



# B&W Engineering Corp.

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## BW-LPD-DAQ4000 PARTICLE IMPACT NOISE DETECTOR

## Features

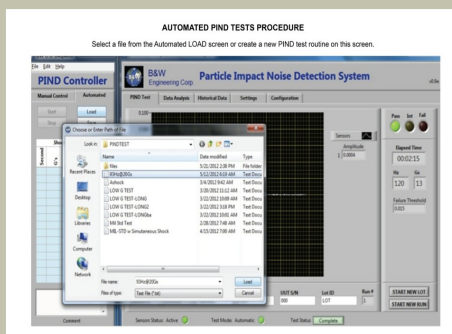


PC Controlled PIND Tester on test bench

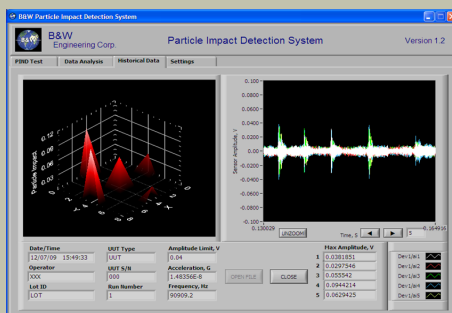
B&W Engineering Corp. is proud to present the next generation in Particle Impact Noise Detection (PIND). With the advent of economical high performance data acquisition and control products and the PCs with their intuitive graphical interface, B&W has developed the most advanced and reliable PIND system available. The ease of use of the BW-LPD-DAQ4000 software and the workhorse reliability of over 30 years of the shaker and sensors ensure this PIND tester will be on the job for many years.

Until now there has been no significant improvement to the PIND test systems. Now the particle (or interference) is recorded in digital format and can be easily recalled for post test analysis. This advancement finally provides the ability to distinguish a particle from other noise that the PIND system has detected. The optional Transient Detector is another failsafe, detecting interference from stray RF, EMI and other sources present in lab.

The BW-LPD-DAQ4000 is designed to detect loose particles in all kinds of products from your smallest integrated and discrete components to your largest hybrids and subassembly packages. With speed and accuracy critical to your bottom line, the BW-LPD-DAQ4000 allows you to quickly select your test of choice and begin automatically testing without fiddling with knobs or entering complicated programming steps.



The BW-LPD-DAQ4000 comes pre-programmed to meet or exceed MIL-STD -883 Method 2020 for hybrids and MIL-STD 750 Method 2052 and provides the option to store the results of each test run.

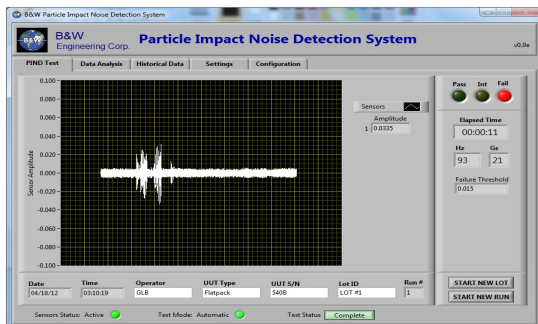


- Computer based controller with predefined MIL-STD test sequences stored (New)
- Create unlimited custom tests with multiple vibration frequencies and acceleration and other parameters to meet unique requirements (New)
- Easily store and recall custom tests (New)
- Continuous on screen display of test noise, frequency, vibration level, time and device serial and lot numbers, etc. for test reports
- A custom shaker capable of testing packages up to 5kg/10lbs at 20gs
- A custom test platen with up to 5 particle detection sensors
- On screen monitoring of signals created by loose particles
- On screen indicator signals particle detections
- Stops the test when particle noise threshold is exceeded (user selectable)
- Easily store and recall test results (New)
- Supports both fully automatic and manual operation modes
- Sensitivity Test Unit (STU) provided to verify MIL-STD compliance



# BW-LPD-DAQ4000 Particle Impact Noise Detector

B&W Engineering Corporation introduces a new generation in Particle Impact Noise Detection systems, the **BW-LPD-DAQ4000**. Our new test system is the one you will need to accurately test cavity devices for particle contamination with the ease you want and the reliability and precision you require.



Programming of the new **BW-LPD-DAQ4000** is so simple that any operator can be trained with ease. Our new PC controller provides the flexibility to comply with the evolving MIL-STDs, or your in-house tests at no additional cost. The constant digital displayed frequency and acceleration may be set by the user or, password protected allowing only engineering personnel to change the program.

After mounting the device with either the ultrasonic couplant or tape dots supplied, simply depress the footswitch, and programmed tests will begin. Throughput can exceed 200 parts per hour. Production is enhanced and your product is protected by using the optional PIND station Test Bench with ESD work surface and operator grounding.

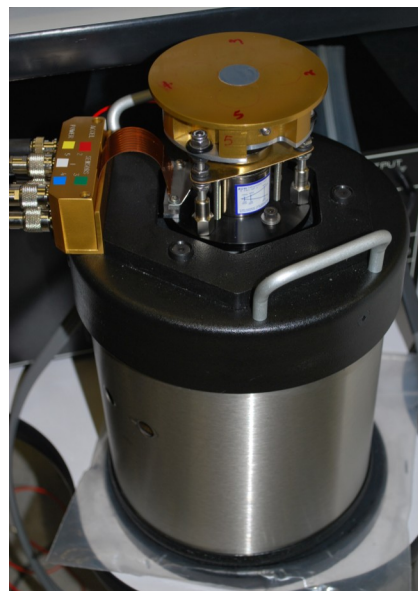
Any signal derived from loose particles is transmitted by our patented Particle Sensor with built-in pre-amplifier. The pre-amplification allows low impedance signal transmission which does away with interference caused by cable noise etc., the assembly is acoustically isolated to suppress the reception of mechanical noise.

The optional Transient Detector provides an independent sensor which detects environmental failure stimulus (RFI/EMI) so that you can be reassured that only devices with particles are rejected. The detection of such stimuli is presented on the INF Indicator.

Our patented PIND Shock Test Fixture produces true co-test shocks with or without stopping the vibration. Select the shock application on the controller screen - in the **DYNAMIC**, (A) position the shock is applied simultaneously with the vibration. The vibrations stops for less than 250 milliseconds during the shock while in the **STATIC**, (B) position.

As a standard feature B&W supplies a 100 force pound vibration shaker which can test devices up to one pound.

Sinusoidal vibration between 40Hz and 250Hz is standard and may be lowered to 27Hz at no additional cost with the click of a button. You may also frequency sweep through this range during the test. G level is accurate throughout the frequency range. The magnitude and frequency are constantly presented on the digital displays.



The degaussing magnet on our 100 force pound shaker reduces the magnetic field at the **Device Under Test (DUT)** location to less than 5 gauss to ensure the detection of ferrous particles. The co-test shock fixtures allows shocking with vibration.

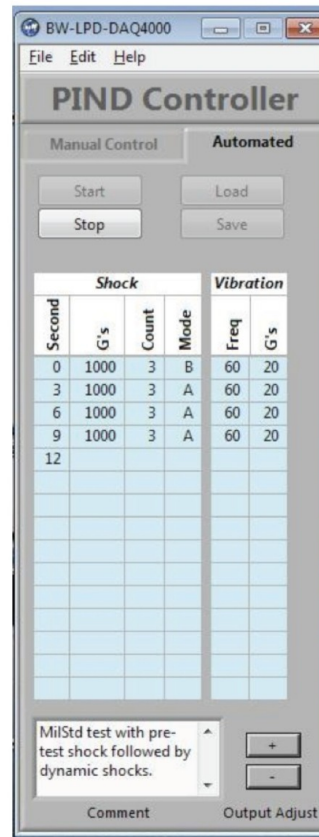
Any noise bursts as detected by any one of the three detection systems is cause for the device to be rejected. You may discover these defects visually as spikes on the oscilloscope screen, audibly as clicks or pops on the speaker, or by simply observing a lit threshold detector **FAIL** indication. Although the **FAIL** acts as the prime failure indicator, the other indicators provide useful evidence in failure analysis.

To assist in your evaluation of devices, we recommend that you retain two samples of each device type as “check units”. One of these devices should be known to be free of particles; the other seeded with particles of the type expected to be the most prevalent in that package and of minimum size. You will use these two samples to evaluate the mounting means, confirm the vibration frequency to be used, and to identify any noises generated by other than loose particles. The device should be visually inspected for cleanliness immediately prior to performing the PIND test.

Devices that are particularly prone to particle contamination can be decontaminated by a PIND test immediately prior to final seal. The product manufacturer can apply this type of test in all production processes to help determine weld schedules, sealing techniques, cleaning processes, and other means of controlling contamination.

Each of our systems comes with a full one year warranty, Calibration Certification in accordance with ANSI-Z540, MIL-STD-45662A and meets or exceeds all the requirements of MIL-STD-883, 750, and 202 for PIND. The Maintenance Manual contains all calibration procedures and outlines the instruments required. A well equipped calibration lab will have adequate instruments for most procedures. B&W Engineering provides complete system calibration including preventative maintenance and is completed typically within 5 days from receipt. Sensors are completed within 3 days.

## PIND CONTROLLER AUTOMATIC MODE



Or you can make the following selections below:

Example 1:

**SAVE:** Opens a file save dialog box  
**LOAD:** Opens a file open dialog box

**Parameter Limits:**

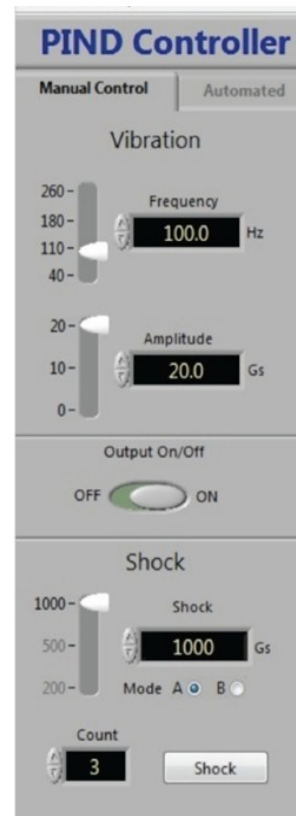
**Shock:**  
 G's – 200, 500, 100  
 Count – 1,2,3,4  
 Mode – A, B  
 • Mode A Shock is simultaneous with vibration.  
 • Mode B Shock stops the vibration briefly (<250 milliseconds).

**Vibration:**  
 Frequency – 40 – 260Hz in 1Hz increments  
 G's – 0 – 20Gs in .1G increments

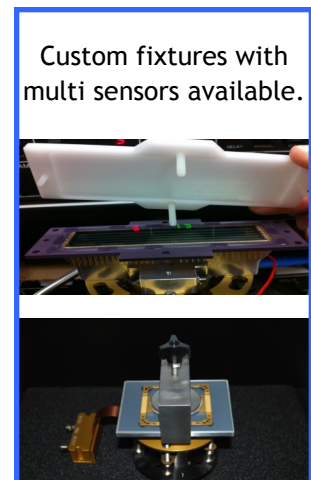
Example 2:

- When configured with solenoid shock, use shock mode B in first step to administer pre-shock.
- When configured with solenoid shock, all shock will be administered at the same pre-calibrated G force; typically 1000 G's.
- A Value of 0 (zero) for Vibration G's terminates a test.
- Vibrations entry is not allowed for any step without a second (left column) entry.
- Unless left blank, step times must be increased by at least one second for each entry.
- When using the armature, the behavior is the same as mode B.
- Unless muted, vibration is continuous (same Hz and G's) until the next vibration step is executed.

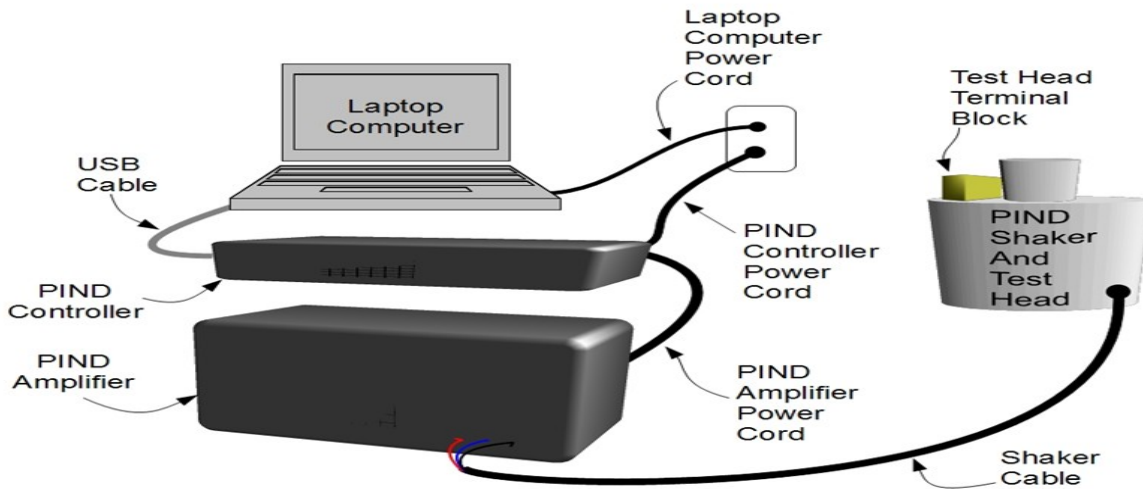
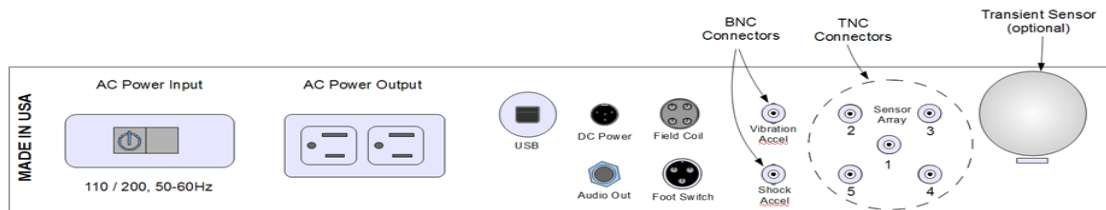
## PIND CONTROLLER MANUAL MODE



The versatile Manual Mode is useful for experiments and can apply a vibration frequency sweep (to find resonances that make particle type noise) and apply shocks simultaneous with or without vibration. The shock level, count and application can be chosen. In Manual Mode the user has complete control over Vibration frequency and acceleration level and the shock.



Custom fixtures with multi sensors available.



**SPECIFICATIONS: PARTICLE IMPACT NOISE DETECTOR  
BW-LPD-DAQ4000**

**CONTROLLER:**

TYPE.....PC WINDOWS XP or HIGHER

**SHOCK:**

SEQUENCE.....PROGRAMMABLE TEST

DURATION.....INFINITE PROGRAMMABLE

INTERFACE.....CUSTOM USB DATA ACQUISITION AND CONTROL

**VIBRATION:**

FREQUENCY.....SINE WAVE 27Hz TO265Hz

ACCELERATION.....0 TO 20G PEAK

SHAKER.....100 FORCE LBS., 0.75 IN. STROKE,  
75 IN.PER/SEC VELOCITY

AMPLIFIER.....250 WATTS MINIMUM

D.U.T. WEIGHT.....200 GRAMS PRACTICAL LIMIT @ 20G

**SHOCK:**

DURATION.....LESS THAN 100 MICROSECONDS HALF SINE

AMPLITUDE.....TYPICAL 1000 ± 200 G

APPLICATION.....AUTO OR MANUAL WITH OR WITHOUT  
SIMULTANEOUS VIBRATION

AXIS.....SAME AS VIBRATION

**DETECTION:**

ULTRASONIC TRANSDUCER.....SENSITIVITY= -77.5 ± 3dB re  
1 VOLT per μBAR @ 155 ± 5KHz

AMPLIFIER......60 ± 2dB @ 155 ± 5KHz  
WITH LESS THAN 10mV PEAK NOISE

THRESHOLD DETECTOR.....ADJUSTABLE 0 - INFINITE

**OUTPUTS:**

ACCELERATION..... 2.5 DIGIT DISPLAY

FREQUENCY.....2 DIGIT DISPLAY

THRESHOLD DETECTOR.....RED DISPLAY "FAIL"

TEST COMPLETE.....GREEN DISPLAY "TEST COMPLETE"

TEST TIME.....PROGRAMMABLE DIGITAL CLOCK

SHOCK MULTIPLIER TIMES.....1 DIGIT DISPLAY

SHOCK LEVEL DISPLAY.....4 DIGIT DISPLAY

TRANSIENT DETECTOR (OPTIONAL).....YELLOW DISPLAY

SPEAKER.....INTEGRAL PC OR EXTERNAL

OSCILLOSCOPE.....INTEGRAL PC VERTICAL = 20mV per CM,  
HORIZ. » 200mV per G

**DIMENSIONS / WEIGHT:**

LAPTOP.....APPROX. 15"W x 10"H x 1.5"D, 6 LBS.

INTERFACE.....18"W x 3.5"H x 16"D, 20 LBS.

SHAKER.....10"H x 8"DIA., 50 LBS.

AMPLIFIER.....15"W x 7"H x 10"D, 24 LBS.

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