



DELTA-3N

DLI Watchman® DCX™ Hammerhead

Portable Vibration Data Collector & Machine Diagnostic Analyzer

DLI is pleased to introduce the DLI Watchman® DCX™ Hammerhead Portable Vibration Data Collector & Machine Diagnostic Analyzer. The DCX Hammerhead is a rugged, multi-channel, vibration data collector; it supports both triaxial and single axis sensors for acquiring data and performing vibration analysis applied to:

- Machinery Condition Monitoring
- Automatic Condition Assessment
- Bearing Detection & Diagnosis
- Process Parameter Monitoring
- Vibration Data Screening, Trending & Analysis



The Software

Embedded in the DCX is a Windows® XP Tablet operating system and DLI's popular ExpertALERT™, Intelligent Condition Assessment Software. All traditional host system functionality is integral to the DCX. This means that at the point of data collection, you have all of your machinery history, trend data, analysis tools and machine fault diagnostic results available to you!

The Hardware

The DCX employs a pen tablet PC built by Walkabout Computers, West Palm Beach, Florida. Walkabout is well-known for its "industrial strength" tablet computers. The new Hammerhead is extra-rugged; its enclosure is milled from billet aluminum. It can withstand the toughest plant environment up to 55 degrees C and can even be submersed in water (IP-67 rating)! Data collection is performed by simply selecting the equipment/test location from a hierarchical tree, by pressing a graphical button on a displayed machine image or by striking a bar-code label with the optional bar-code wand. Select tri-axial data format and view all three axes of vibration data simultaneously.



Standard Features

- **Four (4) Channel, simultaneous data acquisition**
 - > Windows® XP Tablet OS
 - > Embedded ExpertALERT™ software
 - > Database Setup Wizards
 - > Real Time Analysis
 - > Envelop Demodulation for Bearing Detection
 - > Run-up / Coast Down Measurements
 - > 256 megabytes RAM
 - Shock Mounted 40 gigabyte internal hard drive
- IP-67, Watertight & Dust-Resistant

Optional Features

- ExpertALERT Enterprise™ Upgrade for network applications
- Multi-plane Field Balancing
- Advanced Cross Channel Analysis with 3D Animation Software
- Online Data Acquisition Software
- Database Replication
- Stroboscope / Tachometer for Motion/Speed Analysis
- Current Clamp for Motor Current Signature Analysis
- Temperature / Pressure Monitoring
- Other process sensors available on request



DELIVERING MACHINE INTELLIGENCE

Specifications

Digital Signal Processing

- Texas Instruments TMS320C51 Digital Signal Processor (DSP), running @ 40 MHz
- Four 16 Bit delta-sigma A/D converters
- Simultaneous sampling of all four inputs up to 41 KHz
- Anti-aliasing via an analog RC filter plus a 64th order digital FIR filter
- Dynamic range greater than 85 dB
- Signal to noise ratio greater than 76 dB
- Overall RMS amplitude detection from 10 Hz to 1 kHz per ISO 2954-1975 (E)

Spectral Analysis

- Four channel, simultaneous FFT analysis of the analog input channels up to 16 kHz span
- FFT Resolution of: 50, 100, 200, 400, 800, 1600, and 3200 lines
- Spectral Windows: Hanning, Hamming, Flattop, and Uniform
- Averaging Types: Linear, Exponential, Peak-hold, and Peak-hold continuous
- Overlap processing; selectable overlaps of 0%, 25%, 50%, and 75%

Time Domain Analysis

- Long time record capture greater than 50k samples per channel (more if RAM is available), four channels simultaneously
- Sample rates from 1 Hz to 41 kHz Inputs
- Four single-ended analog inputs
- Selectable ICP accelerometer sources

Cable fault detection

- Input signal clipping detection (25 Volts maximum input signal amplitude)
- TTL-level tachometer input

Analog Signal Processing

- Selectable DC coupling or 0.2 Hz or 10 Hz high pass analog filtering
- Selectable single stage analog integration
- No more than -76 dB inter-channel cross talk

Triggering

- Internal
- Selectable from any analog input channel
- Level, slope, rising or falling edge
- External TTL trigger, rising or falling edge
- Pre or Post-triggering: 0 to 100% of capture

Physical

- Size: 11.25" x 8" x 1.5"
- Weight: 4.5 lbs including battery
- Fully machined from aircraft grade aluminum
- Sealed airtight and dust proof (vacuum tested)
- Chemically strengthened display cover glass
- Unique system for clamping circuit boards into position for improved durability
- Easy grip matte finish

Processor System Memory

- Intel Pentium III processor - 800 MHz with enhanced SpeedStep® technology
- 256 MB RAM
- 256 KB L2 cache

Video & Display

- 10.4" 800x600 active matrix transfective color display
- Rich color saturation and good contrast even in direct sunlight
- Full 32 bit local bus video and flat panel controller 1MB
- 2 MB video memory
- High visibility display glass

Hard Disk Storage

- Standard 40 GB shock mounted hard drive
- Drives use Ultra ATA interface with transfer rate up to 33.3 MB/sec
- All hard disk drives are shock mounted for maximum field reliability

Carrying Case

- Durable, shock-absorbing, insulating, molded foam case
- Computer fully dockable without removing case
- Shoulder and hand straps
- Rugged carrying handle
- Will not absorb fluids, fully washable

Power Consumption & Battery Life

- 2 1/4 hours continuous data collection (data acquisition card energized)
- 4 - 6 hour battery life with power management & Extended-life external battery (Item 8845)
- Full MS Advanced Power Management
- Photo sensor automatically turns off back light
- Will accept 12V DC direct input from vehicle
- Battery fast charge from empty in 2 hours
- Uses long-lasting low memory Lithium batteries
- Universal AC power adapter 110-250 volts, 50-60 Hz

BIOS & Software Compatibility

- Software compatibility assured using SystemSoft™ BIOS
- Source code maintained by WalkAbout Computers
- Standard with Windows XP Tablet and CIC HRS 5.0
- Electromagnetic Digitizer Technology
- Proximity sensing high resolution electromagnetic active pen with right mouse button
- No surface coatings can be damaged or wear with use
- More than 1000 dpi resolution
- Highly transmissive tempered glass for superior viewing

Environmental Specifications

- Temperature:
 - o Operating 0°C to 55°C
 - o Operating -20°C with optional LCD heater
 - o Storage -40°C to 70°C
- Shock: 100 G, 2 ms
- Three foot drop with rotating drive (in case)
- Vibration: 17 Grms (random vibration 6 axis)
- Enclosure (IP-67 rating):
 - o Sealed against rain & dust
 - o Submersible to six inches for five minutes
- Humidity: 0 to 100% condensing humidity

Specifications are subject to change without notice



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DLI Watchman® DCX™

Ordering Information

Standard Package (Item 2703)

- DCX™ Hammerhead Diagnostic Data Collector/Real Time Analyzer, tablet-style
- Sybase SQL Anywhere Database (Item 1090)
- Embedded ExpertALERT™ software (Item 1110)
- Four (4) Channel PCMCIA (Type III) Card with DSP (Item 2721)
- Triaxial Accelerometer with integral 4 foot cable (Item 6007)
- Ball Driver for Triaxial Accelerometer (Item 8573)
- AC Power Adapter/Internal Battery Charger (Item 8832)
- Two (2) Lithium Ion Batteries (Item 8835)
- DCX Protective Cover with Shoulder Strap and Accessory Pockets (Item 8837)
- Port Replicator with VGA, PS2, Serial and Parallel ports (Item 8844)
- External Extended-life Battery (Item 8845)
- CD-RW External Drive (USB) (Item 8858)
- USB-USB PC Connection Cable (Item 8859)
- USB Hub (4 ports) (Item 8860)
- ExpertALERT User Manual (Item 1119)
- DCX User Manual (Item 2772)
- Carrying Case for DCX (Item 2765)
- PS-2 Keyboard & USB Mouse

Training / Service / Support

- iLearn ExpertALERT/Vibration Interactive Training CD (Item 8670)
- On-site Training and System Setup (Item 9431)
- Vibration Principles and PdM Practices Training Course - 2 days (Item 9412)
- Advanced Vibration Analysis Techniques Training Course - 2-1/2 days (Item 9414)
- Introduction to ExpertALERT Training Course - 2 days (Item 9416)
- Advanced ExpertALERT Training Course - 2-1/2 days (Item 9418)
- Off site Database Audit/Review with analysis of machine condition (Item 9462)
- One or three year Extended Warranty Support Plans for DCX and/or ExpertALERT (Items 1310/1311/3470/3471)

Optional Accessories

- Additional ExpertALERT software for desktop PC (Item 1114/1118)
- Replication Wizard (Item 1127)

Note: one copy required for each computer a replicating database is installed on

- ExpertALERT Enterprise™ upgrade for network applications (Item 1129)
- Multi-plane Balancing Kit with software & hardware accessory package (Item 8800)
- DCX Online™ Data Acquisition software (Item 1150)
- Signal AQ Advanced Multi-channel Analysis software (Item 1160)
- Visual ODS Pro™ for animating machine deflection patterns (Item 1180)
- Four (4) Channel Signal Input Cable with BNC plugs (Item 2719)
- Magnet, Rare Earth, 10-32 tapped hole for Triaxial Accelerometer w/ Notch (Item 8596)
- PR-2 Precision Reference™ Source with external controls (Item 4020)
- Clamp on AC Current Transducer for motor current analysis (Item 8525-DCXHH)
- Digital Strobe Tachometer /115V (Item 4100-DCXHH) or 230V (Item 4105-DCXHH)
- Infrared Thermometer (Item 4200-DCXHH)
- Infrared Tachometer Pickup with power supply for DCX (Item 4401-DCXHH)
- Infrared Tachometer extension cable - specify cable length in feet, XX (Item 4430-XX)
- Attachment Pads for Triaxial Accelerometer - Qty: 100 (Item 4300-1)
- Barcode Labels - Qty: 100 (Item 4320-1)
- Adhesive Kit for attachments pads and barcode labels (Item 4350)
- Single Axis Accelerometer, general purpose (Item 6040)
- Magnetic Mounting Base for single axis accelerometers (Item 8591)
- Keyphasor Buffer Cable (Item 6355)
- USB/Ethernet Adapter (Item 8848)



DELIVERING MACHINE INTELLIGENCE



DCX, Diagnostic Data Collector/ Field Analyzer



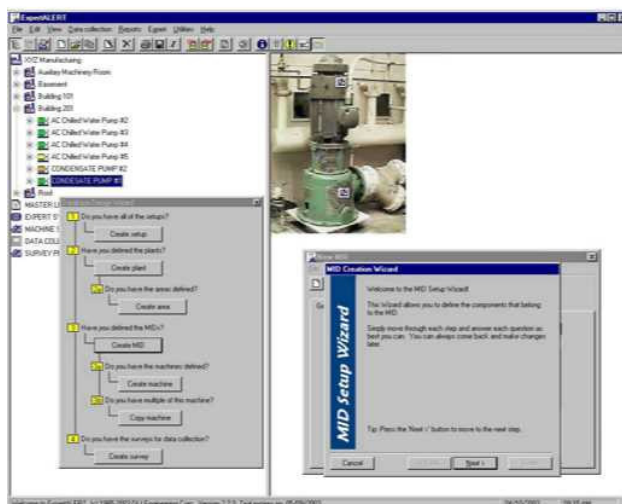
AQ204, Four Channel Data Acquisition PC Card



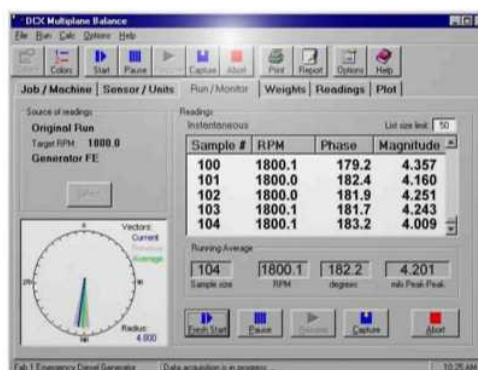
Attachment Pads for collecting repeatable vibration data



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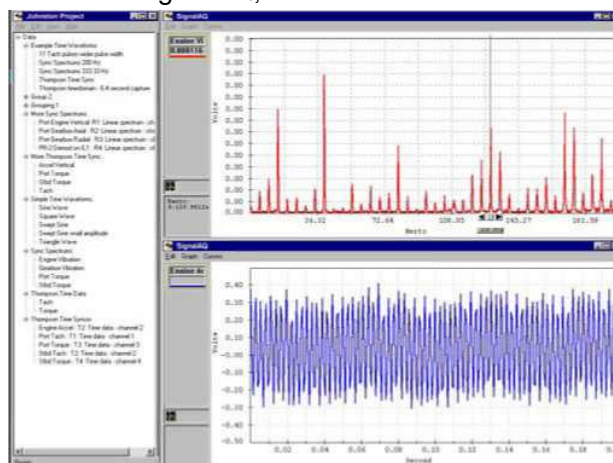


ExpertALERT™ Intelligent Condition Assessment



Software

DCX Multi-plane Balancing Software
Signal AQ, Advanced Vibration



Analysis Software

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