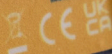




Southern
Scientific
Radhound Mini
Radiation Contamination Monitor

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Made in the UK



Radhound Mini

Radiation Contamination Monitor

User Manual



Southern
Scientific

EXPERIENCE & EXPERTISE

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1. Introduction and Overview

The Radhound Mini is a lightweight digital radiation survey meter dedicated to Nuclear Medicine contamination monitoring, the Radhound Mini is an intuitive solution designed for ergonomics and ease of use, whilst providing the sensitive response needed for monitoring of gamma contamination.

2. System Specifications

| | | |
|---|--|---|
| Dimensions | 170 (H) x 88 (L) x 72 (W) mm | |
| Mass | 610 g | |
| Power Requirements | 2x AA 1.5 V Batteries (NiMH rechargeable or single-use) | |
| Counting Efficiency (Open Window; sealed source 30 mm from end window) | ⁵⁷ Co: 3.5% ¹³³ Ba: 4.8% ²² Na: 1.6% ¹³⁷ Cs: 1.1% ⁶⁰ Co: 0.7% | |
| ^{99m}Tc Counting Efficiency (Open Window, 882 MBq/ml) | 1.8% | |
| Background Count Rate (30 s Averaged Measurement) | Low Window: 2 cps Med Window: 0.8 cps High Window: 0.1 cps Open Window: 4.5 cps | |
| Detector Operating Voltages | Silicon Photomultiplier (SiPM) based detector – 40 V | |
| Scintillator | NaI(Tl) Crystal | |
| Default Discrimination Window Settings | Window (mV) | Equivalent Energy (keV) |
| | Low: 80 - 450 Medium: 450 - 1500 High: 1500 - 3000 Open: 80 - 3000 | Low: 50 - 110 Medium: 110 - 500 High: 500 - 1000 Open: 50 - 1000 |
| Lower and Upper Detection Limits | Upper limit: 20,000 cps (Over range) Alarm level selectable in software | |
| Detector Energy (Gamma) | Optimised for ^{99m} Tc (140 keV); capable of measuring 50 keV to 1.0 MeV in the Open Window | |

Radhound Mini

3. Important Safety Information

Care must be taken when handling this sensitive piece of electronic equipment. Rough handling and improper storage can lead to premature failure of the components contained within.

Important! Servicing must be undertaken by trained Southern Scientific personnel or authorised representatives ONLY.



4. Environmental Information

Important Note: This equipment is for INDOOR USE ONLY

| | |
|-----------------------------|--------------------------------|
| Operating Altitude | Up to 2,000 m |
| Operating Temperature Range | +15 to +40 °C |
| Operating Humidity | Up to 95% RH |
| Pollution Degree | 2 – Standard Office/Laboratory |

5. Shipping and Unpacking

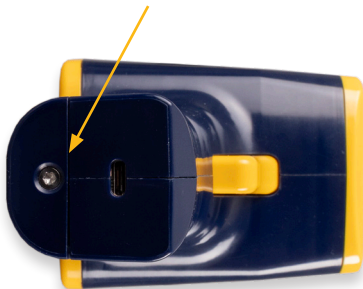
When shipped, the packaging will contain the following items:

- Main Radhound Mini Unit
- 2 x AA NiMH Rechargeable Batteries
- Supplementary documentation

When unpacking and installing the instrument, the following procedure should be followed:

1. Remove the small screw from the base of the handle using a screwdriver.

2. Slide the battery cover down to access the battery compartment.
3. Install 2 x AA batteries (Note correct orientation), replace the battery cover and re-insert the screw.



6. Switching the Instrument On

To turn on the instrument, simply press and release the Trigger.

To turn off the instrument, press the Trigger for > 1 second and release.



7. User Interface

7.1 Status Bar

The device shows a status bar at the top of the screen. The left side of the bar shows an icon for each screen, with the title of the screen shown in the centre. It also shows icons for the current sound setting and current battery level. The battery icon will turn red when the battery level is low.

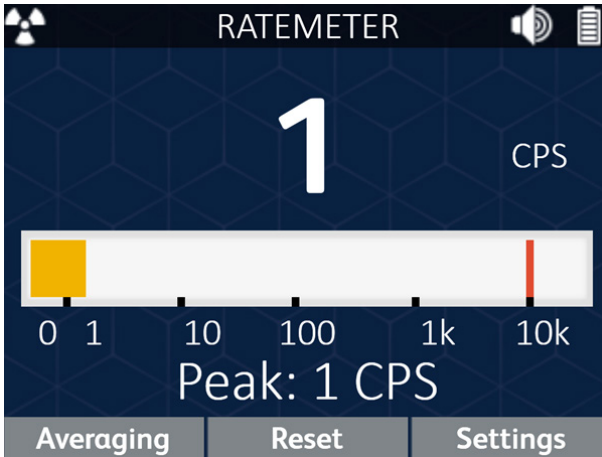


7.2 Navigation Bar

The device shows a bar at the bottom of the screen to assist with navigation. The bar shows up to three labels. Each label describes the function of the three buttons below the screen. These labels will dynamically update as the screens change and the button's functions change. If no label is displayed above a button, the button has no function.

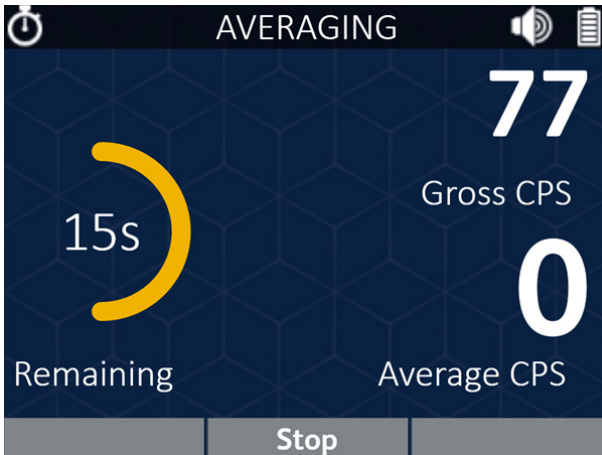


8. Ratemeter Screen



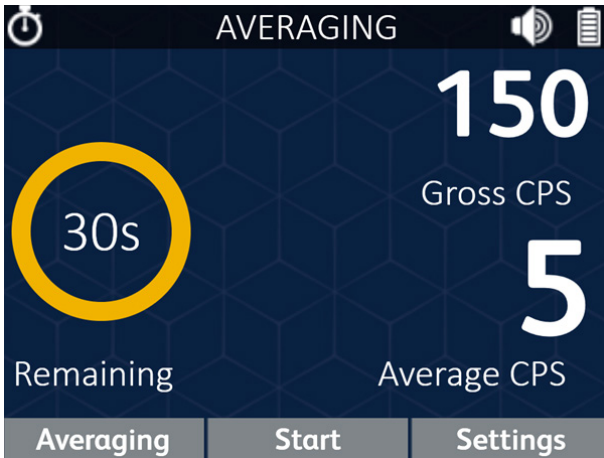
This screen is the default display of the device. The device will return to this screen when powering on. By default, it shows the current Counts Per Second (CPS) detected in the centre of the screen. The maximum (Peak) value detected during the current usage period are displayed along the bottom of the screen. These will be reset when the screen is changed or the unit is restarted.

The orange vertical bar in the count rate bar indicates the count rate alarm level (10,000 cps in this case). If the alarm level is not set, the vertical bar will not appear.



If the **Averaging** setting has been selected, the screen will change to the AVERAGING screen and allow a settable integrated count measurement to be taken.

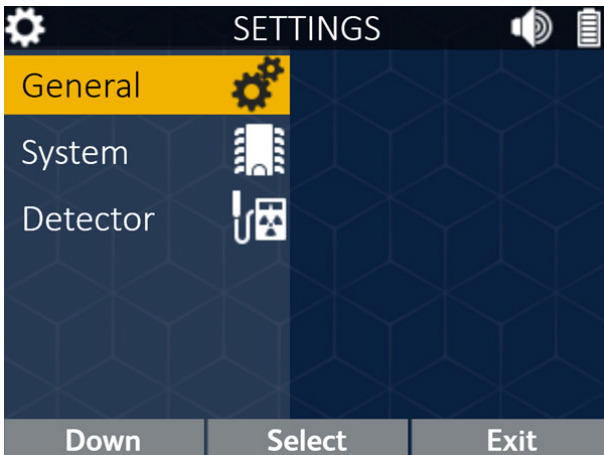




At the end of the period, the Gross cps and Average cps values will be displayed.

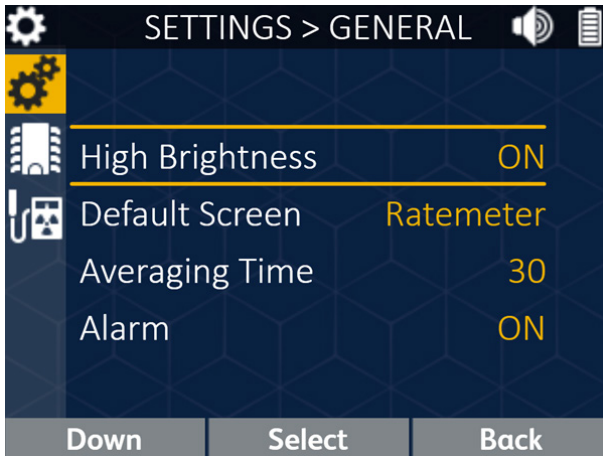
9. Settings

If the **Settings** menu is selected, the following screen will appear:



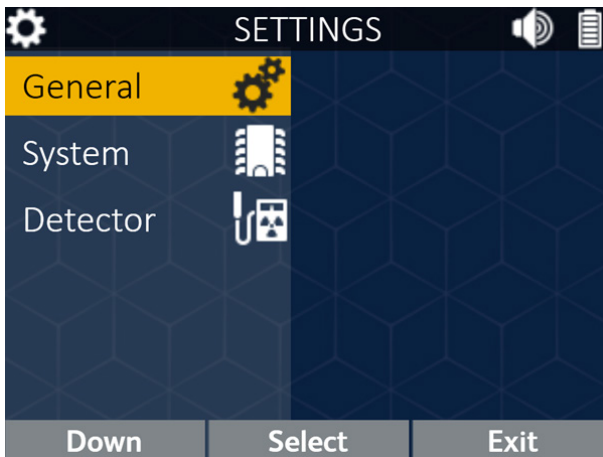
Radhound Mini

The **Settings** menu allow a number of system-level settings to be altered for preference.



The **General Settings** screen allows the screen brightness to be changed, along with the default user screen, integrated measurement averaging time and count rate alarm level.

The **System Settings** screen submenu can be accessed below the **General Settings**.

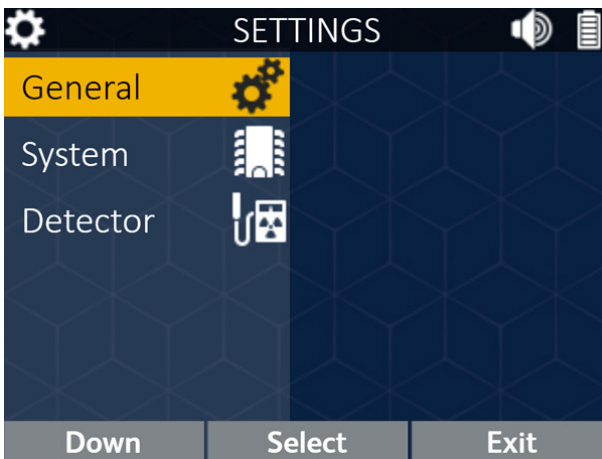


This screen contains multiple user-facing settings that can be changed. The “Select” key must be pressed to change any settings. Each setting changes the following:



| | |
|-------------------------|--|
| Auto Shutdown | This setting toggles the unit's auto shutdown feature. When enabled, if the device does not detect motion for 5 minutes, it will shutdown. |
| Sound Output | This setting toggles the sound output of the device. |
| Button Vibration | This setting toggles the button press vibration on the device. |

The **Detector Settings** menu below the System Settings allows the discrimination window to be set to the pre-set levels of Low, Medium, High and Open. The specification table at the beginning of this manual defines the gamma energy ranges equivalent to these counting window settings.



10. Cleaning

Should the Radhound Mini require cleaning, the instrument must first be powered down and batteries removed.

Surfaces can then be cleaned using an appropriate cleaning agent e.g. alcohol-based wipes. Concentrated solvents (e.g. Acetone or Methanol) should NOT be used.

Important! The instrument must not be immersed in water or any liquid to clean.

Important! All surfaces must be thoroughly dry before the batteries are reinstalled and the instrument powered on.

11. Basic Instrument Care

The Radhound Mini does not require any intervention from users to keep the instrument in good working order. The following good practice guidelines will however help with trouble-free use of the instrument.

1. Avoid mechanical shock due to the delicate detector components.
2. The Radhound Mini should have annual preventative maintenance by a Southern Scientific-certified engineer.

If the device is left idle (i.e. not moved around) for five minutes, the system will power off to save the battery.

UK Declaration of Conformity

Southern Scientific | Radhound Mini



THIS DECLARATION OF CONFORMITY IS ISSUED UNDER THE SOLE RESPONSIBILITY OF THE MANUFACTURER

Product: Radhound Mini (NM and Floor Monitor Versions)

The product detailed above is in conformity with the following UK harmonisation legislation: Electromagnetic Compatibility Regulations 2016 and the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012, based on test results using the harmonized standards stated below:

EMC:

EN61326-1:2013 (Electrical equipment for measurement, control and laboratory use – EMC requirements)

EN55011:2009+A1:2010 (Radiated emissions Class A 30 MHz to 1000 MHz, radiated disturbance measurement)

EN61000-4-2:2009 (Electrostatic discharge immunity)

EN61000-4-3:2006 +A1:2008 + A2:2010 (Radiated RF and EM field immunity)

Signed for and on behalf of Southern Scientific Ltd.

A handwritten signature in black ink, appearing to be "R. A. Brown", written over a light blue horizontal line.

R. A. Brown, Managing Director

Henfield, United Kingdom: 8th March, 2024

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QC...CD07

Radhound Mini

EU Declaration of Conformity

Southern Scientific | Radhound Mini



THIS DECLARATION OF CONFORMITY IS ISSUED UNDER THE SOLE RESPONSIBILITY OF THE MANUFACTURER

Product: Radhound Mini (NM and Floor Monitor Versions)

The product detailed above is in conformity with the following Union harmonisation legislation: EMC Directive 2014/30/EU and the RoHS Directive 2011/65/EU, based on test results using the harmonized standards stated below:

EMC:

EN61326-1:2013 (Electrical equipment for measurement, control and laboratory use – EMC requirements)

EN55011:2009+A1:2010 (Radiated emissions Class A 30 MHz to 1000 MHz, radiated disturbance measurement)

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R. A. Brown, Managing Director

Henfield, United Kingdom: 8th March, 2024

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