Vibration Shaker Controller - overview

Our suite of vibration controllers and associated software modules incorporates the latest developments in vibration testing while retaining a broad range of capabilities for standard test protocols. Our software applications are regularly updated and operate with our universal hardware module which is based on National Instrument® hardware that is recognized for quality and reliability worldwide. Some of the main specifications and features of our systems are:

Hardware Modules:

	6221 Hardware platform	6341 Hardware Platform	6363 Hardware Platform
Analog input			
Number of channels	8 Differential, 16 Single-ended	16 Differential, 32 Single-ended	16 Differential, 32 Single-ended
ADC resolution	16 Bits	16 Bits	16 Bits
Sampling rate	250 kS/s (aggregate)	500 kS/s (aggregate)	1 MS/s (single channel, 2 MS/s (aggregate)
Timing accuracy	50 ppm of sampling rate	50 ppm of sampling rate	50 ppm of sampling rate
Timing resolution	50 ns	10 ns	10 ns
Input range	±10 V, ±5 V, ±1 V, ±0.2 V	±10 V, ±5 V, ±1 V, ±0.2 V	±10 V, ±5 V, ±2 V, ±1 V, ±0.5 V, ±0.2 V, ±0.1 V
CMRR (DC to 60 Hz)	92 dB	100 dB	100 dB
Input impedance	>10GΩ in parallel with 100pF	>10GΩ in parallel with 100pF	>10GΩ in parallel with 100pF
Crosstalk (at 100 kHz)	-75dB (adjacent channels) -90dB (non adjacent channels)	-75dB (adjacent channels) -90dB (non adjacent channels)	-75dB (adjacent channels) -90dB (non adjacent channel)
Analog output			
Number of channels	2	4	4
DAC resolution	16 Bits	16 Bits	16 Bits
Monotonicity	16 bit guaranteed	16 bit guaranteed	16 bit guaranteed
Maximum update rate	833 kS/s (1 channel) 740 KS/s (2 channels)	900 kS/s (1 channel) 840 KS/s (2 channels) 775 KS/s (3 channels) 819 KS/s (4 channels)	2.86 MS/s (1 channel) 2.0 MS/s (2 channels) 1.54 MS/s (3 channels) 1.25 MS/s (4 channels)
Timing accuracy	50 ppm of sampling rate	50 ppm of sampling rate	50 ppm of sampling rate
Timing resolution	50 ns	10 ns	10 ns
Output range	±10 V	±10 V	±10 V, ±5 V
Output coupling	DC	DC	DC
Output impedance	0.2Ω	0.2Ω	0.2Ω
Output current drive	±5 mA	±5 mA	±5 mA
Overdrive protection	±25 V	±15 V	±25 V
Overdrive current	10 mA	15 mA	15 mA
Settling time (1 LSB)	6 µs	6 µs	2 µs
Slew rate	15 V/µs	15 V/µs	20 V/µs

Random Vibration Controller / Statistical Vibration Synthesizer:

- Control of up to four independent channels simultaneously (ideally suited to multi-axis test systems)
- Constant or variable rms (randomized modulation based on RMS distribution)
- Easy-to-use target PSD table and rms distribution definition
- Target PSD import facility
- Data capture (gap-free streaming to hard disk) on up to 32 channels
- Real-time spectral analysis on all available measurement channels
- Data capture sampling rates of up to 2 MSamples/s
- 16 Bit resolution (90 dB dynamic range)
- Up to 20 kHz control bandwidth
- Very high spectral (frequency) resolution (up to 16,000 spectral lines)
- Ability to generate multiple sinusoids superimposed onto random vibrations (multi sine-on-random)
- Ability to generate multiple swept sinusoids superimposed onto random vibrations (multi sine sweep-on-random – also known as Random-on-Random)
- Ability to generate shocks (classical or arbitrary) superimposed onto random vibrations (shock-on-random)

Sine & Swept-Sine Vibration Controller (Optional):
- Control of up to four independent channels simultaneously
- Complete freedom to set and vary the frequency range, sweep rate, sweep mode (linear or logarithmic) and amplitude
- Real-time measurement and display of magnitudes and magnitude ratios (transmissibility) on up to 30 channels
- Ability to pause, resume and change the sweep direction
- Plot of response amplitude vs frequency in real time
- Plot of transmissibility vs frequency (resonance search) in real time
- Set alarms and abort levels
- Configurable digital filter to remove distortion components from the measured sinusoid
- Data capture (gap-free streaming to hard disk) on up to 32 channels
- Data capture sampling rates of up to 2 MSamples/s
- Optional COLA (Constant Output Level Analogue) signal for stroboscope synchronisation
- 16 Bit resolution (90 dB dynamic range)
- Up to 20 kHz control bandwidth
- Controllable quantities: displacement, velocity and acceleration (including angular quantities for pitch and roll test systems)

Signal replicator (Optional):
- Replication of arbitrary waveforms of any duration including measured signals
- Replication of classical shocks and pulses (half sine or any other mathematically defined function)
- Replication of random signals defined from spectral function and rms distribution
- Can be used with any suitable feedback sensors (such as displacement, velocity, acceleration, angular displacement and angular velocity)
- Data capture (gap-free streaming) on up to 32 channels
- Real-time spectral analysis on all available measurement channels
- Data capture sampling rates of up to 2 MSamples/s (aggregate)
- 16 Bit resolution (90 dB dynamic range)
- Up to 20 kHz control bandwidth
- Very high spectral (frequency) resolution (up to 16,000 spectral lines)

Field Data Analysis software module (Optional):
Used for importing and analysing field data recorded with Saver® devices (Lansmont®) or Real Vibrations data acquisition systems. This can be used to calculate the required target PSD and RMS distribution functions needed for either conventional (constant rms) random vibration simulation or Statistical Vibration Synthesis (randomly fluctuating rms). Software module can be configured for data upload from other well-known data recorders.

Vehicle-trip Synthesizer software module (Optional):
Enables the generation of test schedules by combining road roughness information with vehicle types and speed.

Service and support
In addition to our 12 month replacement warranty, we are committed to deliver a rapid turn-around for hardware repair. This includes the supply (courtesy and express shipment) of a replacement hardware module while diagnosis and repair is undertaken.

For more information contact: enquiries@realvibrations.com