

SYSTEM DATA

LDS COMET_{USB}™ Vibration Control System



Offering high performance at a very affordable price, the COMET_{USB} Vibration Controller is an ideal solution to the everyday demands of your shock and vibration testing. COMET_{USB} provides the flexibility to do random, swept sine, and shock testing on electrodynamic shakers. Easy-to-use software together with extensive automation features, it is a perfect fit for vibration stress screening and production test applications.

Key Benefits

- Supports both 32 and 64-bit Windows® operating systems
- Suitable for random, sine, and shock tests
- Simplified or advanced user interfaces suitable for different operators and tests
- Setup Wizard for quick and sure test setup
- Coordinated operation of thermal chamber and vibration controller from the same PC for seamless combined thermal and vibration testing
- Superb dynamic range aids control of highly dynamic structures
- Automatic safety checks to protect your valuable equipment
- USB connectivity for easy installation

Uses

- Vibration testing in both R&D and production environments
- Intended to drive a switching power amplifier
- Random tests
- Sine oscillator tests
- Swept sine tests
- Shock tests

COMET_{USB} Delivers What Test Engineers Demand: Convenience, Performance, Flexibility, and Safety

Convenience

All major PC makers, and consumers worldwide, have adopted USB 2.0 because of its superior speed and convenience. As a true USB 2.0 device, connecting COMET_{USB} to your PC or notebook is as easy as plugging in a mouse or keyboard. But plug and play is just the beginning of COMET_{USB}'s convenience. In addition:

- The vibration control applications are easy to master
- The Setup wizard smoothes the learning curve and reduces set-up time
- Powerful automation features take the tedium out of repetitive tasks, allowing you to run complex test schedules with a single keystroke

Performance

COMET_{USB} delivers exceptional performance in both R&D and production environments. Distributed DSP processors provide fast loop times for quick test load equalization and enhanced safety. COMET_{USB} is a true multi-tasking system with the control loop handled independently of the PC. You can use test run time to analyze data and prepare test reports, instantly transmitting all reports and data via email. The system features 24-bit resolution hardware. Housed in a low-noise enclosure, the hardware offers programmable voltage ranges on all inputs and outputs. This design provides the exceptional dynamic range you need for precise control of complex structures or difficult fixtures.

Flexibility

Design and development of COMET_{USB} included input from test engineers within many industries in order to ensure that the software is user-friendly and rich in features. All applications minimize training time, allow quick test setup, and easy report generation. They help you handle operation, monitoring, and reporting in the way that works best for you. COMET_{USB} is an ideal solution to the everyday demands of your vibration testing. It provides the flexibility to do random, swept sine, and shock testing on electrodynamic shakers.

Safety

COMET_{USB} offers enhanced safety and reliability. Over 20 safety checks and interlocks act to ensure the safety of the test article, shaker system, and personnel. In addition, COMET_{USB} provides unique safety features not available with other controllers. A built-in hardware abort button connects directly to the output hardware circuitry so that you are never at the mercy of the software user interface. Special circuitry on the output protects the shaker from voltage transients due to power failures or accidents such as switching off controller power.

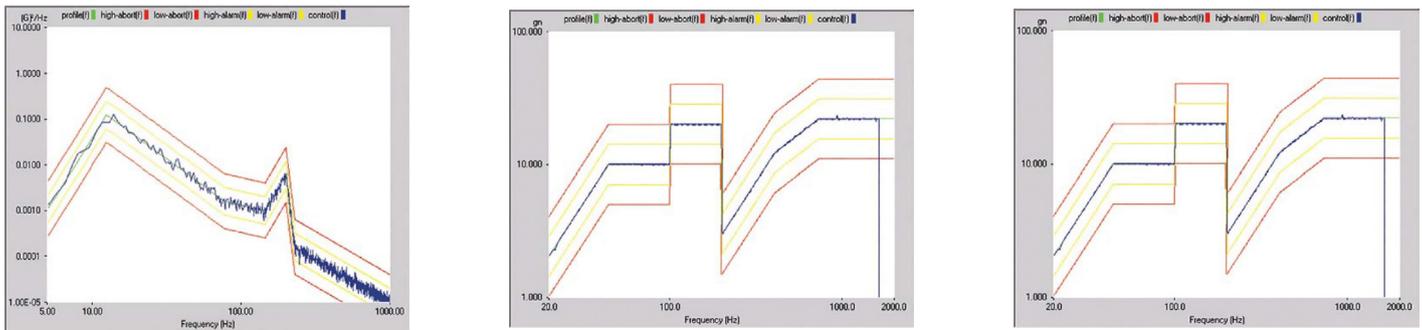


Fig 1. Examples of COMET_{USB} displays during Random, Sine, and Shock testing, respectively

Specifications - COMET_{USB} Vibration Control System

Inputs	
Analogue Channels	2 standard Differential inputs with 220 kΩ impedance
Filtering	An analog filter plus a 160 dB/octave digital filter eliminates non-linear phase, distortion and aliasing
Signal-to-Noise	>100 dB (from DC to 1 kHz measured with half-full scale sine wave)
Voltage Ranges	±10, 1 or 0.1 V
Signal Conditioning	Voltage or CCLD* sensor power (4.7 mA, 23 V _{peak} open circuit)
Maximum Input	±36 V _{peak} without damage
Resolution	24-bit Analog-to-Digital converter
Dynamic Range	120 dBfs
Accuracy	±0.08 dB (1 kHz sine at full scale)
Channel Match Amplitude	Within ±0.04 dB
Channel Match Phase	Within ±0.5 degree, from DC to 20 kHz
Channel Crosstalk	< -110 dB
Harmonic Distortion	< -105 dBfs

* CCLD is Constant Current Line Drive, the generic name for a constant power supply for accelerometers with built-in electronics

Outputs	
Analogue Channels	One drive channel standard
Resolution	24-bit Digital-to-Analog Converter (DAC)
Filtering	A 160 dB/octave digital filter plus an analog filter eliminates non-linear phase, distortion and imaging
Voltage Ranges	±10 V _{peak} with adjustable attenuator
Harmonic Distortion	< -95 dBfs

Reference Profile	
Validation Tools	Profile displayed and updated as it is created. Automatic listing of peak acceleration, peak velocity, and peak-to-peak displacement values for profile. Profiles are validated against shaker parameter table
Engineering Units	English, SI, metric, mixed
Test Schedule	User-defined sequence of events or profiles that are automatically executed during the test

Post-test Documentation

Icon for single click generation of data plots and test reports, including setup parameter listings, test logs, and formatted signal plots, within Microsoft® Word.

Software: Random	
Reference Profile	Breakpoint table with unlimited combination of PSD levels with slope (dB/octave) at user-defined frequencies
Frequency Range	0 to 2.4 kHz in eight ranges 4 kHz optional
Resolution	110, 225 or 450 spectral lines 800 lines optional
Dynamic Range	Up to 95 dB
Randomization	True gaussian distribution
Loop Time	Typically 100 ms
Transfer Function	Measure during pre-test or, for quickest test start-up, recall a function from disk
DOF	2 to 1000
Control Accuracy	±1 dB at 99% confidence with 200 DOFs
Control Strategy	Control to any single channel Multiple channel control optional
Drive Clipping	2.5 to 6 sigma

Software: Swept Sine	
Reference Profile	Unlimited combination of amplitudes (A, V or D) and slopes at defined frequencies
Frequency Range	0.4 Hz to 2.4 kHz 4 kHz and 12 kHz optional
Resolution	110, 225, 450, 900, or 1800 lines
Dynamic Range	Up to 100 dB
Loop Time	Typically 10 ms
Control Accuracy	±1 dB through a peak-notch with a Q of 50, at 1 octave/min
Control Strategy	Control to any single channel Multiple channel control optional
Compression Rate	Adaptive or fixed 0.3 to 3000 dB/s
Signal Processing	Peak, Mean or RMS input channel amplitude processing Tracking filters optional
Sweep Type and Rate	Linear from 0 to 6 kHz/min or logarithmic from 0 to 100 octaves/min
Drive Resolution	As fine as 0.000001 Hz
Sine Dwell	User-specified dwell frequency with duration in cycles or time

Software: Classical Shock	
Pulse Types	Half-sine, Haversine, initial and terminal peak sawtooth, triangle, rectangle, and trapezoid
Compensation	Pre- and post-pulse, post-pulse only, or prepulse only Single- or double-sided for minimum acceleration and full use of shaker stroke
Frequency Range	0 to 22 kHz
Frame Size	128 to 16384 points or automatically optimized Linear filter design minimizes distortion and preserves the true waveform shape
Transfer Function	Measure during pre-test or, for quickest test start-up, recall a function from disk
Averaging	User-defined coefficient from 1 to 500
Filtering	User-defined cut-off frequency for low-pass filtering
Pulse Delay	User-defined, in seconds

Specifications - COMET_{USB} Vibration Control System

Hardware	
AC Power	100 to 240 V, 50/60 Hz, auto-sensing
Power Consumption	25 W
Dimensions	Height: 20.6 cm (8.1 in) Width: 8.9 cm (3.5 in) Depth: 34.0 cm (13.4 in)
Weight	3.1 kg (6.8 lb)
Temperature	5 to 45° C (41 to 113° F)
Humidity	10% to 90% RH non-condensing
PC Requirements	USB 2.0 port Windows 7(32 and 64-bit), Windows 8 (64-bit), or Windows 10 (64-bit) operating system Microsoft® Word
PC Expansion	PC upgrades and peripheral additions do not delay or interrupt the control loop processing

Safety Features	
Control Signal	Automatic detection of input overload, open loop, and loss of signal
Line-abort Trigger	Ratio of spectral lines allowed to exceed their limits, from 0 to 1
Test Shutdown	Shutdown initiated by operator or software. Performed gracefully at a user-defined rate

Regulatory Compliance	
Compliance	CE marking
Safety	EN 61010–1, IEC 1010–1
EMC	FCC Par 15 (CFR 47) Class A, EN 61326 Class A, CISPR 22 Class A

Ordering Information

Hardware

COM-200 COMET_{USB} Shaker Control System, including:

- Two inputs
- One output

Software Bundles

SCO-107 Value Bundle: Value Random, Value Sine, Value Shock, and Analyze Anywhere

Software Packages

SCO-01V Value Random Vibration Control
SCO-02V Value Swept-sine Vibration Control
SCO-03V Value Classical Shock Transient Control

Optional Hardware

COM-204 Rack Mounting Kit
ACC-101 Wireless Remote Control Pendant (includes hardware and software)

Optional Software

SCO-05P Sine Oscillator
SCO-01V-02 Resolution Extension for Value Random
SCO-01V-03 Frequency Range Extension for Value Random
SCO-01V-04 Import of PSD as Reference for Value Random
SCO-02V-03 Frequency Range Extension for Value Swept-sine
SCO-100-02 Multi-layer Password Security System
SCO-110 Analyze Anywhere for Shaker Control
SCO-111 Waveform Editor
SCO-113 Thermal Chamber Communication and Control
SCO-114 Amplifier Control Interface

Network Enabled Software

NET-103-01 NET-Integrator™ ActiveX Command and Communication Interface
NET-104-01 NET-Integrator Run-time License (per seat)

Calibration

VTS-CTRL-CAI Initial Accredited Calibration

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