Environmental Instruments Canada Inc.

Quick Start Guide

CT007-R Radon Sniffer

Step 1: Preparation

1. Download the "Radon Sniffer" app from the Google Play Store or App Store. (Use of the app is optional.)
2. Start app and Radon Sniffer.
3. Connect the Radon Sniffer via Bluetooth to the app.
4. Let the Radon Sniffer run for about 3-5 minutes in a place with little or no radon so that it can calibrate itself.
5. Start sniffing.

Step 2: Sniffing

1. Let the Radon Sniffer suck in air for at least 30 seconds (recommendation is about 90 seconds) where radon entry points are suspected.
2. Use the app to check if there is a significant increase in radon levels.
3. If values do not rise significantly after 120 seconds you can move on to the next measuring point.
4. When high values were sampled the device will need some time to recover.
5. If very high radon concentrations were sampled before, there will be larger fluctuations shortly afterwards, in lower radon concentrations. This is due to the subsequent decays of radon decay products that are stuck in the measuring chamber, even when no new radon is being sampled.
6. Do not switch off the device during sampling (the device has a battery life of over 12 hours).

Step 3: After Sniffing

1. After sampling, let the measuring chamber flush with fresh air for at least 5 minutes or longer. To do this, simply let the device run in fresh air or in a room with very low values for about 5 minutes or longer.
2. There is a dust filter in the inlet pipe that you can change if it becomes very dirty. You can use a cotton ball or a piece of furnace filter or similar.

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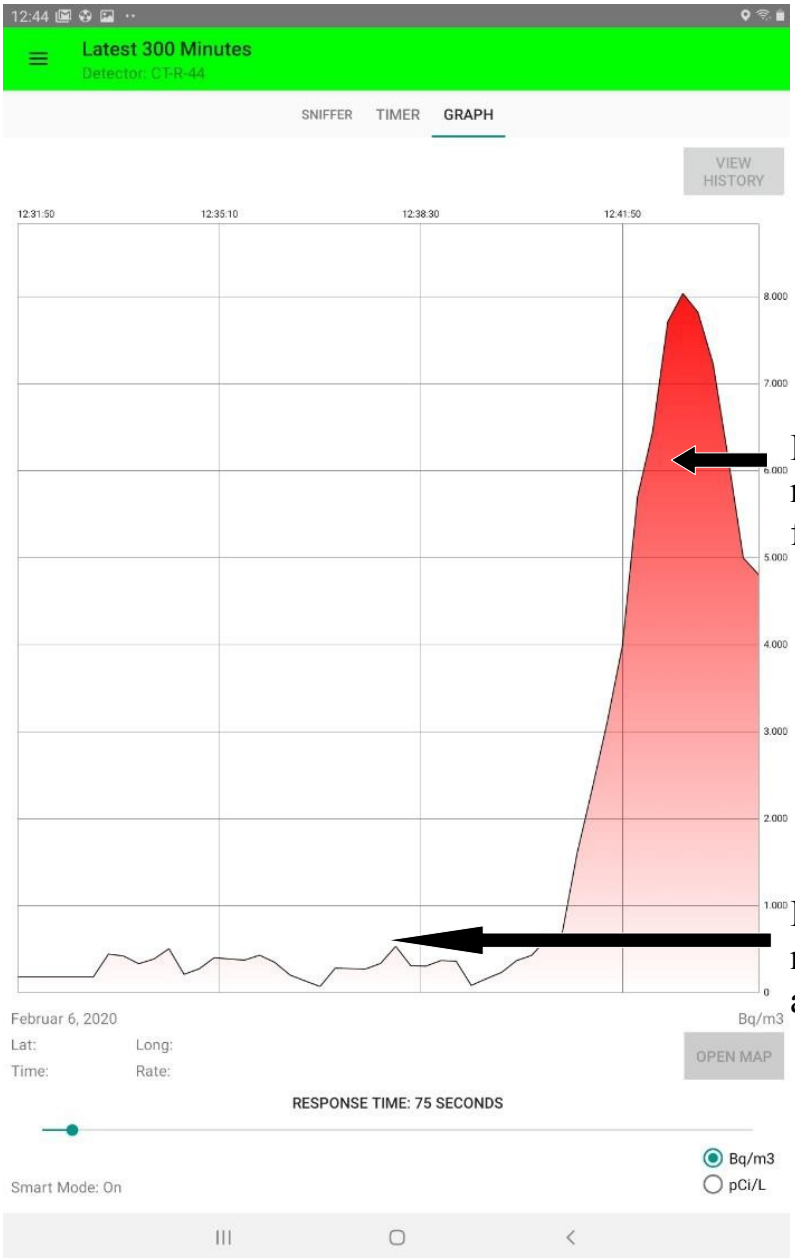
"Radon Sniffer" App

With the "Radon Sniffer" app you can read out the values that were detected during the sniffing (see following figure).
You should pay attention to the following special features:



In case of high radon progeny it may take several minutes until the final measurement value is reached.

In the lower measuring range there may be stronger fluctuations which are quite normal.

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Response Time at Low Rn-222-Concentrations

The Radon Sniffer works based on a sampling principle so that 1 radioactive decay within 15 sec corresponds to approximately 340 Bq/m³ or 9 pCi/L.
In low Rn-222-concentrations, there may not even be 1 decay within the 15-sec-sampling-interval.
But a decay frequency of less than 1 cannot be shown. Radon decay occurs irregularly. In concentrations below 340 Bq/m³ or 9 pCi/L and using the "short" 15-sec-sampling-interval, the sniffer will sometimes show "0", which corresponds to no decays detected in the last 15 seconds. Sometimes, it will show around 340 Bq/m³ or 9 pCi/L, which corresponds to 1 decay detected in the last 15 seconds. It could also detect 2 or 3 counts in 15 seconds and display 700 and 1000 Bq/m³ or 18 and 27 pCi/L.

The short sampling interval of only 15 sec may lead to jagged readings at low radon concentrations. The 15 second scale should only be used when you are in high levels. Since radioactive decay is random, you need to count long enough to get a statistically significant number of counts. To get reasonably stable readings, you have to wait long enough to count at least about 10 alpha particles (that gives you about a 30-40% statistical error). To achieve this, the following integration/counting times are needed:

Rn-222-concentration of **30 Bq/m³ or 1 pCi/L**: Approx. **30 min**.
Rn-222-concentration of **150 Bq/m³ or 4 pCi/L**: Approx. **5 min**.
Rn-222-concentration of **3400 Bq/m³ or 90 pCi/L**: Approx. **15 sec**.

In the app

On the bottom of the "Graph" page, you can set the integration/counting time on the "Response Time" slider. The higher the number is set, the smoother the graph will appear and the more accurate the readings will be. The trade-off is that it will take longer to detect changes in radon concentrations.

On the Sniffer

You can select between the intervals 15 sec = SHORT (to detect so called "hot spots") and 5 min = LONG (e.g when you are measuring the ambient air in a house that needs to be mitigated).

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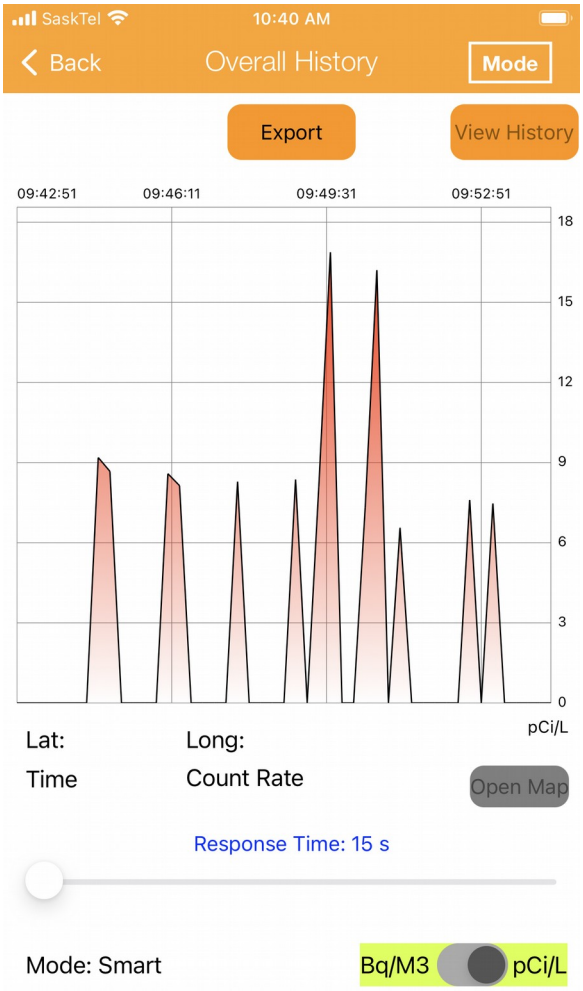
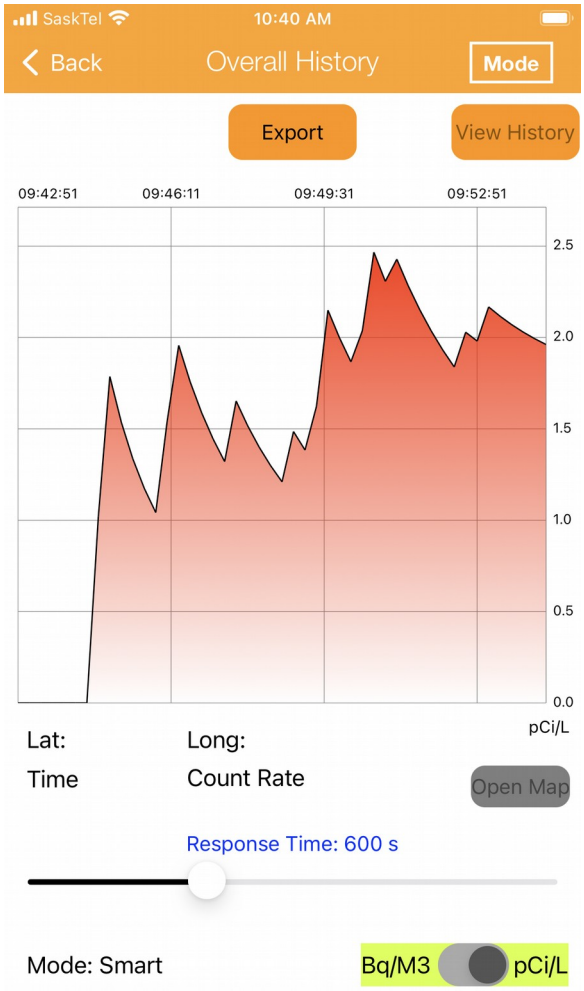


At a *short* response time of only 15 seconds, the graph becomes jagged, when measuring very low radon concentrations. Readings jump between 0, 9 and 18 pCi/L or 0, 340 and 700 Bq/m^3.



At a *longer* response time of 600 seconds, the graph becomes smooth and steady at around 1.5 pCi/L or 50 Bq/m^3. Both of these graphs are based on the same data.

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