

VibeLab™ VL-144x

DIGITAL SINE AND RANDOM VIBRATION CONTROLLER



- Straightforward Virtual Instrument operating under Windows™
- Automatic calculation of Acceleration, Velocity, and Displacement
- Programmed test requirements automatically compared to system capabilities and accelerometer sensitivity
- Online help for both novice and experienced users
- Password protection and extensive report generating capabilities
- Comes assembled with everything you need including computer, monitor, printer, keyboard, and accelerometer. Ready to Run, Not a Kit



Complete Controller System Includes:

- Computer
- VibeLab™ and Windows™ software installed, ready to run
- Monitor, Keyboard, Mouse
- Printer
- VibeLab™ Shaker interface PC Board w/accelerometer power supply factory installed
- Accelerometer package: accelerometer, cable, stud, and mounting base



Sine Program Screen

Program Sine Test

Sweep Break Points

Brk. Pt.	Accel. (g's pk)	Vel. (ips pk)	Disp. (in p-p)	Freq. (Hz)
#1	0.64	7.9	0.500	5.0
#2	10.00	31.1	0.500	19.8
#3	10.00	.1	0.000	10000.0
#4				
#5				
#6				
#7				
#8				
#9				
#10				
#11				

Control / Input

Input Sensitivity (mV/g) Control Mode
 Channel 1 100.0 Ch1 Avg Res D
 Channel 2 100.0 Ch2 Ext Def Q

Open Loop Trip Sensitivity Norm

Sweep

Sweep Mode Log
 Sweep Rate 3.000 Oct / min
 Res. Dwell Time 5 minutes

Run Schedule

Manual Start / Stop
 External Start / Stop
 Time Scheduled Test:
 Total Run Time 00:10:00
 Sweep Cycles Scheduled Test:
 Total Sweep Cycles 1.0
 7/24/00 17:28:22

Vibration System

System ET-127
 Payload weight 10.00 lbs
 Armature weight 5.00 lbs
 Max. pk. Sine force 500.0 lbf
 Max. pk. velocity 70.0 ips units
 Max. displacement 1.000 in.

Program

New Recall Save
 Prgm name Labworks std
 Created/modified 4/3/00 16:32

Graph

Accel, Vel, Disp
 g, in/sec, in.

Frequency 5 10 20 50 100 200 500 1000 2000 5000 10000

Annotations:

- Go to the run test screen.
- Scale the graph to best suit the test.
- Access password protection.
- Complete online and pointer help available.
- Go back to the introduction screen.
- The programmed acceleration, velocity, and displacement are shown graphically as they are programmed.
- Enter the vibration system limitations and payload information and the controller will alert the user to potential problems during the programming phase. Set the system abort to provide automatic system protection during the actual test.
- Easily add, insert, and delete break points.
- Set the accelerometer sensitivity and turn channels on and off. Select the desired control mode; channel 1, channel 2, average, extremel or resonance search and dwell.
- Select the desired type of sweep; logarithmic, linear, resonance search and dwell, accelerometer calibration, etc.
- Control the schedule of the test. Select the desired total test time or the number of sweep cycles or allow the test to be externally or operator controlled.
- Save useful information to the disk along with the test profile.
- Create new test programs or recall existing ones. Run, modify, rename, and save to the test library.

Sine Run Test Screen

Run Sine Test

Control Channel

Acceleration Reference: 10.0 (gpk) **0.00**
 Velocity (in/sec. pk) **0.00**
 Displacement (inch p-p) **.0000**
 Frequency (Hz) **10000**

System ET-127 Controller Output
 Load (lbs) 10 on/off R E A System Operation Level
 Accesses 7/24/00 17:40:29 Help ?

Run Time Timer

Total Elapsed Time 00:07:53 Hold
 Total Full Test Time 00:04:18 Reset
 Remaining Test Time
 Sweep Cycles Accum. 0.5 Reset

Test Log

Time	Cntl	Ch1	Ch2	Status
17:40:09	10.00	10.00	0.93	Man. Sht Dn
17:39:57	9.94	9.96	0.83	Stop Sweep
17:36:17	0.64	0.64	0.30	Start Sweep
17:35:52	0.58	0.57	0.27	At Full Test
17:35:30	----	07/24/00	----	Servo Start

Labworks std
 ET-127

Graph

Accel, g
 Channel 1
 Channel 2

Frequency 5 10 20 50 100 200 500 1000 2000 5000 10000

Frequency/Sweep

Autg Sweep Start
 Start Swp Up
 Start Swp Down
 Sweep Cycle Single Cont C

Logarithmic Sweep Rate
 E Pgm 3.000
 SL Oct / min

Sweep Magual

Servo/Output

Servo Spd Norm
 Trip Sens Norm

STOP Start Servo Cont. Manual

Annotations:

- Clicking in this area toggles the display between the large control channel format shown and the more detailed format which displays channel one, two and control information simultaneously.
- Graphic display of either run time or recalled test data. T-Square and cursor position displays (not shown) enable detailed inspection of the graphic data.
- Scale the graph to suit the test spectrum.
- Chose which data is graphically displayed at any given time.
- Save up to ten complete sets of test data for post analysis. Return later and recall test data, reformat and either print or transfer to the clipboard for generating reports.
- Select single or dual graph display
- Go back to the program screen.
- The data displayed can be cleared without stopping the test.
- The servo speed and trip sensitivity can be adjusted to accommodate difficult to control test articles.
- One bar graph displays the current output level of the controller which allows the operator to adjust the system gain to best suite a specific test requirement. The other bar graph can be enabled to display the overall vibration system operating level.
- A controllable timer keeps track of the current test.
- A continuous test log automatically keeps track of significant events. This log may be printed along with notations entered by the operator.
- Select either manual or program control of the sweep. In the program mode the sweep rate and direction may be adjusted during the test. The sweep can be set to start automatically and sweep either up or down in frequency.
- Select either servo or manual gain control. The test may be stopped and then continued under program control without losing the test data. Indicators warn the operator when the gain is up or the cursor keys are enabled.

Random Program Screen

Program Random Test

Spectrum Break Points

BRK PT #	FREQ. (Hz)	LEVEL (g2/Hz)
#1	7.0	.3823
#2	8.0	.1487
#3	10.0	1.684
#4	11.0	.0593
#5	12.0	.0975

Control / Input

Input Sensitivity, mV/g Alarm Abort

Channel 1 100.0

Channel 2 OFF

Control Mode Ch1 Ch2 Avg Ext

Offset dB High Low

Alarm 3.0

Abort 6.0

Detect BW%: 10.0 Log Lin

Test Graph Random Program Access Help ? Exit

PSD, g2/Hz

2/19/99 11:31:25 Acceleration 1.9 Velocity 21.8 Displacement 0.80

Run Schedule

PreTest Level (dB) -6 Go to Test Hold Auto

Manual Start / Stop

External Start / Stop

Time Scheduled Test

Total Run Time 00:10:00

Continuous

Cycling: on off

00:02:00 00:03:30

Vibration System

System LW-127-500-BT

Payload weight 50.0 lbs

Armature weight 5.0 lbs

Max. random force 350.0 lbf units

Max. displacement 1.00 in.

Drive signal clip 3.0 s

Program

New Recall Save

Prgr name Mil Std 810 514-37

Created/modified 12/22/98 15:23

Basic Transportation, composi tactical wheeled environment, vertical

Go to the run test screen.

Scale the graph to best suit the test.

Select Frequency Bandwidth.

Access password protection.

Complete online and pointer help available.

Go back to the introduction screen.

Acceleration, velocity and displacement requirements automatically calculated and displayed as the test is defined.

Save new test profiles or recall existing ones. Run, modify, rename and save to the test library.

Save useful information to the disk along with the test profile.

Easily add, insert, and delete break points.

Turn channels on and off and control the sensitivity, alarms and aborts. Select the desired method of control. Select tolerances for the alarms and aborts.

Control the schedule of the test. Program the desired elapsed time for the test, either continuous or cycled on and off, or allow the test to be operator controlled.

Enter the vibration system limitations and payload information and the controller will alert the user to potential problems during the programming phase. Set the system abort to provide automatic system protection during the actual test.

Random Run Test Screen

Run Random Test

UP Control 1.78 (grms) Acceleration 1.77

DN Reference: 1.78 (grms)

Velocity (in/sec. pk) 17.3 Displacement (inch p-p) 0.54

STOP

Hold Servo

Shaker System Status Abort

At Full Test

System LW-127-500-BT

Load (lbs) 50

Ch 1 Alarm on/off Ch 2 Alarm on/off

Access 2/19/99 12:30:10 Help ?

Run Time Timer

Total Elapsed Time 00:02:26 Timer Hold

Total Full Test Time 00:01:29

Remaining Test Time

Time To Off Cycle

Test Log

Time Cntl Ch1 Ch2 Status

12:28:41 1.78 1.46 0.00 At Full Test

12:28:30 0.73 0.49 0.00 At Pretest

12:27:44 ---- 02/19/99 ---- Start Test

Mil Std 810 514-37

Basic Transportation, composi tactical wheeled e

LW-127-500-BT

Graph

PSD, g2/Hz

Control 1.77 grms

Drive

Reference 1.78 grms

Display Data

Data Manager

Average

Single Display

Dual Display

Exit

Up and Down buttons allow the operator to change the control acceleration manually while under servo control.

Displays the current vibration acceleration, velocity, and displacement along with the programmed reference and the current control servo reference acceleration.

Graphic display of either run time or recalled test data. T-Square and cursor position displays (not shown) enable detailed inspection of the graphic data.

Scale the graph to suit the test spectrum.

Chose which data is graphically displayed at any given time.

Save up to ten complete sets of test data for post analysis. Return later and recall test data, reformat and either print or transfer to the clipboard for generating reports.

Control the averaging of the run time display data.

Start, Stop, Reset and Resume controls are located next to the controller signal output bar graph. The shaker system information and the status window, which provides the operator with information regarding the current tests progress, are also located here.

A control to enable and disable the previously programmed alarm and aborts is provided along with status indicators.

A controllable timer keeps track of the current test.

A continuous test log automatically keeps track of significant events. This log may be printed along with notations entered by the operator.

Go back to the program screen.

Select single or dual graph display

VibeLab™ VL-144x

Digital Sine and Random Vibration Controller



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General Description

The VibeLab Digital Sine and Random Vibration Controller is a pc-based vibration test controller. Running under the Windows operating system, the controller generates and runs user-defined vibration tests. The electrical output of the VibeLab controller is a real-time analog voltage signal suitable for use in driving most commercially available wide band vibration test systems. VibeLab utilizes vibration acceleration feedback from one or two accelerometers mounted on the shaker, fixture, and/or test article.

VibeLab's straight forward user interface allows creation and running of vibration tests with minimal learning time. All critical settings are software interlocked and cross checked to insure that only valid tests are generated. The virtual instrument approach to the controller user interface puts all of the user-required settings and parameters in view, with minimal hidden menu activity required when defining or running a vibration test.

While running a test, VibeLab can be configured to monitor the vibration system operating level and even abort its operation if system limits are exceeded. Most common Labworks vibration systems are included in the VibeLab system library or the user can easily define and store custom system parameters.

VibeLab's primary report output is graphical. Either a single large or two smaller graphs can be prepared and printed directly, or copied, to the clipboard, for inclusion on other Windows-based applications. Each graph carries its own notation field that prints automatically in the direct print mode. The test log header includes the name of the parent test program for reference. Any two data sets can be displayed on each graph with crosshairs provided for specific level or frequency identification, if required. The data files saved are spreadsheet compatible for custom report generation. The chronological test log is also available for incorporating into reports.

General Specifications

Frequency Range

Random	6 to 2,000 Hz or 2 to 500 Hz
Sine	2 to 10,000 Hz
Display Units	English or Metric units with automatic conversion

Reports

Graphical, Tabular, Current or Post Analysis

Signal Input

Number of Input Channels	2
Acceleration Range	Random: 0.2 to 100 grms Sine: 0.1 to 200 gpk
Acceleration Resolution	16 Bit
Maximum Input Voltage	5 V
Connectors	BNC
Dynamic Range	80 dB minimum

Vibration System Protection

System Checker	Automatic cross check of program with the vibration system force and displacement capabilities
Sensitivity Checker	Automatic cross check of program with accelerometer dynamic range and sensitivity
Run-Time and Output Level Monitors	Show the vibration system operating level and VibeLab signal output voltage level

Test Article Protection

Acceleration	Open loop/low gain + rate detection
Random	Over and/or under acceleration alarm and abort levels
Sine	System operation level, acceleration and displacement
Manual Abort	Red "STOP" key and external shutdown terminals
External Interlock	Normally open switch or Logic Low

Password Access/Training

Up to 3 levels plus demonstration/learning mode

Operating Modes

Manual, Timed, Timed Cycle, Sweep Cycle, External Switch/TTL

Control

Random Modes	Single channel, average, or extremal technique
Sine Modes	Single channel, average, extremal, resonant search and dwell, calibration. All modes use a tracking harmonic comb filter

Program

Random Spectrum Entry	Break point or line segment slope, graphical display
Sine Sweep Profile Entry	Break point or constant level, graphical display of acceleration, velocity, displacement, and frequency
Other Parameters	Virtual instrument design, minimum hidden menus

Test

Save and Recall	All parameters, user named including all program parameters, data, and display setting
Last Test	The last test run is automatically saved and can be recalled and continued or analyzed

Run Time Display

Graphical Data	Single or dual graphs with up to 2 acceleration/data channels or output drive data sets/graph: Ch 1, Ch 2, Control, Drive, Transmissibility: Ch 1/2 and Ch 2/1 (ch1/drive, sine)
System Monitor	Vibration system operation level meter
Timers	Cycle timers and sweep cycle counter

Graph/Data Save and Print

Save a full data set to disk, print direct, or clipboard the Test Log or any Graph

Post Analysis

Any saved test can be recalled and the data re-configured for report printing or saving to the clipboard for incorporation into other Windows applications