

CR:110A dose Badge



Personal Noise Dosemeter

Introduction



- Small size and weight with simple operation
- No cables or controls on the doseBadge reduces the risk of damage, misuse or tampering
- Ideal for Occupational Noise and Industrial Hygiene measurements
- Overall noise level and Time History Data Logging with Peak(C) & Battery Level
- Independent configuration of Exchange Rate, Criterion Level, Criterion Time, Threshold & Time Weighting
- 115dB(A) Sound Level Exceedence
- Rechargeable Nickel Metal Hydride (NiMH) Battery
- "Shake-to-Wake" function to extend battery life and operating time
- Infra-Red download of data to the Reader Unit
- Analysis & Reporting software supplied as standard

The doseBadge is a unique solution to the problems associated with the measurement of personal noise exposure.

The small size and light weight of the unit allow it to be used in situations where a traditional style noise dosimeter, with the microphone attached to a cable, often causes problems.

The doseBadge unit does not have any cables or controls which means that the units can be worn by operators and employees who are using machinery where there is a risk of the instrument becoming caught or trapped.

Inside the CR:110A doseBadge is a rechargeable Nickel Metal Hydride battery, an internal microphone and electronic systems which measure and log the noise data.

All of this is housed in a robust metal case which protects the microphone and electronics.

The doseBadge is controlled via an Infra-Red link by the RC:110A Reader Unit which contains a specially designed Acoustic Calibrator.

The setup of the doseBadge is controlled by the Reader unit which allows the user to program the doseBadge to meet different measurement criteria.

The doseBadge can be configured to meet the requirements of the new EU Physical Agents (Noise) Directive as well as the many different noise measurement Standards and Regulations in use around the world.

The doseBadge system is usually supplied as a complete measurement kit which includes the doseBadges, Reader Unit, Charger, Power Supply and software, all contained in a robust carrying case.

The dBLink3 and dBase Database programs that are supplied as standard with the system allow the user to configure the system, download data and produce measurement reports quickly and easily.



doseBadge shown actual size

Applications

- The measurement of occupational noise exposure
- Assessment of the risk of noise induced hearing loss
- Monitoring and recording of long term noise exposure
- Compliance with Noise at Work Regulations, Industrial Hygiene Standards and Occupational Noise Exposure Guidelines

There are many situations where there is the need to accurately assess the risk of exposure to high noise levels and to continually monitor any employees who are exposed to potentially damaging noise.

Workers who move between different locations or where the noise exposure pattern varies throughout the day are very difficult to assess using traditional methods.

Machinery or moving equipment can also present problems to those responsible for carrying out risk assessments and noise exposure measurements. Cables can become trapped or caught damaging the measurement equipment and reducing the effectiveness of any measurement schedule. In extreme circumstances cables trapped in rotating machinery can pose a risk of injury.

In these situations, the most accurate method of measuring the noise exposure can often be to use a personal noise dosimeter, where the microphone is attached to the person under measurement, rather than using a Sound Level Meter to measure static noise sources.

The CR:110A doseBadge from Cirrus Research plc provides a unique way to carry out these measurements in a simple and cost effective way.

The small size and weight of the doseBadge also means that the person under assessment is less aware of wearing the unit and is less likely to tamper with the instrument.

In areas where the employee is operating machinery or where there is a risk of a cable becoming caught or trapped, the doseBadge offers a safer and more reliable way of gathering noise exposure data.

The CR:110A doseBadge and RC:110A Reader Unit allow measurements to be made that meet most Regulations and Standards whilst maintaining the advantages that the small size and weight of the unit provide.

Using the doseBadge

The doseBadge provides a simple and effective method of measuring personal noise exposure and removes all of the common problems associated with using traditional style noise dosimeters.

The number of user keys on the Reader and therefore the number of steps required to make a measurement have been reduced to a minimum.

The Reader unit controls the doseBadge using an InfraRed link, which removes the need for keys or controls on the doseBadge itself.

The Reader unit can prepare any number of doseBadges for use and provides the facility to change the setup of the doseBadge to suit the Regulations and Standards that the measurements are to comply with.

Charging

Each doseBadge is a self contained unit with an internal microphone and rechargeable battery which powers the doseBadge over the measurement period.

The doseBadge is charged using the supplied charger units and, when the doseBadge is fully charged, it can be safely left on the charger unit ready for use.

The use of reliable rechargeable batteries in the doseBadge results in reduced running costs.

Shake to Wake

If the doseBadge has not been running for 20 minutes, it will shut down to preserve battery power.

The doseBadge must be woken before the unit will communicate with the Reader unit.

The CR:110A doseBadge has a "Shake-to-Wake" function which minimises the standby power consumption.

To prepare the doseBadge for use, the user must shake the doseBadge to activate a sensor.

The doseBadge indicates that it is ready for use by flashing the blue status indicator in the InfraRed communications window.

Resetting and configuring the doseBadge

The doseBadge is reset and configured using the Reader Unit. The doseBadge is inserted into the Acoustic Calibrator of the Reader Unit and the InfraRed windows aligned.

When the doseBadge is reset, the memory of the badge is cleared.

At this point, the Reader unit also programs the doseBadge with the setup information that will be used for the next measurement.

Calibration

The doseBadge is calibrated by the Reader unit, which has a built-in Acoustic Calibrator specifically designed for the dose Badge. Once the doseBadge has been reset and calibrated, it is ready for use.

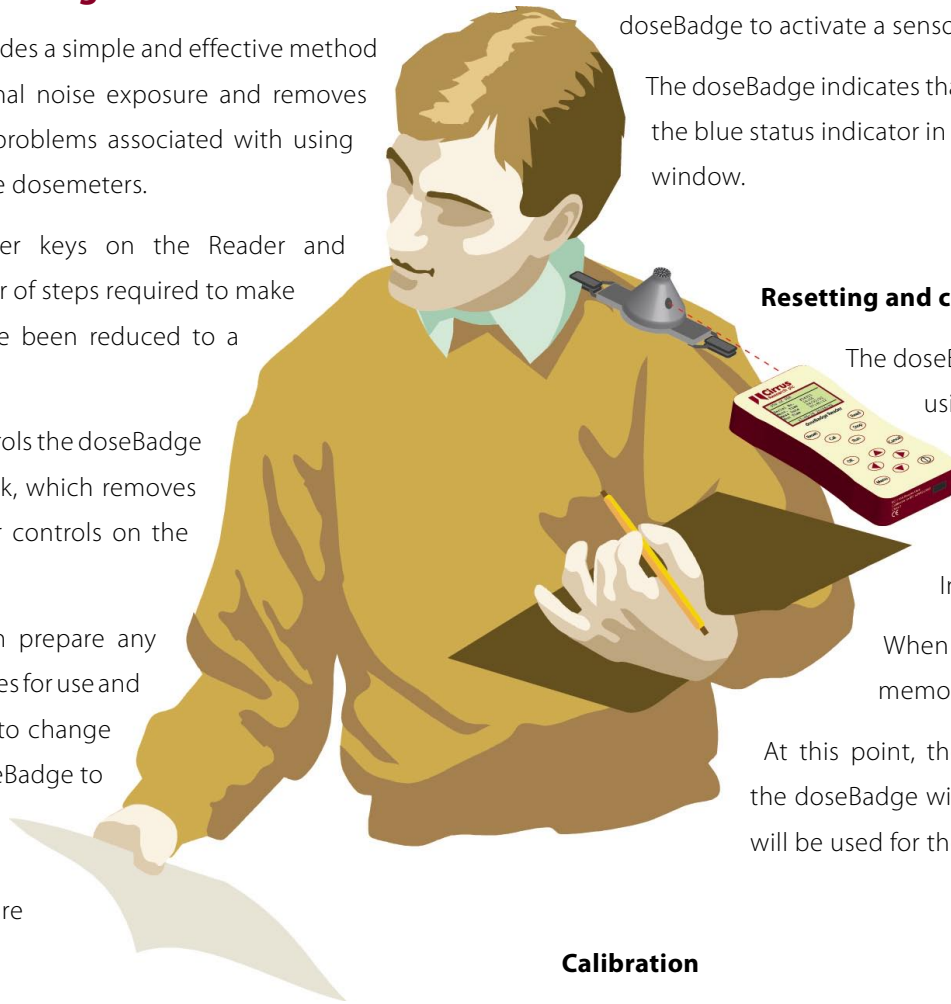
It is good practice to calibrate the doseBadge at the end of the measurement. The Reader unit allows for this and carries out a calibration check.

The doseBadge can also be calibrated at the end of the measurement by inserting the unit into the Reader and pressing the Cal button. This allows the measurement to be verified.

Starting & Stopping the measurement

The doseBadge is secured onto the person to be measured using the supplied mounting kit and the measurement started using the Reader unit or the Keyfob Remote Control.

At the end of the measurement period, the doseBadge is stopped using the Reader unit and the measurement information downloaded to the Reader at the touch of a button.



Downloading measurement data

After the measurement has been stopped, the doseBadge is removed from the wearer and plugged into the Reader unit. The calibration of the doseBadge can be checked to ensure that the measurement is valid.

Once the measurement has been downloaded from the doseBadge to the Reader, the information is automatically stored and the parameters can be reviewed.

The Reader unit will store many measurements which can be downloaded to the dBLink and dBase Database software.

Configuration of the doseBadge

The CR:110A doseBadge, when used with the RC:110A Reader Unit, can be configured to meet almost any current and planned occupational noise regulations and standards.

For example, in the European Union, the EU Physical Agents (Noise) Directive requires the measurement of the noise exposure using a 3dB Exchange Rate and recording of $L_{EX,8h}$ and Peak(C), whereas the American OSHA Regulations require the use of a 5dB Exchange Rate, a Slow Time Weighting and an 80dB Threshold. The CR:110A doseBadge can be easily configured to meet any of these requirements.

The configuration can be changed quickly and easily by using the menu on the Reader Unit or by programming the Reader from the dBLink3 software.

The RC:110A Reader Unit allows the following parameters to be configured in the doseBadge, quickly and easily:

Parameter	Available Configuration
Exchange Rate(Q)	3dB, 4dB or 5dB
Criterion Level	80dB, 85dB, 87dB or 90dB
Criterion Time	8, 12, 16 or 18 hours
Threshold	None, 80dB, 85dB or 90dB
Time Weighting	None or Slow

The dBLink3 software allows the user to configure these parameters individually and also to select from a list of preset configurations such as ISO, OSHA, MSHA and ACGIH. The software also allows custom configurations to be stored for later use.

Measurements

The CR:110A doseBadge has been designed to meet the needs of as many occupational and industrial noise measurement Standards, Regulations and Guidelines as possible.

The user can select from a range of preset configurations which will present the commonly used noise parameters, or a user defined setup can be programmed into the doseBadge by the Reader Unit. The independent control over the Exchange Rate (Q), Criterion Level, Criterion Time, Threshold and Time Weighting allows the doseBadge to be used in a wide range of situations.

The doseBadge provides two different forms of noise data, Overall Measurement Information and Time History Data.

Overall Measurement Information

The Overall Measurement Information data contains the most important and commonly used noise parameters. For all configurations, this data contains the Measurement Start Time and Date, Run Time, Calibration Information, Highest Peak(C) Level, 115dB(A) Maximum Sound Level Exceedence, Overload and Battery Level.

When the doseBadge is set to the 3dB Exchange Rate the Overall Measurement Information contains L_{eq} , $L_{EX,8h}$ ($L_{EP,d}$), L_{AE} (SEL), Exposure & Estimated Exposure in Pa²h, % Noise Dose and Estimated % Noise Dose.

When the doseBadge is configured to either the 4dB or 5dB Exchange rates, the Overall Measurement Information contains the L_{AVG} , TWA, % Noise Dose and the Estimated % Noise Dose.

Please note that if the Time Weighting is set to Slow or a Threshold is set, with any exchange rate (3dB, 4dB or 5dB) the Overall Measurement Information will be set to L_{AVG} , TWA, % Noise Dose and the Estimated % Noise Dose.

Time History Data

The CR:110A doseBadge will measure and log the noise levels during the measurement period. In addition to the overall noise levels, such as L_{eq} or TWA, the instrument also logs a Time History or Noise Profile.

When the doseBadge is configured to 3dB (Q=3) with no Time Weighting or Threshold, this Time History data is stored as 1 minute L_{Aeq} samples. For any other configuration, the Time History data is stored as L_{AVG} .



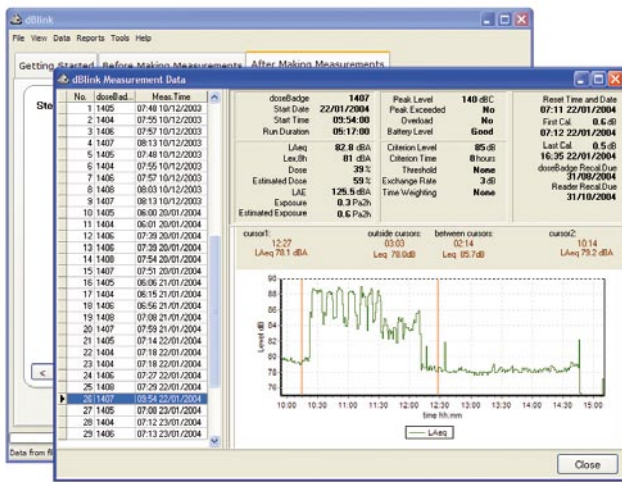
At the same time, the doseBadge will also store the highest Peak(C) level and the Battery level every minute. This data is available with the Time History data in the dLink3 and dBase Database software programs.

Software

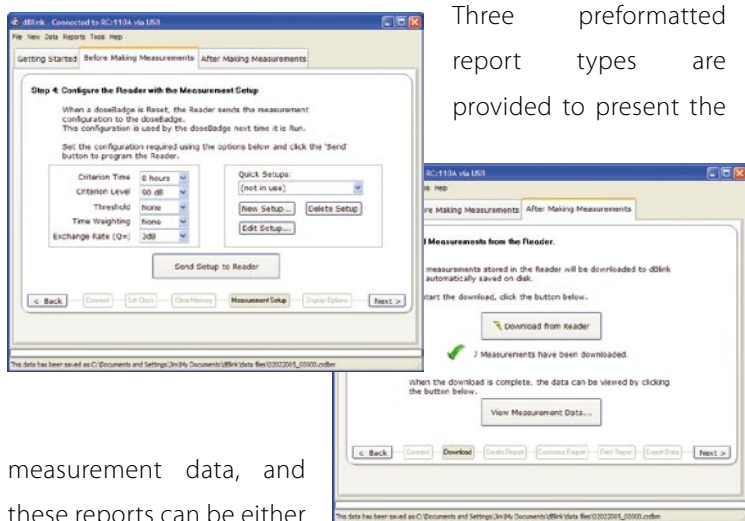
The CR:110A doseBadge and RC:110A Reader are supplied with the dLink3 and dBase Database software programs.

dLink3

dLink3 is a simple, easy to use program that allows the measurement data to be downloaded from the RC:110A Reader Unit. dLink3 can be used as a stand alone program or in conjunction with the dBase Database program.



The program uses a Step-by-Step wizard to guide the user through the setup and download procedures and allows the measurement data to be viewed and printed.



measurement data, and these reports can be either printed or exported into a range of formats, including Word, Excel and PDF.

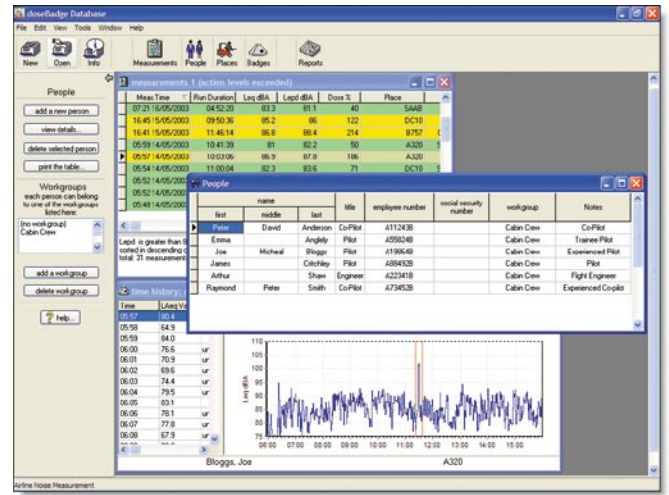
The measurement data can be saved and the data transferred automatically into the dBase Database program for further

analysis and reporting.

dLink3 also supports previous versions of the doseBadge and Reader units allowing existing users to upgrade to this new program.

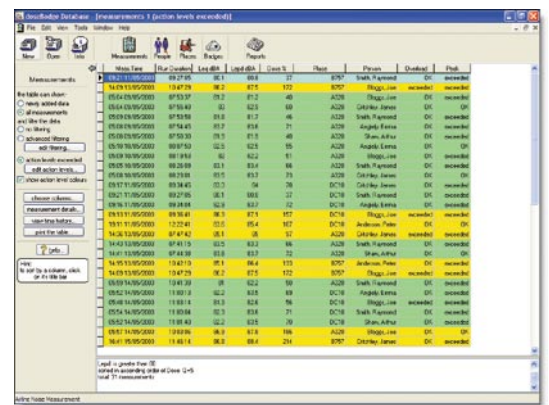
dBase Database

The dBase Database program takes measurement data from the dLink3 program and stores the information in a database.



The user can enter additional information into the program which allows measurements to be tagged. The database holds details of employees, measurement locations and workgroups.

Any measurement can be tagged with these items, allowing the user to quickly produce reports of noise exposures for different employees, workgroups or locations.



Measurement data can be sorted and filtered using any of the parameters and a range of informative reports created from a wide range of measurement data. Employee data can be imported from an external file for companies with a large work force.

The latest versions of the dLink3 and the dBase Database program can be downloaded from the Cirrus Research plc website free of charge.

doseBadge Measurement Kits

Although the doseBadge Personal Noise Dosimeter can be ordered as an individual unit, Cirrus Research plc recommends that the doseBadge is supplied as a complete measurement kit.

The doseBadge measurement kits can be ordered using the following codes:

Code	Specification
CK:110A/1	doseBadge Measurement kit with 1 doseBadge
CK:110A/2	doseBadge Measurement kit with 2 doseBadges
CK:110A/5	doseBadge Measurement kit with 5 doseBadges
CK:110A/10	doseBadge Measurement kit with 10 doseBadges

In addition to the individual CR:110A doseBadges, the measurement kits contain the following items:

- RC:110A Reader Unit
- doseBadge Mounting Kits for each doseBadge
- CU:195A Mains Power Supply
Available with UK, US or EU style plug
- CU Series Charger Unit
 - CK:110A/1 contains the CU:100A 2 Way Charger Unit
 - CK:110A/2 contains the CU:100A 2 Way Charger Unit
 - CK:110A/5 contains the CU:101A 5 Way Charger Unit
 - CK:110A/10 contains the CU:102A 10 Way Charger Unit
- CK:100 Carrying Case
- ZL:102 USB Cable
- dBLink & dBase Database Software
- Operating Manuals & Quick Start Guide
- Certificates of Calibration



Accessories

In addition to the standard components of the doseBadge measurement kits, the following accessories can be added at extra cost:

• RC:101A Keyfob Remote Control Unit

The Keyfob Remote Control allows the doseBadge to be started and stopped without using the RC:110A Reader Unit. The Keyfob has been designed to be used in situations or locations where there is a risk of damage to the Reader Unit, or where additional control units are required.



Please note that the RC:101A Keyfob does not replace the RC:110A Reader Unit and does not have the facility to Reset, Calibrate or download data from the doseBadge.

• CM:100 Helmet Mount

The CM:100 Helmet Mount allows the doseBadge to be secured to a standard Helmet or Hard Hat using the mounting points designed to locate Hearing Defenders. Please note that if the CM:100 Helmet Mount is used, Hearing Defenders cannot be attached.



Different versions of the CM:100 Helmet Mount are available to suit different helmets.

Please contact Cirrus Research plc for more details or visit www.cirrusresearch.co.uk/cm100.html for more information.

• UA:100 Windshield

The UA:100 Windshield protects the doseBadge from dust and other contaminants as well as reducing the effects of the movement of air over the microphone capsule of the doseBadge. The UA:100 Windshield also helps to reduce noise generated by handling of the doseBadge.



CR:110A doseBadge with Mounting Kit shown with UA:100 Windshield

Specifications

Applicable Standards

CR:110A doseBadge

IEC 61252:1993 Personal Sound Exposure Meters
ANSI S1.25:1991 Personal Noise Dosimeters

RC:110A

Internal Acoustic Calibrator to IEC 60942:2001 Class 2

Measurement Range (Typical)

70dB(A) to 130dB(A) RMS
120dB(C) to 140dB(C) Peak

Measurement Functions

All configurations:

doseBadge Configuration	Calibration Record,
Measurement Duration	Highest Peak(C)Sound Level
Overload Exceedence	Battery Status
115dB(A) Maximum Sound Level Exceedence	

1 Minute Time History of:

L_{Aeq} (3dB) or L_{AVG} (4dB or 5dB)
Peak(C) Level
Battery Level

For 3dB Exchange Rate:

L_{Aeq} , $L_{EX,8hr}$, L_{AET} , % Dose, Exposure (Pa²h), Estimated % Dose,
Estimated Exposure (Pa²h)

For 4dB & 5dB Exchange Rates:

L_{AVG} , TWA, % Dose, Estimated % Dose

Weightings

Frequency

'A' for all RMS measurements.
'C' for Peak Sound Pressure

doseBadge Configuration

Independent User Configuration of:

Exchange Rate

3dB, 4dB or 5dB

Criterion Level

80dB, 85dB, 87dB, 90dB

Criterion Time

8hrs, 12hrs, 16hrs, 18hrs

Threshold

None, 80dB, 85dB, 90dB

Time Weighting

None, 'S' (Slow)

Memory

The RC:110A Reader Unit can store the following measurement data:

With 8 hours of 1 minute Time History

Up to 93 measurements

With 12 hours of 1 minute Time History

Up to 64 measurements

With 24 hours of 1 minute Time History

Up to 33 measurements

Power

RC:110A doseBadge

Internal NiMH Battery with intelligent charging system

RC:110A Reader

2 x AA/LR6 with Auto Power Switch Off

CU Series Chargers

CU:195A Mains Power Supply

Output

CR:110A doseBadge

Infrared to RC:110A Reader Unit

RC:110A Reader

USB 2.0 (which also provides power to the RC:110A Reader)

Dimensions

CR:110A doseBadge

Microphone Apex Ø13.0mm, Base Ø47mm, Height 38mm

Environmental

Temperature

-10°C to +50°C Operating

-20°C to +60°C Storage

Humidity

Up to 95% RH Non-Condensing

Weight

CR:110A doseBadge 45gms (1.6oz)

RC:110A Reader 400gms (14oz)

Software

dBLink and dBase Database supplied as standard.

Compatible with Microsoft Windows versions 98 or later.

Intrinsic Safety Certification

Refer to the CR:110AIS doseBadge Datasheet for details of Intrinsic Safety Certification for the doseBadge.

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