GQ Radon Gas Detector
User Guide

For Model: RadonScan, RadonPRO

GQ Electronics LLC

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ACKNOWLEDGEMENTS

[TO BE FILLED]

Overview

The GQ RadonScan / RadonPro digital Radon Gas Detector is specially designed to continuously monitor and detect the presence of radon gas in indoor environments. Radon is a radioactive gas that can pose health risks, and this detector helps you stay informed about radon levels in your living spaces. It can be used in personal house and or similar environment. The device comes with built in audible and visual signals for the level of radon gas detected. The RadonScan / RadonPro uses fastest calculation algorithm to speed up the process for the final reading. It features automatic data recording, continually monitoring the radon gas radiation level, logging the data into internal memory every second so that it can keep track of the current cumulative readings even after the device is shut off.

The RadonPRO also has integrated nuclear radiation detector, the Geiger Counter feature. It can be used for radiation detection and monitoring for both indoor and outdoor environments. The radiation data cumulative dosimeter mode provides long term cumulative dose. It also be used to confirm the existence of Radon gas. The Wifi connection on the RadonPro will link the device globally. Users are able to read data on mobile app and track the real time data at any time anywhere in the world. Users will enjoy the free online storage of data. The on board real time clock provides the timestamp for time related data logging purposes.

GQ Radon Gas Detector also comes with a high-quality color LCD Module and a friendly designed graphic user interface to fully utilize the color LCD. Lastly, the device has front and rear LED together with a buzzer to indicate high alarm levels.

The device is equipped with a Type-C USB port, utilized for communication and external power supply. It works 24/7 continually with no battery needed. It gives users freedom from the limitations of a battery and guaranteeing consistent and accurate measurements.

RadonPRO / RadonScan 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, back lighted
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 is installed with a high sensitivity GQ Radon Gas Sensor to detect radon gas.

When the radon gas passes through the sensor, it triggers electrical signal for the CPU to register its level. The basic level rate unit is pCi/L. The pCi/L rate indicates the radon gas level and it can be converted to other traditional radiation units, such as Becquerels per cubic meter (Bq/m^3) and Working Level (WL).

After RadonPRO/RadonScan is powered on, it will show the background radon level reading in about 5 minutes. For RadonPRO, the background radiation level reading (in CPM) indicates the natural radiation detected at that minute. This reading may change from time to time and location to location. To get an accurate reading, user may need to get an average value over a longer time period.

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.

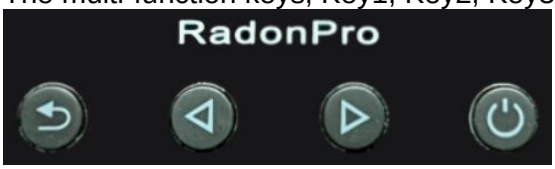
3. Now the unit is ready to use. You should see the background radon level in about 5 minutes. On RadonPro model, the correct CPM reading will be shown in one minute.

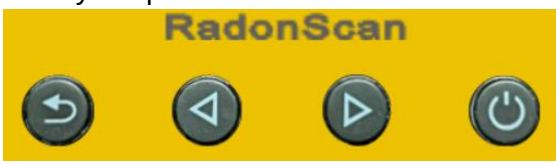
For technical questions and support, please use the forum at the following link:

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.

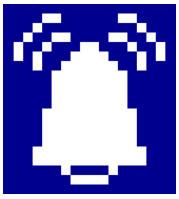
Key4

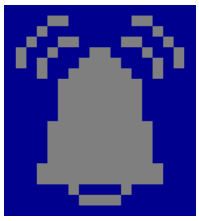
1. Pressing Key4 will enter the Menu options.
2. In menu mode, Key4 is the "Confirm", "Select", "Enter" key

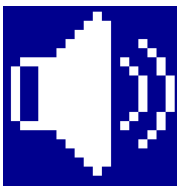
Popup Windows

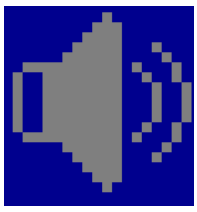
Popup Windows will show the current status/value of selected features. The current status/value can be changed only when it is displayed in the Popup Window and the currently displayed status/value will be stored when the Popup Window has timed out after 3 seconds if no key has been pressed.

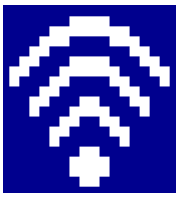
Graphical User Interface (GUI)

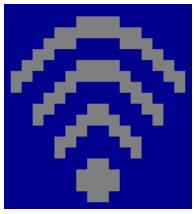
 Alarm enabled

 Alarm disabled

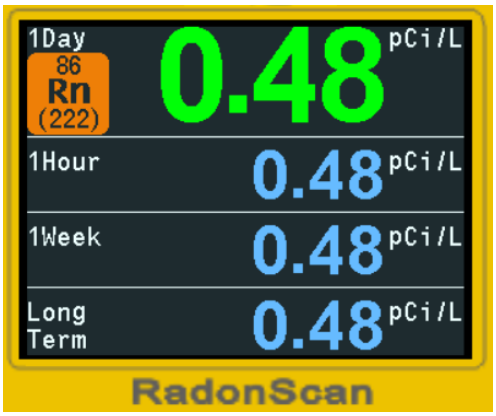
 Speaker Enabled

 Speaker Disabled

 WiFi Enabled

 WiFi Disabled

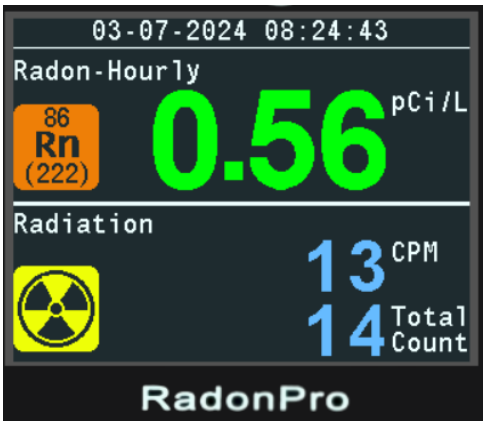
RadonScan main display:



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 Menu:

Navigation keys:

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

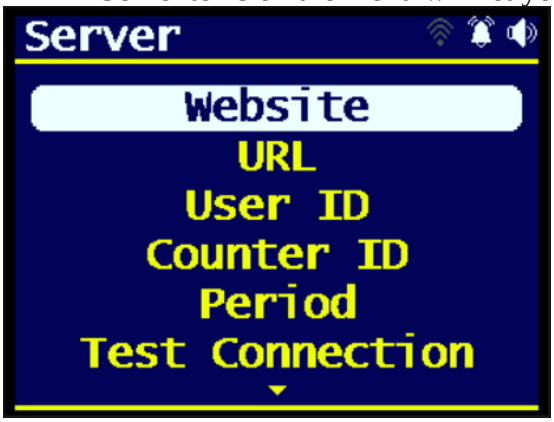
RadonPRO Menu:

Navigation keys:

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

Input Screen

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



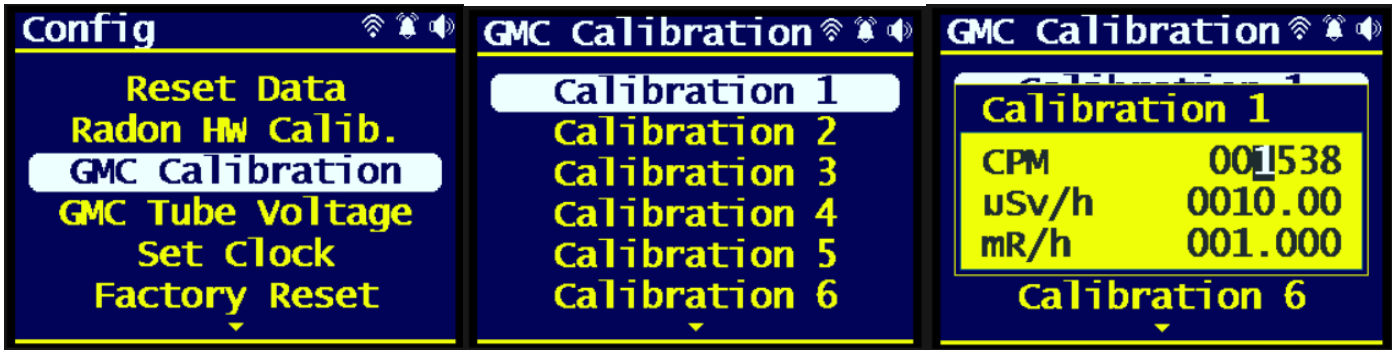
Navigation keys:

- **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

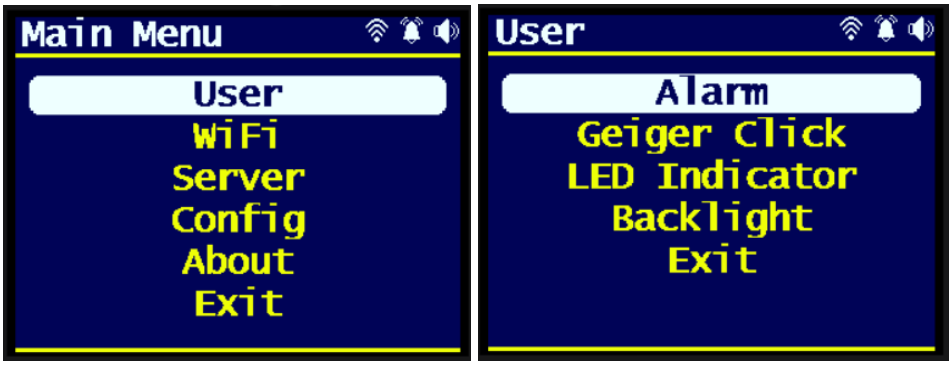
Some popup menus will display values that can be updated. E.g. Main Menu -> Config -> Calibration -> Calibration 1



Navigation keys:

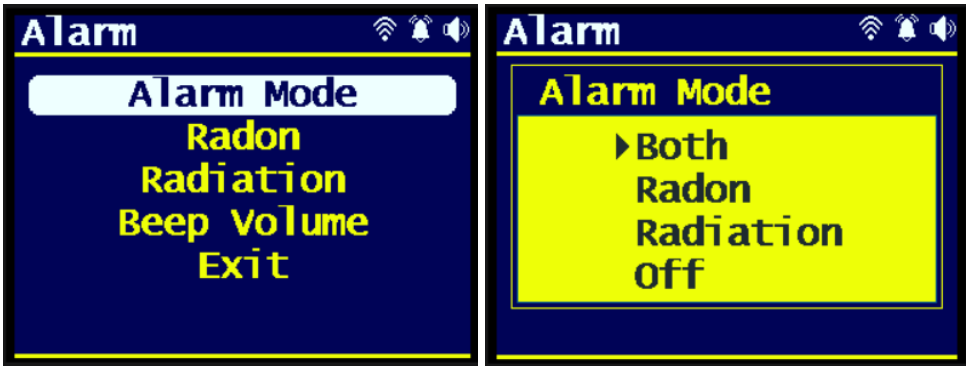
Key1: Back or confirm/save
Key2: Increase the digit value in highlighted position.
Key3: Decrease the digit value in highlighted position.
Key4: Confirm and move to next digit.

User Options



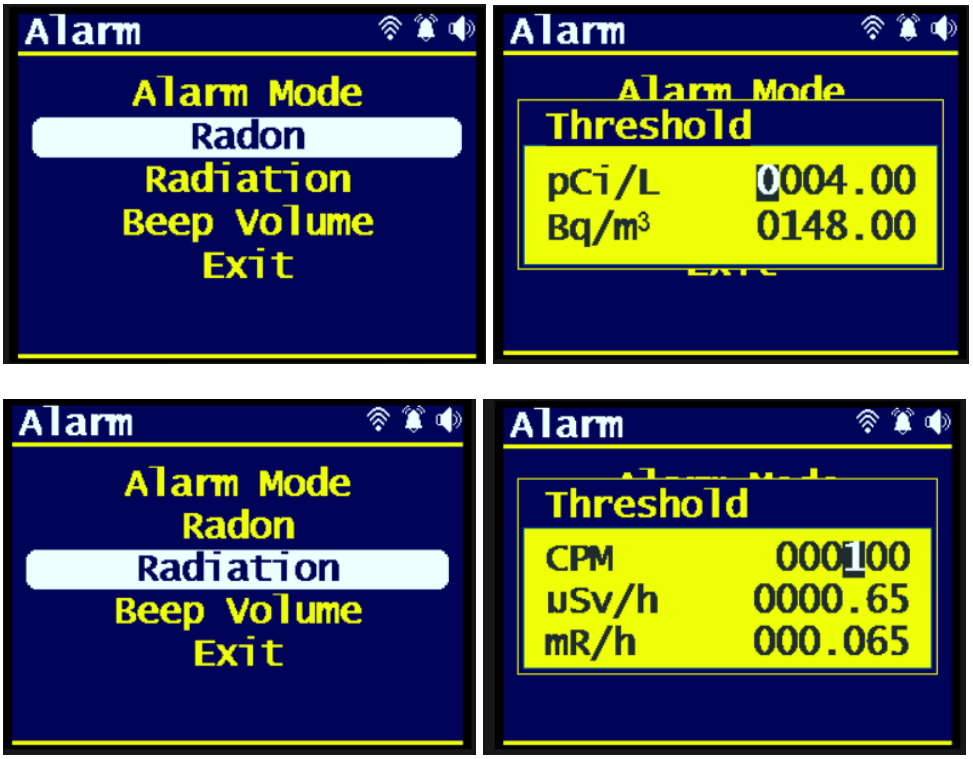
Alarm

Alarm Mode - Turn's alarm audio On/Off and change the trigger to either Radon, Radiation, or Both.



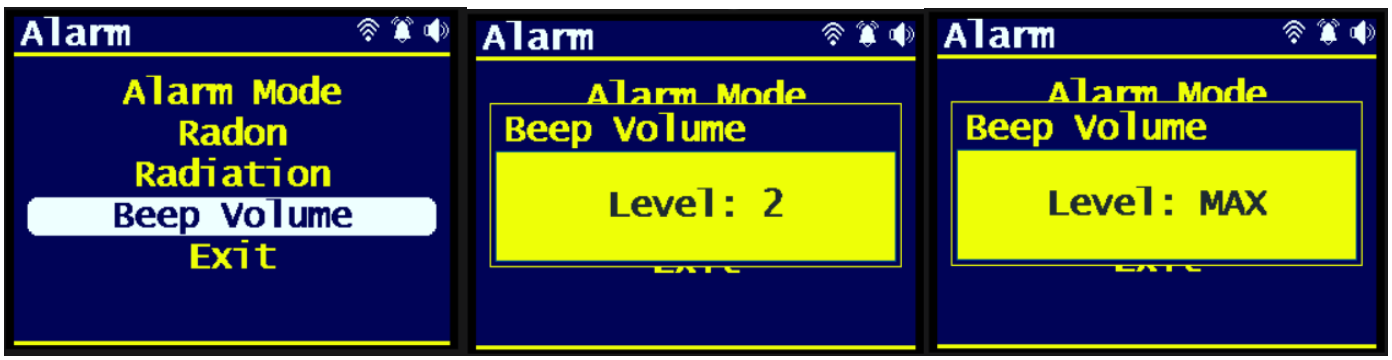
Alarm Threshold

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



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.

Geiger Click

Turns the gieger counter click sound on or off.

LED Indicator

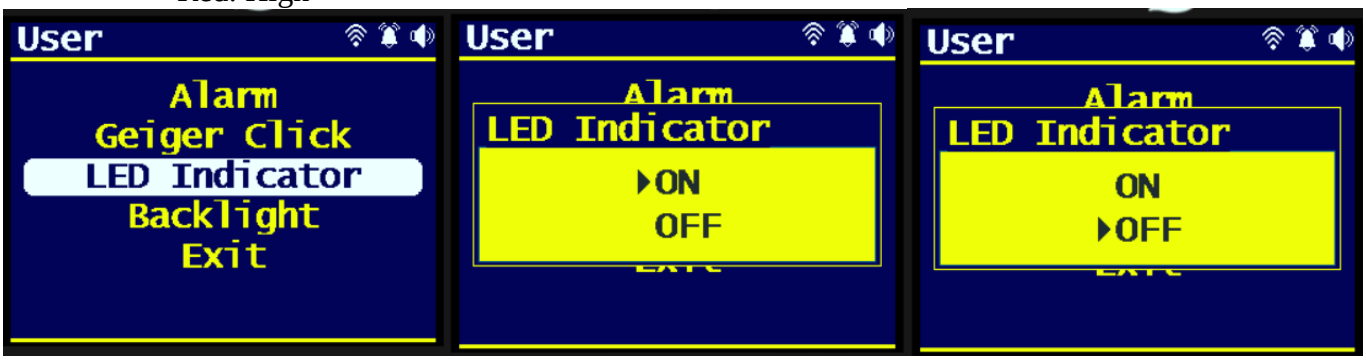
Turns LED indicator On/Off

LED Color Reading Indication:

Green: Normal Readings

Yellow: Medium

Red: High



Backlight

Changes the backlight level.

Wi-Fi Menu

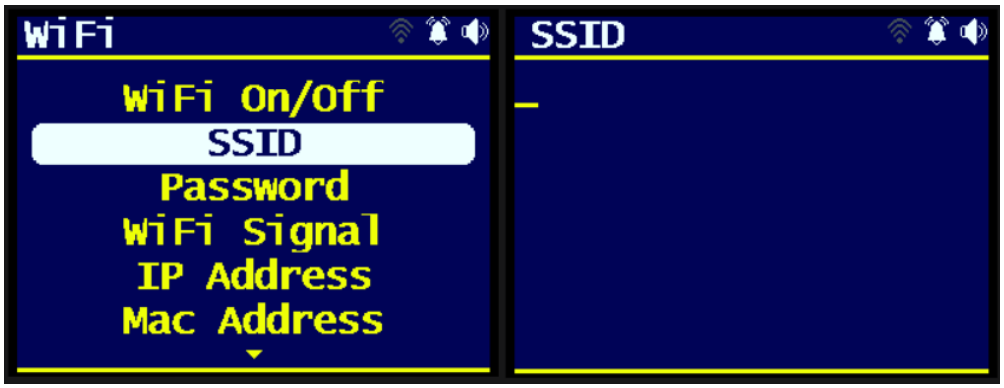
The RadonPro can submit data online via Wi-Fi. User must create a user account online and create a radon detector in their online account in order to get the credentials (mainly user ID and counter ID) that are needed to fill up the Server Settings. Once everything is filled up correctly, connect to 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

SSID

SSID for Wi-Fi Connection



Password

Password for W-Fi Connection

WiFi Signal

Displays the Wi-Fi signal when connected

IP Address

Displays the IP Address when connected

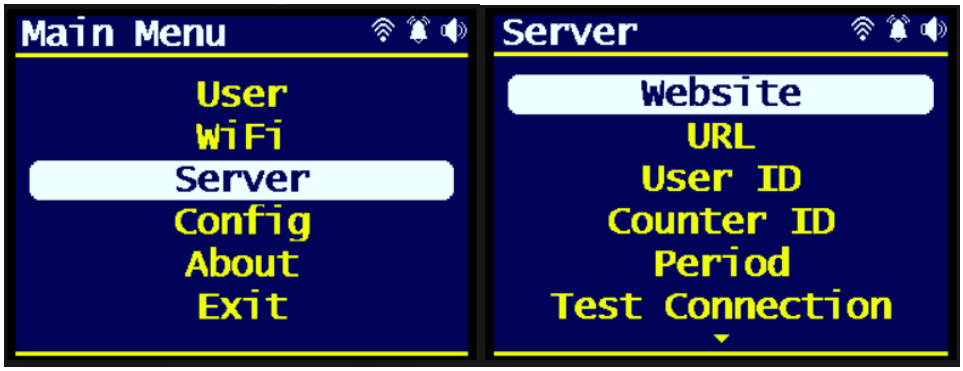
MAC Address

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

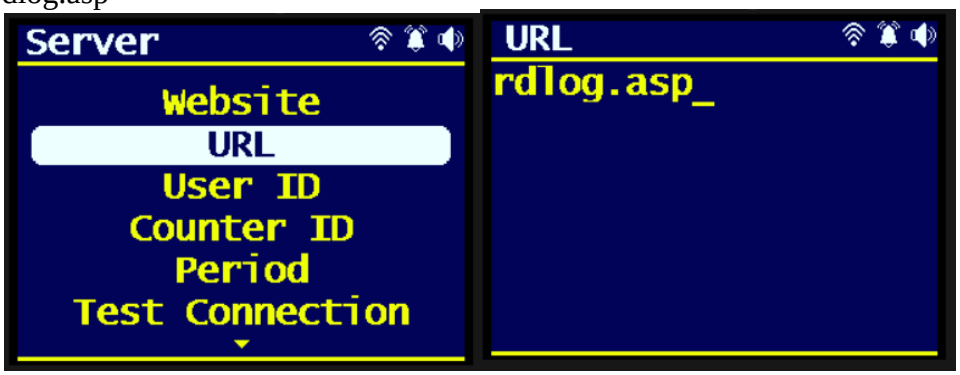


Website

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

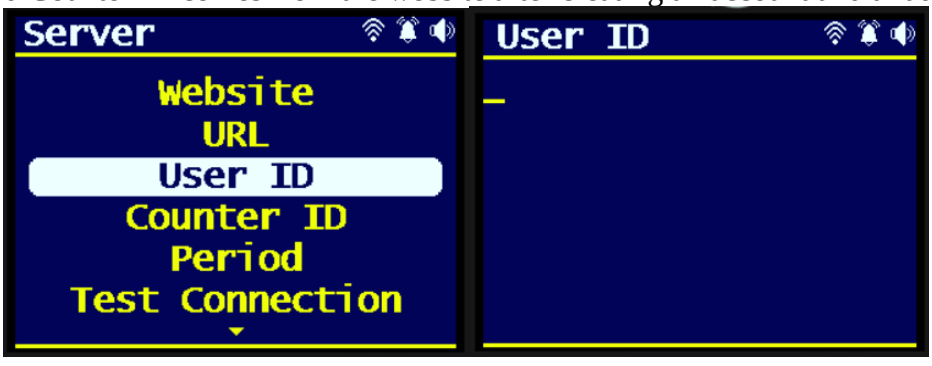
URL

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

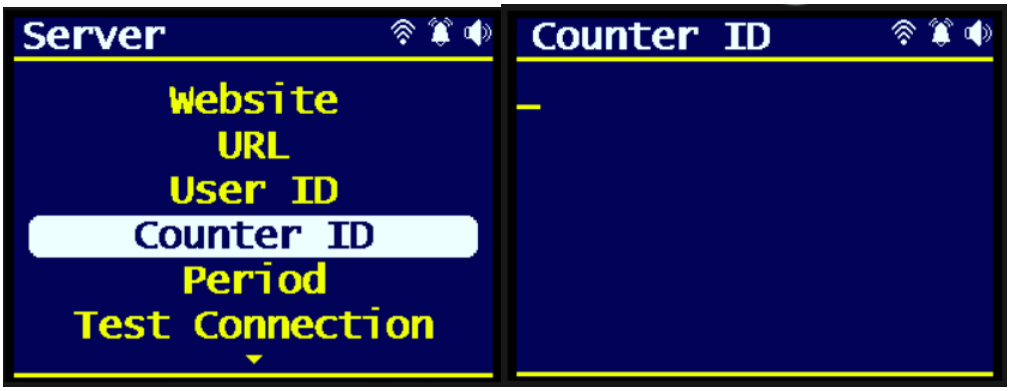


User ID

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

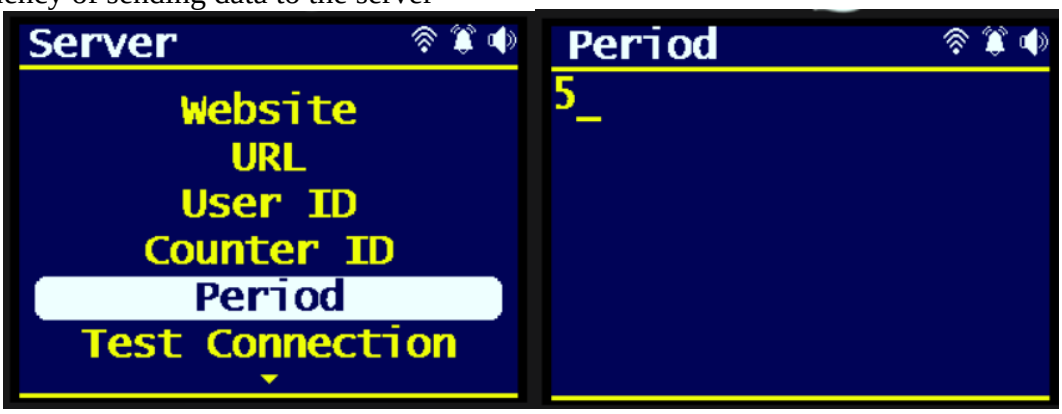


Counter ID



Period

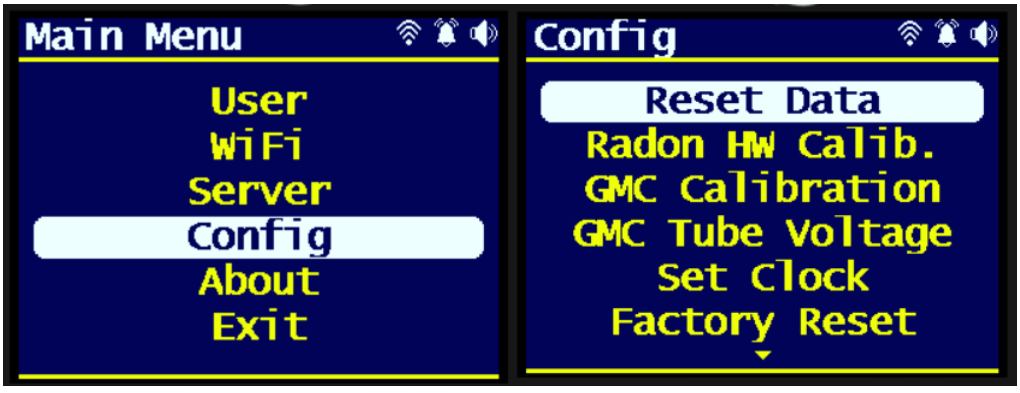
Frequency of sending data to the server



Test Connection

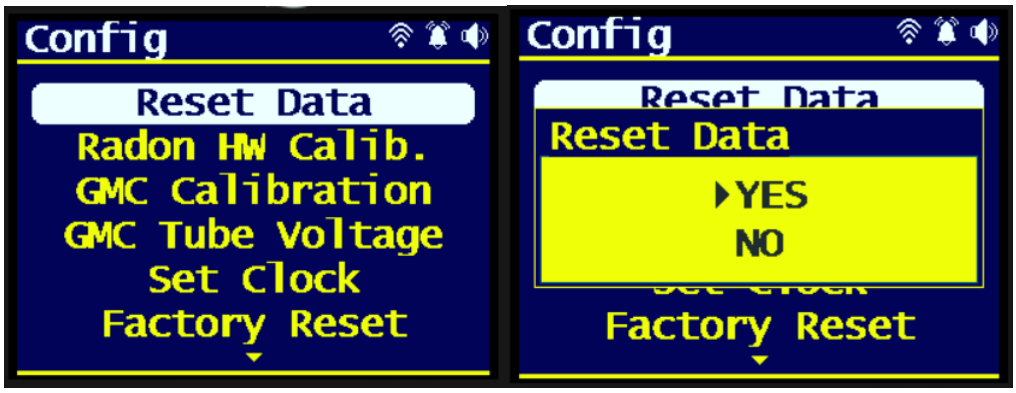
Tests the server connection. If everything is entered correctly, and Wi-Fi is connected, it will return a "Successful" message

Config Options



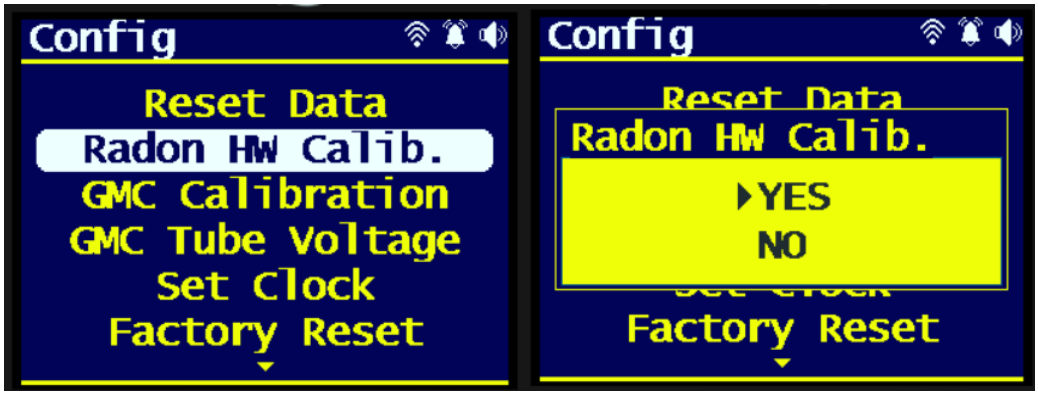
Reset Data

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.



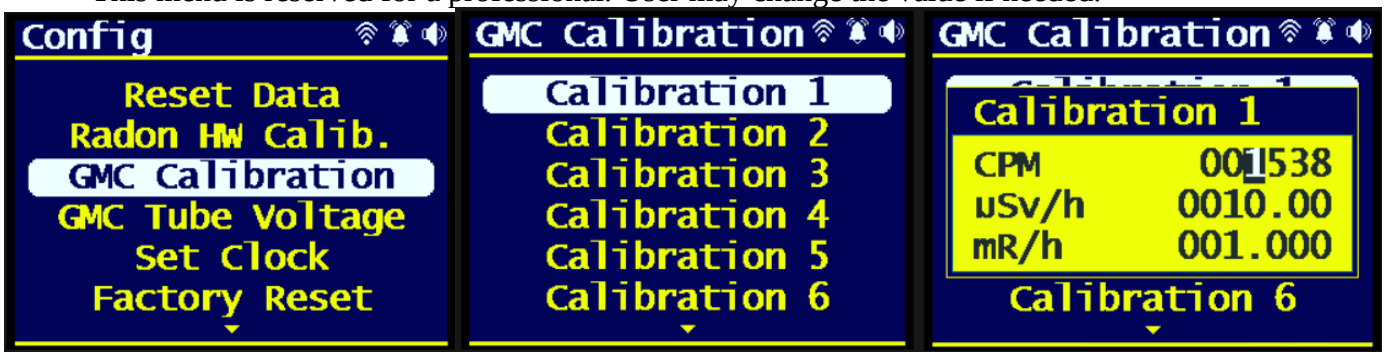
Radon Hardware Calibration

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



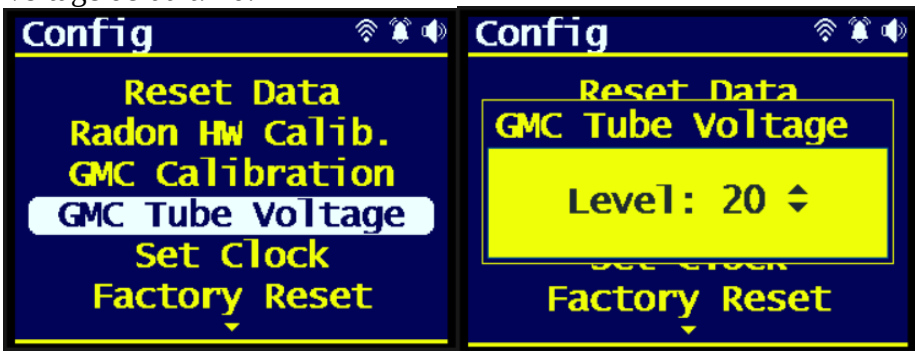
GMC Calibration Menu

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



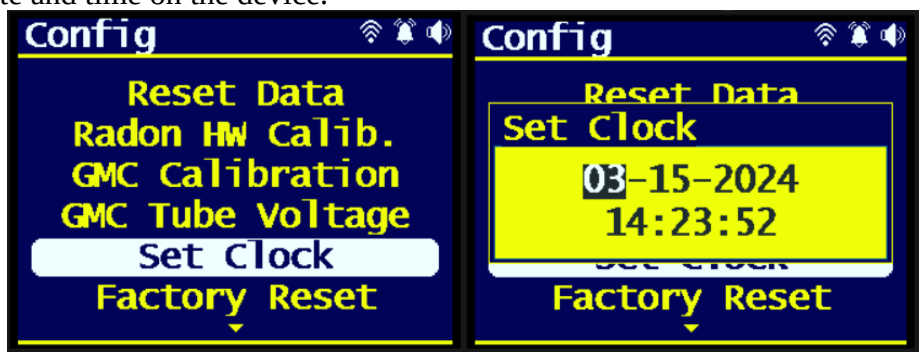
Tube Voltage

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



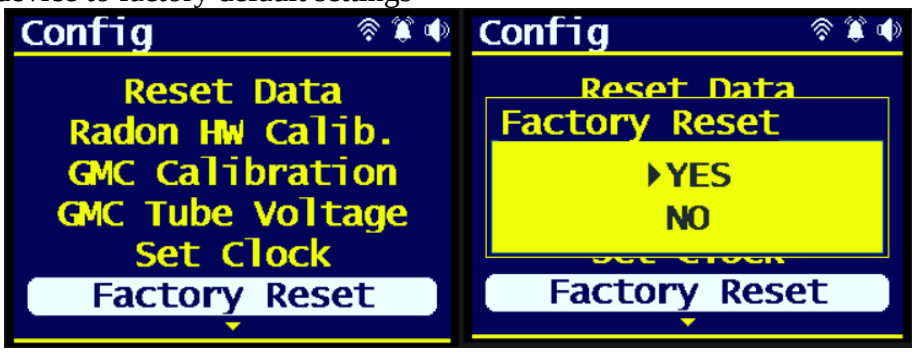
Set Clock

Sets the date and time on the device.



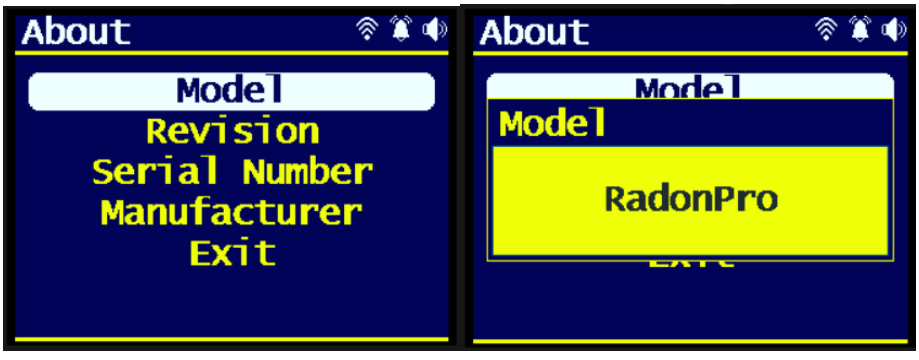
Factory Reset

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.

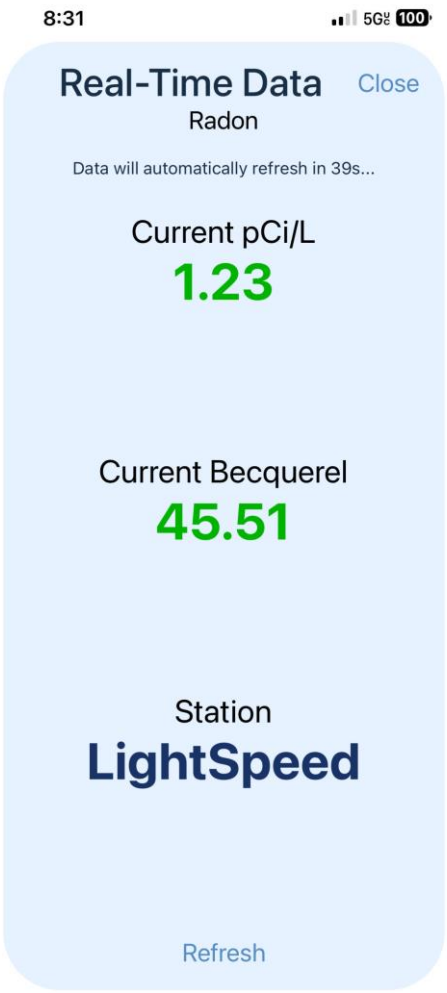
Mobile App GMCmap

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.

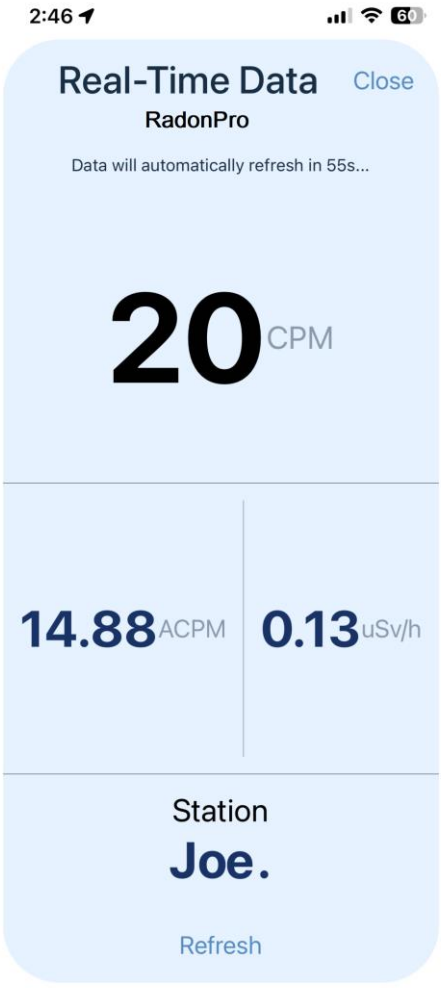
iPhone/iOS Apple app

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@ggelectronicsllc.com if you have any questions.

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

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