doseBadge^5

Instrument Handbook

CR:120A doseBadge^5
Noise Dosimeters

Cirrus Research plc

About this manual

• The instructions in this user manual refer to the operation of Cirrus Research plc doseBadge[5] CR:120A noise dosimeter

• In this manual, “doseBadge” is used as a general reference to the CR:120A noise dosimeter, and “calibrator” is used as a general reference for an acoustic calibrator.

• This manual describes the recommended usage of the doseBadge[5]. Any warnings will be indicated by the following symbol:

• It is not possible to change the way that the instrument measures through the software or firmware. Any legal metrology aspects of the instrument cannot be affected by any changes made in the instrument.

• The Specifications section on page 67 defines the standards and functionality that relate to the noise dosimeter and the different components that can be used with it.

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1 Introduction

Welcome to your doseBadge5 personal noise dosimeter. Measuring people's personal exposure to noise is now easier than ever before with a range of features and functions that will change the way you monitor noise in the workplace.

The doseBadge5 is the result over 20 year's development of the original doseBadge concept and maintains the unique features of the doseBadge including:

- No cables, controls or display
- Simple setup, deployment & data download
- Robust, rugged design with a secure, internal microphone capsule.

The doseBadge5 advances the concept with a range of new functions & features including:

- LCeq - LAeq measurements for HML (C-A)
- Storage of multiple measurements with
- Up to 80 hours of Time History Data (6 Channels)
- Up to 40 individual measurements
- 1 second data logging of all integrators & peak channels
- Scheduled, automatic timed measurements with daily timers
- Remote communication to the dBLink App (Android & iOS) and the doseBadge5 wand
- View measurements & configure the doseBadge5 with the dBLink App for mobile devices
- Tap sensor to protect your measurements from external impacts
- Up to 4 simultaneous integrators & 2 peak channels
- Allocate doseBadge5 instruments to individual users to track measurements easily & effectively
- Internal microphone with automatic calibration
- Visual indication of Dose exceedence with user defined levels
- 60dB to 143dB measurement range

The doseBadge5 has been designed to allow noise exposure measurements to be made in accordance with a wide range of standards, regulations and guidelines such as:

- CFR 1910.95 Occupational Noise Exposure
- ISO 9612:2009 Acoustics – Determination of occupational noise exposure – Engineering method
- HSE Document L108 Controlling Noise at Work – Guidance on Regulations

The doseBadge5 is capable of measuring up to 4 simultaneous integrators and 2 Peak channels at the same time with data logging available for all channels and so can be configured to meet any combination of occupational noise standards.

Quick settings can be applied through the NoiseTools software to enable the appropriate channels and settings for a number of pre-set configurations which makes deployment of the doseBadge[5] quick and straight forward.

In addition to the pre-set configurations, users can create custom settings to meet specific applications or as regulations change.

The doseBadge5 uses Bluetooth® connectivity to either the RC:120A wand or to the dBLink app (which is available to download for free, for both Android and iOS devices). This allows measurements to be controlled and data viewed without having to disturb or interrupt the worker.

In addition to the remote connectivity, measurements can be controlled via the NoiseTools software (when units are attached to the CU:120A Dock) or by using the scheduled timers.

Please note: the RC:120A wand is sold as an additional accessory and ***is not*** supplied as standard with the CR:120A doseBadge[5] instrument.

2 Safety & warnings

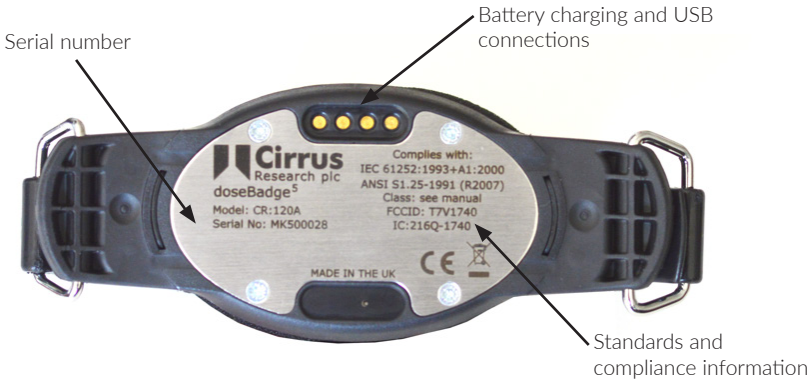
	This product is not approved for intrinsically safe operation and must not be used in hazardous areas or zones.
	The CR:120A doseBadge5, RC:120A Wand and CU:120A Dock contain no user serviceable parts. Do not open the product case as this will invalidate the product warranty and may cause damage to the instrument. Replacement of the battery in the CR:120A doseBadge5 must only be carried out by authorised service personnel.
	The normal operation of the CR:120A doseBadge5 is with the windshield attached.
	The materials used in the CR:120A doseBadge5, RC:120A Wand and CU:120A Dock should only be cleaned using a damp cloth. Do not use solvent or chemical based cleaners.
	When the Bluetooth® communication is enabled, care must be taken to avoid interference with sensitive electronic equipment, for example in safety critical areas, aviation or medical environments.
	The CU:120A dock contains small (<1cm3) Neodymium & Samarium Cobalt magnets that are used to secure the CR:120A doseBadge5 units to the Dock. Keep a safe distance (50mm+) between the magnets and all objects that can be damaged by magnetism. These include mechanical watches, heart pacemakers, CRT monitors, credit cards and magnetically stored media. See page 65 for more information.

3 Getting to know your doseBadge

3.1 The CR:120A doseBadge[5]

The CR:120A doseBadge[5] is supplied complete with a windshield (which is secured to the carrier) and mounting clips to attach the instrument to the person whose noise exposure is to be measured.

Each doseBadge is identified by a unique serial number that is shown on the information plate on the underside of the instrument.



3.2 The RC:120A wand

The RC:120A wand comes with a wrist strap and 2 x AAA/LR03 batteries. The battery compartment is on the back of the wand unit along with the serial number and compliance information.

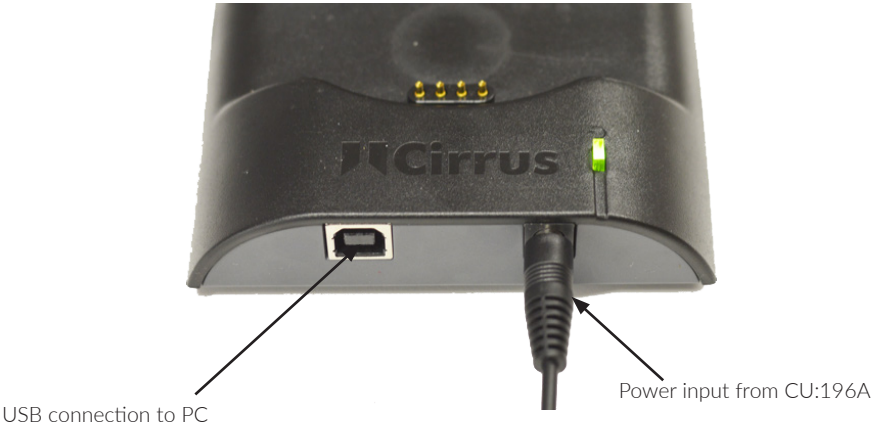
Please note: the wand is sold as an optional accessory and is not supplied as standard with the CR:120A doseBadge[5] noise dosimeter.

3.3 The CU:120A dock

The CU:120A dock is supplied with the CU:196A mains power supply and a standard USB cable (Type A to Type B).

There are five slots, each of which can accommodate one of your doseBadge[5] instruments. All of the slots provide charging and data download functions.

The serial number of the dock is shown on the label on the underside of the unit.



4 Getting started

Step	Action	Optional actions	See page
1	Charge your doseBadge		11
2		Clear the memory	21
3	Configure the integrators and peak channels	Check the configuration	13
4		Program scheduled timers	13
		Allocating instruments to a person, place or project	16
5	Calibrate your doseBadge		22
6	Attach to a person		24
7	Start the measurement		25
8		Pause the measurement	27
9		View mid-shift readings	29
10	Stop the measurement		30
11	Remove from a person		24
12	Check the calibration		22
13	Download the measurement data		32

5 Charging your doseBadge

Your doseBadge(s) is/are charged using the CU:120A dock.

The doseBadge instruments are intelligent and store information about the amount of charge that has been put into and taken out of the batteries. This allows the instrument to maintain optimum battery performance for as long as possible.

The CU:120A dock allows up to five doseBadges to be charged at the same time and also allows measurement data to be downloaded to NoiseTools via the USB connections.

Typically, the CU:120A dock will charge a doseBadge from flat, in around three hours.

Connect the CU:196A mains power supply to the power socket on the dock and then to a suitable supply. The green LED on the dock will indicate that power is connected.

The USB connection is used to donload measurements from the connected instruments to NoiseTools, on your PC.

Connect a doseBadge to any of the docking points. Each docking point has a magnetic base that ensures that the connection between the doseBadge and the dock is secure.

The blue LED next to each docking point will illuminate when the connection has been made. The indicators on the doseBadge will show the charging status as follows:

Charging: solid orange

Fully charged: solid green

The level of the battery can also be checked in NoiseTools, on dBLink or if owned, on the wand.

Important: you must only use the power supply that comes supplied with CU:120A dock.

Charging should be carried out where the ambient temperature is between +15°C and +30°C (+59°F to +86°F). Charging at higher temperatures may increase the charge time required or may result in a failure to fully charge.

Please note that the CU:120A dock must be connected to the mains power supply for data download to be possible.

6 Connecting to your doseBadge

Your doseBadge can be connected to a number of different controllers, which allow measurements to be started, paused and stopped, and also for your instrument to be configured.

Your doseBadge can be connected to NoiseTools via USB, Bluetooth® to the RC:120A wand and via Bluetooth® to the dBLink App.

6.1 Connecting to the NoiseTools software

Connection to the NoiseTools software is through the CU:120A Dock which connects to a PC via a USB connection. See page 14 for details of configuring the doseBadge5 via NoiseTools and page 32 for details of downloading data into NoiseTools.

6.2 Connecting to the RC:120A Wand

The connection between the RC:120A Wand and the doseBadge5 is via Bluetooth®.
See page 51 for details of connecting to and using the Wand.

6.3 Connecting to the dBLink App

Connection to the dBLink App is via Bluetooth®. Ensure that the Bluetooth® is enabled on the mobile device.

See page 61 for details of connecting to and using the dBLink App.

7 Configuring your doseBadge

7.1 Configuration overview

Your doseBadge is an advanced noise measurement instrument and can provide up to 4 independent integrators, 2 independent Peak channels and up to 4 independent maximum SPL channels.

In many applications, the configuration of your doseBadge will not change once it has been setup for the first time, but any of the configuration options can be adjusted to allow the instrument to meet any noise measurement standard or regulation.

The most comprehensive configuration options are available through NoiseTools. A limited set of options are available through the dBLink App and the RC:120A wand allows scheduled timers to be enabled or disabled.

7.1.1 Integrator settings

Integrators are at the heart of any noise dosimeter and your doseBadge is no different. The advantage of the doseBadge[5] is that it allows up to 4 independent integrators to be run at the same time, each of which can be individually tailored as needed.

Full control over the exchange rate, time weighting, frequency weighting, threshold level, criterion time, criterion level and upper limit threshold are provided for each integrator.

A number of pre-set integrators are provided covering most applications and these are referred to as ISO LAeq, ISO LCeq, OSHA HC, OSHA PEL, OSHA HC/C (C-weighted), MSHA HC, MSHA PEL, ACGIH and Custom.

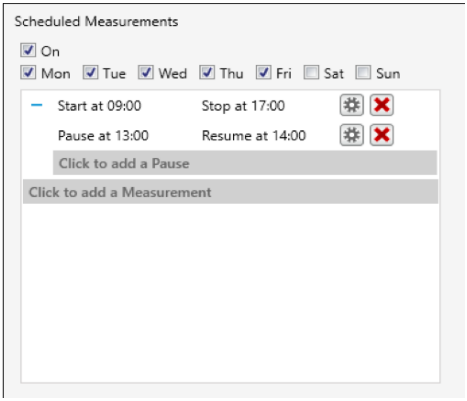
Detailed configuration of these can be found on page 74.

7.1.2 Scheduled measurements

Scheduled measurements are a new feature in the doseBadge5 that give the user more control over when measurements are made.

There may be situations where it is not possible for the person responsible for making noise measurements to be present to start, pause or stop the instrument.

Your doseBadge can be pre-programmed to start and stop recording noise data, allowing your measurements to be made without the need for you to be present.



The doseBadge[5] has no controls, cables or displays so the wearer cannot tamper with the scheduled measurements. The timers can be also enabled on specific days of the week (to exclude weekends for example).

Up to three time periods can be programmed allowing for breaks to be automatically excluded (where standards require this).

If scheduled measurements are enabled, they will only be active when your doseBadge is removed from a powered dock. This allows timers to be enabled and used only when instruments are needed.

See page 45 for details of configuring the scheduled timers.

7.2 Configuring through NoiseTools

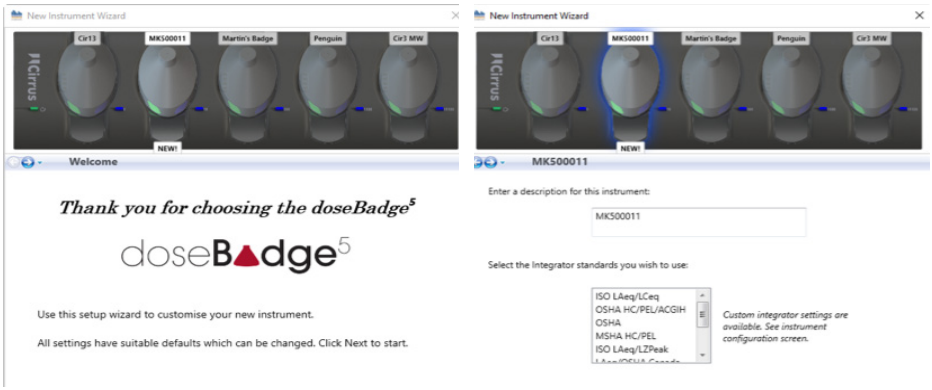
The NoiseTools software allows all of the configuration options on your doseBadge to be adjusted.

Settings can be transferred between instruments and doseBadge[5] units can be allocated to a person, project and place before measurements are made. This information is downloaded with the measurement data once the measurement is complete.

7.2.1 New Instrument Wizard

When a doseBadge[5] is connected to an installation of NoiseTools that has not seen the badge before, the New Instrument Wizard will run.

The wizard allows for the quick setup of new instruments and allows a pre-set integrator configuration to be loaded into the instruments. The name of the instrument can also be changed.



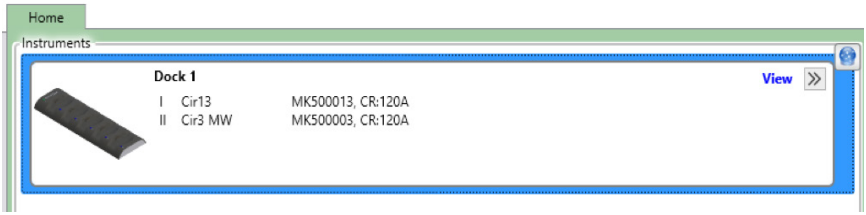
If more than one instrument is connected, each can be configured in turn and the settings saved to the doseBadge5 units.

For experienced users, the New Instrument Wizard can be skipped.

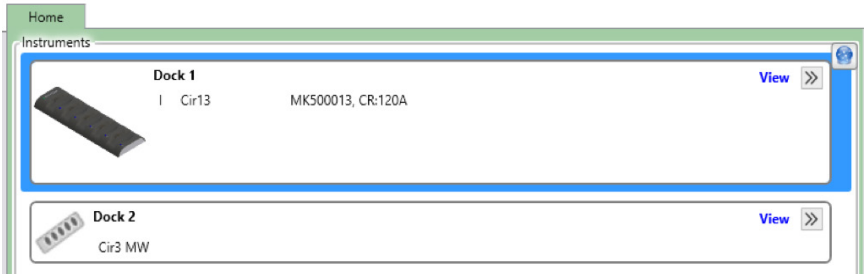
7.2.2 The dock view

When your doseBadge5 is connected to a powered CU:120A dock and it is connected to the NoiseTools software via a USB cable, it will appear in the Instrument window.

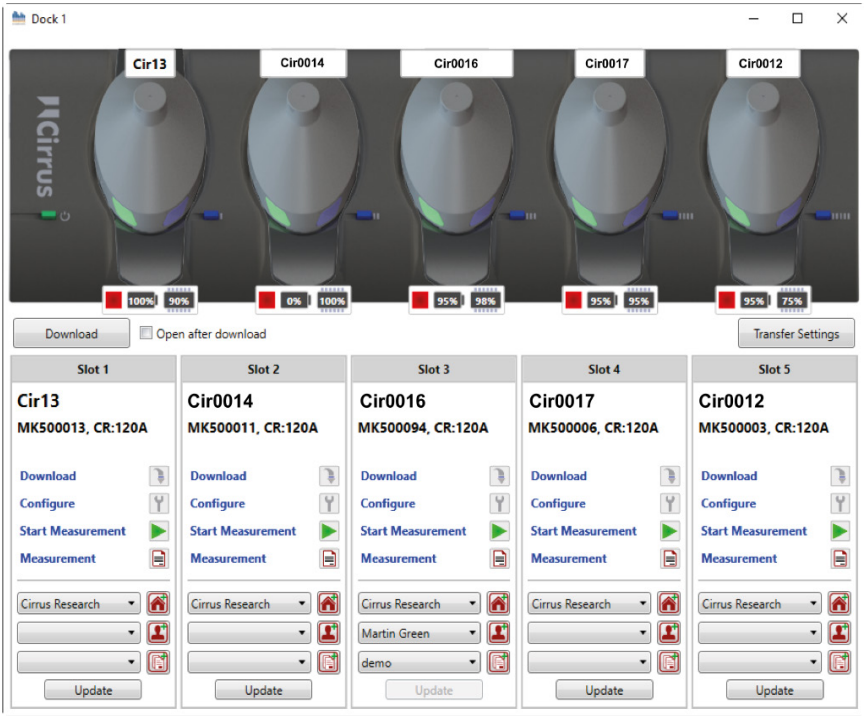
If you have more than one doseBadge5 instrument connected to the dock, each instrument will be shown with its serial number as shown below:



If multiple docks are connected to NoiseTools, these will be visible in the main window:



Click on View to open the dock view. In the example on the next page, five individual doseBadges units are connected to the dock.



7.2.3 Person, Place & Project

Each one of your doseBadges can be individually assigned to a person before measurements are made.

Alternatively, measurements can be assigned either at the point of download into NoiseTools or afterwards when measurements are analysed.

This information is stored along with the measurement data in the NoiseTools database, allowing the measurement information to be sorted, filtered and searched quickly and effectively.

As well the allocating a doseBadge to a specific person, badges can be allocated to a place. For example, the place may be a building or part of a site where the person is working.

The badge can also be assigned to a project. For example, if a set of measurements are being taken after new equipment has been installed, this can be referenced as a project.

To pre-assign any of these functions, select the required name from the pull down list. If the required information is not available, a new person, place or project can be entered by selecting the icons to the side of the pull down lists.

Click Update to program the new information into the badge.

7.2.4 Transfer Settings

Settings can be copied from one doseBadge to any others that are connected to the dock using the Transfer Settings option.

To transfer settings, select the source doseBadge (which will be highlighted in blue) and from the Transfer Settings button, select From Selected Instrument.

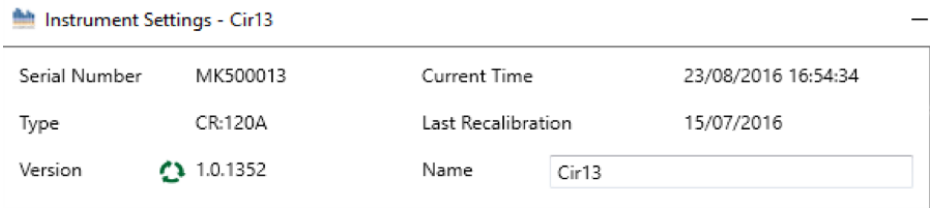
The setting will be copied from the source badge to the other doseBadges on the dock.

Settings can also be loaded from a saved configuration file. This can be applied to one or all doseBadges on the dock.

The following options are available by clicking Configure for each connected doseBadge. Any changes must be saved to the instrument by pressing Save to Instrument.

7.2.5 Name

Each of your doseBadges can be given a unique name to help you identify them. This is in addition to the serial number which is unique to each and every instrument. This is also in addition to any Person, Place or Project that have been assigned to your instruments.



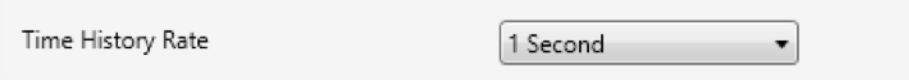
To change the name of the instrument, enter the information into the Name field and save the changes.

7.2.6 Storage

The storage options allow for the configuration of the following:

7.2.6.1 Time history rate

Throughout a measurement, your doseBadge is logging the noise data at a specified rate. This information is used in the NoiseTools software to display the graphs of noise vs time.

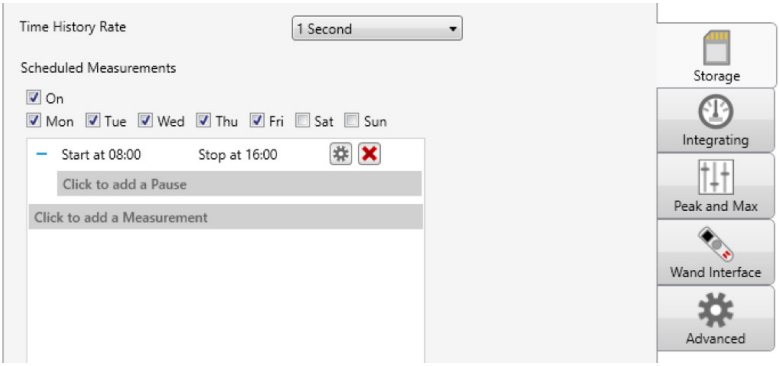


The sample period for data logging can be selected to be either 1 second or 1 minute, and this affects all data logging channels.

7.2.6.2 Scheduled measurements

Scheduled measurements are a powerful feature of your doseBadge. It allows measurements to be started, paused and stopped automatically without the need for user intervention.

Up to three periods can be set during the day allowing for breaks to be accommodated (where regulations require), and the schedules can be enabled or disabled for different days of the week.

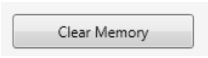


For more details of setting scheduled measurements, please see page 45.

Please note: when your doseBadge is attached to a powered dock, the scheduled measurements will not be activated. Remove the doseBadge5 from the dock to activate the scheduled measurements.

7.2.6.3 Clear memory

This allows the memory of the selected doseBadge to be cleared. Ensure that any measurements required have been downloaded.



Confirmation is required before the memory is cleared. Once the memory has been cleared, measurements cannot be retrieved.

7.2.7 Integrating

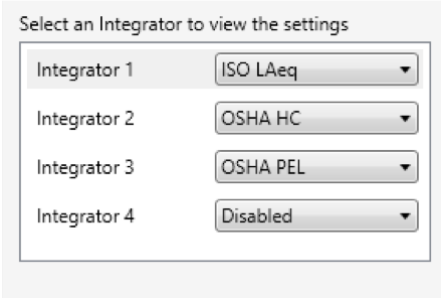
Integrators are at the heart of any noise dosimeter and your doseBadge is no different. Up to four independent integrators can be run at any time and these can be chosen from a pre-set list, or customised as required.

7.2.7.1 Pre-set integrators

To choose a pre-set integrator, pull down the selection options and choose the required option.

If an integrator is not required, select Disabled from the list.

See page 76 for details of the pre-set integrators.



7.2.7.2 Custom integrators

To customise an integrator, select Custom from the drop down list and choose the required parameters. See page 76 for details of the options available for custom integrators.

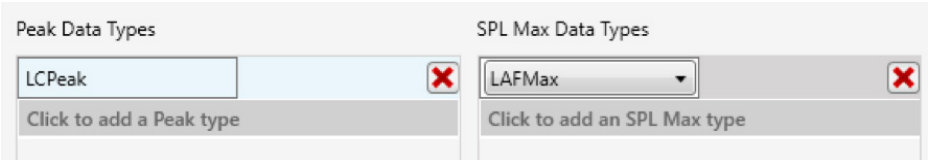
7.2.8 Peak and maximum

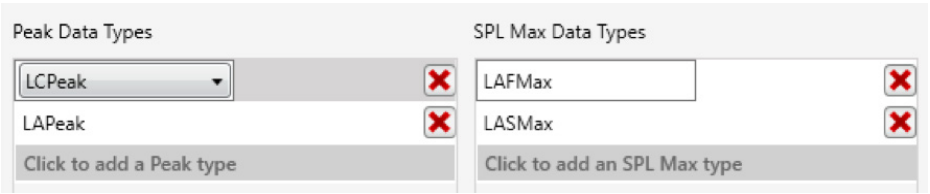
Your doseBadge allows for up to two independent Peak channels to be measured and logged along with up to four independent SPL max values.

For the Peak channels, the overall value and data logging values are stored.

For the SPL max values, the overall values are stored.

To add a Peak or SPL max value, click Click to add a Peak type or Click to add an SPL Max type and choose one of the options from the drop down list:





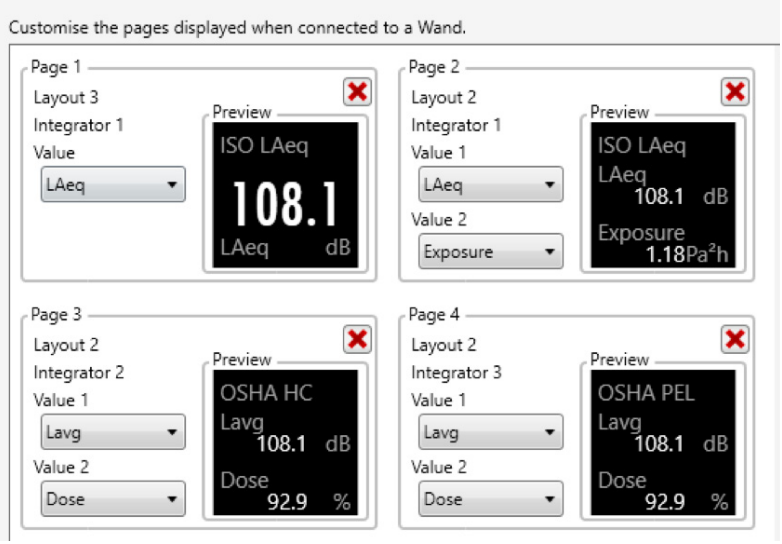
7.2.9 Wand interface

The wand interface allows you to define what information is displayed your wand (if purchased) when a measurement is read from your doseBadge.

The wand can display up to five pages of acoustic values in addition to calibration information and measurement summary information.

On each page, your wand can display one of three types of information:

1. The “integrator template”, which contains the name of the integrator (e.g. ISO, OSHA PEL, ACGIH, etc.) and two acoustic values (e.g LAeq, Lavg, TWA, exposure, dose, etc.).
2. The “values only template”, which contains two acoustic values not linked to an integrator channel (e.g. LCPeak).
3. The “big number template”, which contains one large acoustic value linked to an integrator channel (e.g. dose, exposure).

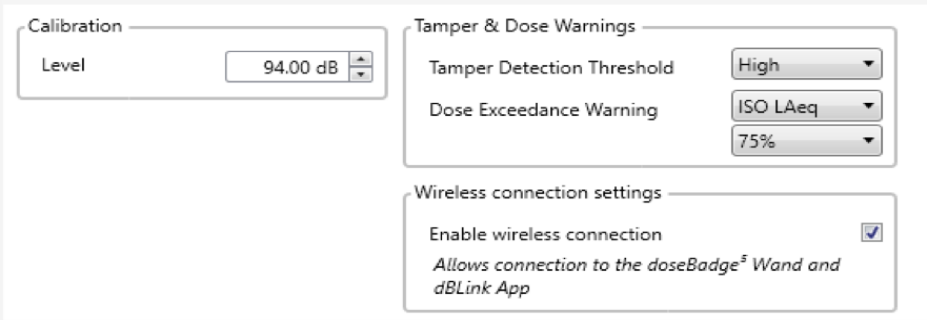


To add a new page, click “Click to add a page” at the bottom of the screen and select the type of screen required.

Select the data type for that screen from the drop down options. Pages can be deleted using . Please note that the pages shown on the wand do not affect the measurement data stored by the instrument, which is defined in the Storage, Integrating and Peak/Max tabs.

7.2.10 Advanced

The advanced tab allows for more detailed functions to be configured.



7.2.10.1 Calibration

This setting allows the calibration level that the doseBadge5 is expecting to be adjusted to suit the acoustic calibrator being used. By default this is set to 114dB to suit the CR:518 acoustic calibrator.

7.2.10.2 Tamper & Dose Warning

The doseBadge5 can be programmed to display a visual warning when either of the following conditions are met:

Tamper
The doseBadge5 contains an accelerometer which can be used to indicate when the instrument has been knocked or has been subject to an impact. This can affect the validity of noise measurements and so it is useful to know when this occurred. The measurement data can be recalculated to exclude areas where the tamper sensor has been activated.
If this option is enabled, the time history graph will be marked to show when the sensor was activated.

Dose Warning
The doseBadge5 can indicate with the Red LED when a pre-set % dose level has been exceeded. The channel used for the calculation and the level can be configured. The available channels are defined by which integrator channels are enabled.

7.2.10.3 Bluetooth connection settings

This allows the Bluetooth connection to be enabled or disabled in the instrument. This may be required when your equipment is going to be used in a sensitive area or is being transported by air.

When transporting, use Transport Mode described on the next page.

7.2.10.4 Transport Mode

Your doseBadge can be set into Transport Mode for shipping and storage. See page 43 for more information.

7.3 Configuring via the dBLink App

By connecting your doseBadge to dBLink, you can do the following:

- Set the name, place, project or person information for your instrument
  - This information is downloaded into NoiseTools along with the measurement
- Set the clock (synchronise the clock in your doseBadge to the one on your mobile device)
- Clear the instrument's memory
- Select the integrators
  - Up to four independent integrators can be enabled at any time
- Select the SPL Max settings
  - Up to four independent SPL Max values can be enabled at any time
- Select the Peak channels
  - Up to two independent Peak channels can be enabled at any time
- Enable or disable scheduled measurements
- Add a scheduled measurement

See page 62 for further details of configuring your doseBadge from dBLink.

8 Clearing the memory

The memory of your doseBadge can be cleared using either NoiseTools (see page 21), the wand unit (see page 60 or dBLink (see page 67).

Important note: please ensure that all measurement data from your instruments has been downloaded before clearing the memory. Once erased, measurement data cannot be retrieved.

9 Calibrating your doseBadge

It is good practice and often a legal requirement, that a noise measurement instrument is calibrated both before and after a measurement is made using an acoustic calibrator.

Your doseBadge records the time and level of calibrations that have been carried out, which can be viewed in NoiseTools, via the wand, or through dBLink.

9.1 Setting the calibration level

The calibration level of the doseBadge[5] is nominally set to 114dB to match the Cirrus Research CR:518 acoustic calibrator. However, the level can be changed to suit other calibrators, such as the Cirrus Research CR:514 or CR:515, which provide a calibration level of 94dB.

To change or check the level, connect your doseBadge to NoiseTools via the dock and go to the Configure menu. Adjust the calibration level as required and save the changes to your instrument.

See page 17 for details of configuring your doseBadge in NoiseTools.

Your doseBadge will not enter calibration mode if a measurement is running or paused. Ensure that the instrument is stopped before calibrating (if the blue LED is flashing, the instrument is running or is in pause mode).

9.2 Removing the windshield

The windshield is secured to the doseBadge[5] using a plastic carrier. To remove the windshield, carefully press on the sides of the windshield carrier and pull the assembly away from the body of the instrument as shown in the image on the next page.

Do not pull the foam windshield as this may cause damage.

9.3 Connecting the acoustic calibrator

Connect the acoustic calibrator to your doseBadge's microphone and switch on the calibrator.

Your doseBadge will automatically detect the acoustic signal from the calibrator and will start the calibration process. If the level provided by the acoustic calibrator is within the tolerances acceptable to your dosimeter, the instrument will calibrate.

When calibration is complete, the blue LED on your doseBadge will illuminate for five seconds. If calibration fails, the red LED on your dosimeter will illuminate for five seconds. See page 79 for troubleshooting if the calibration fails.

When calibration is complete, remove the acoustic calibrator and replace the windshield. To re-attach the windshield, press the assembly back onto the body of your doseBadge, taking care to ensure that it is securely located. Your doseBadge is now ready to use.

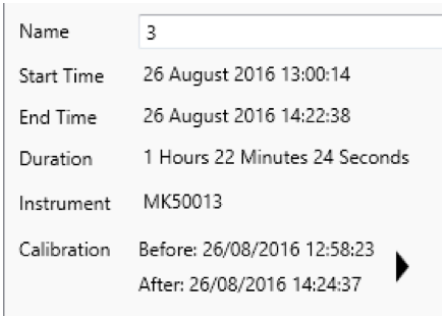
9.4 Post-measurement calibration

The doseBadge5 allows for a calibration to be carried out after a measurement has been completed. Many occupational standards and regulations require a post-measurement calibration to be carried out and for the differences between the pre and post measurement calibration levels to be reviewed.

To carry out a post measurement calibration, follow the same process as outlined in the previous section.

The second calibration is recorded by the instrument and can be viewed in NoiseTools, on dBLink, or through the wand.

In the example below, the measurement has been downloaded into NoiseTools. The pre and post measurement calibration information is shown in the summary view:



Clicking on the arrow or the details tab shows the detailed information with the time, date, level and offsets.

For applications where the drift between calibrations is required, this can be calculated from the difference between the Calibration Before Offset and the Calibration After Offset.

In this example, the drift is 0.28dB – 0.20 dB = 0.08dB.

^ Calibration	
Last Factory Calibration	16/07/2016
^ Calibration Before	
Time	26/08/2016 12:58:23
Level	94.0 dB
Offset	0.28 dB
^ Calibration After	
Time	26/08/2016 14:24:37
Level	94.0 dB
Offset	0.20 dB

10 Attaching & removing your doseBadge

You should consult any local regulations or standards for specific information about the positioning of noise dosimeters, but it is recommend that the doseBadge[5] is mounted close to the ear, typically within 10-15cm (4" to 6"). This will help to avoid reflections from the head, which can affect measurements.

The microphone should be as vertical as possible and the windshield should always be attached before measurements are started.

Avoid handling the doseBadge5 when it is running and storing data.

Physical impacts upon your doseBadge can affect the measurements data and so the dosimeter will record impacts using the internal accelerometer. When the sensor is activated, the time history data is marked and this can be seen in NoiseTools.

If the source of the noise to be measured appears to be coming from one direction, it is recommended that the instrument is mounted onto the shoulder closest to that source.

When the doseBadge[5] is measuring, keep clothing away from the windshield and microphone to avoid any unwanted noise being recorded.

Clip your doseBadge onto clothing using the mounting clips supplied and ensure that the unit is secure, as show below.

To remove your doseBadge, ensure that the instrument is stopped (the blue LED will flash when the instrument is measuring).

Release the clips and remove your dosimeter.

11 Measuring noise with your doseBadge

11.1 Starting a measurement

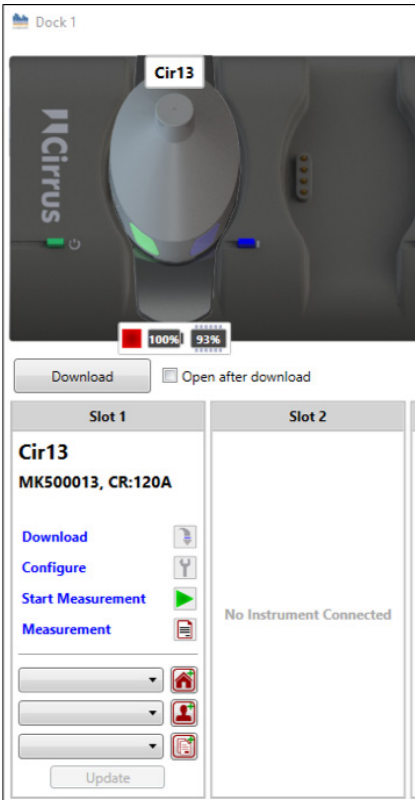
11.1.1 Scheduled measurements

If scheduled measurements have been configured and enabled on your doseBadge, they will be activated once it has been removed from the dock.

Remove your doseBadge from the dock and attach it to the person whose noise exposure you need to measure (see page 30 for more details). Measurements will start, pause and stop as defined in the scheduled measurement settings. See page 45 for details of configuring scheduled measurements.

Please note that when a doseBadge[5] is connected to a powered CU:120A dock, the scheduled measurements will not be activated.

11.1.2 Starting a measurement with NoiseTools



Measurements can be started and stopped through NoiseTools.

The status of any doseBadge dosimeters that are connected to the dock is displayed in the dock window as shown on the left.

In this example, the instrument is stopped. The red 'stop' icon below the image of the doseBadge shows this.

Information about the current battery charge and the available memory in the instrument is also displayed.

In this example, the battery is fully charged (100%) and 91% of the available memory is free.

To start a measurement, press the green 'start' arrow and the instrument will begin a new measurement.

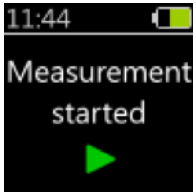
The green arrow will become a red 'stop' button, allowing measurements to be stopped manually.

11.1.3 Starting a measurement with the RC:120A wand

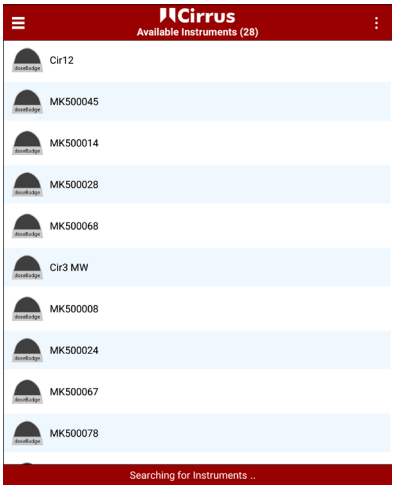
Connect to your doseBadge instrument and select measure as shown below:

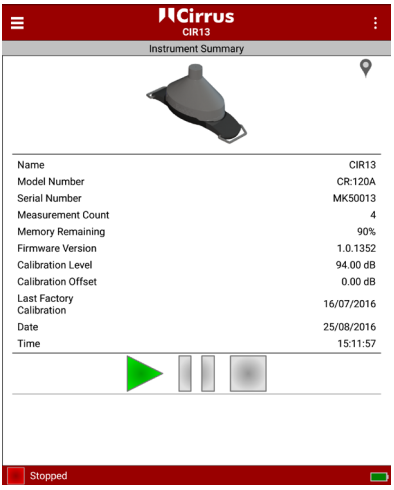
When your instrument is not measuring, the only option is to start a measurement.

Pressing the Left button will start a measurement and a confirmation will appear for a few seconds:



11.1.4 Starting a measurement with dBLink





To start a measurement with dBLink, connect to the required instrument from the instrument discovery window and press the green ‘run’ button.

Press again to confirm.

The measurement will start and the available options will change from Start, to Pause and Stop.

In the example on the previous page, the top instrument is ready to start and the bottom instrument is already running. The Pause and Stop options are available.

11.1.5 Measurement running indication

When a doseBadge is running, the blue LED will flash every two seconds. See page 77 for details of the LED status indicators.

11.2 Pausing a measurement

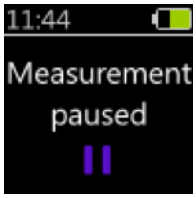
When your doseBadge is running and measuring data, the blue LED will flash every two seconds. The measurement can be paused using a number of different methods as described below.

11.2.1 Pausing a measurement with the wand

Connect to your doseBadge and select the measure option as shown below:

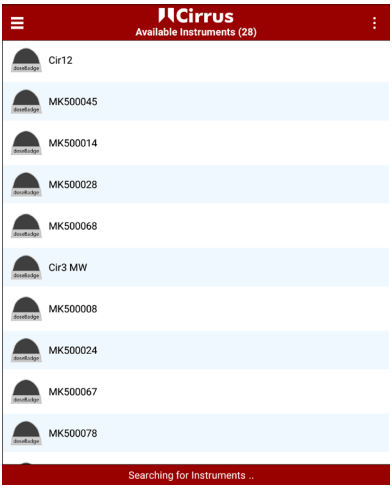
When the instrument is measuring, the options are to either pause it or stop it. The small green “Recording” icon in the status bar indicates that the instrument is measuring.

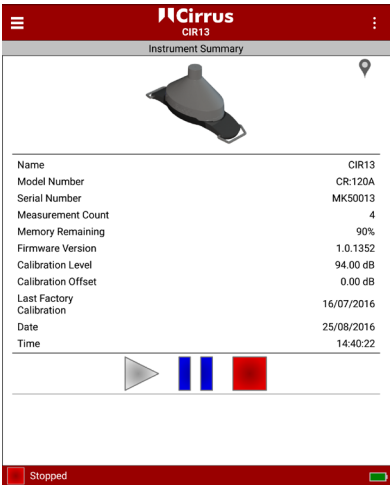
Pressing the Up button will pause the measurement and a confirmation will appear for a few seconds:



11.2.2 Pausing a measurement with dBLink

To pause a measurement with dBLink, connect to the required instrument. From the instrument discovery window, press the blue pause button. Press again to confirm.





The status of the instrument is shown by the green run, blue pause and red stop buttons.

11.2.3 Using scheduled measurements

If a scheduled pause has been programmed into the instrument, this will be activated at the appropriate time.

11.2.4 Pause indication

When your doseBadge5 is paused, the blue LED will flash every five seconds.

See page 77 for details of the LED status indicators.

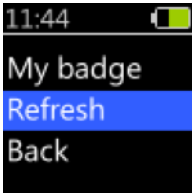
11.3 Mid-shift readings

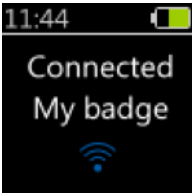
It can be useful to view the accumulated noise exposure whilst a measurement is in progress. This is commonly known as a mid-shift reading.

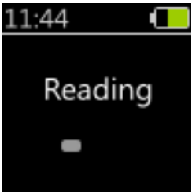
Your doseBadge allows measurements to be viewed whilst in progress using either the wand or the dBLink App as described below.

11.3.1 Using the wand

Connect to your instrument and select the Read option as shown on the next page:







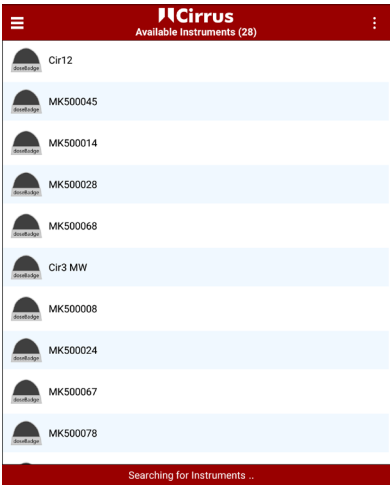
The wand will read the current measurement information from your doseBadge. Use the left and right keys to move between the information for the current measurement:

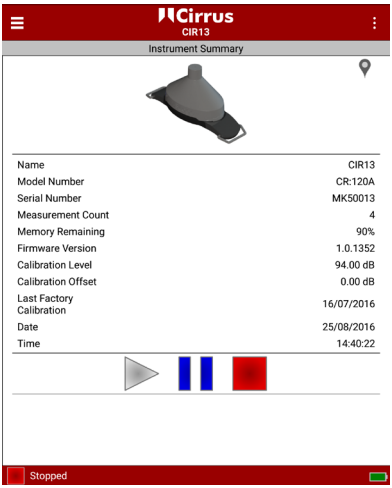
The word “Meas” and the green icon show that the badge is running and that this is a mid-shift reading.

Press the round centre key to exit from the reading.

11.3.1 Using dBLink

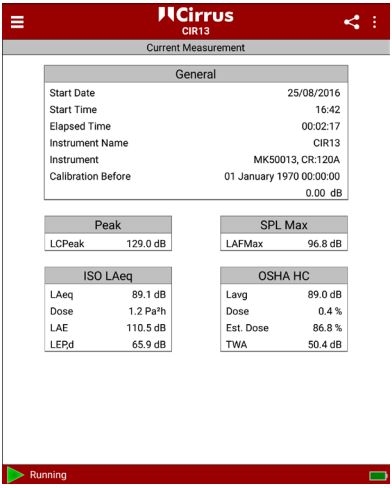
To view the measurement status of an instrument whilst it is running, connect to the badge and select it from the discovery window, as shown on the next page.

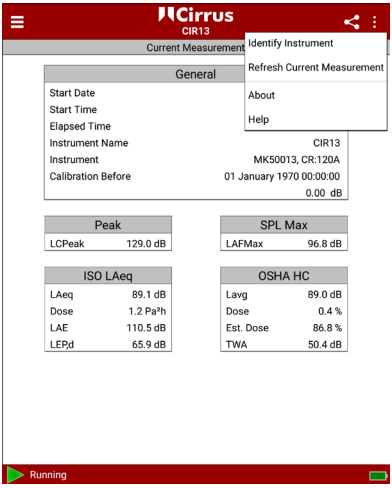




If the badge is running, the current measurement data will be displayed below the badge information.

The measurement data for the first integrator is displayed on this screen. To view the measurement data for other integrators, select the badge and swipe to view the Current Measurement screen or use the menu to select the View Measurements option.





The current information can be refreshed by selecting the menu in the top right and choosing Refresh Current Measurement.

Please note that in order to reduce power consumption, the data is not refreshed automatically. Pressing the refresh icon will load the current measurement data again.

11.4 Stopping a measurement

11.4.1 Stopping a measurement with NoiseTools

To stop a measurement through NoiseTools, connect your doseBadge to the dock and from the dock window, press “Stop a Measurement” and the status will change from running, to stopped.

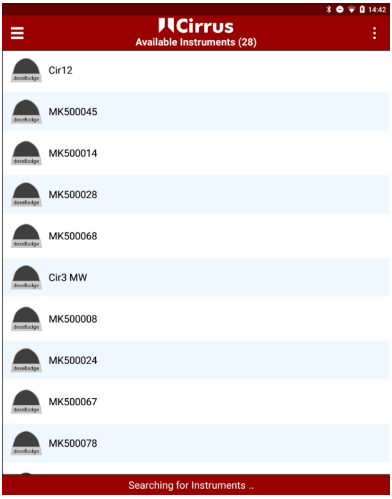
11.4.2 Stopping a measurement with the wand

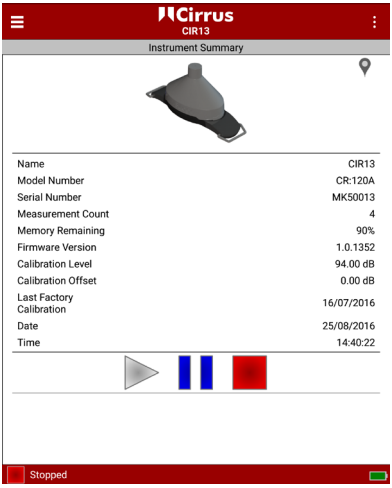
When the instrument is measuring, the options are to either pause it or stop it. The small green recording icon in the status bar indicates that the instrument is measuring.

Pressing the right button will stop the measurement and a confirmation screen will appear for a few seconds.

11.4.3 Stopping a measurement with dBLink

To stop a measurement with dBLink, connect to the required instrument that is running and from the instrument discovery window, press the red stop button. Press again to confirm.





The status of the instrument is shown by the Green run, Blue pause and Red Stop buttons.

11.4.4 Scheduled measurements

If a scheduled stop time has been programmed into the instrument, this will be activated at the appropriate time and the instrument will end measuring. The measurement data will be stored in the instrument, ready for download or viewing.

11.5 Downloading measurements

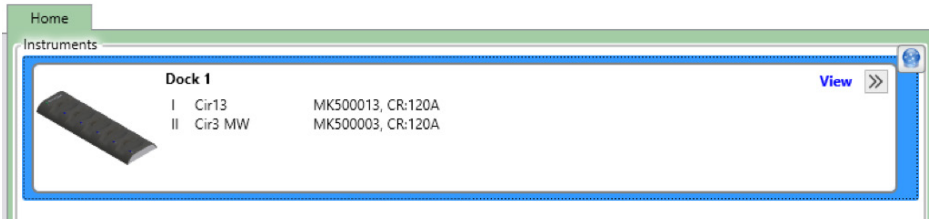
11.5.1 Downloading to NoiseTools

NoiseTools allows measurement data to be downloaded and analysed, and for measurement reports to be created.

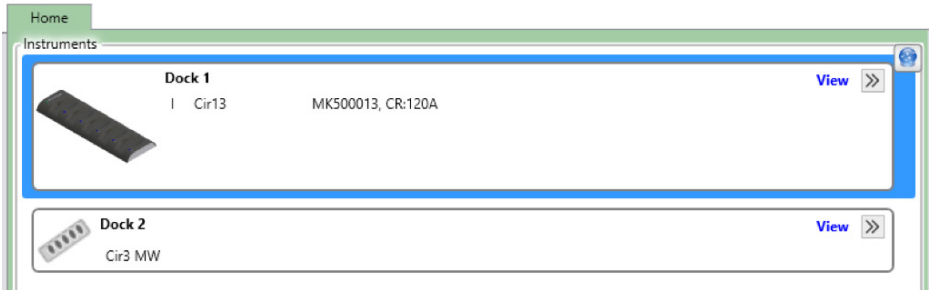
For further guidance on using NoiseTools, please refer to online documentation, training videos and support information.

When a doseBadge[5] is connected to a powered dock, which is connected to the NoiseTools software via a USB cable, it will appear in the Instrument window.

If more than one doseBadge unit is connected to the dock, each instrument will be shown with its serial number as shown below:

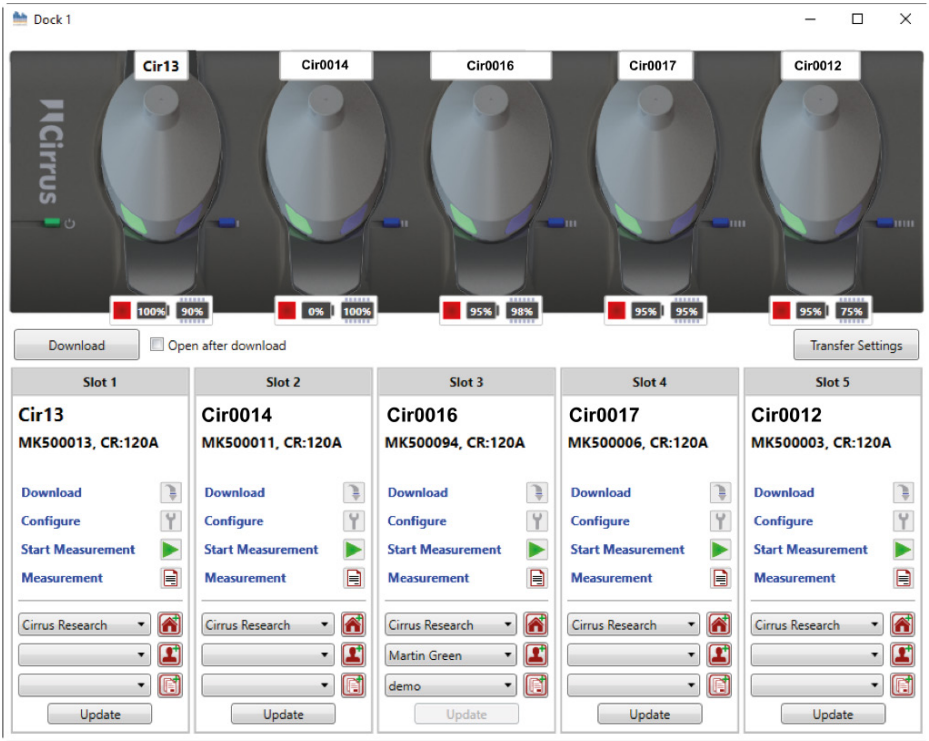


If multiple docks are connected to NoiseTools, these will be visible in the main window:



Click on View to open the dock View.

In the example on the next page, five individual dosimeter units are connected to the dock.



11.5.1.1 Download all measurements

This function will download all measurements from every connected instrument and store them in the database.

Where a person, project or place has been allocated to an instrument, these will be added to the appropriate measurement.

Click Open After Download to open all measurements once the download has completed.

The progress of the download is shown by a green bar. Close the download window when the process is complete.

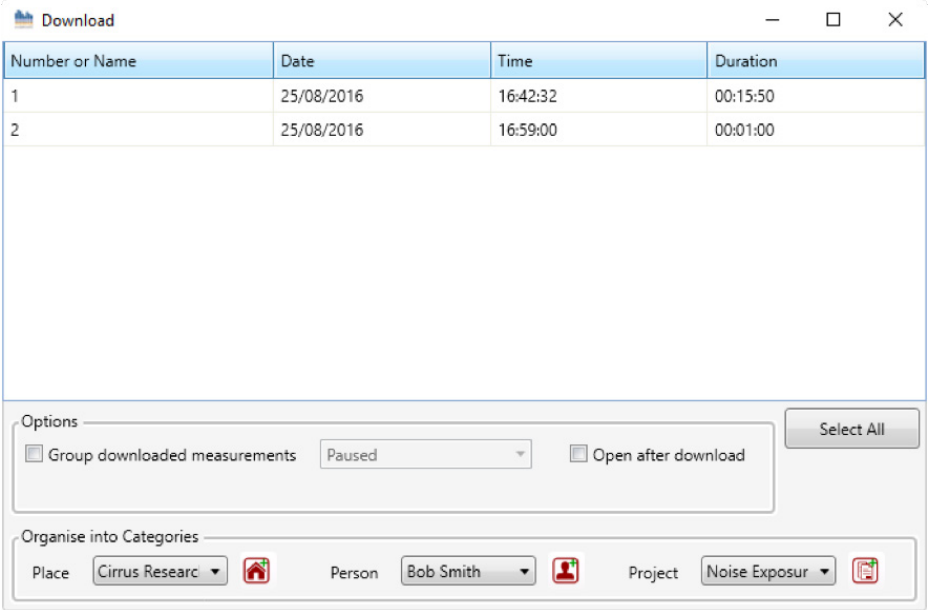
11.5.1.2 Download selected measurements

To download measurements from an instrument, click Download for each of your doseBadges.

To download selected measurements from individual instruments, use the Download link within the appropriate slot.

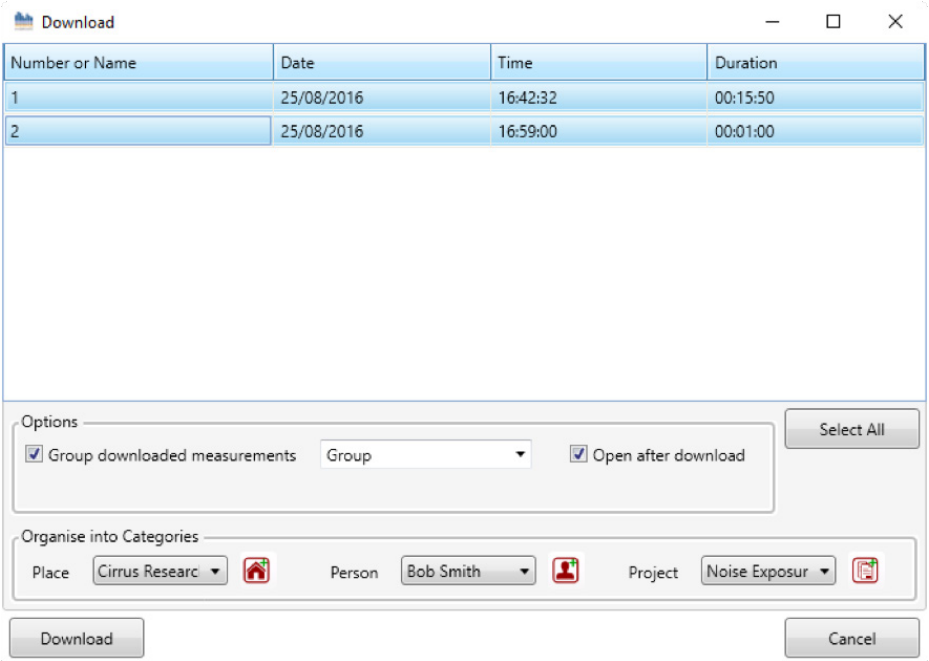
This will open the measurement list, which shows details of the measurements stored in the instrument.

Any or all measurements can be selected and the place, person and project to be allocated to each measurement can be changed.



The Group downloaded measurements option allows a number of measurements to be grouped together for analysis, comparison and reporting. The measurement group can be named as required.

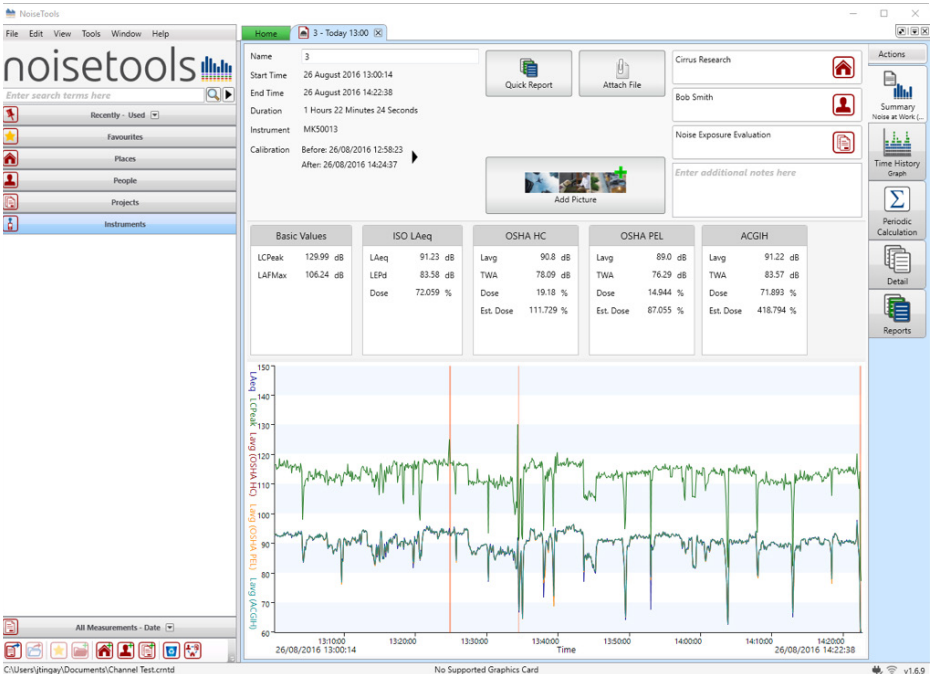
The Open After Download option allows any measurements to be opened automatically in NoiseTools once the download has completed.



When the measurements have been selected, click Download to store the measurements into the NoiseTools database.

If the Open After Download option is selected, the downloaded measurements will be shown.

An example measurement is shown on the next page:



In this measurement, four integrators have been enabled along with LCPeak and LAFmax.

11.5.2 Viewing measurements with dBLink

Measurement data can be viewed whilst measurements are being made (see Mid-Shift readings on page 34) or at the end of a measurement once the instrument has been stopped.

Please refer to page 64 for details of viewing measurements with the dBLink App.

11.5.3 Viewing measurements on the wand

Measurements can reviewed on the RC:120A wand unit. Please refer to page 54 for details of reviewing measurements on the wand.

Please note that the wand unit does not allow measurement data to be download to NoiseTools.

12 Storing & transporting your doseBadge

Where your doseBadge will not be used for extended periods, it can be set to Transport Mode. This will prevent the badge from running and will minimise its power consumption.

The doseBadge[5] can then be stored for long periods of time without needing to charge the battery.

Please note that the battery will be depleted after approximately four weeks whilst Transport Mode is enabled.

If your doseBadge is not set to Transport Mode, the battery will be depleted after approximately seven days.

12.1 Transport mode

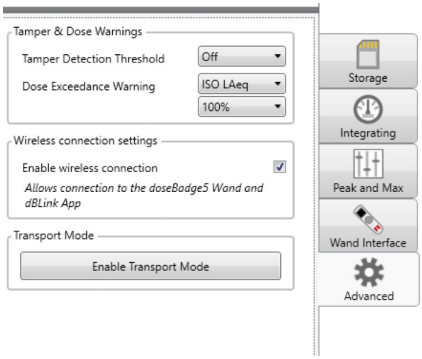
Your doseBadge can be put into Transport Mode, which shuts down the instrument, disables the shake-to-wake sensor and puts the instrument into its lowest power mode.

This can be used if the instrument is being shipped or where movement will activate the sensor and wake the badge, which will result in the battery being drained.

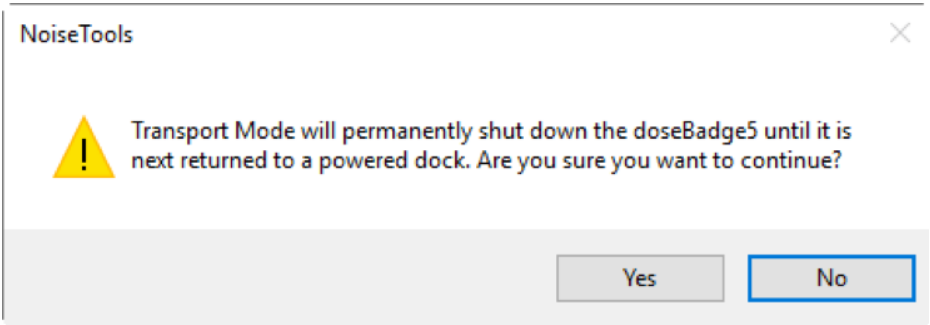
When Transport Mode is enabled, your doseBadge will shut down and the shake-to-wake sensor will be deactivated. This will prevent the instrument from waking during transport and will conserve battery power.

Before the doseBadge[5] can be used again, it must be connected to a powered dock. This will disable Transport Mode and allow the instrument to be used as normal. The instrument must be fully charged before use.

To enable Transport Mode, connect the instrument to NoiseTools. From the Configure menu, select the Advanced tab.

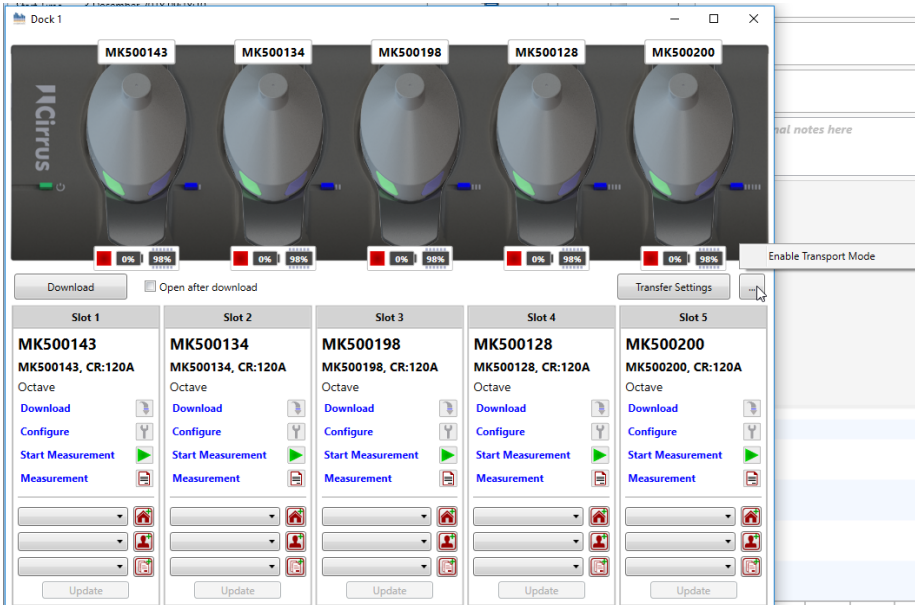


NoiseTools will display a warning as follows:



Click Yes and your doseBadge will be set to Transport Mode. Remove the doseBadge[5] from the dock and store in the carrying case.

To disable Transport Mode, reconnect your doseBadge to a powered dock.



If you need to set multiple doseBadges into Transport Mode, you can do so by clicking "..." on the main window and selecting Enable Transport Mode, as shown above.

13 Configuring scheduled measurements

The scheduled measurements function is a powerful and unique function of your doseBadge.

It allows you to configure your instruments to start, pause and stop at specific times throughout the day, and to enable or disable the schedules for specific days of the week when measurements are not required. This allows instruments to be configured ready for use before they are needed.

For example, instruments can be configured ready for a night shift and can be given to workers, without the need for you to be there to manually start the measurements. Measurements will be made automatically and stored in the instrument ready for download the next day.

The overall Scheduled Measurement function can be enabled or disabled through NoiseTools, the wand or dBLink.

If a doseBadge[5] is connected to a powered dock, the scheduled measurements will not be activated.

If a scheduled start is missed (if the badge is still on the dock for example), the instrument can be started manually and any subsequent automatic measurements will trigger as intended.

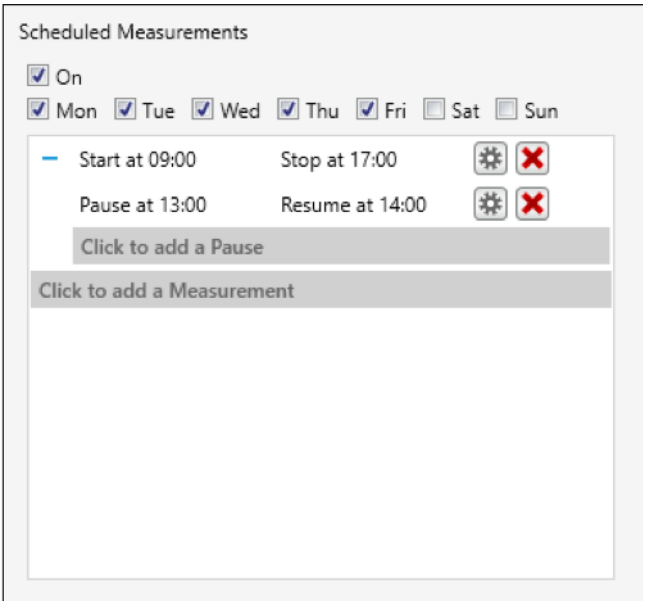
An example of where this can be used is as follows:

1. Configure the instruments to start measuring at 8am and run for eight hours
2. Calibrate the instrument(s)
3. Leave the instruments on the dock ready for deployment
4. Give the instruments your workforce before the scheduled start time, ready to start measuring at 8am
5. Measurements will start automatically at 8am and run for eight hours
6. At 4pm the instruments will stop measuring
7. Return the instruments to the dock for charging & download
8. Repeat the next day

13.1 Adding a timed measurement

To add a timed measurement, click “Click to Add a Measurement”.

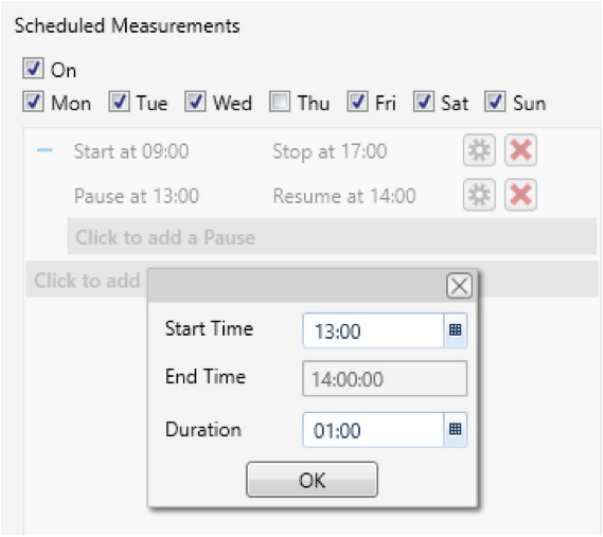
Choose the start time and the duration of the measurement. NoiseTools will show the stop time based on the start time and duration.



The time and duration can be selected either by typing it into the box or by using the pre-set selection.

13.2 Adding a pause to the measurement

To add a pause to a measurement, click “Click to add a Pause”.



Choose the start time and the duration of the measurement.

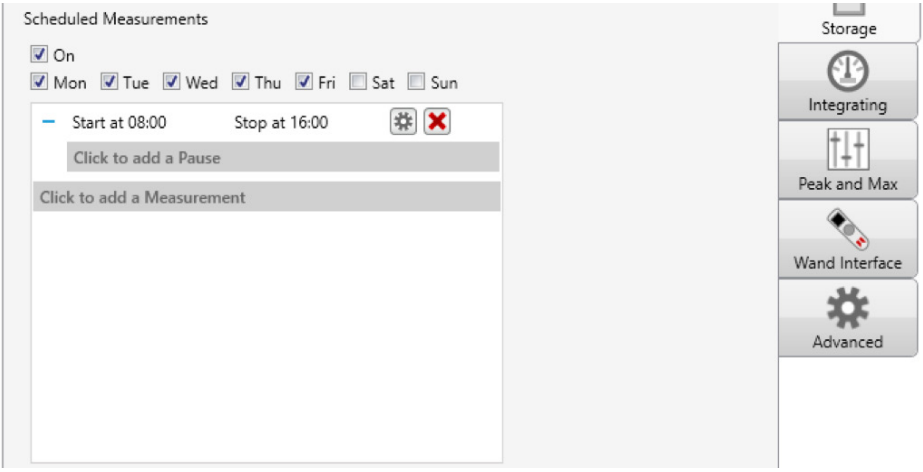
NoiseTools will show the stop time based on the start time and duration of the measurement.

The time and duration can be selected either by typing it into the box or by using the pre-set selection.

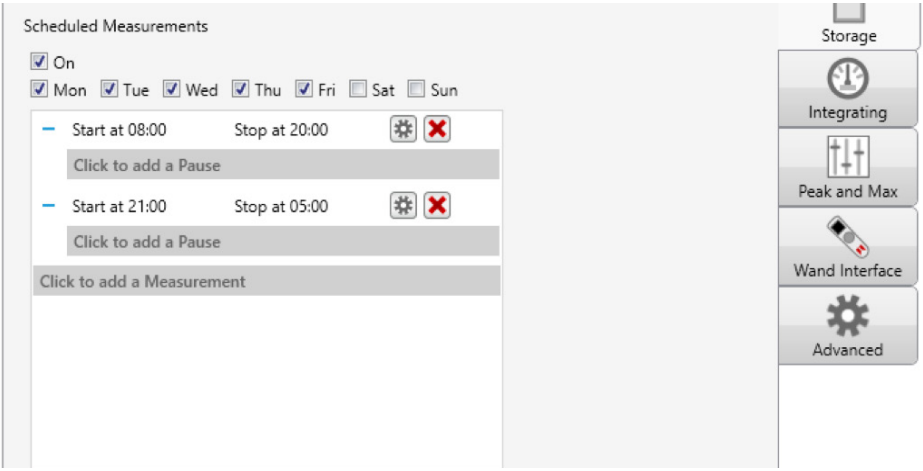
13.3 Example configurations for scheduled measurements

On the following pages are examples of how scheduled measurements can be used.

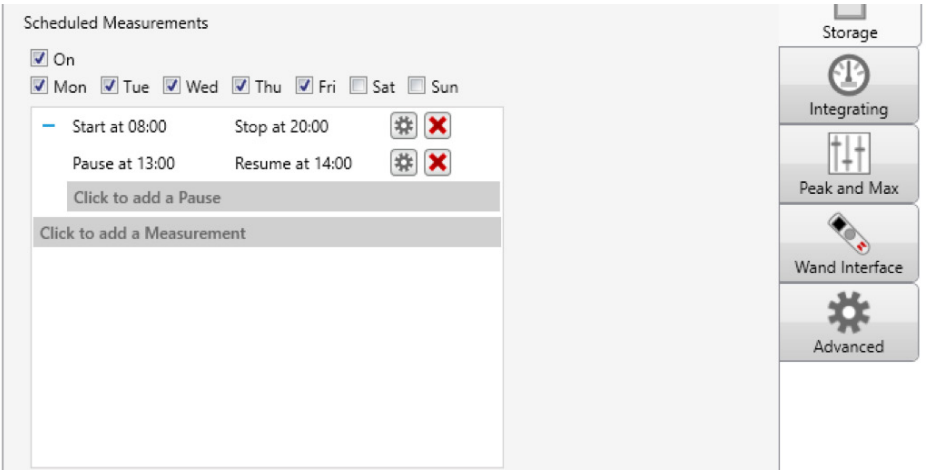
13.3.1 Example 1 - Start at 8am and run for eight hours



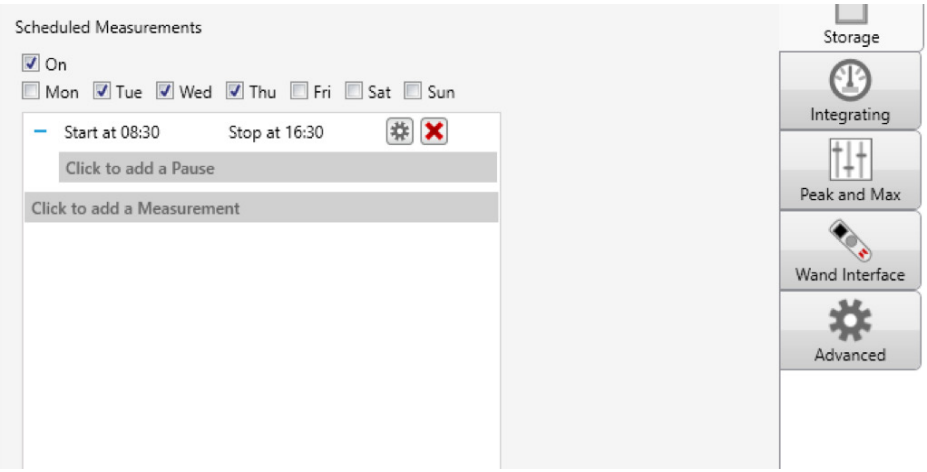
13.3.2 Example 2 - Start at 8am and run for 12 hours. Start at 9pm and run for eight hours



13.3.3 Example 3 - Start at 8am and run for 12 hours with a one-hour pause at 1pm



13.3.4 Example 4 - Start at 8.30am and run for eight hours (Tuesday, Wednesday and Thursday)

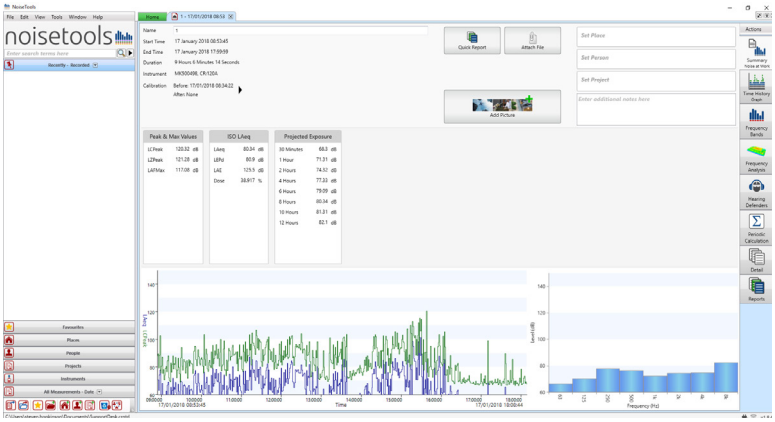


14 Octave band filters

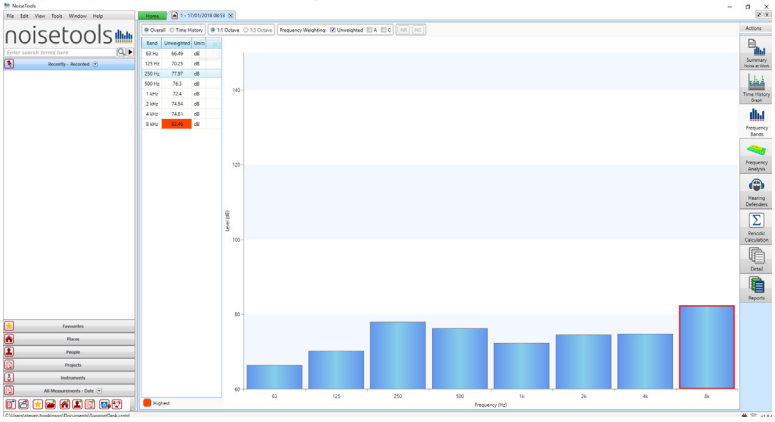
In addition to the four independent channels or integrators (which can be configured to meet any combination of regulations, standards or guidelines), your doseBadge also provides real-time octave band analysis over the entire measurement, and when combined with NoiseTools, allows individual noise sources to be identified, making the selection of hearing protection, quicker, simpler and more effective.

This feature does not need to be activated; octave band data will be recorded along with other noise parameters throughout the duration of a measurement. Octave band data can be reviewed in NoiseTools:

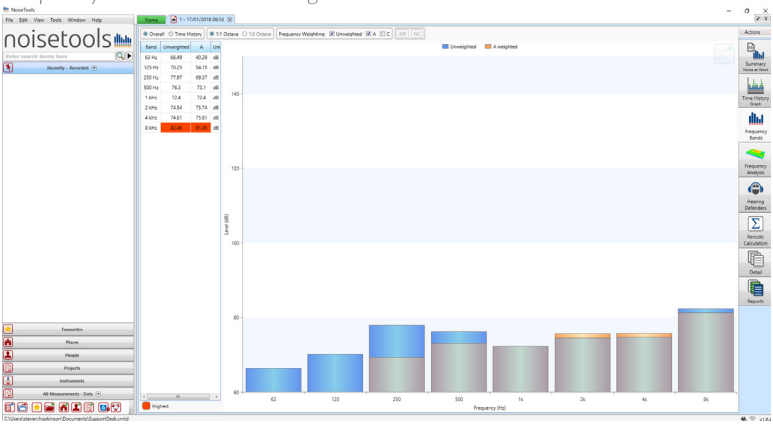
Summary screen



Frequency bands screen - unweighted



Frequency bands screen - A-weighted



15 The RC:120A wand

The RC:120A doseBadge[5] wand is an optional item that allows instruments to be controlled, measurements started, paused and stopped, and for mid-shift readings to be taken remotely.

The information displayed by the wand when reading measurements from your doseBadge, is configured on the instrument.

The wand communicates to any number of doseBadge units via Bluetooth® (this requires that the Bluetooth communications are enabled on your doseBadge instruments).

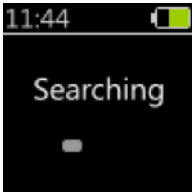
15.1 Switching on the wand

The wand is switched on by pressing the round key in the centre of the keypad. The wand will display the Cirrus Research logo and then show the Connect screen:

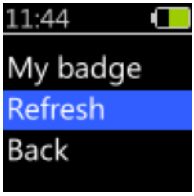
To switch off the wand, press and hold the round key, and wait for the countdown to complete. The wand will automatically power off after two minutes to reduce battery consumption.

15.2 Connecting to your doseBadge(s)

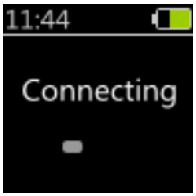
To connect to one or more doseBadge instruments, select the Connect screen and press the round key. The wand will search for available doseBadge instruments and will show the following screen:



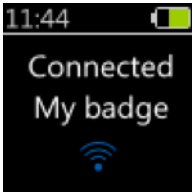
When one more doseBadge instruments are detected, the wand will show a list of the available units.



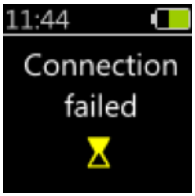
The Refresh option forces the wand to search again for available instruments that are in range. Select the instrument required and press the round key to continue. The wand will display the Connecting screen:

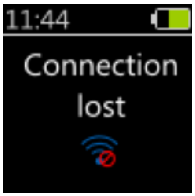


When the connection has been made, the Wand will show the connected screen:



If the connection from the wand to your doseBadge fails or the connection is lost, one of the following screens will be displayed:

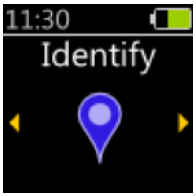




“Connection lost” will be displayed when your doseBadge moves out of range of the wand.

When the wand is connected to a doseBadge, more options become available from the main menu:

Disconnect - disconnects from the instrument.

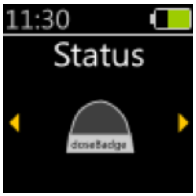


Identify - activates the ‘Identify’ blue LED on your doseBadge for a few seconds to help identify which instrument is connected.

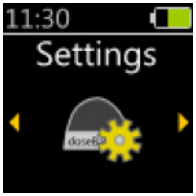
Measure - start/stop/pause/resume measurements.

Read - read the acoustic values from the instrument.

Review - review the acoustic values from the measurement previously read,



Status - check the status of your doseBadge (battery level, remaining memory, calibration information etc).



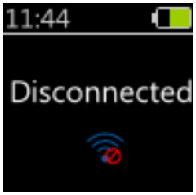
Settings - check and change your doseBadge's settings (enable timers, change the clock, clear the memory etc).

Settings - check and change the settings of your wand.

15.3 Controlling your doseBadge with the wand

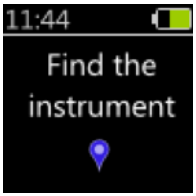
15.3.1 Disconnect

This screen is shown for a few seconds after disconnecting from the instrument.



15.3.2 Identify

After using the “Identify” function from the main menu, your doseBadge’s “identify” blue LED will turn on for a few seconds, so the user can visually locate the instrument. This screen is displayed for a similar duration:



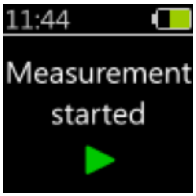
15.3.3 Measure

This page lets you start/stop/peause/resume measurements. The available actions depend on whether the instrument is currently measuring or not.

15.3.3.1 Your doseBadge is not measuring

When the instrument is not measuring, the only option is to start a measurement.

Pressing the Left button will start a measurement and a confirmation message will appear for a few seconds.

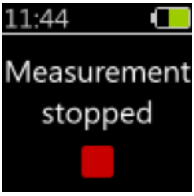


An error message will be displayed if the instrument cannot start a measurement because its memory is full.

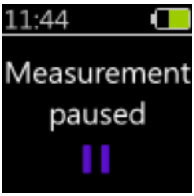
15.3.3.2 Your doseBadge is measuring

When your instrument is measuring, the options are to either pause or stop the measurement. The small green "recording" icon in the status bar indicates that your doseBadge is measuring.

Pressing the right button will stop the measurement and a confirmation will appear for a few seconds. The message is split into two lines.



Pressing the up button will pause the measurement and a confirmation will appear for a few seconds. The message is split into two lines.

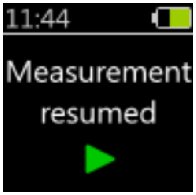


A measurement can be paused up to five times. An error message will be displayed if you attempt to pause a measurement too many times.

15.3.3.3 Your doseBadge is paused

When the measurement is paused, the options are to either resume it, or stop it. The small purple "paused" icon in the status bar indicates that the measurement is paused.

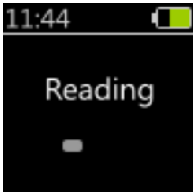
Pressing the left button will resume the measurement and a confirmation screen will appear for a few seconds.



Pressing the right button will stop the measurement and the “Measurement Stopped” confirmation screen will appear for a few seconds.

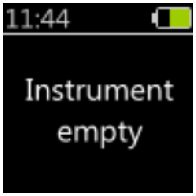
15.3.4 Read

When selecting the “Read” page on the main view, your wand will read the measurements on your doseBadge and present the results.



15.3.4.1 Instrument is empty

If the instrument is not measuring and does not contain any measurement data, a message will be displayed for a few seconds.



15.3.5 Review

After reading the measurements from your doseBadge, the Review page is shown. The details of a measurement are accessed by using the left/right buttons, while the up/down buttons are used to go to the next/previous measurement.

Each measurement consists of several pages:

- The summary page with the measurement number, start time and duration
- The calibration page with information about the last calibration before the measurement

- Up to five pages of measured acoustic values. Which value is displayed depends on the settings of the measurement channels on the badge, and can be modified using NoiseTools. Available values include LAeq, LCPeak, exposure, estimated exposure, and dose.

A red triangle is shown in the top-right corner of all those pages if an overload occurred during the measurement.

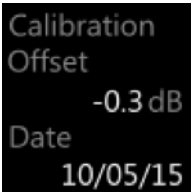
Note that the "Review" page stays accessible, even after disconnecting from your doseBadge.

15.3.5.1 Measurement summary

This page displays the number of the measurement, the start date and time, and the measurement duration. If your doseBadge is currently measuring, the measurement number is replaced with a "Recording" symbol to indicate that this measurement is currently in progress.

15.3.5.2 Calibration status

This page shows the details of the last calibration done before the measurement started.



15.3.5.3 Acoustic values

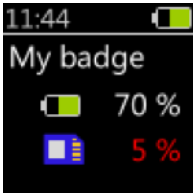
These pages display the measured acoustic values. There are three page templates:

The "Integrator template" contains the name of the integrator (e.g. ISO, OSHA PEL, ACGIH, etc.) and two acoustic values (e.g LAeq, Lavg, TWA, exposure, dose, etc.).

The “Values only template” contains two acoustic values not linked to an integrator channel (e.g. LCPeak).

The “Big number template” contains one large acoustic value linked to an integrator channel (e.g. dose, exposure).

15.3.6 Status

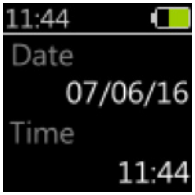


This screen displays the battery level and remaining available memory

This screen displays the unique serial number of your instrument and its model name. A CR:120A is a doseBadge[5].

This screen displays the date of the last factory calibration and the version of the firmware installed on your instrument.

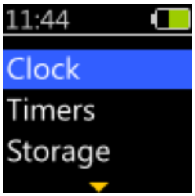
This screen displays the date of the last user calibration and the calibration offset value.



This screen displays the current date and time.

15.3.7 Settings

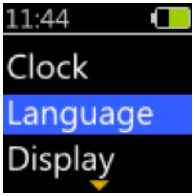
This menu presents multiple options for your doseBadge:

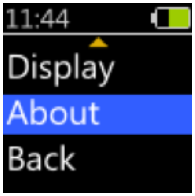


1. Clock - synchronise the clock on your doseBadge with the clock on the wand.
2. Timers - enable or disable scheduled measurements.
3. Storage - clear the memory on your doseBagde. This will display a subsidiary screen, which will ask you to confirm before erasing the memory.

15.4 Wand settings

This page displays a menu that allows you to change the configuration of the wand.





1. Clock - set the clock on the wand.
2. Language - change the language of the wand's user interface.
3. Display - change how the date and time is dsplayed on the user interface (24hr/12hr etc).
4. About - display information about the wand such its model and unique serial number.
5. Back - return to the main menu.

15.5 Inserting/replacing the batteries

The RC:120A wand is powered two AAA/LR03 batteries.

These are located behind the battery cover on the rear side of the wand. In order to insert or replace the batteries, remove the retaining screw and open the cover. The cover is secured by a strap to prevent it from being lost.

Replace the batteries and secure the cover. Take care to ensure that the batteries are inserted to match the polarity as shown in the battery compartment.

15.6 Factory reset

When started for the first time, the wand will ask you to select a language before doing anything else. This is shown when you first receives the wand and will only be asked once. However, it is still possible to change the language after this from the Language menu (see page 59).

There is a special function on the wand to reset this feature, so the language selection screen will be displayed when the wand is next restarted. This screen is shown to confirm the reset:

16 The dBLink app

The dBLink app is a mobile application that can be installed onto Android and iOS devices.

It allows for doseBadge[5] instruments to be controlled and configured, and for measurement information to be viewed remotely. It can also be used to gather mid-shift readings from instruments without having to disturb the person wearing the doseBadge.

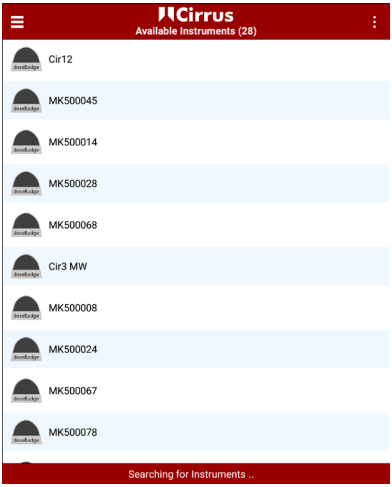
16.1 Connecting to your doseBadge

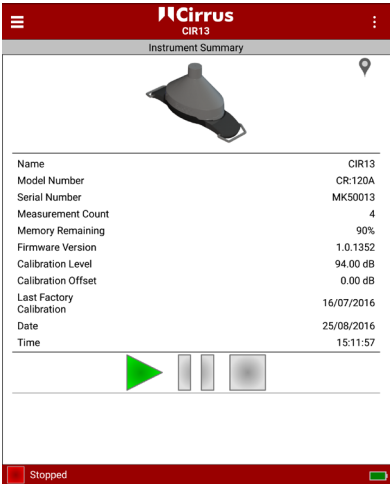
Connection to dBLink is via Bluetooth. Ensure that Bluetooth is enabled on your mobile device.

To connect to an available doseBadge[5], run the dBLink app and allow the program to discover instruments that are within range.

Once instruments have been detected, they will be displayed on the discovery screen.

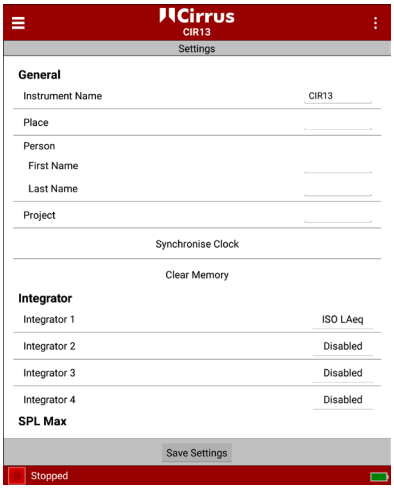
Note that a doseBadge can only be connected to dBLink ***or*** the wand. If dBLink is running and has detected a doseBadge[5], close the app before connecting to the wand.





16.2 Configuring your doseBadge

Select the instrument from the discovery screen and use the menu to select the measurements option or swipe left to view the Setting screen.



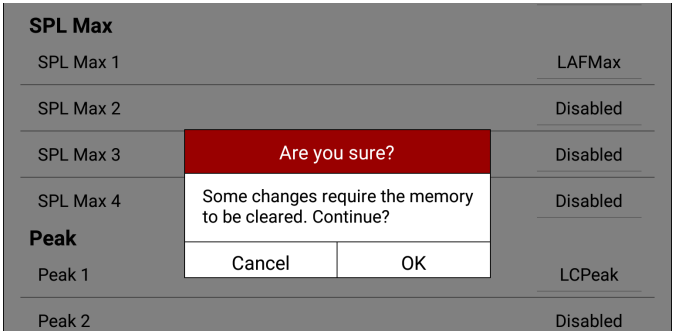
The following items can be configured from the settings screen:

- Instrument name
- Place - this information is downloaded into NoiseTools
- Person - this information is downloaded into NoiseTools
- Project - this person is downloaded into NoiseTools
- Clock (synchronise the clock on the doseBadge to the one on your mobile device)

You can also perform the following functions on the settings screen:

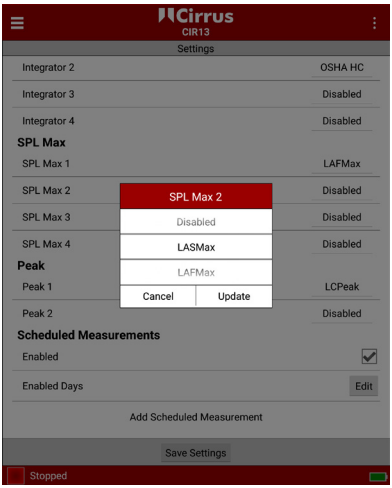
- Clear the instrument's memory
- Select the integrators (up to four independent integrators can be enabled at any time)
- Select the SPL Max settings (up to four independent SPL Mac values can be enabled at any time)
- Select the Peak channels (up to two independent Peak channels can be enabled at any time)
- Enable or disable scheduled measurements
- Add a scheduled measurement

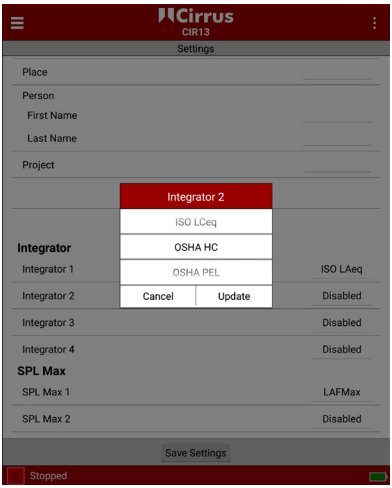
If any settings have been changed, press Save Settings at the bottom of the screen to save the new configuration to the instrument. This will require the instrument's memory to be cleared. Confirm the changes to clear the memory and to program the new settings into the doseBadge5.



16.3 Integrators, Peak & SPL Max values

To change the integrators, Peak or SPL Max values, press on the option on the right hand side and choose from the available selections. Press Update to accept the new values or Cancel to return to the previous screen.

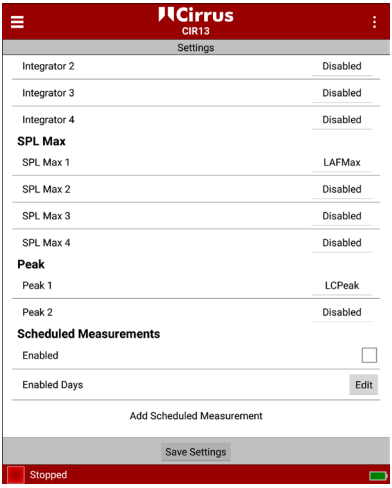


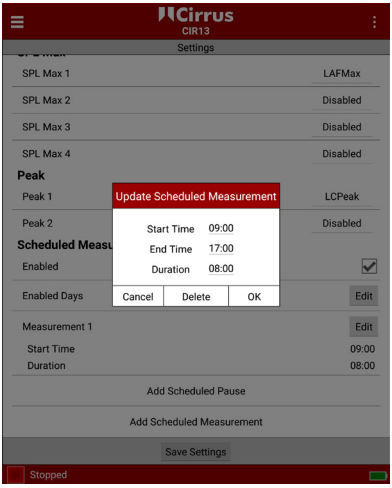


16.4 Scheduled measurements

Scheduled measurements can be enabled or disabled on dBLink. New settings can be added and existing settings can be adjusted. Any existing scheduled measurements will be displayed; press Edit to adjust the current settings or delete to remove the current setting.

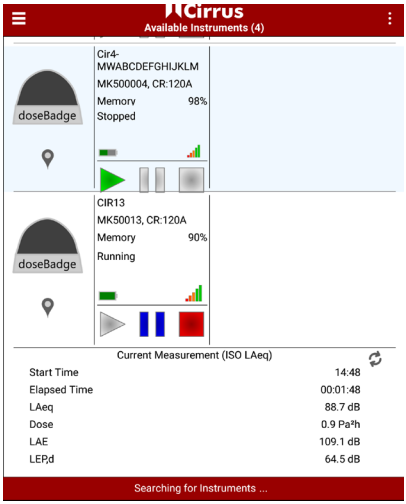
Press OK to accept the changes or Cancel to return to previous screen.





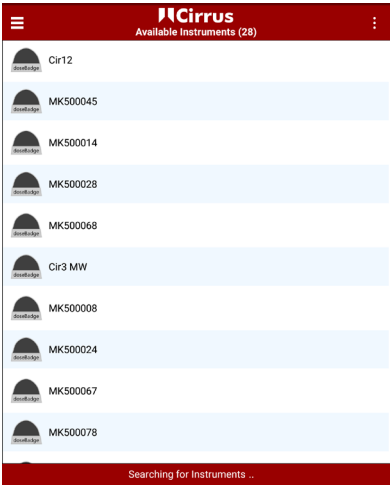
16.5 Starting a measurement

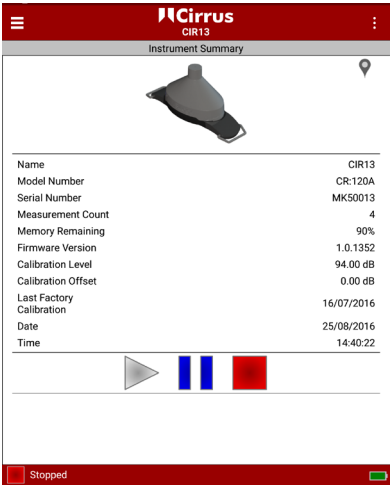
To start a measurement with dBLink, connect to the required instrument and from the instrument discovery window, press the Green button. Press again to confirm.



16.6 Mid-shift readings

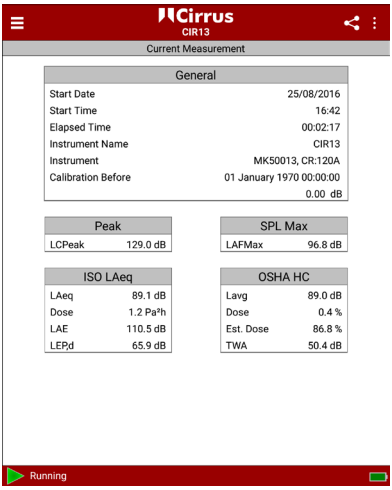
To view the measurement status of an instrument whilst it's running, connect to the badge and select it from the discovering window.

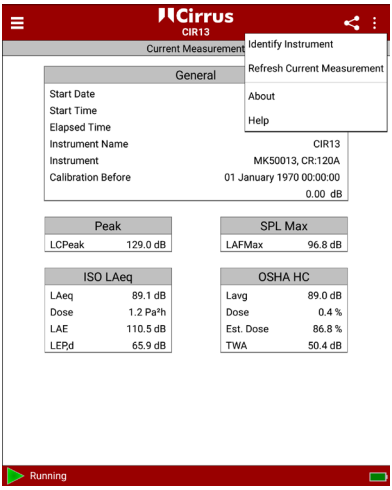




If the badge is running, the current measurement data will de displayed below the badge information. The measurement data for the first integrator is displayed on this screen.

To view the measurement data for other integrators, select the badge and swipe to view the Current Measurement screen.





The current information can be refreshed by selecting the menu in the top right and by choosing Refresh Current Measurement.

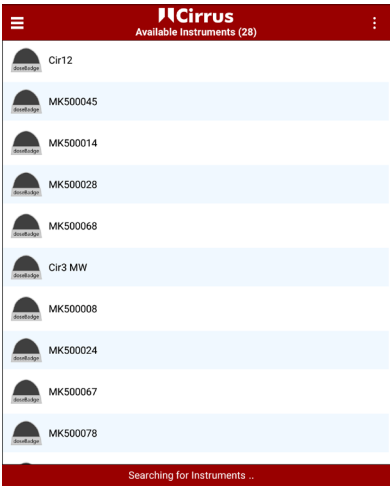
Tte current status of the instrument is shown at the bottom of the screen.

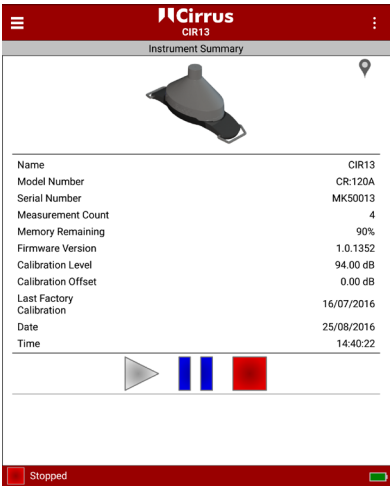
Please note that to reduce power consumption, this data is not refreshed automatically.

Pressing the refresh icon will load the current measurement data again.

16.7 Pausing a measurement

To pause a measurement with dBLink, connect to the required doseBadge and from the instrument discovery window, press the blue pause button. Press again to confirm.





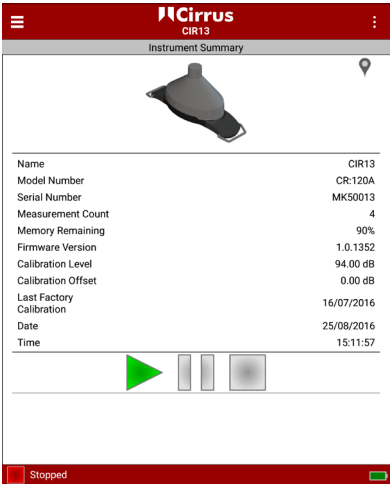
The status of the instrument is shown by the green 'play', blue 'pause' and red 'stop' icons.

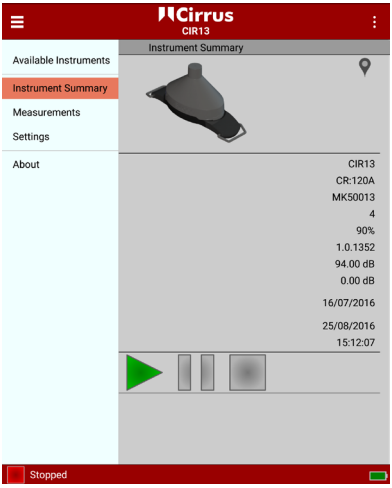
16.8 Stopping a measurement

To stop a measurement with dBLink, connect to the required instrument and from the instrument discovery window, press the red 'stop' button. Press again to confirm.

16.9 Viewing measurements

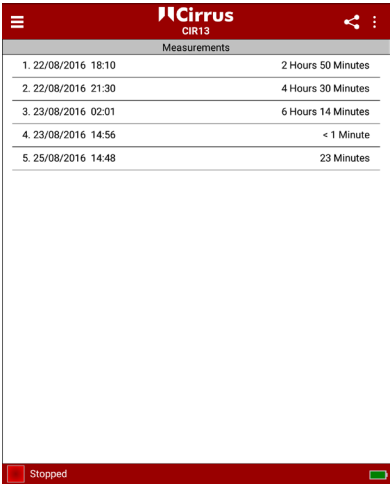
Measurement can be viewed whilst they are being made or at the end of a measurement once the instrument has been stopped. To view the current measurement or all measurements in the instrument, connect to and select the instrument from the discovery screen.

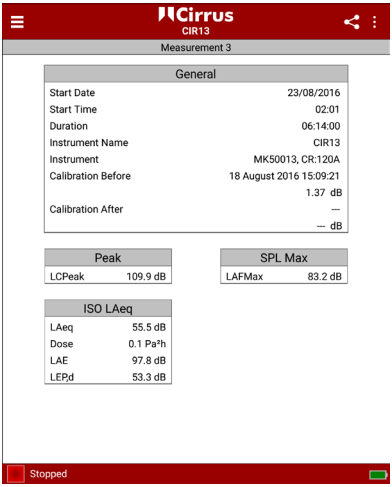




Using either the menu in the top left of by swiping, select the Measurement option to view the list of measurements stored on the instrument.

From the measurement list, select the measurement required and the data will be displayed.

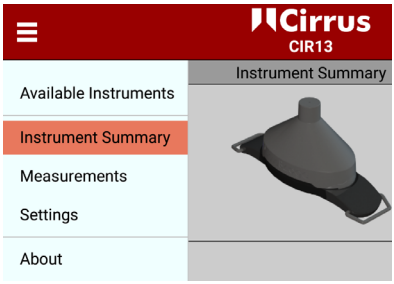




Swiping left and right will move through the available measurements.

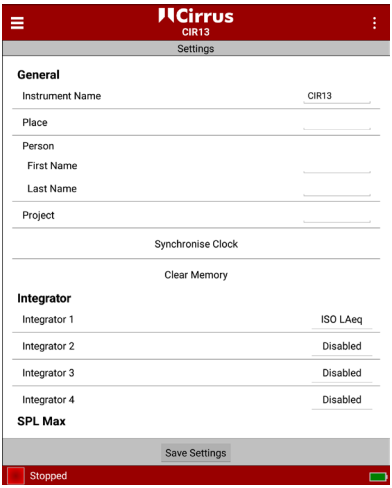
The current measurement number is shown at the top of the screen.

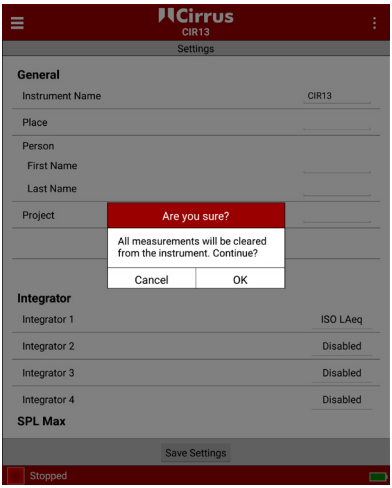
Use the menu to return to the instrument summary, instrument settings, or instrument discovery screen.



16.10 Clearing the memory

The memory of your doseBadge can be cleared from the instrument settings screen. Please be advised that all measurement data should be downloaded to NoiseTools before clearing your device's memory as this function cannot be undone; all measurement data will be permenantly lost once erased from the instrument.





Press Clear Memory followed by Confirm to erase all the measurement data from your doseBadge.

17 Specifications

17.1 CR:120A doseBadge[5] noise dosimeter

Applicable standards
IEC 61252:1993 +AMD1:2000 Personal Sound Exposure Meters
ANSI S1.25:1991 (R2007) Personal Noise Dosimeters

Measurement range (typical)

RMS range	60 dB(A) to 140 dB(A)
Peak range	80 dB(C) to 143 dB(C)
RMS frequency weighting	A,C or Z
RMS time response	F or S
Peak frequency weighting	A,C or Z
Linear operating range	65dB(A) to 140dB(A)

Visual indication of status
Four colour LED to show instrument status and measurement activity

Measurement functions
The doseBadge[5] provides, simultaneously, the following measurement channels:
Four independent Integrator channels
Two independent Peak channels

Configuration of the integrators and peak channels can be chosen from a pre-set list, for example ISO (LAeq), ISO (LCeq), OSHA HC, OSHA PEL, ACGIH or user configured as needed.

Overall measurement data
Measurement duration
Start time and date
Instrument serial number and name
Calibration information (field and factory calibration)
Overload and tamper sensor detection

For each integrator channel
Average integrated sound Level (Leq/LAVG)
Time weighted average (LEP,d/LEX,8/TWA)
Sound exposure and estimated sound exposure
% dose and estimated % dose
ULT duration
SPL max level and time
SPL min level

For each peak channel
Overall LPeak level

Time history data
1 second or 1 minute time history data (user selectable)

For each integrator channel
Integrated sound level (Leq/LAVG)

For each peak channel
Peak sound pressure

Configuration Options

Integrator channels

Channel name	Pre-set or user defined
Exchange rate	3, 4 or 5 dB
Criterion level	80 dB to 100 dB in 1 dB steps
Criterion time	1 hr to 24 hrs in 1hr steps
Threshold Level	None, 70 dB to 100 dB n 1dB steps
Time weighting	Fast, Slow or None
Frequency weighting	A, C or Z
ULT level	70 dB to 140 dB in 1 dB steps
ULT time weighting	None, Fast or Slow
ULT frequency weighting	A,C, or Z
SPL max time weighting	Fast or Slow
SPL max freq weighting	A,C or Z
LED threshold trigger	User selectable channel with user selectable % Dose trigger levels 75% to 100% in 5% steps

Peak Channels

Frequency weighting	A,C or Z

Measurement Control

Manual
Manual start, stop &and pause via the doseBadge[5] wand or the dBLink App
Manual start and stop via NoiseTools

Automatic scheduled measurements
Timed start, pause and stop of measurements
Three timed periods per day
Lunch break pause
Day-by-day control

Shock/Tamper Sensor
Internal accelerometer with Off/Low/Medium/High sensitivity settings to detect impact and tampering. Detected impacts marked on time history data

Calibration
Automatic detection of external acoustic calibration

User-configurable calibration level (typically 114dB or 94dB) for use with 1/2" acoustic calibrators such as the Cirrus CR:514 (94dB) or CR:518 (114dB).

Memory

CR:120A doseBadge[5]
Up to 80 hours of Time History Data (6 Channels)
Up to 40 individual measurements
Maximum duration of any single measurement: 24 hours

Power

CR:120A doseBadge[5]
Internal NiMH Battery
Typical Battery Life >22 hours (typically > 10 hours with octave band filters activated)
Typical 3 hours charge time from empty
Charging should be carried out where the ambient temperature is between +15°C and +30°C (+59°F to +86°F).
Charging at higher temperatures may increase the charge time required or may result in a failure to fully charge.

Communication

CR:120A doseBadge[5]
Bluetooth® to the doseBadge[5] wand
Bluetooth® to the dBLink app (Android and iOS)
USB download to NoiseTools via the doseBadge[5] Dock

dBLink App
Bluetooth® to the doseBadge[5]

Weight & Dimensions

CR:120A doseBadge[5]
66 mm x 43 mm x 53 mm (excluding clips)
2.53" x 1.69" x 2.01" (excluding clips)
85 g/2.9 oz

Temperature
-10°C to +50°C (+14°F to +122°F) Operating
-20°C to +60°C (-4°F to +120°F) Storage

Humidity
Up to 95% RH Non-Condensing

Software
NoiseTools software supplied as standard with license-free installation and free of charge upgrades available from the Cirrus Research website

16.2 RC:120A doseBadge5 Wand

Weight & Dimensions
170 mm x 45 mm x 30 mm
6.7" x 1.7" x 1.2"
100 g/3.5 oz including batteries (78 g/ 2.7 oz without batteries)

Power
2 x AAA (MN2400)

Communication
Bluetooth® communication to the doseBadge[5]

Temperature
-10°C to +50°C (+14°F to +122°F) operating
-20°C to +60°C (-4°F to +120°F) storage

16.3 CU:120A doseBadge5 Dock

Weight & Dimensions
305 mm x 100 mm x 22 mm
12" x 3.9" x 0.8"
350 g/12.7 oz

Power
External power via CU:196A mains power supply

Communication
USB to the host PC
Simultaneous download and charging of up to five doseBadge[5] units

Temperature
-10°C to +50°C (+14°F to +122°F) operating
-20°C to +60°C (-4°F to +120°F) storage

16.4 CR:51x Acoustic Calibrator

Frequency	1kHz +/- 1%		
Sound level	CR:514	94dB	re 20uPa
	CR:515	94dB	re 20uPa
	CR:518	114dB	re 20uPa

Standardisation	CR:514 - IEC 60942:2003 Class 2 CR:515 - IEC 60942:2003 Class 1 CR:518 - IEC 60942:2003 Class 2
Distortion	Less than 2%
Operating humidity	25 to 90% relative humidity
Operating static pressure	65 kPa to 108kPa
Operating temperature	-10oC to +50oC
Storing Temperature	-20oC to +60oC
Effective Volume	6.19 cm^3 +/- 0.2 cm^3
Cavity Diameter	0.525 inch
Battery	1 x 9v 6F22 (Neda 1604)
Battery Life	Approx 15 hours continuous use
Battery Voltage	9v nominal (10v maximum, 6.4v minimum)
Weight with Battery	185g
Dimensions	135mm x Ø48mm

18 Safety information for the CU:120A dock

The CU:120A dock contains small (<1cm3) neodymium and samarium cobalt magnets that are used to secure the CR:120A doseBadge[5] units to the dock.

There are no magnets in the CR:120A doseBadge[5] noise dosimeter.

The magnets are securely located inside the case of the CU:120A dock, but if the case is opened or damaged, the magnets may become visible.

Keep a safe distance (50mm+) between the magnets and all objects that can be damaged by magnetism. These include mechanical watches, heart pacemakers, CRT monitors, credit cards and magnetically stored media.

Heart Pacemakers
Keep magnets away from heart pacemakers. The operation of heart pacemakers will be affected by the close proximity of a magnet. Magnets can set a pacemaker working in a way that is not suitable for the user, which may adversely affect their health.

19 Glossary of terms

A detailed glossary of the terminology used in the doseBadge[5] can be downloaded from the Cirrus Research website. This information is available in a range of different languages and is free of charge.

Please visit www.cirrusresearch.co.uk/library/ebooks/ to download the latest versions of these documents.

20 Preset integrator settings

A number of present integrators are provided for the doseBadge[5]. The settings for these are shown below:

Name	Exchange Rate (Q)	Time Weighting	Frequency Weighting	Threshold Level	Criterion Time	Criterion Level	ULT Level
ISO LAeq	3	None	A	None	8 hrs	85 dB	115dB
ISO LCeq	3	None	C	None	8 hrs	90 dB	115 dB
OSHA HC	5	Slow	A	80 dB	8 hrs	90 dB	115 dB
OSHA PEL	5	Slow	A	90 dB	8 hrs	90 dB	115 dB
OSHA HC/C	5	Slow	C	80 dB	8 hrs	90 dB	115 dB
MSHA HC	5	Slow	A	80 dB	8 hrs	90 dB	105 dB
MSHA PEL	5	Slow	A	90 dB	8 hrs	90 dB	105 dB
ACGIH	3	Slow	A	80 dB	8 hrs	85 dB	115 dB

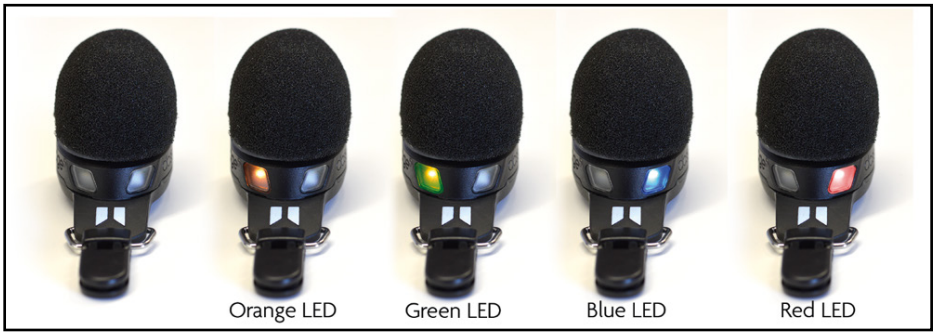
Custom integrators can be configured using the following options:

Channel name	Preset or user defined
Exchange rate	3, 4 or 5 dB
Criterion Level	80 dB to 100 dB in 1 dB steps
Criterion Time	1 hr to 24 hrs in 1hr steps
Threshold Level	None, 70 dB to 100 dB n 1dB steps
Time Weighting	Fast, Slow or None
Frequency Weighting	A, C or Z
ULT Level	70 dB to 140 dB in 1 dB steps
ULT Time Weighting	None, Fast or Slow
ULT Frequency Weighting	A,C, or Z
SPL Max Time Weighting	Fast or Slow
SPL Max Freq Weighting	A,C or Z

21 Support and troubleshooting

Additional support and information is available from the Cirrus Research website: www.cirrusresearch.co.uk/dosebadge5support

21.1 LED indicators on the doseBadge[5]



21.1.1 doseBadge[5] on the charging dock

Status	Left LED	Right LED	Notes
Badge charging	Orange solid		
Badge fully charged	Green solid		
Badge charging and measuring	Orange solid	Blue flashing	
Badge charged and measuring	Green solid	Blue flashing	
Badge charging and memory full (or badge error)	Orange solid	Red solid	
Badge charged and memory full (or badge error)	Green solid	Red solid	
Calibration successful		Blue solid (5 seconds)	The badge will revert to the previous indication after five seconds
Calibration failed		Red solid (5 seconds)	The badge will revert to the previous indication after five seconds
Instrument start-up		Orange solid	Approximately one second

21.1.2 doseBadge[5] undocked

Status	Left LED	Right LED	Notes
Badge on (not measuring)	Green flashing		
Badge measuring		Blue flashing	
Badge measuring and dose threshold exceeded		Red flashing	
Badge paused		Blue flashing	
Badge pause and dose threshold exceeded		Red flashing	
Battery low (not measuring)	Orange flashing		
Battery low and measuring	Orange flashing	Blue flashing	Alternating flashes
Battery low and paused	Orange flashing	Red flashing	Alternating flashes
Battery low, measuring and dose threshold exceeded	Orange flashing	Blue flashing	Alternating flashes
Battery low, paused and dose threshole exceeded	Orange flashing	Red flashing	Alternating flashes
Calibration successful		Blue solid	The badge will revert to the previous indication after five seconds
Calibration failed		Red solid	The badge will revert to the previous indication after five seconds
Instrument start-up		Orange solid	Approximately one second

21.1.3 Error conditions or warning indications

Status	Left LED	Right LED	Notes
Memory full		Red solid	Connect to NoiseTools to download and clear measurements
Badge error		Red solid	Connect to NoiseTools to confirm status

21.1.3 Resetting your doseBadge

Your doseBadge can be reset using the small button on the underside of the instrument as shown below. This will reboot the instrument; any stored measurements will not be affected.

If your doseBadge is reset using the reset Button, ensure that the unit is awake by gently shaking the instrument. The green status LED will flash to show that the instrument is awake and ready for use.

21.1.4 Calibration failure

The doseBadge5 is pre-programmed to accept a calibration level that is provided by an acoustic calibrator.

If the level provided by the acoustic calibrator is different from the level that the instrument is expecting by more than +/- 3dB, the instrument will not start the calibration process. This will not show as a failure, rather the instrument will simply not calibrate.

If the calibration level is within +/- 3dB of the expected value but is unstable, for example if the background noise if too high and is affecting the calibration level, your doseBadge will show a calibration error with a solid red LED for 5 seconds.

The most likely causes of a calibration failure are:

1. The level being provided by the acoustic calibrator is incorrect
- Check the level of the calibrator matches that of the doseBadge5
- Check that the expected calibration level programmed into the doseBadge5 matches the acoustic calibrator
2. The background noise is affecting the stability of the calibration level
- Move to a quieter location and retry the calibration process

To check or adjust the expected calibration level that is programmed into the doseBadge5:

1. Connect the doseBadge5 to the NoiseTools software via the Dock

2. Open the Configure screen for the doseBadge
3. On the Advanced options tab, ensure that the Calibration Level matches the one being provided by the acoustic calibrator. Adjust the level if needed
4. Save any changes to the instrument

22 Declarations

22.1 CE Declaration of Conformity

Cirrus Research plc Hunmanby UK
CE Certificate of Conformity

Manufacturer: Cirrus Research plc
Acoustic House, Bridlington Road
Hunmanby, North Yorkshire, YO14 0PH
United Kingdom
Telephone: +44 1723 891655

Equipment Description
The following equipment manufactured after 1st August 2016:

CR:120A doseBadge5 Personal Noise Dosimeter
CU:120A doseBadge5 Dock
RC:120A doseBadge5 Wand
CR:518 Acoustic Calibrator

Along with their standard accessories
According to EMC Directives 89/336/EEC and 93/98/EEC
meet the following standards

EN 61000-6-3:2007+A1:2011
Electromagnetic compatibility (EMC). Generic standards. Emission standard for residential, commercial and light-industrial environments

EN 61000-6-1:2007
Electromagnetic compatibility (EMC). Generic standards. Immunity for residential, commercial and light-industrial environments

Signed Dated 1st December 2018

Martin Williams
Director

22.2 Bluetooth® connectivity

All models of the CR:120A doseBadge[5] noise dosimeter support wireless connectivity via Bluetooth.

Declaration ID	D034062
Receiver sensitivity	-93 dBm (Typical)
TX power	0 dBm (Typical)

22.3 FCC/Industry Canada

This product contains an FCC and Industry Canada certified Class 2 wireless (Bluetooth) low energy single mode module:

FCC Identifier:	T7V1740.
Industry Canada:	IC: 216Q-1740

Producer:	Panasonic Industrial Devices Europe GmbH
Model:	PAN1740
Modular Type:	Single Mode

FCC Conformity Statement

The devices PAN1740, including the antennas, complies with Part 15 of the FCC Rules. The device meets the requirements for modular transmitter approval as detailed in FCC public Notice DA00-1407.transmitter

Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

Industry Canada Statement

The devices PAN1740, including including the antennas, complies with Canada RSS-GEN Rules. The device meets the requirements for modular transmitter approval as detailed in RSS-GEN.

Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

(1) l'appareil ne doit pas produire de brouillage, et
(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

PAN1740 est garanti conforme aux dispositions règlementaires d'Industry Canada (IC), licences: IC: 216Q-1740

Radiation Exposure Statement

The product complies with the FCC portable RF exposure limits set forth for an uncontrolled environmental and is safe for intended operation as described in this manual.

23 Warranty information

1. This document is a summary of the full warranty document and explains the Cirrus Research plc warranty in ordinary English; not in legal or complex terms.
2. The warranty covers any acoustic instrument such as a sound level meter, acoustic calibrator, real time acoustic analyser or personal sound exposure meter (dosimeter) manufactured by Cirrus Research plc after September 1st 2011.
3. The warranty covers all faults on, and minor accidental damage to, the instrument except the microphone capsule for the period defined in para (5) below.
4. Minor accidental damage does not include blatant miss-use, damage caused by the use of any accessories or components not specified or recommended by Cirrus, damage caused through non-Cirrus modification, continued use outside of Cirrus' recommended procedure or conditions or use contrary to the any advice provided by Cirrus.
5. The initial period of the warranty is 2 (two) years or 104 weeks from the date of purchase as a new instrument from Cirrus Research plc or their formally approved distributors OR 130 weeks from the date the instrument passed its final manufacturing inspection at Cirrus Research plc - whichever is the shorter.
6. A shorter 1 (one) year or 52 week warranty is offered for used, ex-demo or ex-rental equipment unless a special arrangement is made and a written confirmation of the special warranty is given by Cirrus Research plc.
7. Any rechargeable battery only has the battery manufacturer's one year warranty, however there will be a reduced charge for their replacement during the annual "Traceable Calibration."
8. On completion of the annual "Traceable Calibration" by Cirrus Research plc, or an official Cirrus Calibration Centre, the instrument will automatically be given an additional free one year warranty.
9. It follows that should the instrument be calibrated by Cirrus Research plc, or an official Cirrus Calibration Centre every year, the warranty is effectively continuous to a maximum of 15 (fifteen) years from the date of purchase.
10. There will be a charge for this "Traceable Calibration" and the price is published in the Calibration Price List. The customer is responsible for all shipping, duty and other charges relating to the annual "Traceable Calibration".
11. Where a repair service is conducted under warranty, Cirrus Research plc will cover the shipping, duty and other costs relating to the repair of the instrument.
12. Cirrus Research endeavours to ensure stocks of instrument components for the full fifteen year period but do not guarantee to do so as certain components do become obsolete or discontinued.
13. If a sub-component becomes obsolete and stocks are depleted then Cirrus Research will endeavour to facilitate a repair but will not offer the same length warranty.
14. In the event of any dispute on the terms of the warranty Cirrus Research plc will accept pendulum arbitration by the United Kingdom Institute of Acoustics Ltd.
15. The warranty does not in any way reduce any legal right of the buyer or user of the sound level meter; it is in addition to all legal rights determined by the European Union.
16. Cirrus Research plc reserves the right to amend or update these terms and conditions without prior notice.

24 Cirrus Research offices

The addresses given below are the Cirrus Research plc offices. Cirrus Research plc also have approved distributors and agents is many countries worldwide. For details of your local representative, please contact Cirrus Research plc at the address below. Contact details for Cirrus Research authorised distributors and agents are also available from the Internet Web site at the address shown below.

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