Lynx™ Sine

Powerful, Flexable, and Affordable Vibration Controller

Sine testing can be done two ways:

1. Overall test level control, where we do not care about what frequency causes the response energy.
2. Fundamental Control, which requires Tracking Filters. See Figure 2 below

Nearly all tests presume Tracking Filters are being employed. LYNX™ provides True analog quality tracking filters created in DSP with the same Sine-Co-Sine Heterodyne method SD patented in 1961, If you must test to MilStd expectations, you must use tracking filters. FFT based processes DO NOT yield the same accuracy that Digital Tracking Filters offer.

Signal Generation hardware matters. LYNX™ generates harmonic free analog quality Sine signals that permit remarkable resonance control and accuracy.

NOT generating Harmonic content, means the power amplifier WON'T receive high frequency energy which it CANNOT reproduce, thereby removing another worry from the Test Professional's mind.
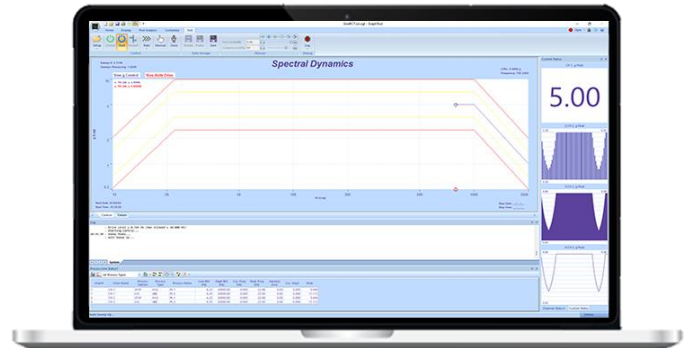
FEATURES
• Analog quality sine signal generation
• Multi-channel digital tracking filters with variable fixed and proportional bandwidths
•Digital re-sampling provides true proportional bandwidth tracking filters
•Sweep range from 0.1 to 10,000 Hz
•Optional resonance search and phase-tracked dwell
•Frequency Response Function (FRF) measurements for all active channels
•Independent limit profiles for each active measurement channel

Control Methods

Control loop — True analog-quality sine sweep with a double precision integrated phase algorithm for low distortion

Control Performance

Dynamic range — Greater than 80 dB with 0.05 dB level step control over the full range

Output signal — Analog-quality digital sine generation, using a double precision integrated phase algorithm for low distortion

Level accuracy — Control to within ± 1 dB at a sweep rate of 1 oct/min through a 600 Hz resonance of a linear system with a Q of 70 with an internal 20% proportional tracking filter Sweep frequency resolution ±0.5% of the drive frequency

Loop time — Less than 5 msec for single channel control

Compression rate — Up to 3,500 dB/sec with unconditionally stable feedback control loop

Harmonic distortion — < -75 dB at full output

Reference Profile

Definition — Up to 500 frequency segments

Segment types — Constant displacement, velocity, acceleration, and straight line acceleration (linear or logarithmic)

Crossover frequencies — Automatically calculated to avoid segment boundary discontinuities

Alarm and abort limits — Independent positive and negative alarm and abort margins

Sweep range — User-defined sweep range from 1 to 5000 Hz; and 0.01 to 10000 Hz (Premier) optional

Sweep resolution — User-defined resolution of 450 to 800 points per sweep; 450 to 2400 points per sweep (Premier) optional

Spectrum dynamic limits — Acceleration range, maximum or minimum acceleration, maximum velocity and maximum displacement

Limit Profiles (optional)

Definition — Up to 500 frequency segments

Segment types — Constant displacement, velocity, acceleration, and straight-line acceleration (linear or logarithmic)

Crossover frequencies — Automatically calculated to avoid segment boundary discontinuities

Number — Up to the number of active channels minus one (Premier)

Control Parameters

Mode of operation — Manual, automatic

Test duration — Maximum 99,999 sweeps or 9999:59:59 (hhhh:mm:ss); unlimited test

Measurement processing — RMS, or tracking filter processing for all channels in parallel; processing type individually selectable for each channel

Tracking filter types — Proportional to drive frequency, 1 to 200% and fixed bandwidth, 1 Hz to 1,000Hz

Transducer types — Control based on acceleration, velocity, displacement (transducer with programmable transition frequency band)

Number of control channels — 1 to all available channels, max 16

Multi-channel control strategy — RMS, arithmetic average, min, max

Abort channels — Abort test when user-defined level exceeded

Compression — 5% to 100%

Units — m/s^2 - m/s - mm; g – in/sec - in; g - m/s – mm

Box Tolerance Enable — Alarm & Abort width set 0 to 100%

Startup/Shutdown Rate — 1 to 99 dB/sec

Sweep Parameters

Sweep mode — Linear, logarithmic

Sweep duration — User-defined, maximum 999:59:59 (hhh:mm:ss)

Number of sweeps — 0.01 to 100,000

Sweep rate-linear — 0.00003 to 300 Hz/sec (0.0018 to 18,000Hz/min)

Sweep rate-logarithmic — 0.1 to 800 Oct/min

Initial sweep direction — Up, down

Safety Features

Shaker limits — Pretest verification that spectrum dynamic limits are within shaker operational limits (acceleration, velocity, displacement and voltage)

Loop check max. drive — User-selectable, 0 to 5,000 mV RMS

Control signal loss — Continuous automatic detection

Manual abort — Graphical and keyboard abort buttons

Maximum drive signal — 0.0001 to 12 V peak

Startup/shutdown rates — Independently selectable, 1 to 99 dB/sec

Test Automation

Test scheduling — User-defined sequence of up to 500 independent tests run automatically

Sweep rate table — Up to 50 sweep rate vs. frequency segments

Compression table — Up to 50 compression speed vs. frequency segments

Schedule cycles — 1 to 100

Print Automation — Ability to create reports Automatically with Customized displays

Base Engineering Units — Label(EU), Conversion(EU/Transducer Units)

Engineering Units — Integrated (Label and Scale Factor), Double

Calculations — Integrated(Label and Scale Factor), Differentiated (Label and Scale Factor), Double Differentiated (Label and Scale Factor)

Channel Setup

Channel type — Control, measurement, reference, limit, abort, inactive

Sensitivity — 0.001 to 999,999 mV/g or $mV/(m/s^2)$ mm; EU for Measurement Channels

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

On-Line Test Analysis

Display functions — Control, drive, measurement channel 1 to 32, frequency response function (magnitude/phase or real/imaginary

Cursors — X and Y value readout, peak search, trace tagging, multi-window looked positioning

Scaling of display — Log/linear, auto-scaled/fixed

Real-time/stored data — Simultaneous display and overlay of real-time data and any stored data

Passive Sine Analysis — Same capability as test operations w/o output generation

Resonance Search & Dwell (optional)

Dwell modes — Fixed frequency, phase tracked(auto/manual), Continuous (w/reset option)

Search parameters — Max no. of resonances, hysteresis, minimum Q value

Q Search — Peak Ratio or –3dB points

Smoothing — Low, Medium, High

Search Channel — Any active channel

Phase Reference Channel — Any active channel

Resonance calculation — Resonance frequency, Q, phase, level

Dwell table parameters — Duration, start frequency, dwell frequency, end frequency, dwell level and phase, alarm limit, abort limit

Dwell level type — Acceleration, velocity, displacement

Data Storage

Setup options — Sweep Increment, first sweep, last sweep

Playback — Scan through the entire test data file, with adjustable

delay and tagging

Documentation

Test summary   Fully documented post-test summary, easily printed or
                              incorporated into any document using standard word
                              processing software

Run message log   Text file records all system status messages displayed
                              during test run

Safety Features

Shaker limits   Pretest verification that spectrum dynamic limits are
                              within shaker operational limits (acceleration, velocity,
                              displacement and voltage)

Loop check max. drive   User-selectable, 0 to 5,000 mV RMS

Control signal loss   Continuous automatic detection

Manual abort   Graphical and keyboard abort buttons

Maximum drive signal   0.0001 to 12 V peak

Startup/shutdown rates   Independently selectable, 1 to 99 dB/sec

CATS™
Computer Aided Test Suite