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# Bloomy Solutions

For Automated Test, Data Acquisition, and Control Users

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## LabVIEW and TEDS Streamline Automotive R&D

by Peter Blume and Lesley Cannon, Bloomy Controls  
and Robert Greene, NSK Steering Systems America Inc.

Automation can help you overcome the roadblocks of manual, time-consuming tests and processes, and outdated equipment and technologies.

*Free download: Running Average.vi maintains a running average of data in your LabVIEW application, page 3.*

Bloomy Controls is a National Instruments Select Alliance Partner and a Registered Member of the Control and Information System Integrators Association. We can help you form an automation strategy to address your current test, data acquisition, and control needs, while keeping your future goals in mind. We partner with you to examine your challenges and identify opportunities where automation can increase your productivity, improve quality, and reduce costs. We help you develop and implement high-performance software and systems that scale from research to design to manufacturing. We provide training, so you can take advantage of and maintain the system's full functionality.

Contact our office nearest you to put our experienced team to work for you. ↗

NSK Steering Systems America Inc. (NSK) manufactures steering systems for vehicle and cockpit manufacturers. Its R&D laboratory in Bennington, VT, performs a wide variety of mechanical testing on steering columns. Most tests involve applying a load or torque to a steering column and measuring the corresponding linear or angular displacement of the unit. A variety of steering column designs, in varying states of assembly, is tested on several different test stations. The wide array of tests requires a vast assortment of load cells, torque meters, and displacement transducers.

To accommodate the different transducers, NSK developed separate data acquisition software applications for each transducer/test combination. An engineer had to manually edit transducer range and calibration data hard-coded within the software. This mass duplication, distribution, and editing of source code created reliability and repeatability issues. Additionally, user interfaces became inconsistent, increasing the time required to train operators.

To streamline the maintenance and control of the data acquisition software, NSK contracted Bloomy Controls. Using LabVIEW and IEEE 1451.4 standard format and virtual transducer electronic data sheets (TEDS), Bloomy Controls created applications that easily supported transducer interchangeability and provided reliable storage of calibration data.

### Hardware

Bloomy Controls began by replacing several legacy data acquisition boards in NSK's existing system with one National Instruments (NI) M Series PCI-6221 data acquisition card, reducing the cost and complexity of the system. The PCI-6221 performs both analog voltage and quadrature encoder measurements. Analog transducer conditioning is accomplished using the existing NI 5B signal conditioning in an NI SC-2311 carrier. By simply treating each module channel as high-level  $\pm 5 V_{DC}$  analog input

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Figure 1. To test the bending stiffness of a shift cable holding bracket, the S-shaped load transducer (left) measures applied load while the dial indicator (right) measures displacement as the bracket flexes. Both devices are candidates for TEDS. Photo courtesy of NSK Steering Systems America Inc.

*Don't miss the June 7 Automated Test Summit 2005 in Chelmsford, MA, page 3.*





## Results

Bloomy Controls replaced dozens of applications in NSK's R&D laboratory with two flexible, easy-to-use LabVIEW applications. Operators can configure new transducers for their ever changing test requirements without editing the source code. Transducers can be interchanged or replaced as test requirements demand or hardware failure necessitates. Each test station maintains a folder of Virtual TEDS files allowing transducers to be interchanged between stations and accurately calibrated at the stations where they are applied. Time is saved in not having to develop new software for every new test requirement, and test stations are now easily replicated. Consistent user interfaces reduce operator error and training requirements. Overall efficiency in the R&D laboratory has increased with less time being spent searching for the correct version of an application or trying to determine the proper calibration data. ↪

*Use LabVIEW and TEDS to simplify your test lab. Contact Bob Hamburger (860) 298-9925 or [inquiry@bloomy.com](mailto:inquiry@bloomy.com) to discuss your needs.*

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