Casella *dB*adge Personal Sound Exposure Meter

IMPROVED CLIPS FOR 2014

Designed to make personal noise exposure measurements with confidence!

The *dB*adge Series comprises of the *dB*adge and *dB*adge 'Plus'. The *dB*adge Series is ideal for personal noise exposure measurements around the workplace. By using the latest digital technology, the *dB*adge Series achieves new standards of performance levels in noise dosimetry.

Applications

- Measuring personal noise exposure
- Assessing and monitoring noise in the workplace
- Ensuring compliance with Workplace Noise Regulations
- Selection of effective hearing protection (*dB*adge 'Plus')
- Measurements according to ISO9612: 2009, OSHA 29 CFR 1910.95

Key features

- Compact, rugged (rubber overmoulded) design weighs only 71g
- No cables to damage or get in the way
- Measures and logs all workplace noise parameters
- 28 hour battery life, fully charges in 90 minutes
- Integrated display and visual exposure alarm
- Simple auto-calibration function
- Comprehensive software package
- 'Pro' mode displays dose and projected dose values
- Run duration timers
- Intrinsically safe models available for use in hazardous atmospheres
- Simultaneous 'C' and 'A' weighted measurements on the *dB*adge 'Plus'

The *dB*adge design eliminates cables, unlike traditional dosimeters, and weighs only 71g. No other external equipment is needed to operate the *dB*adge Series. It is simply operated by the 2 keys on the side of the instrument.

Battery life and memory capacity are sufficient to perform many consecutive shift measurements without charging or downloading. Recharging the integral NiMH battery can be achieved in 90 minutes. A variety of mounting options are available for all types of working conditions, making the *dB*adge Series very easy to fit to the shoulder of the employee and comfortable to wear.

The *dB*adge model has additional functionality to measure the time history of noise levels on top of these cumulative levels, which can later be graphed on the PC Software. The *dB*adge 'Plus' model is also available which measures simultaneous 'C' and 'A' weighted Leq measurements as additional functionality. These can then be used to calculate the effectiveness of hearing protection by either the SNR or HML method further increasing the applications for this innovative product. For any model no set-up is required so there is no risk of measuring the wrong parameters.

Built in Display

- **Display shows measurement status and data**
- **Unique LED action level alarm function**
- **'Fuel gauge' display for memory and battery information**
- **1 minute values of average and peak noise levels stored**
- **'Pro' mode enables projected exposure values to be displayed**

The *dB*adge Series is the first compact noise badge product to be designed with a display. This internal display makes it easy to perform calibration, provides status information and shows key measured data. The *dB*adge has a unique 'fuel gauge' to display memory and battery status, ensuring the exact remaining battery and memory capacity can be viewed on the display. Also a unique feature of the *dB*adge is the alarm function. An ultra-bright LED on the *dB*adge gives a visual indication of when exposure action levels have been exceeded by flashing at different rates. These action levels can be configured via the Insight software and used to instantly see if noise control or hearing protection measures are needed. The alarm function can be switched on or off via the *dB*adge keys.

'Fuel gauge' display for memory and battery information

In addition to noise exposure parameters, the time history of the noise is logged in 1 minute values of both the average noise level and the peak value for subsequent analysis of how the noise exposure has occurred. This data can be viewed and analysed via Insight software.

'Pro' mode, available on CEL-350 and CEL-352 models, allows additional exposure values to be displayed. For EU regulations LEX,8h and Projected LEX,8h are displayed; for US regulations TWA, Projected TWA and percentage dose values are displayed. The screen can of course be locked so the operator cannot see any noise parameters, removing the temptation to tamper with results!

Simple 2 key operation

- **Unique automatic calibration function**
- **Lockable keys and display**
- **Easy to mount on employees' shoulder**

The *dB*adge Series is quick and easy to operate. After switching the *dB*adge on, place the calibrator over the microphone and the *dB*adge Series will auto-calibrate, and store the calibration data and time, ensuring accurate and validated results. The unique design of the windshield ensures it can be securely clipped into place to give protection in dusty environments and prevent air movement affecting the measurement. The *dB*adge can be started and the keypad locked before being placed on the shoulder of the employee.

Overall, a measurement can be started within seconds of switching the *dB*adge on. At the end of the measurement run, simply unclip the *dB*adge. The data can be viewed on the easy to read graphic display to ensure the noise measurement was valid. Consecutive measurements can be taken without the need to charge or download the *dB*adge.

Casella Insight Data Management Software

CASELLA≡ INSIGHT

- **Store results in simple tree structured database, by person, place or process etc.**
- **Automatically colour codes results for exceeded noise action levels**
- **Graphical display and analysis of noise time history**
- **Automatic report generation**
- **Data can easily be exported to other applications**

The *dB*adge downloads to a PC automatically using Casella Insight software, simply by pointing the *dB*adge at the infra-red download cable provided. Once downloaded, data can be stored under an employees' name, location or process so that a database of noise exposures can be built up.

An automatic colour coding system can be used to highlight which employees have been exposed to specific noise action levels. Graphs can be analysed by adding zones (shown right) which subsequently provides exposure levels inside and outside these zones. This allows the exclusion of extraneous events, breaks etc. to provide comparative exposure calculations. Any exclusion zones added to data are retained with the data file.

Data can be viewed according to different measurement protocols, either ISO (Europe) or OSHA (USA). Alternatively the data displayed can be customised to a specific users own requirements.

For larger organisations, data can be shared with colleagues anywhere in the world with the inbuilt import and export feature. A 'backup database' feature is also included allowing data to be stored on a secure drive within you company, therefore preventing the loss of valuable data.

Report templates provided with the software can be customised and saved, so that user-defined reports can be easily generated. Reports can summarise the required dose data and any information about the employees' working day, together with the logged time history of noise exposure throughout the day. This useful feature ensures exposure data is presented concisely without having copy data to any other software package to produce reports.
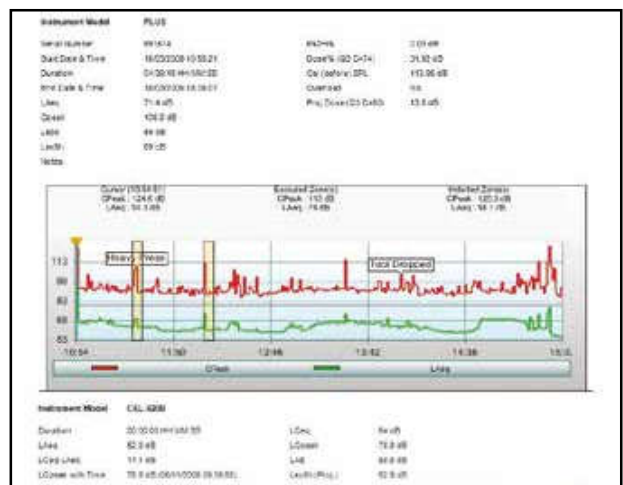
Casella Insight Data Management Software has many other features, such as the ability to be used with other Casella instruments, for further details please see Casella Insight data sheet.
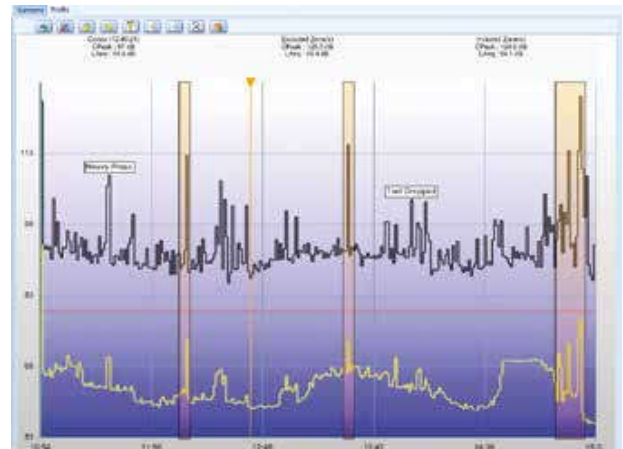
Graphical analysis of noise time history

Tree style database of results with colour coding for exceeded noise action levels

An example of a run report

Variety of Mounting Options

- **Safe and secure**
- **Comfortable for the wearer**
- **Can be fitted to all clothing types**

The choice of mounting clips, ensures that through it's combined light weight and size, the *dB*adge is both unobtrusive and comfortable to wear on the shoulder. The *dB*adge is supplied with both the crocodile clips (fitted) and the pin clip; an alternative hard hat mounting kit is available.

Mounting Options:
- CEL-6351 Pin Kit
- CEL-6352 Crocodile Clip Kit
- CEL-6354 Hard Hat Kit

Mounted on a hard hat
using CEL-6354

*dB*adge with CEL-6352
Crocodile Clip Kit

Intelligent Fast Charging System

- **Full charge gives the *dB*adge a 28 hour operating time**
- **Fully charges in 90 minutes**
- **Charger units can be linked together**
- **Single mains supply can supply up to 12 *dB*adge units**
- **Visual display of charge progress with unique 'fuel gauge'**

Due to the battery technology and intelligent charging method used, the *dB*adge unit does not have to be continually on charge. The standard 3-way charger can be used to manage many *dB*adge units.

When placed on the charger, the *dB*adge will display a 'fuel gauge' which shows how much operating capacity, in hours, is currently held in the batteries. When fully charged, the blue LED on the front of the *dB*adge illuminates.

The *dB*adge does not have to be fully charged prior to use. A 30 minute charge will give an operating time of greater than 8 hours, enough for a typical working day.

A single CEL-6362 3-way charger is required. The number of charging points can be increased using the CEL-6363 3-way charger extension kit. Up to 12 *dB*adge units can be charged in this way.

The CEL-6362 3-way charger with 1 *dB*adge

Measurements Kits

- **Standard kits of 1 and 10 units**

- **Additional *dB*adges can be added to make any quantity of kit**

- **Robust kit case holds up to 10 *dB*adges and accessories**

*dB*adge measurement kits are available with various quantities of *dB*adges and include all items necessary for workplace noise dosimetry measurements. Each kit is complete with the appropriate number of *dB*adge units, as well as a CEL-120/2 Acoustic Calibrator, infra-red download cable, 3-way charger, and power supply. The *dB*adges and the CEL-120/2 Acoustic Calibrator are supplied with calibration certificates.

For software to go with the *dB*adge kits, please refer to Casella Insight data sheet.

A typical measurement kit

MEASUREMENT KIT PART NUMBERS

CEL-350 *dB*adge KITS

Standard Kits	I.S. Kits	
CEL-350/K1	CEL-350/IS/K1	*dB*adge Measurement Kit with 1x *dB*adge and 3-way charger
CEL-350/K10	CEL-350/IS/K10	*dB*adge Measurement Kit with 10x *dB*adge and 2x 3-way chargers

CEL-352 *dB*adge 'PLUS' KITS

Standard Kits	I.S. Kits	
CEL-352/K1	CEL-352/IS/K1	*dB*adge 'Plus' Measurement Kit with 1x *dB*adge 'Plus' and 3-way charger
CEL-352/K10	CEL-352/IS/K10	*dB*adge 'Plus' Measurement Kit with 10x *dB*adge 'Plus' and 2x 3-way charger

Kits include: CEL-35X(/IS) *dB*adge(s). Where 'X' represents model variant. CEL-120/2 Acoustic Calibrator, CEL-6355 kit case, 193200B Infra-red to USB (PC) download cable, CEL-6352 crocodile clip mounting kit, CEL-6351 pin mounting kit, CEL-6362 3-way charger and 1x CEL-6363 3-way charger extension unit on CEL-35X/K10, HK111 screwdriver for changing mounting clips.
All kits include calibration certificates for the *dB*adge(s) and CEL-120 Acoustic Calibrator.

Intrinsically Safe (I.S.) models

An Intrinsically Safe version of the dBadge is available meeting the requirements of ATEX EEx ia I M1, EEx ia IIC T2 II 1 G, certificate number 07ATEX2032X and IECEx Ex ia I Ma, Ex ia IIC T2, certificate number IECEx SIR 11.0063X. FM American and Canadian approvals are to Class 1, Division 1, Groups A, B C, D, temperature classification T2. This makes the I.S. dBadge particularly suitable for use in hazardous areas such as mines, printing works, petrochemical plants and other areas that require safe monitoring instruments. The part number for the I.S. version is CEL-35X/IS, where X represents the model variant.

The Selection of Hearing Protection

- **Simultaneous measurement of 'C'and 'A' weighted levels**
- **Used to calculate the effectiveness of hearing protection**
- **The SNR or HML method can be used**

The *dB*adge 'Plus' simultaneously measures L_{Ceq}, and L_{Aeq}. The Single Number Rating (SNR) and High, Medium, Low (HML) values are provided by hearing protection manufacturers for all their PPE. The L_{Ceq}, and/or the ,L_{Aeq}, are used in conjunction with these values to calculate the dB value at the ear via simple internationally recognised calculations.
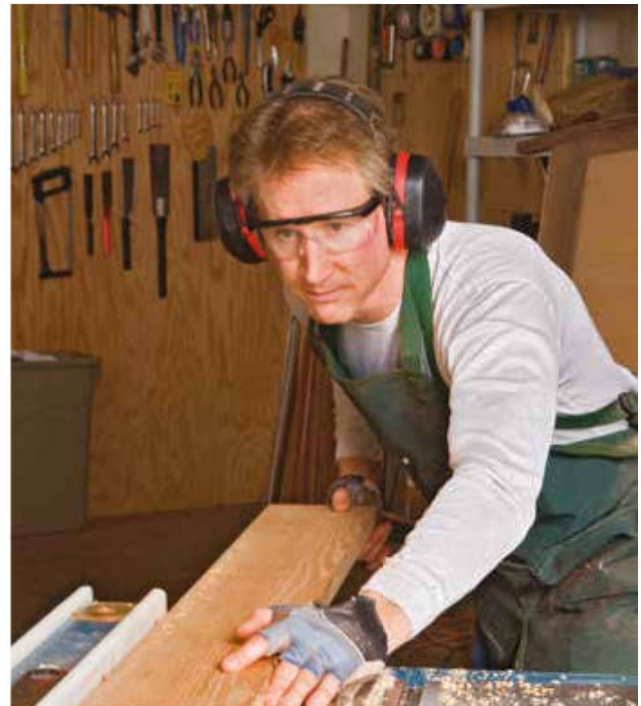
Technical Specification

Linear operating range:	65.0 to 140.3dB RMS
Peak measurement range:	95.0 to 143.3dB Peak
Frequency weightings RMS:	A (and 'C' on CEL-352)
Frequency weightings Peak:	C, A, Z (Linear)
Time weightings:	Slow, Fast & Impulse
Amplitude weightings:	Q=3 & Q=5
Selectable thresholds:	2 (70 to 90dB), selectable in 1dB steps
Selectable criterion:	1 (70 to 90dB), selectable in 1dB steps
Memory capacity:	(180 Hours of measurements)
Default modes:	ISO or OSHA
Calibration information:	Calibration dates, times and levels
Run duration timer:	Selectable up to 12 hours in 30min intervals
Security:	Lock via keys
Power supply:	Internal NiMH cells
Battery life:	28 Hours run capacity
Size mm (in):	80x47x52 (3.1x1.8x2.0) inc windshield
Weight g (oz):	71g (2.5)
Data storage:	Non-volatile, 10 years of storage
Display:	Graphic LCD 96 x 26 pixels
Output (PC):	Infra-red to USB (PC) cable to Insight Software

Applied Standards:

IEC 61252:2002 Personal Sound Exposure Meters
ANSI S1.25:1991 Personal Noise Dosimeters

Casella have a continuous product improvement policy and therefore reserve the right to change the specification without notice.

Measured Parameters:

ISO:	L_{Aeq}, L_{Cpeak}, $L_{AEX,8h}$, Projected $L_{AEX,8h}$, Pa²Hours Projected %dose (Q=3)
OSHA:	L_{Aavg} (Q=5), L_{Zpeak}, L_{ASmax}, %dose (Q=5), TWA , Projected TWA, %dose, Projected %dose (Q=5)
General:	L_{AFmax}, L_{AFmin}, L_{ASmin} (via insight) L_{Aleq}, L_{Almax}, L_{Almin}, L_{Apeak}
Time history:	L_{Aeq}, L_{Zpeak}, L_{Cpeak}, L_{Aavg} (Q=5) Stored as 1 minute values (except CEL-350L)

Note: dose values ($L_{AEX,8h}$, & TWA) are only shown when 'Pro' mode is enabled on CEL-350 and CEL-352 models.

*dB*adge 'Plus':

Simultaneous measurement of L_{Ceq}, and L_{Aeq}, together with calculated L_{Ceq}-L_{Aeq}, used for the selection of hearing protection

Storage:	All parameters simultaneously stored

Environmental Conditions:

In storage:	Temperature: -10 to +50°C,
Humidity:	30 to 95% RH (non-condensing)
In operation:	Temperature: 0 to +40°C

ORDERING INFORMATION

CEL-350	*dB*adge Personal Sound Exposure Meter
CEL-350/IS	I.S. *dB*adge Personal Sound Exposure Meter
CEL-352	*dB*adge 'Plus' Personal Sound Exposure Meter
CEL-352/IS	I.S. *dB*adge 'Plus' Personal Sound Exposure Meter
CEL-6362	3-Way Charger (inc PC18 power supply)
CEL-6363	3-Way Charger Extension (inc C6359/0.2)
CEL-120/2	Class 2 Acoustic Calibrator
CEL-6355	Kit Case for 10x *dB*adges

193200B	Infra-red to USB (PC) Download Cable
CEL-6351	Pin mounting kit (5 pack)
CEL-6352	Crocodile clip mounting kit (5 pack)
CEL-6356	Spare windshield assembly
C6359/0.2	Spare lead for connecting CEL-6362 to CEL-6363
HK111	Spare screwdriver for changing mounting clips

For software to go with the *dB*adge, please refer to Casella Insight data sheet.

SELECT YOUR *dB*ADGE MODEL

	CEL-350	CEL-352
Cumulative Dose Data	Yes	Yes
Time History Profiling	Yes	Yes
HML Parameters for the Selection of Hearing Protection		Yes

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