GQ Radon Gas Detector
User Guide

For Model: RadonScan, RadonScan-Plus, RadonPRO

GQ Electronics LLC

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Table of Contents

User Guide 1
Table of Contents 3
ACKNOWLEDGEMENTS 5
RadonPRO / RadonScan / RadonScan Plus Radon Gas Detector Specifications: 6
RadonPRO Nuclear Radiation Detector (Geiger Counter) Specifications: 6
Packing List: 8
How it works? 8
Caution 8
Background Safe Levels 8
Hardware setup 9
GQ Radon Gas Detector Multi-Function Keys 10
Key1 10
Key2 10
Key3 10
Key4 10
Popup Windows 10
Graphical User Interface (GUI) Icons 11
RadonScan, RadonScan-Plus, RadonPro Menu screen layout: 13
Input Screen (RadonScan-Plus, RadonPro only) 13
Updating Values (RadonPro only) 13
User Options 14
Alarm 14
Alarm Threshold 14
Radon Alarm Trigger (Alarm) 15
Beep Volume (Alarm) 15
Radon Unit 15
Geiger Click 16
LED Indicator 16
Backlight 16
Display Timer 16
Wi-Fi Menu 17
Wi-Fi On/Off 17
Search SSID 18
Password 18
WiFi Signal 18
IP Address 18
MAC Address 19
Reset WiFi Module 19
Server Menu 19
Website (RadonPro,RadonScan-Plus only) 20
URL 20
User ID 20
Counter ID 20
Period 21
Test Connection 21
Config Options 21
Reset Data 21
Radon Calibration Menu Values and Auto Calibrate 22
Radon Auto Calibration 22
Radon Hardware Calibration 22
GMC Calibration Menu (RadonPro only) 23
Tube Voltage (RadonPro only) 23
Set Clock 23
Factory Reset 23

About 24
Demo Software 25
Mobile App GMCmap 26
iPhone/iOS Apple app Android Mobile app 26
Online Geiger Counter World Map 27
www.GMCmap.com 27
Auto Submit Data Protocol 27
Applications 28
Stationary Application 28
Other Important Technical Details 28
USB Port 28
Data collection time 28
Third party software developers 28

ACKNOWLEDGEMENTS

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Overview

The GQ RadonScan, RadonScan Plus, and RadonPro digital Radon Gas Detector are specially designed to continuously monitor and detect the presence of radon gas in indoor environments. Radon is a radioactive gas that can pose various health risks and this detector helps you stay informed about radon levels in your living spaces. These detectors are ideal for use in homes and similar settings. The device comes with built in audible and visual signals for the level of radon gas detected.

Equipped with both audible and visual alerts, the devices notify you of detected radon levels. The RadonScan and RadonPro utilize a fast and efficient algorithm to calculate and process radon measurements. They also feature automatic data recording, consistently monitoring radon levels and logging readings every second into internal memory. This ensures that cumulative data is preserved, even when the device is turned off.

The RadonPro also includes an integrated Geiger Counter, which functions as a nuclear radiation detector. This feature allows for radiation detection and monitoring in both indoor and outdoor environments. The radiation data is logged in a cumulative dosimeter mode, providing long-term dose tracking. It can also help confirm the presence of radon gas.

Additionally, the RadonScan Plus and the RadonPro offers Wi-Fi connectivity, enabling global access to device data. Users can view real-time data on iOS or Android devices, allowing them to monitor radon levels from anywhere in the world, at any time. The device also provides free online data storage for convenience. A built-in real-time clock ensures accurate timestamps for time-sensitive data logging.

The GQ Radon Gas Detector features a high-quality color LCD display paired with an intuitive, user-friendly graphic interface, ensuring easy navigation and clear visibility of readings. Additionally, the device is equipped with front and rear LEDs, along with a buzzer, to alert users to high radon levels.

For added convenience, the detector includes a Type-C USB port for both communication and external power supply. This allows the device to operate continuously 24/7 without the need for batteries, providing users with reliable, uninterrupted performance and ensuring consistent, accurate measurements at all times.

RadonPRO / RadonScan / RadonScan Plus Radon Gas Detector Specifications:

Range of dose rate indications, pCi/L	0.00 to 100
Range of dose rate indications, Bq/m^3	0.00 to 3700
Types of registered radon gas:	Rn222
Reproducibility of indication	30%
Alarm levels by pCi/L	0 to 99 (continuously)
Date indication (RadonPRO only)	YYYY-MM-DD (continuously)
Time indication (RadonPRO only)	HH-MM-SS (continuously)
Elapsed time indication (RadonPRO only)	99 years(maximum)
Display:	Color LCD dot matrix, back lighted
On board Memory:	1M Bytes flash memory for data storage
Power: **Consumption**	25mW – 125mW (count rate dependent)
Power: **Supply**	USB power

RadonPRO Nuclear Radiation Detector (Geiger Counter) Specifications:

Range of dose rate indications, µSv/h	0.00 to 2000
Range of exposure dose rate indications, mR/h	0.00 to 200
Range of registered beta radiation energy MeV	0.25 to 3.5
Range of gamma radiation energy, MeV	0.1 to 1.25
Range of registered X-ray radiation energy MeV	0.03 to 3.0
Reproducibility of indication	20%

Gamma Sensitivity Co^{60} (cps/mR/hr)	22
Alarm levels by CPM	0 to 999999 (continuously)
Alarm levels by µSv/h	0.00 to 9999 (continuously)
Alarm levels by mR/h	0.00 to 999 (continuously)
Date indication	YYYY-MM-DD (continuously)
Time indication	HH-MM-SS (continuously)
Elapsed time indication	99 years(maximum)
Radiation detection:	β,γ, x
Detectable Radiation Range:	0.1 ~ 3 MeV
Instrument Background:	0-2 pulses/s
Working Voltage:	5V DC
Display:	Color LCD dot matrix, backlight
On board Memory:	2M Bytes flash memory for data storage
Power: **Consumption**	25mW – 125mW (count rate dependent)
Power: **Supply**	USB power

Packing List:

1. GQ Radon Detector main unit.
2. Type C USB cable
3. USB Power adapter Type A
4. Quick start guide

How it works?

The GQ Radon Gas Detector uses a high-sensitivity GQ Radon Gas Sensor to detect radon gas in the environment.

As radon gas passes through the sensor, it triggers an electrical signal that the CPU registers, allowing it to measure the gas levels. The primary unit of measurement is pCi/L (picocuries per liter), which indicates the radon gas concentration. This value can also be converted to other traditional radiation units, such as Becquerels per cubic meter (Bq/m^3) or Working Level (WL).

Once powered on, the GQ Radon devices will display the background radon level within about 5 minutes. For the RadonPRO, the background radiation reading is shown in CPM (counts per minute), reflecting the natural radiation detected at that moment. These readings can vary depending on the time and location. To obtain the most accurate results, it's recommended to average readings over a longer period of time.

Caution

1. Do not get the unit wet.
2. Avoid doing measurements in direct sunlight.
3. Keep the detector out of reach of children.
4. Place the detector in locations representative of the air you breathe, away from drafts, windows, and doors.
5. Do not tamper with or open the detector unit.

Background Safe Levels

Suggested background readings levels:

Radon Gas Level:
1. **Safe level**. Less than 2.00 pCi/L. Nothing to worry about.
2. **Attention level**. Between 2.00 to 4.00 pCi/L. Medium, check reading regularly, check ventilation system, open windows.
3. **Warning level.** More than 4.00 pCi/L. Dangerous to stay in this area for long. Need to be ventilated.

Radiation Level:
1. **Safe level**. Less than 50CPM or 0.32uSv/h. Nothing to worry about.
2. **Attention level**. 51CPM – 99CPM. OR 0.32uSv/h – 0.65uSv/h. Medium, check regularly.
3. **Warning level.** More than 100CPM or more than 0.65uSv/h. Not Recommended and dangerous to stay in this area for long.

Hardware setup

There are four buttons on the front of the unit: Key1, Key2, Key3 and Key4 (from left to right)

1. Power up the unit. Connecting the Type-C USB power will turn on the unit.

2. Set date/time if needed. Press the Key4 key to enter the menu. Navigate through the menu using the up and down button. Set Clock is located under the Config Settings. Once set, press the back button Key1 repeatedly in order to go back to the Home screen.

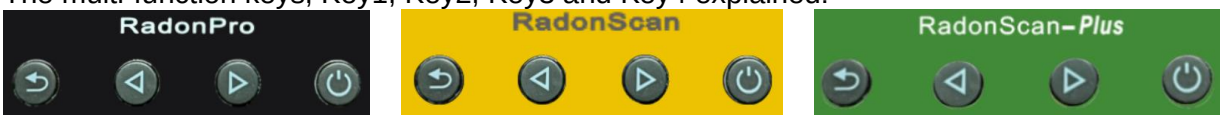
3. Now the unit is ready to use. You should see the background radon level in about 5 minutes. On RadonPro model, the correct CPM reading will be shown in one minute.

For technical questions and support, please use the forum at the following link:

http://www.GQElectronicsLLC.com/forum

GQ Radon Gas Detector Multi-Function Keys

The multi-function keys, Key1, Key2, Key3 and Key4 explained:



The key name from left to right are: Key1, Key2,Key3,Key4

These key's function will be reassigned dynamically based on the context of the current (sub-) menu being displayed.

Key1

1. There are four display modes: Hourly, Daily, Weekly, and Long-Term mode.
   Pressing the Key1 toggles between these modes.
   - When the mode is changed to Hourly, the Date and Time will swap to Elapsed Time and vice versa.
2. In the menu screen, pressing the Key1 will exit the current menu and will return back one menu level.
3 In the data input mode, pressing the Key1 will delete the last character entered.

Key2

1. Pressing the Key2 will toggle the radon reading unit between pCi/L and Bq/m^3.
2. In menu mode, the Key2 acts as the UP key to move the highlighted menu item upwards.
3. In the menu mode, while a popup message box is opened, the Key3 changes the value by cycling through the predefined values.

Key3

1. Changes Radiation Does Rate and does units between CPM, uSv and mR.
2. In menu mode, the Key3 acts as the DOWN key to move the highlight menu item downwards.
3. In the menu mode, while a popup message box is opened, the Key3 changes the value by cycling through the predefined values.

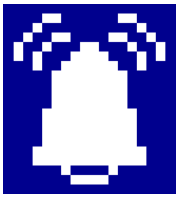
Key4

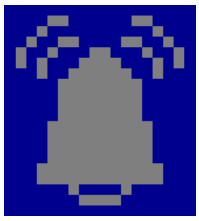
1. Pressing Key4 will enter the Menu options.
2. In menu mode, Key4 is the "Confirm", "Select", "Enter" key

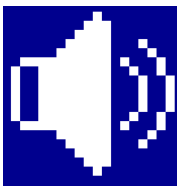
Popup Windows

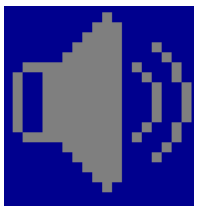
Popup Windows will show the current status/value of selected features. The current status/value can be changed only when it is displayed in the Popup Window and the currently displayed status/value will be stored when the Popup Window has timed out after 3 seconds if no key has been pressed.

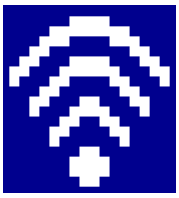
Graphical User Interface (GUI) Icons

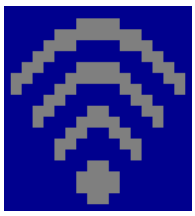
 Alarm enabled

 Alarm disabled

 Speaker Enabled

 Speaker Disabled

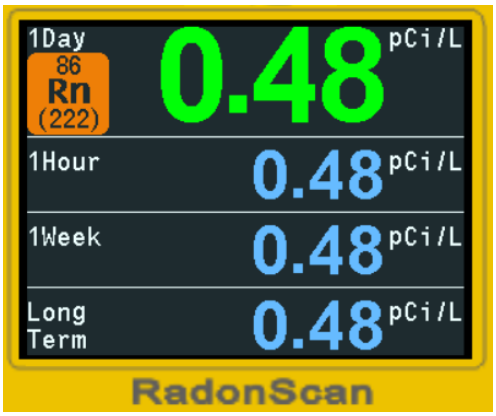
 WiFi Enabled

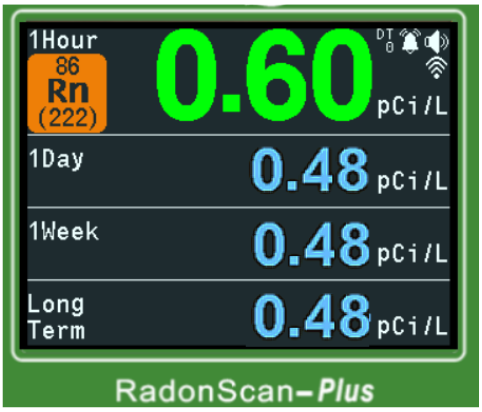
 WiFi Disabled

Backlight Timer Countdown

Backlight Timer Disabled

RadonScan, RadonScan-Plus main display:

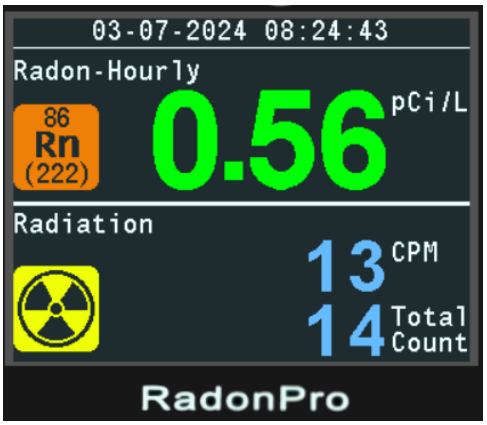




Key2/Key3 to toggle between pCi/L and Bq/m3 unit

The main screen consists four average pCi/L readings: 1 Day, 1 Hour, 1 Week, and Long-Term.

RadonPRO main display:



Key2 to toggle between pCi/L and Bq/m3 unit

The main screen consists four average pCi/L readings: 1 Day, 1 Hour, 1 Week, and Long-Term.

RadonScan, RadonScan-Plus, RadonPro Menu screen layout:

Navigation keys:

Key1: Exit / Cancel
Key2: Up Key
Key3: Down Key
Key4: Select / Confirm / Enter Sub Menu

Input Screen (RadonScan-Plus, RadonPro only)

Some items on the menu will let you enter text. E.g. Main Menu -> Server -> Website.

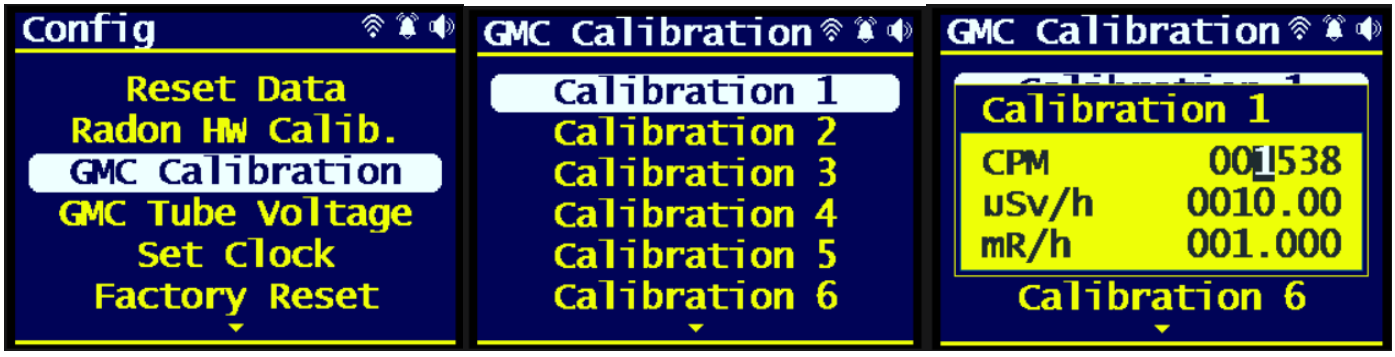
Navigation keys:

- **User needs to wait 2 seconds to advance the cursor automatically**
- **Must press Key4/confirm to save the input or press back key and erase all characters to cancel the edit**

Key1: Backspace / Exit / Cancel
Key2: Toggle through the letters, numbers, and special characters
Key3: Toggle through the letters, numbers, and special characters
Key4: Confirm and Exit

Updating Values (RadonPro only)

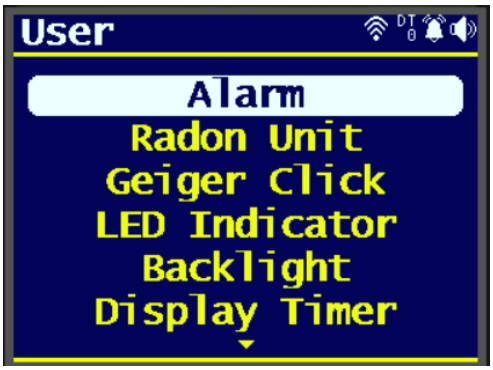
Some popup menus will display values that can be updated. E.g. Main Menu -> Config -> Calibration -> Calibration 1



Navigation keys:

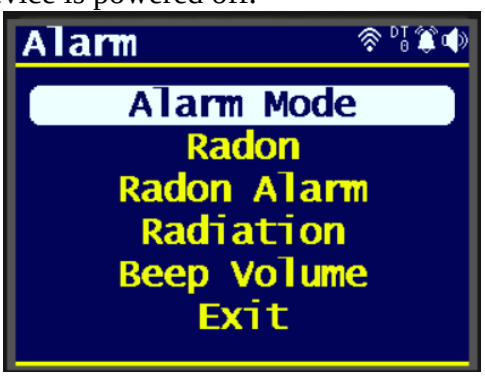
Key1: Back or confirm/save
Key2: Increase the digit value in highlighted position.
Key3: Decrease the digit value in highlighted position.
Key4: Confirm and move to next digit.

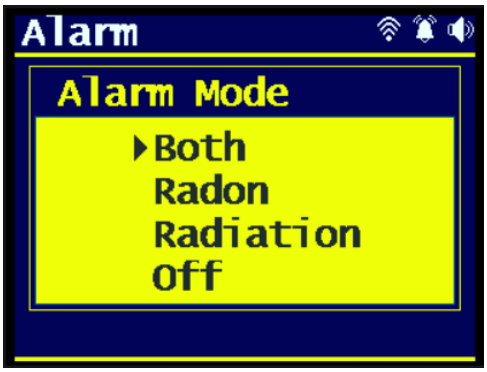
User Options



Alarm

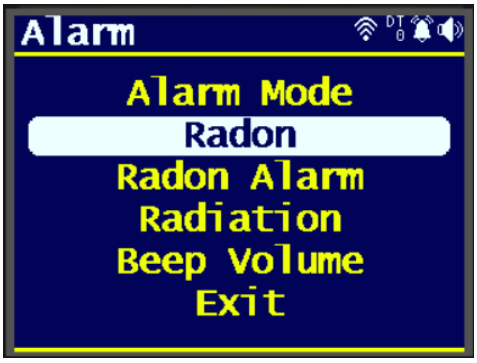
Alarm Mode - Turn's alarm audio On/Off and change the trigger to either Radon, Radiation, or Both. Pressing any key while the alarm is being triggered will disable the beep sound until the readings goes below threshold or device is powered off.

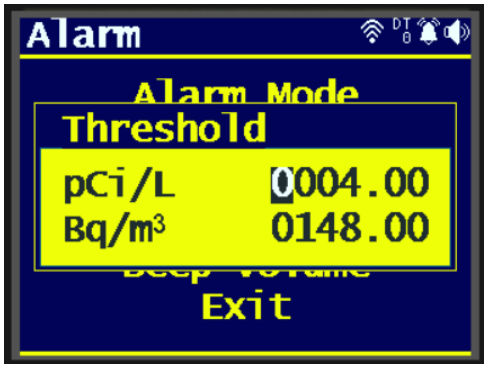


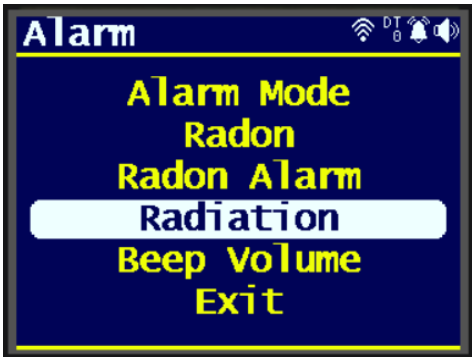


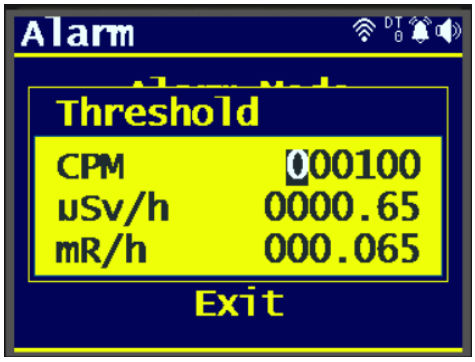
Alarm Threshold

The audio alarm will be triggered once the radiation level reaches the preset alarm threshold in CPM.







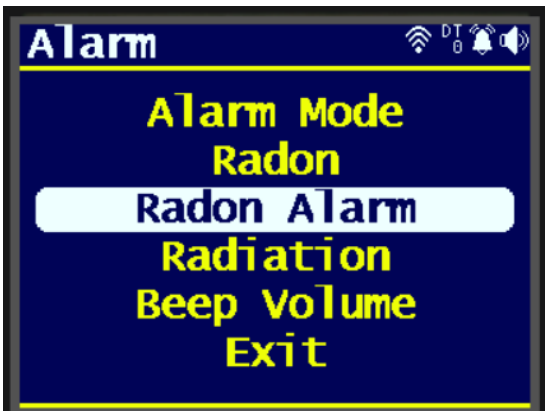


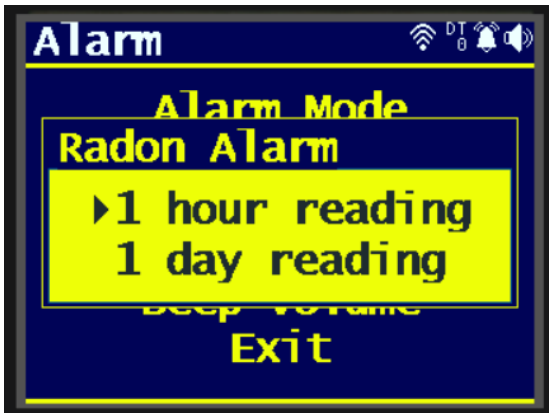
Navigation keys:

Key1: Back or confirm/save
Key2: Increase the digit value in highlighted position.
Key3: Decrease the digit value in highlighted position.
Key4: Confirm and move to next digit.

Radon Alarm Trigger (Alarm)

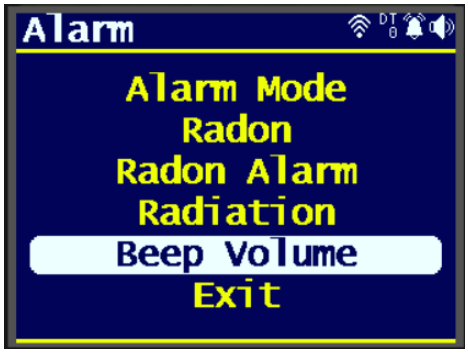
Select which reading will the Radon alarm will trigger.

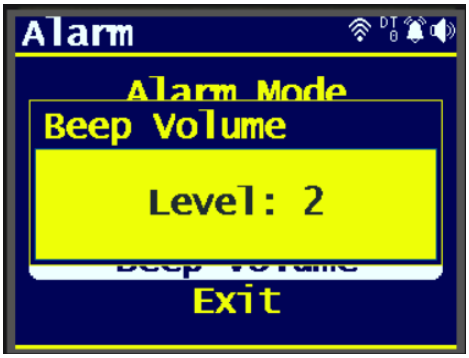




Beep Volume (Alarm)

Press Key4 to enter and Beep Volume setting mode.





Navigation keys:

Key1: Back Key2: Up Key3: Down

Final volum will be saved when pop up Window close on 6 seconds times out.

Radon Unit

Sets radon unit to be used in readings.

Geiger Click

Turns the gieger counter click sound on or off.

LED Indicator

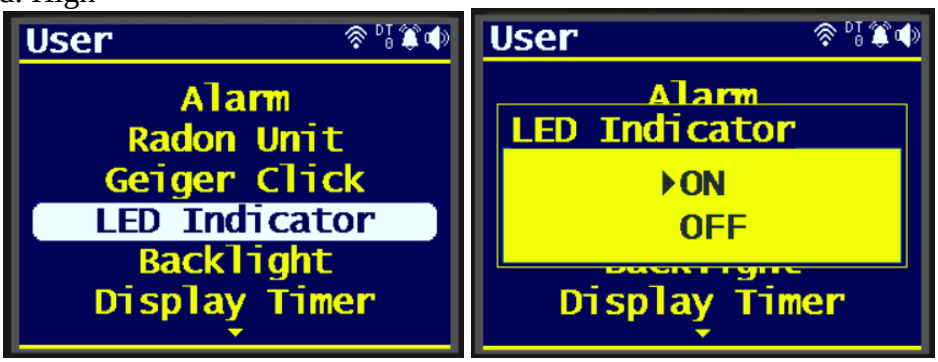
Turns LED indicator On/Off

LED Color Reading Indication:

Green: Normal Readings

Yellow: Medium

Red: High



Backlight

Changes the backlight level.

Display Timer

Display backlight dims or turns off after a certain period of time. Device is still operating and a button press will turn back the display.

Wi-Fi Menu

The RadonPro and RadonScan-Plus can submit data online via Wi-Fi. User must create a user account online and create a radon detector in their online account in order to get the credentials (mainly user ID and counter ID) that are needed to fill up the Server Settings. Once everything is filled up correctly, connect to Wi-Fi by selecting the Connect option in WiFi On/Off. Once connected, user can test if data can be sent correctly by going to the Server -> Test Connection. A popup message that says “Successful” will appear if data is sent correctly.

Wi-Fi On/Off

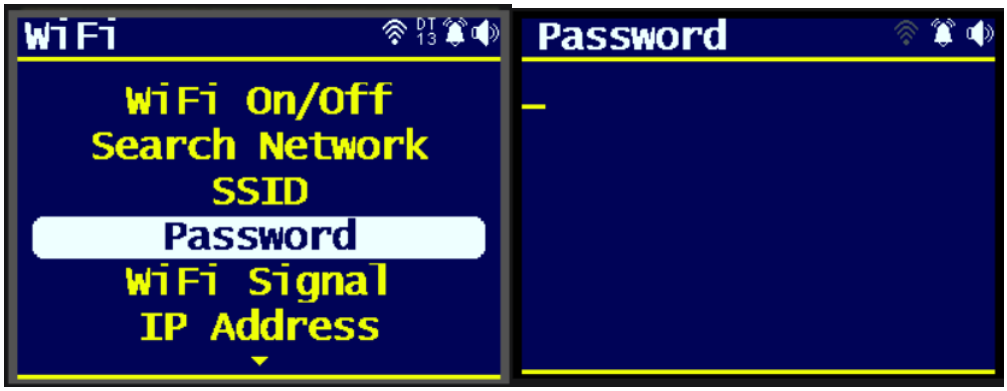
Connect or Disconnect Wi-Fi connection

Search SSID

SSID for Wi-Fi Connection. It can be searched or entered manually.

Password

Password for W-Fi Connection



WiFi Signal

Displays the Wi-Fi signal when connected

IP Address

Displays the IP Address when connected

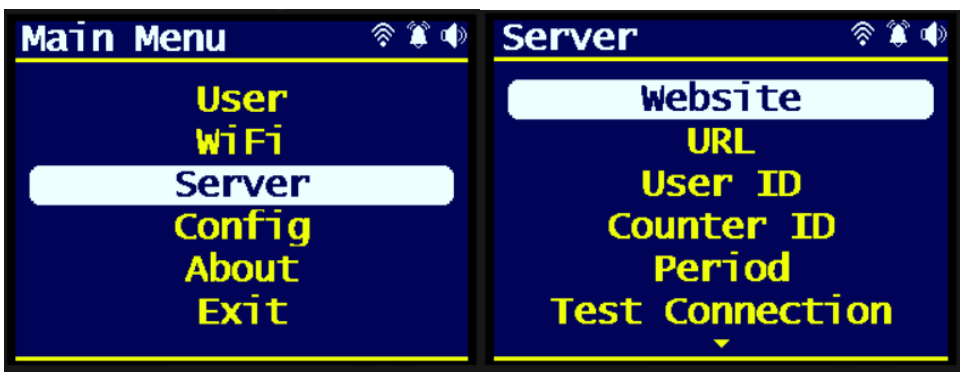
MAC Address

Displays the MAC Address of the Wi-Fi Module

Reset WiFi Module

Resets the Wi-Fi Module of the device. Sometimes useful when user cannot connect to Wi-Fi.

Server Menu

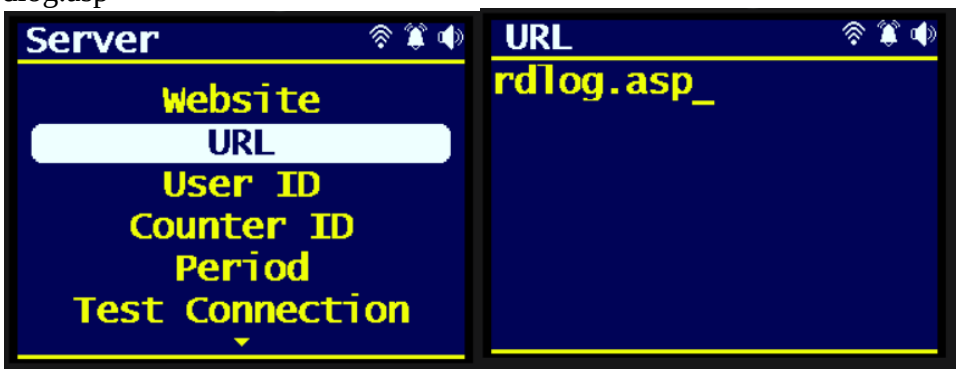


Website (RadonPro,RadonScan-Plus only)

Server Domain. If user has their own server, they can enter it here.
Default: www.gmcmap.com

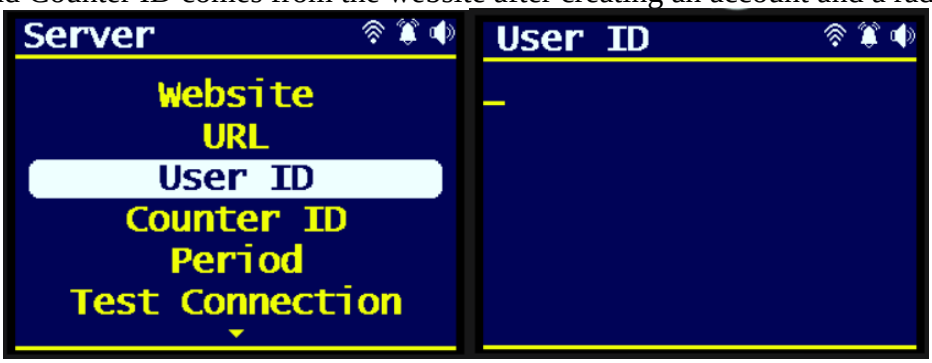
URL

Website URL. If user has their own URL, they can also enter it here.
Default: rdlog.asp

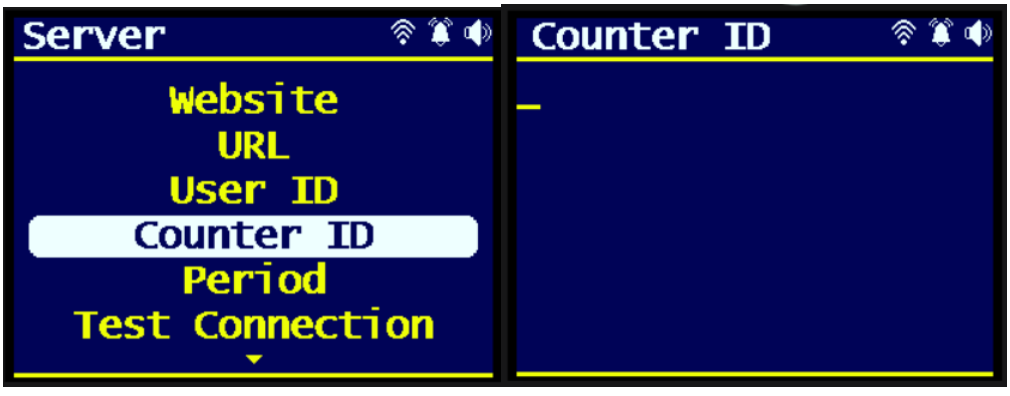


User ID

User ID and Counter ID comes from the website after creating an account and a radon counter.

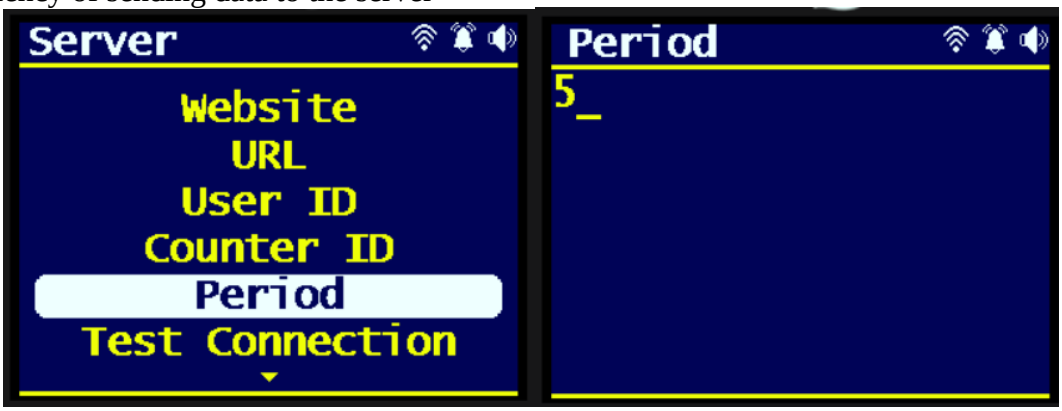


Counter ID



Period

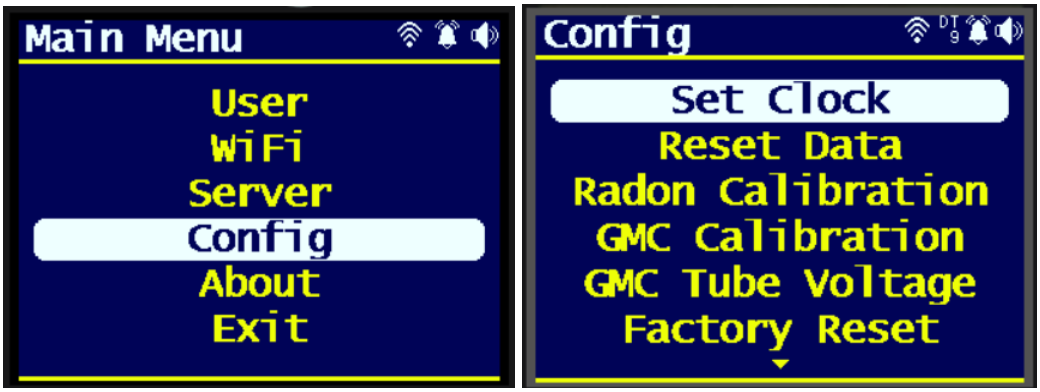
Frequency of sending data to the server



Test Connection

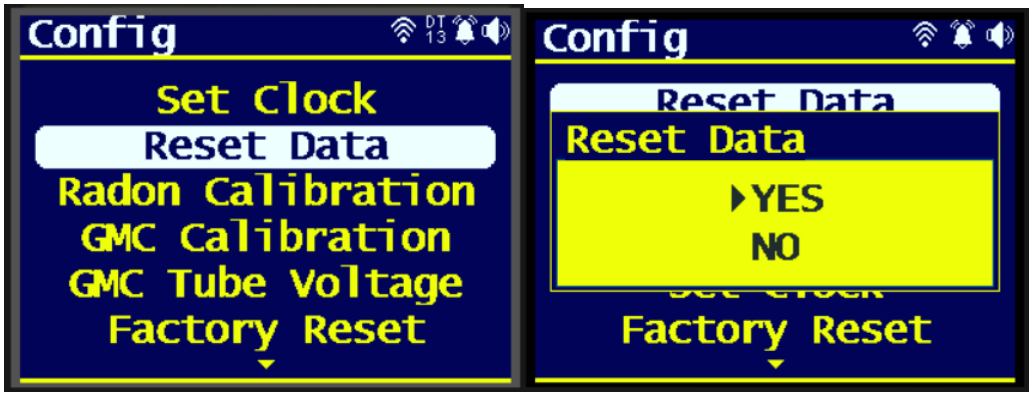
Tests the server connection. If everything is entered correctly, and Wi-Fi is connected, it will return a "Successful" message

Config Options



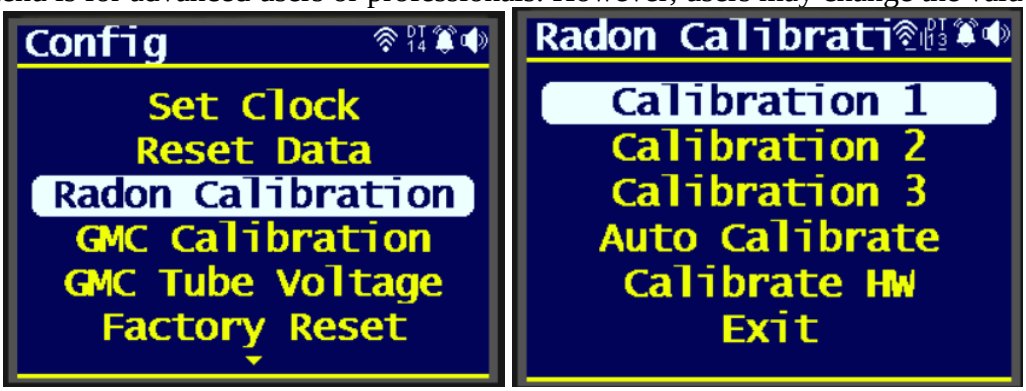
Reset Data

Clears the saved radon and radiation data. When device is turned off, radon stores the past saved Hourly, Daily, Weekly, Long-Term data. Also for RadonPro, it stores the cumulative dose reading. Resetting the data will clear the stored data and start fresh.



Radon Calibration Menu Values and Auto Calibrate

This menu is for advanced users or professionals. However, users may change the values if needed.

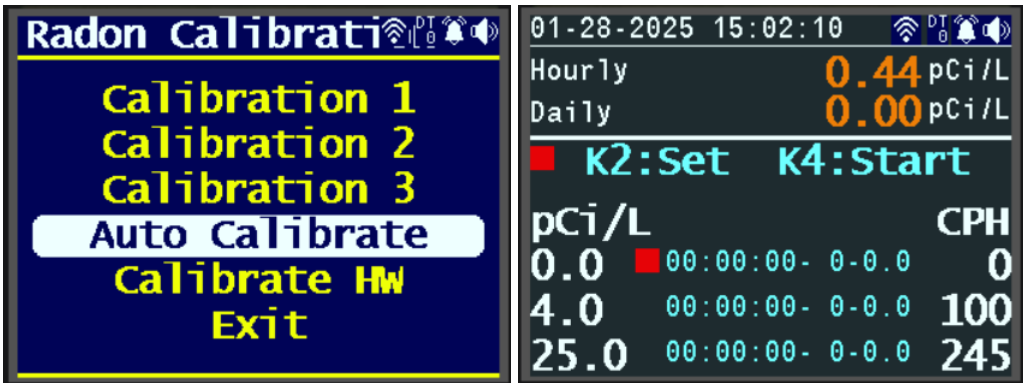


Radon Auto Calibration

This menu is designed for calibrating radon with known radon levels in pCi/L. Use Calibration 1, 2, and 3 to set the known radon levels (three levels are recommended: 0, 4, and 25 pCi/L). The device will automatically measure and calculate the Counts Per Hour (CPH) during the calibration process. Press Key 2 to select the level you wish to calibrate, then press Key 4 to start or stop the calibration. Radon values are calculated and saved every hour. Longer test durations will provide more accurate results. While it is recommended to calibrate the device for at least one day, testing for just one hour can still provide reliable estimates.

Note: If only one known radon level is available, set Calibration 1 and 2 to 0 pCi/L and 0 CPH, then use Calibration 3 to set the known radon level in pCi/L, followed by Auto Calibrate to calculate the CPH.

The Hourly and Daily readings above represent the current values based on the ongoing calibration process.



Radon Hardware Calibration

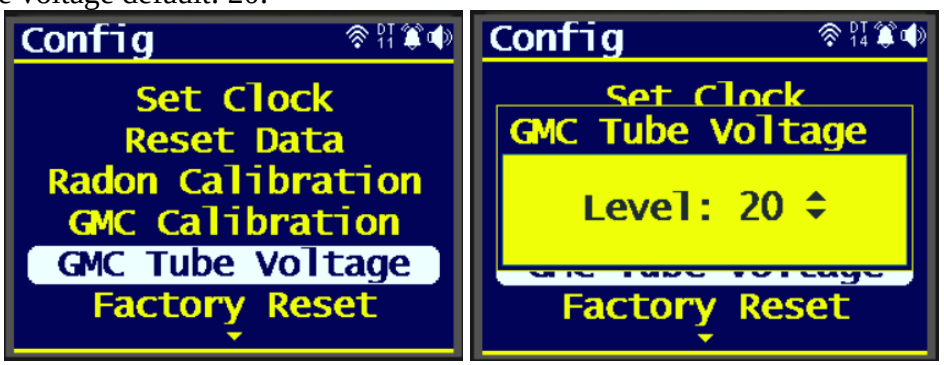
Performs hardware calibration for the radon sensor. Takes around 1-2 minutes. User can cancel by holding Key4 for at most 1 second.

GMC Calibration Menu (RadonPro only)

This menu is reserved for a professional. User may change the value if needed.

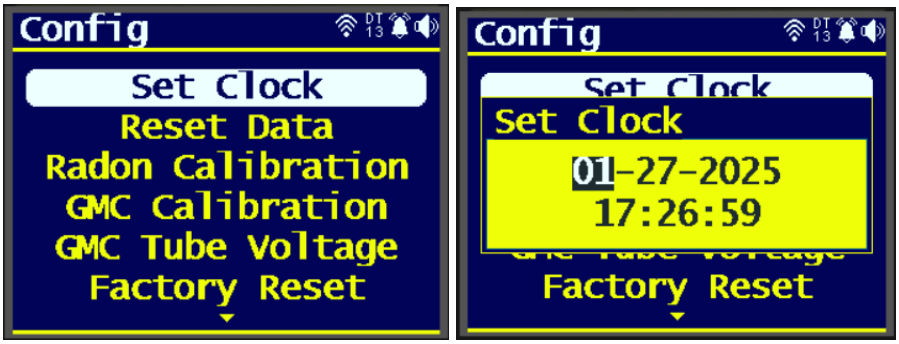
Tube Voltage (RadonPro only)

This menu option is reserved for a professional. User may only change it if instructed by a professional. Tube voltage default: 20.



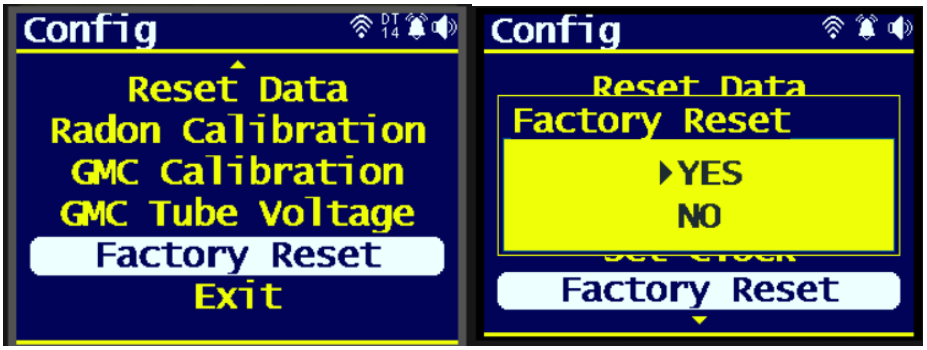
Set Clock

Sets the date and time on the device.



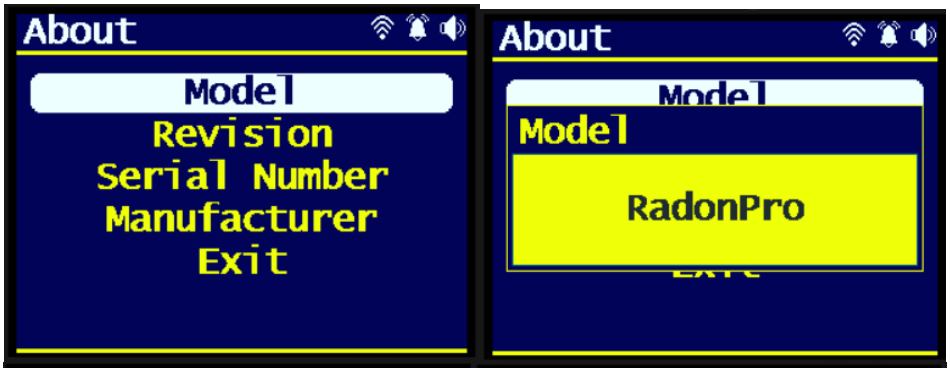
Factory Reset

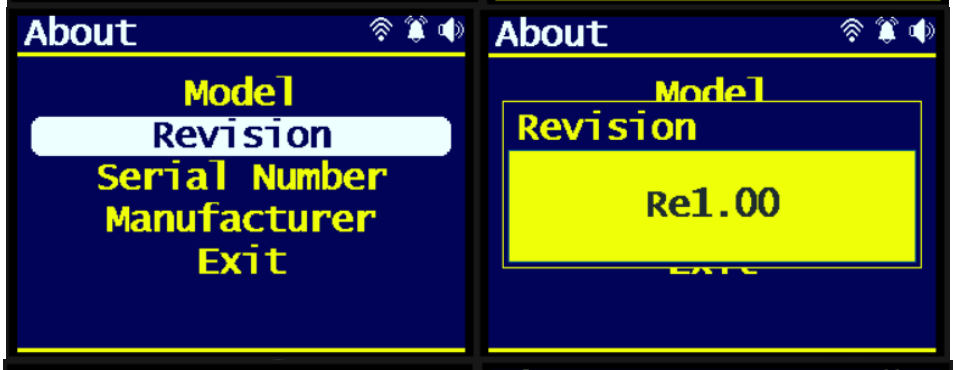
Resets the device to factory default settings

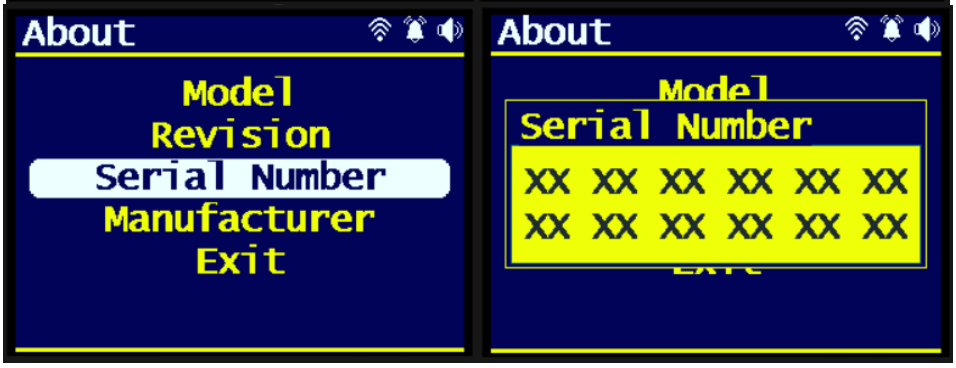


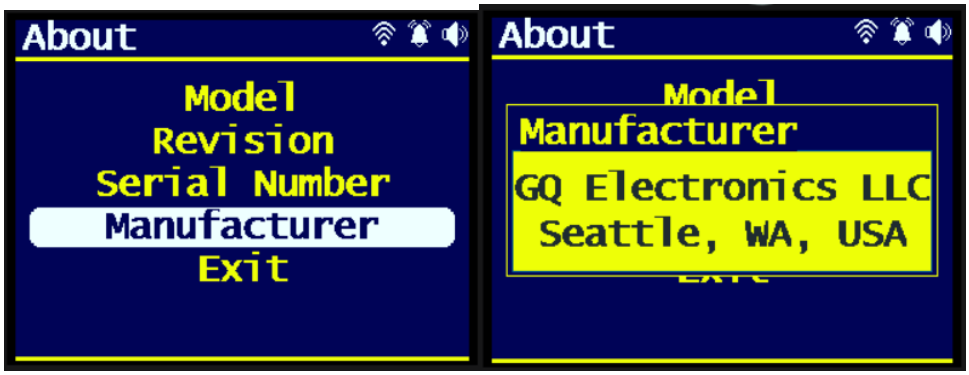
About

About displays device system information.









Demo Software

See download page for the demo version. The Windows demo software is a 1-to-1 device user interface simulator. User may download and try it before get the actual device.

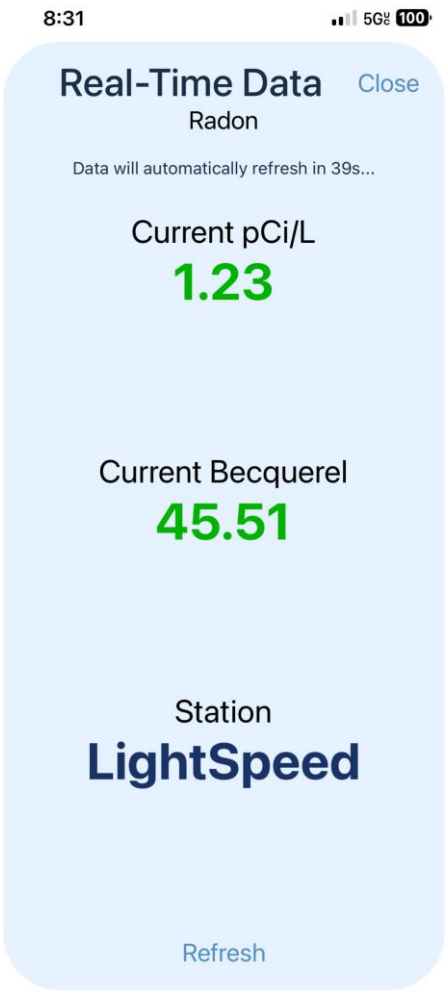
Mobile App GMCmap

For the RadonPRO model, users are able to download the application software and run it on the mobile phone. With GMCmap app, users are able to monitor the real time reading remotely anywhere in the world.

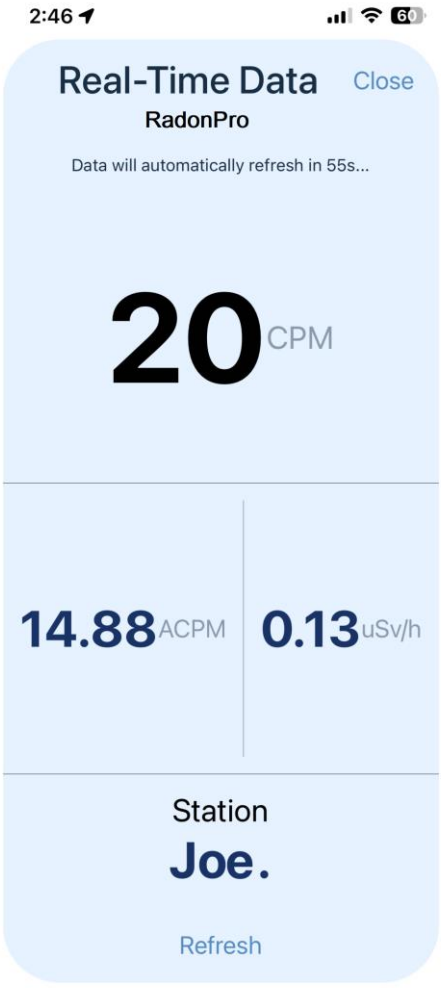
iPhone/iOS Apple app

Android Mobile app

Real-time Mobile App Radon and Radiation data interfaces:



Radon On App



Radiation On App

Online Geiger Counter World Map

www.GMCmap.com

The GMCmap is free and open protocol map. Anyone can use it for free. It provides a free space to all RadonPro users.

As a registered user, each user can have multiple radon detector and Geiger Counters at different locations. All registered devices have free history data storage space. User is able to retrieve their history data anytime, anywhere. Users can publish their history data to others by set the data properties.

Auto Submit Data Protocol

The GMCmap accepts automatically submitted data.

In order to use automatically submit data, user has to be registered on GMCmap.com, so that to get a valid user account ID and Geiger Counter ID. Each user can have multiple Geiger Counters at the different locations.

Auto submit data url format:
http://www.GMCmap.com/log2.asp?id=UserAccountID+GeigerCounterID+CPM+ACPM+uSV+pCi

At least one reading data has to be submitted.

Here:
1. UserAccountID: user account ID. This ID is assigned once a user registration is completed. 2. Device ID: a global unique ID for each registered Geiger Counter/Radon Detector.
3. CPM: Count Per Minute reading from this Geiger Counter .
4. ACPM: Average Count Per Minute reading from this Geiger Counter(optional).
5. uSv: uSv/h reading from this Geiger Counter(optional).

Followings are valid data submission examples:

http://www.GMCmap.com/log2.asp?AID=0230111&GID=0034021&CPM=15&ACPM=13.2&uSV=0.075

http://www.GMCmap.com/log2.asp?AID=0230111&GID=0034021&CPM=15&ACPM=0&uSV=0
http://www.GMCmap.com/log2.asp?AID=0230111&GID=0034021&CPM=15&ACPM=0&uSV=0&pCi=0.32
http://www.GMCmap.com/log2.asp?AID=0230111&GID=0034021&CPM=15&pCi=0.32
http://www.GMCmap.com/log2.asp?AID=0230111&GID=0034021&CPM=15&ACPM=13.2&pCi=0.32
http://www.GMCmap.com/log2.asp?AID=0230111&GID=0034021&CPM=15&ACPM=13.2&pCi=0.32
The result will be returned immediately.

The following are the returned result examples:

1. OK.
2. Error! User is not found.
3. Error! Geiger Counter is not found.
4. Warning! The Geiger Counter location changed, please confirm the location.

If a location change warning received, the user will need to confirm the location from that Geiger Counter profile OR create another Geiger Counter from your account. In this case, you can have two locations share one Geiger Counter.

Applications

Stationary Application

The unit can be placed to almost anywhere for stationary monitoring of radiation and long-term surveillance applications. With the wall adapter, it is able to monitor the data continuously, 24/7.

Other Important Technical Details

USB Port

The USB port is the standard Type-C USB port. It is used for data communication and DC power supply.

Data collection time

Radon and radiation data are collected continuously, and every second the measured data are being transmitted to the CPU for processing.

Third party software developers

The RadonPRO and RadonScan are open application protocol products. Users are encouraged to develop their own software based on the published GQ-RFC2401 protocol. We encourage you to share your generic software with other users. Please contact support@gqelectronicsllc.com if you have any questions.

You can find the GQ-RFC2401 protocol at the software download page.

http://www.gqelectronicsllc.com/comersus/store/download.asp