

We have one goal — improving the noise and vibration quality of our customers' products. Roush delivers innovative, effective noise and vibration control solutions. By combining advanced analysis capabilities, comprehensive engineering services, and state-of-the-art facilities, Roush has become a proven partner in identifying and resolving challenging noise and vibration issues. Backed by the diverse capabilities of the Roush family of companies, we are uniquely equipped to provide turnkey noise and vibration solutions.

Roush... your silent partner in developing smoother, quieter products.

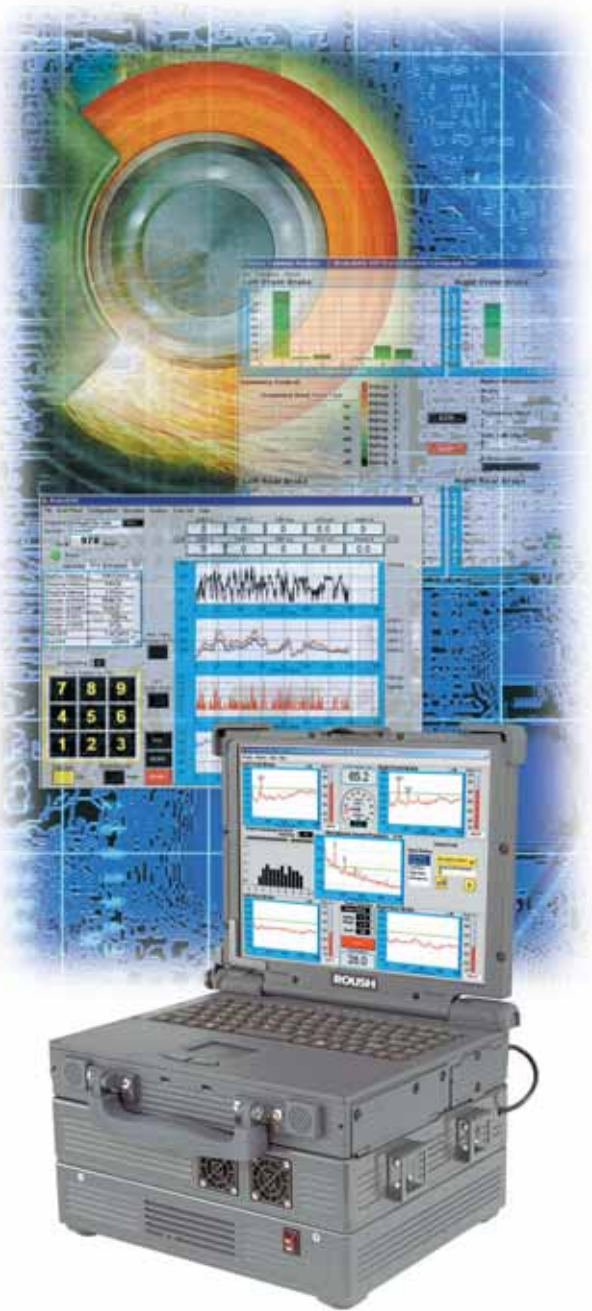
BrakeDAQ® G3 System

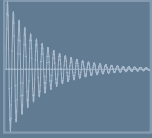
The philosophy behind the design of Roush's third generation BrakeDAQ® (G3) is simplicity, reliability and speed. A tap on the brake while the vehicle is in motion is all that is required to initiate a data capture and the subsequent post-processing and display of relevant data. Automated brake noise characterization is achieved with a proprietary algorithm that matches each brake's vibration spectrum with the corresponding interior noise characteristics to define a brake self-noise event.

BrakeDAQ (G3) is also equipped to run brake performance tests. Data initiation, data capture and channel configuration are based on the same underlying philosophy of the noise module.

System Features:

- BrakeDAQ® software provides a robust set of features including:
 - User-friendly graphical interface
 - User Interface, channel definitions, test parameters, test summary, and file I/O are user configurable
 - Graphs and digital displays of data as it is collected
 - Comprehensive replay screen allowing review of data collection with spectral information
 - Noise and performance data acquisition system
 - User-friendly interface to run performance tests such as FMVSS 105/135
 - EzVIEW is an optional stand alone application that further enhances BrakeDAQ's data visualization and processing capabilities
- Embedded PC, data acquisition devices, and signal conditioners incorporated in a single rugged chassis
- Consolidated front panel that provides easy access to all input connections

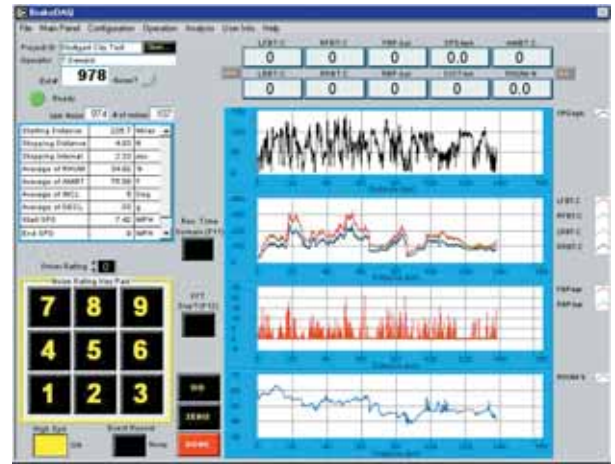




ENGINEERING TEST TOOLS

BrakeDAQ® (G3) Setup

Safe operation demands simple controls. BrakeDAQ® offers customizable on-road displays, which are presented on a huge 17" flat screen display. Important quantities such as speed, braking pressure, brake temperature and relative humidity can be graphically presented and up to 20 on-screen digital indicators can be assigned to monitor many other important quantities. The driver's display can be configured to show a statistical summary of the previous stop, to offer a driver comments and queues display, and to provide a facility to collect the subjective rating of the driver for each stop via an on-screen mouse pad.



Typical configuration of the main front panel.

BrakeDAQ® was designed for brake engineers by brake engineers. A compilation of years of our own testing know-how, BrakeDAQ offers straightforward configuration, intuitive channel setup and signal verification utilities.



Signal handling and test control settings are organized onto a single easy-to-use control panel.



Channel configuration is now a snap in BrakeDAQ (G3).

Each data channel can be verified — time domain verification for all the analog channels and time and frequency domain verification for dynamic channels.

BrakeDAQ in Replay Mode

A good instrument should provide answers fast. BrakeDAQ's Replay mode permits all of the data from the last day, hour or minute to be reviewed on command. Each brake noise event is analyzed for spectral structure and correlation to brake vibration. BrakeDAQ will identify peaks in the spectra and point out the offending wheel. It will also rate each sub-event according to a user-specified noise table, which facilitates later sorting and comparison.

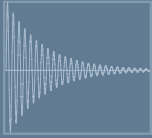


BrakeDAQ in Replay mode provides immediate review of detailed test data. A large software buffer allows a virtually unlimited number of brake events to be rapidly stacked up while processing proceeds in parallel, making instant data review possible.



Also available in Replay, BrakeDAQ's summary page gives a statistical overview of past noise events.

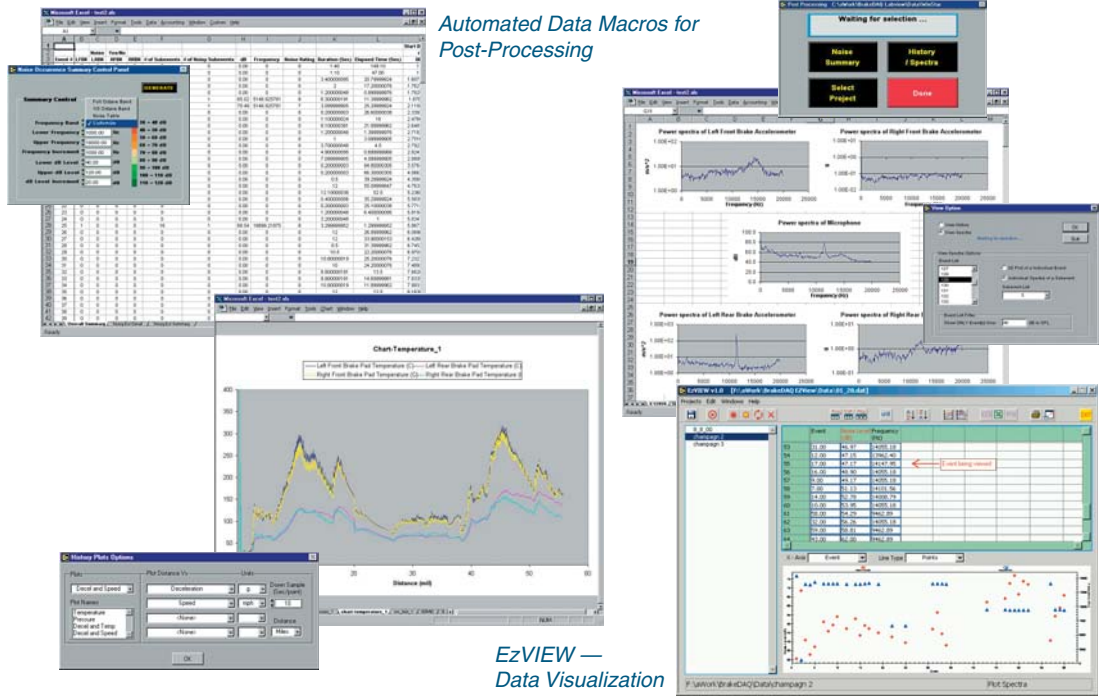
Furthermore, Replay is designed to run separately from the hardware and can be loaded free-of-charge on any PC already equipped with LabVIEW software. Just plug BrakeDAQ into the network, download your data, and get to work on your analysis while you send the hardware out for another run.



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Post Processing and Advanced Data Visualization

With the touch of a button, BrakeDAQ links to Microsoft® Excel and exports project data to formatted worksheets. Pre-defined Excel macros launched from LabVIEW provide standardized, report-ready output. Harnessing Excel gives you unlimited opportunity to customize and automate all of your formal reporting tasks.



Automated Data Macros for Post-Processing

EzVIEW — Data Visualization

Customization

Although we've designed BrakeDAQ to be the most comprehensive brake NVH instrument available, we know that unique customer requirements are inevitable. If there is a special requirement, it can easily be accommodated. With BrakeDAQ now maintained in LabVIEW's patented graphical programming language, we can usually turn around a customized version in a few days rather than the weeks text-based languages typically require.



The professional software engineers of the Roush Test and Measurement Group develop and maintain all of Roush's custom software solutions and commercial software products.

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