

NI Sound Power System™

NI Sound Power System

Application Features

Real-Time third-octave analysis from
25 Hz to 20 kHz
Type 1 sound level meter
800 line FFT with zoom FFT
12,800 line FFT with prominent
tone analysis
Configurations for ISO 7779 and
other free-field sound power standards
Microphone calibration and position
configuration setup routines included
Parallelepiped, hemispheric, and
spherical measurement surfaces
handled
Leading multiplexers handled

Application Benefits

Ready-to-run application – no
programming required source
code to develop custom functions
Comprehensive documentation
for device-under-test
Automated calibration routine
for multiple microphones
Tabular screen display of sound
power and sound pressure
data and results
Comprehensive measurement results
exported to Microsoft Excel
Single page certificate-style
test report

NEW!



Overview

The National Instruments Sound Power System (SPS) includes low-cost, ready-to-run application program designed for noise emission testing in free-field test environments. It incorporates PC-based instruments with LabVIEW™-based application code to provide sound power and sound pressure measurements. The SPS is an ideal solution if you are performing ISO 7779 measurements and is also useful in a wide range of other acoustic applications. With the SPS, you can begin acquiring data immediately in your acoustic lab.

Supported Standards

The NI Sound Power System handles the following standards:

- Sound power measurement in free-field test environments with configuration flexibility to meet requirements of ISO 7779, ECMA-74, ISO 3744, and ISO 3745
- Sound pressure-level measurements in accordance with ISO 7779 and ECMA-74
- Prominent tone analysis via tone-to-noise ratio method as defined in ISO 7779 and ECMA-74
- Prominent tone analysis via prominence ratio method as defined in ANSI S1.13
- Impulsive noise analysis as defined in ISO 7779 and ECMA-74

Typical System Configuration

A typical configuration consists of the following products, which you must purchase separately.

- Pentium PC running Microsoft Windows 2000/NT/9x with a minimum of 64 MB RAM and 50 MB hard disk space
- SPS Software*

- LabVIEW Professional Development System*
- LabVIEW Sound and Vibration Toolset*
- NI 455x DSA instrument board*
- Real-Time Octave Analysis software*
- GPIB Board – optional*
- Microsoft Excel
- Microphone(s)
- Multiplexer(s) – optional

*products offered by National Instruments

NI Sound Power System Software

The SPS software consists of a stand-alone application targeted to the measurements of product noise emissions in free-field test environments.

You can choose between two different software packages.

- Sound Power User Software – executable version
- Sound Power Developer Software – executable version and source code.

With the LabVIEW Professional Development System and the LabVIEW Sound and Vibration Toolset, you can make changes to the source code and recompile it into a new executable. Both the executable and the source code offer the same functionality.

Instrument and Measurement Configuration

With menu-based configuration routines, you can configure instrumentation and measurement parameters including a virtual acoustic instrument. Configuration settings include selection of the board, setup of system microphones, and selection of microphone multiplexers.

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With sound power and sound pressure level measurement configuration routines, you select the number of positions to be measured, measurement times, and configure ambient and environmental corrections.

Microphone Calibration

Both versions of the SPS software provide a calibration routine that automates the process of calibrating several microphones and provides tools to assist users in maintaining control over the calibration process. With audio feedback, multiple microphones can be calibrated by a single technician.

The SPS software tracks calibration parameters for microphone sensitivity and frequency response. Using a built-in control chart, out-of-range conditions are indicated before they have a chance to affect the measurement data.

Measurements

The core functionality of the SPS software is the measurement of sound power and sound pressure levels. The automated routine samples the system microphones, records the data, and conducts the analysis to measure 1/3 octave band, A-weighted, and linear levels over a user-selectable frequency range of 25 Hz to 20 kHz. The sound pressure level routine includes sound quality analysis for impulsive noise and prominent tones. The prominent tone analysis routine conducts analysis of potential tones by both the tone-to-noise and prominence ratio methods. A powerful 12,800 line FFT is used to speed up the analysis by eliminating the need for constantly zooming the FFT.

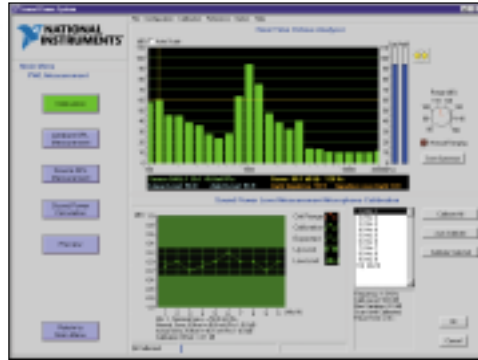
Test Reporting and Documentation

The SPS software provides an extensive routine for documenting the device-under-test. We provide forms for test information, source documentation, and recording of meteorological conditions. With six user-definable fields, you can document custom test parameters. All test documentation is exported along with the test data into a Microsoft Excel spreadsheet. Therefore, you can use Microsoft Excel and other Microsoft Office tools to generate custom reports based on the SPS data. A standard certificate-style report template is generated.

DSA Instrument Board

The NI 4551 and NI 4552 dynamic signal analyzer (DSA) boards are high-performance, high accuracy, computer-based dynamic signal analyzers for the PCI bus. The measurement capabilities of these DSA boards include:

- Two or four channels
- 95 kHz DSA with real-time zoom
- FFT resolution – 100, 200, 400, 800, 1,600 lines
- Time and measurement capture to disk
- Overload detection



The microphone calibration front panel displays calibration results, both graphically and numerically.

- 90 dB dynamic range
- 16-bit ADC
- 32 digital I/O lines
- Analog and digital triggering
- Input gain adjustable for over a 70 dB range

For the current version of the software, we recommend the NI 4551 which has two input channels and two output channels. If you need more than two input channels (e.g. four microphones directly connected to the system or three multiplexers), then we recommend the NI 4552.

Real-Time Octave Analysis Software

The Real-Time Octave Analysis software is add-on software for use with NI-455x DSA boards for fractional octave and sound level measurements. Following is a list of features included in the analysis software:

- Full, 1/2, 1/3 octave analysis
- Third-octave analysis from 25 Hz to 20 kHz
- Equivalent continuous sound pressure level (Leq)
- Exponential averaged sound pressure level
- A-weighted Impulsive sound pressure level
- Type 1 compliant
- A, B, C weighting

LabVIEW Professional Development System

The LabVIEW Professional Development System (PDS) includes the LabVIEW Full Development System plus the LabVIEW Application Builder for building stand-alone executables and creating distribution kits. The LabVIEW PDS also furnishes source code control tools and offers utilities for quantitatively measuring the complexity of your applications.

LabVIEW Sound and Vibration Toolset

The Sound and Vibration Toolset extends LabVIEW with functions and indicators for handling engineering units, calibration,

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frequency analysis, transient analysis, sound-level measurements, and fractional-octave analysis. With the toolset, you have a customizable software foundation with which to build custom sound and vibration applications.

Multiplexer

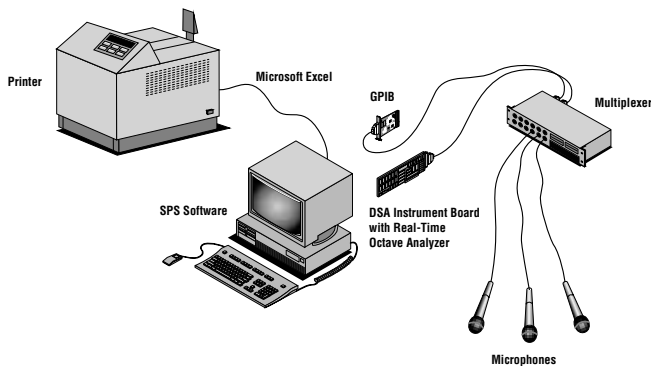
The SPS handles the Bruel & Kjaer Type 2811 and Type 2822 multiplexers, and the Larson-Davis Model 2210 multiplexer. You need a GPIB (IEEE-488) board to control the Bruel & Kjaer multiplexer.

PCI-GPIB

The PCI-GPIB is a high-performance Plug and Play IEEE 488 interface for personal computers and workstations equipped with PCI expansion slots.

Microphone

You can use any microphone(s) designed for sound level measurements in accordance with IEC Type 1 with the NI Sound Power System.



Sound Power System Configuration diagram

Worldwide Technical Support and Services

National Instruments strives to provide you with superior technical assistance worldwide. As a registered user of National Instruments products, you are entitled to our extensive online technical support resources, located on our Web site at ni.com/support. Our technical support resources include comprehensive KnowledgeBase, troubleshooting wizards, example programs database, and driver and updates library.

Standard technical support gives you direct access to our Applications Engineers to help you get up and running with your National Instruments products. Standard support is free with purchase of hardware or the Sound Power User Software. For your expanded support needs, we also offer a variety of fee-based support services including priority access to product specialist, software maintenance, and on-site startup assistance.

SPS Services and Support

When you purchase the Sound Power User Software, you receive free telephone technical support for one year. When you purchase the Sound Power Developer Software, you can purchase a fee-based contract for telephone support for the source code version. Both versions of the software include free one-year telephone support for the installation and functioning of National Instruments hardware products.

Hardware and Software Services

To ensure that your application takes advantage of the latest developments in measurement and automation, we offer fee-based hardware and software support and maintenance programs to keep your products up-to-date with the latest features and minimize downtime. These programs include extended services such as extended warranties, calibration, and software subscription programs.

Installation and Training

Two-day on-site installation and training is available in the U.S. and Canada. This includes installation of the plug-in board hardware, application software, and connection to multiplexer and microphones. The training includes a tutorial of the application software from configuration to report generation. For customers outside the U.S. and Canada, please contact your local National Instruments representative for information on pricing and availability.

Ordering Information

Step 1. Select your software application package.

Sound Power User Software	778121-03
SPS executable (does not require LabVIEW)	
Sound Power Developer Software	778122-03
SPS executable and source code software	
LabVIEW	
Professional Development System*	776678-03
Sound and Vibration Toolset*	777970-03
*Required for the Sound Power Developer Software	
Real-time Octave Analysis	
Software**	777728-01

**Only 1 needed per development computer.

Step 2. Select your hardware.

NI 4551 for PCI	777726-01
NI 4552 for PCI	777727-01
PCI-GPIB and NI-488.2M [®] for Windows 2000/NT/9x	
and 2 m GPIB cable**	777158-51

***Only required if you are using a Bruel & Kjaer multiplexer.

Sound Power System

National Instruments strives to provide you with quality technical assistance worldwide. We currently offer electronic technical support along with our technical support centers staffed by Applications Engineers.

Access information from our Web site at ni.com. Our FTP site is dedicated to 24-hour support, with a collection of files and documents to answer your questions. Log on to our Internet host at [ftp.natinst.com](ftp://ftp.natinst.com)

Warranty

All National Instruments data acquisition, computer-based instrument, VXIbus, and MXIbus products are covered by a one-year warranty. GPIB hardware products are covered by a two-year warranty from the date of shipment. The warranty covers board failures, components, cables, connectors, and switches, but does not cover faults caused by misuse. The owner may return a failed assembly to National Instruments for repair during the warranty period. Extended warranties are available at an additional charge.

Information furnished by National Instruments is believed to be accurate and reliable. National Instruments reserves the right to change product specifications without notice.

Customer Education

National Instruments is committed to offering training that permits you to get the best possible use of your National Instruments products and minimize startup time. We provide alternatives to meet your training needs from self-paced tutorials and interactive CDs to instructor-led courses. We offer courses that help you take advantage of your measurement and automation system. These courses are available in several programming environments. Topics include LabVIEW and NI hardware products.

Alliance Program

The National Instruments Alliance Program offers benefits to users, integrators, and developers. Users who have time constraints can rely on a vast network of Alliance Program members to provide consulting or integration services. National Instruments offers Alliance Program members a valuable portfolio of sales, marketing, and technical benefits designed to give tangible results. For more information on Alliance Program membership, please visit ni.com/alliance



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