

## CEL-400 Series Real Time Analyzers

### Introduction

The new CEL-400 series is an advanced and comprehensive instrument family for a wide range of applications. It has been designed for convenience and ease of use in many popular tasks. From simple workplace noise surveys to full community noise audits the new CEL-400 can do it quickly and easily.

Advanced digital signal processing technology enable the meters in the range to cover the whole audible sound range in a single span. This eliminates the need to select the best range for a measurement since everything is covered from the quietest quiet to the loudest loud.



### Applications

#### Workplace noise:

Automatic calculation of noise exposure. Real time octave band measurements for the correct selection of hearing protectors.

#### Community noise:

All the necessary parameters measured for site boundary noise, impact assessments, and transportation noise studies. Available with a wide range of accessories for unattended monitoring.

#### Product noise:

New product development, emission assessment, quality control, and noise reduction troubleshooting.

#### General noise:

All types of steady and variable or impulsive noise can be quickly and accurately assessed using the real time frequency filters in the B and C models of the meters.

The primary role of the **CEL-450** model is an occupational hygiene instrument. It can be purchased as a broadband model that automatically calculates noise exposure (TWA) and can be used for workplace noise assessments. For the selection of the correct hearing protection the **CEL-450** features the calculation of L<sub>Ceq</sub>-L<sub>Aeq</sub> for use in the HML or NRR method. A more detailed assessment of the frequencies of noise an employee is exposed to can be made with the octave band model. For product development the 1/3 octave version will measure the more 'tonal' components of noise, giving better assessment of noise emissions and allowing noise reduction techniques to be applied more effectively. In frequency analysis modes the instrument measures all the bands simultaneously in real-time, making for fast and accurate results.

### Key benefits

- ❑ Single ultra wide 140 dB dynamic range
- ❑ Real time octaves
- ❑ Real time third octaves
- ❑ 3 Simultaneous broadband frequency weightings
- ❑ Available in both ANSI Type 1 & Type 2 accuracy classifications
- ❑ User definable setup menus for the most commonly used measurements
- ❑ Large and easy to read display
- ❑ Intuitive keypad operation
- ❑ Huge memory stores all that is usually needed for most measurement requirements
- ❑ Rapid data capture up to 100 spectra per second

The **CEL-450** will also measure time history profiles of noise that show how the noise climate has changed over time. The stored results can then be downloaded, and displayed on the included dB23 software. The main role of the **CEL-490** is as an environmental instrument for longer-term community noise applications. This model adds the LN% statistical measurement parameters required for many environmental regulations and these can be calculated in real time in both broadband and frequency bands on the relevant versions. The **CEL-490** also adds more comprehensive data logging functions in the form of period time intervals selectable from 10 msec to 1 hour as well as time history profile recording. Automatic start and stop timers are standard functions on the **CEL-490** and with the companion outdoor microphone enclosure system it can be used for unattended monitoring.

**Product Information**

**CEL-450**

**CEL-490**

Broadband measured parameters	L, L <sub>eq</sub> , L <sub>max</sub> , L <sub>min</sub> , L <sub>pk</sub> , L <sub>tm3</sub> , L <sub>tm5</sub> , L <sub>EP,d</sub> , TWA, L <sub>AE</sub> , L <sub>avg</sub> , L <sub>Aeq</sub> -L <sub>Ceq</sub>	L, L <sub>eq</sub> , L <sub>max</sub> , L <sub>min</sub> , L <sub>pk</sub> , L <sub>tm3</sub> , L <sub>tm5</sub> , L <sub>EP,d</sub> , TWA, L <sub>AE</sub> , L <sub>avg</sub> , L <sub>Aeq</sub> -L <sub>Ceq</sub> , 5 x L <sub>N%</sub> (user selectable 0.1 to 99.9%)
Octave and third octave measured parameters	L, L <sub>eq</sub> , L <sub>max</sub> , L <sub>min</sub> , L <sub>pk</sub>	L, L <sub>eq</sub> , L <sub>max</sub> , L <sub>min</sub> , L <sub>pk</sub> , 5 x L <sub>N%</sub> (user selectable 0.1 to 99.9%)
Timer facility	Fixed duration timer (1 min to 24 hours)	Fixed duration timer (1 min to 24 hrs) Automatic On/Off timers (7 sets, up to 1 month in advance)
Profile time history	4 broadband parameters measured (10 msec to 30 min)	4 broadband parameters measured (10 msec to 30 min)
Period time history	Not available	All parameters selectable in broadband, octave and third octave depending on model (10 ms to 1 hr)
<b>Specification</b>		
Acoustic accuracy:	ANSI S1.4 (R1997), IEC 61672: 2002, IEC 60651:1994, IEC 60804: 2000, IEC 61260:Class 0	
Frequency weightings:	A, C and Z (unweighted)	
Time weightings:	Slow, Fast and Impulse plus Peak	
Amplitude weightings:	Exchange rate Q = 3 plus one from 4, 5 or 6 or none	
Measurement range:	0 to 140 dB rms. Or 143.3 dB peak	
Noise floor:	17 dBA – Class 1 models 25 dBA – Class 2 models	
Frequency analysis mode:	Octave – 11 bands from 16 Hz to 16 kHz plus 3 broadbands A, C and Z Third octave – 33 bands from 12.5 Hz to 20 kHz plus 3 broadbands A, C & Z	
Stored user setup configurations:	4 per mode with user selectable name plus factory default (automatically used next time meter is used)	
Memory:	2 M byte capacity stores up to 999 separate runs plus 880,000 broadband results, 40,000 octave spectra, 13,300 spectra	
Physical properties:	Weight – 17 oz (480 gm) Size – 13.5 x 4 x 1.5 in (343 x 100 x 37 mm) Batteries – 4 x AA cells (alkaline or NiMH types recommended) External power - 12 V dc at 150 mA from mains transformer or battery pack Tripod socket – standard camera tripod thread ¼" Whitworth	
Pc software:	Windows™ compatible package dB23 and RS232 cable included with every model for download of stored results to pc and upload of control to meter	
<b>Ordering information</b>		
<b>ANSI/IEC model compliance:</b> Real time analyzer Type 1:	<b>Model part number:</b> CEL-450.A1 CEL-450.B1 CEL-450.C1 CEL-490.A1 CEL-490.B1 CEL-490.C1	<b>Functions available:</b> Broadband only Broadband plus RT Octaves Broadband plus RT Octaves & 1/3 Octaves
Real time analyzer Type 2:	CEL-450.A2 CEL-450.B2 CEL-450.C2 CEL-490.A2 CEL-490.B2 CEL-490.C2	Broadband only Broadband plus RT Octaves Broadband plus RT Octaves & 1/3 Octaves Broadband only Broadband plus RT Octaves Broadband plus RT Octaves & 1/3 Octaves Broadband only Broadband plus RT Octaves Broadband plus RT Octaves & 1/3 Octaves
<b>Kits and other accessories:</b> Standard kits are available including the relevant real time analyzer, a matching CEL-110 acoustic calibrator, a foam windscreen, RS232 cable, dB23 Windows™ software in a custom attaché case by specifying the part number CEL-4X0.XX/K1 where CEL-4X0.XX is the version of the instrument. Other accessories such as microphone extension cables, long-term waterproof case; interface connections and power supply options are available upon request.		