The single most important issue in Random testing after accuracy is correct random energy. This means the excitation energy must be, not only random in frequency, amplitude, and phase but constantly changing as well. Incorrect random energy causes the test to fail to conform to industry test standards. With LYNX you are guaranteed your excitation is the best Random available today. The accepted specification for amplitude variability is described as: 120 Degrees of Freedom (DOF) for control and WILL vary at least +/- 1dB. It does not say it MAY. The statistical standard for Random says it WILL vary +/- 1dB, at least.

ADAPTIVE CONTROL (standard on Lynx™) – is a tool that permits Lynx™ to "see the future" and adjust the control speed in real time to the next measure of error that is about to happen. This 'look ahead' feature allows the Lynx to control problems lesser systems don't even understand.

FEATURES

- Continuous Control to a PSD rather than "Once per Test" control to the system ID
- One Click Data Reporting
- Choose independent limit profiles for each active measurement channel
- Determine Frequency Response Function (FRF) measurements for selected channels
- Easy integration with chambers and other test instrumentation
- Exceptionally rapid correction for resonant frequencies – provides excellent protection against over test

Control Methods

Control method	Patented adaptive control algorithm with separate controls loops dedicated to controlling the shape of the drive spectrum and overall RMS level optimizes both control speed and stability

Input/Output

Input channels	4 to 16; all simultaneously sampled
Input dynamic range	>94dB with auto-ranging
Output dynamics range	>90dB

Control Performance

Dynamic range	> 90 dB
Output	True Gaussian noise
Equalization accuracy	Control to within ± 1 dB for a flat reference spectrum with 120 DOF 90% statistical confidence
Loop time	With 4 control channels, 4 new data frames per loop, 2000 Hz, 200 lines 120 DOF, less than 0.5 seconds
Re-equalization rate	For an instantaneous change of 6 dB in all control spectrum lines, the spectrum RMS is re-equalized to within ±1 dB within 8 control loops, for a flat reference with 4 control channels, 120 DOF

Reference Spectrum

Definition	Easily defined by a combination of up to 500 amplitude/frequency breakpoints, (PSD value/frequency value) and slopes (dB/octave values)
Spectral alarm/abort limits	Independent positive and negative alarm and abort tolerances for each breakpoint
Frequency range (DC to)	50, 80, 100, 200, 400, 500, 800, 1000, 2000, 4000, 5000 Hz; 10000 Hz and 20000 Hz (Premier) optional
Frequency resolution	100, 200, 400 and 800 lines;1600 and 3200 lines (Premier) optional
Units	g-in/s-in: g-m/s-mm; m/s^2-m/s-mm EU for Measurement Channels)
Import reference	Copy & paste from spreadsheet program; optional: import from Universal File Format (Intermediate)

Limit Profiles (optional)

Definition	Easily defined by a combination of up to 500 amplitude/frequency breakpoints, (PSD value/frequency value) and slopes (dB/octave values)
Number	Up to the number of active channels minus 1 (Premier)

Control Parameters

Number of control channels	1 to all available channels
Multi-channel control strategy	Average, maximum, minimum; user-defined weighting for each control channel
Mode of operation	Manual, automatic, automatic only
Test duration	User-defined, maximum 9999:59:59 (hhhh:mm:ss)
Degrees of freedom	User-defined. minimum 8, maximum 30000
Output level control	Automatic, manual
Overlap Processing	None, 25%, 50%

Startup Parameters

Initial test level	User-selectable; -80 to 0 dB
Time at initial level	User-defined number of loops
Level increment	1 to 20 dB
Pre-stored drive startup	User-selectable (No/Yes/Yes with verify before start)

Test Automation Features

Level scheduling	Up to 500 test levels; each level with programmable time at level, time between levels, abort/ignore action
Test scheduling	Up to 500 tests run automatically; each test with programmable number of cycles, external start (requires Remote Control Interface), and delay time before starting next test (option)
Print Automation	Ability to create reports automatically with customizable displays

Safety Features

Shaker limits	Pretest verification that spectrum dynamic limits are within shaker operational limits (acceleration, velocity displacement and voltage)
Loop check max. drive signal	User-selectable, 0 to 5000 mV RMS
Alarm/Abort RMS	RMS acceleration limit in dB or Absolute units
Alarm/Abort spectral lines	Number of lines, or percent of lines within user-specified range
Channel abort profile	User-defined profile for any non-control channel with up to 500 breakpoints each with + and - dB abort tolerances
Channel RMS abort	Aborts test if any channel RMS threshold exceeded
Control signal loss	Automatic detection with smooth drive shutdown
Manual abort	Graphical and keyboard abort buttons
External kill-switch	Rack or desktop mountable external abort circuit with programmed shutdown (option)
Drive signal clipping	2 to 20 sigma
Startup/shutdown rates	Independently selectable 1 to 50 dB/sec

Channel Setup

Channel type	Control, measurement, limit, abort, inactive
Sensitivity	0.001 to 9,999 mV/g or mV/(m/s2)
ICP power	On/off
Coupling	AC or DC
Channel loop check	Enabled, disabled
Channel label	Up to 20 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/s2)rms
Base Engineering Units	Label(EU), Conversion (EU/Transducer Unit)
Engineering Units Calculations	Integrated(Label and Scale), Double Integrated(Label and Scale),Differentiated(Label and Scale),Double Differentiated (Label and Scale)

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, drive RMS level, Control Level GRMS
Channel status	RMS levels for all active channels
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
Level	Step up or step down
Pause	Lower drive level to -90 dB, hold until resume

On-line Analysis

Real-time displays	Spectra or time histories for all available channels may be simultaneously displayed during the test

Lynx™ Random - Technical Specifications

Spectra analyzed	PSD, auto-spectrum, linear-spectrum, transmissibility, frequency response function (magnitude/phase or real/imaginary), coherence,
Averaging control	User-selectable; 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
Data Storage	
Setup options	Automatic storage every 1 to 10,000 seconds, save on level change, save on alarm, save on external command, 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

SPECTRAL DYNAMICS

Spectral Dynamics Inc.
2199 Zanker Road
San Jose, CA 95131-2109

(800) 778-8755

www.spectraldynamics.com

CATS™ Computer Aided Test Suite