### Specifications

<table>
<thead>
<tr>
<th>Configurations</th>
<th>Main Components</th>
<th>Application Software</th>
<th>Input Signal Cable</th>
<th>Output Signal Cable</th>
<th>PC</th>
<th>Configurations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4GB FM, LAN, DSP, 8ch DIO, 4ch Inputs with Charge Amplifiers (Option: Max. 8ch)</td>
<td>Site, PSD Random, Classical Shock, RSTD, Mixed Mode, TTH, SRS, LTH etc.</td>
<td>BNC-BNC cable (Option: Low-noise cable for accelerometer)</td>
<td>BNC-BNC cable</td>
<td>Note PC or Desktop PC or without PC (option)</td>
<td>1 set</td>
</tr>
<tr>
<td>Input</td>
<td>4 standard, expandable to 8 simultaneous channels. Each can be control, monitor, or disabled. Setup allows selection of voltage/charge/ICP input, weighting for multi-channel averaging (option) and coupling (AC or DC)</td>
<td>4 pcs</td>
<td></td>
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<tr>
<td></td>
<td>4 built-in charge amplifiers, expandable to 8 channels. Setup allows selection of range and accelerometer charge sensitivity of 0.01 to 5,000m/s²</td>
<td>4 pcs</td>
<td></td>
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<tr>
<td></td>
<td>Built-in supply for four ICP’s, expandable to 8 channels. 4.7mA/21V DC</td>
<td>4 pcs</td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>4 standard, expandable to 8 channels. Differential or Single-Ended inputs with 250k Ohm impedance, Input protection voltage of ±20Vpk</td>
<td>4 pcs</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Anti-aliasing low-pass filters</td>
<td>4 pcs</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Analog filter plus 160 dB/oct. digital filter eliminates non-linear phase distortion and aliasing</td>
<td>4 pcs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.48 Hz to 102.4kHz, with 54 stages</td>
<td>4 pcs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating System(OS)</td>
<td>Windows XP, Vista, 7 with Microsoft Word</td>
<td>4 pcs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DSP Card</td>
<td>All-digital Circuitry with DSP for Control Calculations</td>
<td>4 pcs</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>On-board Memory</td>
<td>4GB Non-volatile Flash Memory, 32MB DRAM</td>
<td>4 pcs</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>LAN Card</td>
<td>Ethernet 100BASE-T, RJ45 Female Connector</td>
<td>4 pcs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Network Protocol</td>
<td>Control Modules are synchronized through IEEE 1588 Protocol</td>
<td>4 pcs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal Clock</td>
<td>Built-in</td>
<td>4 pcs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Display</td>
<td>Blue-green LCD Display, 115.05mm x 28.65mm VFD, 8 level brightness</td>
<td>4 pcs</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>System Disaster Recovery</td>
<td>Dedicated Reset Pin. Watch-dog based recovery can be enabled</td>
<td>4 pcs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power management</td>
<td>Active and Sleep Mode</td>
<td>4 pcs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Digital Input/Output</td>
<td>External Power Supply DC 3.3V – 12V</td>
<td>4 pcs</td>
<td></td>
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<tr>
<td></td>
<td>Internal Power DC 3.3V 350mA, 12V 400mA</td>
<td>4 pcs</td>
<td></td>
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<tr>
<td></td>
<td>Digital Input 8 ch opto-isolated input (current-sink output compatible)</td>
<td>4 pcs</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Digital Output 8 ch opto-isolated output (current-sink output compatible)</td>
<td>4 pcs</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Powered from external DC Power with Internal Backup Battery Source</td>
<td>4 pcs</td>
<td></td>
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<tr>
<td></td>
<td>AC Adapter accepts 100 – 240V (47 – 440Hz), DC Power 15V (+10%)</td>
<td>4 pcs</td>
<td></td>
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<tr>
<td></td>
<td>Max. 18W</td>
<td>4 pcs</td>
<td></td>
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<tr>
<td></td>
<td>W 440 (483 for Rack-mount) X D 330 X H 66mm</td>
<td>4 pcs</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Approx. 4.2kg</td>
<td>4 pcs</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>~10 to 55°C</td>
<td>4 pcs</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>10% to 85% RH non-condensing</td>
<td>4 pcs</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Hardware**

- Digital Vibration Controller
  - Docking of “CI’s Supreme Control Functions” & “Shinken’s Ease of Operation” Achieves 4th-Generation Digital Vibration Controllers having a Variety of Functions with Ease of Operation in Stand-alone Compact Rack!

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**Line of Products**

- Electro-dynamic Vibration Test Systems
- Vibration Controllers
- Vibration Meters

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**TEL:** 03(3261)3211  **FAX:** 03(3264)2930

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**Distributor**

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**Collaboration with Crystal Instruments (CI): UF leading controller’s maker**

**Digital Vibration Controller - D-5800 Series -**

- Challenging to Any Applications Related to Vibration...
4th Generation Vibration Controller
D-5800 Series

Main Features

DSP Centralized Architecture

Unlike traditional controllers that rely heavily on an external computer for real-time operation, the D-5800 is the first controller that directly integrates the time-synchronized Ethernet connectivity with embedded DSP technology. This strategy greatly increases control’s performance, system reliability and failure protection of the controller. It also allows a large number of channels to be configured without sacrificing system performance.

Simple Network Connection

Ethernet connectivity allows the D-5800 to be physically located far from the host PC. This distributed structure greatly reduces the noise and electrical interface in the system. One PC can monitor and control multiple controllers over the network. Since all the control processing and data recording are executed locally inside the controller, the network connection won’t affect the control reliability. With wireless network routers, the PC can easily connect to the D-5800.

Black-Box Mode (Run without PC)

The D-5800 can independently run in Black-Box mode which allows it to operate without a PC. In this mode, a PC is used only to configure the control system before the system starts operation and to download data after the test is completed. During the test, the controller can be operated according to a preset schedule or from a variety of external devices.

Latest Hardware Design

The D-5800 modules have voltage, charge and ICP inputs which are ideal for shock and vibration measurement. The internal flash memory stores test configuration data for controlling over a hundred channels simultaneously and stores real-time analysis data. The front panel has a dozen function buttons, while there are built-in isolate digital I/O and RS485 serial ports on the rear panel to interface with other hardware. Also equipped is a bright front panel LCD which displays system status & test information with real-time status such as control RMS or sweeping frequencies instantly viewed.

Designed for High Reliability

The D-5800 is the first vibration controller designed for fail-safe operation even in the event of network or power loss. The backup battery allows the controller to continue to function and save status information if it loses power. Advanced safety routines allow sensor failures to be detected within milliseconds. Also provided is the emergency contact switch to control an immediate shutdown.

Ease of Use

The D-5800 software is further improved at the user interface level. More graphic guidance, wizards and tools are added to make setup easier. The interface has been re-arranged to make it more logical and more useful. Event-Action Rules, Abort-Sensitivity, and numerous other new concepts are introduced in the software to simplify operation. A large number of test files are easily searched with the unique data base. The channel parameter can also be easily set with software setting of sensitivities of piezo-type accelerometers.

Time Synchronization between Multiple Modules

The D-5800 is built on IEEE 1588 time synchronization technology. The D-5800 modules on the same network can be synchronized with up to 100 ns accuracy, which guarantees ±1 degree cross channel phase match up to 20 kHz, thus making addition of another unit for 16ch or more easy. Also expanding from 4ch (standard) to 6 to 8ch can be easily done with purchase of a relevant license key.
Sine Control

Sine Control

Sine performs real-time closed loop control of swept sine vibration. All inputs are simultaneous and gap free. The drive signal uses step sizes as fine as 1 millionth of a Hertz to produce an almost continuous sweep. The control algorithms ensure stable control of electro-dynamic and hydraulic shakers with special techniques to address non-linear behavior.

Options: Sine on Random, Random on Random, Sine and Random on Random, Resonance Search, Track and Dwell, Transient Time History Control, Shock Response Spectrum, Real-time Spectrum Analysis & SRS Analysis, Re-Calibration

Data Base for Test Files

Stored test files are easily searched with the Data Base of the control software.

Application Software

<table>
<thead>
<tr>
<th>Model</th>
<th>D-5800</th>
<th>D-5801</th>
<th>D-5802</th>
<th>D-5803</th>
<th>D-5804</th>
<th>D-5805</th>
<th>D-5806</th>
<th>D-5807</th>
<th>D-5808</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSD Random</td>
<td>○</td>
<td>○</td>
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<td>○</td>
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<tr>
<td>Swept Sine</td>
<td>○</td>
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<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>Classical Shock</td>
<td>○</td>
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<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
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<tr>
<td>Long-time History</td>
<td>○</td>
<td>○</td>
<td></td>
<td>○</td>
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</tr>
</tbody>
</table>

Options: Sine on Random, Random on Random, Sine and Random on Random, Resonance Search, Track and Dwell, Transient Time History Control, Shock Response Spectrum, Real-time Spectrum Analysis & SRS Analysis, Re-Calibration

Typical Specifications

- Frequency Range: 0.4 to 4000 Hz standard
- Control Dynamic Range: Up to 100 dB
- Loop Time: Typically 10 μsec
- Control Accuracy: ±1 dB through a peak-notch with a Q of 50, at 1 octave/min.
- Profile Definition: Breakpoints and connecting lines in a table or Graphical change by dragging points on a plot
- Breakpoints: Defined as level or slope
- Sweeping Rate: Log 0.001 to 120 oct/min., Log 0.001 to 40 dec/min., Lin 0.001 to 120 Hz/s
- Sweep Rate Control: oct/min., Hz/sec., dec/min., sweep/min., sweep duration/sweeps, cycles/min.
- Tracking Filter: Proportional (bandwidth: 7% to 100% of drive frequency), Fixed (bandwidth: 1 Hz to 500 Hz).
- Alarm and Abort: Limits defined in dB or % relative to reference profile
- Drive Resolution: As fine as 0.0000001 Hz
- Related Optional Functions: Resonance Search, Track & Dwell, Multi-point Control, Displacement Control, Step Sine Control, Long Wave Record, Drive Limiting
Random Control

PSD Random Control <RANDOM>
Random performs real-time closed loop control of PSD profiles. All inputs are simultaneous and gap free. The drive signals are continuous true Gaussian random. Special control algorithms ensure stable control of electro-dynamic and hydraulic shakers and overcome non-linear behavior.

An Example of PSD Random Control

Typical Specifications
- Frequency Range: Real-time closed loop control up to 4000 Hz standard
- Control Dynamic Range: 65 dB
- Resolution: 225, 450, 900, and 1800 lines standard
- Loop Time: 12.5 ms for 2000Hz, 225 lines
- DoF: 2 to 1000
- Control Accuracy: ±1 dB at 99% confidence with 200 DoF
- Drive Clipping: 3 to 6 sigma or Disabled
- Profile Definition: Control profiles are defined by breakpoints and connecting lines in a table or graphically edited by dragging points on a plot.
- Breakpoints: Defined as level or slope
- Profile Scaling: Profile can be scaled using RMS value
- Profile Import: ASCII and other types of files (Refer to option VCS2-70)
- Related Optional Functions: Multi-point Control, High Resolution, Sine-on-Random, Random-on-Random

Shock Control

Classical Shock Control <SHOCK>
Classical Shock performs closed loop control of transient waveforms. All inputs are simultaneous and gap free. The control algorithms ensure stability with special techniques to address non-linear behavior. As a related optional function, the Transient Time History (TTH) is available for seismic simulation or the like.

An Example of Half-sine Shock Pulse Control

Typical Specifications
- Shock Wave Types: Half-sine, Haver-sine, Terminal-peak Saw-tooth, Initial-peak Saw-tooth, Triangle, Rectangle and Trapezoid
- Sampling Rate: Automatically calculated or selectable from the ranges up to 102.4kHz
- Block Size: 512 to 4096 points as standard, Large Block Size available up to 65,536 as option
- Pulse Duration: 1ms to 25,600 sec
- Shaker’s Limit Check: Calculation of maximum expected acceleration, velocity and displacement, checked against shaker’s limits

Typical Specifications
- File Format: ASCll delimited format (tab, comma or space) using Y values or X-Y data pairs, ASCII Universal File Format (UFF), and binary format.
- Frame Size: 256, 512, 1024, 2048 or 4096 as standard, up to 65,536 as Option
- Shaker’s Limit Check: Calculation of maximum expected acceleration, velocity and displacement, checked against shaker’s limits
- Data Editing: DC Cut, Data Window, Re-scale

Transient Time History <TTH>
This add-on module for the Classical Shock Control software reproduces arbitrary waveforms imported from disk files. TTH supports a wide range of data file types so these arbitrary waveforms can come from practically any data acquisition system or from data created artificially (e.g., from a spreadsheet program like Excel).