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

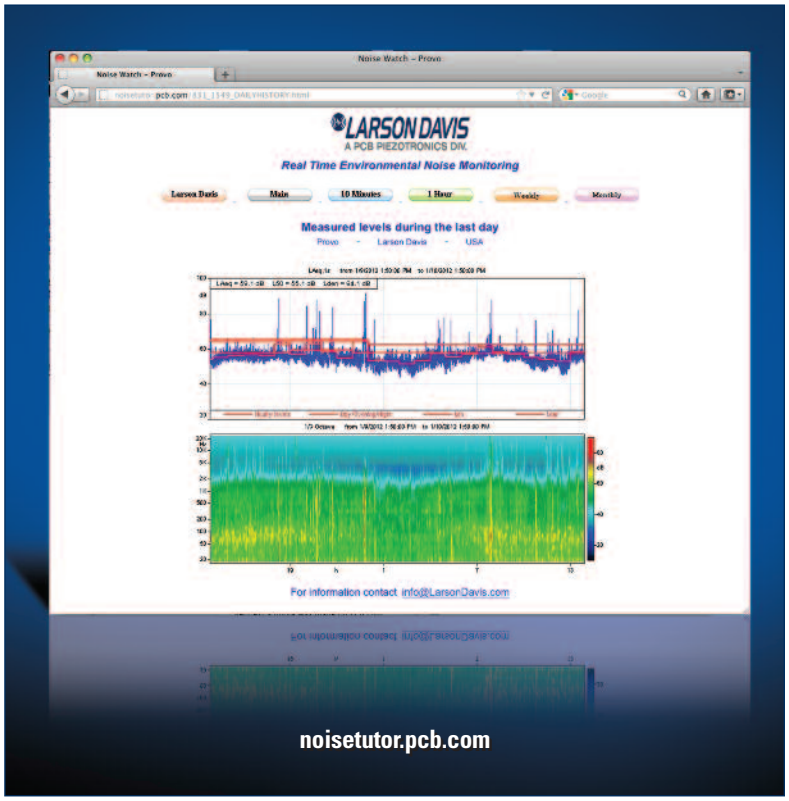
- Environmental Noise Monitoring
- Construction Noise
- Wind Farm Environmental Impact
- Short/Medium Term Noise Consulting Projects

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



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.

NoiseTutor

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

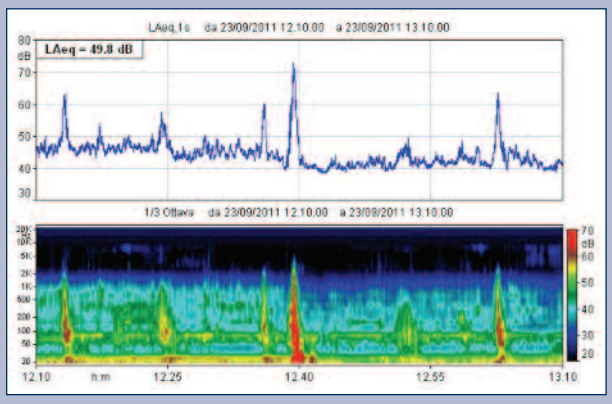
NoiseTutor saves data in SLMDL format which is readable with our no-cost SLMUTILITY-G3 software. Here the data can be easily viewed or exported to Excel for further analysis.

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

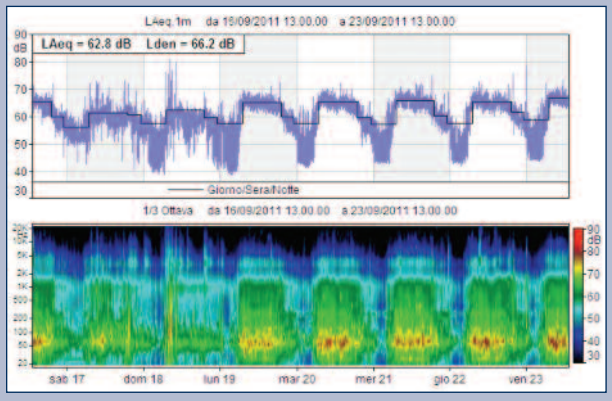
The Sound Level Meter is used as a measurement front-end receiving the Leq and 1/3rd octave data every second. Reports are typically produced as 10 min, 1 hour, 1 day, 1 week or 1-month updates which are published to a website and/or emailed to designated recipients.



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

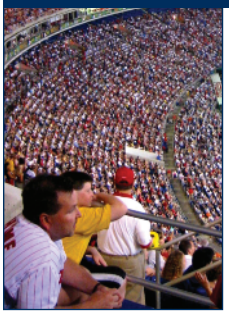
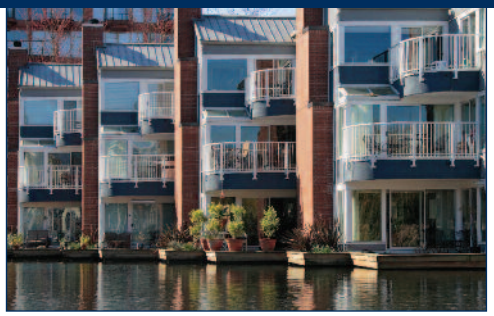
Spectrogram of 1/3rd Octave Bands Versus Time

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.

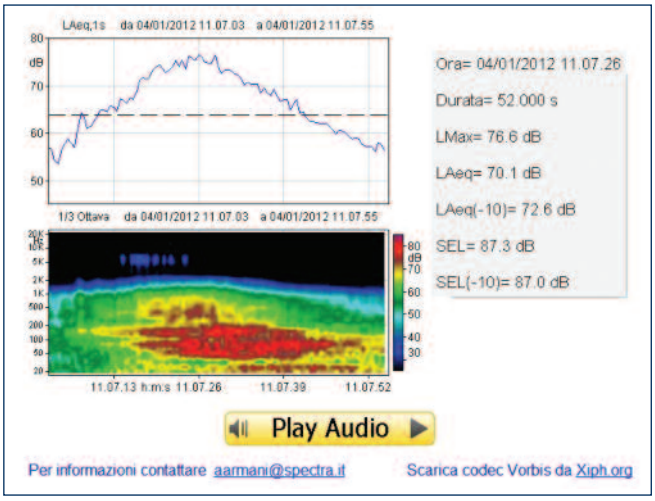
The real-time mode requires internet access that can be realized in different ways. Most typical are:

- 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.

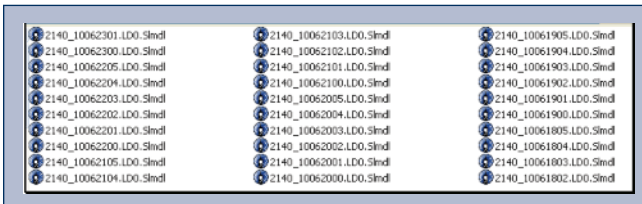
Real Time Publishing – Event Alert Option (SWW-DNA-NT-EV)

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.



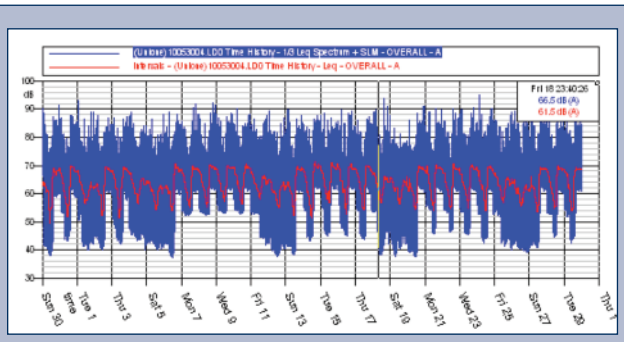
Off-Line

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).

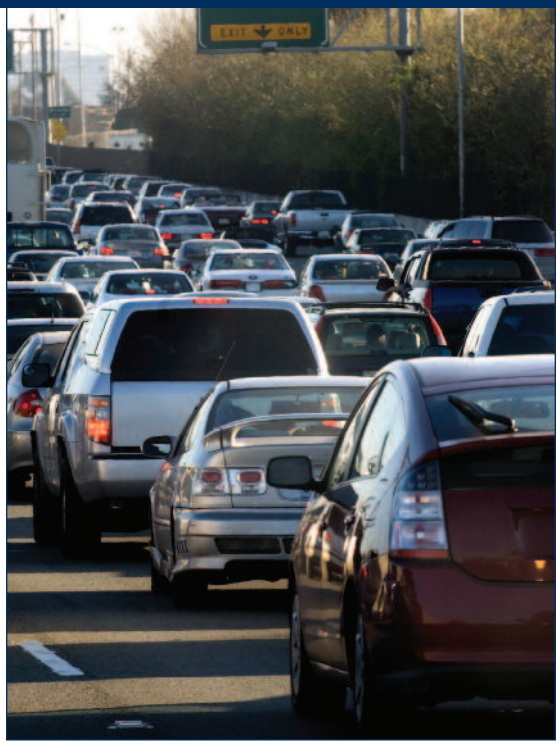
Off-Line - Continuous Sound Recording Option (SWW-DNA-NT-CS)

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.

NoiseTutor



Specifications

Electrical	
AC input 90 – 240 V, 50 – 60 Hz	
Battery runtime (continuous)	6 hrs, typical at 68 °F (20 °C)
Battery runtime (daily wakeup)	1 day, typical at 68 °F (20 °C)
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	
Temperature	-40 °F to 140 °F (-40 °C to 60 °C)
Humidity	0 to 99% RH, non-condensing
Standards Compliance	
IEC 61672-1 Type 1 when used with Model 831 or SoundTrack LxT1	
Available Configurations	
NMS021	Complete NoiseTutor Kit including Model 831 Sound Level Meter
Components	831-FF Type 1 Sound Level Meter
	831-LOG, 831-ELA and 831-OB3 firmware modules
	EPS2106-2 Microphone Protection Shroud
	EPS041 NoiseTutor Accessory Kit (see below)
EPS041	NoiseTutor Accessory Kit
Components	Outdoor enclosure including gland for AC power and mic cable
	Surge suppressor (120 – 240V)
	Compact Industrial PC with Windows® 7 Pro and rated for environmental use -40 °F to 140 °F (-40 °C to 60 °C)
	LCD Monitor (HDMI connection)
	Small, portable, wireless keypad with trackball
	Sierra Wireless USB 308 gateway for cellular access (uses SIM card)
	EXC020 20 ft. (6m) extension cable
	Lithium battery w/ charger
	CD with manuals and web starter software
NoiseTutor Options	SWW-DNA-NT-EV - Event Alert (Email or Web), SMS (3G, EDGE) SWW-DNA-NT-CS - Continuous Sound Recording
Optional (customer supplied)	Instrumentation Tripod (TRP003)
	Tripod Mounting Adapter, EPS2106-2 to TRP003 (ADP034)
	Basic Tripod (TRP001)
	Items necessary to host website (PC, Microsoft IIS and FTP.)
	SIM card for cell access (supplied by customer)
	Software to remotely admin the PC such as logmein, radmin or teamviewer

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

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

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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*