Manual Mode

Schedule

Level Test	Set Level and Pulses
Start/End Loop	Set Loop time and Loop Start/Stop
Abort Check	Enable and Disable Abort Check
Loop Control	Open/Close Loop
Reverse Pulse	Invert Pulse in shape
Run Mode	Auto/Manual Mode
Test Report	Automatically generate reports based on user definition
Save	Auto-save Pane, Screen, or Signals

Safety

Shaker Limit	Max. Acceleration, Velocity, Displacement and Force limit
RMS Abort	Each channel can set abort value
Input channel	Auto-check Open-loop and Overload
Over-limit Check	Line Alarm/Abort check, Point Alarm/Abort ratio range: 0 to 100%
Drive Limit	User-defined Drive Limit Voltage
Abort Rate	User-defined
Abort	User Stop command, Abort button

New Features
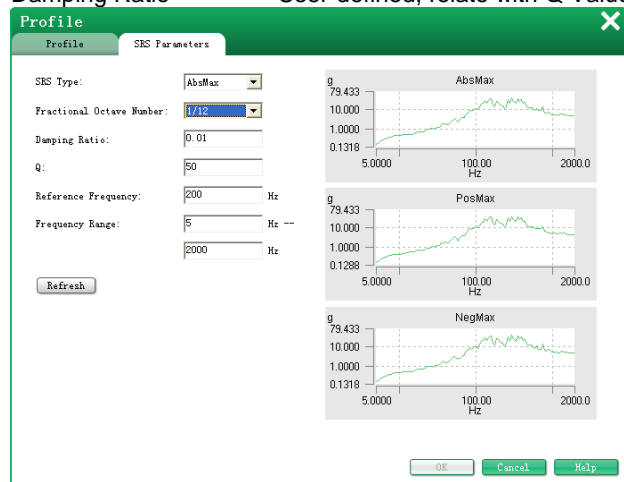
SRS Analysis (optional)

|	
SRS Type	Max. Absolute, Max. Positive, Max. Negative
Frequency Range	User defined Frequency Range and Reference Frequency
Fractional Octave	1/1, 1/3, 1/6, 1/12, 1/24, 1/48
Q Value	User-defined, relate with Damping Ratio
Damping Ratio	User-defined, relate with Q Value

Beat waveform

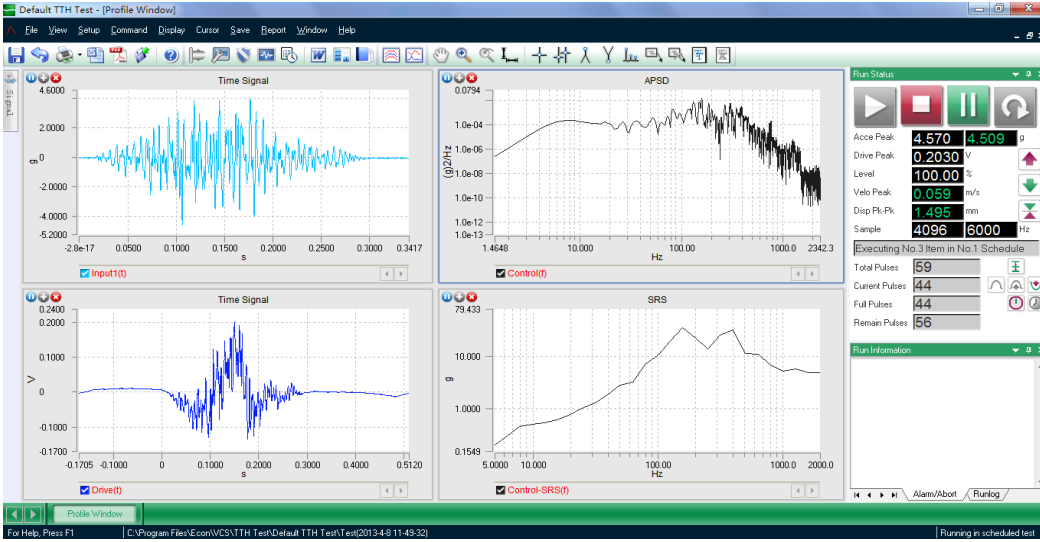|	
Wave Parameters	Peak Value, Sampling Frequency, Frequency, Cycles per Beat, Beats and Interval can be defined
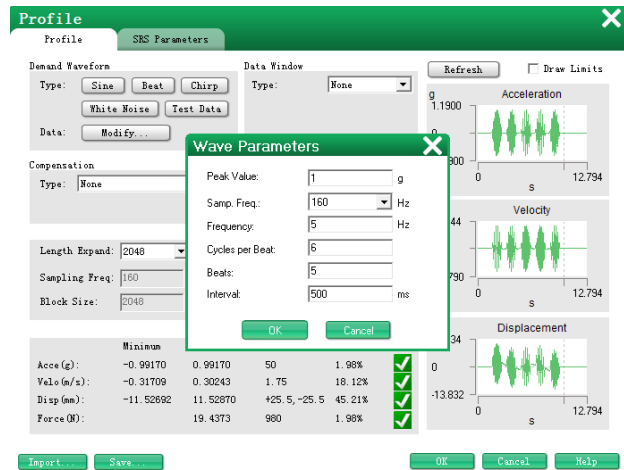
Transient Time History

Long Time History for Load

Control Methods

Equalization method	Low level random equalize transfer function

Control Performance

Control strategy	Single channel control, multi-channel control (optional)
FRF	Obtain from pre-test or import the pre-stored FRF
FRF Update Ratio	0 to 0.5

Pre-test Profile

Break point	Breakpoint table with unlimited combination of APSD levels with slope (dB/octave) at user defined frequencies
Calculated	Auto-calculates the value of crossover frequency, auto-check the validity of defined Break point

Profile

|	
Data sources	Waveform Editor generated road data files (. cps)
Modify Data	Modify scale factor to adjust the amplitude or modify polarity of the waveform
Abort Limit	High/Low Abort Limit specified in acceleration
Frame Size	1024, 2048, 4096
Duration	From tens of milliseconds to several tens of hours, the longest time is related to sampling parameters

Command

Control command	Start, Stop, Pause, Continue
Level command	Set Level, Increase Level, Decrease Level, Resume Schedule Level
Process command	Next Event, Next Profile
Other command	Set FRF Update Ratio, Open/Close Control Loop, Enable/Disable Abort Check

Schedule

Level Test	Set Level
Start/End Loop	Set Loop time and Loop Start/Stop
Abort Check	Enable and Disable Abort Check
Loop Control	Open/Close Loop
Test Report	Automatically generate reports based on user-defined
Save	Auto-save Pane, Screen, or Signals
Run Flow Chart	Support up to 6 Profiles

Safety

Shaker Limit	Max. Acceleration, Velocity, Displacement and Force limit
RMS Abort	Each channel can set abort value
Input channel	Auto-check Open-loop and Overload
Over-limit Check	Line Alarm/Abort check, Line Alarm/Abort ratio range: 0 to 100%
Drive Limit	User-defined Drive Limit Voltage
Abort Rate	User-defined
Abort	User Stop command, Abort button
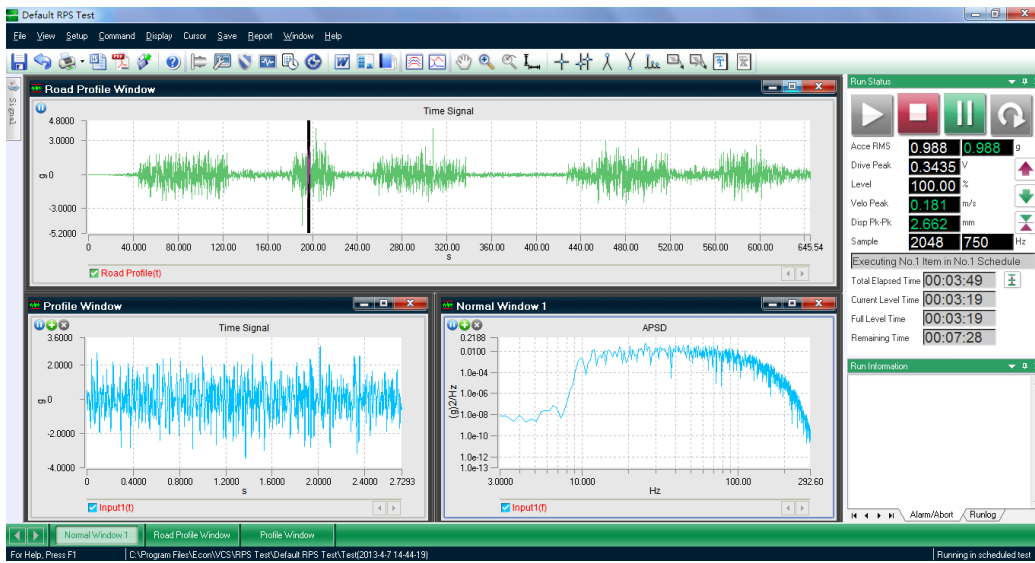
Vibro-Shock

Control Methods

Control loop — PSD control method of Gaussian random signal, patented adaptive control algorithm with frequency response equalization and updating. Open-loop control of Random time domain signal cut-off by defined Shock Shape(full test)

Drive signal — Continuous Gaussian random time domain signal Cut-off by defined Shock Shape

Control Parameters

Pulse Interval — Define the time interval between two pulses

Control strategy — Single channel control, multi-channel control (Weighted Average, Minimum, Maximum)

FRF — Obtain from pre-test or import the pre-stored FRF

Frequency ranges — 0 to 4680 Hz (DC), up to 18750 Hz

Frequency resolution — 100, 200, 400, 800, 1600, 3200, up to 6400 lines

Degrees of freedom — 4 to 1200

Drive clipping — 2 to 6 Sigma

Block Size — 256 to 16384

Control Performance

Dynamic Range — > 90 dB

Security Checks — Each frame

Profile

Breakpoint — Breakpoint table with unlimited combination of PSD levels with slope (dB / octave) at user defined frequencies

Calculation — Auto-calculates the value of crossover frequency, auto-check the validity of defined Break point

Alarm / Abort — High and low profile limits specified at each breakpoint in dB with respect to reference. RMS high and low limits calculated automatically from profile or defined by user Auto-calculated or manual set

Profile view — Profile graphics are shown and updated after created. Automatic listing of RMS acceleration and displacement values for profile. Profile operating levels are compared to the shaker parameter table

Commands

Control commands — Start, Stop, Pause, Continue

Level commands — Set Level, Increase Level, Decrease Level, Resume Schedule Level

Process command — Next Event

Other commands — Enable/Disable Abort Check, Reset Averaging

Schedule

Level Test — Set Level and time

Start/End Loop — Set Loop time and Loop Start/Stop

Abort Check — Enable and Disable Abort Check

Test Report — Automatically generate reports based on user-defined

Save — Auto-save Pane, Screen, or Signals

Shape Profile

Calculation — Cut-off random time domain signal based on time setting to control the output

Slope — Linear/Log

History Signal

Block size — 2048, 4096, 8192, 16384, 32768

Resolutions — 8 to 128

Oscilloscope Points — 128, 256, 512, 1024, 2048, 4096

Safety

Shaker Limit — Max. Acceleration, Velocity, Displacement and Force limit

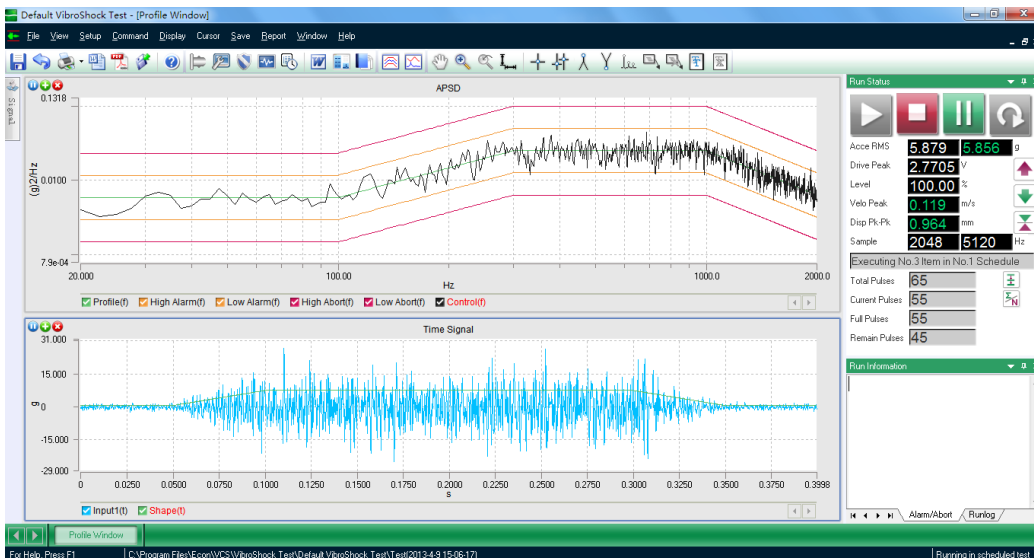RMS Abort — Each channel can set abort value

Input channel — Auto-check Open-loop and Overload

Over-limit Check — Line Alarm/Abort check, Line Alarm/Abort ratio range: 0 to 100%

Drive Limit — User-defined Drive Limit Voltage

Abort Rate — User-defined

Abort — User Stop command, Abort button

Other Applications

Waveform Editor

|	
Waveform Type	Sine, White Noise, Chirp, Band-Limited Random or import data
Import data format	txt, UFF, csv files, ECON data records (. dar), road profile file (. cps)
Digital resampling	20Hz to 48000Hz
Limiting parameters	The Max. Positive and Negative Displacement, Max. Velocity, Max. Acceleration
Resolution	200,400,800,1600
Data Splice	Overlapping, Data Window
Compensation	Acceleration DC remove, Velocity DC remove, High Pass Filter, Low Pass Filter
Amplitude Adjustment	Modify scale factor to adjust the amplitude or modify polarity of the waveform
Editing method	Copy, Paste, Delete, Undo

Channel Limit Spectrum Control (optional)

Including RMS limit and Notching to protect article.
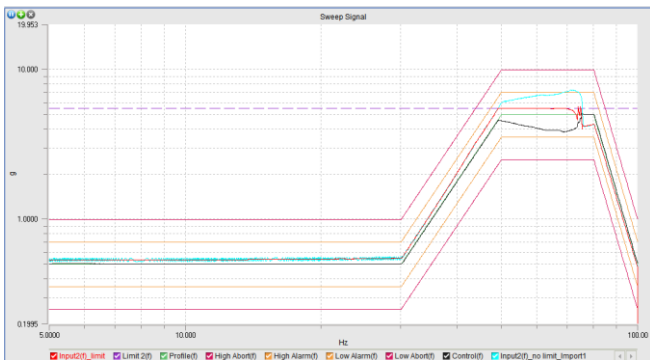
Preview

Preview test is an effective tool for system detection. Controller only does data acquisition and not output waveform. You can observe the input signal to determine the system characteristics.
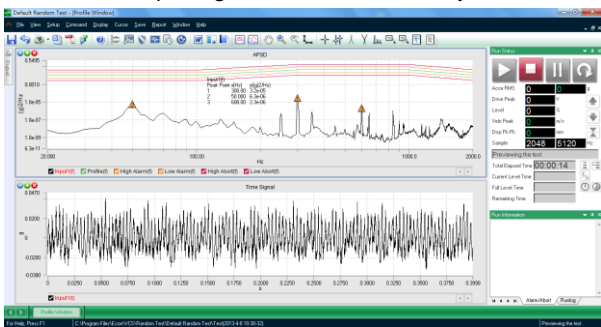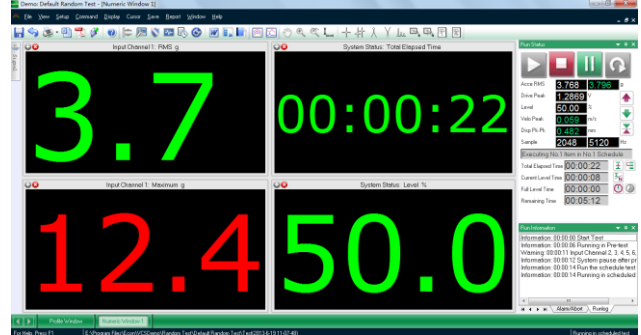

Data Display

Provides many kinds of windows to display different signals and each window can display multiple signals. Also, provides line cursor, band cursor, peak cursor, valley cursor and harmonic cursor to read signal values.
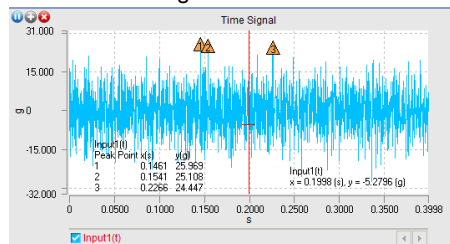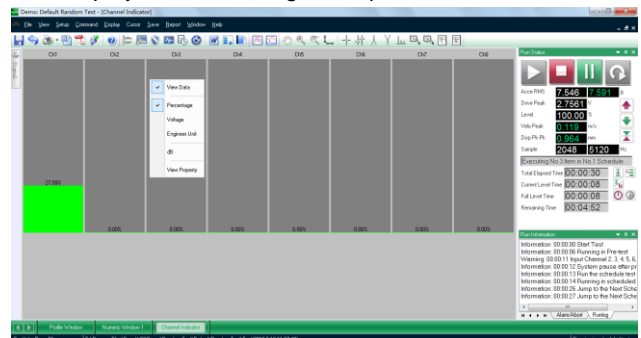

Value Display Window

Can display either channel characteristic values or system status.
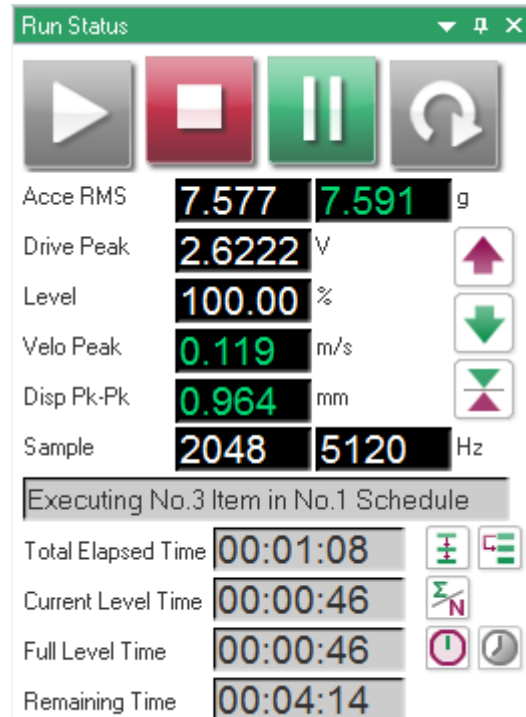

Channel Indicator Window

Can display channel voltage occupation.

Status Display

Real-time display test and operating states include control and demand acceleration RMS value (peak value), the Drive Voltage peak value, the Current Level, velocity Peak value, Displacement peak-peak value, etc.
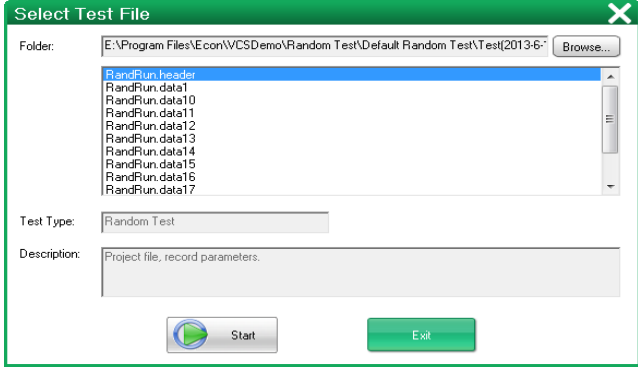
Other Applications

Save Setting

Auto/Manual/Schedule Save Signal, Pane, Screens and Offline data. Data format including Binary, txt and so on. Data can also export to other software freely, such as Excel.

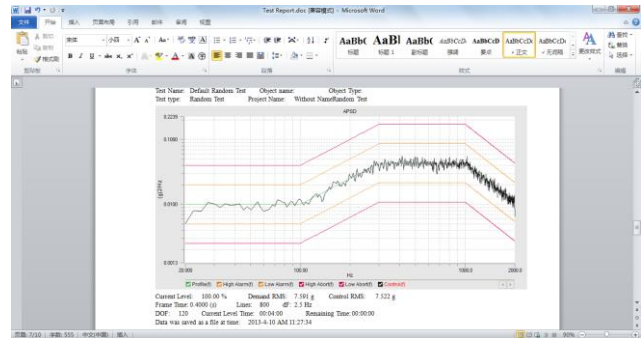### Offline View

To save test data when testing and playback then like a snapshot frame.

Test Report

Automatically generate test reports in Word or PDF format, or you can preview the report and print reports directly.

MATLAB Interface

Provides tools for importing data into the MATLAB software which superb engineering computation and numerical analysis functions are available.

Ordering Guide

WWW.FRANKBACON.COM

UCON Vibration Controller Hardware

Item	Part No.	Description
1	VT-9002-1	**1 Channel UCON Controller**
2	VT-9002-2	**2 Channel UCON Controller**
3	VT-9008-2	**2 Channel UCON Controller**
4	VT-9008-4	**4 Channel UCON Controller**
5	VT-9008-8	**8 Channel UCON Controller**
6	VT-9016-10	**10 Channel UCON Controller**
7	VT-9016-12	**12 Channel UCON Controller**
8	VT-9016-16	**16 Channel UCON Controller**
9	VT-90EX01	**Enable one extra analog input channel** to existing controller
10	VT-90EX02	**Enable one extra analog input channel** to existing controller
11	VT-90EX03	**Emergency Stop Switch** with 10 meters cable.
12	ACC-9000	**Accessories** (1 pcs/copy for each system)

UCON Vibration Controller Application Software

1	9801	**Random Control**
2	9801-01	**Random frequency extension to 18,750 Hz**
3	9801-02	**Random higher resolution lines extension to 6,400 lines**
4	9801-03	**Kurtosis Control**
5	9801-04	**Sine on Random Control**
6	9801-05	**Random on Random Control**
7	9801-06	**Sine and Random on Random Control**
8	9802	**Sine Control**
9	9802-01	**Step Sine Control**
10	9802-02	**Resonance Search, Track and Dwell Control (RSTD)**
11	9802-03	**Sine Frequency Extension low to 0.01 Hz**
12	9802-04	**Sine Frequency Extension high to 10,000 Hz**
13	9802-05	**THD Detection**
14	9803	**Classical Shock Control**
15	9804	**Shock Response Spectrum Control**
16	9805	**Transient Time History Control (FDR-TTH)**
17	9805-01	**Shock Response Spectrum Analysis**
18	9806	**Road Simulation Control (FDR-LTH)**
19	9807	**Vibro-shock Control**

About Us

ECON is a leading designer and manufacturer of instruments and equipment for test and measurement, headquartered in Hangzhou, China.

With more than 10 years experiences, ECON is a comprehensive solution supplier for Vibration Test, Vibration and Noise Measurement and Analysis, Structural Model Test, Transducer Calibration, and Environmental Reliability Test. Frank Bacon Machinery Sales Co. is a distributer for all ECON products

➢ Leading role in design and manufacturing of instrument and equipment for test and measurement in China

➢ A global sales and marketing network.

➢ Over 2,000 instruments installed worldwide: China-Mainland, Taiwan, Europe, USA, Russia, Mid-east, India, Korea, Japan······

➢ Customers among Aerospace, Aviation, Automotive, Electronics, IT & Computers, Packaging, transportation, Institutes and Universities···...

➢ 70 employees, with an experienced and innovative R&D Team.

➢ A subsidiary company specialized in environmental test service

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