RADONTEC

User's Manual

αLPHASNIFFER

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1 Introduction

The AlphaSniffer Radon Sniffer is ideal for locating radon entry points in real-time or for quickly verifying a successful remediation. It responds to the presence of radon in 15 seconds and quantifies the radon concentration more accurately in 5 minutes.

The AlphaSniffer can be used alone or in conjunction with the *Radon Sniffer* app, available on the Google Play Store in Android and App Store in iOS.

2 Controls



Figure 2.1 AlphaSniffer Control Plate



Figure 2.1 AlphaSniffer with air hose and intake port and inlet filter

An overview of the top face plate controls is given in Figure 2.1. The AlphaSniffer Radon Sniffer controls include:

1. **ON/OFF Power Switch**
2. **OLED Screen**: Displays radon concentration averages, battery percentage and unit information.
3. **Radon Counts Light Indicator**: LED will blink for each detected alpha particle count. In addition, this LED will turn on for a second when AlphaSniffer is powered on.
4. **Toggle Screen Button**: toggles views of radon concentration averages over different time periods.
5. **Exhaust Port**

6. **Intake Port and Inlet Filter**: Intake Port must have at least 5 coils of opaque air hose attached to keep light out! Cylindrical tubes contain the desiccant material and filter. The filter is used to remove radon progeny from the air. The desiccant is used to remove moisture from the air.
7. **Fully Charged Light**: when the battery is fully charged, this green LED will turn on.
8. **Charging Light**: when the battery is not fully charged and a charger is connected, this red LED will turn on.
9. **Air Hoses:** Air hoses are used to connect the filter and desiccant to the air intake of the AlphaSniffer. The black coil hose (at least 5 coils) must always be connected to the AlphaSniffer to prevent light from entering and causing spurious counts.

3 Accessories



Figure 3.1 AlphaSnifferRadon Sniffer Kit Accessories

AlphaSniffer Charger and micro USB Cable: The charger and USB cable are used to recharge the internal batteries.

4 Basic Operation

Important: The black curly hose must always be connected to AlphaSniffer to prevent light from entering and causing spurious counts.

Basic operation of the AlphaSniffer is outlined in the following steps.

1. Power unit on by toggling ON/OFF switch to “ON” position.

In a few seconds, the indicator light will illuminate for one second and the display will show “AlphaSniffer Radon Sniffer” for two seconds.

2. The radon sniffer detector is now operating.

The unit will now automatically start radon activity concentration detection. The display shows the radon activity concentration as a calculated average over 15 second intervals in Bq/m3 or pCi/L units, which is referred to as the “SHORT” average. The battery status/percentage is displayed on the right upper corner and the whole screen updates every 3 seconds.



Press “Toggle Screen” button and the screen toggles to display a calculated average over a 5-minute interval in Bq/m3 or pCi/L. This is referred to as the “LONG” average.



Note: *The Sniffer must be running for more than 5 minutes for the 5-minute average to be accurate. But, once it has been running for 5 minutes, you can toggle between the short and long modes at any time, without waiting anther 5 minutes.*

Turn the AlphaSniffer on in a low radon area at the start of the day. Leave it running for the remainder of the day. (Turning it off and on confuses the “smart” algorithm, if you have sampled high radon concentrations.) Let the unit run in a low radon area for at least 5 minutes at the end of the day to flush out radon.

Suggestion: *Use the “Short” reading in high radon concentration environments and “Long” reading in low radon concentrations (i.e. normal residential levels).*

Press “Toggle Screen” button again and the screen shows a calculated average since the start of the operation, in Bq/m3 or pCi/L. This is referred to as the “TOTAL” average.



Pressing the “Toggle Screen” button when it shows on total average screen, the screen will change to display device information, such as serial number, MAC address and firmware version.

Pressing “Toggle Screen” once more will turn off the display, while the sniffer is still running. The screen will toggle in a cycle of “Short”, “Long”, “Total”, device information and finally “Off” screens.

Note: *AlphaSniffer detectors can show only one measurement unit on device, in either Bq/m3 or pCi/L. The user can decide which unit they want to use when they place their order. AlphaSniffer measurement units can be changed through Radon Sniffer App (see next section for details).*

5 App Usage

The AlphaSniffer *Radon Sniffer* app has following features:

- Monitor real-time readings from smartphones
- Switch Smart Mode and Standard Mode

- Change display units on the AlphaSniffer 10 User´s Manual - AlphaSniffer
- Switch to Timer mode, which counts alpha particles over a user defined time period
- Change settings, such as the conversion factor, enabling background running, or enabling data logging
- Email the logged data
- Plot a graph of the live readings in the archive

5.1 App Install and Operation

The console app “Radon Sniffer” is available on both Android and iOS. Simply search for "Radon Sniffer" in the Play Store or App Store. In case “Radon Sniffer” may not be found when searching the Play Store use the following link: https://play.google.com/store/apps/details?id=nu.eic.RadonSniffer

Or scan the QR code:

GET IT ON Google Play

Download on the App Store

Install the “Radon Sniffer” app from the Google Play Store in Android or App Store in iOS.



Figure 5.1 App Icon

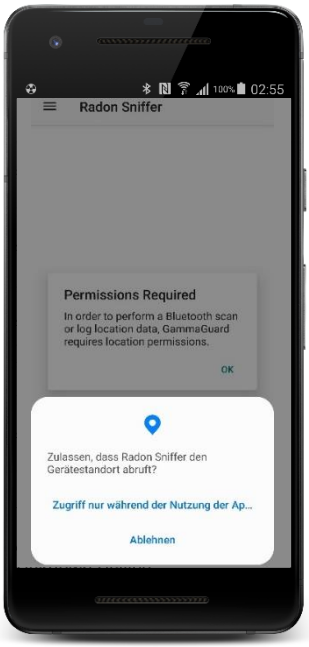


Figure 5.2.1 Accept the retrieval of the device location

Click the *Radon Sniffer* app icon, as seen in Figure 5.1. It will direct the user to the "Detector Scan" screen, seen in Figure 5.2 (left) (if necessary, allow the device location to be retrieved as shown in Figure 5.2.1). All nearby Bluetooth Low Energy devices will be listed. Choose the one called "C-R-##", where ## is the unit number for the detector. After a successful connection, a screen like Figure 5.2 (right) will show up.

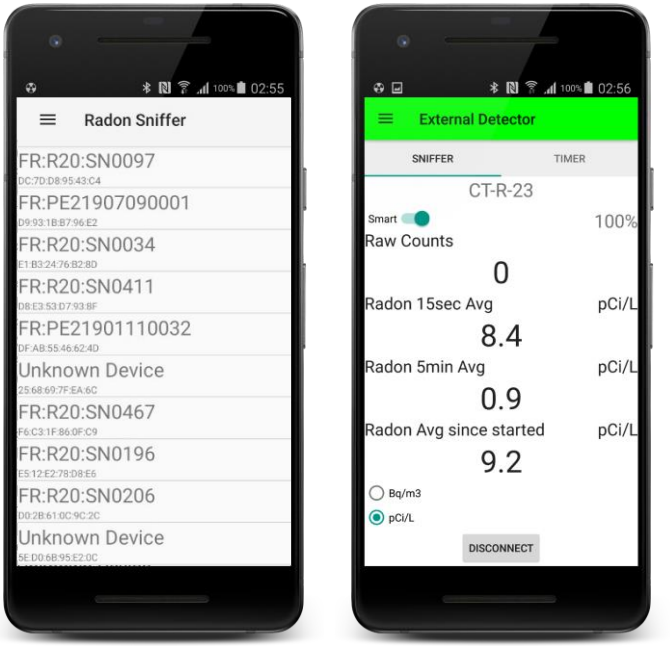


Figure 5.2.2 Detector Scan (left) and Default Screen (right)

This is the default screen. It displays the radon concentration averages in 15-second, 5-minute and overall time intervals. The “Raw Counts” are the detected alpha particles in each second.

All readings from the app are independent of the readings from the detector. Readings from the app are calculated based on the raw radon counts sent from the unit since the connection has been established. Therefore, readings on the app may not be the same as readings on the unit, but should be similar.

5.2 App Features

Smart and Standard Modes

There is a toggle switch on the upper left corner on “Sniffer” tab to enable or disable “Smart” Radon concentration calculations.

“Smart” calculation is the default reading display. It takes the raw number of counts and subtracts the number of counts due to the radon progeny built up in the cell, which it infers from the previous radon measurements. Therefore, “Smart” readings depend on the previous radon levels.

Note: The radon calculations on the AlphaSniffer local display are “Smart” calculations.

If “Smart” calculation is disabled, the calculation directly converts the received raw radon counts for each 15 seconds into radon activity concentration averages. So, each new reading is independent of the previous readings.

The “Standard” mode is what other scintillation cell based radon measuring instruments use. It tends to under-estimate the radon concentration at the beginning of the sampling sequence and over-estimate at the end, once radon progeny has accumulated in the cell.

By default, all radon activity concentration averages are displayed in pCi/L on app. Users can switch to Bq/m3 unit by clicking the radio button at lower left corner of the screen.

Note: *The unit change at this view only affects the app readings, not the local display of the AlphaSniffer. That can be changed through the Settings menu.*

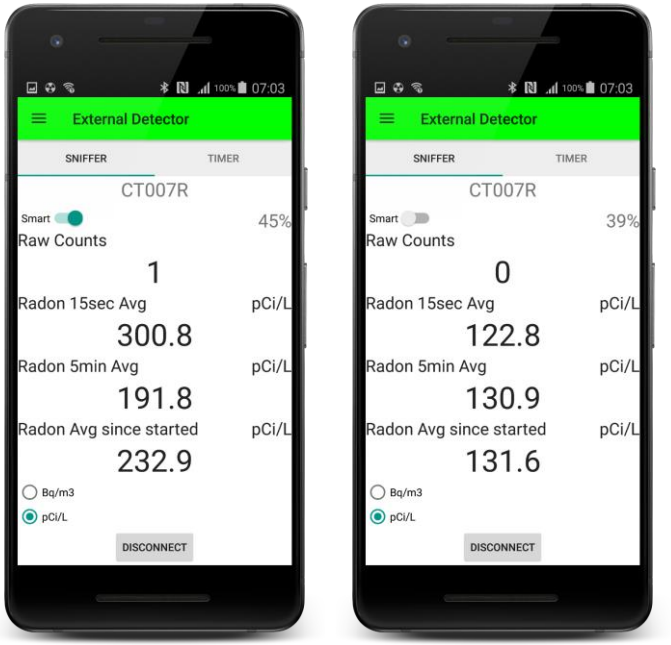


Figure 5.3 "Smart" (left) and "Standard" (right) modes in pCi/L

Timer Mode

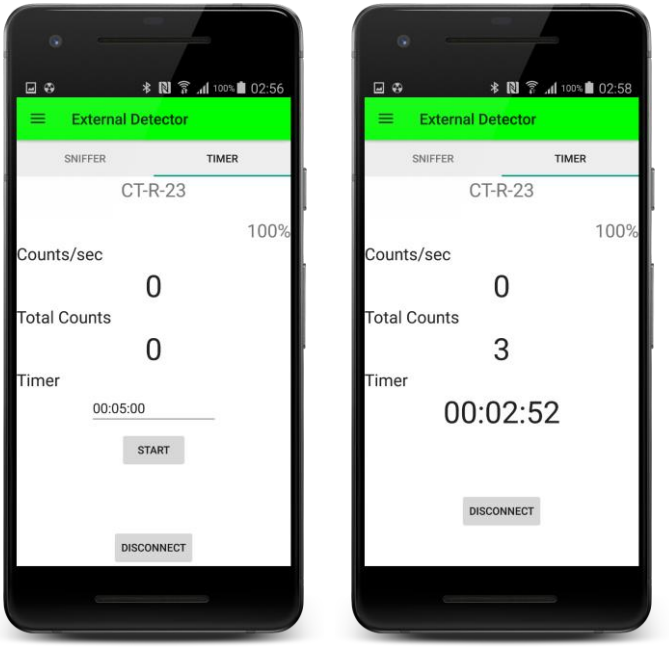


Figure 5.4 Timer default screen (left) and time start running (right)

Swipe the screen from right to left to get to Timer mode screen. This can measure the total counts in a specified period. “Counts/sec” is the raw radon counts coming in from the connected AlphaSniffer unit for each second. It is always updating, even if the timer is not started.

Before using the timer, enter the desired counting time by typing the time in “hh:mm:ss” format. If no time is entered, the timer will run for 5 minutes by default.

Click the “START” button to begin the timer mode run. This will accumulate all counts received from the unit to the “Total

Counts” for the specified period. When the time is up, “Total Counts” will continue to show the accumulated counts until the timer is started again.

Timer mode is independent of sniffer mode, and they run simultaneously.

Live Graphing

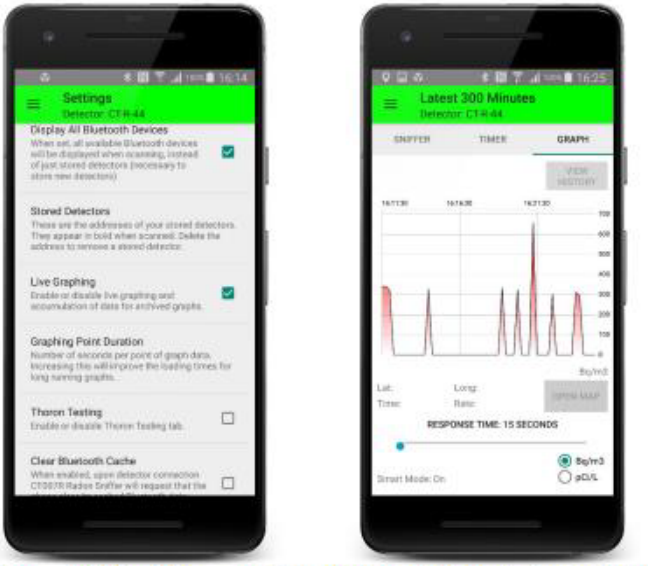
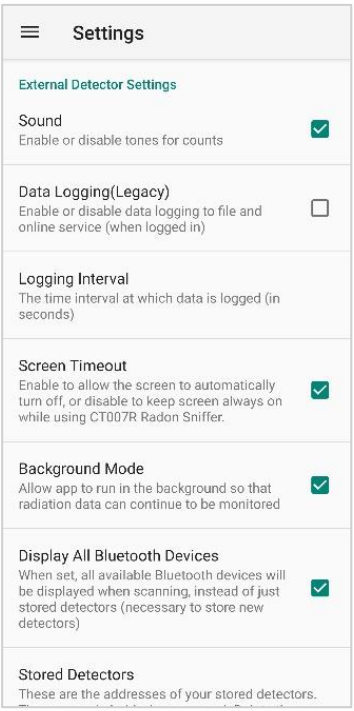
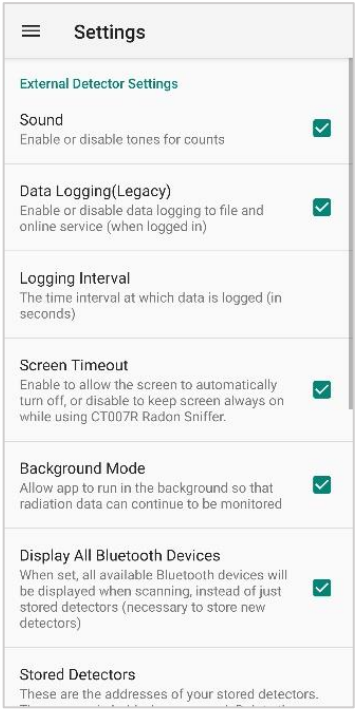


Figure 4.8 Enabling graphing (left) and Graph view (right)

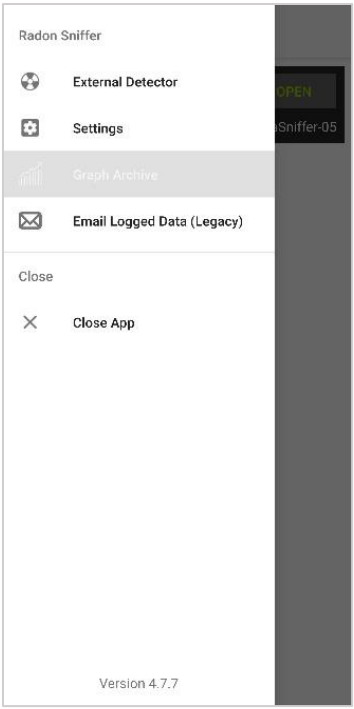
Go to Menu > Settings. Scroll down and find “Live Graphing” and enable it. Then go back to detector views.
There will be a third tab, “GRAPH” on the top.
Click “GRAPH” tab and it will show as Figure 4.8. (right)

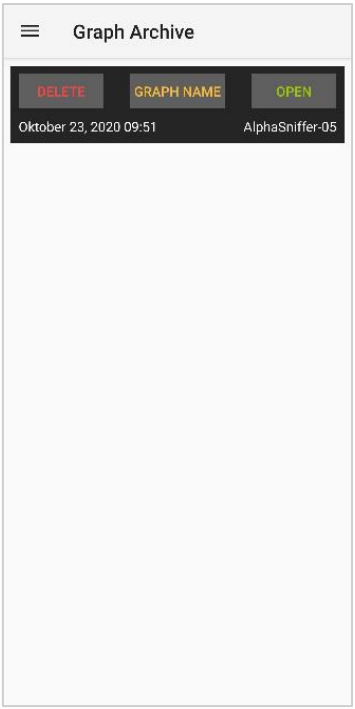
Data Export



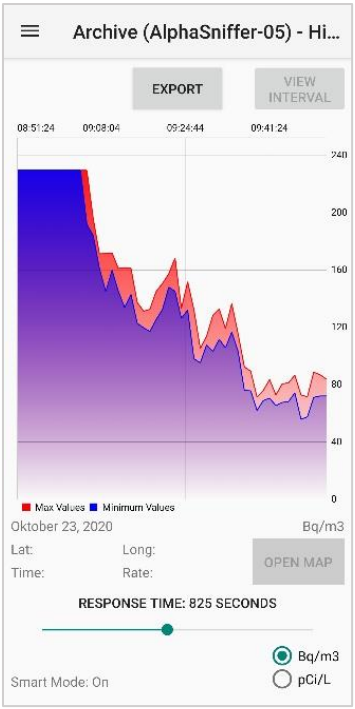


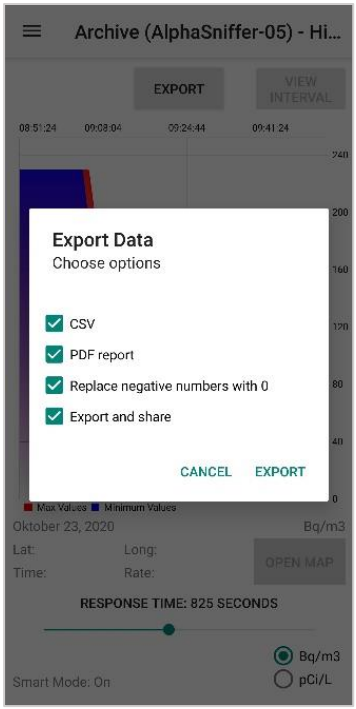
Activate "Data Logging" to file sniffing data





At the „Graph Archive“ saved data are listed and can be selected. Therefore choose the slider „OPEN“.

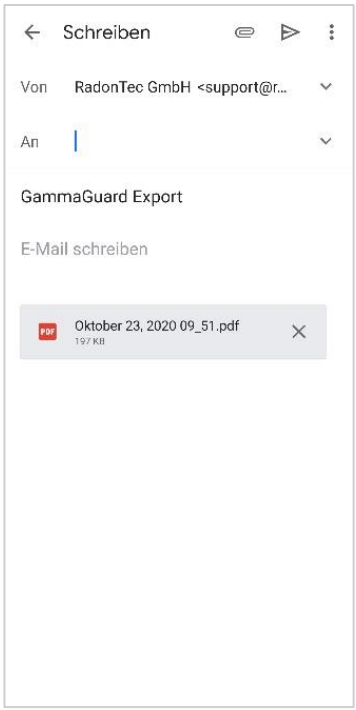




At „EXPORT“ a pdf-file as well as a csv-file can be selected. If you do not only want to save but also to share data, select „Export and share“.

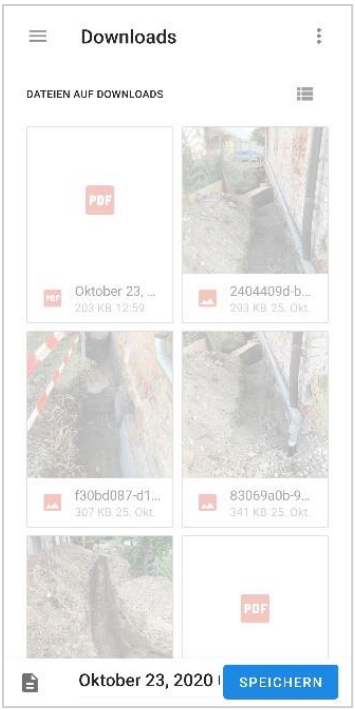
The panel „Replace negative numbers with 0” always has to be selected.

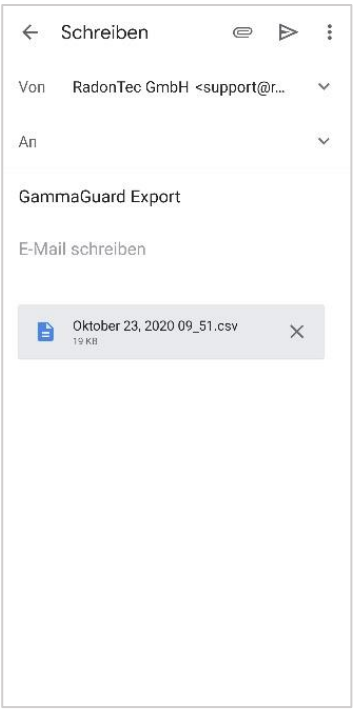




Left: Saving of data as pdf-file in a local folder on the smartphone.

Right: When selected „Export and share“, please choose your exporting programme, as for example “e-mail”. The selected option shall open and the files shall be attached as enclosure.





Left: Saving of data as csv-file in a local folder on the smartphone.

Right: When selected „Export and share“, please choose your exporting programme, as for example “e-mail”. The selected option shall open and the files shall be attached as enclosure.

6 Battery Charging

The AlphaSniffer contains rechargeable batteries which are located inside the unit. Fully charged batteries should provide around 19 hours of normal operation. If the battery is lower than 25%, the display will have an extra “!!” sign in front of the battery percentage. Once the battery gets too low, the unit will automatically shut down.

Once the battery is low or depleted, connect the wall adapter charger and USB cable and plug in to the charger connector on the detector. Once a charger is connected to the detector and the battery is not fully charged, the “Charging” light (red LED) will turn on. The “Charged” light (green LED) will switch on when the battery is fully charged. It may take 16 hours to restore full charge, if the detector remains off during charging time.

The unit may operate while the batteries are charging, but the charging process will take longer.

7 Other Useful Information

In the menu bar on the left top corner of the *Radon Sniffer* app, there are “External Detector”, “Settings”, “Email Logged Data”, and “Close App” options as in Figure 7.1.

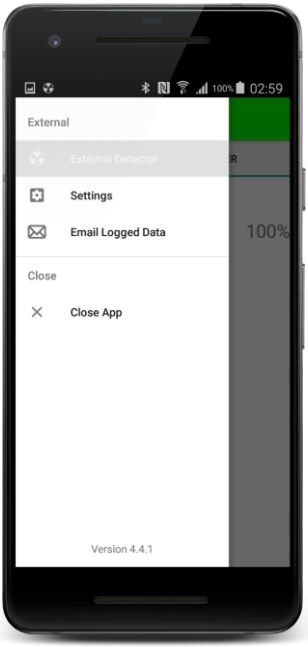


Figure 7.1 Menu bar

Clicking “External Detector” will lead you to the measurement display screen.

In the “Settings” menu, a window will pop up asking you to enter the password to access secure settings, such as the conversion factor and changing the password. The default password is “1234”.

Some settings options are introduced in detail below.

7.1 Detector Unit Update

In “Settings”, you can update detector display units. Find and click “Detector Unit”. Select either “Bq/m3” or “pCi/L”. Then a warning message will prompt up which says a new setting is about to be stored and the detector will be rebooted. Click “STORE SETTING” and the unit update on detector will start and you need to wait until the detector is re-connected to the app.

7.2 Automatic Firmware Updates

In “Settings”, you can enable or disable automatic firmware updates. By enabling it, it will automatically check for available firmware every time when a AlphaSniffer detector is connected. It usually takes a few minutes to complete firmware updates.

7.3 Conversion Factor

The default conversion factor is 340 [Bq/m3/counts/15sec] . The conversion factor can be changed on the app, but this change will not be reflected on the detector.

7.4 Data Logging

By checking “Data Logging” in settings, the next available measurement data will be written into a CSV file, “dataLog-CT007R.csv” in a folder called

"Radon Sniffer" in local storage. The data will be logged each "Logging Interval".

The data in .CSV file includes the date and time, conversion factor, SHORT, LONG, and TOTAL readings in both Smart and Standard modes.

7.5 Data Share by Email

Clicking "Email Logged Data" will direct you to an email composition window, where the current data log file has been attached. Once the recipient email address is entered, the email can be sent out.

Note: *If you don't have an email account logged in on your smartphone, it will require you to enter the email account and password.*

7.6 Demonstration Video

For video demonstrations, please go to:

https://radontec.com

7.7 One Year Limited Warranty

This limited warranty applies to AlphaSniffer, purchased from RadonTec GmbH or authorized vendors.

This covers defects in material or workmanship under normal use for a period of one year after receipt of the product.

Contamination due to dirt or improper use is not covered by the warranty.

During this period the product will be repaired or replaced the product at no charge.

**Exclusions:*

This warranty does not cover damages caused by abuse, neglect, or misuse. This includes damage from drops, impacts, or penetrations. It will also be rendered void if the product has been repaired or altered by anyone other EIC Inc.

To obtain this warranty service, please contact us at:

info@radontec.com

8 Support and Contact

8.1 Troubleshooting/FAQ

If you have any troubles or questions, please visit page:
https://www.radontec.com

8.2 Contact Us

If you are not satisfied with the answers on our website or you need further assistance and technical supports, please don't hesitate to contact us.

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