# SoundExpert™ LXT

## Sound Level Meter

Designed for Professionals

**LARSON DAVIS**
A PCB PIEZOTRONICS DIV.

# The All-In-One Sound Level Meter For The Noise Professional

- Standard 1/2 inch Free Field or Random Incidence Microphone
- Integrated Preamplifier Collar to Eliminate Reflections

Large High Resolution Display

One-button Access to Measurement Set-up

Run/Pause Control

Navigational Keypad

System Set-up Access

Display Navigation

Dual Purpose Start/Stop

Reset/Clear Memory

Recessed On/Off Button

## Applications

- Product Noise Evaluation
- Production Line Acoustic Testing
- Site Assessment
- Attended Noise Measuring
- Environmental Noise Monitoring

## Highlights

- Class 1 Sound Level Meter
- Random Incidence (RI) or Free Field (FF) microphones
- Complete firmware package
- 30 hours of operations using AA lithium batteries
- Rugged, compact, lightweight

## Included Features & Capabilities

- Real-Time Octave Band Analysis (1/1 & 1/3)
- Time History Logging
- Community Noise Metrics
- 2GB Internal Memory
- Measurement History

## Options

- Tripod (TRP001)
- Class 1 Calibrator (CAL200)
- Rugged Outdoor Case (EPS042)

USB Host (Thumb Drive Storage)

USB and Power

Headphone Jack

## SoundExpert LxT Sound Level Meter:

### (LxT1-SE-FF or LxT1-SE-RI)

The Larson Davis SoundExpert LxT Sound Level Meter is a full-featured meter designed for general product evaluation and noise monitoring applications. SoundExpert LxT comes with a graphic display and a fixed set of firmware options applicable for these applications. It is available as a general hand-held meter or data acquisition tool and also in a short-term noise monitoring kit. The meter expands upon the Larson Davis tradition of delivering value, innovation and function in a rugged, single-handed package, and is backed by our 2-year factory warranty, 24-hour application support, and accredited factory service/calibration.

# Compact, Portable & Lightweight
## Designed For Rapid Deployment

## Applications

- Mining Operations
- Construction Site Noise
- Wind Turbine Noise
- Motorsports
- Entertainment Events
- Industrial Operations
- Unattended Noise Monitoring

## Highlights

- Complete noise measuring system
- Weatherpoof, lightweight, compact case (EPS042)
- Up to 300 hours of operations with a D-cell battery pack (BAT015)
- Ideal to deploy, measure, download, then analyze
- Includes SoundExpert LxT

## SoundExpert LxT  Noise Monitoring Kit:

### (NMS-SE-FF or NMS-SE-RI)

In addition to the SoundExpert LxT meter, this kit includes the EPS042 protection case and D-cell battery pack, the  EPS2108-2 microphone protection shroud, and EXC010 10 ft. cable.  Using D-cell alkaline batteries, allows the noise monitor to be smaller and lighter; avoid the expense of shipping heavy lead acid batteries and the hassle of recharging.  You can transport it easily to your site, deploy it, measure data, retrieve your system, download the data, and issue your report.

## Options

- Tripod (TRP001)
- Class 1 calibrator (CAL200)
- DNA analysis software (SWW-DNA)
- LxT driver for DNA (SWW-DNA-LXT)

# Application Solutions:

The SoundExpert LxT was specifically designed to provide a simple, easy-to-use meter to provide professional measurements to support your Product Engineering or Basic Noise Monitoring needs. It comes configured with a fixed set of firmware options that will typically meet the needs of the professional engineer or consultant.

## Product Engineering Applications

- Vehicle NVH Analysis
- Acoustic Target Setting and Evaluation
- Appliance Noise Testing
- Speaker Evaluation
- Production Line Acoustic Testing

### Product Noise Evaluation

The SoundExpert LxT provides the functions, metrics, and accessories needed to help you develop quieter products. This instrument is well suited for acoustic development in the automotive, motorcycle, appliance, turbine, and speaker industries. Available with free field or random incidence microphones and with a detachable preamplifier and microphone that comes with extension cable options from 6 to 200 feet, this device makes noise measurement and recording simple and portable.

### Production Line Acoustic Testing

Production line acoustic testing is necessary for qualifying and inspecting a wide range of products and sub-assemblies. The SoundExpert LxT meter provides an affordable method to measure noise for pass/fail assessments and for archiving for future traceability. This data can identify alignment errors, missing components, cracks, defects, and other anomalies. Octave band analysis can be used to get immediate diagnostic feedback as to what has failed on the component that can help root cause the concern and eliminate warranty costs. This data can also be used to predict subjective customer perceptions and to set quality standards that drive product acceptance and differentiation.

## Noise Monitoring

- Mining Industry
- Traffic
- Industrial Assessments
- Wind Turbine
- Construction Sites
- Public Venues
- Code Enforcement

### Attended Noise Measuring

The SoundExpert LxT is your professional tool for hand-held or attended noise monitoring projects. It comes loaded with the firmware you need for logging, metrics, and octave band analysis and 2GB internal memory is standard. It's perfect for site assessments, compliance evaluations, and root cause investigations.

### Short Term Monitoring Projects

When you need a simple and affordable noise monitoring solution for periods less than two weeks, the SoundExpert LxT, battery powered, monitoring kit is the perfect fit. It's small, lightweight, and easy to transport with a basic D-cell battery pack. Optional tripods and analysis software are available. Deploy it, measure it, retrieve, download your data, and issue the report!
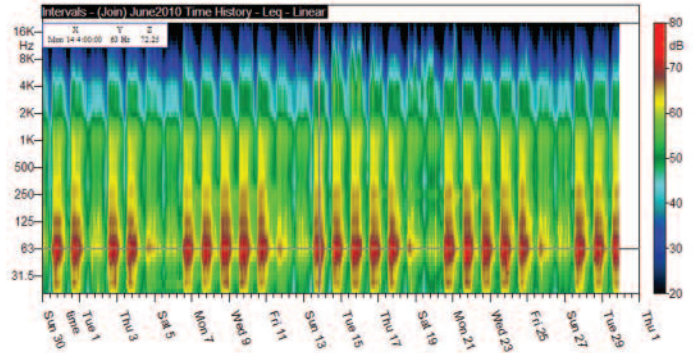
*Environmental Noise Spectrogram from DNA*

## Data Navigation and Analysis Software (SWW-DNA)

Data Navigation and Analysis Software (SWW-DNA) is designed to analyze and report environmental noise, factory noise and product noise with an interactive graphical interface. DNA and the SoundExpert LxT can be used in two ways: DNA retrieves files from the SoundExpert LxT or DNA uses the SoundExpert LxT as a data acquisition front-end.

- Interactive graphs with data zoom, evaluate processing for events with linked cursors over several graphs
- Reprocess time history data to remove unwanted noise
- Customizable template-based operation

A major differentiating concept of DNA is the principle of separation of data and graphical layout. This allows for drag-and-drop functionality of new data in the same layout. With many environmental studies being similar in nature, this feature allows for quick, professional looking reports.

## Software Development Kit (831-SDK)

The Software Development Kit for the SoundExpert LxT interfaces smoothly and directly with the Microsoft® programming environment, either for Excel® VBA or Visual C++ programming. The SDK consists of two main parts, the SLM Server and the SLM Translator.

The SLM Translator is the library that allows for the reading of data files. The SLM Server provides on-line SLM access and control. The SDK integrates completely and seamlessly into the Microsoft® programming environment with the included files and interfaces.

The SDK is ideal for those who want to integrate a SoundExpert LxT into their system.

# Software Solutions:

The SoundExpert LxT has numerous on-board capabilities, yet often further processing, visualization or reporting needs exist. For this purpose the SoundExpert LxT can be used as a portable instrument and retrieve the data, work as a data acquisition front-end, or in combination.

## SLM Utility-G3

The SLM Utility-G3 program is included with your SoundExpert LxT and is an easy-to-use utility for managing and providing configuration set-up and data download. The Screengrabber feature emulates the SLM screen on your PC, convenient for presenting data stored on the SoundExpert LxT or for teaching classes. Measurement set-ups can be stored on the PC and exchanged with one or more sound level meters. Data can be downloaded into a PC and easily exported to Excel® for further analysis.

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## SoundExpert LxT Features

| |
|---|
| Class 1 Precision Integrating Sound Level Meter |
| 1/1 and 1/3 Octave filters |
| 2GB internal, non-volatile memory |
| User defined Data Logging with selectable parameters and storage rate |
| Intervals (Measurement History) for a second independent data logger |
| LDEN and LDN community noise |
| High Contrast LCD display with LED backlight; sunlight readable |
| USB communication |
| Slow, Fast, or Impulse time weighting |
| A, C, and Z frequency weighting |
| Six (6) user defined statistic levels (Ln) |
| Battery life > 16 hours using 4 AA Alkaline batteries |
| AC and DC outputs |
| Multiple language support (English, German, French, Italian, Spanish, Portuguese, Swedish, Turkish) |
| Field upgradable firmware using SLM Utility G3 |
| Removable Microphone and Preamplifier |
| Back erase -5 or -10 s |
| Two year limited warranty |

## SoundExpert LxT Specifications

| | |
|---|---|
| Averaging (Integration Method) | Linear or Exponential |
| RMS Time Weighting | Slow, Fast or Impulse |
| RMS Frequency Weighting | A, C or Z |
| Peak Frequency Weighting | A, C or Z |
| Sample Rate | 51200 Hz |
| Peak Rise Time | $\leq 30\ \mu s$ |
| Range Level Error (OBA) | $\leq \pm 0.1$ dB |
| Compliance | ANSI Type 1, IEC Class 1 |
| Ranges | Singe Range for Broadband |
| | 2 ranges for OBA |
| Maximum Clock Drift at 77 °F (25 °C) | < 2.6 s per day |
| **1/1 and 1/3 Octave Filters** | |
| 1/1 Octave Filters | 8 Hz to 16 kHz |
| 1/3 Octave Filters | 6.3 Hz to 20 kHz |
| Filter Selection | None, 1/1, 1/3, or 1/1 & 1/3 |
| Frequency Weighting | A, C or Z (unweighted ) |
| Maximum Spectrum | Maximum in each band or at broadband Lmax |
| Compliance | ANSI and IEC Class 1 |
| **Logging and Measurement History** | |
| Logging Period | 1 s to 24 hr |
| Logged Parameter | User selectable from Leq; Lmax; Lmin; LCSeq – LASeq; LAleq – Laeq; 1/1 OBA Leq, Lmax, Lmin; 1/3 OBA Leq, Lmax, Lmin, Battery, Internal Temperature |
| Measurement History Period (Continuous run mode) | 1 min to 24 hr |
| Measurement History Parameters | Leq; Lmin w/time; Lmax w/time; Lpeak w/time; Exceedance counts w/duration; LAeq, Lceq, 1/1 OBA Leq, Lmax, Lmin; 1/3 OBA Leq, Lmax, Lmin |
| **Community Noise** | |
| Measured Parameters | LDEN, LDN |
| Day, Evening, Night Times | Programmable |
| Evening and Night Penalty | Programmable |
| **Time Averaged Level Integration Time** | |
| Minimum | 1 s |
| Maximum (error < 0.5 dB) | > 23 days |
| **Ln Percentile** | |
| Number of User Defined Ln's | 6 |
| Ln Resolution | 0.01% |
| Distribution Table Resolution | 0.1 dB |
| **Markers** | |
| Number of Markers | 10 |
| Predefined Markers | 5 |
| **Measurement Modes** | |
| Available Modes | Manual Stop, Timed Stop, Stop when Stable, Continuous, Single Block Timer, Daily Block Timer |
| Manual Stop | Measurement defined by run and stop button |
| Timed Stop | Time in hh:mm:ss |
| Stop When Stable | Change < xx.x dB for hh:mm:ss |
| Continuous | Auto file store 1, 2, 4, 6, 12, 24, 48, 96, 144 times per day |
| Single Block Timer | Start date and time to end date and time |
| Daily Block Timer | 3 unique start/stop times per day, multiple days |
| **AC/DC Output** | |
| Connector | 2.5 mm stereo |
| AC Output Maximum Voltage | $\pm 2.3$ V peak |
| AC Output Recommended Load | $\geq 16\ \Omega$ |
| DC Output Resolution | 10 mV/dB (0 to 100 dB) |
| DC Output Time Weighting | Follows SLM Setting (F, S, I) |
| DC Output Frequency Weighting | Follows SLM Setting (A, C, Z) |
| **Dynamic Range (typical)** | |
| A Weighted | 17 dB to 118 dB |
| C Weighted | 19 dB to 118 dB |
| Z Weighted | 24 dB to 118 dB |

| Power | |
|---|---|
| Batteries | 4-AA (LR6) 1.5 V Lithium or Alkaline |
| External Power | 5V from USB |
| AC Power Supply | PSA029 (Worldwide) |
| 12V Supply (optional) | PSA031 – 12 VDC to 5 VDC |
| Continuous Runtime | 18 hours Typical using Alkaline Batteries |
| Continuous Runtime | 30 hours Typical using 1.5 V Lithium Batteries |
| Continuous Runtime | > 13 Days Typical using optional BAT015 |

| Physical Characteristics | |
|---|---|
| Length (overall) | 11.4 in (29.0 cm) |
| Length (instrument body only) | 8.8 in (22.4 cm) |
| Width | 2.8 in (7.1 cm) |
| Depth | 1.6 in (4.1 cm) |
| Weight (with batteries) | 1.0 lb (471 g) |
| Weight (with batteries, microphone and preamplifier) | 1.1 lb (513 g) |
| Maximum Preamplifier Cable Length | 200 ft (61 m) |
| Ingress Protection Rating | IP54 |

| Environmental | |
|---|---|
| Temperature Sensitivity | ≤ ± 0.5 dB +14 to +122 °F (-10 to +50 °C) |
| Storage Temperature | -22 to +140 °F (-30 to +60 °C) |
| Humidity Sensitivity | ≤ ± 0.5 dB, 30% to 95% RH  at +104 °F (+40 °C) |

| SoundExpert™ LxT Standards |
|---|
| ANSI S1.4-1985 (R2001) Specification for  Type 1 Sound Level Meters |
| ANSI S1.43-1997 (2002) Specifications for Integrating-Averaging Sound Level Meters, Type 1 |
| ANSI S1.11-2004 Specification For Octave-Band And Fractional-Octave-Band Analog And Digital Filters, Classs 1 |
| IEC 61672-1:2002 Sound Level Meters, Classs 1 |
| IEC 61260:2001 Octave-Band And Fractional-Octave-Band Filters, Classs 1 |
| IEC 60651:2001 Sound Level Meters |
| IEC 60804:2000 Integrating-Averaging Sound Level Meters |
| IEC 61010-1:2001 Ed 2.0 Safety Requirements For Electrical Equipment For Measurement, Control, And Laboratory Use – Part 1: General Requirements |
| IEC 61326-1:2005 Electrical Equipment for Measurement, Control and Laboratory Use – EMC Requirements |
| CE Directive 2004/108/EC |

# Ordering Information

| Model | Description |
|---|---|
| LXT1-SE-FF | SoundExpert LxT with 377B02 free-field microphone, SLM Utility G3 software |
| LXT1-SE-RI | SoundExpert LxT with 377B20 diffuse field microphone, SLM Utility G3 software |
| NMS-SE-FF | SoundExpert Environmental Noise Monitoring System – includes LXT1-SE-FF, EPS042, EPS2108-2, EXC010, SLM Utility G3 software |
| NMS-SE-RI | SoundExpert Environmental Noise Monitoring System – includes LXT1-SE-RI, EPS042, EPS2108-2, EXC010, SLM Utility G3 software |
| **Included Accessories** | |
| PRMLxT1L | Microphone Preamplifier |
| PSA029 | Universal AC power supply |
| CBL138 | USB Cable 6 ft (2 m) |
| Batteries | 4-AA Alkaline |
| WS001 | Windscreen 3.5" (90 mm) |
| **Optional Accessories** | |
| CAL200 | Class 1 acoustic calibrator with 1/2 inch opening |
| SWW-DNA | Advanced Analysis Software |
| SWW-DNA-LXT | DNA driver for SoundExpert LxT |
| EPS042 | Environmental Enclosure for LxT, includes BAT015 and gland for microphone cable |
| EPS2106-2 | Outdoor protection for preamplifier with 3/4 inch NPT thread |
| EPS2108-2 | Outdoor protection for preamplifier with 1/4 - 20 screw mount for tripod |
| LXT-CCS | Hard Shell carrying case |
| PSA031 | 12 VDC to 5 VDC power converter |
| EXCxxx | Microphone extension cable in various lengths |
| CBL139 | Cable connection AC/DC out to RCA or BNC |
| TRP001 | Camera type Tripod for mounting EPS2108-2 |
| **Calibration** | |
| CER-LXT1 | Calibration for SoundExpert  LxT |
| CER-MIC | Calibration for Microphone |
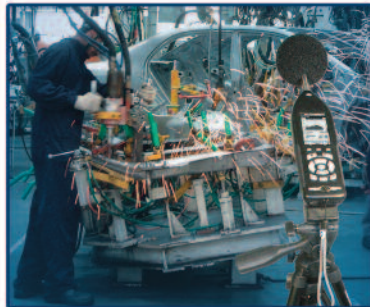
# LxT Family of Products

## SoundExpert LxT
- Product Noise Evaluation
- Product Line Acoustic Testing
- Site Assessment
- Attended Noise Monitoring
- Environmental Noise Monitoring

## SoundTrack LxT N/Forcer
- Community Noise Standards and Code Enforcement
- Nuisance Noise Complaint
- Traffic Noise and 'Boom Cars'
- Evidential Data

## SoundTrack LxT1-QPR
- Firearms Acoustic Analysis
- Shooting Ranges Noise Assessment
- Impulsive Noise Measuring

## SoundTrack LxT
- Workplace Noise Exposure Assessment
- Plant Noise Surveys
- Hearing Protection Analysis

**Total Customer Satisfaction**
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## LARSON DAVIS
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ISO 9001 CERTIFIED

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. As a division of PCB Piezotronics, Inc., Larson Davis guarantees **Total Customer Satisfaction** through our outstanding limited warranty; no-charge, 24 hours toll-free technical support; global distribution; and worldwide customer service.

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