RADIATION ALERT®
GammaView
OPERATION MANUAL

RADIATION ALERT®
A•L•E•R•T®

Made in the USA   Vrs. 2 2022

Contents

Chapter 1: Introduction

Introduction

The GammaView is intended for performing surveys and measurements of gamma radiation fields from the environmental level, a few µR/h, up to 5 mR/h. The standard GammaView uses a 1x1 NaI detector for the most sensitivity in a light and easy to carry package. Calibrated against Cs-137 (662 keV), the GammaView with the 1x1 NaI detector is sensitive to low-energy gamma down to around 30 keV (I-129). The GammaView can also be used as a single-channel analyzer (SCA). This function allows a "window" to be set to focus on a specific energy region of the gamma spectrum. This setting can be changed by using the Observer USB software.

Quick Start

Before starting the GammaView, install 2 AA alkaline batteries in the battery compartment located on the back of the enclosure. Connect the detector using the provided MHV-to-C cable.

NOTE: THE DETECTOR SHOULD NEVER BE CONNECTED OR DISCONNECTED WHILE INSTRUMENT IS ON.

The power button is located in the center of the circular buttons on the front of the GammaView. Press and hold the Power button until the instrument beeps once. After the initial splash screen, a screen showing serial number, firmware version, and calibration date is briefly displayed. Next, all icons are briefly displayed along the top of the display.

Once this bootup cycle is complete, you can press the MODE button to go between all of the available units of measurement. The GammaView will boot up with Audio muted. You can turn on the audio by pressing the Audio/ Minus button. To turn off the GammaView, press and hold the POWER button until the instrument beeps twice and displays "RELEASE BUTTON TO POWER OFF."

Figure 1 (1)

Precautions

To keep the GammaView in good condition, handle it with care and observe the following precautions:

• Never touch the GammaView to a surface that may be contaminated. You may contaminate it.

• The Detector should never be connected or disconnected while the instrument is on.

• Do not leave the GammaView in temperatures over 100° F (38° C) or in direct sunlight for extended periods of time.

• Do not get the GammaView wet. Water can damage the circuitry.

• Do not put the GammaView in a microwave oven. It cannot measure microwaves, and you may damage it or the oven.

• The GammaView may be sensitive to and may not operate properly in radio frequency, microwave, electrostatic, and electromagnetic fields.

• The software may disconnect in high static conditions and may need to be restarted by the user.

• If you do not expect to use the GammaView for longer than one month, remove the batteries to avoid damage from battery corrosion. A battery indicator appears on the display to show remaining power.

• 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:

1. Reorient or relocate the receiving antenna

2. Increase the separation between the equipment and receiver

3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected

4. Consult the dealer or an experienced radio/TV technician for help

Chapter 2: Features

The GammaView measures gamma and x-ray radiation. It is optimized to detect small changes in radiation levels and to have high sensitivity to many common radionuclides. The GammaView counts ionizing events and displays the results on the liquid crystal display (LCD). The unit of measurement is located on the lower right, below the numerical value. The unit of measurement is selected by using the mode switch. Whenever the instrument is operating, the red LED indicator flashes each time a count (an ionizing event) is detected. [Figure 2 (2)]

NOTE: At higher count rates (say, over a couple of thousand counts per minute) the LED may appear to be solidly on.

The LCD Display

The LCD *(liquid crystal display, Figure 2(1))* shows various indicators according to the mode setting, function(s) being performed, and battery condition as shown below.

Figure 2(1)

BATTERY ICON - Indicates that the GammaView is powered by the AA batteries and shows the remaining battery life. The battery icon (not shown) will not appear if it is plugged into USB power.

USB ICON - Indicates that the GammaView is plugged into the USB jack and is running on USB power. The USB icon will not appear if it is running on battery power. *NOTE: USB does not charge the batteries.*

BLUETOOTH ICON - Indicates that Bluetooth connection has been selected and is active.

ALARM ICON - Indicates that the alarm has been set and is active.

HOURGLASS ICON - Indicates that a timed count is being taken.

RADIATION ICON - The flashing radiation icon indicates that an alarm has been triggered and will remain until the radiation levels drop below the set alarm threshold. The radiation icon will continue to flash at the top of the display even if the alarm has been muted.

BACKLIGHT ICON - Indicates that the backlight has been turned on.

AUDIO ICON - Indicates that the audio clicks will sound with each count collected.

QUIET MODE ICON - Indicates the audio has been turned off and the GammaView is operating in quiet mode. While in quiet mode, you will not hear the beeps that indicate turning on or off the alarm, turning on or off the timer or making changes in the menu. You can still activate the clicks by pressing the Audio button. The quiet feature does not turn off the beeps from the Alarm or the Over Range feature. If you turn the instrument off, you will have to turn the quiet feature back on if you wish to use it.

RECORD ICON - Indicates that the readings are being recorded into the internal memory, which can be downloaded with the free Observer USB Software. The record icon will flash when the on board memory is full. *See page 9 for additional information on data logging.*
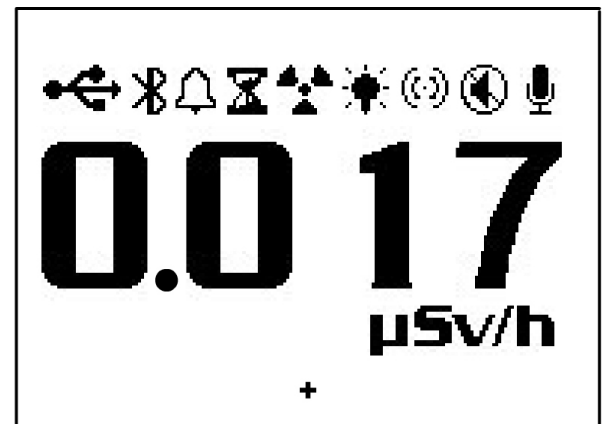
The Front Panel Buttons

The GammaView has a circular membrane switch on the face of the instrument, which consists of: Power/Enter, ALARM, COUNT, Audio/Minus, MENU, Backlight/Plus, and MODE.

Power/Enter Button

The Power/Enter button is located in the center of the membrane switch. It turns the GammaView on and off and acts as the "Enter" button when in the menu. To turn the GammaView on, hold down the power button until you hear a beep. To turn the instrument off, press and hold the power button until prompted to release.

ALARM

The ALARM button is used to activate the alarm after setting the desired alarm levels. The Alarm button can also be used to Mute the alarm audio.

COUNT

The COUNT button is used to take a timed count. To enter the time set screen, press the count button.

The default count time is 10 Minutes

See Page 10: How To Take A Timed Count.

Figure 2(2

Audio/Minus

When not in the menu, the Audio button will function to silence the audio clicks and switch between Silent and Audio operation. To switch between audio clicks and no audio clicks with each count collected, press the Audio button. To switch between Quiet and Audio operation, which mutes everything except the ALARM and OVER RANGE, press and hold the Audio button for 3 seconds.

NOTE: When in the menu, the Audio Button will function as the "scroll down," or "Minus" button, for numbers and settings in the menu.

MENU

Pressing the MENU button will enter into the menu. *See Page 10: Menu.*

Backlight/Plus

The LCD has a backlight that can be activated for the default 7 seconds by pressing the backlight button. Pressing and holding the backlight button for 3 seconds will turn the backlight on permanently. Once the backlight has been permanently activated, pressing and holding the backlight button for 3 seconds will turn off the backlight.

NOTE: The Battery life is shortened if back light is on permanently. The Backlight returns to default when the instrument is powered off.

NOTE: When in the menu, the Backlight Button will function as the "scroll up," or "Plus" button, for numbers and settings in the menu.

MODE

The MODE button *(Figure 2 (2))* is used to select from the available units of measurement.

- mR/hr (milliroentgen)
- µR/hr (microroentgen)
- µSv/hr (microseivert)
- CPM (Counts per Minute)
- CPS (Counts per Second)
- Counts

NOTE: In CPM and Count modes, when numeric values exceed 9999, the unit of measurement will change from COUNTS to kCOUNTS (1000 Counts). In µR/h mode, the unit of measurement will change to mR/r at 1000 µR/h

Detector

The GammaView uses a 1x1 NaI scintillation detector.

USB Port

The USB Port [Figure 2 (2)] allows you to interface with a PC for use with the Observer USB Software.

See Chapter 7: Observer USB Software.

NOTE: The USB does not charge the batteries.

Chapter 3: Operation

Starting the GammaView

Before starting the GammaView, install 2 AA alkaline batteries in the battery compartment located in the lower rear of the enclosure.

The power button is located in the center of the circular buttons on the front of the GammaView. To turn the instrument on, press and hold the power button until you hear a beep. The GammaView then begins a system check, displaying the serial number of the instrument and firmware version. After the system check, the radiation level is displayed in the previously selected mode. Approximately 30 seconds after you start the GammaView, a short beep indicates that enough information has been collected to ensure statistical accuracy.

If you plan on using the datalogging feature, please be sure to set the correct local time and date with the Observer USB Software prior to activating the datalogging.

See Chapter 7: Observer USB Software.

Units of Measurement

The GammaView is designed for the use of conventional measurement units; counts per minute (CPM), milliroentgens per hour (mR/hr), microroentgens per hour (µR/hr), counts per second (CPS), microsieverts per hour (µSv/hr), and counts, which are used when taking a timed count. To switch between units, press the mode button.

Display Update

In the dose, rate, and count modes, the numeric display is updated every second.

Maximum Level

When the maximum level for the current mode is reached, the GammaView beeps for 3 seconds, pauses for 3 seconds, and repeats. The numerical values displayed will show OVER instead of the specific rate. The beeping pattern and the flashing display continue until the level decreases or the instrument is turned off.

Response Time/Auto Averaging

When the radiation level is less than 540 CPM, the reading is based on the radiation detected in the previous 30 seconds. When the radiation level exceeds 1560 CPM, the averaging time is 18 seconds, at 3480 CPM the averaging time is 12 seconds, at 13,560 CPM the averaging time is 6 seconds and when the radiation level exceeds 53,160 CPM, the averaging time is 3 seconds.

NOTE: Though Auto Averaging is on by default, you can disable it to get the fastest response time of 3 seconds. In background conditions, the instrument may show zero counts as there were no counts within the last 3 second time period. This is normal when auto average is disabled.

Auto Ranging

When radiation levels increase in some modes over certain preset levels, the GammaView uses auto ranging, automatically changing from CPM to KCPM or from µR/hr to mR/hr.

Operating in Dose/Rate Modes

At low count rates, significant changes in the radiation level displayed can take up to 30 seconds to stabilize when set to Auto Averaging. µR/hr, mR/hr and µSv/hr are calculated using a conversion factor optimized for Cesium-137. This mode is less accurate for radionuclides other than Cs-137, unless you have calibrated the GammaView for the specific radionuclide you are surveying. CPM, CPS, and Total counts are the most direct methods of measurement. The most immediate indicators of the radiation level are the audio indicator and count light.

Using The Alarm

The alarm can be set in dose or rate modes using the currently selected unit of measurement. Once the alarm threshold is reached, the beeper will sound and the alert icon (radiation symbol) will flash until the radiation level drops below the set alarm threshold, or the alarm is deactivated. The Alarm setting is transposed to all modes of measurement. ie. If the alarm is set for 1mR/hr it will reflect as 1000 µR/h.

1. To set the alarm, press the ALARM button. The SET ALARM screen will be displayed.

2. Use the + or - buttons to increase or decrease the desired alarm level.

3. Once you have set the alarm to the desired level, press the enter button to retain the setting into memory and activate the alarm. The alarm icon (bell icon) is now displayed to indicate the alarm is active.

4. Once the alarm is triggered, press the ALARM button to mute the alarm. The alert icon (radiation symbol) will remain flashing until the radiation levels fall below the set alarm level.

5. To deactivate the alarm mode, press the ALARM button, then the enter button. The alarm icon is no longer shown at the top of the display.

6. Any changes made to the Alarm Settings will remain until changed again.

Using the Data Logging Feature

We recommend the clock be set prior to collecting data to append the correct time and date in your collected data. The internal clock of the GammaView can be set to the time and date on a PC running the Observer USB Software by clicking Functions > Synchronize GammaView to PC Clock. The instrument will beep twice once synchronization has completed.

Once the time has been set, you can activate the datalogging via the Observer USB Software or via the menu button on the instrument. To activate it on the instrument, simply press Menu > Data Logging, then enter and follow the onscreen prompts. The default data logging frequency is 1 minute. With the instrument set to 1 minute intervals, you will have approximately 3.7 days of stored memory if the instrument is on for a 24 hour period. In a 24 hour day, that would be approximately 1440 data points. with the next time interval set to 10 minutes, you will have approximately 37 days of data.

The data that is collected includes the time, date, raw counts (total counts), and the Highest/Lowest CPM for each time period. The saved data can be put into a spread sheet for analysis. You can change the time period in the Cal Panel window of the Observer USB Software. Any changes made to the time period will remain until it is changed again. For more information, *See Chapter 7: Observer USB Software.*

Operating in Count Mode

A timed count is useful for determining the average counts per minute over a longer period of time. The number of counts detected varies from minute to minute due to the random nature of radioactivity. Taking an average allows you to detect low-level contamination or difference in background radiation due to altitude or soil mineral content.

When a count is taken over a longer period of time, the average count per minute is more accurate. For example, if one 10-minute average is a few counts per minute higher than another 10-minute average, the increase is likely due to normal variation. But over a 12 hour count, a few counts per minute increase may be statistically significant.

How to Take a Timed Count

1. Press the COUNT button.
2. Using the MENU button to switch between seconds, minutes, and hours, set the time using the + and - buttons, to increase and decrease the time.
3. Once you set the count time, press the enter button to begin the timed count.
4. On the count screen, once the count has begun, a flashing hourglass will appear at the top of the display and a star will appear next to the count down time until the count is completed. Once the count is completed the hour glass and star will disappear.
5. From the count screen, press the MODE button to cycle through the various units of measure. If you want to see the remaining time in the count, continue cycling through the units of measure until you return to the count screen.
6. To stop the current count, press the COUNT button, and press enter.
7. The accumulated counts will remain displayed until a new count is started or the instrument is powered off.
8. If you have pressed the COUNT button accidentally and do not wish to start a new timed count, press the COUNT button again to exit the set count time screen and return to the units of measure.
9. Any changes made to the Count Time will remain until it is changed again.

Using Dose/Rate Modes While The Timer is On

Dose/rate modes can be used while the timer is on. In any dose/rate mode, the hour glass indicator will continue to flash during a timed count. Once the count is completed the hour glass and star will disappear.

Menu

The Menu allows the user to change the default settings for several operating parameters. Once a setting is changed, it remains in effect unless it is changed through the Menu or the USB Observer Software.

1. To activate the Menu, press the menu button. The display will show the menu options.
2. Scroll through the menu by pushing the + or - buttons.
3. To select an option, push the enter button.
4. Use the + or - buttons to toggle between choices and press the enter button to select the new value. To adjust another menu option, repeat the above steps.
5. To exit the Menu at any time, press the menu button again. Normal operation will continue.

Menu Items

Auto Averaging

Turns auto averaging on or off. On by default.

Data Logging

Turns the internal memory on or off to record readings. Off by default.

Window

The GammaView can be used as a single-channel analyzer (SCA) by limiting the recorded counts to a specific window of energies within the gamma spectrum. The setup for the SCA must be performed using the Observer USB software.

Audio Div by 10

When this function is used, a single "click" will sound for each 10 counts detected.

Bluetooth LE

In order to preserve battery life, Bluetooth LE (BLE) functionality is not enabled unless specifically directed using this menu item.

When the Bluetooth LE function is selected, the current state of the BLE is displayed. If the Plus (+) button is selected, BLE will be enabled. The Minus (-) button will disable BLE. The Menu button will exit the function without making changes. Following any of these cases, the Main Screen will be displayed.

The serial number and calibration date are also displayed in this window.

Setting the Internal Clock

It is not necessary to set the internal clock to start collecting data to memory, but it is recommended to properly time stamp the data collection on your device to ensure the correct time and date in your collected readings. You will need a copy of the Observer USB Software to set the internal clock. The latest version is available at seintl.com/software. S*ee Chapter 7: Observer USB Software.*

Interfacing with an External Device

The USB jack on the right side provides an interface for use with the USB Observer Software. *See Chapter 7 Observer Software*.

NOTE: The USB connection will not charge the batteries but it will power the instrument when plugged in.

GammaView Factory Defaults

- Audio - Muted

- Timed Count - 10 minutes

- Auto Averaging - Enabled

- Data Logging - 1 minute

- Window - Unenabled

- Bluetooth - Disabled

> **NOTE: Timed count, data logging, and alarm values do not revert to the defaults if changed.**

Chapter 4: Common Procedures

The following sections give instructions for several commonly-used procedures. With any procedure, the user must determine the suitability of the instrument or procedure for that application.

Establishing the Background Count

Normal background radiation levels vary at different locations, different times, even in different areas of the same room. To accurately interpret the readings you get, it is good to establish the normal background radiation count rate for each area you plan to monitor. You can do this by taking a timed count. *See Page 10: How To Take A Timed Count*.

A 10-minute average is moderately accurate. You can repeat it several times and compare the results to establish accuracy. To establish a more accurate average, take a 1 hour timed count. If you need to determine whether there is prior contamination, take averages in several locations, and compare the averages.

Environmental Area Monitoring

You can keep the GammaView in dose/rate mode whenever you want to monitor the ambient radiation, and look at it from time to time to check for elevated readings.

If you suspect an increase in ambient radiation, use the count mode and take a 5 or 10 minute count, and compare the average to your average background count. If you suspect an increase that is too small to detect with a short timed reading, you can take a longer count (for example 6, 12, or 24 hours).

Checking for Surface Contamination

To check a surface, hold the detector close to the surface, and read the count rate (wait 30 seconds or until the reading has stabilized). **Do not touch the detector to whatever you are checking to avoid contaminating the detector.**

Chapter 5: Maintenance

The GammaView requires regular calibration and careful handling to assure accurate measurements. Use the following guidelines to properly maintain the instrument.

Calibration

We recommend that the GammaView be calibrated annually, or as often as your regulations require. The best way to calibrate is using a calibrated source at a calibration lab.

The standard by which the GammaView is calibrated is Cesium-137. A certified calibration source should be used. To calibrate the GammaView for another radionuclide, use a calibrated source for that radionuclide or the appropriate conversion factor referenced to Cs-137.

CAUTION: Errors can occur when using low level sources or background for calibrating. In the Calibration mode, the smallest increment which can be adjusted is .010.

If you would like more information about source calibrations, please contact us at 1.800.293.5759 or go to seintl.com/calibration.

General Maintenance Tips

1. Do not operate without probe. Always power the GammaView off to attach or change the probe.
2. Never touch the GammaView to a surface that may be contaminated. You may contaminate it.
3. Do not get the GammaView wet.
4. Be sure to store the instrument in a location without direct sunlight, as sunlight can damage the detector over time.
5. Be sure to store the GammaView inside the carrying case when not in use.
6. If you are planning to store the GammaView for longer than one month, remove the batteries to avoid battery corrosion inside the battery compartment.
7. Do not place the GammaView inside a microwave oven as it can damage the GammaView and/or the microwave. This instrument is for detecting ionizing gamma radiation. It will not detect non-ionizing radiation such as microwave and radio emissions.
8. 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

Chapter 6: Instructions for Changing Probes

Initial Setup of Radiation Alert ® Gamma View with a Gamma Scintillation probe (e.g., NaI(Tl), CsI(Na), CsI(Tl), etc.)

Preliminary Setup

The Gamma View comes optimized for Cs-137 using the supplied NaI probe. If you wish to use a different probe, you will have to follow these steps to optimize the probe you are changing to.

All the tests below are done with the GammaView connected to the Observer Software *(See Chapter 7)*. You will need to use the CAL Panel throughout the testing process. You may want to write down the settings your original probe is set to. This will aid in changing back to it if the need arises.

After connecting the instrument to the Observer software, open the CAL panel and check the Edit Calibration Values box. When prompted click YES. Set the HV (volts) to 400 and Thresh (mv) to 2.5. On the main screen of Observer, you will see a box marked Count. Click it open and put 6 into Preset Time.
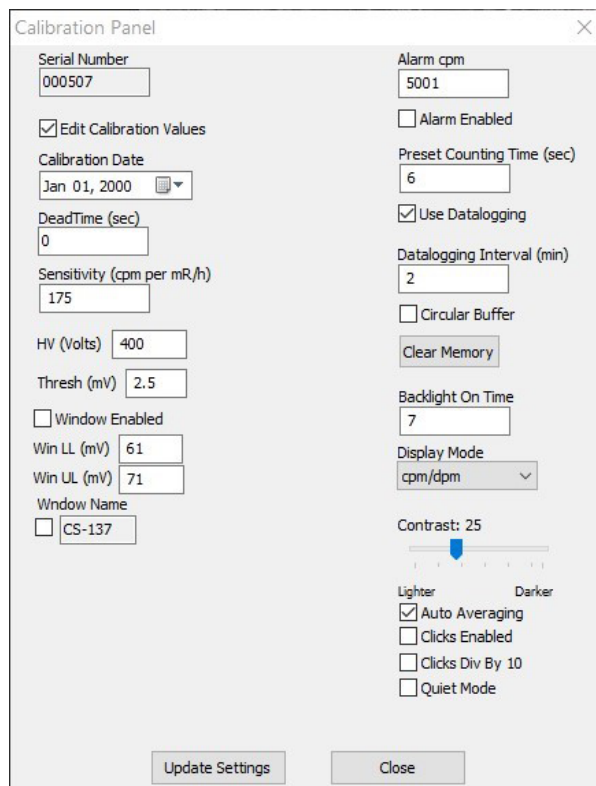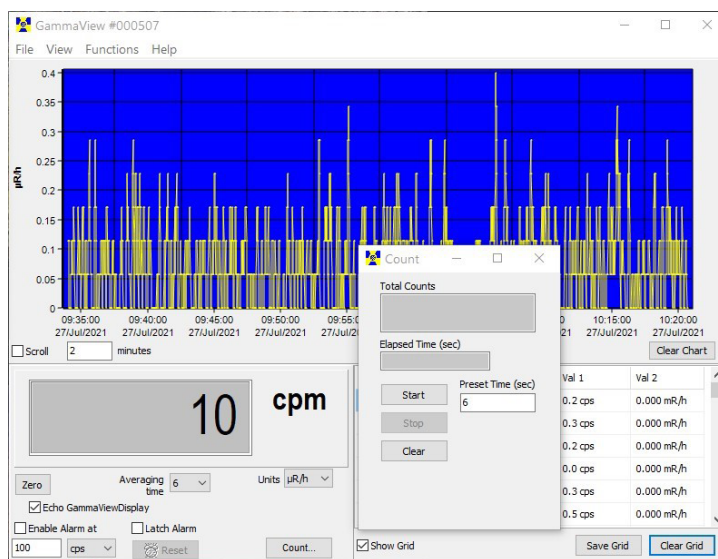
See diagram below.

Figure 6(1)

Figure 6(2)

Starting High Voltage

Materials
Cs-137 source, approximately 1 µCi. The instrument should be in the CPM mode.

1. Place the source in a fixed, repeatable location with respect to the detector. The source should be placed in contact with the probe, centered with respect to the crystal.

2. Start the 6 second count by clicking the Start button on Count box.

3. Increase the voltage by 20 volts, until the count rate becomes substantial (at least a few hundred counts) and note the HV value. You will have to click Clear before starting another timed count.

[In the sample GammaView used in documenting this procedure, the starting voltage was 480 Volts. The 6 second count at this voltage was 1441.]

Determine the Approximate HV
The primary gamma energy for Cs-137 is 662 keV. It is reasonable to expect the majority of the counts from this energy to fall within ±50 keV of the primary energy. Since the GammaView will be set up such that 10 keV gamma energy is approximately equal to 1 mV of pulse height, the primary energy will be centered around 66 mV ± 5 mV.

Enter the Win LL value to 61 mV and the Win UL to 71 mV in the Cal Panel, check the box for Window Enabled and set the Window Name to CS-137. Note that immediately after the window is enabled, the count rate drops nearly to zero. This is because the HV is set lower than optimal. The correct HV will be determined next.

1. Place the source in a fixed, repeatable location with respect to the detector.

2. In the Cal Panel, the High Voltage should be set to the starting voltage (480 Volts for the instrument used in documenting this procedure), Win LL to 61 mV, Win UL to 71 mV, and Window Enabled should be checked. (The Thresh setting is irrelevant at this moment since the window is enabled.) There should be no counts (or very few) coming from the GammaView.

3. Increase the HV by 10 Volts. Check if the count rate has become substantial (e.g., at least 100 counts).

4. Repeat step 3 until the count rate becomes substantial and note the HV value. [In the sample GammaView used in documenting this procedure, at 640 Volts the 6 second count rate increased to 330]. We are using a spreadsheet to track and record values.

5. Beginning with the HV determined in step 4 above, take and record a 6 second acquisition

6. Increase the HV by 5 Volts and take and record a 6 second acquisition.

7. Repeat step 6 until a clear downward trend is observed.

8. Determine the range that has the highest number of counts. [In the sample GammaView used in documenting this procedure, the 6 second count was 1178 at 650 Volts.]

9. Set the HV to the value determined in step 8 and take and record a 30-second acquisition.

10. Increase the HV by 1V and take and record a 30-second acquisition.

11. Repeat step 10 until a clear downward trend is observed. The HV value with the highest number of counts is the final value, and the GammaView HV should be set to this. [In the sample GammaView used in documenting this procedure,the maximum counts are seen at 651 Volts.]

A	B	C	D	E	F
win checked	LL 61, UL 71		win checked	LL 61, UL 71	
Volts by 5	6 second count		Volts by 1	30 second count	
640	330		650	6103	
645	799		651	6249	
650	1178		652	6159	
655	1121		653	6107	
660	704				

Verify Sensitivity to I-129/Determine Optimum Threshold

The final necessary step is to confirm that I-129 (energy roughly 30 keV) can be detected when the window is disabled. This is to demonstrate that the instrument is sensitive down to the lowest intended energy. The Thresh may need to be adjusted from the approximate value set earlier. This MUST be completed before performing exposure rate calibration or determining the efficiency for any isotopes.

Electronic noise will occur near the same vicinity as the lowest energies that can be detected. This procedure looks at the response of the instrument to I-129 as well as to background radiation as a function of threshold.

It is presumed that the I-129 source can be in a fixed, repeatable geometry to the detector, that the GammaView is connected to Observer USB as in the earlier steps, and that the HV is set to the determined value from the proceeding procedure. The Window must be disabled for this procedure. (The Threshold value has no effect when the Window is enabled—the Window Lower Level supersedes the Threshold setting.)

If no I-129 is available, it may be safe to assume that a Threshold of 1 or 2 will be acceptable

Materials
I-129 source, approximately 0.1 µCi

1. Set the Threshold to 6 mV. (Window MUST be disabled!)
2. With no source near the detector, observe the background count rate. It will likely be in the vicinity of 500 to 1000 CPM.
3. Place the I-129 source on the detector and observe the count rate.
4. Take and record a 30 second acquisition.
5. Decrease the Threshold by 1 mV and take and record a 30 second acquisition.
6. Repeat step 5 until the Threshold is 0 mV.
7. Remove the source and repeat steps 5 and 6 (starting at 6 mV) for Background.
8. Determine the operating point as the highest threshold value that has the about the maximum count for I-129, while making sure the background is not too high. [In the sample GammaView used in documenting this procedure, this is seen at 1.0 mV.]

As a point of reference, I-129 efficiency should be roughly 7% with the source in contact with the detector face. This could potentially be as low as 4 or 5%, but a value in excess of 8% for a standard 1"x1" NaI (Tl) detector potentially indicates a problem.
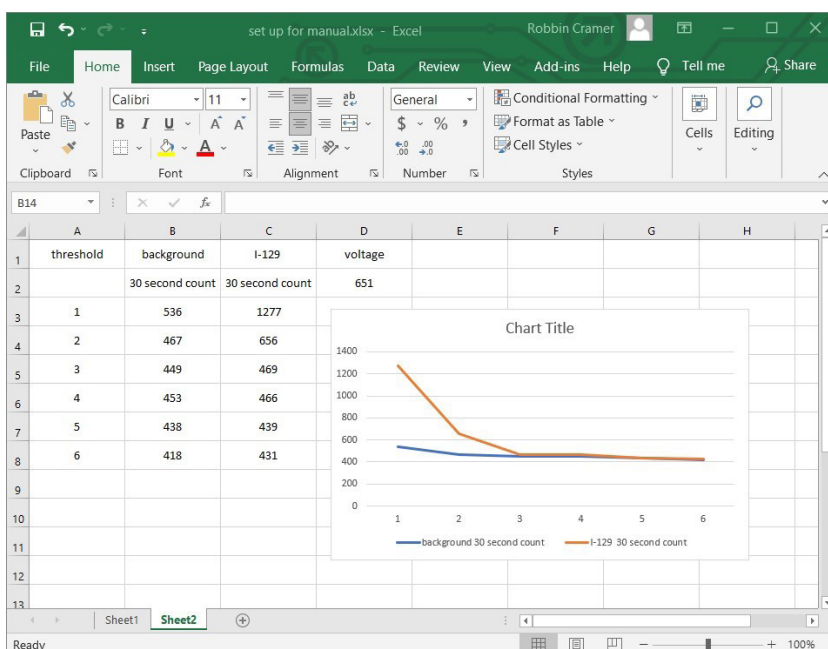

Figure 6(4)

Chapter 7: Observer USB Software

The Observer USB reads in Total Counts, CPM, µR/hr, mR/hr, CPS, µSv/hr, and has the ability to collect, log the data received, set the calibration parameters and echo the readings from your GammaView while it is operating. The data is displayed on a graph, as well as a digital on-screen meter. Saved data can be downloaded and put into a spreadsheet for analysis.

Installing the Observer USB Software

The Observer USB is a free software you can download at seintl.com/software. Install the software prior to connecting your GammaView to the computer. After the software has completed downloading, double click on the installer, and follow the on-screen prompts.

Connect to the GammaView

Ensure that you have installed the Observer USB Software before connecting the instrument. The USB port is a microUSB type jack located on the side of the instrument. *Figure 2 (2)*. To connect the GammaView, power on your instrument, plug the cable into the USB jack, and connect the other end to the USB port on your computer.

Once the instrument is connected, the Observer Software will launch and open a window for the instrument with a serial number displayed in the upper left corner of the title bar. A new window will open for each instrument connected.*See Figure 7(1)*
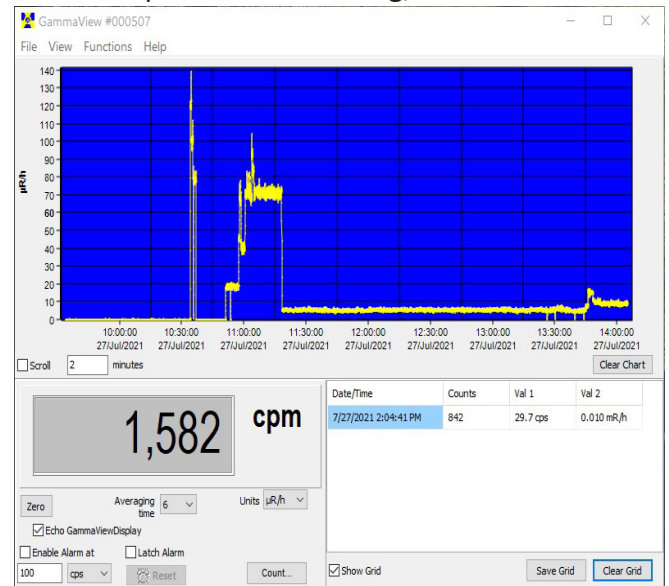

Figure 7(1)

Observer USB Chart Screen

The Observer USB Chart Screen *(Figure 7(2))* displays a chart of the data currently collected by the attached instrument.

The X Axis

The X axis consists of the time and date stamp of the reading collected and will adjust automatically to display all of the data collected unless the Scroll check box is selected. If the **Scroll** check box is selected, the X axis will display the latest readings collected in the minute(s) time frame selected next to the **Scroll** check box. For example, if 2 minutes is selected in the **Scroll** time, then the chart will display the latest 2 minutes of data collected. The most recent data collected will be shown on the right side of the graph.

Figure 7(2)

The Y Axis

The Y axis displays the unit of measurement for the reading displayed and will automatically adjust to display the highest reading collected.
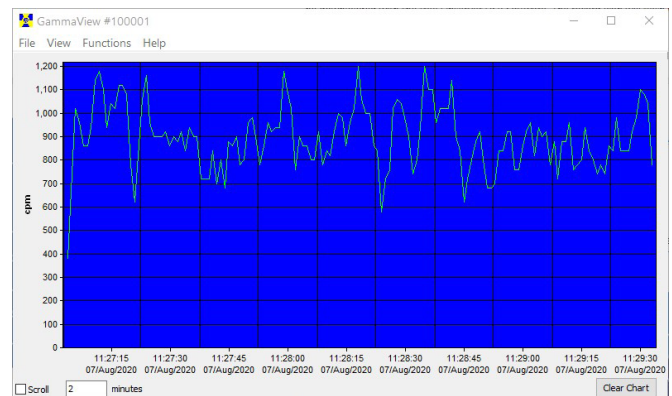
Observer USB Meter Screen

The Observer USB Meter Screen *(Figure 7(3))* simulates a digital meter to display the readings collected by the detector.

Figure 7(3)

Zero

When the **Zero** is clicked, the averaging of the collected counts starts over.

Averaging Time

The **Averaging Time** selects the amount of time in which the previous readings are averaged. The longer the averaging time, the more accurate your reading. Shorter averaging times allow significant changes to be seen more quickly.

Units

To switch between units of measurement, use the **Units** drop down menu. The **Units** drop down box selects the unit of measurement displayed on the y axis of the chart screen. You can select **Averaging Time** and the **Units** of measurement of the chart screen and the meter screen.

Echo GammaView Display

When Echo Display is checked, the meter screen will mirror the display of your GammaView. When Echo Display is not checked, the meter screen will not mirror the display of your GammaView. You can select the unit of measurement from the drop down box.

Enable Alarm at and Latch Alarm

This will enable the alarm that is built into the software. Once the radiation levels go back below the set level of the alarm, the alarm will stop unless you have checked Latch Alarm. When the Latch Alarm is checked, the alarm will continue to sound until the reset button is pressed. This is a USB Observer Software alarm only, not the alarm on the instrument itself.

Show Grid

The **Show Grid** check box displays the data collected in the grid. The grid displays an ongoing collection of data based on the user selectable settings in the View > Preferences > Grid Settings dialog box. For example, if the grid setting is 60 seconds, a new data point will appear on the grid every minute.

Figure 7(4)

File

Save Chart

A text file of the Chart data is saved.

Save Grid

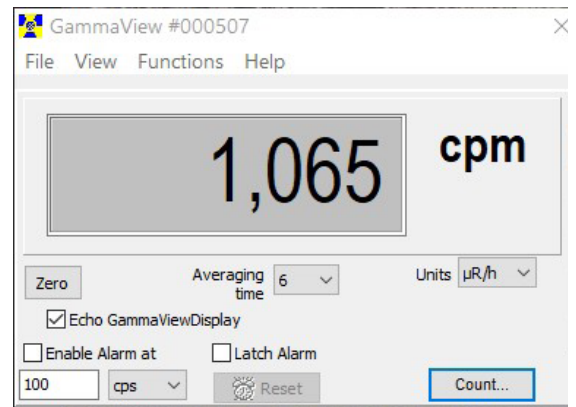A text file of the Grid data is saved.

Exit

Closes the program.

View
Preferences

The alarm settings, auto-save chart feature, the grid settings for datalogging frequency and units of measurement can be adjusted in View > Preferences menu. Auto Save files are saved to the Observer USB Files folder, located in the Observer program file on your computer.

Figure 7(5)

Chart Settings
Autosave and Clear Chart Every
Will automatically save and clear the chart at the number of minutes selected. Autosave files are saved to the Observer USB Files folder located in the Observer program file on your computer.

Use Audible Alarm
Will sound an alarm on the computer's sound system.

Grid Settings
Write to Grid Every
Will set how often a new data point will appear on the grid.

Autosave and Clear Grid Every
Will automatically save and clear the grid at the number of data points selected.

Additional Grid Data
Allows the setting of the units of measurement shown in the grid for **Value 1** and **Value 2**.

Cal Panel (Calibration Panel)

Located under View > Cal Panel, the Cal Panel Window can be used to change a number of settings on your instrument. The instrument should be in the mode or count screen when Updating the Settings, as some changes to the menu items via the Cal Panel will not refresh if the instrument is displaying a menu screen.

Calibration Information

Calibrations, such as an NIST Source Calibration, contain information including the Serial Number, Calibration Date, Deadtime (sec), and Sensitivity (cpm per µR/hr).

CAUTION: Please note that changes to the Calibration Date, Deadtime (sec), and Sensitivity (cpm per µR/hr) may void any calibration of the instrument on record.

Figure 7(6)
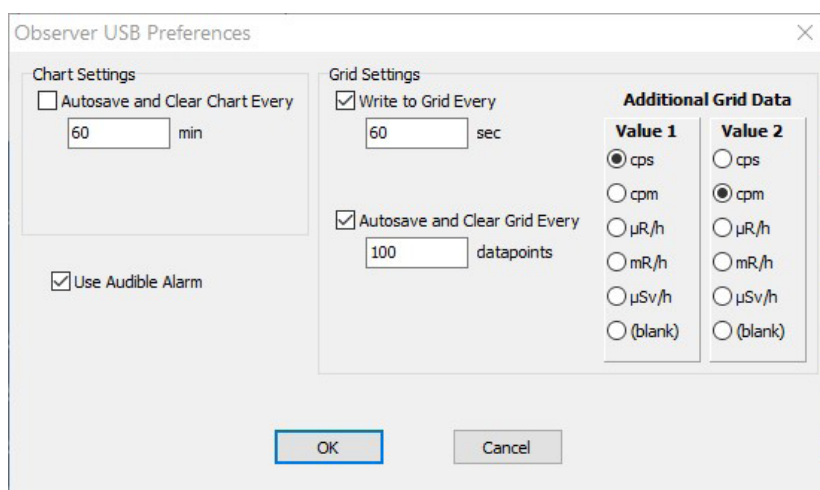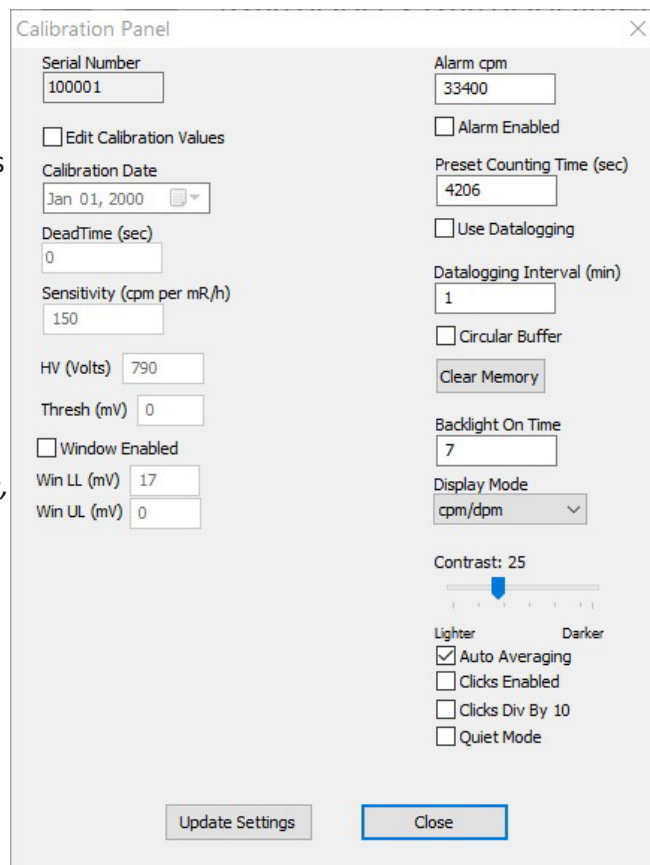
Additional Calibration Panel Settings *Refer to Figure 7(6)*

Alarm Settings

The Alarm cpm and Alarm Enabled fields set the alarm. To activate the alarm, enter the desired alarm threshold in the Alarm cpm field and check Alarm Enabled. To disable the alarm, uncheck Alarm Enabled.

Preset Counting Time (sec)

Enter the number of seconds to set the default time for taking a timed count. The default is 600 seconds

Data Logging Settings

Use Datalogging, Datalogging Interval (min), Circular Buffer, and Clear Memory handle the data logging settings in the Cal Panel. *Note: Be sure to set the time and date on your instrument before activating the datalogging feature.*

Use Datalogging

Check the box to enable writing the collected data to the internal memory.

Datalogging Interval (min)

Sets the interval for data logging. The default is 1 minute. This can only be changed through the software.

Circular Buffer

When this box is checked, the oldest collected data will be overwritten with the most recent data collected.

Clear Memory

Clears the data stored in the internal memory on the instrument.

Backlight On Time

Sets how many seconds the backlight will be on when pressing the backlight button.

Contrast

Sets the contrast of the LCD display numbers and icons.

Auto Averaging

This activates the auto averaging feature. When unchecked, the GammaView is in fast response mode. Fast response mode is only recommended for use in high radiation fields.

Clicks Enabled - enable/disable the clicks only with the Clicks Enabled checkbox.
Clicks Divided by 10 - a single 'click' will sound for each 10 counts detected.
Quiet Mode - enable/disable all sounds, except Alarm and OVER range (*See page 6: Audio/minus*).

Functions *Refer to Figure 7(1)*

Retrieve Memory

If the recording feature is activated and the internal clock is set, then the collected data can be retrieved from the internal memory by selecting Functions > Retrieve Memory. Data is stored in a delimited text file, which can be opened in your preferred spreadsheet software.

Synchronize GammaView to PC Clock

Sets the date and time on a PC running the Observer USB. The instrument will beep twice when synchronization has completed.

Chapter 8: Radiation Alert Observer Bluetooth BLE

To connect via Bluetooth

1. Download the Radiation Alert Observer BLE app from the Google App Store onto your phone or tablet.

2. Turn on your instrument and activate the Bluetooth by pressing the menu button and using the up and down arrows to scroll to Bluetooth LE and press Enter.

3. Use BluetoothLE? will appear. Press the plus (+) button to activate it or press the minus (-) button to turn it off.

4. The device will remain discoverable for 1 minute. Make sure your phone or tablet's Bluetooth is turned on.

5. Launch the Observer BLE App.

6. Select Scan to begin searching for your instrument.

7. The Model and Serial Number will appear in the list of available devices. Select your instrument and you will be prompted to connect.

8. Select Yes and you will be taken to the opening screen of the Observer BLE app.

9. On this screen, you will notice the status of the BLE and the units of measurement that your instrument is currently showing.

10. Open the menu, three dots will be on the right side of the Observer BLE title bar. This will show all the options available.

Readings Screen

1. The Readings screen displays the readings from your instrument at the top of the screen. The unit of measurement shown will reflect whichever unit of measurement is selected on the instrument.

2. Below the readings are two text fields. The top one is the title of your survey/notes. The lower text box is for notes and descriptions, as well as any GPS data you want to append to your survey.

3. Users can add any GPS data collected by their mobile device to the notes section of their survey by tapping the GPS button.

4. Note: If the GPS data is not available, the GPS data will be displayed as "NO FIX." Depending on the settings of your device, you may need to allow the app to access the GPS data, as some settings will restrict the access to that data.

5. To quickly clear any of the text fields, select the "X" to the right of the corresponding text fields.

6. To Save a survey, select Save. Users will be given the option to append the current data to the existing text file on their device or to create a new one. Files will be saved to the ObserverBLE directory on your device and accessed through the File Manager option in the app.

7. To send your saved survey file, select File Manager from the menu.

8. You can also have data automatically saved. Check the "Log Reading every" button and choose the time frame for auto save. You will be prompted to add to LogData.csv file, or create a new file to save data in. The data files will be saved to the ObserverBLE directory on your device and accessed through the File Manager option in the app.

Timed Count Screen

The Timed Count Screen enables users to automate the process of collecting, saving, and sharing your collected Timed Counts. The units of measure displayed are raw counts.

1. **Count Time (sec) -** Select the time (in seconds) for your count.

2. **Start** – Your device will stay awake during the count. Total counts are the top of our screen.

3. To start a new count, select **Clear**, set your time, and select **Start**

4. The top text field is the title of your timed count. The lower text box is for notes and descriptions, as well as any GPS data you want to append to your count.

Settings Screen

The Alarm level is set on the instrument or through the Observer Software. The Settings Screen enables users to set the scale of the Graphic Screen.

To set the Graph Screen

1. Tap the Three dots on the top right.

2. Select Settings...

3. Select the units of measurement used by the Graphic screen at the top, which are limited to dose rate.

4. Select the Scale Max in the selected units of measurement. The Scale Max is the unit of measurement that will determine the top end of the color wheel in the Graphic Screen. For example, if the Scale Max is set to 10 mR/hr, then the color wheel will show a graphic representation of the readings collected up to 10 mR/hr. Users should be sure that the Scale Max is not set to a value higher than the average background to see if the full range available on the display. Additionally, the Scale Max should also be set higher than the alarm set on the detector.

5. Select the units used for GPS coordinates, either decimal degrees or degrees and minutes.

Graphic Screen

The Graphic Screen is a graphical representation of the radiation levels detected.

1. The set up for the Graphic Screen is set up in the Settings Screen. It is recommended that you set the Scale Max at least equal to the alarm set point on your detector. For example, if the alarm set point on the detector is set to 10 mR/hr, the you might set Max Scale to 15 mR/hr.

2. Warnings are indicated by a change in the color wheel

- Green - Okay

- Yellow warning icon - 20% below the alarm level

- Red - Alarm level reached

For example, If the alarm on your instrument is set to 10 mR/hr, the warning will appear at 8 mR/hr. The warning alarm will remain active until the radiation level falls below the warning threshold or increases enough to trigger the alarm. Once the alarm level is reached, the warning icon will change to a radiation symbol and the portion of the color wheel below the alarm set point will change to red. The alarm will remain active until the radiation level falls below the set alarm threshold on your instrument.

File Manager Screen

The File Manager screen is used to transmit, move, or delete any survey or log files created by Observer BLE.

To use the File Manager Screen

1. Tap the three dots on the top right.
2. Select File Manager...
3. Tap on a file in the list box on the lower portion of the screen. The selected file will appear in the Selected File box
4. Tapping the Delete... button will permanently delete the selected file

Rad Responder Screen

To use the RadResponder you must create a log in through RadResponder.net

Once logged in, follow the prompts to upload data.

About

Shows the Version number of the Observer BLE app.

Chapter 9: Troubleshooting

WARNING: HIGH VOLTAGE INSIDE.

The GammaView has no user serviceable components. Opening the instrument may void the warranty

The GammaView is a highly reliable instrument. If it does not seem to be working properly, look through the following chart to see if you can identify the problem.

Problem	Possible Cause	Action
Display works, but no counts are registered	defective cable, defective probe, weak batteries	Check the cable for defects. If you have a known good cable and probe, connect them to the instrument. If the GammaView reads, either the cable or the probe may need to be replaced, or instrument may need to be sent in for service.
Reading is high, but another instrument has a normal reading in the same location	possible contamination	Scan the GammaView with another instrument.
Display is blank	no battery, dead battery, poor battery connection, defective LCD	Install new AA batteries. If the count light and audio work, it requires service.

Accessories

Xtreme Boot (Included)

The Xtreme boot offers maximum performance in a lightweight rugged solution for using Radiation Alert® products in the field. The Xtreme boot is designed specifically for individuals operating in tough environments, such as 1st Responders, Mining and HAZMAT crews. Made of a RoHS compliant TPE rubber, the case also offers superior grip and drop protection.

Stand (Included)

The Stand offers a convenient way for the instrument to stand vertically while leaving your hands free for other tasks.

NOTE: if you choose to use the stand, we recommend that you anchor it to your workspace.

Lanyard (Included)

The loop on the bottom of the enclosure can accommodate the included lanyard to help protect the GammaView from drops.

Free Observer USB Software (Download)

The Observer USB is a free version of the Observer software that runs on Windows®. It can be used with the USB versions of the Radiation Alert® Radiation Detector Family. The Observer USB reads in Counts, CPM, and CPS, as well as µR/hr, mR/hr, and µSv/hr and has the ability to collect, log, and perform statistical analysis on the data received. You can download a copy at seintl.com/software.

No Mac or WinRT versions are available.

Appendix A: Technical Specifications

Detector
1x1 NaI Scintillation Probe.

Operating Range
mR/hr – 1 µR/hr to 5mR/hr
µSv/hr - 0.001 to 50
CPM – 0 to approx. 875,000
CPS – 0 to approx. 14,584
Total Counts- 999,999

Typical Sensitivity
150 CPM/µR/hr

Temperature Range
-15° to 50C°/14°F to 122°F

Humidity Range
10% to 70% (non-condensing)

Accuracy (Referenced to Cs137)
Typically ±10% with
NIST Source Calibration

Energy Range
20 KeV to 1.5 MeV.

Operating Voltage
Typically 500 to 1200 Volts

Selectable Alert Set Range
mR/hr - 0.001 to 5
µSv/hr - 0.001 to 50
CPM - 1 to 875,000
CPS- 1 to 14,584
Pulsating beeper sounds the alert.

Anti-Saturation
Meter will hold at OVER range in fields as high as 100 times the maximum reading.

Averaging Periods
Display updates every second. At low background levels, the update is the average for the past 30-second time period. The timed period for the average decreases as the radiation level increases.

Display
Graphic Display with Backlight

Count Light
Red LED flashes with each radiation event

Audio Indicator
Internally mounted beeper approximately 70db @ 1 meter - can be switched off for silent operation.

Outputs
USB and Bluetooth BLE (4.1) for use with Free Observer Family Software for PCs and Android OS.

Power Requirements
Two AA alkaline batteries (included). Approx. 500 hrs @ background.

Size
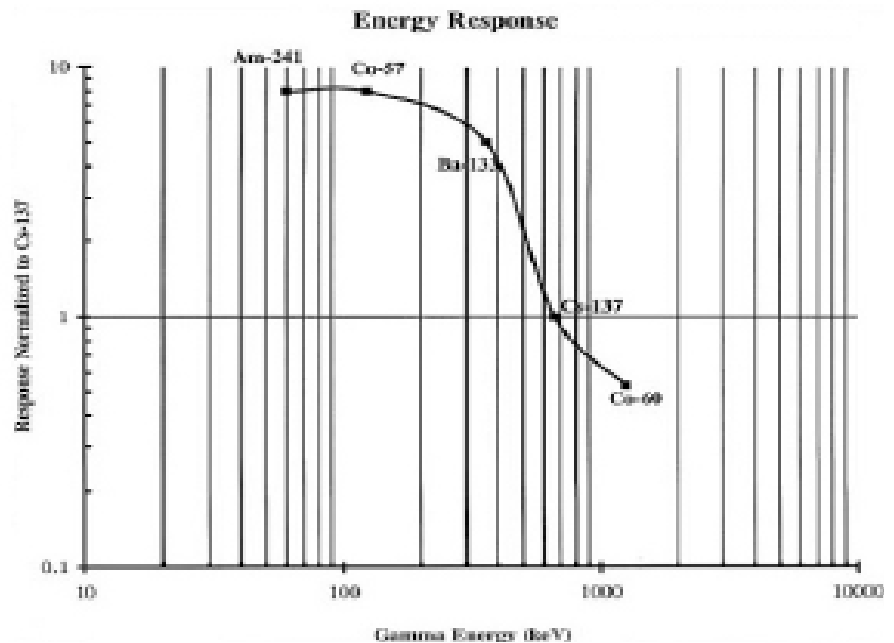Base unit - 140 X 68 X 33 mm (5.5 X 2.7 X 1.3 in.), Probe- 5.0 X 18.5 cm (2 x 7.3 in)

Weight
Base unit - 193 grams (6.8 oz) with batteries, Probe- 393 grams (13.8 oz)

Includes
Carrying Case, Xtreme Boot, Stand, Lanyard, Mini-USB Cable, Observer USB Software Download, Observer BLE Software Download, Certificate of Calibration

Limited Warran   ty - 1 year limited warranty

Energy Response

Appendix B: Limited Warranty

WARRANTOR: S.E. International, Inc., P.O. Box 39, 436 Farm Road, Summertown, TN 38483-0039, USA, (931) 964-3561

ELEMENTS OF WARRANTY: S.E. International, Inc., warrants for one year all materials and craftsmanship in this product to be free from all defects with only the limitations set out below.

WARRANTY DURATION: The warranty shall terminate and be of no further effect one year after the original date of purchase of the product or at the time the product is: a) damaged or not maintained as is reasonable or necessary, b) modified, c) repaired by someone other than the warrantor for a defect or malfunction covered by this Warranty, d) contaminated with radioactive materials, or e) used in a manner or purpose for which the instrument was not intended or contrary to S.E. International, Inc.'s written instructions. This warranty does not apply to any product subjected to corrosive elements, misuse, abuse, or neglect.

STATEMENT OF REMEDY: In the event that the product does not conform to the warranty at any time while this warranty is effective, the Warrantor will repair the defect and return the instrument to you prepaid, without charge for parts or labor. Shipping cost to the factory for repair is the responsibility of the customer. Customer is also responsible for international costumes, duties, and taxes to and from the repair facility.

NOTE: While the product will be remedied under this warranty without charge, this warranty does not cover or provide for the reimbursement or payment of incidental or consequential damages arising from the use of or the inability to use this product. The liability of the company arising out of the supplying of this instrument, or its use, whether on warranties or otherwise, shall not in any case exceed the cost of correcting defects in the instrument, and after the said one year period all such liability shall terminate. Any implied warranty is limited to the duration of the written warranty.

PROCEDURE FOR OBTAINING PERFORMANCE OF WARRANTY: In the event that the product does not conform to this warranty, please write or call to the address above. S.E. International, Inc. will not accept contaminated instruments for calibration or repair under warranty or otherwise.

NOTE: Before using this instrument, the user must determine the suitability of the product for his or her intended use.

Calibration Database Application

Please fill out this form and send it back to us if you would like to be
notified of the NIST calibration renewal for your instrument to:
S.E. International, Inc.
P.O. Box 39, 436 Farm Rd. Summertown, TN 38483
1.800.293.5759 | 1 931.964.3561 | Fax: 1.931.964.3564
www.seintl.com | radiationinfo@seintl.com

_____
NAME

_____
COMPANY

_____
ADDRESS

_____
CITY

_____
STATE, ZIP, & COUNTRY

_____
MODEL NAME

_____
SERIAL NUMBER

_____
DATE PLACED IN SERVICE

_____
EMAIL

_____
PHONE NUMBER

Or fill out the form online at
http://seintl.com/calibrations/