SOUND ADVISOR™
Model 831C Sound Level Meter & Noise Monitoring Kit
Technically Optimized

As with any device from Larson Davis, a thoughtful design process ensures that your needs are met, from international standards to functionality.

- IEC 61672-1:2013, ANSI S1.4-2014 Class 1 integrating sound level meter
- Real-time frequency analysis in 1/1 and 1/3 octave bands, compliant with IEC 61260:2014 and ANSI S1.11-2014 Class 1
- >120 dB dynamic range
- 2 GB internal memory, expandable by USB
- Full range AC output
- Available low noise option (831C-LOWN)

Applications

- Environmental noise assessment
- Noise reduction validation
- Product quality control
- Spectral noise analysis
- In-situ sound power measurements
- Code enforcement

Measurements Simplified

- Connectivity Is Key – Cellular, WiFi, and wired networking are all available to you when using the SoundAdvisor. The meter can even serve as its own WiFi hotspot.
- Many Platforms, Same Controls – Whether you are setting up a test on the meter, checking in remotely from your laptop, or receiving an alert to your smartphone, you’ll be working with the same interface and menus across all platforms.
- Customizable for Your Application – From complete outdoor monitoring kits to a low noise option to automatic event detection, the SoundAdvisor is designed to help meet your testing needs.
- LCD Color Interface – A full-color user interface allows you to interpret data more easily, right from the meter.

SOUND ADVISOR™
MODEL 831C SOUND LEVEL METER

The Model 831C SoundAdvisor is designed to make noise measurement easy. Due to its color display, connectivity, extensive software features, and small form factor the SoundAdvisor is an ideal choice for handheld operation. Attended measurements are simplified, with the ability to control and monitor data via any PC or mobile device with a standard web interface. Designed with the acoustic professional in mind, the SoundAdvisor offers an elegant solution for complex needs in an easy-to-use system.
Larson Davis has created a new standard for portable noise monitors by making the Model NMS044 SoundAdvisor Kit completely wireless with solar charging and 4G wireless while keeping it truly portable. The SoundAdvisor Kit includes everything needed for a noise monitor that can run indefinitely while remaining connected to the Internet, making your meter and your data always readily available.

### Applications
- Remote noise monitoring
- Environmental noise compliance
- Airport noise management
- Continuous and Event sound recordings
- Networked noise level display

### Remote Access to Data
- **Network Access 24/7** – Login from your computer, your smartphone, or other mobile device to engage directly with the meter at your remote location. Make updates, receive alerts, change test parameters, check microphone calibration, and download data with ease.
- **Complete Power Solutions** – With a low power requirement (831C ~1.2 W / 831C + Cellular gateway ~3.5 W) options are available to power the remote unit via solar power, keeping your measurements running indefinitely and sustainably.
- **Real-Time Alerts** – Receive email or texts with data and sound recordings when set noise limits are exceeded. Allows quick response to compliance concerns and listening to sounds for source identification.
- **Own Your Data** – Control your data without monthly access and maintenance costs.

### Available Kit Configurations

<table>
<thead>
<tr>
<th>Configuration</th>
<th>BAT019</th>
<th>BAT020</th>
<th>SLP001</th>
<th>SLP002</th>
</tr>
</thead>
<tbody>
<tr>
<td>NMS044-LFP60</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>NMS044-LFP100</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>NMS044-SLA60</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>NMS044-SLA100</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

### Powering the SoundAdvisor Kit
The SoundAdvisor Kit is offered with a choice of a traditional lead acid (SLA) battery or a Lithium Iron Phosphate (LiFePo) battery. LiFePo batteries deliver a significant improvement over Lithium ion technology, offering extended life of over 2500 recharge cycles and safer automation. The LiFePo battery provides high capacity at half the weight of a comparable SLA battery with a longer life and great low temperature performance.

To accommodate use in both common and harsh solar conditions, the SoundAdvisor Kit can be configured with one of two different portable solar panels.

### Power Configurations

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Capacity</th>
<th>Weight</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAT019</td>
<td>LiFePo Battery</td>
<td>45 Ah</td>
<td>12.8 lb (5.8 kg)</td>
<td>~2500 charge cycles</td>
</tr>
<tr>
<td>BAT020</td>
<td>Lead-acid Battery</td>
<td>35 Ah</td>
<td>24.7 lb (11.2 kg)</td>
<td>3 – 5 years</td>
</tr>
<tr>
<td>SLP001</td>
<td>Solar Panel</td>
<td>60 W</td>
<td>28.1 lb (9 kg)</td>
<td>Insolation &gt; 2 kWh/(m²/day)</td>
</tr>
<tr>
<td>SLP002</td>
<td>Solar Panel</td>
<td>100 W</td>
<td>24.1 lb (11 kg)</td>
<td>Insolation &gt; 1 kWh/(m²/day)</td>
</tr>
</tbody>
</table>
SOLVING YOUR CHALLENGES

The Larson Davis SoundAdvisor Sound Level Meter is extremely versatile, performing the functions of several instruments. It puts the combined features of a precision Class 1 sound level meter, environmental noise analyzer, and a real-time frequency analyzer in the palm of your hand or on a network. It expands upon the Larson Davis tradition of delivering value, innovation, and function in a rugged, single-handed, expandable package and is backed by a 2-year factory warranty, 24-hour application support, total customer satisfaction, and accredited factory service/calibration.

Solutions with Your Meter

- **Easy Setup and Data Download** – SoundAdvisor offers setup directly on the meter’s keypad, touchscreen, or via web interface, plus streamlined export of data to Excel®.
- **ANY LEVEL™** – Never miss a key sound metric with the ability to view and store multiple time weightings (Slow, Fast, and Impulse) and frequency weightings (A, C, and Z) simultaneously.
- **Flexibility for Integration** – Designed to allow integration into a larger or customized solution, SoundAdvisor allows connection of accessories, internal clock for accurate data synchronization, and local language compatibility.

Solutions with Your Outdoor Kit

- **Data on Demand** – Access the meter from any location to make modifications to the setup, view current noise levels, and modify alerts.
- **Instant Alerts** – Receive immediate notification of noise events and use the recorded sound files to evaluate the cause.
- **Long Term Remote Power** – Lithium Iron Phosphate batteries paired with a solar panel offer a continuous, sustainable means to keep your measurements running.
- **Avoid Trips To the Field** – With access to measurements, event alerts, and continuous power, you can spend time in the office, rather than travelling to reach remote locations.

**Connectivity**

- **Cellular, WiFi, or Wired Networking** – Select your network by choosing what to plug into the USB port. You can choose cellular by using a Sierra Wireless gateway for mobile or permanent applications, WiFi for close proximity wireless, and wired (Ethernet) for permanent locations. A USB hub can be used to support multiple USB devices.
- **Expandable USB Memory** – Easily expand the 831C memory by adding a USB memory stick. Data is written directly to the USB memory so it’s always available and the data is protected if the USB memory is accidentally removed.
USING THE SOUNDADVISOR

Standard Features

- **Web Interface** – Control the SoundAdvisor and view data from any device that runs a web browser.
- **NTP Time Sync and GPS** – Network Time Protocol automatically selects the most accurate clock from several sources and synchronizes the meter for accurate measurement times.
- **External Batteries** – Power directly from 12 V batteries for efficient power usage and long run times.
- **Built-In Power Management** – Safely power the meter off based upon battery voltage. Compatible with solar systems.
- **ANY LEVEL™** – Measure levels simultaneously.
- **Run Modes** – Control how and when the SoundAdvisor will operate to best match measurement conditions. Choices include a manual mode; stop after a predetermined period of time; run continuously with automatic calibration check and file save; and defined timers.

Supported PC Software

- **G4 LD Utility [INCLUDED]** – PC software supplied with the SoundAdvisor that supports full sound level meter control, in-the-field firmware and option upgrades, data export to spreadsheet, and includes a remote display to view the 831C screen on a PC.
- **DNA [OPTIONAL]** – The analysis, post-processing, and reporting tool for sound and vibration measurements. DNA delivers enhanced analysis capability, sound playback, and graphical reporting. Graphs can be annotated and shared amongst multiple users working with DNA reader software.
- **Software Development Kit (SDK) [OPTIONAL]** – Toolkit for developing custom applications in Microsoft Windows® or Linux® for the Model 831C

Common Firmware Options

When performing noise surveys, it is important to have a fully capable sound level meter at your fingertips to capture all of the essential data. Have you ever lost your measurement notes, or worse, forgotten to log the information properly and then had to either go back and reacquire the data altogether or simply not report it? SoundAdvisor is available with a variety of firmware options to help you achieve your testing goals the first time.

- **Octave Band Analysis 831C-OB3** – Simultaneous real-time measurement of 1/1 and 1/3 octave Leq, Lmax, Lmin along with broadband parameters.
- **Logging 831C-LOG** – Select Time History logging periods as short as 2.5 ms to a full 24 hours. Additional parameters such as battery condition, microphone performance, and meteorological data (831C-WTHR) can be recorded.
- **Event Detection and Measurement History 831C-ELA** – Define an Event in terms of threshold level, duration, hysteresis, and continuation period.
- **Sound Recording 831C-SR** – Record audio files in a raw or compressed format to determine the source of the noise event.
- **Direct USB Support for RV50 Gateway 831C-SW** – Connect the SoundAdvisor by USB to a wireless gateway to create a highly portable noise monitor.

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In many applications, it is important to acquire both the broadband level and spectral content of noise data. With spectral information, the source and content of the measured level can be better understood. Constant percentage bandwidth filters (1/1 or 1/3 octave) best approximate human perception of sound.

Option 831C-OB3 firmware enables simultaneous real-time measurement of 1/1 and 1/3 octave Leq, Lmax, Lmin along with all the ANY LEVEL™ broadband parameters. Option 831C-OB3 is compliant with IEC 61260:2014 Class 1 and ANSI S1.11-2014 Class 1 standards covering the entire frequency range of human hearing: 6.3 Hz to 20 kHz for 1/3 octave bands.

When 831C-OB3 is combined with Time History Logging (831C-LOG) or Automatic Event Detection and Event History (831C-ELA), it is possible to review the frequency content of logged data or specific events.

**SoundAdvisor Options**

**Octave Band Analysis (831C-OB3)**

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The Model 831C can be used to record the evolution of sound pressure level over time as a Time History (TH). The Time History is then used to profile the observation period, which can vary from several seconds to continuous monitoring.

With the addition of Time History Logging Firmware (831C-LOG), users can pre-select from logging periods as small as 20 ms to a full 24 hours. Parameter selections consist of familiar acoustic metrics as well as non-acoustic metrics, such as battery condition, outdoor microphone performance, and meteorological data (831C-WTHR).

### Measurement History (831C-ELA)

While Time Histories are typically logged at one sample per second, longer-term averages are often useful to see trends, e.g., 10 minute or hourly averages. 831C-ELA firmware enables Measurement History (MH) and logs these parameters similar to Time History (TH) over a longer interval time. MH and TH can run together simultaneously or independently.

Data for each measurement or location is saved in a unique MH record and may include the Leq, Lmax, Lmin, SPL, and statistical distribution of the SPL (Ln). A complete set of MH records then can be stored in a single measurement that keeps all the noise survey data in a single file. Finally, an automated sound recording at the beginning of each MH period can be achieved with 831C-SR firmware.
Automatic Event Detection and Alerts (831C-ELA)

In the Model 831C, events are defined as one of the following:

- Exceedance of a fixed threshold level for a minimum duration
- Exceedance of a dynamic threshold level for a minimum duration
- External trigger set by the digital input signal

With 831C-ELA firmware, event definition is defined by you – including threshold level, duration, and event continuation period when the SPL drops below the threshold level for a specific period of time. Triggering status icons identify event progression and qualification (see graph above).

The Model 831C can automatically generate an email alert to provide fast notice of any noise exceedance. The event alerts can be sent to a user configurable list of email addresses or by text message using an email to MMS gateway. Email event sound recording in conjunction with option 831C-SR.

### Added Functionality with 831C-ELA Option

<table>
<thead>
<tr>
<th>With Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>831C-0B3</td>
<td>Frequency analysis of the event</td>
</tr>
<tr>
<td>831C-LOG</td>
<td>Record an independent time history of the event including filters when combined with 831C-0B3</td>
</tr>
<tr>
<td>831C-SR</td>
<td>Record event audio in .wav or compressed file</td>
</tr>
</tbody>
</table>

### Cellular Communication (831C-SW)

We understand how beneficial it can be to have access to your noise monitor at any time of the day. Due to the remoteness or need to setup contracts and get permits, connecting a noise monitor to a wired network or main power just isn’t feasible.

With option 831C-SW you can connect the SoundAdvisor by USB directly to a Sierra Wireless gateway and get a highly portable noise monitor that can easily be powered by battery and/or solar. We recommend the Sierra Wireless model RV-50 because of its low power usage and industrial design.
Measuring sound levels is a well-accepted way to objectively quantify the noise radiated by a product in an environmental survey. Rather than rely simply on the objective data, why not record a sample of the sound to truly determine the source of the noise?

The 831C-SR option enables the 831C to record audio files in a raw format (.wav) for a lossless recording or with .ogg compression to reduce file size. Audio data can also be streamed from the 831C to allow remote listening to the current sound.

**Option 831C-SR Recording Triggers**

- **Event History Sound Recordings** – Automatically record the audio for an Event with a user-configured pre-trigger record time and recording length. Recording is time-synchronous with the Event.
- **Measurement History Sound Recordings** – Automated sound recording at the beginning of each Measurement History
- **Manual Sound Recording** – User-controlled recording duration, acquired during operation
- **Marker-based Sound Recording** – User-initiated with user-defined duration, acquired during operation
- **Logic Input (Button) Recording** – User-initiated recording with a button push or other logic level input. The 831C will record for a predetermined period of time.

**Options for Listening to a Recorded Sound**

- **Connect a USB headset to the 831C and play from the meter**
- **Connect to the meter by G4 and play directly from the meter to the PC**
- **Connect to the meter by G4, download the file and then play the audio on the PC**
- **Connect to the meter using a browser and play the file directly from the meter through the browser**

**Size For 1 Minute Recording (kbytes)**

<table>
<thead>
<tr>
<th>Sample Rate</th>
<th>wav</th>
<th>ogg (typical)</th>
</tr>
</thead>
<tbody>
<tr>
<td>48 kHz</td>
<td>5760</td>
<td>960</td>
</tr>
<tr>
<td>24 kHz</td>
<td>2880</td>
<td>480</td>
</tr>
<tr>
<td>16 kHz</td>
<td>1920</td>
<td>320</td>
</tr>
<tr>
<td>8 kHz</td>
<td>960</td>
<td>160</td>
</tr>
</tbody>
</table>

*Connect a USB headset to the meter*  
A recording icon ( ) will turn red on the Model 831C display when recordings are being made.

*Listen to audio recordings while they are still on the 831C*
The Software Development Kit for the Model 831C interfaces smoothly and directly with Microsoft® or Linux® programming environments supporting Excel®, HTML5, Javascript, Visual C++, or C# programming languages. The SDK provides functionality to connect and fully control the Model 831C over USB, network, or wireless gateway (modem) connections. File download is supported and the SDK includes documentation and software for extracting data from files. With JSON (JavaScript Object Notification), the SDK makes it easy to create modern, web-based applications with minimal effort.

The Model 831C has numerous on-board capabilities, yet often further processing, visualization, or reporting needs exist. For this purpose the Model 831C can be used as a portable instrument and retrieve the data, work as a data acquisition front-end, or in combination with other products.

**G4 LD Utility**

The G4 LD Utility program is easy-to-use Windows® software for the Model 831C providing configuration set-up, data download, and remote access. Measurement set-ups can be stored on the PC for use on one or more Model 831C Sound Level Meters. Data can be downloaded onto a PC and easily exported to Excel® for further analysis. G4 LD Utility can simultaneously access multiple 831C-based noise monitoring stations via USB or Ethernet, which makes managing multiple noise monitors simple and convenient. A convenient Live View emulates the SLM screen on your PC, ideal for quick presentations or training.

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

Data Navigation and Analysis Software (SWW-DNA) is designed to analyze and report environmental noise, worker exposure, and architectural acoustic measurements with an interactive graphical interface. With many sound studies being similar in nature, a drag-and-drop feature places new data in an existing layout that allows for quick, professional-looking reports. DNA can either retrieve existing files from Model 831C, or can drive the 831C as a data acquisition front-end.

- Remote network access
- Interactive graphs with data: zoom, overlay Time History and spectrogram with playable event sound recordings, advanced event analysis, mapping, industrial hygiene, and more.
- Template-based operation with customizable options

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## General Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference Level</td>
<td>114.0 dB re. 20 µPa</td>
</tr>
<tr>
<td>Reference Level Range</td>
<td>Single large range for SLM measurements</td>
</tr>
<tr>
<td>Reference Frequency</td>
<td>1000 Hz</td>
</tr>
<tr>
<td>Reference Direction</td>
<td>0° is perpendicular to the microphone diaphragm</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>± 0.5 dB error between -22°F to +122°F (-30 °C to 50 °C)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40 °F to 176 °F (-40 °C to 80 °C)</td>
</tr>
<tr>
<td>Humidity</td>
<td>≤ ± 0.5 dB error from 30% to 90% relative humidity at 104 °F (40 °C)</td>
</tr>
<tr>
<td>Equivalent Microphone Impedance</td>
<td>12 pF</td>
</tr>
<tr>
<td>Effect of an Extension Cable</td>
<td>None up to 200 ft (61 m) with EXCxxx cable</td>
</tr>
<tr>
<td>Approvals</td>
<td>CE, ROHS, WEEE</td>
</tr>
<tr>
<td>Extended Weather Options</td>
<td>-40 °F to +158 °F (-40 °C to +70 °C) operation with CER-831-E</td>
</tr>
</tbody>
</table>

## Resolution Specifications

### Levels
- 0.1 dB

### Elapsed Time
- 0.1 s

### Real Time Clock
- 1 s

## Integration Time
- Time-Averaged Levels and Sound Exposure Levels
  - Minimum: 0.1 s
  - Maximum with Daily Autostore Enabled: Unlimited
  - Maximum with Daily Autostore Disabled: > 23 days with error < 0.5 dB

### Ln Statistics
- Number of Selectable Parameters: 6 in xx.xx% format
- Distribution Resolution: 0.1 dB
- Spectral Statistics: Requires Octave Analysis option (831C-OB3)

### Markers
- Number of Markers: 10
- Prenamed Markers: Truck, Automobile, Motorcycle, Aircraft, Exclude

### Back Erase
- Back Erase Time: 5 or 10 s

## Measurement Control Modes

### Available Modes
- Manual Stop, Timed Stop, Stop when Stable, Continuous, Single Block Timer, Daily Block Timer

### Time-Related Settings
- Time in hh:mm:ss
- Delta level in xx dB and time in hh:mm:ss

### File Management
- 1, 2, 4, 6, 12, 24, 48, 96 or 144 files per day, automated file numbering "ymmdmm.LD0"
- Restart after Power Failure: Automatic if powered by 12 VDC and continuous run mode
- Single Block Timer: Start date and time to end date and time
- Daily Block Timer: Up to 3 blocks between each start and end date

## Clock Stability
- ±1 sec in 24 hours, at 75 °F (+24 °C)
- ±10 sec in 30 days, at -40 °F to +158 °F (-40 °C to +70 °C)
- <1 s when using NTP

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**Standards Met by Model 831C**

The Model 831C meets the specifications of the following standards:

### Sound Level Meter Standards
- IEC61672-1 Ed. 2.0 (2013) Class 1, Group X
- IEC60651 Ed 1.2 (2001) plus Amendment 1 (1993-02) and Amendment 2 (2000-10) Type 1, Group X
- ANSI S1.4-2014 Class 1
- ANSI S1.43-1997 Type 1
- DIN 45667

### Octave Filter Standards (Option 831C-OB3)
- IEC81260 Ed. 2.0 (2014) Class 1, all filters
- ANSI S1.11-2014 Class 1, all filters

### Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use
- 2014/35/EU Low Voltage Safety Directive
- IEC 61010-1 Ed. 3.0 (2010-06)
- 2011/65/EU RoHS Directive

### EMC Immunity and Emission
- 2014/30/EU EMC Directive
- IEC 61126-1 Ed. 2.0 (2012-07)
- IEC 61871-1 Ed. 2.0 (2013-09)
- FCC Title 47 CRF Part 15, Class B

### Physical Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length with Microphone and Preamplifier</td>
<td>11.35 in</td>
</tr>
<tr>
<td>Length, Instrument Body Only</td>
<td>8.8 in</td>
</tr>
<tr>
<td>Width</td>
<td>2.8 in</td>
</tr>
<tr>
<td>Depth</td>
<td>1.6 in</td>
</tr>
<tr>
<td>Weight with Batteries, No Preamplifier or Microphone</td>
<td>17.3 oz</td>
</tr>
</tbody>
</table>

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**ADDITIONAL HARDWARE SPECIFICATIONS AND BROADBAND NOISE LEVELS**

### General Specifications (Continued)

**Microphone Input**
- Connector: Latching 5-pin connector
- Input Impedance: 100 kΩ and 300 pF
- Full Scale Input (0 dB gain): 14 Vpeak
- ICP Current (requires ADP074): ≤ 4 mA

**AC/DC Output**
- Jack: 2.5 mm (3/32 in) female
- AC Output Voltage Range: ± 14 Vpeak (preamplifier output)
- ± 2.1 Vpeak with 0, 20 or 40 dB gain (for LINE inputs)
- DC Output Voltage Range: ± 10 mV per dB, 0 V for 0 dB, 1 V = 100 dB
- DC Output Frequency & Time Weighting: Follows SLM Settings: A, C, or Z and S, F, or I

**Power Supply**
- Batteries: 4-AA (LR6) NiMH, 1.5 V Lithium or Alkaline cells (supplied with 2500 mAh NiMH)
- External Power (5 V from USB): USB Mini B connector to USB interface from computer
- * PSAD09 AC to DC power adaptor
- External Power: 10 connector, 10 to 25 VDC (Use cable CBL140)
- Operating Time (with power save options): > 18 hours (1.5 V Lithium batteries)
- > 8 hours (Alkaline or NiMH batteries)
- Power Consumption with PRM831: 1.1 W (backlight off, running)
- 2.2 W (with DIV12)
- 5 W (maximum)

**Memory Retention**
- Data Memory: Non-volatile flash memory, backup performed every minute
- Real-time Clock: ≥ 1 year with batteries removed

**Broadband Noise Levels**

<table>
<thead>
<tr>
<th>Weighting</th>
<th>0 dB Gain (Typical)</th>
<th>0 dB Gain (Max)</th>
<th>20 dB Gain (Typical)</th>
<th>20 dB Gain (Max)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>10</td>
<td>12</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>C</td>
<td>13</td>
<td>16</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>Z</td>
<td>22</td>
<td>25</td>
<td>22</td>
<td>25</td>
</tr>
</tbody>
</table>

**Self generated Total Noise**

<table>
<thead>
<tr>
<th>Weighting</th>
<th>0 dB Gain (Typical)</th>
<th>0 dB Gain (Max)</th>
<th>20 dB Gain (Typical)</th>
<th>20 dB Gain (Max)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>16</td>
<td>19</td>
<td>16</td>
<td>17</td>
</tr>
<tr>
<td>C</td>
<td>17</td>
<td>20</td>
<td>16</td>
<td>19</td>
</tr>
<tr>
<td>Z</td>
<td>23</td>
<td>26</td>
<td>23</td>
<td>26</td>
</tr>
</tbody>
</table>

**Model 831C Preamplifier Specification (PRM831)**

- Frequency response with respect to the response at 1 kHz with 1 Vrms input
  - 8 Hz to 16 Hz: +0.1 dB, -0.2 dB
  - 16 Hz to 100 kHz: +0.1 dB, -0.1 dB
  - Lower -3 dB limit: < 1.5 Hz
- Attenuation: 0.1 dB (typical)
- Input Impedance: 10 GΩ / 0.16 pF
- Output Impedance: 50 Ω
- Maximum Output: 28 Vpp 143 dB peak for microphones with 50 mV/Pa sensitivity
- Maximum Output Current: 12 mA peak
- Harmonic Distortion: < -70 dBC with 8 VRMS output at 1 kHz
- Output Slew Rate: 2 V per µs (typical)
- Electronic Noise With 12 pF Equivalent Microphone
  - A: 1.8 µV typical A-weighted (2.4 µV max)
  - C: 4.3 µV typical Flat 20 Hz to 20 kHz (5.0 µV max)
- Power Supply Voltage: 15 V to 36 V
- DC Output Level: 3/2 power supply voltage
- Power Supply Current: 1.9 mA (typical)
- Temperature Sensitivity: < ±0.05 dB from -40 °F to +176 °F (-40 °C to +80 °C)
- Humidity Sensitivity: < ±0.05 dB from 0 to 90% RH, non-condensing at +122 °F (+50 °C)
- Dimensions (D x L): 0.50 in x 2.88 in (12.7 mm x 73 mm)
- Microphone Thread: 11.7 mm - 60 UNS (0.4606 in - 60 UNS)
- Maximum Cable Length: 200 ft (61 m) for signals up to 20 kHz
- Output Connector: Switchcraft TA5M (5-pin male)

**Model 831C with PRM831 and 377B02 Microphone**

<table>
<thead>
<tr>
<th>Dynamic Range</th>
<th>0 dB Gain</th>
<th>20 dB Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>17 dB - 140 dB</td>
<td>16 - 120 dB</td>
</tr>
<tr>
<td>C</td>
<td>17 dB - 140 dB</td>
<td>17 - 120 dB</td>
</tr>
<tr>
<td>Z</td>
<td>24 dB - 140 dB</td>
<td>23 - 120 dB</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measurement Range [1]</th>
<th>0 dB Gain</th>
<th>20 dB Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>24 dB - 140 dB</td>
<td>20 - 120 dB</td>
</tr>
<tr>
<td>C</td>
<td>26 dB - 140 dB</td>
<td>25 - 120 dB</td>
</tr>
<tr>
<td>Z</td>
<td>36 dB - 140 dB</td>
<td>33 - 120 dB</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Peak Range</th>
<th>0 dB Gain</th>
<th>20 dB Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>65 dB - 143 dB</td>
<td>44 - 123 dB</td>
</tr>
<tr>
<td>C</td>
<td>66 dB - 143 dB</td>
<td>45 - 123 dB</td>
</tr>
<tr>
<td>Z</td>
<td>68 dB - 143 dB</td>
<td>59 - 123 dB</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Max Level</th>
<th>0 dB Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPL</td>
<td>140 dB</td>
</tr>
<tr>
<td>PEAK</td>
<td>143 dB</td>
</tr>
</tbody>
</table>

**Notes**
- [1]: As defined in IEC 61672-1. Microphone and electrical self-noise included

**Model 831C Preamp & 377B02 Mic**

**PRM831 Preamplifier**

**377B02 Microphone**

---

**SYSTEMS FOR RESEARCH & DEVELOPMENT**

**ADDITIONAL HARDWARE SPECIFICATIONS AND BROADBAND NOISE LEVELS**

---

**Broadband Noise Levels**

<table>
<thead>
<tr>
<th>Weighting</th>
<th>Self-generated Electrical Noise</th>
<th>Typical (dB)</th>
<th>Max (dB)</th>
<th>Self-generated Total Noise</th>
<th>Typical (dB)</th>
<th>Max (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Weighting</td>
<td>-0.1 to 0.1</td>
<td>-0.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Weighting</td>
<td>-0.1 to 0.1</td>
<td>-0.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Z</td>
<td>Weighting</td>
<td>-0.1 to 0.1</td>
<td>-0.2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Combination of the electronic noise and the thermal noise of the 377B02 microphone at 68 °F (20 °C) measured in a sealed and vibration isolated cavity with an averaging time of 60 seconds. Electronic noise of the instrument with an ADP090 (12 pF) in place of the microphone highest anticipated self-generated noise.
OPTIONS AT-A-GLANCE

Spectral Analysis

<table>
<thead>
<tr>
<th>Octave Analysis (with Option 831C-OB3)</th>
<th>1/3 Octave Filters</th>
<th>2.0 Hz to 20 kHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>L/3 Octave Filters</td>
<td>4.0 to 160 Hz</td>
<td></td>
</tr>
<tr>
<td>Measurement Parameters</td>
<td>All Octaves</td>
<td></td>
</tr>
<tr>
<td>Frequency Weighting</td>
<td>A, C, Z</td>
<td></td>
</tr>
<tr>
<td>Max Spectrum</td>
<td>Maximum on Band</td>
<td></td>
</tr>
<tr>
<td>Spectral Statistics</td>
<td>0-90%</td>
<td></td>
</tr>
<tr>
<td>Octave Band Logging Capability</td>
<td>Time History</td>
<td></td>
</tr>
</tbody>
</table>

Normalized Spectrum

- View Modes: SPL, Leq, Lmax, or Lmin, absolute or relative
- Predefined Curves: A, C, or Z
- User-Defined Curves: Four named for 1/1 octave and four for 1/3 octave bands

Profiling with Time History Logging, Measurement History, and Event History

- Time History Logging (with option 831C-ELA)
  - Record Period: Selections from 2.5 ms to 24 hr
  - Logging Parameters: Any combination of available broadband and spectral
    AnyData plus non sound metrics

Measurement History Logging (with option 831C-ELA)

- Interval: 1 min to 99 hr
- Logging Parameters: Same as overall measurements
- Sound Record Tagging: Required to enable SR

Event History Logging (with option 831C-ELA)

- Logging Period: 20 ms to 5 s (independent of TH or MH)
- Logging Parameters: Leq, Lmax, Leq, Date and Time, Duration, Exposure in dB and Pa2
- Sound Record Tagging: At start of each interval (required to enable SR)

Sound Recording (831-SR)

- SEL: Yes (LAE)
- Data Format: Mono wave file (.wav) or compressed (.ogg)
- Listening Options: On Model 831 using USB headset with utility program, DNA, or using
  standard wave file player
- Sample Rate: 9, 16, 24, 48, or 51.2 kbps
- Storage Requirement: 1 MB/min at 8 kbps or 6 MB/min at 48 kbps for .wav file
- Sound Recording Modes: Manual, coupled to marker, at measurement interval start, upon
  event
- Pretrigger: Variable depending upon sample rate; up to 50 s
- Duration: Max 9999 s
- Sound Streaming: Streaming to host

Weather (Meteorological Parameters)

Combined Meteorological Unit (with sensor SEN031)

- Measured Parameters: Wind speed and direction, temperature, relative humidity, rain, and
  hail
- Communication: USB using DVX008A
- Sensor Model: SEN031 (requires CBL167 & DVX008A)
- Sensor Noise Level: 30 dB A-weighted at 2 ft (61 cm)

Ultrasonic Anemometer - Wind Sensor (with sensor SEN032)

- Measured Parameters: Wind speed and direction
- Communication: USB using DVX008A
- Sensor Model: SEN032 (requires CBL167 & DVX008A)
- Sensor Noise Level: 30 dB A-weighted at 2 ft (61 cm)

Communication Options

- Direct USB to Sierra Wireless (831C-SW)
  - Sierra Wireless RV50 4G cellular gateway
  - Power: 3.2 W with power save configuration

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>831C-ENV</td>
<td>SoundAdvisor Model 831C sound level meter with Class-1 free-field, pre-polarized precision condenser microphone (50 mV/Pa), preamplifier (PRM831), accessory kit (831C-ACC)</td>
</tr>
<tr>
<td>831C-FF</td>
<td>SoundAdvisor Model 831C sound level meter with Class-1 free-field, pre-polarized condenser microphone (50 mV/Pa), preamplifier (PRM831), accessory kit (831C-ACC)</td>
</tr>
<tr>
<td>831C-FF-KIT1</td>
<td>SoundAdvisor Model 831C-FF with firmware options 831C-LOG &amp; 831C-OB3</td>
</tr>
<tr>
<td>831C-RI</td>
<td>SoundAdvisor Model 831C sound level meter with Class-1 random-incidence pre-polarized condenser microphone (50 mV/Pa), preamplifier (PRM831), accessory kit (831C-ACC)</td>
</tr>
<tr>
<td>831C-RI-KIT1</td>
<td>SoundAdvisor Model 831C-RI with DVX012 and firmware options 831C-LOG, 831C-OB3, 831C-ELA &amp; 831C-SR</td>
</tr>
<tr>
<td>831C-LOWN</td>
<td>SoundAdvisor Model 831C sound level meter with 378A04 low noise, ICP microphone and preamplifier (450 mV/Pa), accessory kit (831C-ACC) and ICP adapter (ADP074)</td>
</tr>
<tr>
<td>831C-SW</td>
<td>SoundAdvisor Model 831C sound level meter for environmental and community noise without microphone or preamplifier</td>
</tr>
</tbody>
</table>

Sound Advisor Model 831C sound level meter base kit for environmental noise. Includes EPM135, PRM2033-PF, CBL1305-20, and firmware options 831C-LOG, 831C-OB3, 831C-ELA, 831C-SR & 831C-SW STOCK ORDERING INFORMATION

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</table>

Firmware Options

- 831C-LOG Upgrade Model 831C sound level meter with logging of time histories with periods from 20 ms to 24 hr
- 831C-OB3 Upgrade Model 831C sound level meter with real-time 1/1 & 1/3 octave filter set
- 831C-ELA Upgrade Model 831C sound level meter with event, interval and daily histories logging
- 831C-SR Upgrade Model 831C to record compressed and uncompressed audio
- 831C-MSR Upgrade Model 831C to add measurement history and sound recording
- 831C-SW Upgrade Model 831C to add direct USB communication with Sierra Wireless R50 gateway

Calibration

- CER-831 ISO 17025 compliant calibration and certification of 831C (SLM, preamplifier with microphone) and 831C RPT
- CER-MIC Calibration and certification for microphone
- CER-PRM2103-E Environmental Certification Model PRM2103 for [-40, +158] °F [-40, +70] °C range; no microphone certification; environmental test of microphone
- CER-426A12 Calibration and certification for 426A12 including environmental testing for temperature and humidity stability. Replaces windscreen, o-ring, and desiccant cartridges
- 831-RPT Model 831C Sound Level Meter certification test report. Certificate for SLM, preamplifier, and microphone.
ORDERING INFORMATION

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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>31-ACC</td>
<td>Accessory kit for Model 831C sound level meter, which includes case (31-ACC-CCS), 15.75 Hz to 20 kHz (±2 dB) and 15.75 Hz to 16 kHz (±2 dB)</td>
</tr>
</tbody>
</table>

**Accessories**

- **MD-0324 RevB  062617**
  - All information is preliminary and subject to change

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<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>EPS030-831</td>
<td>Case on wheels (CCS035) to enclose Model 831C with 100 Ah batteries (BAT015) in a CCS002 hard case; includes a cable gland</td>
</tr>
<tr>
<td>EPS034</td>
<td>Environmentally protected for 831C, 831 or 870 with Battery Holder (BAT017) in a CCS002 hard case; includes a cable gland</td>
</tr>
<tr>
<td>EPS034-LFP</td>
<td>Noise monitor enclosure for 831C including CCS051, CCS052, ACC009, PS0438, CBL224-02, CBL225-01, CBL226-02 &amp; CBL228-03</td>
</tr>
<tr>
<td>EPS044-LFP</td>
<td>Noise monitor enclosure for 831C including CCS051, CCS052, BAT017 83 Ah SLA battery, ACC009, PS0438, CBL224-02, CBL225-01, CBL226-02 &amp; CBL228-03</td>
</tr>
<tr>
<td>EPS045</td>
<td>Environmental protection for 2/3 inch preamplifiers with windscreen, bird spooks, desiccants, and universal mounting</td>
</tr>
</tbody>
</table>

---

**Calibrators**

- **CAL200**
  - Combined weather sensor: wind speed and direction (no moving parts), temperature, humidity, pressure, rainfall (requires CBL167 cable + DVX008A)

---

**Microphones and Preamplifiers**

- **377B02**
  - 0.5 inch free-field, pre-polarized condenser microphone, typical sensitivity 50 mV/Pa, 3.5 Hz to 20 kHz (±2 dB)

---

**Software**

- **SWW-SLM-UTIL04**
  - 44 Lb LD Utility software for SoundTrack LiX™ and Model 831C sound level meter; download, upgrade, print test reports or export to spreadsheet

---

**Systems for Research & Development**

- **TRP003**
  - Tripod, maximum height 8 ft (2.4 m) included with portable NMS systems

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**Noise Monitoring System Components**

- **COM-RV50-DC-E/U**
  - Sierra Wireless Model R50 cellular gateway to add Internet connectivity through cellular network to 831C. Choose /U for US and /E for rest of world. Requires option 831C-SW, 831C-LFP for direct USB connection.

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**Accessories**

- **CBL218**
  - Cable, USB-A to micro B, 3 ft (1 m)

---

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**Battery Holders**

- **BAT015**
  - 45 Ah LiFePo battery. Weighs 12.8 pounds (5.8 kg)

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**Noise Monitoring System Components**

- **COM-RV50-DC-E/U**
  - Sierra Wireless Model R50 cellular gateway to add Internet connectivity through cellular network to 831C. Choose /U for US and /E for rest of world. Requires option 831C-SW, 831C-LFP for direct USB connection.

---

**Microphones and Preamplifiers**

- **377B02**
  - 0.5 inch free-field, pre-polarized condenser microphone, typical sensitivity 50 mV/Pa, 3.5 Hz to 20 kHz (±2 dB)

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Larson Davis provides complete solutions for noise and vibration measurement and analysis. From stand-alone, simple-to-use instruments to complete systems including sensors, data acquisition, and software, Larson Davis has what you need.

As a part of MTS Systems Corporation, Larson Davis guarantees Total Customer Satisfaction through our outstanding limited warranty; no-charge, 24-hour, toll-free technical support; global distribution; and worldwide customer service.