



# **GQ GMC-500/GMC-500+ Geiger Counter User Guide**



**GQ Electronics LLC**

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#### Document Revision History:

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## Overview

The GQ GMC-500/GMC-500+ digital Geiger Muller Counter is designed to be a portable and convenient device. It can be used as industrial, commercial maintenance, research, evaluation, simulation and other analytical or scientific applications in areas such as industrial plants, public utilities, universities, laboratories, and electronic repair shops. The device comes with built in audible and visual signals for the level of radiation detected. It can be used for radiation detection and monitoring both indoor and outdoor, as well as in other similar environments. It features automatic data recording. It can continually monitor the radiation and log the data each second into internal memory. When connected to a PC, software can download the radiation history data to the computer and the user is able to analyze those data later. The GQ GMC-500 installed a high contrast black/white LCD module, one front LED indicator and one analog data port. The analog data port can be connected to any third party device application as data input.

The GMC-500 installed a WiFi module, user is able to log the data via WiFi wirelessly.

The GMC-500+ installed a second high dose sensor tube to ensure the detection range up to ten times higher.

The device is equipped with an USB port, utilized for communication and external power supply/charging of the internal rechargeable Li-Ion 3.6V/3.7V battery.

The internal rechargeable battery can be charged with the a standard USB port, USB charger or with a computer USB port. Using the external power, continuous data monitoring is possible. Using either power adapter you will not have to worry about the batteries charge condition or any data loss.

The main board also has a real time clock on board for time related data logging purposes.

The GMC-500+ installed multiple sensors to ensure full scale/range measurement and higher accuracy. .

## Specifications:

<b>Range of dose rate indications, <math>\mu\text{Sv/h}</math></b>	0.00 to ~4250 (0.00 to ~42500 on GMC-500+)
<b>Range of exposure dose rate indications, mRem/h</b>	0.00 to ~425 (0.00 to ~4250 on GMC-500+)
<b>Range of registered beta radiation energy MeV</b>	0.25 to 3.5
<b>Range of gamma radiation energy, MeV</b>	0.1 to 1.25
<b>Range of registered X-ray radiation energy MeV</b>	0.03 to 3.0
<b>Reproducibility of indication</b>	10%
<b>Alarm levels by CPM</b>	0 to 655350 (continuously) 0 to 982980 (GMC-500+)
<b>Alarm levels by <math>\mu\text{Sv/h}</math></b>	0.00 to 4250 (42500 on GMC-500+)
<b>Alarm levels by mRm/h</b>	0.00 to 425 (4250 on GMC-500+)
<b>Date indication</b>	YYYY-MM-DD (continuously)
<b>Time indication</b>	HH-MM-SS (continuously)
<b>Elapsed time indication</b>	99 years(maximum)
<b>Timed Count</b>	1 Second to 256 days(programmable)
<b>Scheduled Timed Count</b>	0 Second to 256 days(programmable)
<b>Radiation detection</b>	$\beta, \gamma, x$
<b>Detectable Radiation Range</b>	0.1 ~ 3 MeV
<b>Instrument Background</b>	< 0,2 pulses/s
<b>Working Voltage</b>	3.6-3.7V
<b>Display</b>	LCD dot matrix, back lighted
<b>On board Memory</b>	1M Bytes flash memory for data storage
<b>Power: Consumption</b>	25mW – 125mW (count rate dependant)
<b>Power: Supply</b>	3.7V Li-Ion battery / USB power
<b>Dimensions</b>	135 x 78 x 25 mm(5.25"x 3" x 1")

## Packing List:

1. GMC-500/GMC-500+ main unit.
2. USB cable
3. Quick start guide
4. Download link for SoftGeigerCounter software and USB driver for Windows 32 and 64 bits (see Quick start guide)
5. Download link for a complete user guide in pdf version.

## How it works?

The GQ-500/GMC-500+ Geiger Counter installed Geiger tubes to detect radiation.

When the radiation pass through the Geiger tube, it triggers electrical pulses for the CPU to register as count. The basic count rate unit is CPM(Count Per Minute). The CPM count rate indicates the radiation level and it can be converted to a other traditional radiation units, such as  $\mu\text{Sv/h}$  or  $\text{mR/h}$ .

After unit turned on for one minute, it will show the background radiation reading. The background radiation reading (in CPM) indicates the nature radiation detected at that minute. This reading may change from time to time and location to location. To get accurate reading, user may need to get an average value over a longer time period.

The GM-500 built-in intelligent algorithm always select one of the most adequate sensors to measure the target, so that to guarantee the accuracy of the measurement.

## Caution

1. Avoid doing measurements when battery low.
2. Do not get the Geiger counter wet. Use sealed plastic bag to void wet.
2. Avoid doing measurements in direct sunlight.
3. Avoid directly contact the radioactive material. Use sealed plastic bag if needed.
4. Turn off the unit when not in use.
5. Keep it in a protective pouch after use.
6. When the unit not in use, store it in a dry place or box. This will avoid mechanical part be oxidized, such as button or battery contacting points.

-

## Background Safe Levels

Suggested background readings levels:

1. **Safe level.** Less than 50CPM or  $0.325\mu\text{Sv/h}$ . Means no worry at all.
2. **Attention level.** 51CPM – 99CPM. OR  $0.326\mu\text{Sv/h}$  –  $0.65\mu\text{Sv/h}$ . Means you need to find out why.
3. **Warning level.** More than 100CPM or more than  $0.65\mu\text{Sv/h}$ . Means do not stay in this area for long period.

## Hardware setup

There are four buttons on the front of the unit: **S1, S2, S3 and S4** (from left to right)

1. Power up the unit. Pressing the S4 (power) key for 3 seconds will turn on the unit. Check the battery level. Charge the battery fully when first time use. It may take a few hours to get the battery fully charged. Check the battery icon on the display, a fully charged battery icon will be filled with solid color, without flashing.
2. Set date/time. Press the S4 key to enter the menu and set the date and time. This is very important for time stamping the recorded data. Do not skip this step. Most of the data are related to the date and time.
3. Set the backlight timeout in second, in order to minimize the power consumption. Set the power savings mode. If the power savings mode is ON, then the LCD display will be turned off after 30 second if no key is being pressed during this period.
4. Now the unit is ready to use. You should see the background CPM rate in absence of a radioactive source.

Note: There is a transparent protective sheet covering the units surface. Users need to remove it to get better view of the LCD display.

## Software set up

Before connecting the GMC-500/GMC-500+ Geiger Counter to a computer, download the application software and install the USB driver. Download these from: <http://www.ggelectronicssl.com>.

1. The unit needs an USB driver in order to communicate with the application software. Running **GQGMCGeigerCounterUSBDriverV4.exe** will install the USB driver.
2. GMCDataviewer.exe is for viewing the data on a computer.
3. SoftGeigerCounterGMC500.exe is a soft copy of GMC-500 demo software.

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

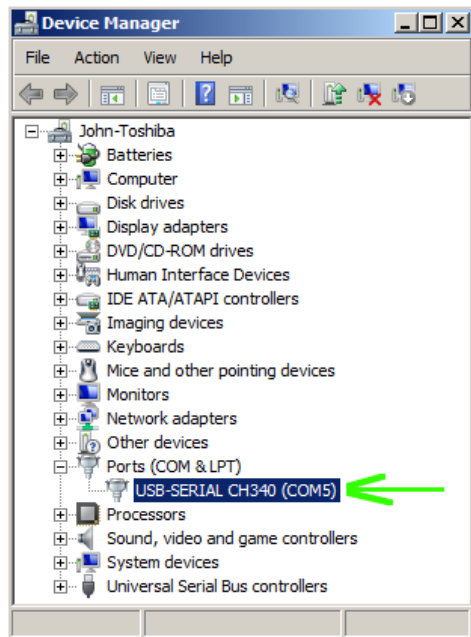
<http://www.GQElectronicsLLC.com/forum>

For the latest software, please visit our software download page:

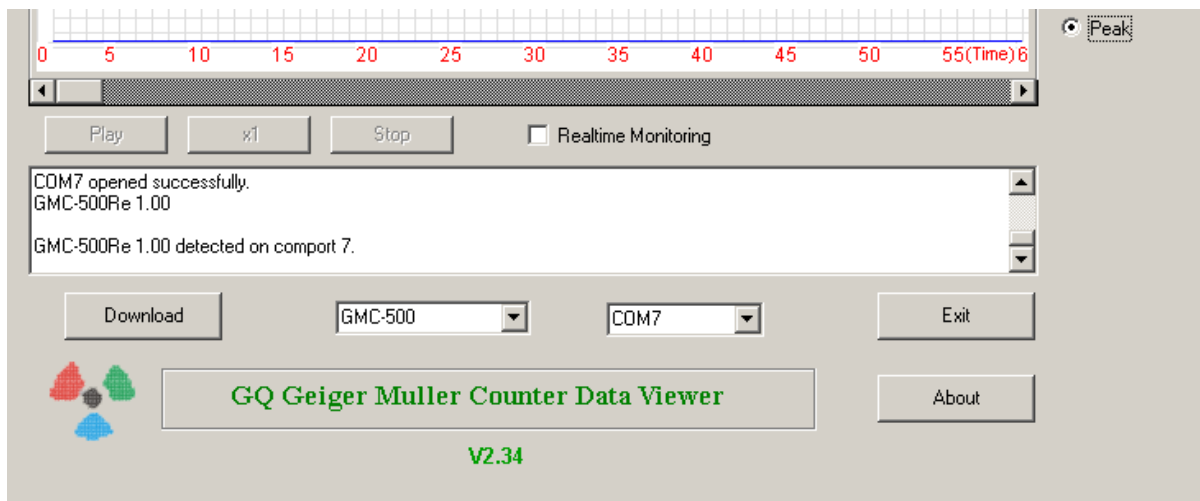
<http://www.ggelectronicssl.com/comersus/store/download.asp>

## Verify USB driver installation in Windows

Once the GMC-500/GMC-500+ is connected to a computer, from the device manger, you should see which COM port is assigned to the unit . See the example below. Windows assigned COM3 to the GMC-500 unit in this example.



For the data viewer or the data logger software, selecting COM5 will establish the connection to the GMC-500 Geiger counter for the above example





## GQ GMC Geiger Counter Multi-Function Keys

The multi-function keys S1,S2,S3 and S4 explained:



**Vertical Display Mode**



**Horizontal Display Mode**

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

### S1 key

1. There are three display modes: Text, Large Font and Graphic mode. Pressing the S1 key toggles between these modes.
2. In the menu screen, pressing the S1 key will exit the current menu and will return back one menu level.
3. In the data input mode, pressing the S1 key will delete the last character entered.

### S2 key

1. In text mode, pressing the S2 key will change the text information format.
2. In graphic mode, the S2 key will increase the graphic ZOOM factor.
3. In menu mode, the S2 key acts as the UP key to move the highlight menu item upwards.
4. In the menu mode, while a popup message box is opened, the S2 key changes the value by cycling through the predefined values.

### S3 key

1. In text mode, pressing the S3 key will change the displayed date/time selection.
2. In graphic mode, the S3 key will decrease the graphic ZOOM factor.
3. In menu mode, the S3 key acts as the DOWN key to move the highlight menu item downwards.
4. In the menu mode, while a popup message box is opened, the S3 key changes the value by cycling through the predefined values.

### S4 key

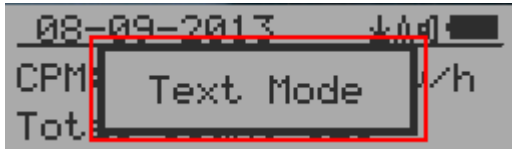
1. In power off state, only the S4 key acts as the power switch. Holding it for 3 seconds will power up the unit.
2. In power on state, holding S4 key for 3 seconds will switch the unit off.
3. In menu mode, S4 is the "Confirm", "Select", "Enter" key

## Power saving mode

The units factory default power saving mode is ON. In this mode, the unit will turn off the display after 30 seconds idle time. It turns on the LCD display when any key is pressed.

## Popup Windows

The 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.



## Graphic User Interface (GUI)

### Graphic Icons:



Graphic ZOOM factors: 0.5, 1.0, 2.0, AUTO



Battery Status.



Data saving enabled / (History data)



Alarm enabled



Sound enabled



Timed Count. It flashes if timed count in progress.



WiFi Connection



Current graphic ZOOM factor



Current CPM reading



History CPM reading



Total count since power on OR reset/clear.

**Average CPM:**

Average CPM of a specific time frame.

**Maximum CPM:**

Maximum CPM since power on.

**Normal**

Current radiation level is normal.

**Medium**

Current radiation level is medium.

**High**

Current radiation level is high.

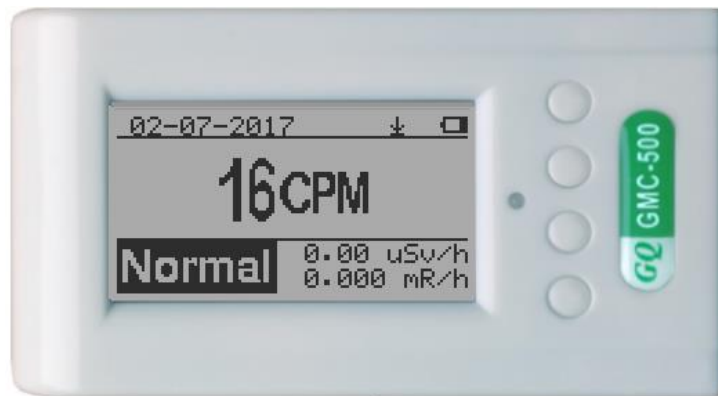
## Dual Display Modes

GMC-500 supports two display formats to fit user's display preferences: Vertical Display and Horizontal Display.

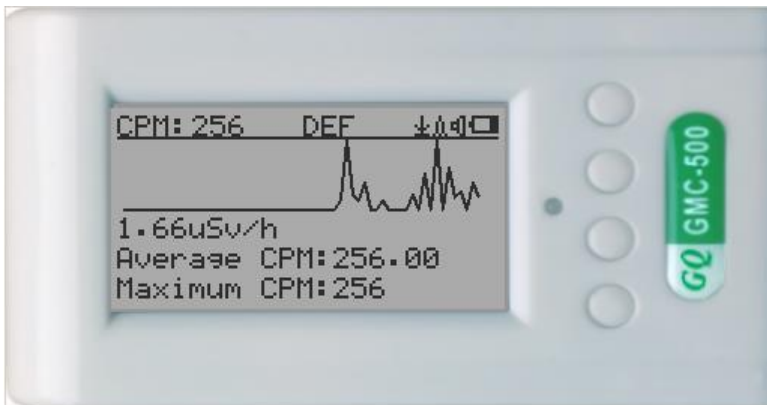
With the Horizontal Display, the user can select one information screen from: **Text**, **Graphic**, **Large Font** or **Menu**. The Vertical Display Mode displays **Large Font mode**..



**Vertical Display**



**Horizontal Display**

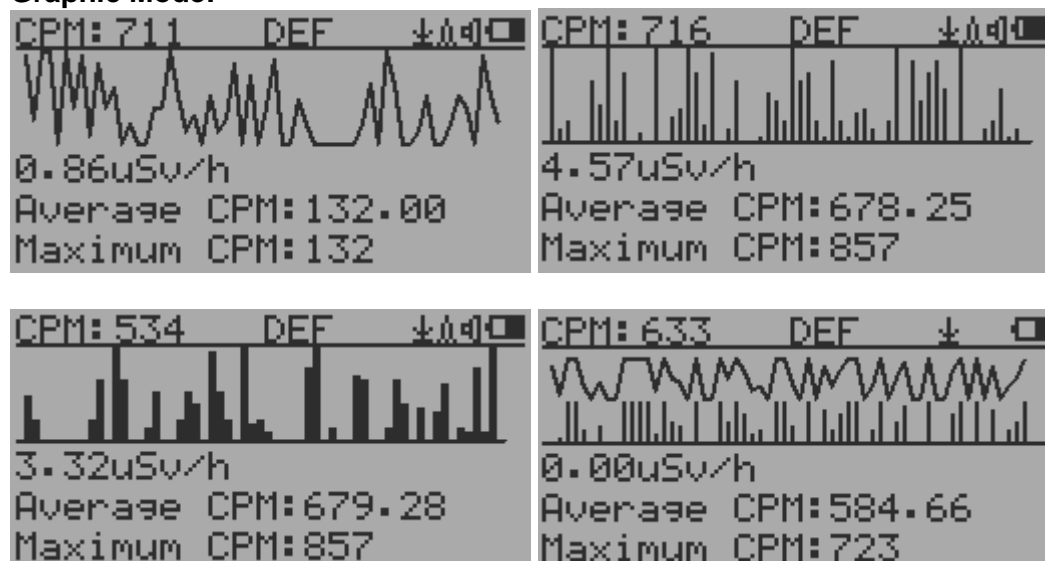


**Horizontal Displays**

## Display Modes

There are four ways to display the information, Text Mode, Large Font Mode , Graphic Mode and Timed Count

### Graphic Mode:

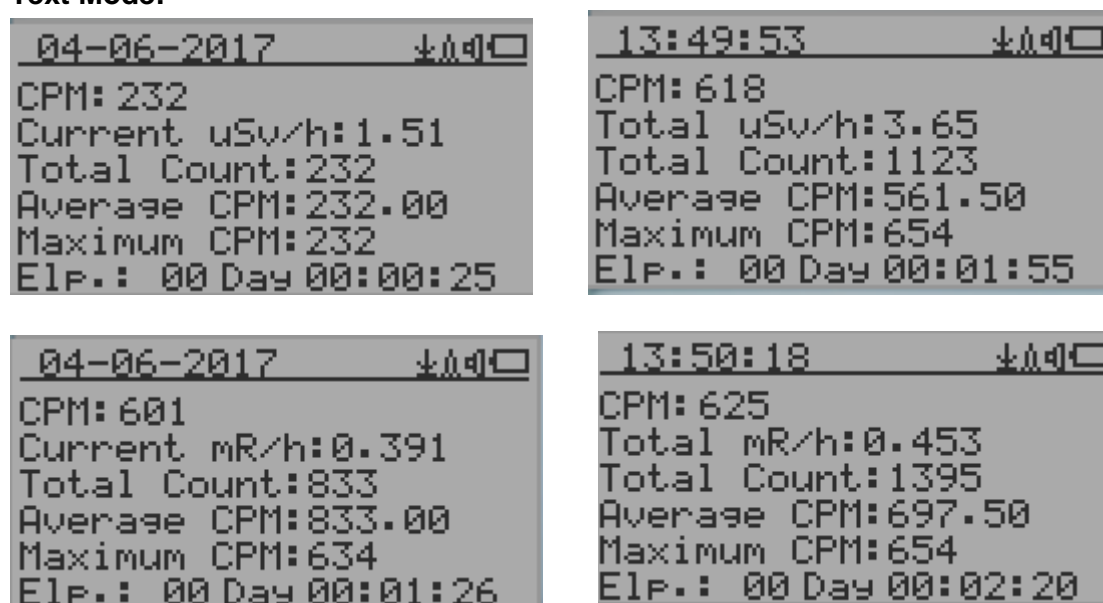


CPM: 606 Current radiation level reading in CPM format (Counts Per Minute)



CPS(Count Per Second) in last 60 seconds.

### Text Mode:



08-09-2013 , 15:29:36

Current date and time (Press S3 for toggling between date and time)

CPM: 554

Current radiation level reading in CPM

Current uSv/h: 4.95

Current radiation level in  $\mu$ Sv/h or

Current mR/h: 0.414

mR/h format

Total Count:10052

Total mR:0.432

Total count.

Total cumulated radiation dose in mR since power on.

Total uSv:4.26

Total cumulated radiation dose in uSv since power on.

Elp.:00 Day 00:16:34

Elapsed time since power on

(Press S2 for toggling displayed info)

Maximum CPM:30

Maximum CPM since power on

Average CPM:28.25

Average CPM since power on.

#### Navigation keys for both modes:

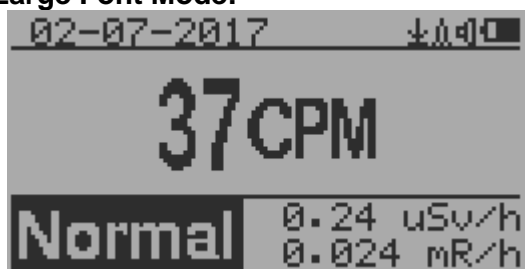
S1: Text/Graphic Display Mode Selection

S2:  $\mu$ Sv/h, mR/h, Total Count, Elapsed Time selection

S3: Date or Time on title selection

S4: Menu

#### **Large Font Mode:**



08-09-2013 , 15:29:36

Current date and time (Change it in Text Mode)

S2 key toggles between CPM,  $\mu$ Sv/h and mR/h mode

#### Navigation keys:

S1: Text/Graphic/Large Font Display Mode Selection

S2:  $\mu$ Sv/h, mR/h, CPM selection →

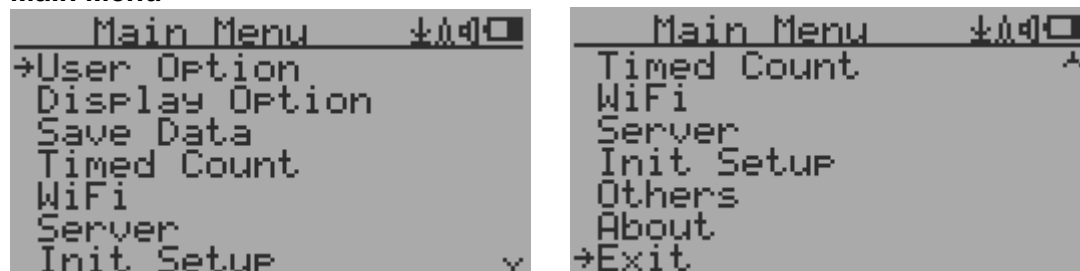
S3:  $\mu$ Sv/h, mR/h, CPM selection ←

S4: Menu

**NOTE:** Large Font Mode is available in firmware Ver. 2.20 or later only

## Menu Display

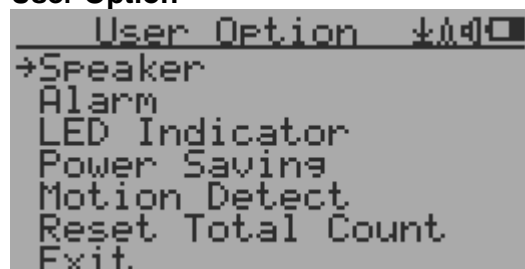
### Main Menu



#### Navigation keys:

S1: Back   S2: Up   S3: Down   S4: Select/Enter

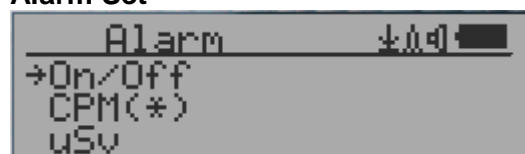
### User Option



#### Navigation keys:

S1: Back   S2: Up   S3: Down   S4: Select/Enter

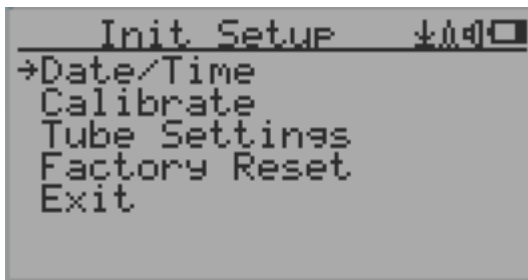
### Alarm Set



#### **CPM(\*)**

Currently the CPM alarm mode is selected  
The audio alarm will be triggered once the radiation level reaches the preset alarm threshold.

## Date and Time setting



### Navigation keys:

S1: Back/Exit

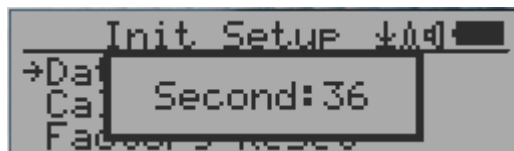
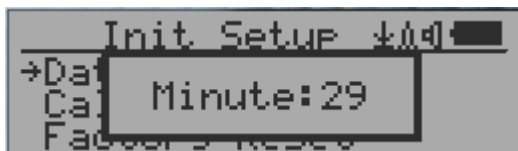
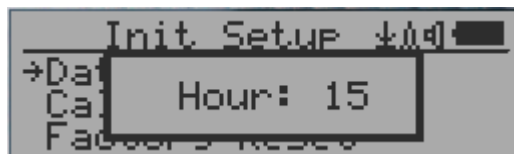
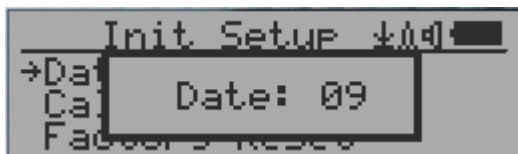
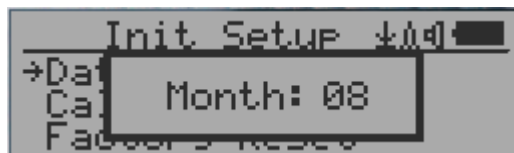
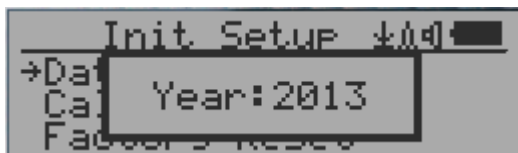
S2: Increase value by 1 (or hold the key down )

S3: Decrease value by 1 1 (or hold the key down)

S4: Select setting mode between Year, Month, Date, Hour, Minute and Second.

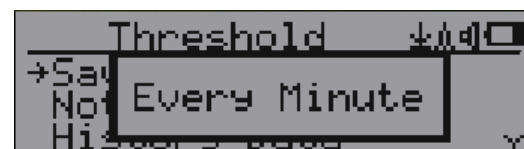
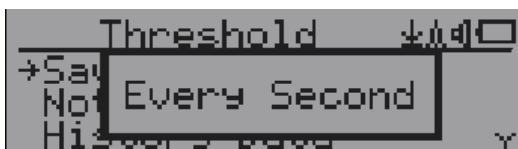
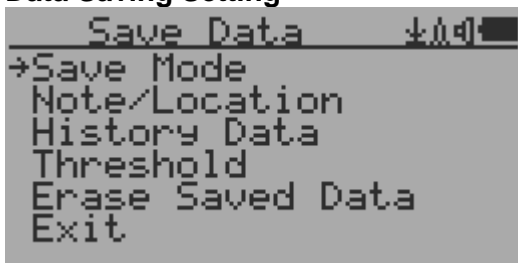
Each key press will change the mode to be set.

**NOTE: Setting of Date and Time is important, all history data use Date and Time as a time stamp reference.**

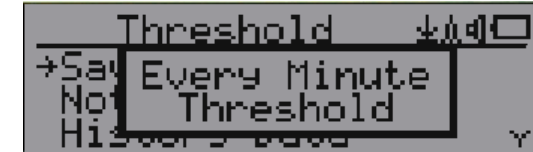
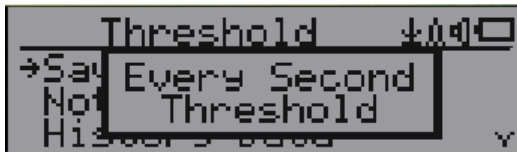
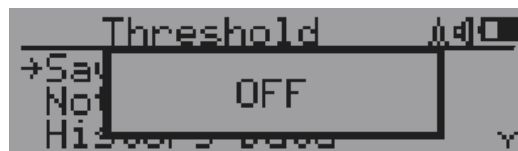
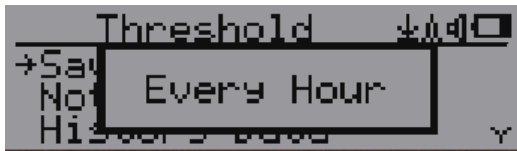


**NOTE:** you need to set the seconds to let unit complete the date & time setup.

## Data Saving Setting







Selecting this item will turn on/off the real time data saving from followings:

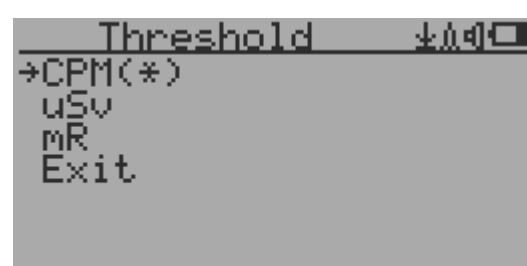
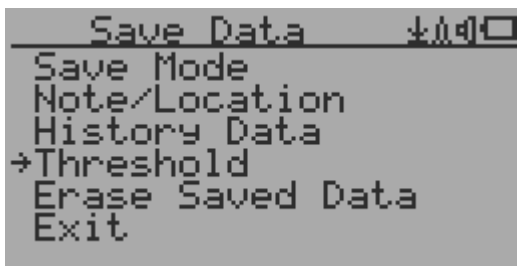
OFF -> Every Second ->Every Minute -> Every Hour->Every Second Threshold->Every Minute Threshold

**NOTE:** The history data memory will be used as a ring buffer. Once the end of the memory is reached, the oldest data will be over written. Carefully select the data saving interval to save memory space.

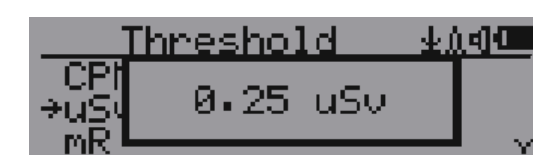
With Threshold saving mode, data only will be logged if it exceed the threshold value.

The data will not be logged while viewing history data in the History Data menu.

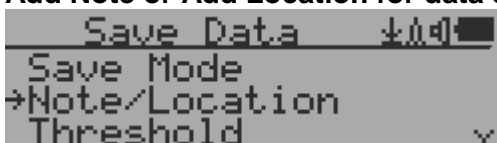
### Threshold Data Saving Setting



Select threshold type you want to use: CPM, uSv OR mR



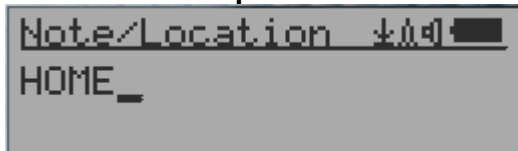
### Add Note or Add Location for data saving



The user may add a note with up to 16 characters into the history data to identify the measurement or location.

This note/location information will be saved together with the radiation data.

### Note/Location Input



The cursor indicates the position of current character input.

### Navigation keys:

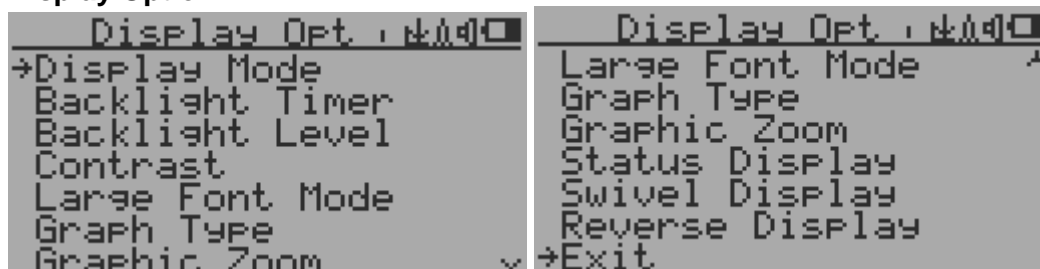
- S1: Backspace and erase
- S2: Move cursor right ←
- S3: Move cursor left →
- S4: Exit & Store

### Erase Saved History Data

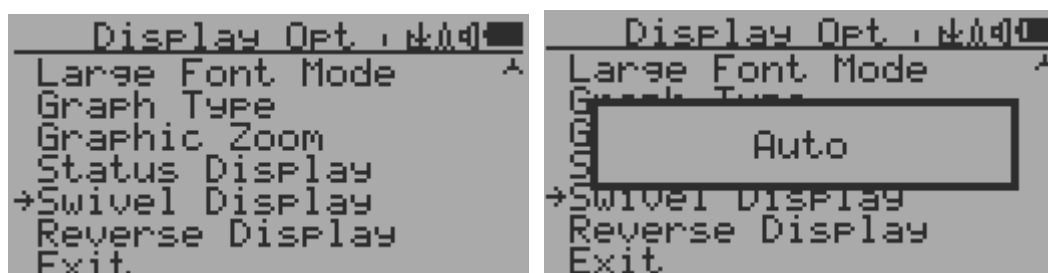


Use S2 and S3 to select Yes or No on the screen to confirm the request. After about 3 seconds with Yes confirmation, the unit will start to erase entire saved history data. It may take a few seconds to complete the task.

### Display Option



### Swivel Display Option

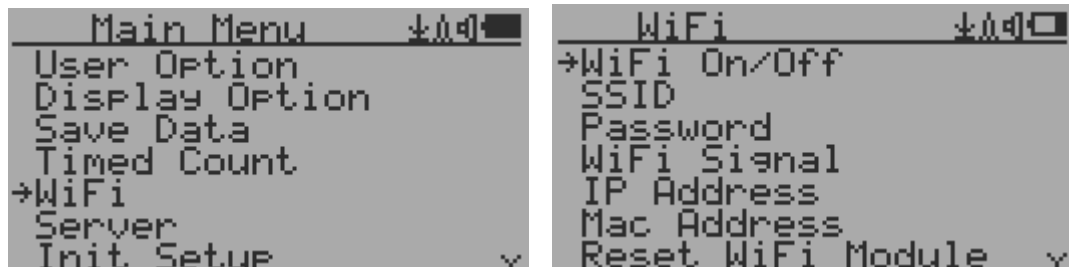


Pressing the S4 key will cycle between: Normal -> Swivel -> Auto Swivel modes

In the Auto Swivel mode, the display will be rotated by 180° if the unit is held upside down.

## WiFi Setup and Check

The WiFi tested with 802.11 n , 802.11 g/n, ,802.11 b/g/n under WPA2-PSK (AES), WEP, WPAWPA2-PSK (TKIP/AES) and Open security modes.

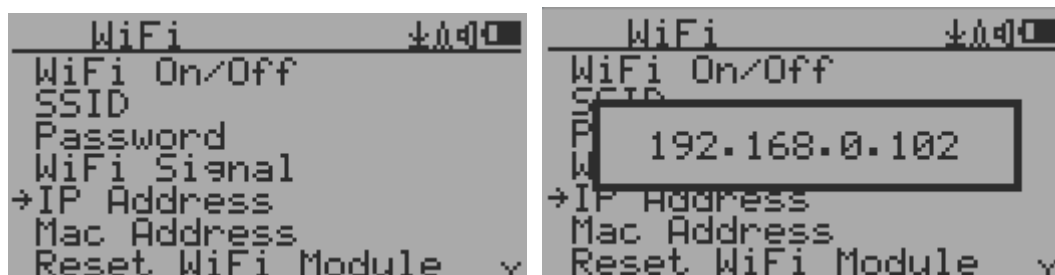


Select WiFi On/Off item will turn the WiFi connection On/Off

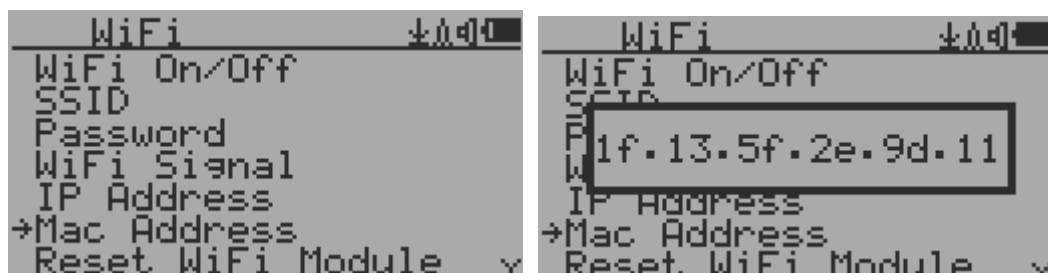
Make sure the WiFi SSID and Password have been set.

**Note: All WiFi settings available from GQ GMC Data Viewer Windows software for easier and faster setup.**

### WiFi IP address



### WiFi Mac address



### WiFi Signal Level Checking



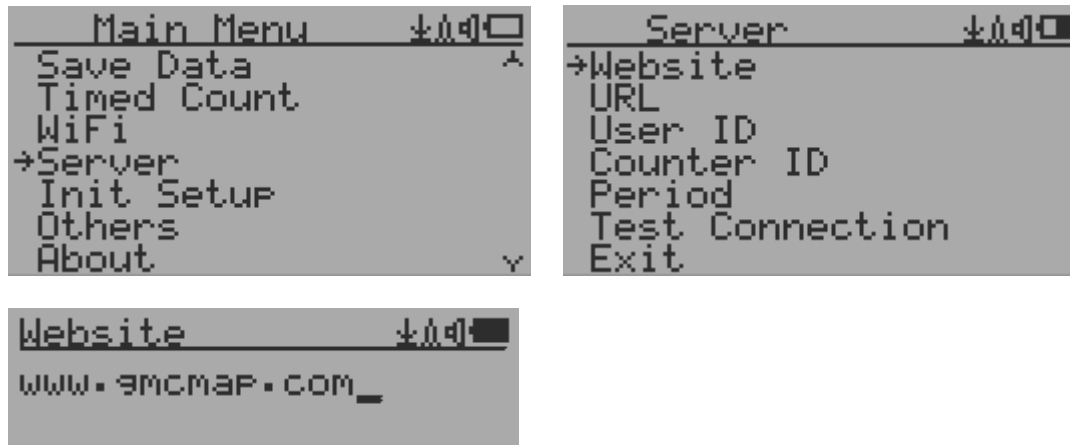
## Internet Data Server Setting

This menu setup is mainly for a data logging server. The unit data can be logged to a server automatically via WiFi internet HTTP connection.

Here is the default website server setup for: [www.gmcmap.com](http://www.gmcmap.com)

### Website server

User is able to change the server name to point to another http server.



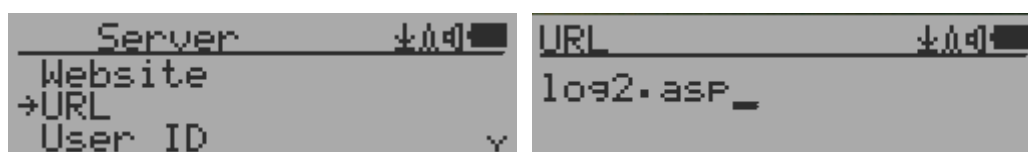
### URL for Website server

The default web server data receiving URL is log2.asp.

User is able to change the URL to user specific URL. However, the URL data parameters in a fixed format.

Example:

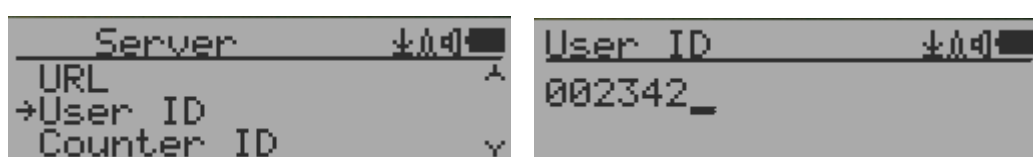
<http://www.GMCmap.com/log2.asp?AID=0230111&GID=0034021&CPM=15&ACPM=13.2&uSV=0.075>



### Website server User ID

Each data submission has a user ID. The user ID is the user account ID from the data server. It will send to server with the data to log.

This is an example user ID from [www.gmcmap.com](http://www.gmcmap.com)



## Website server Geiger Counter ID

Each data submission has a Geiger Counter ID. The Geiger Counter ID is a unique ID in data server database. It will send to server with the data to log.

This is an example Geiger Counter ID from [www.gmcmap.com](http://www.gmcmap.com)



## WiFi Data Logging Period

The default data logging period is 2 minutes. This will let unit to log the data to website server every two minute.

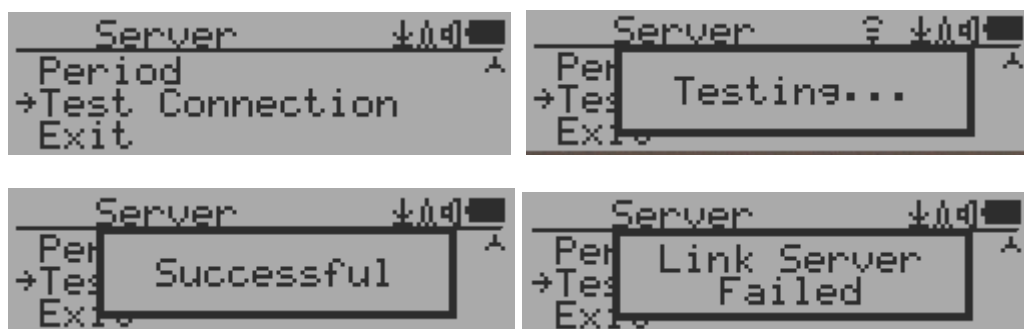
User is able to change the period from 1 to any minutes.



## WiFi Data Logging Testing

User can test the server settings anytime to confirm the server settings are working.

The result will be either Successful or Link Server Failed.



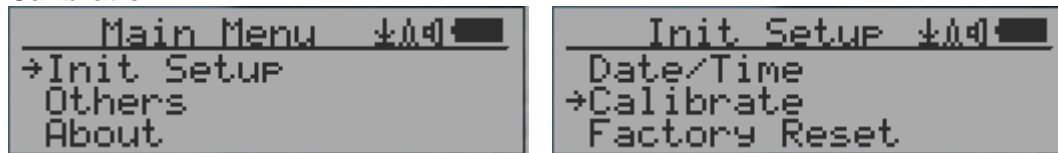
**Note: All Server settings available from GQ GMC Data Viewer Windows software for easier and faster setup.**

## Calibrate the reading

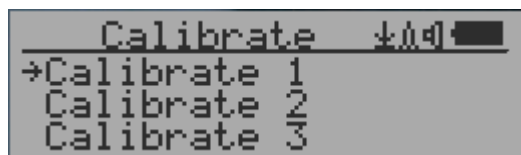
You do not need to do the calibration if you just want to qualitatively detect radiation. However, if you have standard radiation sources with known  $\mu\text{Sv/h}$  value, you may calibrate the instrument to get accurate readings.

The factory default calibration value is for general in-door and out-door measurements.

### Calibration



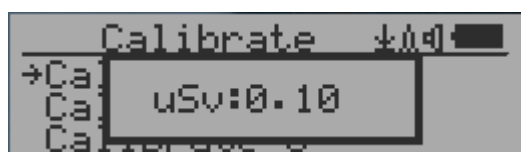
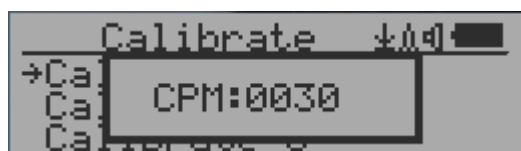
Select Calibrate from the Main Menu. There are three points provided for calibration.



Each calibration point needs two values to be entered, the CPM value and the  $\mu\text{Sv/h}$  value. The user can enter up to three calibration points from large to high count rates.

#### Procedure:

1. Place the testing radiation source ~30mm away to the center of unit Geiger Tube side. In Text or Graphic mode, wait for at least 3 minutes.
2. Note the CPM value.
3. Select Calibrate menu item on the device, then input both the CPM value you noted and the known  $\mu\text{Sv/h}$  value of the calibration source.
4. Wait for the popup window to close to save the data for this calibration point.
5. Continue with step 1 with other calibrated radiation sources.



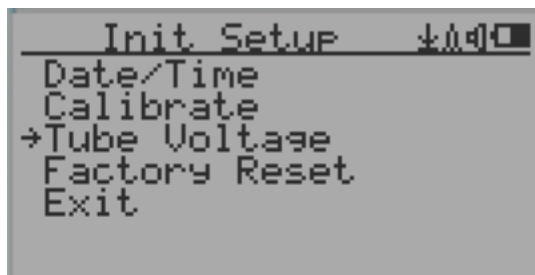
#### Navigation keys:

- S1: Back/Exit
- S2: Increase the value by 10 CPM or  $0.1\mu\text{Sv/h}$  respectively
- S3: Decrease the value by 1 CPM or  $0.01\mu\text{Sv/h}$  respectively
- S4: Toggle input data type between CPM and  $\mu\text{Sv/h}$

### Tube Voltage (GMC-500 only)

The menu allows advanced user to configure a specific sensor tube voltage.

Factory reset will remove all user settings to default.

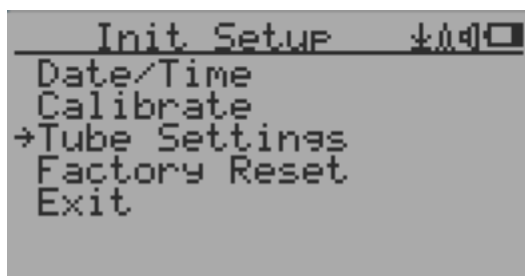


Tube1 Voltage: about 3 to 600V, Steps: 1 to 100, the voltage change is not in linear.

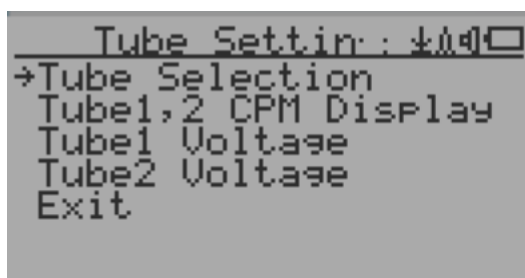
### Tube Settings (GMC-500+ only)

The menu allows advanced user to configure a specific sensor. User also allows to change the two tubes voltage independently.

Factory reset will remove all user settings to default.



Select Tube Settings to change tube settings on GMC-500+.



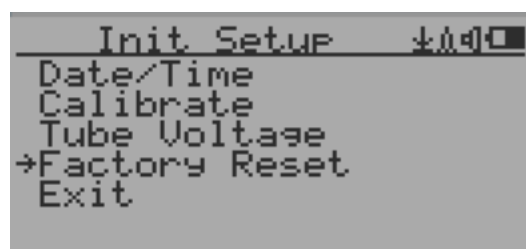
Tube Selection allow user to select the active tube: #1 high sensitivity tube, #2 high dose tube or Both.

Tube1,2 CPM Display enables individual tube readings on large font mode screen.

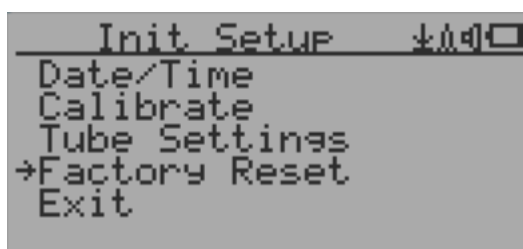
Tube1 Voltage: about 3 to 600V, Steps: 1 to 100, the voltage change is not in linear.

Tube2 Voltage: about 3 to 600V, Steps: 1 to 100, the voltage change is not in linear.

## Factory reset



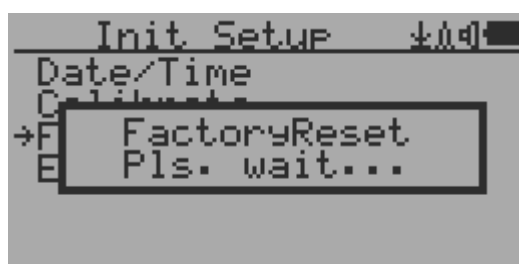
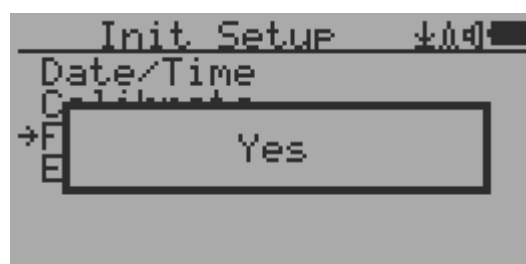
(GMC-500)



(GMC-500+)

Select Factory Reset to reset the unit to the factory default settings.

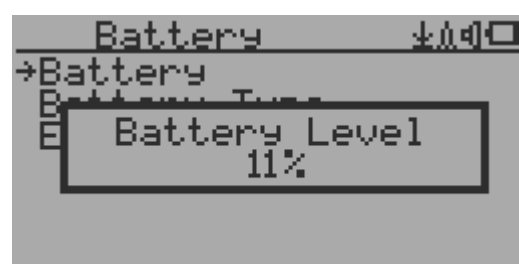
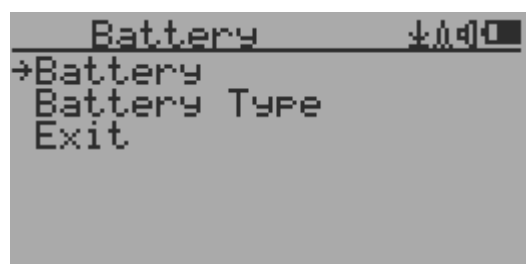
**Note:** The reset will erase all user settings and recorded history data.



Procedure:

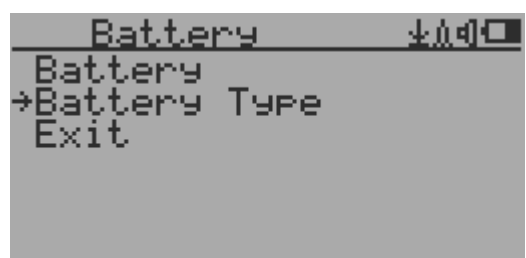
Select Factory Reset menu item and change the popup Windows message to Yes. Wait for popup message window's timeout to confirm the reset request. Any other key press will cancel the reset request. It may take up to 30 seconds to complete the reset.

## Battery Status

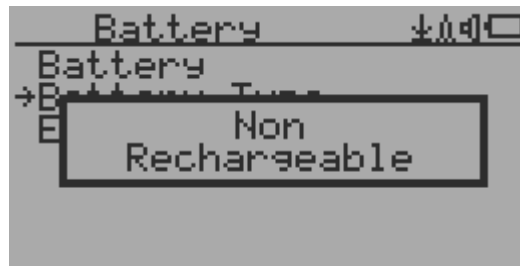
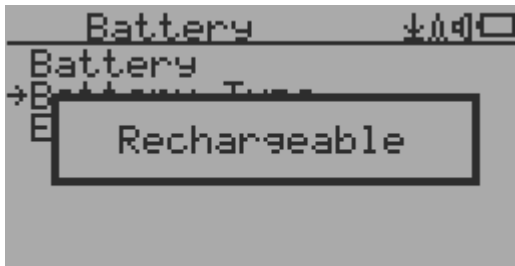


Select Battery submenu and Battery item for checking the current battery voltage.

## Battery Type

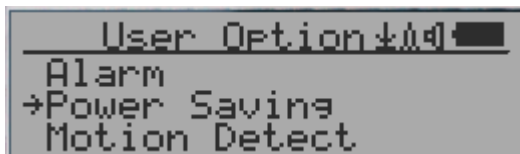






Select different battery type to match the installed battery type.

## Power saving mode



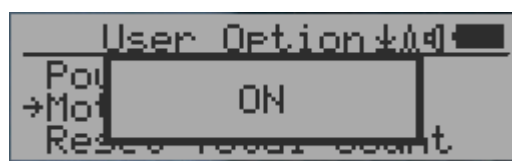
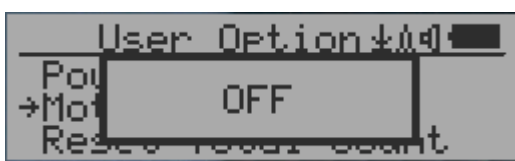
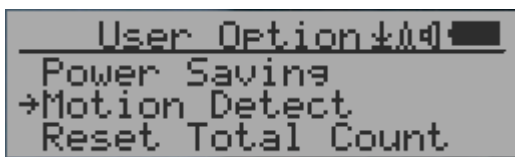
Pressing the S4 key will toggle the Power Saving mode ON and OFF.

In power saving mode, the units LCD display will be turned off after 30 seconds if no key is pressed to save battery power. The audio signal will not be turned off if it has been set to ON. The LCD back light will be off during the power saving mode.

Pressing any key will active the LCD backlight again.

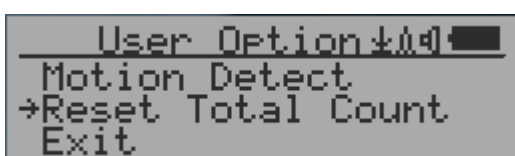
The unit movement does not weak up the unit if the motion detection is OFF.

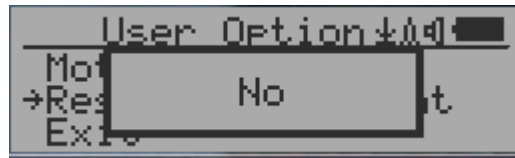
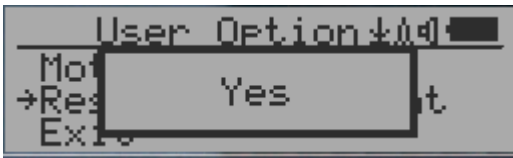
## Motion Detection



GMC-500 has motion detection feature. It can detect unit movement, upside down, single tap and double tap. Turn off the motion detection disables all motion related features.

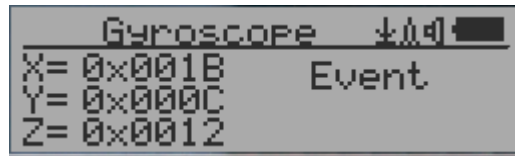
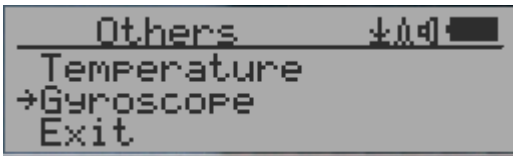
## Reset Total Count





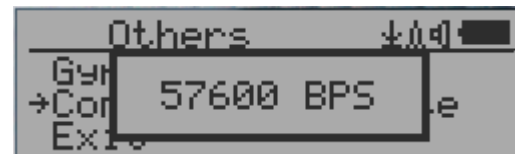
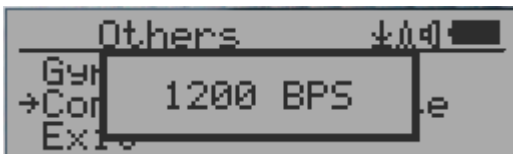
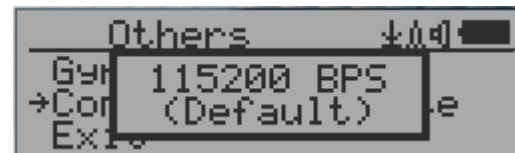
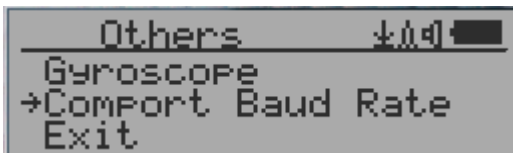
The Reset Total Count menu item let user to clear the total count on main text mode screen. This may be used before a fixed time count measurement start.

### Gyroscope Data Display



The internal digital accelerometer is able to provide real-time gyroscope data. It displays current unit X,Y,Z axis data and detected motion event. Such as single tap OR double tap.

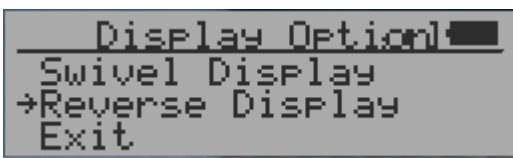
### Communication Baud Rate



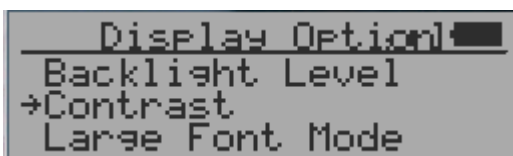
This Geiger counter serial communication baud rate is selectable from following value: 1200,2400,4800,9600,14400,19200,28800, 38400,57600,115200. Press S4 key changes baud rate.

The new baud will take immediate effect. The new value also be saved and used on next power up.

### Reverse Display



### Contrast Adjustment



Use S2 and S3 to adjust the contrast level. The contrast level will be saved and it will be used when the unit is ON.

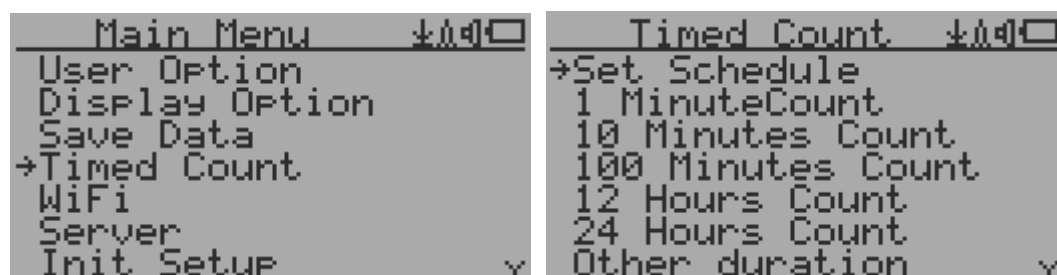
## Timed Count

The Timed Count can be started with a schedule OR without a schedule.

When it started with a schedule, the Timed Count will be started after a scheduled time period passed. This is useful if a testing target is not ready immediately.

When it started without a schedule, the Timed Count will be started immediately once the timed count period is set.

The Timed Count can be set from the menu:



## Set a schedule



This example shows the schedule is set to 2 minute.

### Navigation keys:

- S1: Back/Exit
- S2: Increase the cursor position value
- S3: Decrease the position value.
- S4: Move the cursor to input data type between Day, Hour, Minute and Second.

## Set Timed Count Duration

There are 5 preset durations from menu: 1 minutes, 10 minutes, 100 minutes, 12 Hours and 24 Hours.

If the duration is not listed, then you can set a new duration (1 second to 256 days) from menu Other duration:



This example shows a 2 days duration is set for Timed Count.

#### Navigation keys:

S1: Back/Exit

S2: Increase the cursor position value

S3: Decrease the position value.

S4: Move the cursor to input data type between Day, Hour, Minute and Second.

#### **Start a Timed Count**

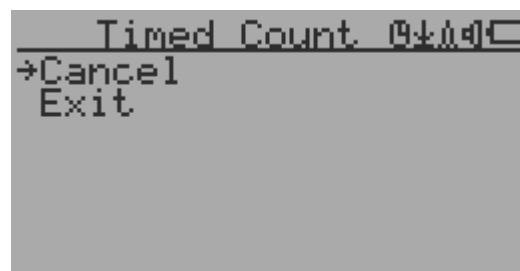
If no Schedule set, then the Timed Count starts immediately after the duration set.

If the Schedule is set, then the Timed Count will be started after a scheduled time period passed. This is useful if a testing target is not ready immediately.

Once the Timed Count schedule is active, the Timer icon will be showed on the top icon area.

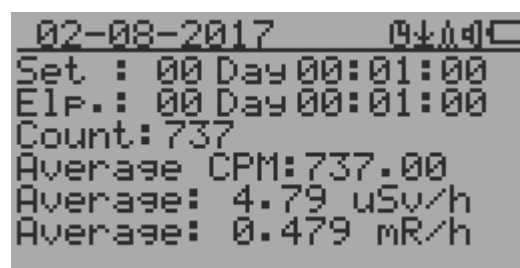


When the Timed Count started, the screen will pop up a message: Timed Count Started.



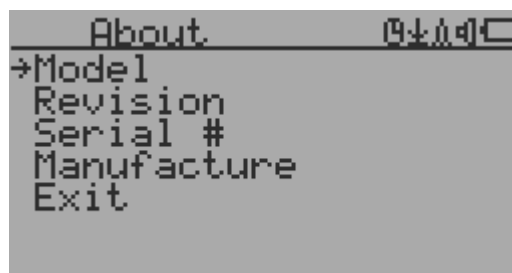
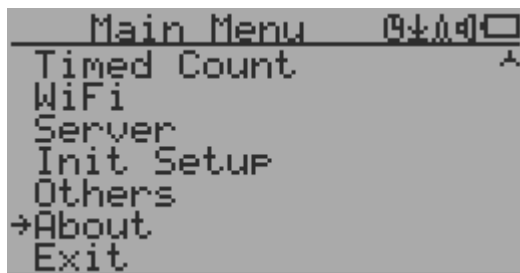
The Timed Count can be cancelled anytime.

Now you can exit the menu and see the Timed Count progress screen and information:

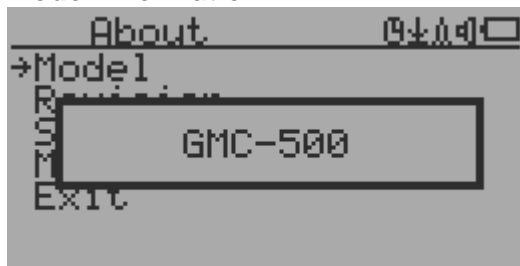


## About

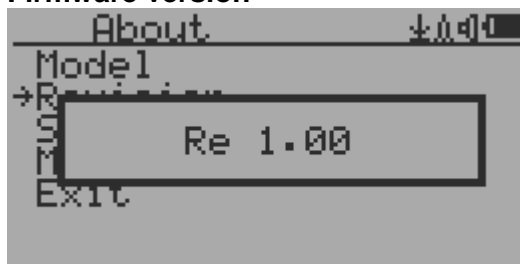
This menu item is used to gather information about the instruments model number, firmware revision and serial number.



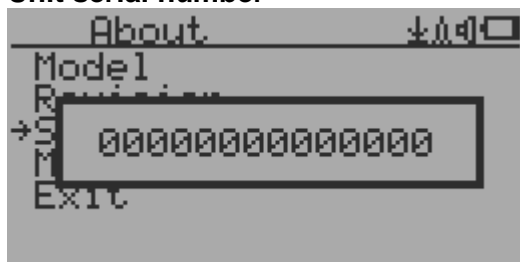
### Model information



### Firmware version

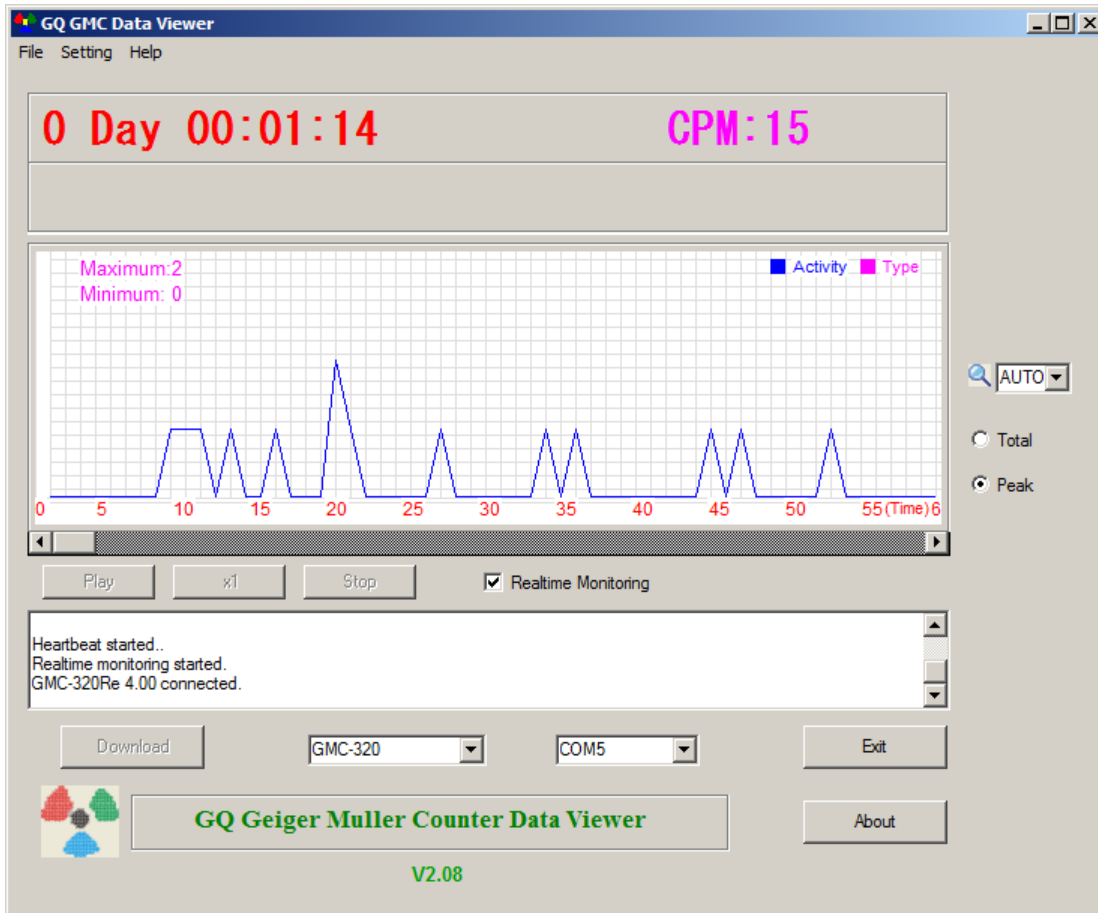


### Unit serial number



# GQ GMC Data Viewer Software

The GQ MGC Data Viewer software is a utility software comes with the GMC-500 package.

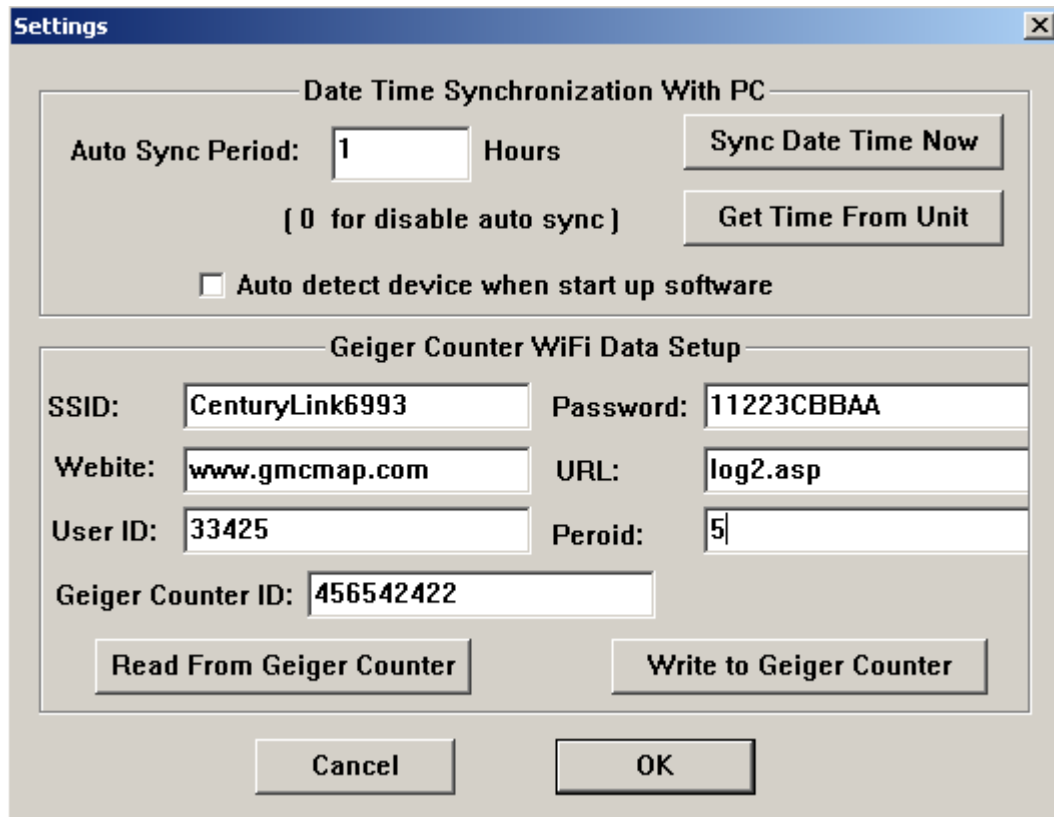


Main features:

- Download the history data from GMC-500
- Real time monitoring with graphic when it connected with GMC-500
- Save the history data in .bin OR .csv MS Excel format.
- Synchronize the data and time to GMC-500 with computer's data and time
- User defined automatic date and time synchronization period.
- GQ Terminal feature provide a detailed communication protocol exercise interface.

## WiFi Setup Utility

With Data Viewer software Settings menu, users are able to quick and easily setup the device WiFi connection and data logging.



The screenshot shows a 'Settings' dialog box with two main sections: 'Date Time Synchronization With PC' and 'Geiger Counter WiFi Data Setup'.

**Date Time Synchronization With PC**

- Auto Sync Period: 1 Hours
- [ 0 for disable auto sync ]
- ☐ Auto detect device when start up software
- Buttons: Sync Date Time Now, Get Time From Unit

**Geiger Counter WiFi Data Setup**

- SSID: CenturyLink6993
- Password: 11223CBBAA
- Website: www.gmcmap.com
- URL: log2.asp
- User ID: 33425
- Peroid: 5
- Geiger Counter ID: 456542422
- Buttons: Read From Geiger Counter, Write to Geiger Counter

At the bottom are 'Cancel' and 'OK' buttons.

## GQ Terminal

Comport information: **COM7,115200,n,8,1** Reconnect

Received in Hex Value:  
47 4D 43 2D 33 32 30 52 65 20 34 2E 30 39 Clear

Received in ASCII text:  
GMC-320Re 4.09 Clear

Last command in hexadecimal been sent to comport  
3C 47 45 54 56 45 52 3E 3E

Command Text Parameters in hexadecimal (E.g. 00 AE F0)  
< GETVER >>  
Send command with parameters

Key commands  
Key1 (S1) Key2 (S2) Key3 (S3) Key4 (S4)

Calibration

	Example	#1	#2	#3
CPM:	60	60	240	1000
uSv:	0.05	0.30	1.20	5.00

Read From Unit  
Max. 65535 CPM  
Write To Unit

Exit

The GQ Terminal provides an immediate access interface to the GMC-500 communication protocol.

Followings are click to send commands in software, for not listed commands user can type into the command box of software:

GETVER, GETSERIAL, GETCPM, KEY0, KEY1, KEY2, KEY3, SPEAKER0, SPEAKER1, ALARM0, ALARM1, GETVOLT, GETGYRO, GETCFG, GETCPS, GETTEMP, HEARTBEAT0, HEARTBEAT1, GETDATETIME, CFGUPDATE, POWEROFF, POWERON, SETDATETIME, FACTORYRESET

For detailed communication protocol commands, please see:

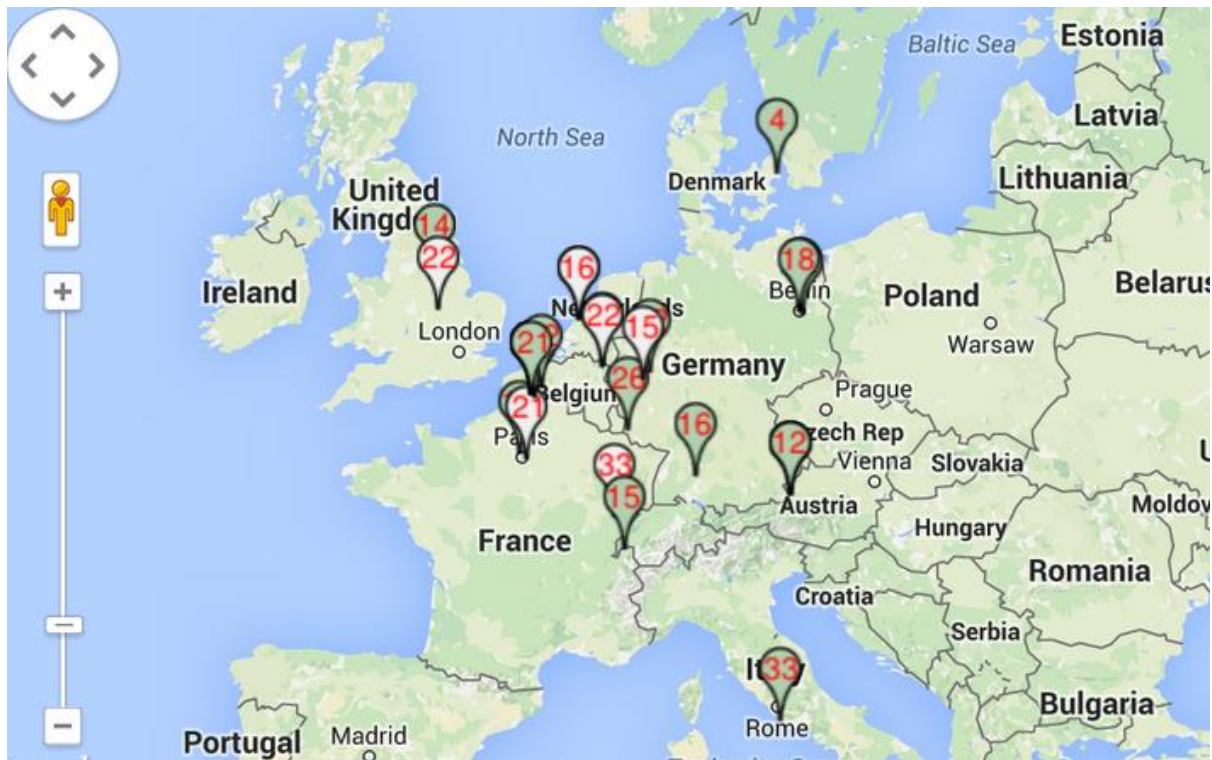
<http://www.ggelectronicsllc.com/downloads/download.asp?DownloadID=62>

An optional software is the GQ GMC Data Logger PRO. It is a generic software for different brand and model Geiger Counters. It has much more advanced features for advanced users.

See download page for the demo version.



# Online Geiger Counter World Map



[www.GMCmap.com](http://www.GMCmap.com)

The Geiger Counter World Map is free and open protocol map. Anyone can use it for free. It provides a free space to all Geiger Counter users.

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

## Software

The GMCmap accepts any software automatically submitted data.

The following tested software are free for automatic submit data feature.

1. GQ Geiger Counter Data Logger PRO (works on all Geiger Counter)
2. GQ Geiger Counter Data Viewer (works on GMC-300, GMC-320, GMC-500 series Geiger Counters)

Both software can be found and downloaded from GQ Electronics LLC download page

The GMC-500 series is able to submit the data via internal WiFi connection without other software.

## Auto Submit Data Protocol

In order to use automatically submit data, user has to be registered from 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/log.asp?id=UserAccountID+GeigerCounterID+CPM+ACPM+uSV>

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. GeigerCounterID: a global unique ID for each registered Geiger Counter. 3. CPM: Count Per Minute reading from this Geiger Counter . 4. ACPM: Average Count Per Minute reading from this Geiger Counter(optional). 5. uSv:  $\mu\text{Sv/h}$  reading from this Geiger Counter(optional).

Followings are valid data submission examples:

1. <http://www.GMCmap.com/log.asp?id=0230111+0034021+15+13.2+0.075>
2. <http://www.GMCmap.com/log.asp?id=0230111+0034021+15+13.2+0>
3. <http://www.GMCmap.com/log.asp?id=0230111+0034021+15+0+0>
4. <http://www.GMCmap.com/log.asp?id=0230111+0034021+0+13.2+0>
5. <http://www.GMCmap.com/log.asp?id=0230111+0034021+0+0+0.075>

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 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 has two holes on its back for hanging the unit on the wall for stationary monitoring of radiation and long term surveillance applications. With the wall adapter, it is able to monitor the data continuously, 24/7.



### Mobile Application

To use the unit in the car while driving, use a car USB power adapter to charge/power the unit. Position the unit where it can easily detect radiation, i.e. on the dashboard or similar locations in the car. You may need to fix the unit to an appropriate location for safety reasons.

## **Other technical details you may want to know**

### **Data Port**

This model has a 3.5mm analog data output port. It uses standard 3.5mm audio stereo plug, This port is not for the earphone. The audio signal is for third party device and software. The signal can be connected to other devices or computer microphone port directly.

### **USB Port**

The USB port is the standard mini-USB port. It is used for data communication, external power and the battery charger connection.

### **Data collection time**

The GMC-500 radiation data is collected continuously, and every second the measured data is being transmitted to the CPU for processing.

### **Extend battery operating time**

Turn on the Power Saving mode to extend the battery operating time. Turn off the speaker if it is not necessary. If a fully charged battery run-out in less than 5 operating hours, then the battery needs to be replaced. Use a standard 18650 (18 x 65.0 mm) rechargeable Li-ion battery.

The GMC-500 will operate normally when a non-rechargeable battery is installed. Select the battery type to none rechargeable battery from the unit menu.

### **Third party software developers**

The GMC-500 is an open application protocol product. Users are able to develop their own software based on the published GQ-RFC1201 protocol. We encourage you to share your generic software with other users. Please contact [support@ggelectronicssl.com](mailto:support@ggelectronicssl.com) if you have any questions.

You can find the GQ-RFC1201 protocol at the software download page.

<http://www.ggelectronicssl.com/comersus/store/download.asp>