dBBadge2
Personal Noise Dosimeter

Designed to make personal noise exposure measurements simpler than ever before.
The latest dBade2 is the ideal tool for a variety of workplace noise assessments and campaigns with the added benefit of wireless connectivity that will increase confidence and productivity.

### Applications
- Complete shift exposure measurements
- Task based measurements
- Measurements in accordance with CFR 1910.95.
- Identification of noise sources
- Selection of hearing protection

### Key features
- Bluetooth® 4.0 wireless connectivity
- Airwave App for Mobile devices such as phones and tablets
- Multiple ‘simulated’ dosimeters
- Full color display
- Motion Sensor
- 1 second time history profiling
- Pause function
- Recording of audio events (optional)
- Octave band frequency analysis (optional)
- Updated and Simplified Casella Insight Plug-in with advanced noise analysis features

Noise induced hearing loss (NIHL) remains one of the leading causes of occupational disease and it is estimated that 16% of global hearing loss is due to occupational noise exposure. It is particularly acute in the mining, construction and oil & gas sectors plus a wide variety of industrial manufacturing activities where the cumulative effects of noise exposure can lead to irreversible yet avoidable hearing damage.

Noise exposure measurements using a personal noise dosimeter is one recognised method of exposure assessment to the requirements of regulation CFR 1910.95 plus many other National regulations and standards.

The iconic, original dBade® proved an invaluable tool in monitoring personal exposure but dBade2® represents the next generation, building on well established must-have features and usability; a true evolution.

"You can’t manage what you don’t measure."
Monitor your workforce without disturbing them, keep productivity up. They may be involved in a critical task or be inaccessible.

Get connected
Bluetooth wireless connectivity, with supporting Airwave app.

Monitor multiple devices at once.

Easy to use clear color display.

Analysing your work environment to form a hearing conservation strategy for your workers.

Summary data along with photographs and notes can be emailed to yourself or colleague for inclusion in reports.

I like the simplicity. The microphone mounting is strong.

The Right Source For Your Test & Measurement Needs

8715 Mesa Point Terrace San Diego, CA 92154
Toll Free: 1.866.363.6634 Tel: 1.619.429.4545 Fax: 1.619.374.7012
Email: sales@calright.com http://www.calright.com
We’d like the capability to monitor the device remotely without the need to interfere with or disturb the worker.

Get Connected!

Getting workers to participate in your survey may already be a challenge so the addition of Bluetooth® 4.0 wireless connectivity with the supporting Airwave App allows you to remotely start, stop or pause a measurement run, monitor battery life and memory capacity, check measurement progress and alarms without having to disturb the worker who may be involved in a critical task or be otherwise inaccessible!

Being able to see results in this way brings added confidence that your survey is progressing as planned and therefore minimizes the likelihood of having to repeat a measurement and therefore maximizes your productivity particularly if you have a number of dBadge2 deployed.

Collecting field data and making notes is difficult.

Connectivity brings other benefits when it comes to collecting data in the field. Summary data, along with a photograph of the task plus on the spot notes can be emailed to yourself or a colleague for review or inclusion in a report.

Multiple Simulated Dosimeters

The dBadge2 has a ‘multiple simulated dosimeter’ capability to display noise exposure results according to differing regional or international protocols.

These ‘simulated dosimeters’ termed D1, D2 and D3 simply define the measurement parameters that are displayed on screen or that appear on the Airwave App. The primary dosimeter, D1, provides access to any LAVG or LEQ based noise dose parameters plus a comprehensive set of related noise measurement parameters. There are pre-defined ISO, OSHA, MSHA, and ACGIH setups (selectable from the dBadge2 itself) but also a fully custom configured mode using Casella Insight data management software.

Dosimeters D2 and D3 allow you to display additional LAVG based noise dose results based upon their associated Threshold (T), Criterion (C) and Exchange rates (or Q factor). As an example, you may wish to simultaneously compare noise exposure data based upon the OSHA Personal Exposure Limit (PEL) or Hearing Conservation (HC) setups.

For every measurement run, dBadge2 records a comprehensive data set which means that you can retrospectively analyse the results to whatever standards or parameters you need within Casella Insight data management software, regardless of what D1, D2 or D3 displayed on screen meaning you never need to worry about having the wrong setting and missing a measurement opportunity.

Color Display

- Color-coded data and alarms
- Aids data interpretation in the field
- Alarms shown on Airwave App

The dBadge2 takes full advantage of the OLED display by color-coding both the D1, D2 and D3 data to aid review in the field but also an ability to define color coded alarm values.

These alarms are based on up to two sources (LAS, LAeq, LCPk, LZPk, LAVG, TWA, Projected TWA, Lepd, Projected Lepd, LEX8h, Projected LEX 8h) with both lower and upper trigger levels specifiable for each alarm.

When a data parameter has been specified as an alarm source, the parameter is shown in green font for levels below the lower limit. Above the lower and upper trigger levels the alarm parameter is displayed using amber and then red colored fonts respectively. Used in conjunction with the ‘large font’ mode, where just one main parameter is displayed, makes it a valuable tool in the field when the Airwave App cannot be used.

A high visibility blue LED additionally flashes at a slow rate when a lower level exceedance is active and at a fast rate whenever an upper level alarm has been triggered.
Motion Sensing

- Built-in motion sensor
- Motion index expressed in % of time
- Increases confidence in measurements

Worker engagement in the survey is essential to a successful outcome but in extreme cases a worker may remove the dBadge2 without your knowledge rendering the results invalid. A built-in motion sensor expresses the worker’s movement as a percentage of time motion has been detected during a measurement run. Armed with this data you can choose to accept or reject the measurement run.

Audio Recording - Plus & Pro models

Available on Plus and Pro models and enabled/disabled in the dBadge2 configuration menu, the audio recording option offers the ability to store 15 seconds of voice notes when a measurement run is started, simply controlled using the left and right hand buttons. Recording the employees name and the task for example adds valuable information for audit purposes.

It also provides the facility to record the actual noise associated with triggered events as defined by user-settable exceedance and parameters based on 1 second SPL or LPeak or LMAX profile data. The resulting audio saved in a .WAV file may be subsequently reviewed in Casella Insight data management software.

Octave band frequency analysis

Available on the Pro model only, real-time octave band frequency analysis, once the preserve of a hand-held sound level meter, gives the specialist yet more information on which to base their all-important control measures. Similarly enabled/disabled in the configuration menu, overall cumulative instantaneous, LEQ and LMAX values are displayed for the measurement run both on screen in graphical format, with an on-screen cursor and in a table format in the Airwave App.

Combined Docking Station and Charger

The combined docking station and charger allows an individual dBadge2 to be downloaded via USB either using the Utility provided which downloads the dBadge2 data directly to XLS format or directly into Casella Insight Data Management Software using the dBadge2 plug in.

When placed in any of the three ‘pockets’ the dBadge2 will also begin to charge the battery displaying its charge status in terms of % charge and projected run time (based on how the dBadge is configured). To check progress, simply press either key or tilt the docking station to ‘wake’ the dBadge2. A complete charge from empty will take 6 hours, whilst a charge sufficient to conduct an 8 hour survey will take just over an hour.

Up to 12 dBadge2 can be charged in this way using a master Docking Station and extension units.

What gets measured gets managed.
d Badge2 can be custom configured by and downloaded to PC using the Docking Station and Casella Insight Data Management Software. Once downloaded, data can be stored under a worker’s name, location or process so that a database of noise exposure can be built up.

A color coded system can be used to highlight workers who have been exposed to specific action levels. Graphs can be modified by adding exclusion zones, which subsequently provides exposure data with and without these zones.

Data can also be viewed according to different measurement protocols e.g. either ISO or OSHA or alternatively the data can be customised to a user’s own requirements.

Furthermore, a multi-track approach to displaying time history, events, pauses, exclusions and modifications, notes and motion saves time when analysing data because it allows you to view all the data tagged to the same time-line e.g. view profile data, listen to an audio file associated with an event (PLUS & PRO models) or read/write descriptive notes.

Reports can summarize the required close data and any information about the worker’s working day, together with the time history and other ‘tagged’ data. To create (or tailor) a report, simply select the view icon to select your personal report template and it’s just a one button press to generate a report. As an audit trail original and modified data can be specified.
Measurement Kits and Models

dBadge2 is available as a complete starter kit with everything you require to get you up and running. A kit includes the dBadge of your choice; Standard, Plus or Pro, a CEL-120/2 Acoustic Calibrator, 3-way combined Docking Station and charger, universal mains power supply, USB cable and Casella Insight data management software, all housed in a kit case capable of carrying 10 dBadge2 (and up to 3 Docking Stations).

dBadge2/KIT1
dBadge2Plus/KIT1
dBadge2Pro/KIT1

Additional dBadges may then be purchased as required (and additional extension Docking Stations). For more information please see ‘Ordering Information’ below.

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<th>dBadge2</th>
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*Bluetooth 'Smart' Wireless may be disabled in any version using the USB utility App

Ordering information

dBadge2 dBadge2 Personal Noise Dosimeter complete with Airwave App and download utility

dBadge2Plus dBadge2 Plus Personal Noise Dosimeter with Audio Recording, Airwave App and download utility

dBadge2Pro dBadge2 Pro Personal Noise Dosimeter with Audio Recording and Real-time Octave Band frequency analysis, Airwave App and download utility

DB2 Upgrade 1 Upgrade from dBadge2 to dBadge2 Plus
DB2 Upgrade 2 Upgrade from dBadge2 Plus to dBadge2 Pro
DB2 Upgrade 3 Upgrade from dBadge2 to dBadge2 Pro

207078B/P 3-way combined Docking Station and Charger

207078B/KIT 3-way combined Docking Station and Charger, PC-18 power supply and CMC51

207078B/EXT 3 way extension Docking station (inc C6359/0.2 cable)

CEL-120/2 Class 2 Acoustic Calibrator

DB2CASE/10 Kit case for 10 off dBadge2

DB2WS Pack of 5 off spare windscreens

DB2CLIPS Pack of 10 single clip assemblies (5 pairs)

PC18 Universal 12V mains adaptor

C6359/0.2 Spare lead for connecting master & extension Docking Stations

CMC51 Mini B to USB A (PC) Cable

CEL-252 Replacement measurement microphone (Type 2)
Technical Specification

Linear Operating Range: 55.0-140.3 dB (A) RMS
Dynamic Range: 96dB
Peak Measurement Range: 90.0-143.3 dB (C or Z weighted),
Sound Exposure Range: 0.0 - 6,100.0 Pa2Hours
0.00 – 22,000,000.00 Pa2Secs
0.0-100,000.0% Dose
Frequency Weightings: A, C and Z, Type 2
Time Weightings: Fast, Slow and Impulse
Exchange Rate: Q=3 or Q=5dB exchange rates
Threshold: 70-90dB in 1dB steps
(Calculated via Casella Insight Data Management Software)
Criterion Level: 70-90dB in 1dB steps
(Computed via Casella Insight Data Management Software)
Real Time Clock: Accuracy better than 1min per month
Under Range Indication: 1dB below the bottom of the range,
Overload Indication: 140.4dB RMS
Peak Overload Value: 143.4dB Peak
Stabilisation Time: <3 seconds after power up,
Operating Temperature Range: 0°C to +40°C (for <±0.5dB error limit)
-10°C to +50°C (for <±0.8dB error limit)
Ambient Pressure Range: <±0.5dB over 85 - 112kPa,
Humidity range: <± 0.5dB over 30% - 90% (non-condensing),
Magnetic Fields: Negligible
Storage Temperature Range: -10°C to +50°C,
Battery: Internal NiMH, 800mAH
Run time: Typically 35 hours using Broadband Mode
Typically 15 hours using Octave mode
Charge Time: <6 hours from fully discharged
Maximum Run Duration: 24 hours
Maximum number of Runs: 100
Storage Capacity: Internal USD Flash memory - 300 hours of run data
(including 1 second profile data) and up to 90 minutes of event audio recording.
PC Interface: USB 2.0 Full speed 12Mbps via Docking Station.
Dimensions: 85 L x 54 W x 55 H mm
Weight: 117g
Environmental I.P. Rating: IP65 (with permeable air vent)
Construction Materials: Plastic Case/ Charger - PC/ABS
Mounting Clips - POM
Gasket - Silicone
Display window - Acrylic
Foam Windscreen - Polyester foam
Microphone - Brass / Nickel

Stored Data Sets

The dBBadge2 simultaneously records and computes all noise data for every measurement run. The comprehensive set of data containing all of the below parameters is available to view and analyse within the Casella Insight PC application or using the download utility. The Dosimeter Setups D1, D2 and D3 define which parameters are displayed on the instrument itself but all values are automatically stored in the memory of the dBBadge2 for download.

**LAeq**

TWA (8hr) | Projected TWA 8hr
Dose% | Proj Dose%
Lcestor / LEX, 8h | Proj Lcestor/LEX, 8h
Lave + Time | Lcestor + Time
Pa2Hrs | Pa2Secs
ISO Dose% (using ISO Criterion level) | ISO Proj Dose% (using ISO Criterion level)
Projected Exposure Points (using ISO Criterion level) | Exposure Points (using ISO Criterion level)
Exceedance time (LAS > Exceedance level)
HML (LC-LA)
Lpk > 135 (count) | Lpk > 137 (count) | Lpk > 140 (count)
Lpk + Time | Lpk + Time
Lpk + Time | Lpk + Time
Lpk + Time | Lpk + Time
LAeq | LCeq
LAeq (Q5, T=0) | LAeq (Q3, T=0)
LAeq | LCeq
Motion Index (0/1 status of motion detection)

Profile ‘Time-history’ Data Sets

Time-history data is saved at an interval of once a second for every run and is available following download:

Lmax | Lmin
LAeq | LCeq
Lpk + Time | Lpk + Time
Lpk + Time | Lpk + Time
LAeq | LCeq
Motion Index (0/1 status of motion detection)

Audio events recording (Plus and Pro Model Only)

Settable level will trigger the recording mode which provides an 8kHz sampling rate in a 16 bit compressed .WAV format. Playback is via the Casella Insight PC application or other media player.

Each audio event will record for 10 seconds and include a 3 second pre-trigger buffer to aid identification of the start of the noise event. Audio event trigger sources include LAF, LAS, LCPk, LZPk.

Audio Notes (Plus and Pro Model Only)

Optional audio note of up to 15 seconds attached to each measurement run.

Octave Analysis (Pro Model Only)

Nine octave bands 31.5Hz to 8 KHz, A or Z weighted LEQ (nHz) and LMAX(nHz) cumulative data is saved for each run. Fast or Slow time constant can be selected for LMAX.

Bluetooth Connectivity

All models support wireless connection via Bluetooth® 4.0 (Low energy or Smart).

TX power: 0 dBm to -23 dBm
Receiver sensitivity: -93 dBm
Range: Typically 25m line-of-sight and depending on local RF conditions.

Display

96x64 dots full color OLED display with adjustable contrast.

User Control