



Random On Random simulates complex narrowband random on broadband random vibration environments. Narrow-bands may be swept or stationary. This vibration environment is typically seen in reciprocating equipment, repetitive impacts from tracked vehicles, and aircraft gunfire vibration.

Random is the seed for Random On Random. Your test is assured of true random control with patented Adaptive Control capability, which is enhanced, with the addition of narrowband generation.

The ability to switch the NB on/off as well as sweep in the frequency range, WITHOUT causing “holes” in the broadband, is vital to test accuracy.



FEATURES

- Up to 10 independent Narrow-bands on a broadband random
- Independent sweep profile for each narrowband (acceleration g^2/Hz vs. frequency breakpoints)
- Independent sweep rate and direction (up, down, stationary) for each narrowband
- Manual mode control of narrowband components (on/off, sweep rate, sweep direction)
- Test and level scheduling
- Powerful Adaptive Control permits the Lynx™ to adjust to non-linear conditions dynamically



Lynx™ Random On Random- Technical Specifications

Control Methods

Broadband control	Adaptive control algorithm controlling the shape of the drive spectrum and overall RMS level optimizes both control speed and stability
Narrowband control	Frequency domain level extraction, independent control for each narrowband with automatic adjustment for narrowband sweep and resolution
Drive signal generation	Digital drive signal generation from broadband and tone components, patented randomization algorithm for broadband and narrowband components

Input/Output

Input channels	4 to 16, dependent on hardware subsystem
Input/output dynamic range	>92 dB

Reference Spectrum

Broadband definition	Easily defined by up to 500 frequency break points/slopes
Frequency range	50, 80, 100, 200, 400, 500, 800, 1000, 2000, 4000, 5000 Hz
Frequency resolution	(Broadband) 100, 200, 400, 800 lines
Reference import	Import broadband reference profile from data file (SDD) or Universal File Format (UFF); cut and paste from spreadsheets
Narrowband definition	User-defined bandwidth, sweep profile, composition, sweep rate
Number	Up to 10 narrowbands
Sweep	Linear or log; user defined sweep start frequency, sweep end frequency and sweep rate; independent for each narrowband
Initial sweep direction	Up, down, or stationary
Linear sweep rate	0 to 30 Hz/sec
Log sweep rate	0 to 5 oct/min
Units	g-in/s-in; g-m/s-mm; m/s ² -m/s-mm

Control Parameters

Mode of operation	Manual, automatic, automatic only
Test duration	User defined, maximum 9999:59:59 (hhh:mm:ss)
Degrees of freedom	User defined, minimum 8. maximum 30000
Number of control channels	1 to all available channels
Multi-channel control strategy	Average

Startup Parameters

Initial test level	User-selectable, -99 dB to 0 dB
Time at initial level	Off, 0 to 99 control loops
Level increment	1 to 99 dB
Time to full level	0 to 100000 seconds

Test Automation Features

Level scheduling	User-defined level, time at level, transition time to reach the level
Pre-schedule time	User-defined time at full level prior to level schedule start
Test scheduling	User-defined sequence of independent tests can be scheduled to run automatically
Remote Communication Interface	Supported, enables integration with environmental chamber controllers
Print Automation	Ability to create reports automatically with customizable displays

Safety Features

Shaker limits	Pretest verification that broadband spectrum dynamic limits are within shaker operational limits (acceleration, velocity, displacement and voltage)
Loop check max. drive signal	User-selectable, 1 to 5000 mV RMS
Alarm/Abort RMS	RMS acceleration, specified in dB or absolute level

Alarm/Abort spectral lines	Number of lines, or percent of lines within user-specified range
Remote Communication Interface	Supported, enables integration with environmental chamber controllers
Print Automation	Ability to create reports Automatically with Customized
Alarm/Abort spectral lines	Number of lines, or percent of lines within user-specified range
Control signal loss	Standard (programmed abort when control signal drops to within 3 dB of measured noise floor), low, or off
Drive signal clipping	2 to 20 sigma
Startup/shutdown rates	Independently selectable, 0.1 dB/sec to 999 dB/sec
Channel Setup	
Channel type	Control, measurement, inactive
Sensitivity	0.01 to 9,999 mV/g or mV/(m/s ²) (EU for measurement channels)
ICP power	On/off
Coupling	AC or DC
Channel loop check	Enabled, disabled
Channel label	Up to 8 characters for each channel
Transducer serial number	Up to 10 characters for each channel
Transducer Database	Table Driven Archival Database
Control channel weighting	Individuality defined, -20 to 6 dB
RMS abort	Individually defined, 0 to 999 grms or (m/s ²)rms
Base Engineering Units	Label (EU), Conversion (EU/Transducer Units)
Engineering Units	Integrated (Label and Scale Factor), Double
Calculations	Integrated (Label and Scale Factor), Double Differentiated (Label and Scale Factor)
On-Line Status Monitors	
Test status	Elapsed and remaining test time
Level status	Schedule level number, elapsed and remaining level time
Control status	Test dB level, test and drive RMS level
Channel status	RMS levels for all active channels
Component status	Status for each narrowband: center frequency, sweep direction, sweeps completed
Message log	Records all test operations, including operator commands, and reports on alarm or error conditions
On-Line Controls	
Start/Abort test	Smoothly initiates or terminates test
Resume test	Restart test and complete remaining time
Test Mode	Manual or automatic
Drive update	Update of drive spectrum on or off
Broadband level control	Step up or step down (manual mode)
Narrowband control	Operator control of narrowbands during test (in manual mode only), including on/off, sweep direction, sweep rate
Pause	Lower drive level to -90 dB, hold until resume
On-line Analysis	
Real-time displays	Spectra for all available channels may be simultaneously displayed during the test
Spectra analyzed	PSD, auto-spectrum, linear-spectrum, frequency response function (magnitude/phase or real/imaginary), coherence,
Averaging control	User-defined DOF exponential or linear averaging
Real-time/stored data	Simultaneous display and overlay of spectra or time histories for real-time data and any stored data

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Data Storage

Setup options	Automatic storage every 1 to 999 seconds, save on level change, save on alarm, save on external command, save every sweep, manual save
Playback	Automatic play of entire test data file, with adjustable display update delay; manual selection
Run message log	Text file records all system status messages displayed during test run



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