

## CEL-490 Real time octave and third octave band analyzer

### Introduction

The **CEL-490** is the ultimate instrument for long term community noise measurements where wide changes in levels are expected to occur. Previous generations of noise meters require the user to make a decision on the likely noise levels to be expected during the measurement. Select too high a range and the low background levels will be missed. Choose too low a range and the important peak levels will cause overloads and consequent errors. The single 140 dB range available in the **CEL-490** enable worry free measurements over the whole audio range without changing range. A wide range and all the frequency information collected simultaneously with the power of DSP filters.



*CEL-490 real time analyzer*

### Key benefits

- ❑ Single ultra wide 140 dB dynamic range
- ❑ A, C & Z plus whole octave or third octaves depending on model variant
- ❑ Full data logging as standard
- ❑ Over 800,000 data point non-volatile memory
- ❑ Cumulative results for the whole of the run
- ❑ Regular periodic results at user specified intervals
- ❑ Time history profiles for built-in graphic level recording
- ❑ Storage intervals up to 100 spectra per second for rapid data capture of transients
- ❑ Slow, Fast & Impulse rms. responses plus Peak
- ❑ Simple menu operation using keypad and icon controls
- ❑ Menus in English, French, German, Italian and Spanish

### Applications

- ❑ Long term noise surveys
- ❑ Reverberation time measurements
- ❑ All types of general noise measurements
- ❑ Frequency analysis of transient noise impulses
- ❑ Workplace noise surveys
- ❑ Transportation noise studies
- ❑ ANSI/IEC type 1 & 2 models

The **CEL-490** comes into its own for difficult noise applications when rapid data recording is required. Spectral data capture as fast as 10 millisecond per octave or third octave band spectrum ensures that even the most difficult transient sounds will be measured correctly with no loss of acoustic data integrity.

Remote control of the full operation of the meter from a pc using the included dB23 software enables stored runs to be quickly downloaded and the start and stop of new measurements to be made with a few mouse clicks. Connection can be direct by the included pc cable or by regular and GSM modems.

### Operation and use

Every **CEL-490** comes with a factory default measurement setup pre-configured for ready to go measurements. Additionally, up to 4 user-defined setups can be stored for specific measurement needs with a few or as many parameters chosen from the extensive list in order to customize the way a measurement is captured.

Community noise surveys can cover a total of 24 hours for a single run with hourly period results plus 1 minute profile data saved to show more detail. Up to 999 separate runs can be stored with up to 99,999 periods per run. Four key parameters can be saved as short time history profiles for traditional graphic level recorder operation.

Simple noise surveys can be captured with the overall 'A', 'C' and 'Z' weighted level plus all 33 third octave bands for continuous or impulsive noise sources making this an ideal instrument for the professional acoustics engineer. Statistical noise parameters such as the Ln10% and Ln90% levels are measured in broadband and third octaves.

<b>Product Information</b>		
Broadband measured parameters	Instantaneous level $L_{xy}$ , maximum level $L_{xymx}$ , minimum level $L_{xymn}$ , average level $L_{xeq}$ , exposure level $L_{xE}$ , peak level $L_{xpk}$ , average level $L_{avg}$ , TWA, $L_{Aeq}-L_{Ceq}$ , $L_{EP,D}$ , takmaximal levels $L_{tm3}$ & $L_{tm5}$ , 5 user selectable LN% values	
Octave and third octave band measured parameters	Instantaneous level $L_{xy}$ , maximum level $L_{xymx}$ , minimum level $L_{xymn}$ , average level $L_{xeq}$ , peak level $L_{xpk}$ , 5 user selectable LN% values	
Acoustic accuracy	ANSI S1.4 (R1997) type 1 and type 2, IEC 61672:2002, IEC 60651 : 1994, IEC 60804 : 2000, IEC 61260 : Class 0	
Microphone details	CEL-250 precision electret capsule for type 1 models, CEL-485 combined electret microphone and preamplifier for type 2 models	
Broadband frequency weightings	'A', 'C' and 'Z' (linear, un-weighted, all-pass level)	
Frequency response (Hz)	6.3 Hz to 30 kHz for -3 dB down points	
Octave band center frequencies	11 simultaneous bands with center frequencies 16 Hz to 16 kHz	
Third octave band frequencies	33 simultaneous bands with center frequencies 12.5 Hz to 20 kHz	
Time weightings (response)	Slow, Fast and Impulse for rms.	
Peak frequency weighting	'A', 'C' or 'Z' separate from rms. weighting	
Dynamic range for calculations	140 dB	
Noise floor (dB)	16.5 'A' weighted, 19.7 'C' weighted, 23.4 'Z' weighted	
Maximum noise level (dB)	140 dB rms., 143 dB peak (with standard 50 mV/Pa CEL-250 mic)	
Resolution (dB)	0.1 dB across whole range	
DSP sampling rate (Hz)	67,200 Hz sampling with true rms. values calculated digitally	
Histogram classwidth (dB)	143 x cells at 1 dB steps for full 140 dB range plus over-range and under-range cells (user selectable for broadband measurements)	
Memory storage capability	2 Mbytes (over 800,000 data points) 25,000 full octave spectra,	
Sampling intervals, in periods up to 14 parameters (user selected)	19 times from 10, 20, 50, 100, 250, 500 msec 1, 5, 10, 15, 20, 30 sec 1, 5, 10, 15, 20, 30, 60 min	
Sampling intervals, up to 4 time history profiles (user selected)	18 times from 10, 20, 50, 100, 250, 500 msec 1, 5, 10, 15, 20, 30 sec 1, 5, 10, 15, 20, 30 min (profile interval time must be $\leq$ period times)	
Fixed duration for measurement	12 durations from 1, 5, 10, 15, 20, 30 min 1, 2, 4, 8, 12, 24 hour	
Delayed start and stop for runs	Up to 7 pairs of delayed timers can be set up to 30 days in advance	
Calibration method	Manual or automatic set to user entered dB level, last 4 calibration details saved for review and verification of stability	
Configurations saved in memory	1 factory default plus 4 user setups saved per bandwidth	
Analog outputs	AC signal 0.5 V rms. at 94 or 114 dB FSD (plus optional log DC output 0 to 2 V for 0 to 140 dB at 14.28 mV/dB)	
Digital output	Download or remote control of operations of meter via dB23 software	
Baud rate for digital transfer	8 settings from 9600 to 115200 baud	
Screen languages	English, French, German, Italian, Spanish menu selectable	
LCD screen display	128 x 64 pixel monochrome backlit display with icon indicators	
Size	13.4 x 4 x 1.5 in (340 x 100 x 40 mm)	
Weight	19.3 oz (550 gm)	
Tripod socket	Standard camera thread (1/4 inch)	
Internal power supply	4 off AA alkaline cells (15 hours typical max battery life for broadband, 12 hours typical for narrow band measurements)	
External power supply	12 V dc at 150 mA nominal via 2.1 mm power connector	
<b>Models available</b>	<b>ANSI Type 1 accuracy</b>	<b>ANSI Type 2 accuracy</b>
Broadband model	<b>CEL-490.A1</b>	<b>CEL-490.A2</b>
Octave band model	<b>CEL-490.B1</b>	<b>CEL-490.B2</b>
Third octave band model	<b>CEL-490.C1</b>	<b>CEL-490.C2</b>
<b>Measurement Kits</b>	Specify a standard CEL-490 kit by adding /K1 after meter part #	