# NoiseTutor

**Tutor [too-ter]**
- to have the guardianship, instruction, or care of.

## The Larson Davis Rapid Deployment Noise Monitoring System

### Highlights

- Rapid deployment
- Emailed reports and event notification
- Full data for advanced analysis
- Web publication made easy
- Leverage existing infrastructure
- Remote administration
- User control of system and data

### Applications

- Environmental Noise Monitoring
- Construction Noise
- Wind Farm Environmental Impact
- Short/Medium Term Noise Consulting Projects

### Rapid Deployment

- Set up in the office including email recipient list, operational mode, graphing and data transmission options.
- In the field: launch system, connect to internet – GO!

### Flexible Communication

- On-line publication
- Email update
- Daily data file to central server



noisetutor.pcb.com

**NEW, Improved Lithium Battery**
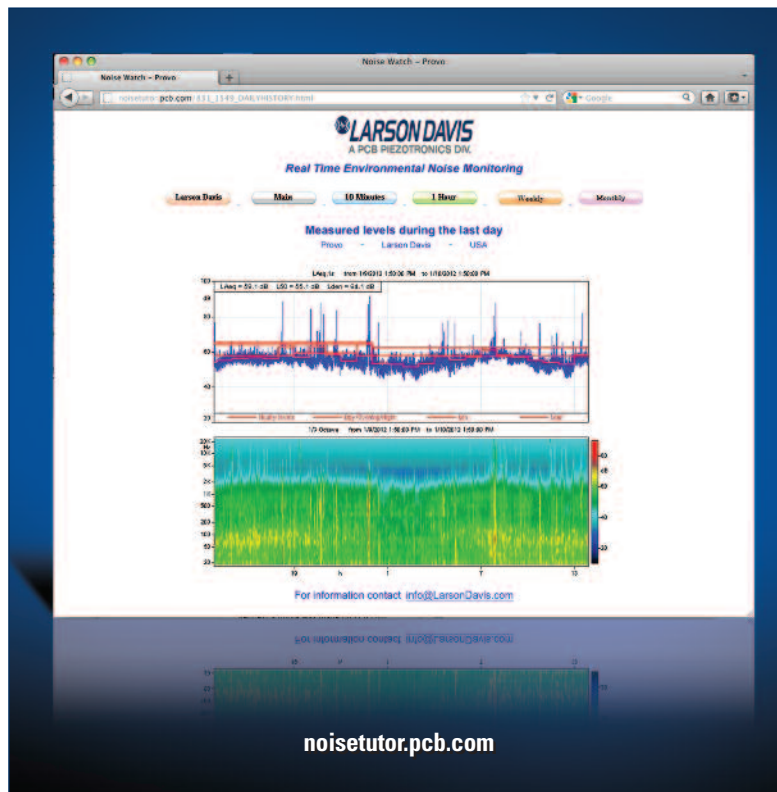
**Integrated Internet Solution for Remote Noise Monitoring**

Continuous monitoring of environmental data in remote areas has always presented a unique set of challenges. Typical solutions involve complex installations, frequent visits to remote locations to keep the system fully operational and require expert level attention to retrieve and share data amongst customers, consultants and project leads.

Additional economic challenges can also present themselves on projects that are shorter in duration (e.g. construction sites, wind farm commissioning, concert venues, etc.). In these instances, customers often incur the expense of a permanent installation when a simple, easily deployed, "temporary" solution is all that is required.

The Larson Davis NoiseTutor is an integrated solution, ideally suited to address the challenges of remote noise monitoring in an efficient and cost effective package. Designed for rapid deployment in a network environment, NoiseTutor provides Internet based remote control, a high speed network connection for the rapid transfer of large files, event alerts and real-time reports published directly to the end user's website.

NoiseTutor allows for easy management of any configuration from a single system to a network of systems, each of which can be individually controlled. A sophisticated power optimization scheme provides individual system power management during low power battery operation, to avoid the loss of critical data in the event of AC power interruption.

**LARSON DAVIS**
A PCB PIEZOTRONICS DIV.

## Benefits of an Internet Connected Noise Monitoring Station:

- Speed and reliability improvements versus classical analog modems
- Support many noise monitor connections using a single Internet connection
- Automated reconnection without losing data when communication is interrupted
- No specialized hardware needed
- Flexible setup, leveraging existing infrastructure and products
- Simplify remote monitoring of data – on site specialists no longer required

For these reasons Larson Davis has focused on a solution leveraging network communications while at the same time ensuring compatibility with existing sound level meters.

### The Larson Davis NoiseTutor Solution

In a network of NoiseTutor monitoring stations each unit can be completely independent with no need for a centralized management system or an associated web server. When a monitoring unit is active, the data is collected by the NoiseTutor at predetermined intervals (e.g. hourly, twice a day, etc.) after which a graphical report is dispatched to designated mail recipients or a website.

Each NoiseTutor station consists of a sound level meter, compact industrial PC, and a rechargeable battery to provide power during AC power interruptions. A power optimization scheme allows the PC to be in "Standby" mode while data collection on the SLM continues and no transmission is required.

The NoiseTutor solution allows for easy management of any configuration from a single remote monitoring station to a network of NoiseTutor stations with automatic distribution of information. Numerous variations are available and can be activated according to the specific monitoring (events, audio, video, weather, etc.) or networking scenario.

Each monitoring unit provides, on request, a method of web-publishing with real-time customizable graphical and numerical tables. Our server application, an example of which is visible at **www.noisetutor.it** or **noisetutor.pcb.com**, is made available for customization.

### Seamless Integration with Larson Davis Sound Level Meter Software

NoiseTutor saves data in SLMDL format which is readable with our no-cost SLMUTILITY-G3 software. Here the data can be easily viewed or exported to Excel for further analysis.

For those looking for advanced analysis features, data received via e-mail can be concatenated and processed using Larson Davis DNA Software to obtain results over daily, weekly, monthly and even annual periods together with Ldn and Lden, numerical tables, time history and spectrograms of Leq and Ln.

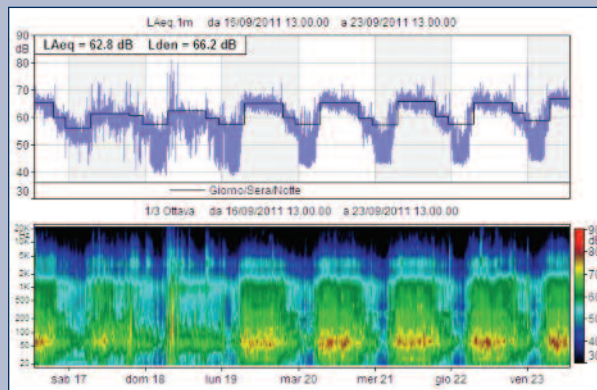## OPERATION MODES

### Real Time Publishing

The Sound Level Meter is used as a measurement front-end receiving the Leq and 1/3 rd octave data every second. Reports are typically produced as 10 min, 1 hour, 1 day, 1 week or 1-month updates which are published to a website and/or emailed to designated recipients.
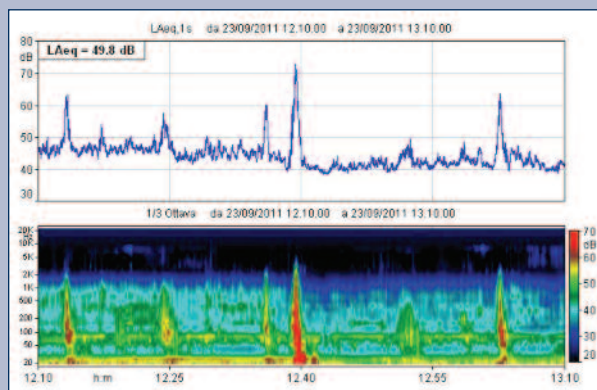


**Typical 1-hour NoiseTutor Realtime Webdisplay – Vicinity of an airport**

### Spectrogram of 1/3rd Octave Bands Versus Time

While most applications only require the 1 second Leq value, the addition of a 1/3 octave spectrogram helps to quickly, visually identify the nature of the noise source. In the example above we clearly recognize the typical noise signature of airplane fly-over. In one quick overview, you recognize any anomalies in the signature.



**Typical 1-week NoiseTutor Realtime Web display – Vicinity of flour mill**

Flour mill operation is visible as high noise level and a 50 Hz base frequency. The mill operates 5 days a week.

The real-time mode requires internet access that can be realized in different ways. Most typical are:

- Wired Ethernet
- Wireless Ethernet, WiFi
- Wireless 3G GSM

While typically users will want to be on-line 24/7, it is possible to send updates periodically and to put the PC to sleep in between. This lowers power consumption and in the case of cellular communication, the cost of transmission as well.

### Real Time Publishing – Event Alert Option (SWW-DNA-NT-EV)

NoiseTutor can be configured to report noise events which can then be viewed on-line or automatically sent via email. All the information necessary to quickly and easily identify and characterize a noise event is reported. In addition, you can receive alerts on various system parameters including a low power condition. Finally, a user can listen to a sound recording for fast noise source identification.
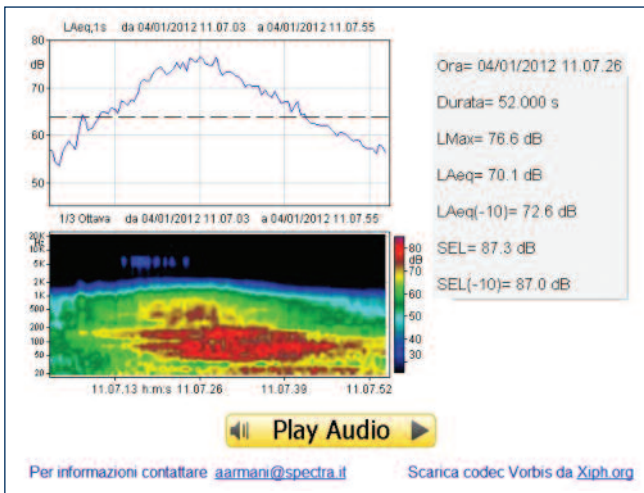


### Off-Line

In parallel with the real-time mode, the SLM can acquire a complete data file using the full range of the SLM capabilities: time history, measurement history with 10 min interval, Spectral Ln, event recording including audio files etc. The SLM regularly generates data files which the PC will retrieve. The user can then opt to store the file on the PC or forward them to a remote ftp site.



**4-hour files forwarded to your ftp site. File names contain SLM serial number, date stamp (y-m-d) and sequential number for easy recognition.**

Using Larson Davis DNA processing software, files can be merged into a single file representing an entire month.



**Example of 1-month of monitoring stored as 4-hour files**
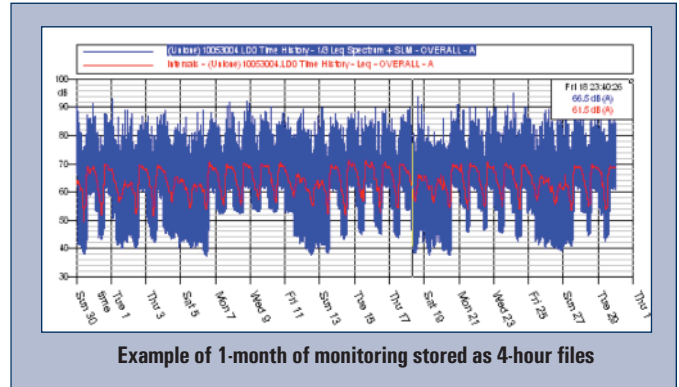
As an alternative, using the 831LXTSDK library, any user can connect the data to his own software or even a corporate database.

### File Size and Scheduling Options to Control Transmission Costs

Email recipients can be in the central administrative office or equipped with a smartphone in the field. During real-time operation the graphical reports can be sized to fit the user's device and help reduce the cellular transmission costs. A typical 1-day file containing 1 second Leq with 1/3rd octave data is about 14 MB (12MB with zip compression).

### Off-Line - Continuous Sound Recording Option (SWW-DNA-NT-CS)

With the continuous sound recording option, NoiseTutor can be configured to stream audio files directly to the compact industrial PC through the AC/DC output of the sound level meter. These compressed audio files (.ogg format) can be displayed along with the time history data in DNA Software and any segment replayed with ease.

### Remote Access to Noise Monitoring Station

Standard, commercially available tools can be used to administer the remote PC. It is also possible to extend the PC functionality and incorporate a directional webcam for visual identification of noise sources. Compared to other solutions, NoiseTutor gives you control over your system components and data.

## Specifications

### Electrical

| | |
|---|---|
| AC input | 90 - 240 V, 50 -60 Hz |
| Battery runtime (continous) | 6 hrs, typical at 68 °F (20 °C) |
| Battery runtime (daily wakeup) | 30 hrs, typical at 68 °F (20 °C) |
| Battery Voltage | 12.8V nominal, 14.7V fully charged, 10.0V low power disconnect |
| Battery Type | Lithium Iron Phosphate (LiFe) |
| Battery Capacity | 81 Wh |
| Shipping requirements | Package labeled to indicate it contains a lithium battery |

### Mechanical

| | |
|---|---|
| Size (W x L x H) | 18 x 13 x 7 in (46 x 33 x 18 cm) |
| Weight | 18.3 lbs (8.3 kg) |
| IP rating | IP65 |

### Environmental

| | |
|---|---|
| Operating Temperature | -40 °F TO 140 °F (-40 °C to 60°C) |
| Operating Humidity | 0 to 99% relative humidity (non-condensing) |

### Standards Compliance

| |
|---|
| IEC 61672-1 Class 1 when used with Model 831 or SoundTrack LxT1 |
| ANSI S1.4 Type 1 when used with Model 831 or SoundTrack LxT1 |

## Run Mode Summary

| | Offline | Realtime Publishing |
|---|---|---|
| Data Management | Transmission only Maintenance window | Continuous |
| IT Requirements | Email Program Email Connection | Web Server |
| File Format | Larson Davis SLMDL file (native SLM-UTILITY G3 Software) .ogg sound file with SWW-DNA-NT-CS option (1 hr continuous audio file, 10k Hz bandwidth = 12MB) | .jpeg image .ogg sound file |
| Processing Software | SLM-UTILITY-G3 DNA 831/LXT SDK | |
| Sound Recording | Events Only Continuous | On Events |
| Remote Maintenance Access | YES | YES |
| Local Storage of Data Files | YES | YES |
| Typical File Size | 15MB (1s Leq with 1/3 octave) <1MB (1s Leq zipped) | |
| Email Groups | 2 | 3 |
| ftp Site | 2 | 1 |

## Available Configurations

| NMS021 | Complete NoiseTutor including Model 831 SLM & PRM831 |
|---|---|
| 831-FF | Type 1 Sound Level Meter with PRM831 and 377B02 microphone |
| EXC020 | 20 ft (6 m) microphone extension cable |
| 831-LOG | Firmware option to enable periodic data logging |
| 831-OB3 | Firmware option to enable 1/1 and 1/3 octave filters |
| 831-ELA | Firmware option to enable exceedance logging and measurement history |
| EPS2116 | Outdoor microphone protection |
| EPS041 | NoiseTutor software, enclosure and accessories (see below) |
| **NMS022** | **Complete NoiseTutor including Model 831 SLM & PRM2103-FF** |
| 831 | Type 1 Sound Level Meter |
| PRM2103-FF | Outdoor preamplifier with automatic calibration check |
| CBL203-20 | PRM2103 to 831 cable, 20 ft (6 m) |
| 831-LOG | Firmware option to enable periodic data logging |
| 831-OB3 | Firmware option to enable 1/1 and 1/3 octave filters |
| 831-ELA | Firmware option to enable exceedance logging and measurement history |
| EPS2116 | Outdoor microphone protection |
| EPS041 | NoiseTutor software, enclosure and accessories (see below) |
| **EPS041** | **NoiseTutor software, enclosure and accessories** |
| | Outdoor enclosure including gland for  AC power & microphone cable |
| FITPC-NT | Compact Industrial PC with Windows® 7 Professional; rated for environmental use -40 °F to 140 °F (-40 °C to 60 °C); Includes NoiseTutor software |
| 1980.0001 | 8 in. LCD monitor |
| 1125.0016 | Small, portable, wireless keypad |
| COM-LS300-DC | Sierra Wireless LS300 gateway for mobile access (specify carrier) |
| 0281.0005 | 80 Whr Lithium Iron Phosphate battery with charger |
| SWW-NT | CD with web starter software and manuals |
| **Optional Accessories** | |
| SWW-DNA-NT-EV | Add event alerts via web, email or SMS (SMS requires 3G or 4G device) |
| SWW-DNA-NT-CS | Add continous sound recording, needed for event audio recording |
| TRP003 | Instrumentation tripod for mounting EPS2116 |
| ADP034 | EPS2116 to TRP003 mounting adapter |
| TRP001 | Camera tripod for mounting EPS2116 |
| SEN031 | Combined weather sensor: wind speed and direction (no moving parts), temperature, humidity, pressure, rainfall (requires CBL167 cable + DVX008A) |
| CBL204-10 | NoiseTutor external 12V battery cable, 10 ft (3 m), with spade connectors |
| EPS037 | Rolling hard case case (CCS035) with 100 Ah battery; requires CBL204-10 |
| EPS036 | Rolling hard case case (CCS035) with 2 x 21 Ah batteries; requires CBL204-10 |
| EPS043 | Fiberglass enclosure for use on TRP019/20 |
| CCS035 | Rolling hard case with foam for single 100 Ah battery or 2 x 21 Ah batteries |
| **Customer Supplied Items** | |
| | Website hosting facilities (server, Microsoft IIS and ftp) |
| | SIM card with mobile data plan for LS300 |
| | PC remote admin software such as logmein, radmin or TeamViewer |

# LARSON DAVIS
## A PCB PIEZOTRONICS DIV.

3425 Walden Avenue, Depew, NY 14043-2495 USA

**Phone** 716-926-8243

**Toll-Free in USA** 888-258-3222

**Fax** 716-926-8215    **E-mail** sales@larsondavis.com

**Web Site** www.larsondavis.com

ISO 9001 CERTIFIED

LD-Noisetutor-0515                                    Printed in U.S.A.

For environmental noise monitoring and building acoustics, **Larson Davis** offers a full line of instruments, accessories and software. For personal noise and vibration exposure monitoring, Larson Davis complements this with sound level meters, personal noise dosimeters, human vibration meters, audiometric calibration systems and hearing conservation programs.

*Visit **www.larsondavis.com** to locate your nearest sales office*