# GMC-500+ Geiger Counter
# User Guide

## GQ Electronics LLC

Revision 2.0

Sep-2020

Document Revision History:

| | |
|---|---|
| Re 2.00, Aug-2020 | Added Dosimeter Mode |
| Re.1.50, Sep-2018 | Content revise |
| Re.1.40, Sep-2018 | Content revise for hardware v2.00 |
| Re.1.30, Sep-2018 | Data saving related content revised. |
| Re.1.20, Sep-2017 | |
| Re.1.01, Apr-2017 | |
| Re.1.00, Feb-2017 | |

# Table of Contents

User Guide ..... 1
Table of Contents ..... 3
Overview ..... 5
Specifications: ..... 5
Packing List: ..... 6
How it works? ..... 6
Caution ..... 6
Background Safe Levels ..... 6
Hardware setup ..... 7
Software set up ..... 7
Verify USB driver installation in Windows ..... 8
S1 key ..... 9
S2 key ..... 9
S3 key ..... 9
S4 key ..... **Error! Bookmark not defined.**
Power saving mode ..... 9
Popup Windows ..... 10
Graphic User Interface (GUI) ..... 10
Graphic Icons: ..... 10
Dual Display Modes ..... 12
Display Modes ..... 13
Graphic Mode: ..... 13
Text Mode: ..... 13
Large Font Mode: ..... 14
User Option ..... 16
Alarm Set ..... 16
Date and Time setting ..... 17
Data Saving Setting ..... 17
Threshold Data Saving Setting ..... 18
Add Note or Add Location for data saving ..... 18
Note/Location Input ..... 19
Erase Saved History Data ..... 19
Display Option ..... 19
Swivel Display Option ..... 19
WiFi Setup and Check ..... 20
WiFi IP address ..... 20
WiFi Mac address ..... 20
WiFi Signal Level Checking ..... 20
Internet Data Server Setting ..... 21
Website server ..... 21
URL for Website server ..... 21
Website server User ID ..... 21
Website server Geiger Counter ID ..... 22
WiFi Data Logging Period ..... 22
WiFi Data Logging Testing ..... 22
Calibrate the reading ..... 23
Tube Voltage (GMC-500 only) ..... 24
Tube Settings (GMC-500+ only) ..... 24
Select Tube Settings to change tube settings on GMC-500+. ..... 24
Factory reset ..... 25
Battery Status ..... 25
Battery Type ..... **Error! Bookmark not defined.**
Power saving mode ..... 25
Motion Detection ..... 25

Reset Total Count ..... 26
Gyroscope Data Display ..... 26
Communication Baud Rate ..... 26
Reverse Display ..... 27
Contrast Adjustment ..... 27
Timed Count ..... 27
Set a schedule ..... 27
Set Timed Count Duration ..... 28
Start a Timed Count ..... 28
About ..... 29
Model information ..... 29
Firmware version ..... 29
Unit serial number ..... 29
GQ GMC Data Viewer Software ..... 30
Online Geiger Counter World Map ..... 33
www.GMCmap.com ..... 33
Software ..... 33
Auto Submit Data Protocol ..... 33
Applications ..... 34
Stationary Application ..... 34
Other technical details you may want to know ..... 35
Data Port ..... 35
USB Port ..... 35
Data collection time ..... 35
Extend battery operating time ..... 35
Third party software developers ..... 35

## 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 Wi-Fi module, user is able to log the data via Wi-Fi 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 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:

| | |
|---|---|
| **Range of dose rate indications, µSv/h** | 0.00 to ~4250<br>(0.00 to ~42500 on GMC-500+) |
| **Range of exposure dose rate indications, mRem/h** | 0.00 to ~425<br>(0.00 to ~4250 on GMC-500+) |
| **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 |
| **Gamma Sensitivity $Co^{60}$ (cps/mR/hr)** | 23 |
| **Reproducibility of indication** | 10% |
| **Alarm levels by CPM** | 0 to 655350 (continuously)<br>0 to 982980 (GMC-500+) |
| **Alarm levels by µSv/h** | 0.00 to 4250 (42500 on GMC-500+) |
| **Alarm levels by mRem/h** | 0.00 to 425 (4250 on GMC-500+) |
| **Date indication** | YYYY-MM-DD (continuously) |
| **Time indication** | HH-MM-SS (continuously) |
| **Elapsed time indication** | 99 years (maximum) |
| **Timed Count** | 1 Second to 256 days (programmable) |
| **Scheduled Timed Count** | 0 Second to 256 days (programmable) |
| **Radiation detection** | $\beta$, $\gamma$, x |
| **Detectable Radiation Range** | 0.1 ~ 3 MeV |
| **Instrument Background Noise** | < 3 pulses/s |
| **Working Voltage** | 3.6-3.7V |
| **Display** | LCD dot matrix, back lighted |
| **On board Memory** | 1M Bytes flash memory for data storage |
| **Power**: **Consumption** | 25mW – 125mW (count rate dependent) |
| **Power**: **Supply** | 3.7V Li-Ion battery / USB power |

**Dimensions** 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 another traditional radiation units, such as µSv/h or 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 0.325µSv/h. Means no worry at all.
2. **Attention level**. 51CPM – 99CPM. OR 0.326µSv/h – 0.65µSv/h. Means you need to find out why.
3. **Warning level.** More than 100CPM or more than 0.65µSv/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 Main menu->Init Setup-> Date/Time submenu to 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 from Main menu->Display Options->Backlight Timer sub menu. User may enable the power saving mode from Main menu->User Options->Power saving Mode sub menu. 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 unit's surface. Users need to remove it to get better view of the LCD display.

## Software

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.gqelectronicsllc.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:

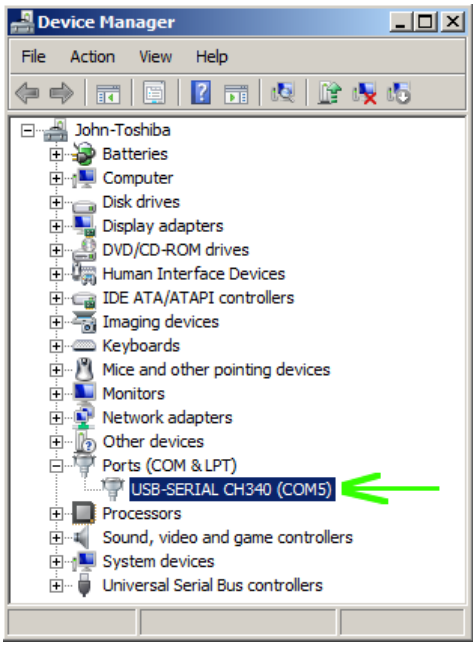
http://www.GQElectronicsLLC.com/forum

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

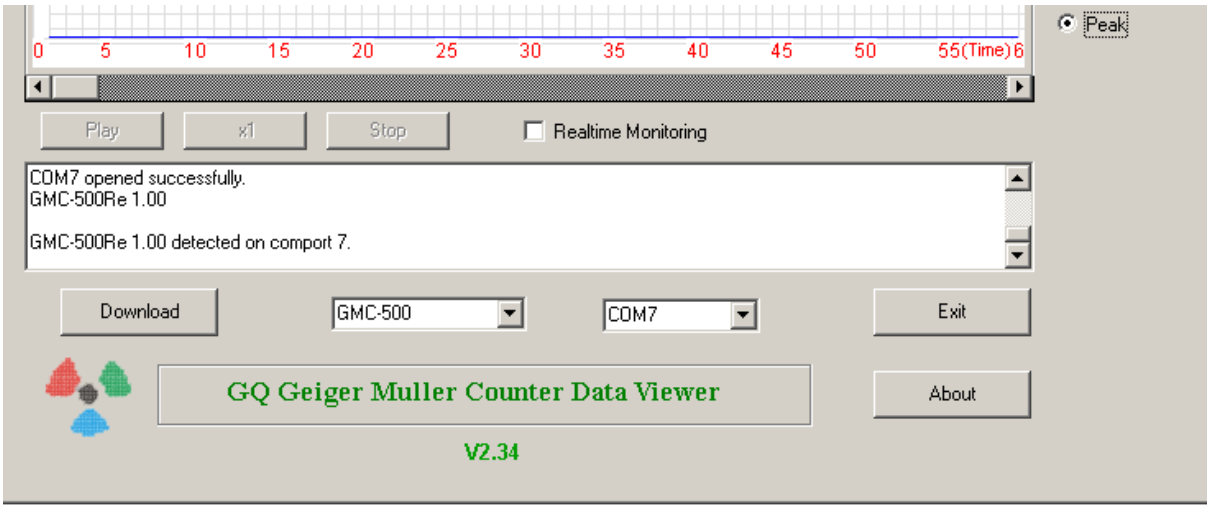
http://www.gqelectronicsllc.com/comersus/store/download.asp

## 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, Dosimeter, Graphic, and Food 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 he 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 unit's 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.

Wi-Fi 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.

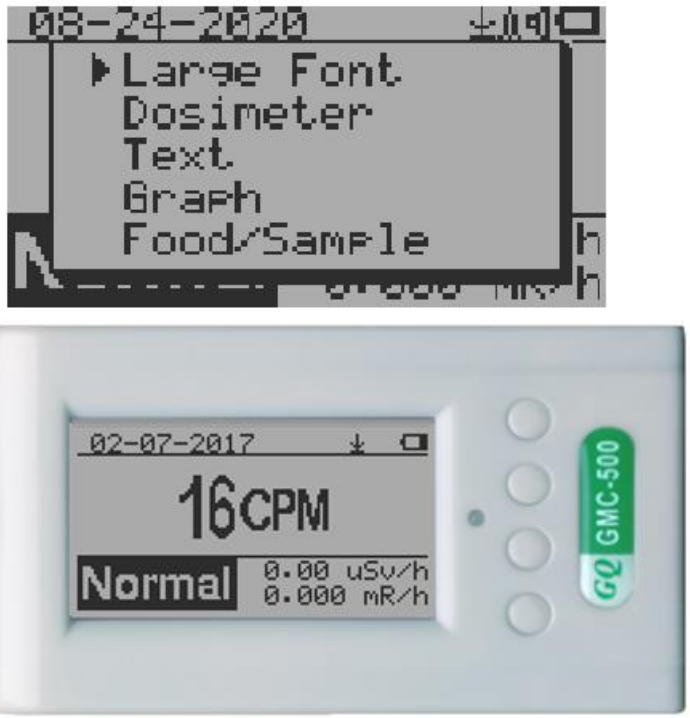
Medium Current radiation level is medium.

High Current radiation level is high.

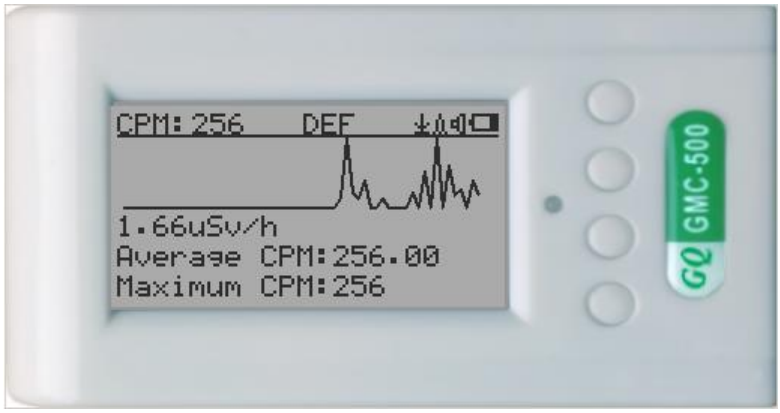
## Dual Display Modes

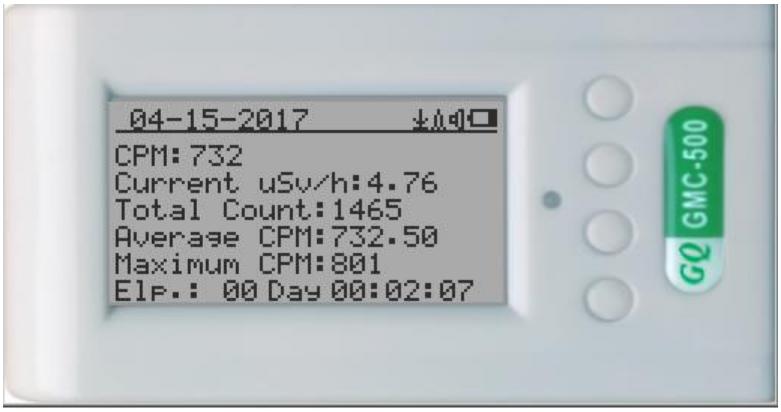
GMC-500 supports two display formats to fit user's display preferences: Vertical Display and Horizontal Display.

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**



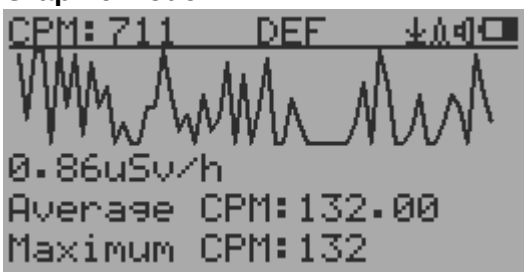



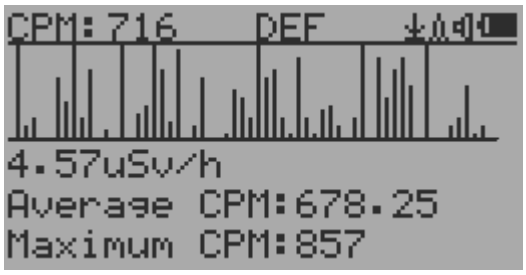

**Horizontal Displays**

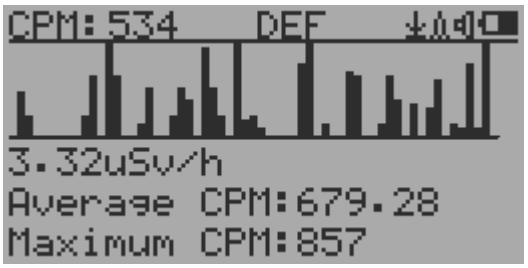
## Display Modes

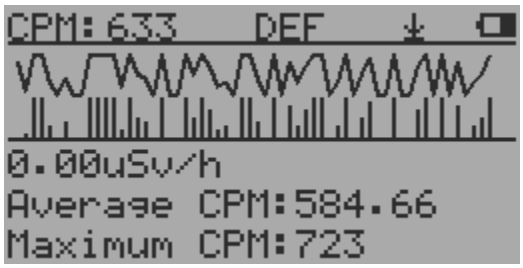
There are six ways to display the information, Large Font Mode, Dosimeter Mode, Text Mode, Graphic Mode, Food/Sample Mode, and Timed Count.

**Graphic Mode:**



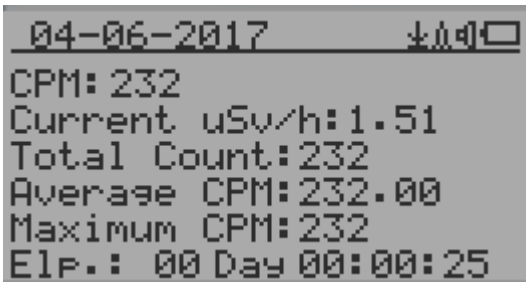



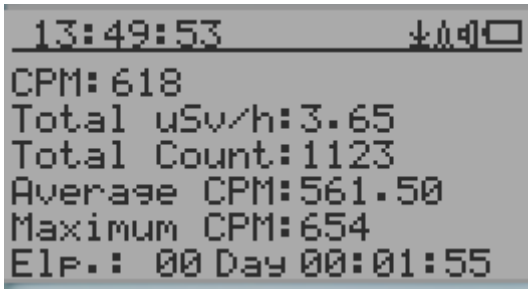



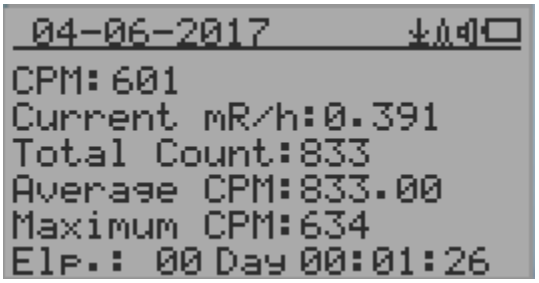
Current radiation level reading in CPM format (Counts Per Minute)

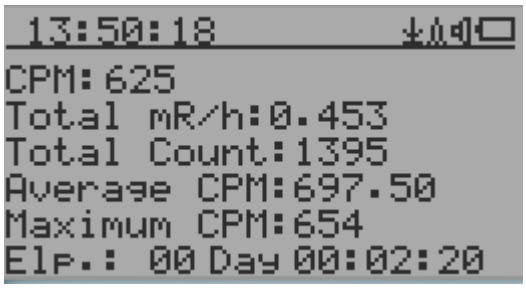
CPS (Count Per Second) in last 60 seconds.

**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 µSv/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
Average CPM:28.25

Maximum CPM since power on
Average CPM since power on.

Navigation keys for both modes:

S1: Text/Graphic Display Mode Selection
S2: µSv/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

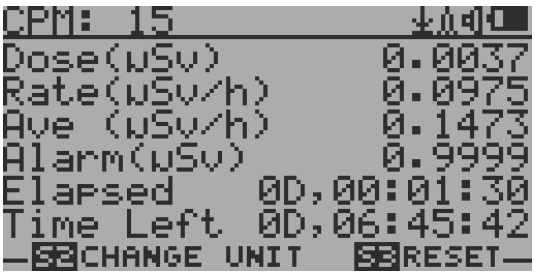
Current date and time (Change it in Text Mode)
S2 key toggles between CPM, µSv/h and mR/h mode

Navigation keys:

S1: Text/Graphic/Large Font Display Mode Selection
S2: µSv/h, mR/h, CPM selection →
S3: µSv/h, mR/h, CPM selection ←
S4: Menu

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

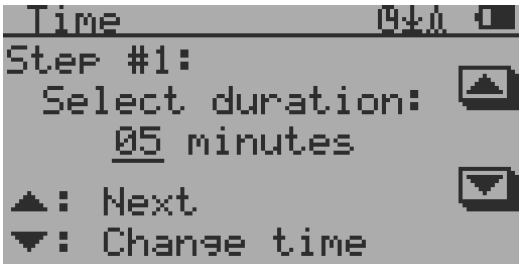
**Dosimeter Mode:**




Navigation keys:

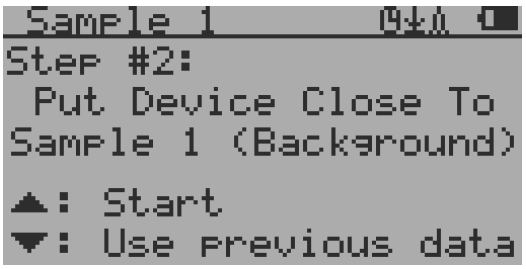
S1: Display Selection Mode
S2: µSv/h, mR/h, CPM selection ←
S3: Reset dose
S4: Menu

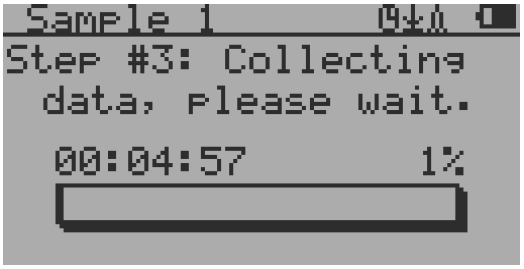
**Food/Sample Testing Mode**

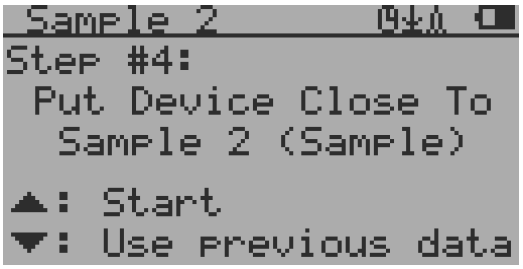


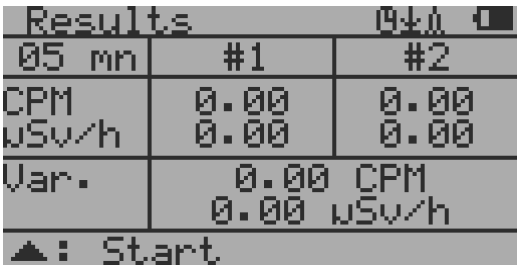

This mode can be used for comparing radiations between two samples. It can be also be used for comparing food radiation to the background.

The first step is choosing the time duration. Pressing the Down Button will update the time, and S3 button to proceed.





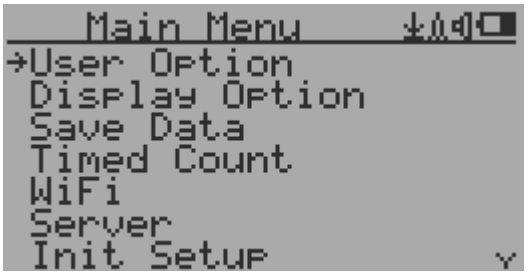

Step 2-5 is for collecting radiation data between samples.

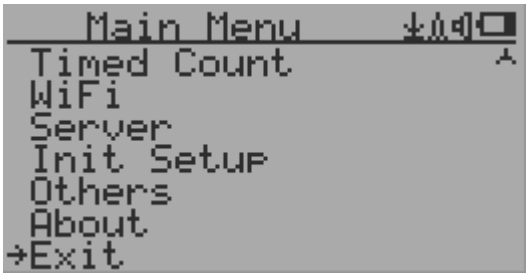
Results screen will popup after step 5 is finshed.

The data collecting process can also be canceled by pressign the S2/Down Button.

## Menu Display

**Main Menu**

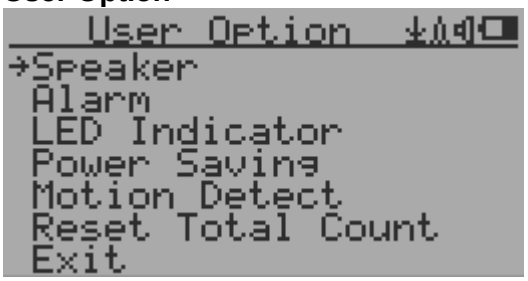



<u>Navigation keys:</u>

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

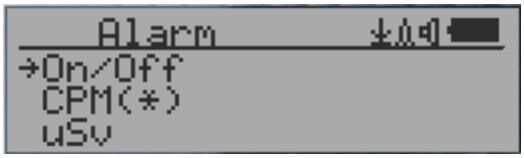
**User Option**




Navigation keys:

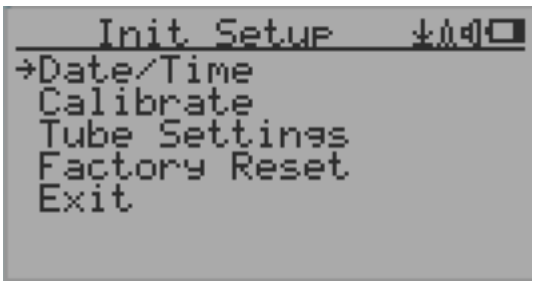
S1: Back  S2: Up  S3: Down  S4: Select/Enter

**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.

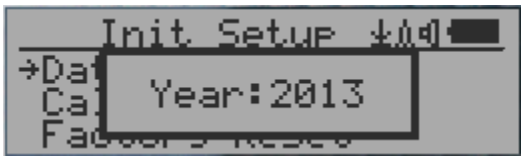
Date and Time setting

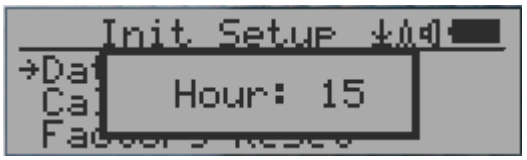



Navigation keys:

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.

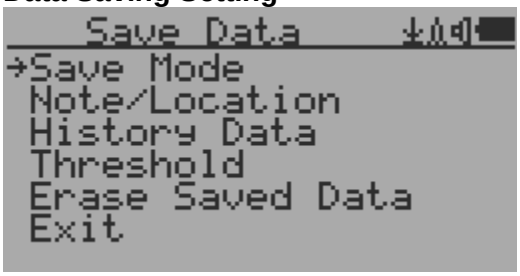
**NOTE: Setting of Date and Time is important, all history data use Date and Time as a time stamp reference.**

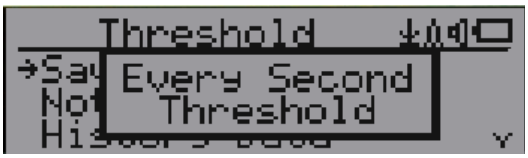




**NOTE:** you need to set the seconds to let unit complete the date & time setup.

**Data Saving Setting**





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

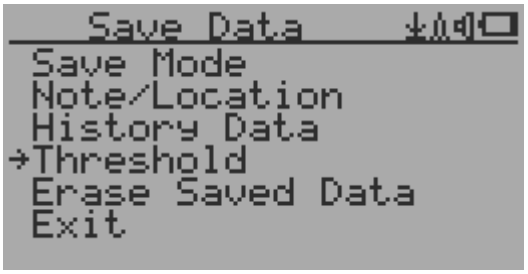
OFF -> Every Second ->Every Minute -> Every Hour->Every Second Threshold->Every Minute Threshold

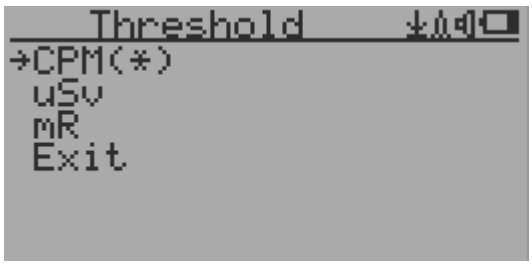
**NOTE:** The history data memory will be used as a ring buffer. Once the end of the memory is reached, the oldest data will be over written. Carefully select the data saving interval to save memory space.

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.

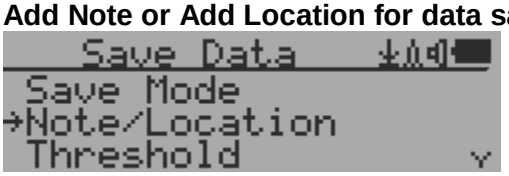
**Threshold Data Saving Setting**



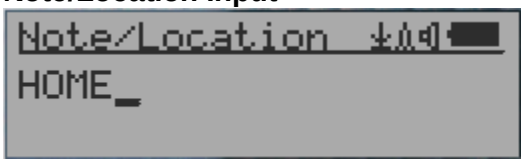

Select threshold type you want to use: CPM, uSv OR mR

**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**

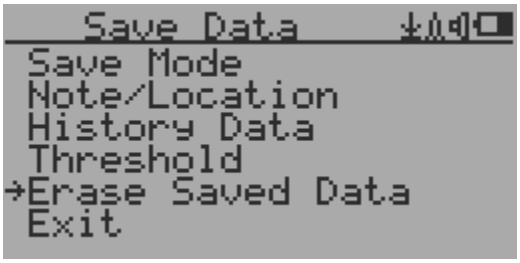


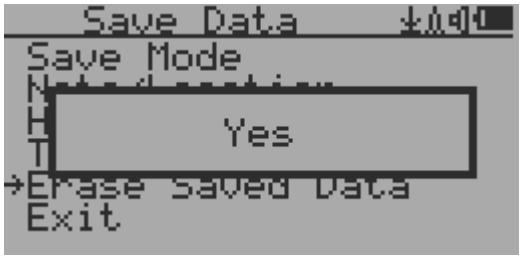

The cursor indicates the position of current character input.

Navigation keys:

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

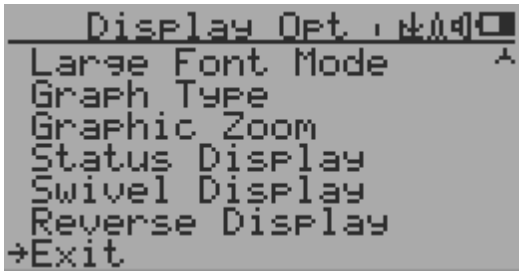
## Erase Saved History Data



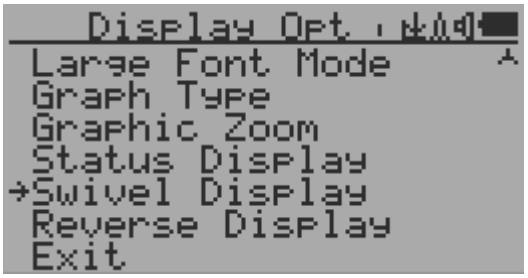




Use S2 and S3 to select Yes or No on the screen to confirm the request. After about 3 seconds with Yes confirmation, the unit will start to erase entire saved history data. It may take a few seconds to complete the task.

**Display Option**




**Swivel Display Option**

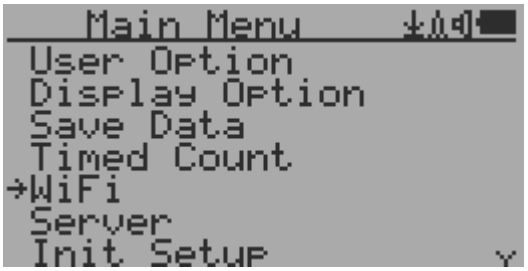


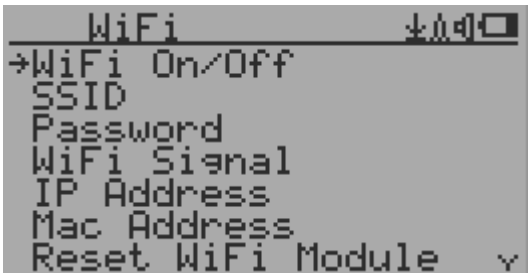
Pressing the S4 key will cycle between: Normal -> Swivel -> Auto Swivel modes

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

## Wi-Fi Setup and Check

The Wi-Fi 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.



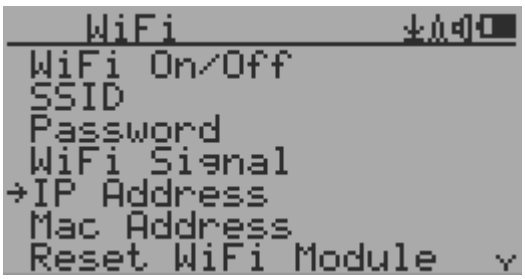



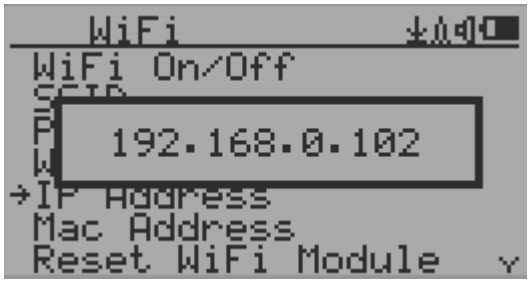

Select Wi-Fi On/Off item will turn the Wi-Fi connection On/Off

Make sure the Wi-Fi SSID and Password have been set.

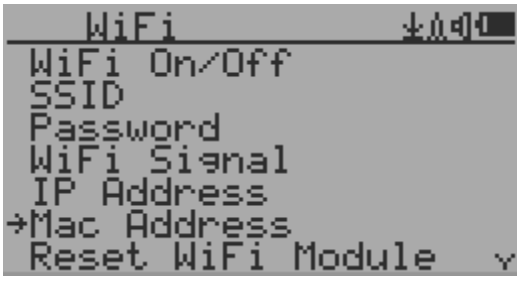
**Note: All Wi-Fi settings available from GQ GMC Data Viewer Windows software for easier and faster setup.**

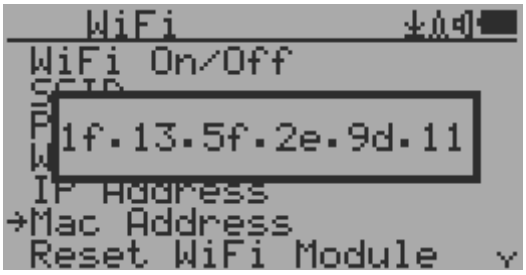
### Wi-Fi IP address




### Wi-Fi Mac address



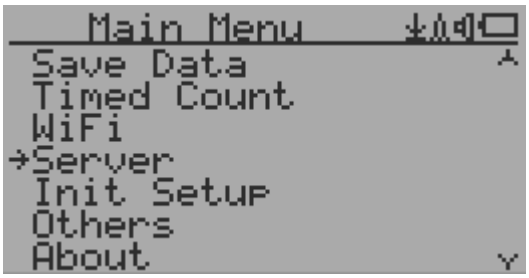

### Wi-Fi Signal Level Checking

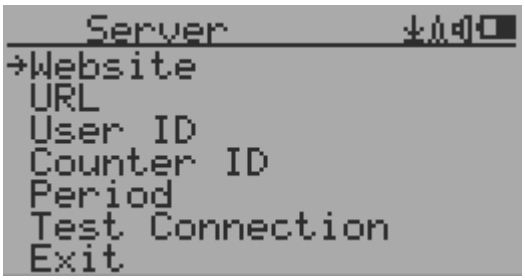
**Internet Data Server Setting**

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

Here is the default website server setup for:  www.gmcmapcom

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

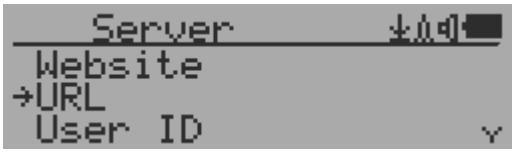


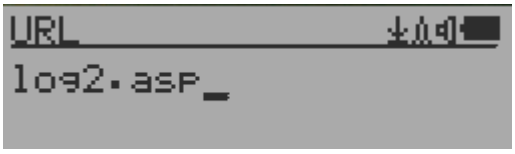



**URL for Website server**

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.

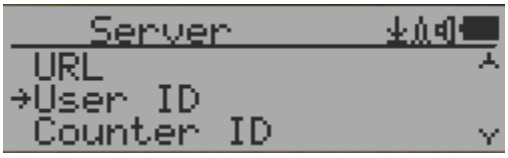
Example:
http://www.GMCmap.com/log2.asp?AID=0230111&GID=0034021&CPM=15&ACPM=13.2&uSV=0.075

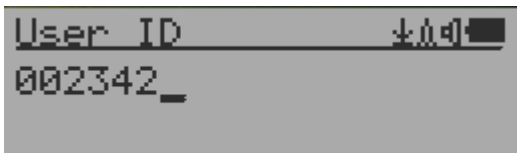



**Website server User ID**

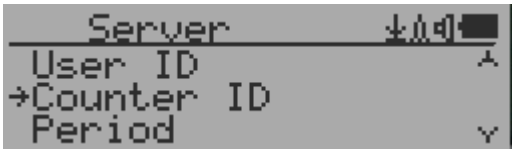
Each data submission has a user ID. The user ID is the user account ID from the data server. It will send to server with the data to log.
This is an example user ID from www.gmcmap.com

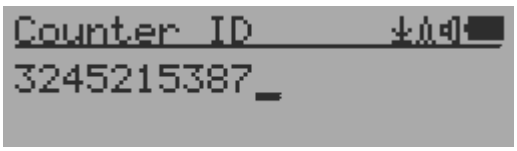


**Website server Geiger Counter ID**

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

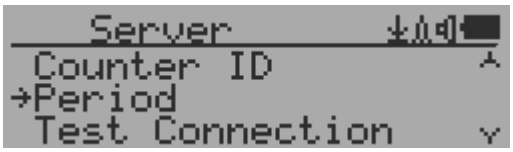



**Wi-Fi Data Logging Period**

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

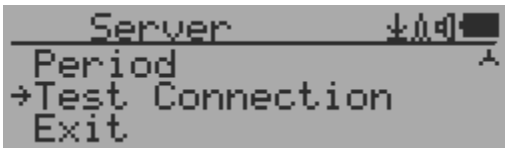
User is able to change the period from 1 to any minutes.



**Wi-Fi 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.



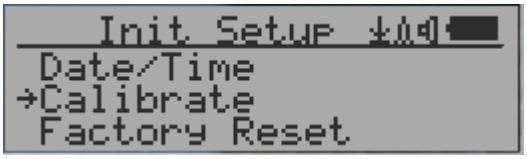
**Note: All Server settings available from GQ GMC Data Viewer Windows software for easier and faster setup.**

## Calibrate the reading

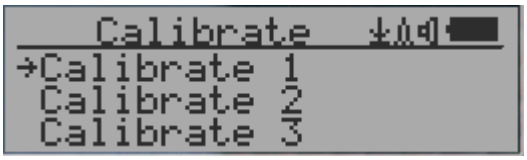
**The unit has been calibrated in factory. In most of case, the re-calibration is not necessary. However, you can calibrate the unit with a standard radiation sources.**

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

**Calibration**



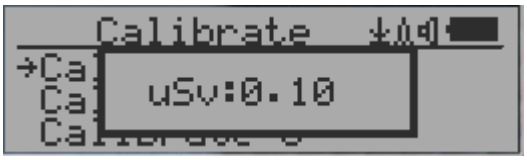

Select Calibrate form the Main Menu. There are three points provided for calibration.




Each calibration point needs two values to be entered, the CPM value and the µSv/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 µSv/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.

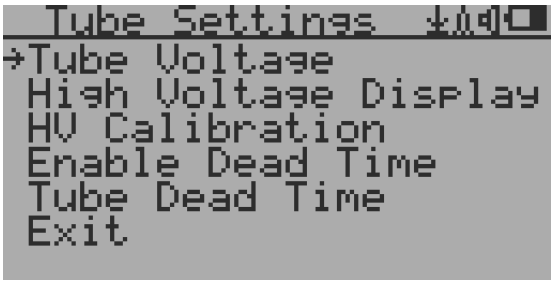



<u>Navigation keys:</u>

S1: Back/Exit
S2: Increase the value by 10 CPM or 0.1µSv/h respectively
S3: Decrease the value by 1 CPM or 0.01µSv/h respectively
S4: Toggle input data type between CPM and µSv/h

### Tube Voltage (GMC-500/600/600+)

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

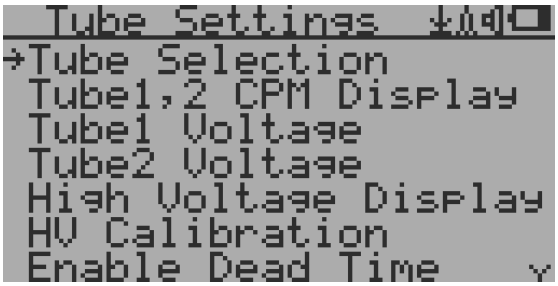


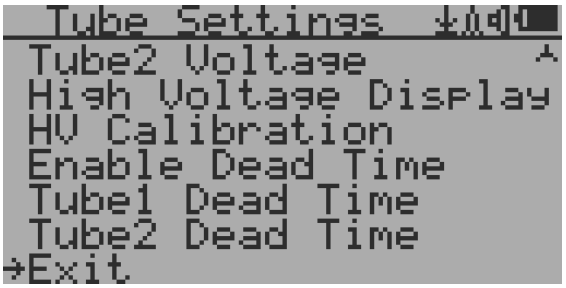

Tube Voltage: about 3 to 600V, Steps: 1 to 100, the voltage change is not in linear.
High Voltage Display: Display high voltage reading in Text Mode
HV Calibration: For adjusting the high voltage reading
Enable Dead Time: For including tube dead time in the CPM calculation
Tube Dead Time: Dead Time Value

### 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. The functions are the same as mentioned above but with also an option for the 2nd tube.

**Select Tube Settings to change tube settings on GMC-500+ under Init Setup.**

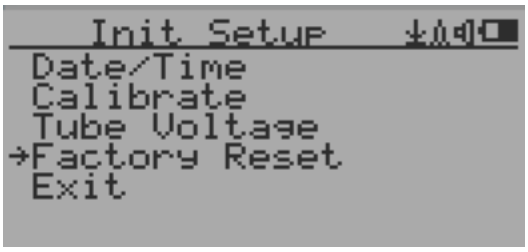


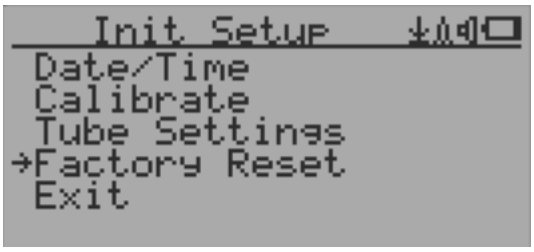

Tube Selection allow user to select the active tube: #1 high sensitivity tube, #2 high dose tube or both

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



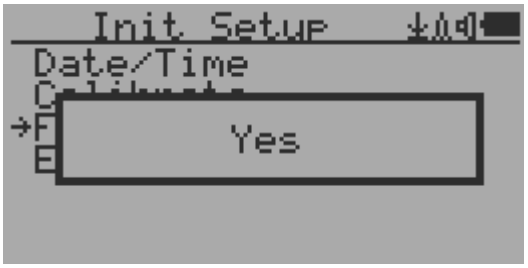

(GMC-500)

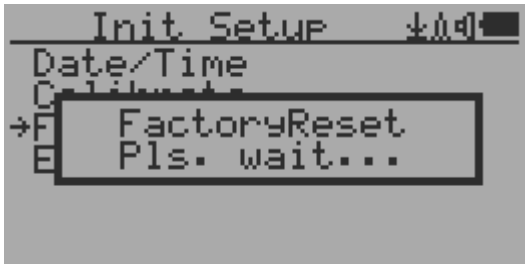



(GMC-500+)

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

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



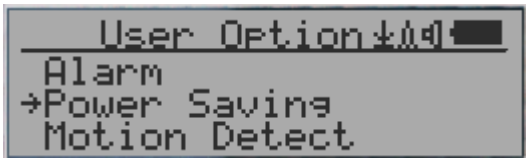




Procedure:
Select Factory Reset menu item and change the popup Windows message to Yes. Wait for popup message window's timeout to confirm the reset request. Any other key press will cancel the reset request. It may take up to 30 seconds to complete the reset.

## Battery

Can be found under 'Others' menu. It displays the current battery voltage.

## Power saving mode



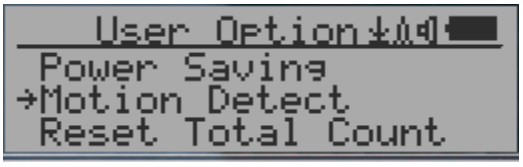

Pressing the S4 key will toggle the Power Saving mode ON and OFF.

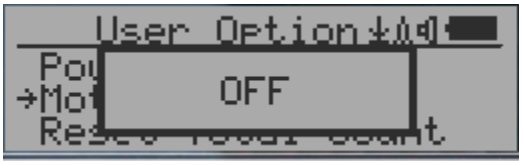
In power saving mode, the units LCD display will be turned off after 30 seconds if no key is pressed to save battery power. The audio signal will not be turned off if it has been set to ON.
The LCD back light will be off during the power saving mode.

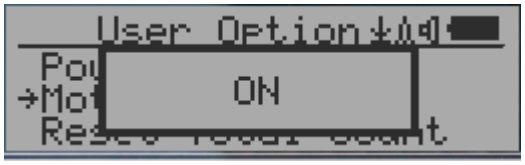
Pressing any key will active the LCD backlight again.

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

## Motion Detection

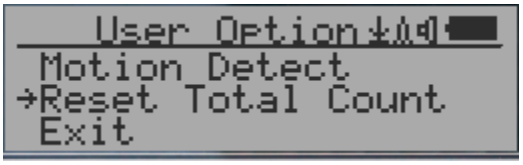


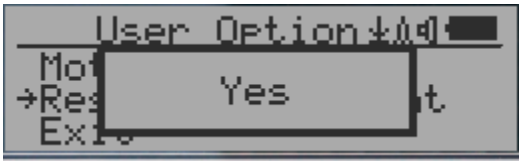


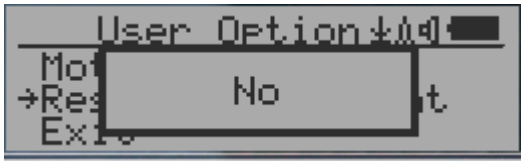



GMC-500 has motion detection feature. It can detect unit movement, upside down, single tap and double tap. Turn off the motion detection disables all motion related features.

### Reset Total Count



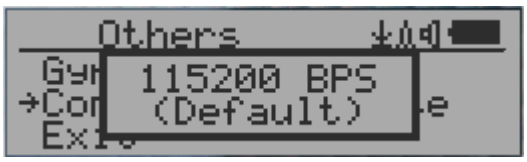


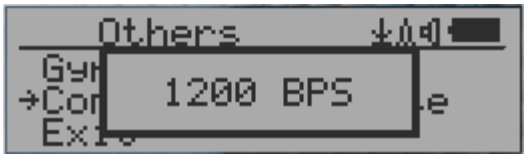

The Reset Total Count menu item let user to clear the total count on main text mode screen.
This may be used before a fixed time count measurement start.

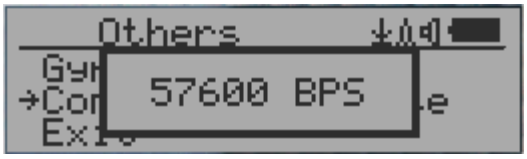
### Gyroscope Data Display

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, and 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.

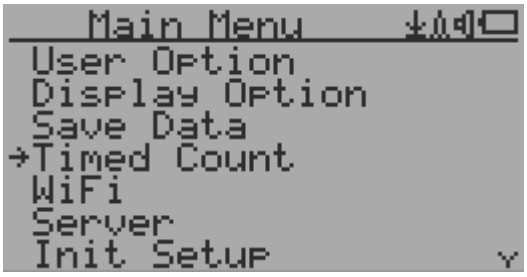
### Timed Count

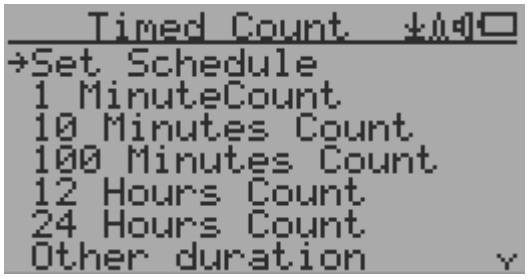
The Timed Count can be started with a schedule OR without a schedule.

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.

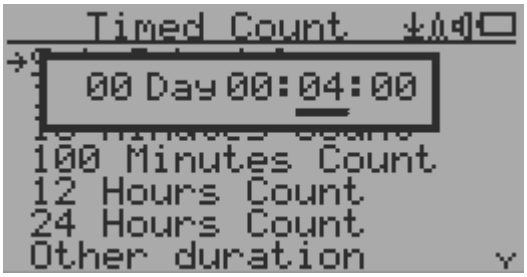
When it started without a schedule, the Timed Count will be started immediately once the timed count period is set.

The Timed Count can be set from the menu:




### Set a schedule




This example shows the schedule is set to 2 minute.

<u>Navigation keys:</u>

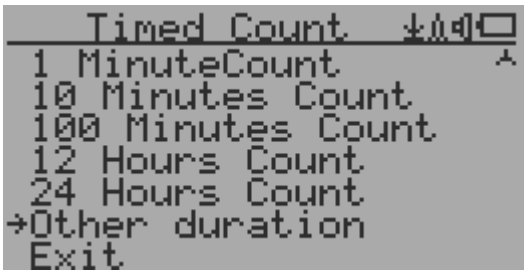
S1: Back/Exit

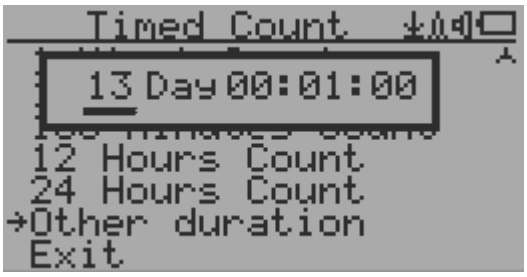
S2: Increase the cursor position value
S3: Decrease the position value.
S4: Move the cursor to input data type between Day, Hour, Minute and Second.

### 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.

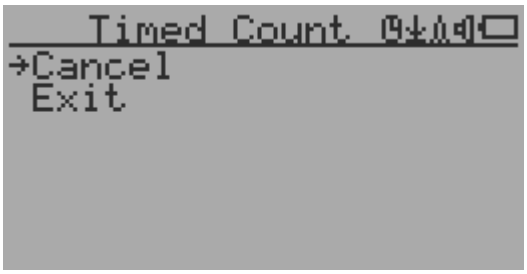
### Start a Timed Count

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

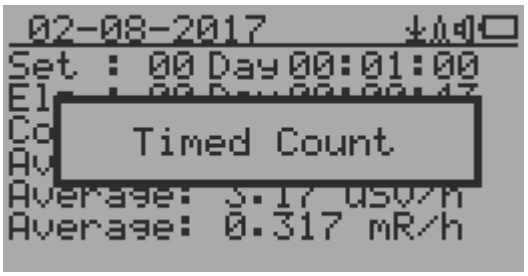
If the Schedule is set, then the Timed Count will be started after a scheduled time period passed. This is useful if a testing target is not ready immediately.

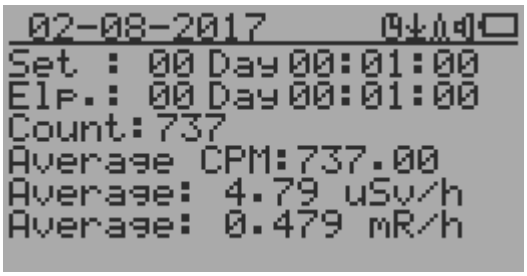
Once the Timed Count schedule is active, the Timer icon will be showed on the top icon area.

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



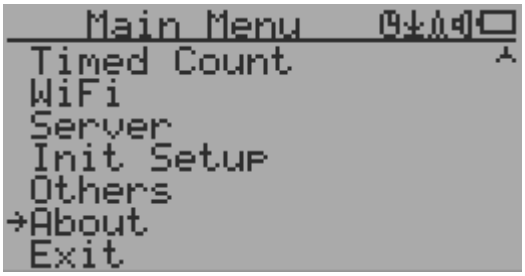
The Timed Count can be cancelled anytime.
Now you can exit the menu and see the Timed Count progress screen and information:

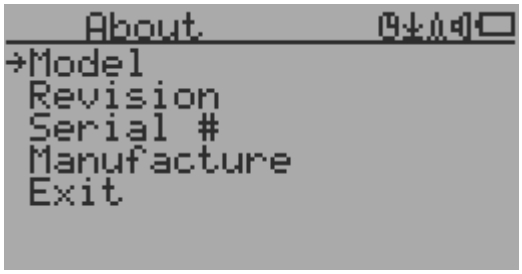


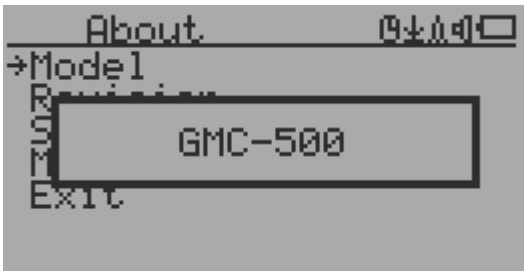

## About

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

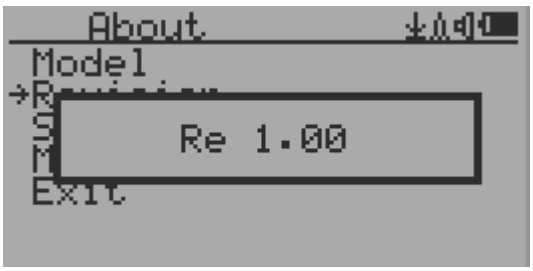


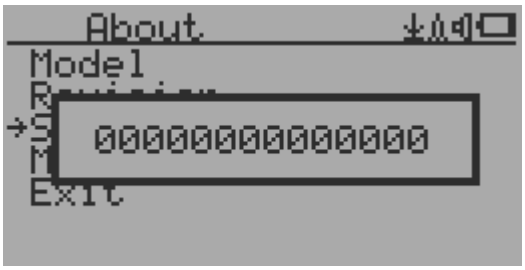

**Model information**




**Firmware version**

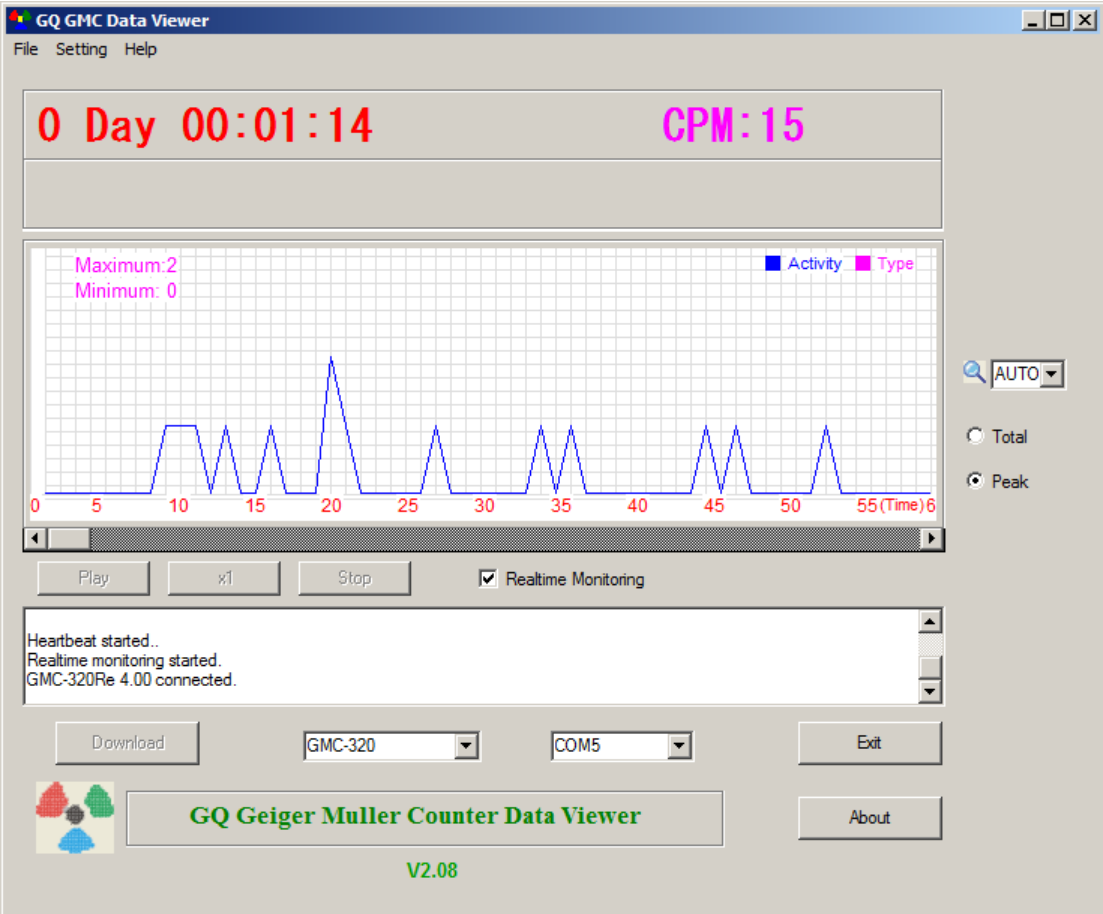



**Unit serial number**



# GQ GMC Data Viewer Software

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

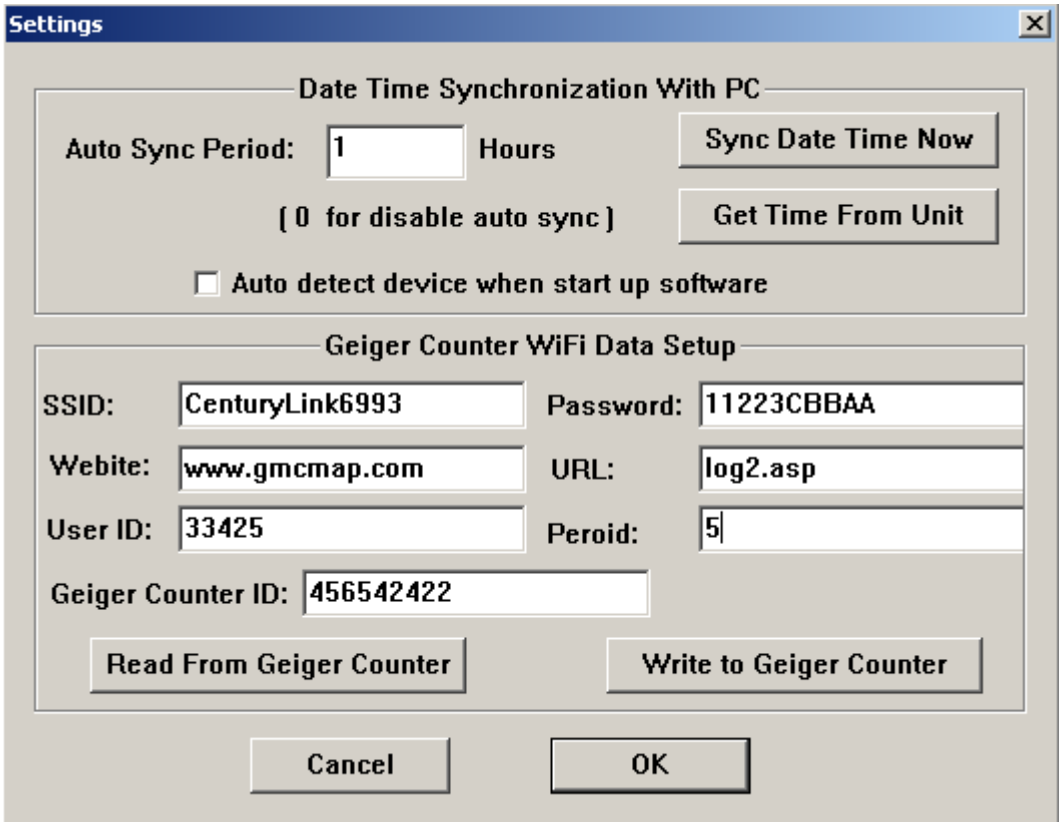



Main features:

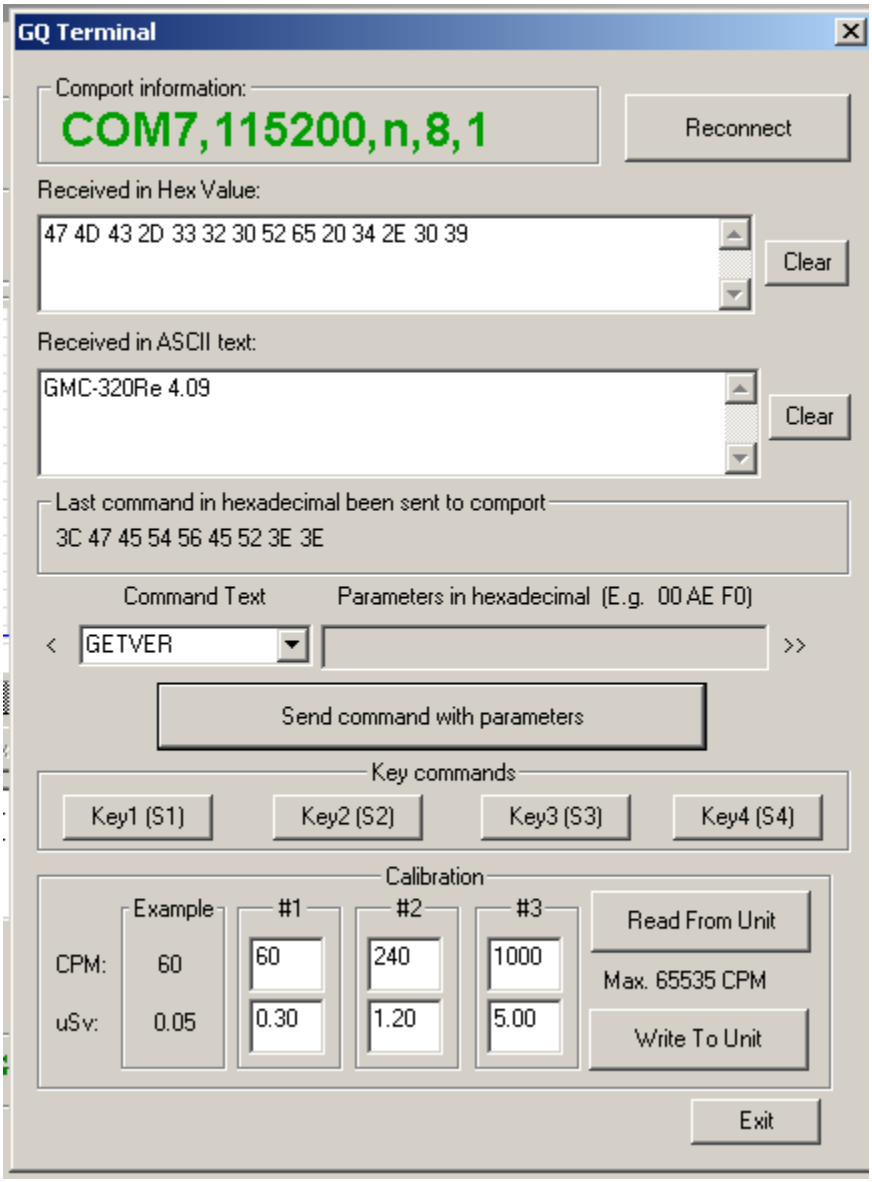
- Download the history data from GMC-500
- Real time monitoring with graphic when it connected with GMC-500
- Save the history data in .bin OR .csv MS Excel format.
- Synchronize the data and time to GMC-500 with computer's data and time
- User defined automatic date and time synchronization period.
- 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.



**GQ Terminal**




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.gqelectronicsllc.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**

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 Wi-Fi 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: µSv/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 n 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@gqelectronicsllc.com if you have any questions.

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

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

### FCC Warning

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. NOTE 1: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

NOTE 2: Any changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.