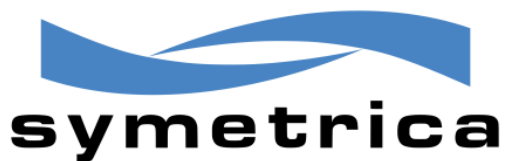

Technical Publications

VeriFinder™ S100

Operator & Maintenance Manual



Discovery Technology ®

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Note: 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 technician for help.

Caution: changes or modifications not expressly approved by Symetrica could void the user's authority to operate the equipment.

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SECTION 1 GENERAL

1.1 Acronyms and Abbreviations

Acronym / Abbreviation	Definition / Description
AC	Alternating Current
APN	Access Point Name
BIT	Built in Test
CCID	Chip/Smart Card Interface Device
c/s	Counts per Second
DU	Depleted Uranium
FWHM	Full-Width Half Maximum
GLONASS	Global Navigation Satellite System
GPS	Global Positioning System
HEU	Highly Enriched Uranium
HTML	Hypertext Markup Language
ID	Identification
IP	Internet Protocol
LED	Light Emitting Diode
NORM	Naturally- Occurring Radioactive Materials. Radioactive materials (minerals and raw materials) containing radionuclides of a natural origin.
Non-NORM	Non-Naturally Occurring Radioactive Materials. Radioactive materials that have increased concentrations of radionuclides due to human intervention.

Acronym / Abbreviation	Definition / Description
n/s	Neutrons per Second.
PDF	Portable Document Format.
RDD	Radiological Dispersal Devices.
RGPu	Reactor Grade Plutonium.
RIID	Radio Isotope Identification Device.
RN	Radionuclide – (radioactive nuclide, radioisotope or radioactive isotope). An atom that has excess nuclear energy making it unstable, which often results in the emission of neutron or gamma ionizing radiation.
RNDIS	Remote Network Driver Interface Specification.
SIM	Subscriber Identity Module.
SNM	Special Nuclear Materials.
SSH	Secure Shell.
TLS	Transport Layer Security.
UI	User Interface.
USB	Universal Serial Bus.
WGPu	Weapons Grade Plutonium.
Wi-Fi	Wireless Fidelity.
WMI	Web Management Interface.

1.2 Contacting Symetrica

Contact Method	UK Office	USA Office
Telephone	+44 2380 111 580	+1 (508) 718-5610
Email / Website	info@symetrica.com / www.symetrica.com	

1.3 Warnings, Cautions and Notes

WARNING

Any operating procedure, practice, or condition which, if not strictly complied with, may result in personal injury or loss of life.

CAUTION

Any operating procedure, practice, or condition which, if not strictly complied with, may result in damage to the system or equipment.

Note:

Any operating procedure, practice, or condition that requires emphasis.

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SECTION 2 SYSTEM OVERVIEW

2.1 What is VeriFinder S100?

VeriFinder S100 is a handheld Radio-isotope Identification Device, that provides accurate radiation detection and identification for cargo inspection, homeland security and emergency use.

The system can be managed as a standalone unit or can be managed from a web-based user interface (refer to document 760-0363 – VeriFinder WMI Manual).

2.2 VeriFinder Kit Contents

The basic kit comprises a Ruggedized Transit Case containing the VeriFinder unit and a 60W power supply with USB C to USB A cable.

Optional accessories include:

- Holster and Leg Strap (refer to Section 2.13)
- Docking Station (refer to Section 2.14)

2.3 System Overview

VeriFinder is designed to:

- Detect nuclear materials.
- Rapidly and reliably discriminate between Innocent and Threat sources such as Special Nuclear Materials (SNM) and Radiological Dispersal Devices (RDD).
- Locate and identify potentially dangerous nuclear radiological materials in unsuspected locations.

Example operational environments include:

- Emergency responders and force protection (Hazmat or Defence response teams).
- Searching for radiological and nuclear material at ports of entry and checkpoints during Custom and Border Protection operations.
- Line-up screening of specific objects identified by other means, such as: primary detectors or intelligence information.
- Screening of people, cars, trucks, containers, railcars, and other conveyances.
- Scanning wide areas such as accident scenes, special events, buildings, ships, public/open areas, container/yard checkpoint areas, piers, aircraft, and so on.

Note: VeriFinder functions exceptionally well in the operational environments described above. VeriFinder has not been tested in an explosive environment.

2.3.1 Main Features

VeriFinder typically operates for up to 12-16 hours on a fully charged battery at room temperature and can store up to 500 events on a first-in-first-out basis.

The screen is a high-contrast, high-resolution LCD that displays color-coded backgrounds and messages, providing real time data to the operator.



Figure 1: VeriFinder Main Features

Item	Description
1	Status indicator LED and next to that is the light sensor for automatic brightness adjustment.
2	320 x 240 2.8" LCD display screen
3	Gamma detector
4	3-button keypad
5	Neutron detector
6	Power connection (USB-C) and charging LED indicator.

Item	Description
6	Headphone connection (USB-C)
6	Data connection (USB-C)
7	Speaker for audio alerts

2.3.2 Display Screen

The display is a high-resolution LCD display with an auto-dimming backlight. The backlight can also be adjusted manually (refer to Section 3.12.2 – Backlight Settings). The landscape display has a resolution of 320 pixels wide by 240 pixels high, which contains a User Interface (UI) that is split into seven main areas.

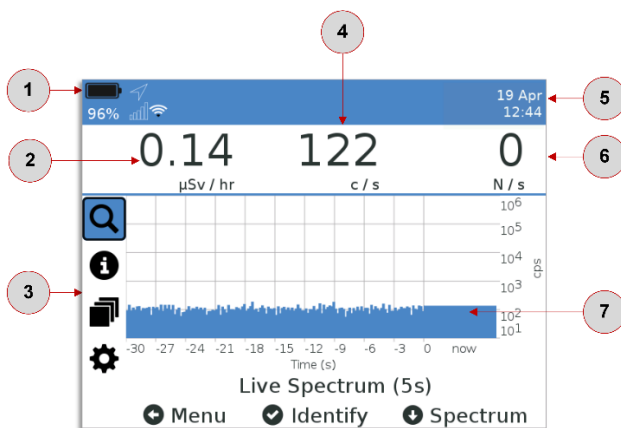


Figure 2: VeriFinder UI

Item	Display Area	Description
1	Battery / Power indicator	Percentage power remaining
2	Dose Rate	$\mu\text{Sv/h}$ or mrem/h

Item	Display Area	Description
3	Menu Bar	Menu options: Detection Mode (see Section 3.4 - Detection of Radionuclide Sources) Information Menu (see Section 3.6 - System Status) Event Viewer (see Section 3.7 - Event Viewer) Settings (see Section 3.9 – Normal Mode Settings) The menu bar will pop up when pressing the back arrow. It will disappear once an option is selected, or the back arrow is pressed to enter the locate mode.
4	Gamma Rate	c/s (counts per second)
5	Status Bar	Displays the battery life of the device, a date and time stamp, and system status icons (refer to Section 2.3.3 – Status Bar icons). The bar also indicates any alarms or alerts. The color will change for detection alarms (gamma - yellow, neutron - red) and system warnings (amber, non-critical faults - grey) and remain changed until the condition is removed.
6	Neutron Rate	n/s (neutrons per second)
7	Gamma History	Provides a historical graph of the count rate to assist in locating hot spots. Note that this default display can be changed to suit the needs of the operator (refer to Section 3.4 - Detection of Radionuclide Sources) The screen is also used to display alarms, warnings and information based on menu options selected.

2.3.3 Status Bar Icons

Status bar icons displayed are summarized as follows:

Icon	Description
	Bluetooth: Black - enabled and connected. White – enabled.
	Muted / Disabled: Audio has been set to mute and / or tactile indicator has been disabled. No icon - indicates audio and tactile indicator are on.
	GPS: Black - enabled and GPS lock achieved. White - enabled and waiting for GPS lock.
	Wi-Fi Signal strength: Black - indicates the signal strength from Wi-Fi network. White - indicates the maximum number of signal strength indicator bars. No icon - indicates Wi-Fi is off or the VeriFinder is not connected to a Wi-Fi network now.

Icon	Description
  	Symetrica Generic Push (SGP) API - Data Upload Notification: Arrow Up - Busy - indicates SGP upload is active. Tick - Idle - indicates SGP is connected but inactive. Warning – indicates there is a history of unacknowledged SGP failures. Warnings can only be cleared by an administrator using the WMI (refer to 760-0363 – VeriFinder WMI manual).

2.3.4 Menu Overview

Menu options are displayed as icons on the left side of the UI.

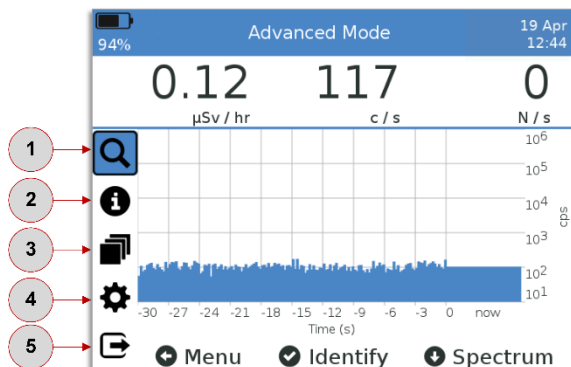


Figure 3: VeriFinder Menu Overview

Item	Title	Description
1	Operating Mode	Operating mode selectable by the user: - Locate. - Spectrum (Advance Mode) - Dose.
2	System Status	Used to view key device information.
3	Event Viewer	Used to: - View all recent events. - View all archived events (that is, those that have been manually downloaded).
4	Settings	View and change device settings.
5	Exit Advanced Mode	Select this to exit Advanced mode. Note: This icon only shows when in Advanced Mode of operation (refer to Section 4.1 – Advanced Mode Login).

2.4 Keypad Operation

Control of the VeriFinder User Interface is through the 3-button keypad.



Figure 4: VeriFinder 3-Button Keypad

Each button has two functions:

- Primary function – Push and release.
- Secondary function – Push and hold for three seconds.

Functions are summarized as follows:

Button	Primary Function	Secondary Function
Select/Power 	Press and release to: ▪ Initiate Identification from locate mode. ▪ Select highlighted menu option. ▪ Acknowledge alarms and warnings.	Press and hold to: ▪ Power On / Shutdown.

Button	Primary Function	Secondary Function
Back 	Press and release to: ▪ Move focus from locate window to main (icon) menu. ▪ Scroll up through tables or menu options. ▪ When the main menu is in view, press to enter locate mode.	Press and hold to: ▪ Mute/unmute Speaker and enable/disable Tactile Indicator. Note: On selection, the system cycles through in a loop as follows: Speaker on, Tactile Indicator on, Speaker on, Tactile Indicator off, Speaker off, Tactile Indicator off. Advanced mode only: ▪ Speaker off, Tactile Indicator off.
Down 	Press and release to: ▪ Select the next menu option. ▪ Scroll down through tables or menu options. ▪ Adjust integer value inputs or levels on applicable screens.	Press and hold to: ▪ Open Tutorial mode for basic help on the system.

2.5 USB-C Connection Point

The USB-C connection point for VeriFinder is located on the rear of the unit. USB-C is used for data, external power, and headphone connections.



Figure 5: VeriFinder USB-C Connection Point

2.6 Audio Indicator

The alert and alarm audio indicators, similar to a Geiger counter, are emitted from a speaker, which is located to the front of the unit.

The audio can be switched on or off as required (refer to Section 4.3 - Adjust Alarm Thresholds and Banners).

Event	Pitch	Audio Sequence
Fault	High	1 beep per second.
Gamma detection	High	1 beep per second.
Neutron detection	High	2 beeps per second.
Personal hazard	Low/high/low	3 beeps (low, high, low pattern) per second.

2.7 Tactile Indicator

When activated, the vibrating tactile indicator automatically switches on when an alert or alarm occurs and remains on until the alarm is acknowledged. The different vibration frequency patterns for each type of alert or alarm type are shown below.

The tactile indicator can be switched on or off as required (refer to Section 4.3 - Adjust Alarm Thresholds and Banners).

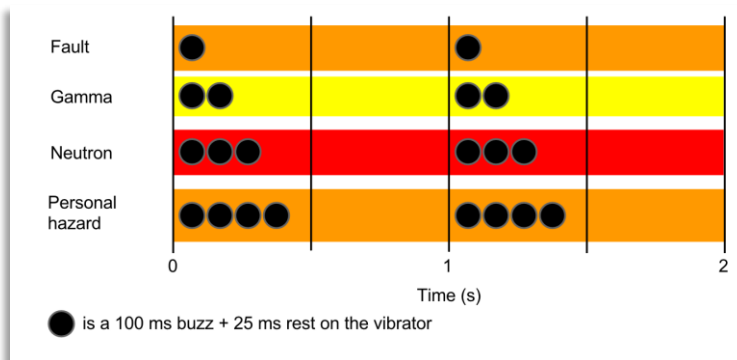


Figure 6: Tactile Indicator Vibration Frequency Patterns

2.8 Stabilization Module

The stabilization module is a tamper-proof, smart calibration device internal to the instrument, which maintains a constant calibration of the gamma detector. It uses a triple encapsulated Na-22 source with a maximum activity of 1000 Bq.

2.9 Low Battery Warning

The System Fault Low Battery warning is generated when the battery capacity falls below the low-capacity threshold (10%). The low battery warning threshold can be changed to a different value (refer to Section 4.3.4 - Low Battery Warning Threshold).

1. Press the Select  button to acknowledge the alarm.

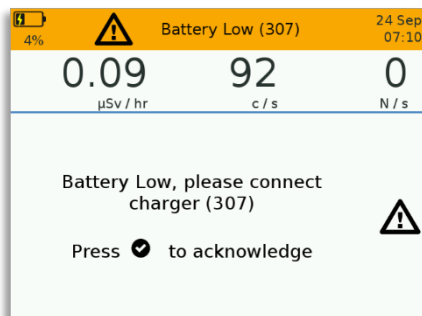


Figure 7: Battery Low Warning

2. The VeriFinder returns to the operation it was performing before the alarm.
3. Recharge the battery through the USB-C receptacle.

2.10 Connecting VeriFinder to External Power

Connecting VeriFinder to an external power supply, recharges the battery without having to power down.

1. Insert the USB-C cable into the USB receptacle on the VeriFinder and the other end of the cable into the power adaptor provided.
2. Plug the power adaptor into an external power outlet to start charging (LED displays red).
3. Once the battery is fully charged (LED displays green) remove the USB-C cable and unplug the adaptor.



Figure 8: Location of the USB-C Receptacle

2.11 Data Transfer

2.11.1 Wired Connection

Transfers data to a PC through the provided USB-C cable. It is also possible to transfer selected events onto a removeable USB media drive if required.

2.11.2 Wi-Fi Communications

Enables Wi-Fi transfer of data to a PC, using b/g/n (communication standards) Wi-Fi networks.

Note: VeriFinder will only connect to authorized networks, that is, networks with a saved security key.

2.11.3 Bluetooth Connection

Sends configured data to a recipient via Bluetooth 4.0 to a paired Android device. Also, enables connection to an Android device for access to the VeriFinder's Web Management Interface (WMI). Refer to Section 5.3 - Web Management Interface.

2.12 Transportation of the VeriFinder

Always place VeriFinder in its protective Ruggedized Transit Case whenever transporting it to a different location. The case is designed to securely hold VeriFinder and all its ancillaries (refer to Section 2.2 – VeriFinder Kit Contents).

2.13 Using the VeriFinder Holster

Note: This is an optional accessory. A holster can be used to conveniently hold and carry the VeriFinder when on operations.

It is attached by feeding a belt through the securing loops on the rear of the holster. For further security, a leg strap attachment is also provided.



Figure 9: VeriFinder Holster – Side and Rear View

2.14 Using the Docking Station

Note: This is an optional accessory. A docking station can be used to conveniently hold and charge the VeriFinder when not on operations.



Figure 10: VeriFinder Docking Station

2.15 Technical Specifications

Specification	Value
Operation time of batteries	15 to 16 hours depending on number of identifications
Dimensions (L x H x W)	11.5" x 4.4" x 4.8" (29.19 cm x 11.21 cm x 12.12 cm)
Water and dust ingress	IP67
Weight	2.8 lb (1.3 kg)
Environmental: Temperature Relative Humidity	-4 °F (-20 °C) to 122 °F (50 °C) Up to 93% relative humidity, non-condensing at 95°F (35 °C)
Altitude	For use below 3000 meters
Gamma detector	2.6 in ³ NaI (TI) Detector (43cm ³)
Neutron detector	⁶ Li:ZnS (³ He-free)
Dose rate measurement	1 µrem/h to 90 rem/h (10 nSv/h to 900 mSv/h)
Energy range	25 keV to 3 MeV

Specification	Value
Start-up duration including stabilization	75 seconds.
Calibration and stabilization	Automatic and continuous
Communications	Bluetooth, WiFi & Spectral QR code

2.16 Detectable Isotopes

Appendix 1 - Isotope Library, lists the standard detectable Isotopes programmed into the VeriFinder.

Although not explicitly listed in the Isotope Library, VeriFinder provides the capability to identify isotopes associated with the following materials:

- DU – Depleted Uranium
- HEU – Highly Enriched Uranium
- WGPu – Weapons Grade Plutonium
- RGPu - Reactor Grade Plutonium

The isotopes associated with the materials are:

- DU = U-238
- HEU = U-235
- WGPu = Pu-239
- RGPu = Pu-239/Pu-241

Functionality is provided for the Advanced user to change display names of isotopes in the library to suit local needs for identifying materials (refer to document 760-0363 – VeriFinder WMI Manual. – Isotope Library).

2.17 Operational Modes

VeriFinder has two operational modes – Normal and Advanced.

Mode	Description
Normal	Basic operation functions including event viewing, reach-back, common user settings like brightness and volume, and activating / deactivating alert indicators like audio and visual feedback outside of the display. For more information regarding the procedures performed in Basic and Normal modes, refer to Section 3 - Normal Mode of Operation.

Mode	Description
Advanced	Adds additional capabilities, including spectrum view with a manual acquisition feature, threshold adjustments, advanced settings. Advanced mode can control the parameters that can affect the result of a measurement (for example, radionuclide library, routine function control, calibration parameters, alarm thresholds). An exit icon provides a shortcut to exit the Advanced mode and return to the normal mode. For more information regarding the procedures performed in Advanced mode, refer to Section 4 - Advanced Mode of Operation.

2.18 Menu Tree

The VeriFinder UI has a navigable menu tree structure for Normal and Advanced modes.

Menu tree structures are navigated using the 3-keypad buttons as described on Section 2.4 - Keypad Operation.

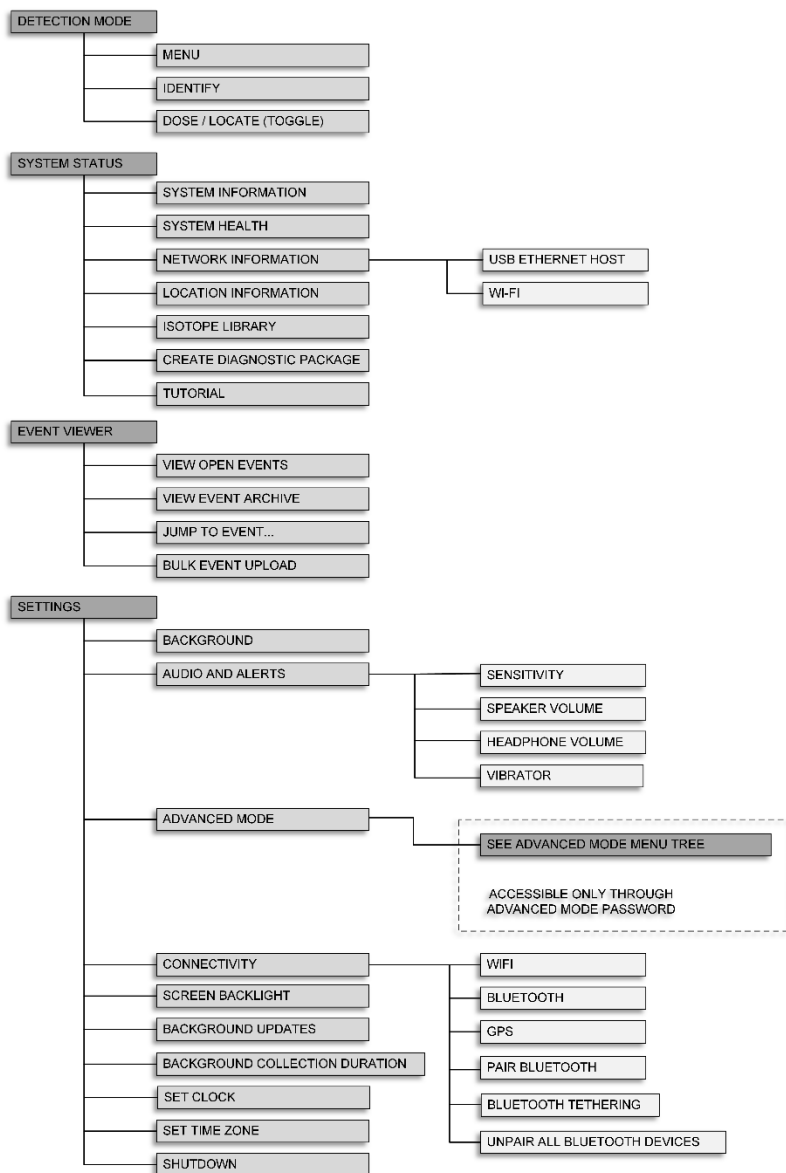


Figure 11: Normal Mode Menu Tree

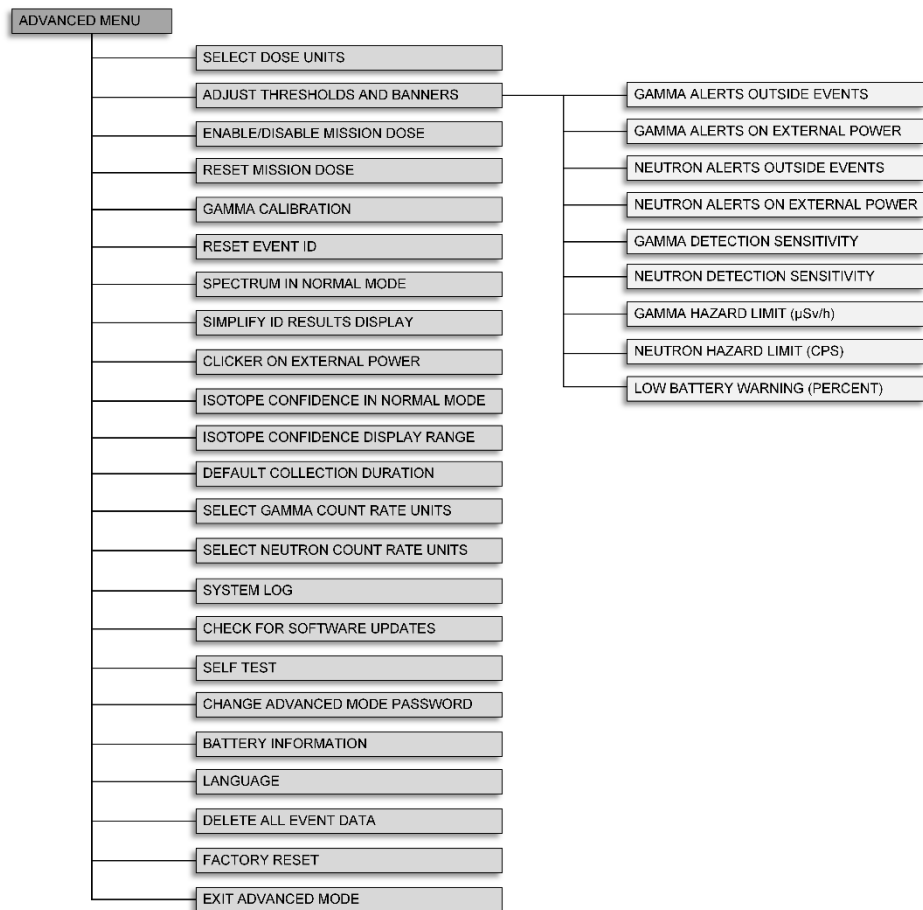


Figure 12: Advanced Mode Menu Tree

SECTION 3 NORMAL MODE OF OPERATION

3.1 Start Up

On start up the system powers in the last configuration and then boots into normal mode of operation.

To start up:

1. Push the Select  button for 3 seconds. After a short while, the splash screen is displayed followed by the stabilizing screen.



Figure 13: VeriFinder Splash Screen

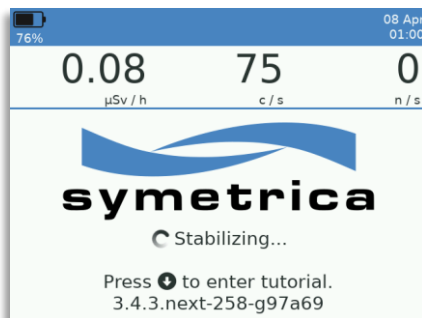


Figure 14: Stabilizing Screen

Note: During stabilization the system also conducts a Self Test (refer to Section 3.1.1 – VeriFinder Self Test – Alarm and Messages).

If required, you can enter **Tutorial** mode by pressing the Down  button. Tutorial mode provides information on how to operate VeriFinder (refer to Section 3.6.8 – Tutorial). The system will continue to stabilize whilst in this mode and will only interrupt should an alert be generated by a system error or threat alarms.

- Once VeriFinder has completed stabilization it enters into **Locate Mode**. The system is now ready for operations (refer to Section 3.4 – Detection of Radionuclide Sources).

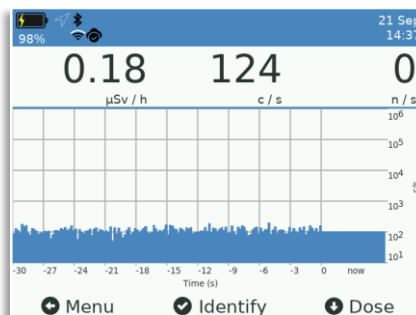


Figure 15: Locate Mode

3.1.1 VeriFinder Self Test – Alarm and Messages

If any part of the Self Test fails during stabilization, a system alarm is generated, and an applicable message is displayed:

- Press the Select  button to acknowledge the alarm. Follow any instructions provided in the error message after acknowledgment. **Note:** The results are displayed on the screen and written to the system log.
- Failure messages are shown in rotation in the top bar, and the dose / count rate bar remains highlighted in an alert color (red, yellow, amber or grey) until the system has determined that the problem has been resolved.

Note: If VeriFinder reports a **Low Battery** error, charge the battery before operating (refer to Section 2.10 – Connecting VeriFinder to External Power).

3.1.2 Audio Checks

Once VeriFinder has successfully booted, a constant clicking noise will indicate that audio is working correctly (assuming the **Audible Rate Indicator** has been enabled with **High** sensitivity). If this is not the case, carry out the following audio checks:

- Check that **Mute** is not enabled (look for the mute icon on the status bar).
- Check that the **Speaker Volume** is on (i.e. $\geq 10\%$).
- Check that the **Sensitivity** option is set to **High**.

Refer to Section 3.11 – Audio and Alert Settings for the above audio checks.

3.2 Shutdown

- Press and hold the Select  button for five seconds.
- If a hard reboot is required, press and hold the Select  button for 15 seconds.

3.3 System Alarms

System alarms are generated whenever a fault or error condition exists within VeriFinder and are indicated by the status bar and / or screen turning orange.

Possible system alarms are:

- GPS fault
- Low battery
- Detector failure

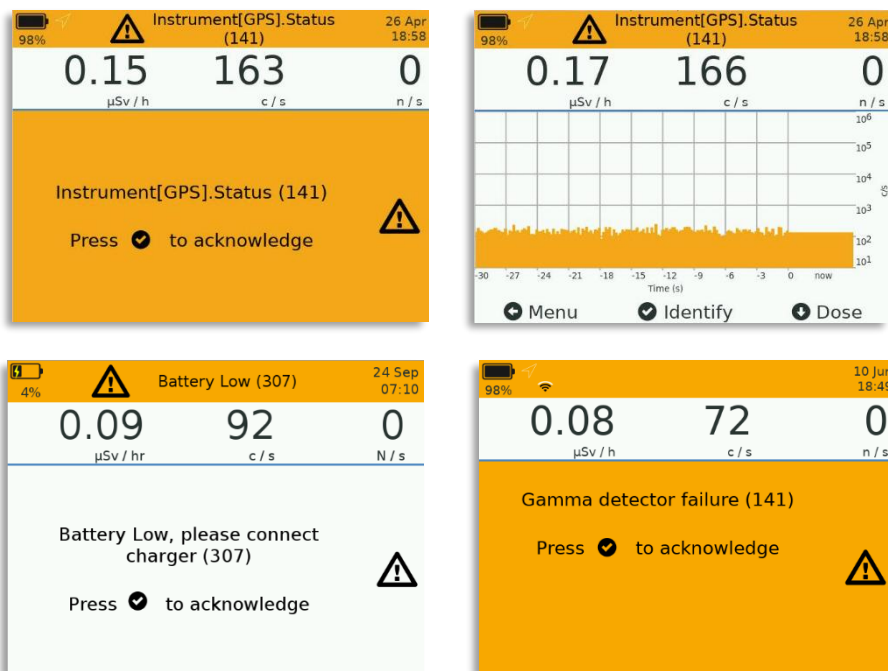


Figure 16: Possible System Alarms

Warnings must be acknowledged. Press the Select  button to acknowledge the alarm and then take appropriate maintenance action to resolve.

3.4 Detection of Radionuclide Sources

VeriFinder will detect a radionuclide source instantaneously and identify the type within 60 seconds, assuming a 30 second collection period. The identification process can be initiated from

either the **Locate**, **Spectrum** or **Dose** screens. **Note:** Spectrum needs to be enabled in normal mode for this screen to be visible (refer to Section 4.8 – Spectrum in Normal Mode).

Locate screen is usually the main operating screen for most users, however screen view can be changed by pressing the Down  button until the required screen is displayed.

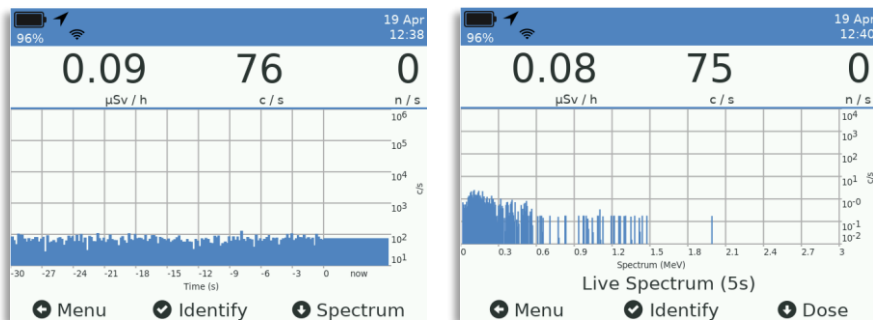


Figure 17: (Left to Right) – Locate Screen and Spectrum Screen

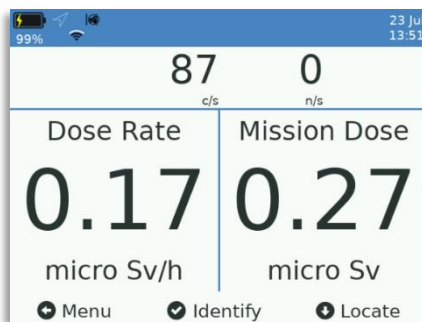


Figure 18: Dose Screen

3.4.1 Detect and Identify a Source (Locate Screen View)

Note: To describe the detection and identification process of a source, the **Locate** screen option is used in the following section, although the identification process is the same for both the **Spectrum** and **Dose** screen options.

The Locate screen view is used to pinpoint a radiation source (gamma or neutron) by moving towards areas that see increased count rates. The displayed graph provides a 30 second window of historical counts assisting in the locate capability. The graph is used to localize the radiation source(s), by determining if the source is getting closer or further away.

The measurement units displayed (Rem and Sieverts) are configurable (refer to Section 4.2 - Selecting Dose Units).

3.4.2 Gamma Detected Alert

On initial detection, VeriFinder vibrates and displays a **Gamma Detected** alert, which occurs whenever the gamma radiation exceeds the configurable threshold value and can occur at any point of operation. For more information about configuring the threshold value, refer to Section 4.3 – Adjust Alarm Thresholds and Banners.

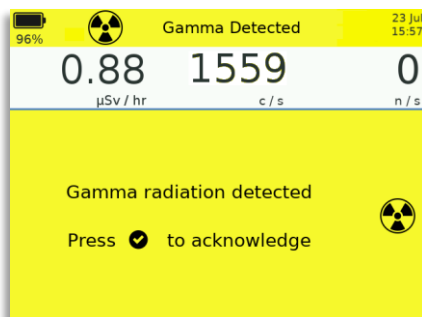


Figure 19: Gamma Detection Alert

The alert remains displayed until it is acknowledged by pressing the Select  button. On acknowledgment the view returns to the **Locate** screen.

Note: The initial alert screen is set by default but can be disabled if required (see Section 4.3.1 – Gamma and Neutron Detection Alerts). If disabled, VeriFinder will instead display the **Locate Screen** on initial detections.

3.4.3 Identification of Gamma Isotopes

Note: When gamma is detected, a **Gamma Detected** banner is displayed in the status bar and remains for as long as the gamma signal continues to be above the threshold, and for 30 seconds thereafter. This 30-second hysteresis value is user-adjustable and helps prevent nuisance alarms when the gross count is near the threshold value.

To create an event and identify the isotope:

1. From the **Locate** screen, press the Select  button to initiate an identification of potential radionuclides present.

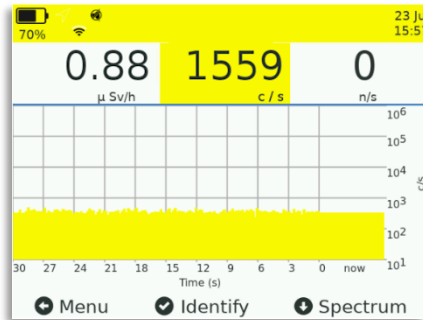


Figure 20: Locate Screen

2. The detector collects spectrum data for the user set period (default 30 seconds). The decreasing collection time is indicated by the progress indicator on the left side. During this time, maintain position of the VeriFinder on the hotspot.

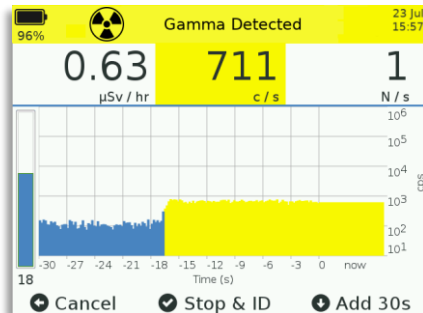


Figure 21: Default Collection Period

Notes: The collection can be manually stopped at any time by one of the following methods:

- a. Press the Select button to stop and identify isotopes with data already captured.
- b. Press the Back button to cancel the data collection and return to the **Locate** screen.

At any time during the collection period, more time can be added by pressing the Down button. This adds time in increasing amounts for a single event. Typically, this would be done in the following situations:

- Low signal or low certainty result.
- SNM result.
- Multiple isotopes.
- Unexpected results.

3. On completion of the data collection, VeriFinder runs through the identification process and presents a summary of the results.

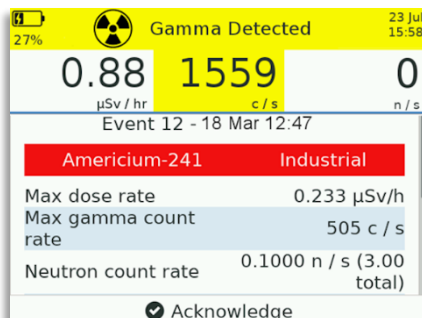


Figure 22: Summary of Results

4. Press the Select  button to acknowledge. For each isotope identified, the following information is shown:
 - Nuclide name and Category.
 - Dose and count rates.
 - Certainty (Advanced Mode only).

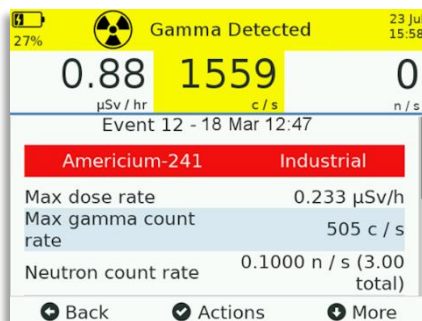


Figure 23: Event Report

5. To scroll through the event report, use the Down  arrow button. The Back  button exits back to the **Locate** screen.
6. If multiple isotopes are identified, they are listed by priority (refer to Section 3.4.8 – Simultaneous Alarms).
7. Once the event has been acknowledged, press the Select  button to display a list of follow up actions (refer to Section 3.5 - Event Actions).

3.4.4 Identification of Low-Level Gamma Signals

When analyzing for identification, VeriFinder will evaluate the gamma spectrum for relative strength over the current background. If VeriFinder determines that the signal strength could be marginal for performing identification, a notification is displayed.

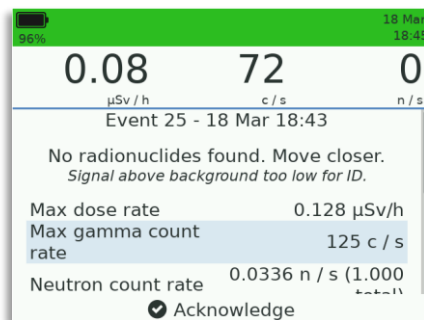


Figure 24: No Radionuclides Found

This can occur in three situations:

- No radiation is visible above background levels.
- The source is strong enough to be detected but below the limit for reliable identification.
- You have an out-of-date / invalid background.

This notification may occur along with the results of one or more identified radionuclides, or with just the message '**No radionuclides found**'. In either case, you may want to get closer to the signal source to obtain a stronger spectrum for analysis.

Note: If radiation is detected whilst the event is being reviewed, the banner will change color.

3.4.5 High Gamma Dose Rate Alarm

The High Gamma Dose Rate alarm is a personal hazard alarm, which triggers when the gamma dose rate detected by VeriFinder exceeds the configurable threshold value. For more information about configuring the threshold value, refer to Section 4.3 – Adjust Alarm Thresholds and Banners.

Features of a High Gamma Dose Rate alarm:

- Default is set to 100 $\mu\text{Sv/h}$, however, is user settable.
- The audible alarm and tactile alert will activate.
- The banner remains whilst the dose is at a hazardous level.
- The alarm must be acknowledged.



Figure 25: High Gamma Dose Rate Alarm

When a high gamma dose rate alarm occurs, press the Select button to acknowledge the alarm and move quickly away from the area.

A **Hazardous Dose** banner is displayed in the status bar and remains for as long as the gamma gross count stays above the threshold value. Regardless of user preferred settings, the audible alarm and tactile alert will be activated.

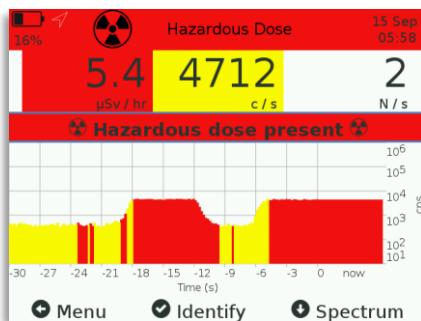


Figure 26: Search Screen – Alarm Status Message

Follow the steps for **Identification of Gamma Isotopes** in Section 3.4.3, to create an event and identify the source of the hazardous dose.

3.4.6 Neutron Detected Alert

On initial detection, VeriFinder vibrates and displays a **Neutron Detected** alert, which occurs whenever the neutron radiation exceeds the configurable threshold value and can occur at any point of operation. For more information about configuring the threshold value, refer to Section 4.3 – Adjust Alarm Thresholds and Banners.

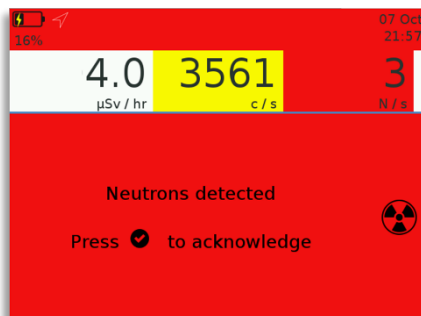


Figure 27: Neutron Detected Alert

The alert remains displayed until it is acknowledged by pressing the Select  button. On acknowledgment the view returns to the **Locate** screen.

Note: The initial alert screen is set by default but can be disabled if required (see Section 4.3.1 – Gamma and Neutron Detection Alerts). If disabled, VeriFinder will instead display the **Locate Screen** on initial detections.

3.4.7 Identification of Neutron Events

Note: When neutron is detected, a **Neutrons Detected** banner is displayed in the status bar and remains for as long as the neutron signal continues to be above the threshold, and for 30 seconds thereafter.

To create an event:

1. From the **Locate** screen, press the Select  button to initiate an identification.

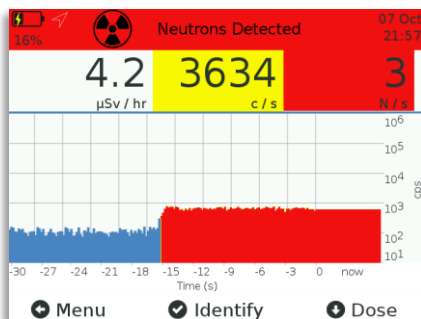


Figure 28: Locate Screen

2. The detector collects data for the user set period (default 30 seconds). The decreasing collection time is indicated by the progress bar on the left side. During this time, maintain position of the VeriFinder on the hotspot.

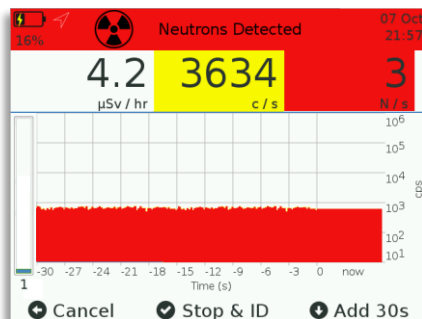


Figure 29: Default Collection Period

Notes: The collection can be manually stopped at any time by one of the following methods:

- a. Press the Select  button to stop and identify neutrons with data already captured.
- b. Press the Back  button to cancel the data collection and return to the **Locate** screen.

At any time during the collection period, more time can be added by pressing the Down  button. This adds time in increasing amounts for a single event.

3. On completion of the data collection, VeriFinder runs through the identification process and presents a summary of the results.

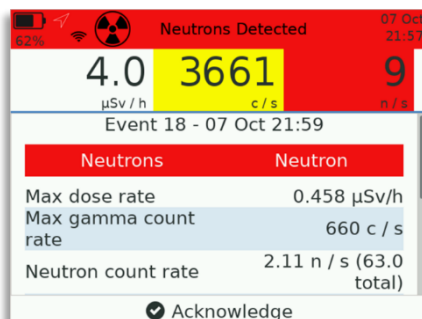


Figure 30: Summary of Results

4. Press the Select  button to acknowledge. The event details, including spectra of any gamma radiation associated with the neutron event, are then displayed in an **Event Report**.

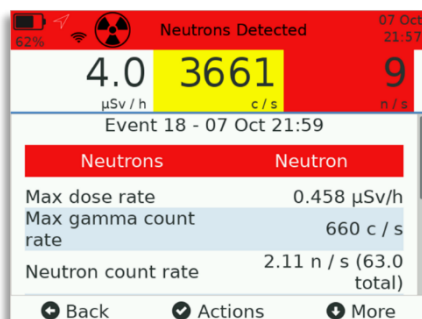


Figure 31: Event Report

5. To scroll through the event report, use the Down  arrow button. The Back  button exits back to the **Locate** screen.
6. Once the event has been acknowledged, press the Select  button to display a list of follow up actions (refer to Section 3.5 - Event Actions).

3.4.8 Simultaneous Alarms

If multiple alarms occur simultaneously, each alarm must be acknowledged separately by the operator. The highest threat alarm is acknowledged first, followed by the others as follows:

Alert/Alarm Condition	Type	Priority Level
High Neutron Count (Saturation)	Alarm	1
High Gamma Dose Rate	Alarm	2
Instrument Failure	Alarm	3
System Fault	Alarm	4
Neutron Detection	Alarm	5
Gamma Detection	Alert	6
Radionuclide Identification	Alert	7
General Alert	Alert	8
Battery Low Warning	Alert	9

If multiple alarms of the same priority occur, they are acknowledged in the order in which they are detected by the software.

3.4.9 Gamma High Dose Mode and Neutron Saturation

3.4.9.1 Gamma High Dose

At a gamma dose of approximately 1 mSv/h from Cs-137, VeriFinder will enter high dose mode.

In this mode, the primary gamma detector saturates, providing only count data and triggering a **High Dose Mode** alarm. A secondary detector then measures the dose rate, enabling operation in exceptionally high-dose environments.

VeriFinder automatically recovers to normal operation within one minute when the dose returns to a normal rate, at which time it reverts to a stabilizing state to enable normal operation to continue.

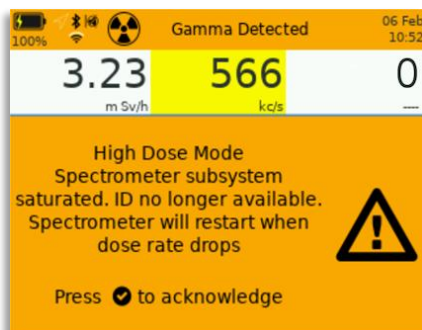


Figure 32: High Dose Mode Alarm

If a high dose mode alarm occurs, press the Select  button to acknowledge the alarm.

3.4.9.2 Neutron Saturation

Under exceptionally high gamma fluxes (2 mSv/h), VeriFinder will enter neutron saturation mode.

In neutron saturation mode, the neutron detector is turned off to preserve the life of the detector and the **Neutron Detector Saturated** alarm appears.

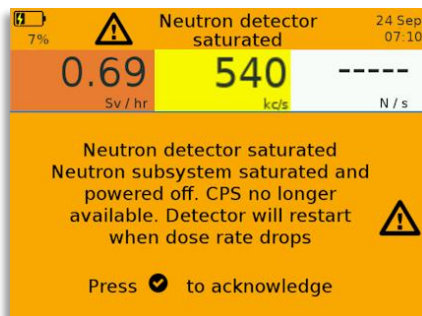


Figure 33: Neutron Detector Saturated Alarm

If a neutron saturation alarm occurs, press the Select  button to acknowledge the alarm and move the VeriFinder to a lower gamma dose environment.

When the dose rate drops below the saturation threshold the neutron detector will automatically restart, and normal operation will resume.

3.4.10 Simplified Identification

If required, a simplified view of identification results can be set from the advanced settings menu (refer to Section 4.9 – Simplify ID Results Display). When in this mode of operation, the display is simplified to show just the identified isotope, category and representative icon.

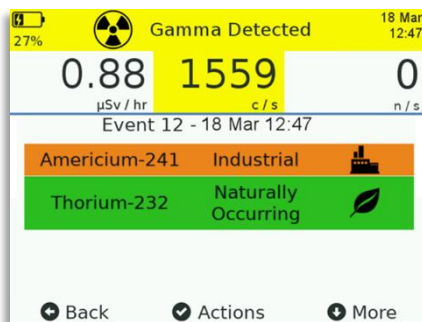


Figure 34: Simplified ID Results

Selection of the Down  button displays the background isotope information, which highlights any NORM and threat nuclides included in the background.

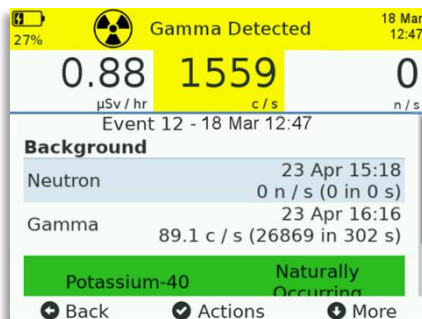


Figure 35: Background Isotope Information

Isotope category icons used on the simplified view are as follows:

Category	Icon
NORM	
Industrial	
Medical	
SNM	
Suspicious	
Neutron	
Unknown	
All else	

3.5 Event Actions

Once an event has been acknowledged, the following options can be available from the **Actions** screen:

- Finish.
- Add Time.
- Upload to SGP. **Note:** can be multiple recipients listed.
- Save to USB Drive.
- Choose Tag.
- Archive Event.
- Email.
- Send via Bluetooth.
- View Spectrum (advanced mode only).
- View QR Code

Note: If an event action is not available for any reason, for example, it has not yet been configured or has been disabled, then it will not be shown in the list.

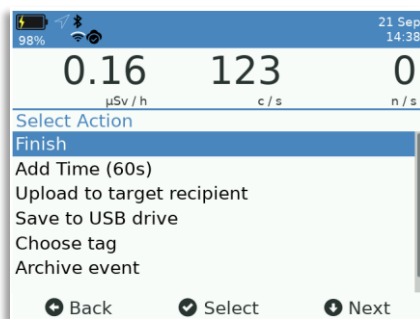


Figure 36: Event Actions

3.5.1 Event Actions – Finish

Finish - returns you back to the screen from where the identification was performed (Locate, Spectrum or Dose screen).

3.5.2 Event Actions – Add Time

To increase certainty of the isotope identification(s) you can add time after the initial collection. The default is 30 seconds and typically would be done in the following situations:

- Low signal or low certainty result.

- SNM result.
- Multiple isotopes.
- Unexpected results.

3.5.3 Event Actions - Upload to SGP

If SGP receivers have been configured, then selection of **Upload to SGP** enables a manual upload of tagged event data for integration into a proprietary database. **Note:** One or more receivers can be displayed depending on the **SGP Integration** configuration.

To upload event data to a receiver:

1. From within the Actions screen, press the Down  button to select the Upload to <target recipient> option, then press the Select  button.
2. If tagging has been configured, a list of tags will be displayed. Press the Down  button to select the required tag for upload, and then press the Select  button.
Note: If tagging has not been configured, then this screen will not be shown.
3. The event data starts the process of uploading. On completion, select **Yes** to close, or **No** to return to Upload to <Receiver> to conduct further uploads.

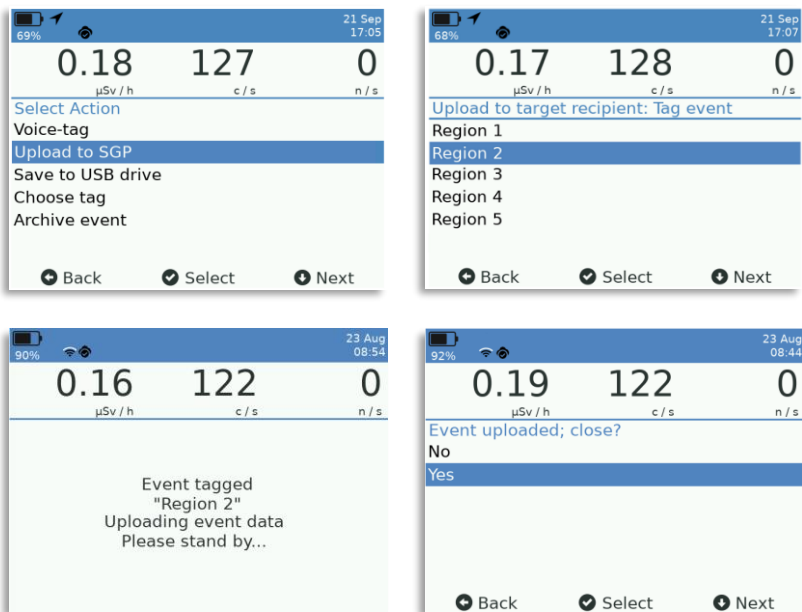


Figure 37: Upload to SGP

4. If an event fails to upload, an error message is displayed with the reason why.

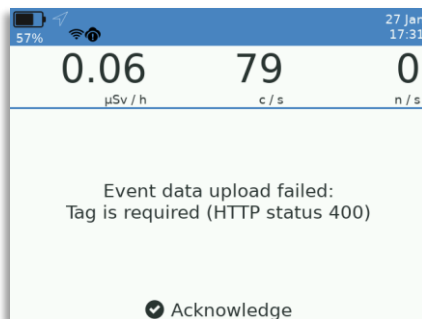


Figure 38 – Event Data Upload Failed Message

5. Press the Select  button to acknowledge and inform an Administrator of the failed upload.

Note: A failed upload can happen for several reasons but normally points to the SGP receiver issuing an HTTP status 400 (for example, the data stream sent by the client to the server didn't follow the rules. In the example shown in Figure 38, the SGP receiver is expecting a tag).

When an event fails to upload, details are shown in the status field on the SGP Integration screen of the Web Management Interface (WMI) as an event failure. Options are then available for the Administrator to either attempt another upload or dismiss the event from the records.

3.5.4 Event Actions – Save to USB Drive

Event files can be saved to an external USB drive. **Notes:** USB drives should be formatted in FAT, VFAT, ExFAT or FAT32 format. Be aware that the USB may take a few seconds to register on the device.

1. Connect the USB-C cable to the USB converter then attach a USB drive.
2. Scroll down the menu and select 'Save to USB drive'.
3. Select the required file format (ANSI N42.42, PDF, HTML or SML) and press the Select  button.

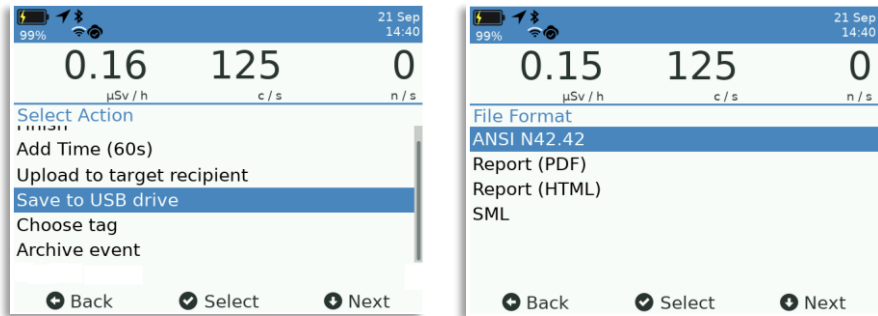


Figure 39: Event Actions – Save to USB Drive

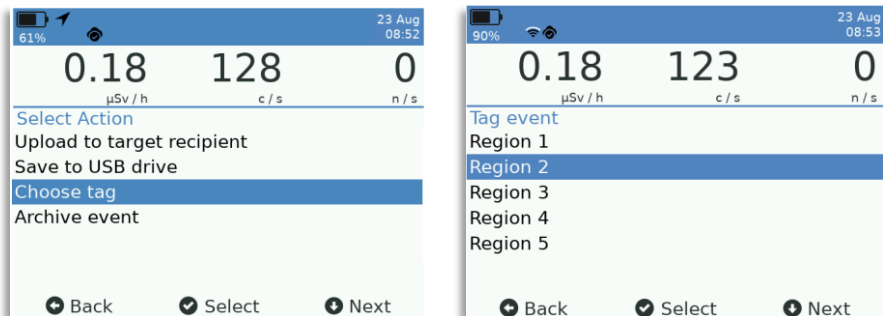
- The files are saved into a 'Symetrica' folder on the drive (user configurable).

3.5.5 Event Actions - Choose Tag

If tagging has been configured by an Administrator, then a list of tags is presented on selection of the **Choose tag** option. Tags are used to associate event data with an administrative system at the time of collection. The tag is then presented with the event data on review.

To choose a tag for event data:

- From within the Actions screen, press the Down  button to select the Choose tag option, then press the Select  button.
- From the list of tags that are displayed, press the Down  button to select the tag that is to be associated with the event data and then press the Select  button.



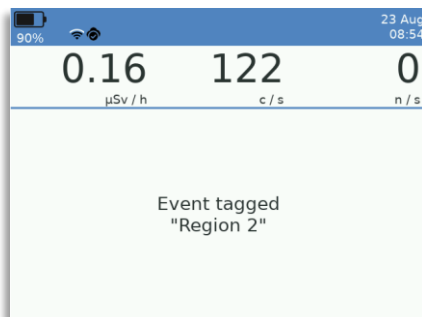


Figure 40: Choose Tag

3.5.6 Event Actions – Archive Event

Performing this action archives the current event, preventing it from being automatically transferred during a data offload process.

Note: No confirmation is required. The event will be archived upon selecting this action. Archived events can be manually offloaded from the Event Archive.

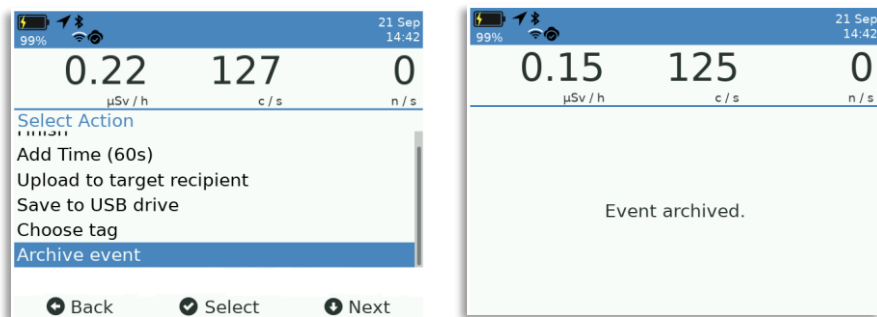


Figure 41: Event Actions – Event Discarded

After archiving an event, the Event Actions menu options change to include a Delete Event. Selection of this option deletes all the event data.

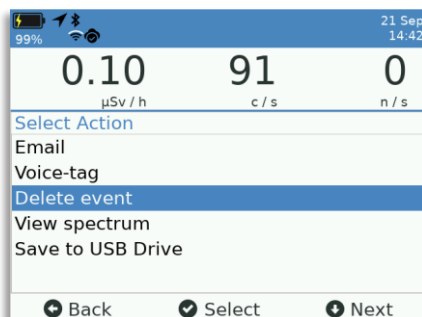


Figure 42: Event Actions – Delete Event

3.5.7 Event Actions – Email

Email sends the configured data to all registered email addresses. If no email addresses are configured or communications are not available, the error message UNEXPECTED_RESPONSE is displayed. **Note:** Always acknowledge the outcome of any email sent, whether this has been a successful or failed attempt.

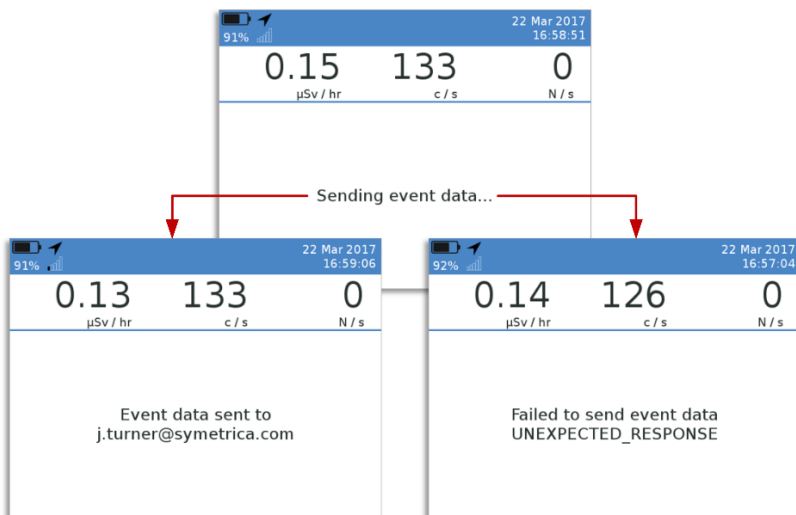


Figure 43: Event Actions – Finish and Email

3.5.8 Event Actions – Send via Bluetooth

Sends the configured data to a recipient via Bluetooth 4.0 to a paired Android device.

1. Scroll down the menu and select 'Send via Bluetooth'.
2. Select the Bluetooth device.
3. Select the required file format (N42.42, PDF, HTML or SML) and press the Select button.

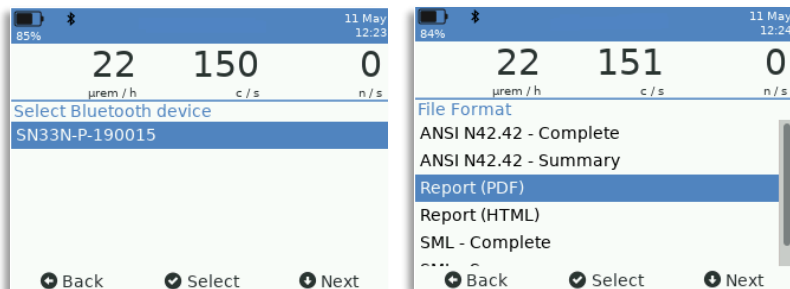


Figure 44: Event Actions – Send via Bluetooth

4. The files are sent to the Bluetooth device.

3.5.9 Event Actions – View Spectrum (Advanced Mode)

Displays the collected spectrum of the event for technical analysis. Press the Back button to return to the Actions screen.

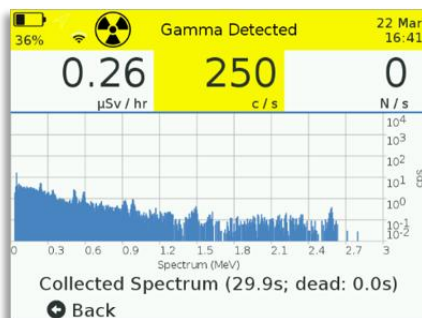


Figure 45: Event Actions – View Spectrum

3.5.10 Event Actions – View QR Code

Event data can be generated as a QR code and subsequently read by a smart device for viewing and sharing for reach-back or other analysis purposes.

1. Scroll down the menu and select 'View QR code'.
2. The device will start generating the QR code of the event.

3. On completion, the QR code is displayed for reading.

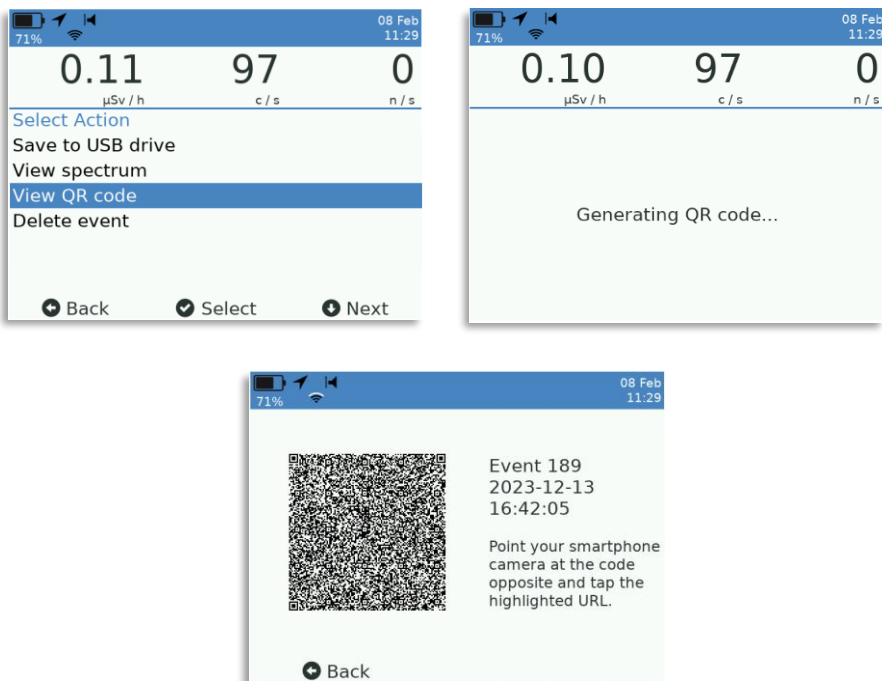


Figure 46: Event Actions – View QR Code

3.6 System Status

To access the System Status from the main menu (Normal and Advanced mode), scroll to the Information icon with the Down  button and press the Select  button.

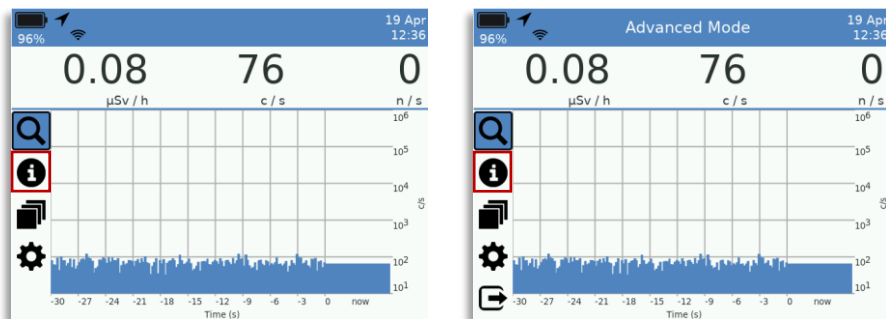


Figure 47: Main Menu – Information Icon

The System Status menu provides detailed information on the status / health of the system.

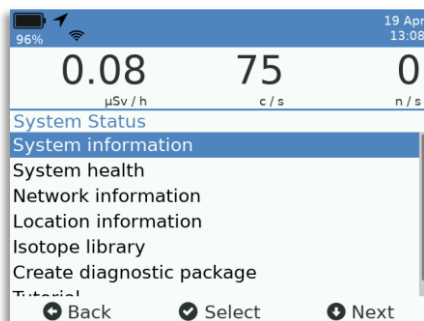


Figure 48: System Status

For more information refer to the following:

- System Information –Section 3.6.1.
- System Health – Section 3.6.2.
- Network Information – Section 3.6.3.
- Location Information –Section 3.6.4.
- Isotope Library – Section 3.6.5.
- Create Diagnostic Package – Section 3.6.7.

3.6.1 System Information

Selecting this option allows you to view the system information.

1. From the System Status screen, select System information. The System information screen is displayed.
2. Press the Back  button to return to the System Status screen.

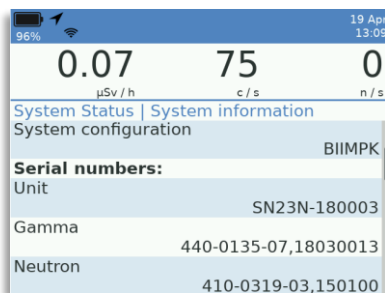


Figure 49: System Information Screen

System Information	Description
Model	VeriFinder Model name.
Gamma detector	Gamma detector type used in the VeriFinder.
Neutron detector	Neutron detector type used in the VeriFinder. Note: If the device does not have a neutron detector installed, this field will be annotated 'None'.
System configuration	Unique identifier for the software, firmware and operating system on the VeriFinder.
Serial number: Unit	Serial number of the VeriFinder.
Serial number: Gamma	Serial number of the gamma detector in the system.
Serial number: Neutron	Serial number of the neutron detector in the system.
Software version: Application	Application software version on the system.
Software version: Kernel	Kernel System version.

System Information	Description
Firmware version: Gamma	Firmware version of the gamma detector in the system.
Firmware version: Neutron	Firmware version of the neutron detector in the system.
Firmware version: Main board	Firmware of the main board in the system.
Calibration information: Gamma	Calibration information related to the gamma date, stabilization number of Becquerels and the born-on date.
Calibration info: Stabilization	Activity of the stabilization source at time of manufacture.
Operating Hours	Total hours of operation of System since it was last factory reset.
Storage: Free disk space	Free storage space in kilobytes.
TLS Certificate Thumbprint	TLS certificate for authenticated access to the web interface.

3.6.2 System Health

Selecting this option allows you to view the system health.

1. From the System Status screen, select System health. The System health screen is displayed.
2. Press the Back button to return to the System Status screen.

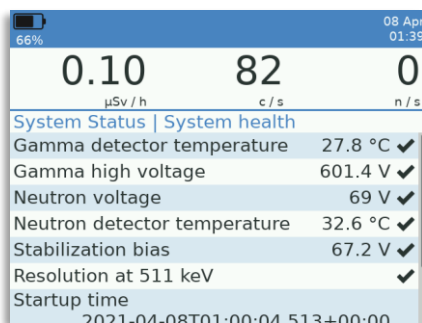


Figure 50: System Health Screen

System Information	Description
Gamma detector temperature	Normal range between -20 °C and 50 °C (-4 °F and 122 °F).
Gamma high voltage	Normal range between 500 V and 1200 V.
Neutron voltage	Normal range between 60 V and 80 V.
Neutron detector temperature	Normal range between -20 °C and 50 °C (-4 °F and 122 °F).
Stabilization bias	Normal range between 60 V and 80 V.
Resolution at 511 keV	Continuously monitors the stabilization peak FWHM. Sets off an alert if it assesses there could be an issue with the detector causing detector resolution degradation.
Startup time	Date and time the device was last switched on in the format YYYY-MM-DD-HH-MM-SS.
Gamma detections since boot	Count of the number of gamma detection events that have occurred since the device last booted.
Neutron detections since boot	Count of the number of neutron detection events that have occurred since the device last booted.

3.6.3 Network Information

Selecting this option allows you to view the network information.

1. From the System Status screen, select Network information.
2. Choose from the list of available connections (USB or Bluetooth (if connected to a Bluetooth device)).

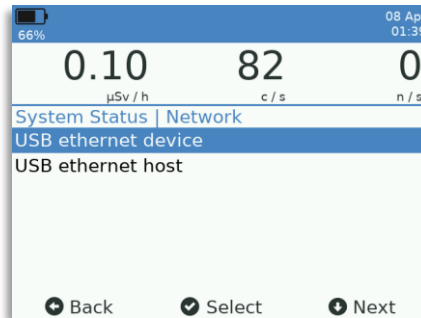


Figure 51: Network Information

3. Once you select the connection, the display indicates the following information:
 - Whether the on-board interface is enabled or disabled.
 - The signal strength (in dB) detected by the on-board interface.
 - The IP address of the wireless interface when connected to a wireless device.
 - The media access control (MAC) address of the on-board interface.
 - Whether the USB interface is connected to a PC.
 - The IP address for the USB interface when connected via a cable to a PC.

Note: If the serial interface is used the USB does not display an IP address.

4. Press the Back  button to return to the System Status screen.

3.6.4 Location Information

Selecting this option allows you to view location information, which is stored in the VeriFinder data file.

1. From the System Status screen, select Location information.
2. The Location information screen appears indicating:
 - Whether the Location chip is enabled or disabled.
 - If a Location fix is obtained.
 - The current Location longitude and latitude co-ordinates of the VeriFinder determined by the onboard location chip.

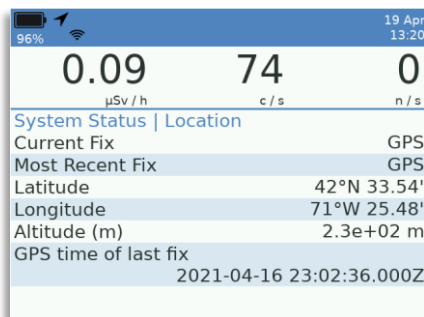


Figure 52: Location Information

- Press the Back button to return to the System Status screen.

3.6.5 Isotope Library (Normal Mode)

Selecting this option allows you to view the Isotope Library.

- From the System Status screen, select Isotope Library. The Isotope Library screen is displayed.
- Press the Down button to scroll through the isotope list. Press the Back button to return to the System Status screen.

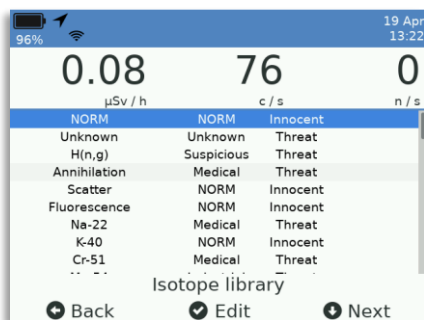


Figure 53: Isotope List

3.6.6 Isotope Library (Advanced Mode)

In Advance mode, the isotope library can be configured allowing some isotopes to be changed from Threat to Innocent, and back. Some isotopes, such as Uranium isotopes, are always a threat and cannot be changed; this is indicated by the Locked column of the web interface isotope library management screen.

To change whether an isotope alarm category is considered innocent or threat:

1. From within the Advanced settings screen, press the Down  button to select the Isotope list option, then press the Select  button.
2. From the list of isotopes screen that appears, press the Down  button to select the isotope whose alarm category you want to change, then press the Select  button.

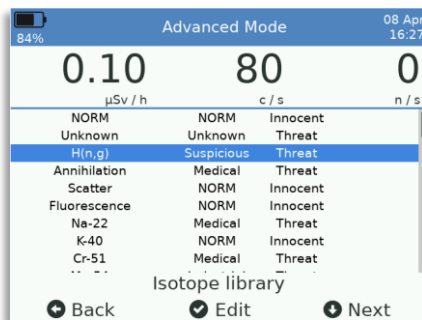


Figure 54: Isotope List (Advance Mode)

3. From the Threat Menu of the isotope you selected, press the Down  button to select the alarm category you want to assign to that isotope (Threat, Suspicious or Innocent), then press the Select  button.

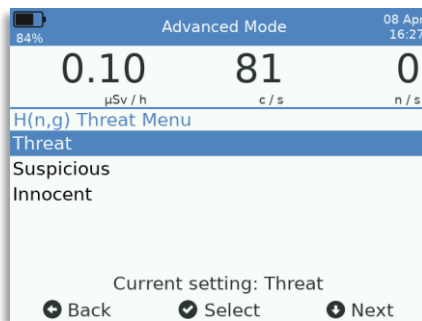


Figure 55: Alarm Category

4. To accept the new alarm category for the isotope, press the Select  button.

3.6.7 Creating a Diagnostic Package

Selecting this option allows you to create a diagnostic package, which can be used for troubleshooting / support purposes. The diagnostic package is an SML file which includes:

- Last 30 seconds of recorded data.
- All health parameters.

- System log file.
- Snapshot of detector communications.

To create a diagnostic package:

1. From the System Status menu select Create Diagnostics Package.
2. Press the Select  button to launch the diagnostics package building process. A screen appears showing the status of the diagnostic package building process.

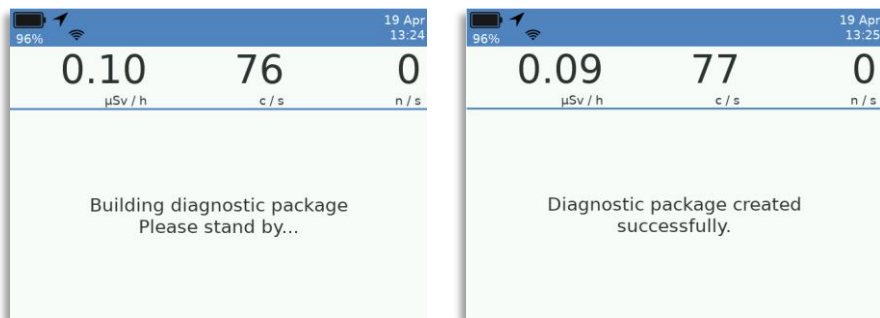


Figure 56: Creating a Diagnostic Package

3. The diagnostic package building process takes approximately five seconds to complete. Once complete, a success message appears and you are returned to the System Status menu.
4. Download using the Web Management Interface through the Advanced menu> Artifacts > Diagnostics options (refer to document 760-0363 – VeriFinder WMI Manual).

3.6.8 Tutorial

Selecting this option opens the VeriFinder tutorial, which displays basic help on the system.

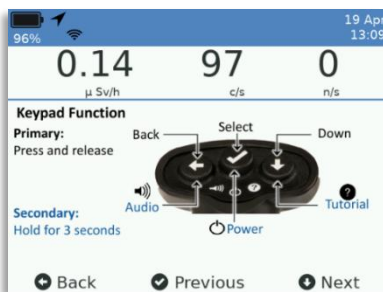


Figure 57: Tutorial Screen

Use the Back  Select  and Down  buttons to navigate through the help topics.

3.7 Event Viewer

There are two types of events:

- **Open Events** – Events that have not been offloaded nor archived by the user.
- **Event Archive** – Displays all events archived by the user.

Events can be:

- Viewed on screen.
- Emailed
- Offloaded through a USB drive.
- Viewed using the Web Management Interface (refer to document 760-0363 – VeriFinder WMI Manual).

To enter the Event Viewer:

1. From the main menu, scroll to the Events icon with the Down  button and press the Select  button.

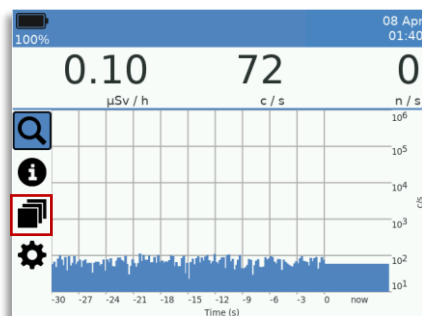


Figure 58: Main Menu

2. The Event Viewer screen is displayed.

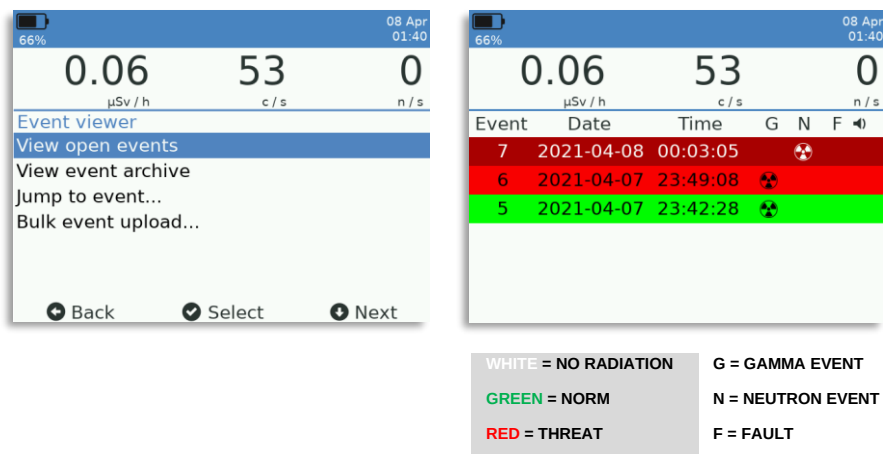


Figure 59: Event Viewer

3. Once in the Event Viewer menu, you can choose to do the following:
 - a. View the full list of open events (that is, events that have not yet been offloaded) starting with the most recent.
 - b. View archived events (that is, everything that has ever happened since the last factory reset) starting with the most recent.
 - c. Jump to a specific event to view (that is, select a specific event to go to by entering the event number).
 - d. Upload bulk events (that is, all, or only open events, by a set number of days (1, 7 or 30 days) or events of any age).
4. For open and archived events, a table is displayed with events listed in date time order. Scroll the list using the Down button. Press the Select button to display the event details. **Note:** On selection of an event, the color changes to a darker variant, for example a red threat event will change to dark red to indicate it is the current selection.

Event	Date	Time	G	N	F	
7	2021-04-08	00:03:05				🔊
6	2021-04-07	23:49:08				🔊
5	2021-04-07	23:42:28				🔊

Figure 60: Event Viewer – Table of Recent Events

- Event details present the radionuclides identified and the threat category. Pressing the Down ⬇ button scrolls through the event details. The Select ✓ button opens the Actions screen (see Section 3.5 – Event Actions). The Back ⬅ button returns you to the events list.

Neutrons	Neutron
Max dose rate	0.180 $\mu\text{Sv/h}$
Max gamma count rate	171 c / s
Neutron count rate	2.33 n / s (70.0 total)

⬅ Back ✓ Actions ⬇ More

Figure 61: Event Viewer Results

3.8 Emailing Historic Events

To e-mail an historic event:

- Navigate to the Events view and select an event.
- Press the Select ✓ button for the action menu.
- Select the Email option.
- An email is sent to all recipients added for that device.



Figure 62: Emailing Historic Events

3.9 Normal Mode Settings

To access the Normal Mode settings from the main menu, scroll to the Gear icon with the Down  button and press the Select  button.

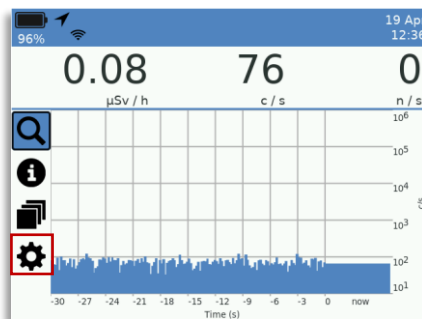


Figure 63: Main Menu – Gear Icon

The menu offers a number of setting options.

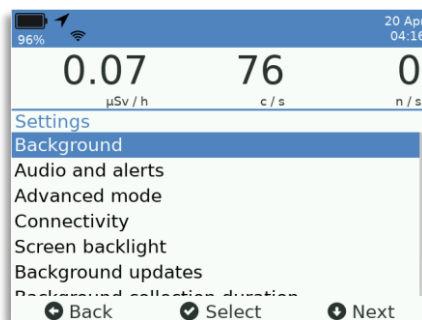


Figure 64: Normal Mode Settings Menu

Setting	Description
Background	VeriFinder updates background continuously and automatically detects when there is a change. Should you wish to capture a new background, you can do so manually using this option. For more information, see Section 3.10.1.1 – New Background Collection.

Setting	Description
Audio and Alerts	These settings allow you to select if audible alerts are on or off and at what volume (0-100% in 10% increments), and if the system provides click sensitivity feedback (low / med / high) based on count rate of a source. It also defines whether vibration indication is enabled. For more information, see Section 3.11.1 – Audio and Alert Settings.
Advanced Mode	Enters the VeriFinder in Advanced mode to provide increased access to settings and makes viewable additional information in Operating mode. Note: Advanced mode is password protected. For more information, see Section 4 – Advanced Mode.
Connectivity	This allows you to enable/disable the various communication methods available on this VeriFinder model. For more information, see Section 3.12.1 – Connectivity Status Settings.
Screen Backlight	This allows you to change the backlight brightness. For more information, see Section 3.12.2 – Backlight Settings.
Background Updates	By default, the VeriFinder updates the background continuously and automatically detects when there is a change. This setting allows you to change whether backgrounds are automatically updated whilst VeriFinder is being used. For more information, see Section 3.12.3 – Background Updates Setting.
Background Collection Duration	This allows you to select the duration in seconds for the background collection. (Must be between 30 s and 999 s).
Set Clock	This allows you to change the internal clock settings to suit your local time configuration.
Set Time Zone	This allows you to change the time zone used by the internal clock.

Setting	Description
Shutdown	This provides a complete shutdown of the VeriFinder. Similar function to holding the Power / Select button for 5 seconds. For more information, see Section 3.12.5 – System Shutdown.

3.10 Background Collection

3.10.1 Manual Background Collection

It is recommended that a manual background collection is taken prior to performing each new set of identifications and / or when you move into a new area.

The recommended duration is at least 300 s in low radiation fields (1 $\mu\text{Sv} / \text{h}$). In higher fields, this can be reduced linearly for example, in 10 $\mu\text{Sv} / \text{h}$, 30 s is sufficient.

You will be informed if the background has changed in two stages:

- Update background (out of date alert).
- Background Invalid.

3.10.1.1 New Background Collection

Normal mode allows for the collection of a new background from the Settings menu.

To collect a new background:

1. Press the Back  button to highlight the menu bar.
2. Scroll down and select the Gear (Settings) icon.
3. Select Background from the Settings screen.

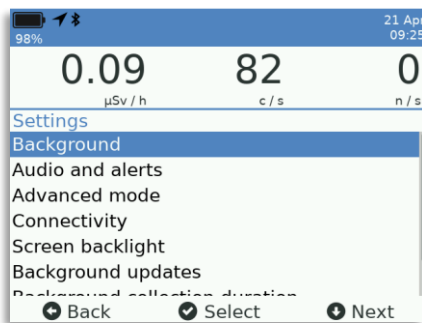


Figure 65: Settings Screen – Background Option

4. The VeriFinder displays the last background collection data.

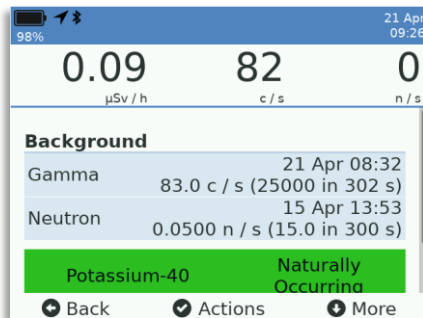


Figure 66: Last Background Collection Data

5. Press the Select  button and from the displayed screen select the Collect option.

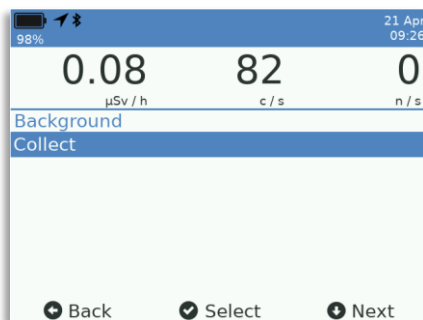


Figure 67: Collect Background Item

6. The VeriFinder starts the background collection and displays the progress.

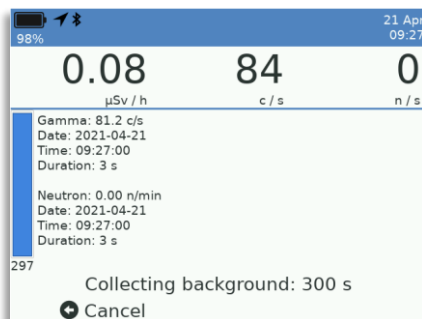


Figure 68: Background Collection Screen

7. To cancel the background collection, press the Back button. On completion of the collection, VeriFinder analyses the background for radionuclides and displays the results.

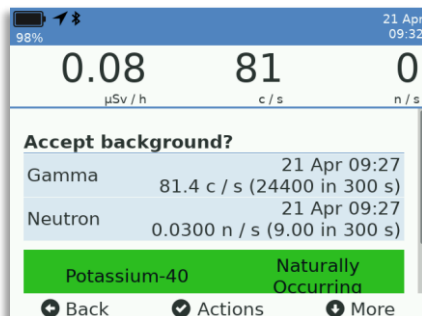


Figure 69: Background Collection Results

8. To reject the background and return to using the previously collected background, press the Back button.
9. To accept the new background, press the Select button. The Accept background screen is displayed with the Accept option highlighted. Press the Select button to accept the new background. Note that the new background can also be rejected from this screen.

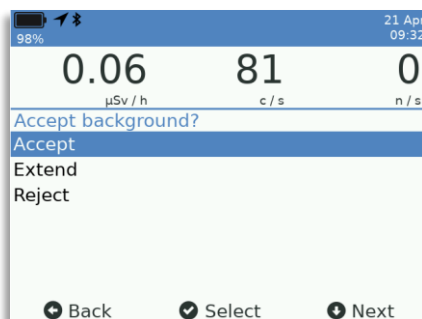


Figure 70: Accept Background Screen

10. If the background collection period requires to be extended, press the Down  button to scroll down to the Extend option and press Select . The Background duration screen is displayed.

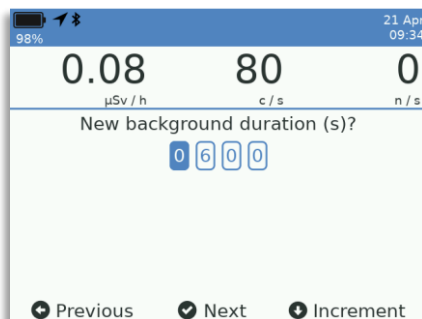


Figure 71: Background Collection Extended Selection

11. Enter the required extended duration using the Down  button to increment the values and the Select  button to move to the next value box. On completion, press the Select  button to initiate the extended background collection. **Note:** Extended duration is any value between the existing collection duration and 7200 seconds.

Note: If Active Background collection is enabled when a manual background collection is initiated, the Active Background is temporarily suspended during the manual collection time. Once the manual background collection is complete and you choose Accept or Reject, the Active Background mode then resumes.

3.10.1.2 New Background Needed

If a background is more than five hours old a warning is displayed. This is to ensure that operator's regularly update the background and prevents it from becoming too out of date when operating in manual background mode.

Note: A warning will remain in the status bar until a new background is taken or Automatic background is enabled.

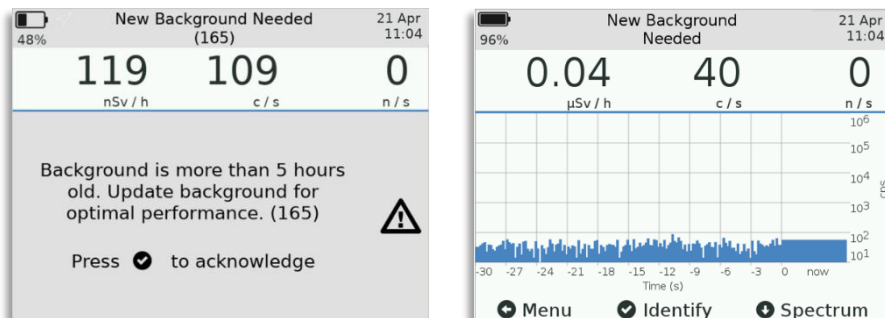


Figure 72: New Background Needed

3.10.2 Automatic Background Collection

Automatic background should only be used when searching for threat sources as NORM sources will be absorbed into the background algorithm.

Conditions for VeriFinder to automatically update its background are:

- The unit has been in an unchanging background for 5 minutes.
- Only NORM sources identified in the new background.

To enable / disable automatic background, navigate to the Settings menu and enable / disable Background Updates.

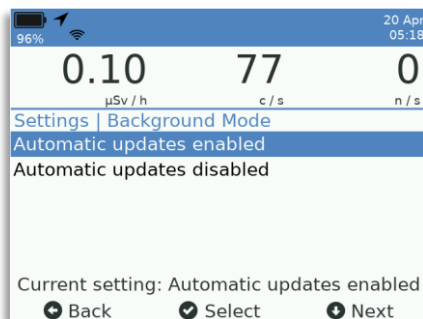


Figure 73: Enable / Disable Background Updates

By default, the system is configured with Automatic Background Updates disabled therefore the operator needs to manually collect background.

When automatic updates are enabled, the system determines if a new background is needed and the operator is notified with an acknowledge message. This situation can appear at any time, like an alert or alarm condition.

If the operator is in the process of conducting a data collection, the background process is temporarily halted.

Note: If the background significantly decreases from the recorded one, to prevent a negative result in the analysis, a previous background will be used.

3.10.2.1 Invalid Background

An error message is displayed when the Automatic Background determines that the background is no longer valid. This situation occurs primarily when the operator moves from a background with NORM present to a background that is clear.

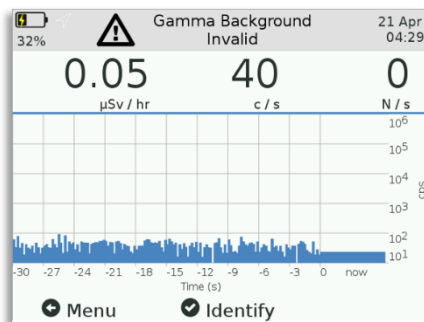


Figure 74: Invalid Background Display

Should this happen, press the Select key to acknowledge. You are advised that a new background collection is in process.

Note: It is left to operator discretion whether to perform any identifications while the background is invalid. It is still possible to perform identifications with an invalid background; however, background subtraction will not be used during analysis, since there is no valid background to use.

Subsequent displays will show a notification in the message bar that the background is presently not valid. The notification will disappear once a valid background is collected and implemented.

3.11 Audio and Alert Settings

3.11.1 Adjusting the Audible Rate Indicator

VeriFinder can provide an audible click with a rate proportional to the count rate measured, negating the need to look directly at the screen when searching for the general location of a source of interest. The default setting for the audible rate indicator is OFF.

To configure the audible rate indicated:

1. Select Audio and Alerts in the Settings menu.
2. Select the Sensitivity option.
3. Press the Down  button to select your desired audible rate indicator setting (Low, Medium, High or Off), then press the Select  button.
4. To accept a new audible rate indicator setting, press the Select  button.

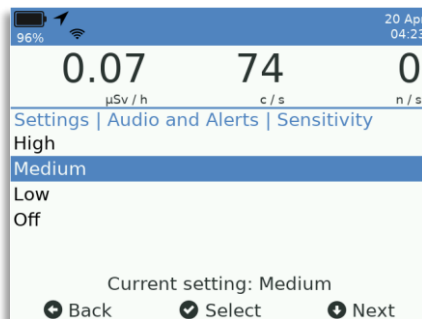


Figure 75: Settings – Audible Rate Indicator

3.11.2 Adjusting the Audible Volume

To adjust the speaker volume:

1. Select Audio and Alerts in the Settings menu.
2. Select the Speaker Volume option.
3. Press the Down  button to select your desired volume setting (10% - 100%), then press the Select  button.
4. To accept the new volume setting, press the Select  button.

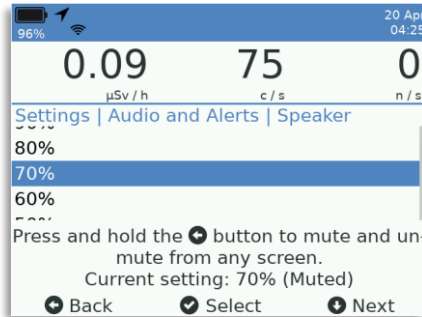


Figure 76: Settings – Audio and Alerts Speaker Volume

5. To mute the speaker volume, press the **Toggle mute** option.

To adjust the Headphone volume:

1. Select Audio and Alerts in the Settings menu.
2. Select the Headphone volume option.
3. Carry out steps 3 – 5 described in adjusting speaker volume above.

3.11.2.1 Audio Sub-System Failure

If the audio sub-system should fail for any reason, you are presented with the following screen.

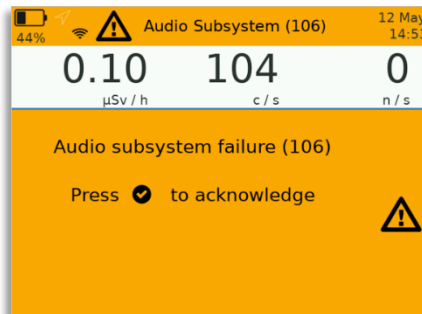


Figure 77: Audio Sub-System Failure

Press the Select  button to acknowledge. Power off of the VeriFinder, leave for 10mins and power back on again. If the problem persists, contact Symetrica support.

3.11.3 Adjusting the Vibrator Indicator

VeriFinder can provide tactile feedback (vibration) for events via its internal vibrator. The default setting vibrator indicator is enabled.

To configure the vibrator indicator (enable or disable):

1. Select Audio and Alerts within the Settings menu.
2. Select the Vibrator option.
3. Press the Down  button to select your desired (Disable or Enable) vibrator indicator setting, then press the Select  button.
4. To accept a vibrator indicator setting, press the Select  button.

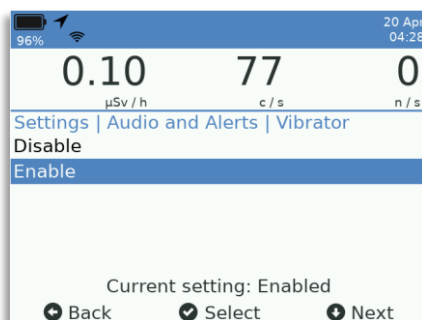


Figure 78: Settings – Vibrator Setting

3.12 Other Settings

3.12.1 Connectivity Status Settings

Note: If VeriFinder is set to operate in Alternate Mode 1 (refer to Section 4 – Advanced Mode of Operation), the Connectivity settings option can be found in the Advanced Settings menu.

You can configure which connectivity modes are enabled on VeriFinder. By default, only GPS is enabled. When a connectivity mode is enabled, its corresponding icon is visible on the status bar.

The available connectivity modes are:

- Wi-Fi – Connects to the strongest authorized Wi-Fi network.
- Bluetooth – Connects via Bluetooth 4.0 to a paired Android device.
- GPS – Turns location information On or Off (only works in outside environment).
- Pair Bluetooth.
- Bluetooth Tethering.
- Unpair all Bluetooth Devices.

To enable/disable the available connectivity modes:

1. From the Settings menu, select Connectivity.

2. A screen appears showing the status of the connectivity modes (enabled or disabled).

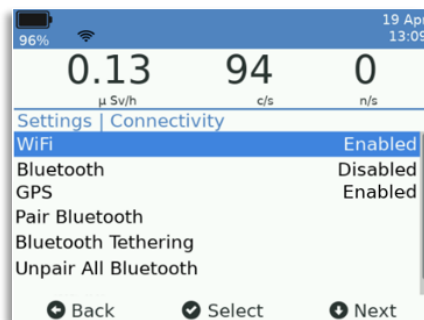


Figure 79: Connectivity Status Settings

3. For each of the connectivity modes you want to change:
 - a. Press the Down  button to select appropriate connectivity mode.
 - b. Press the Select  button to toggle its status to the opposite value.
4. The screen updates with the new setting for the connectivity methods. Icons for each mode are displayed based on the enable/disable status of that mode.
5. Press the Back  button to return to the Settings screen.

3.12.2 Backlight Settings

VeriFinder screen brightness can be adjusted to suit your viewing preferences by configuring the screen backlight. The default screen backlight setting is Auto.

When the backlight setting is set to Auto, the integrated luminosity meter will detect the ambient light and automatically adjust the screen's backlight to an appropriate setting.

To configure the screen backlight:

1. From the Settings menu select Screen backlight.
2. Press the Down  button to select your desired backlight setting (Auto, 100%, 75%, 50%, 25%, 15%, 5%, 1%, 0%), then press the Select  button.
3. To accept a new backlight setting, press the Select  button.

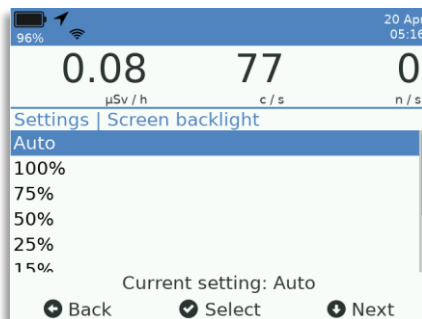


Figure 80: Settings – Screen Backlight

3.12.3 Background Updates Setting

For optimal identification performance you must manually do a background collection whenever new environmental conditions are encountered (refer to Section 3.10.1.1 – New Background Collection).

To enable / disable background automatic update:

1. From the Settings menu select Background updates.
2. Press the Down  button to select the required background mode setting (Automatic updates enabled, or Automatic updates disabled).
3. To accept a new background mode setting, press the Select  button.

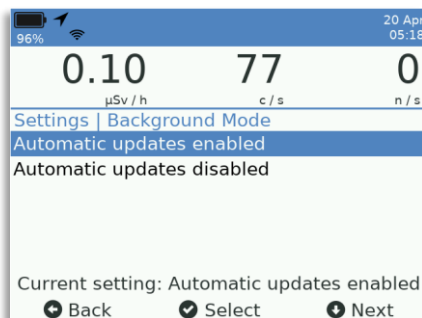


Figure 81: Settings – Background Mode

3.12.4 Background Collection Duration

You can set the duration for background collection between 30 and 999 seconds.

To set the background collection duration:

1. From the Settings menu select Background collections duration.
2. Change the duration by using the Down  button to increment the integer value and the Select  button to move to the next value box.

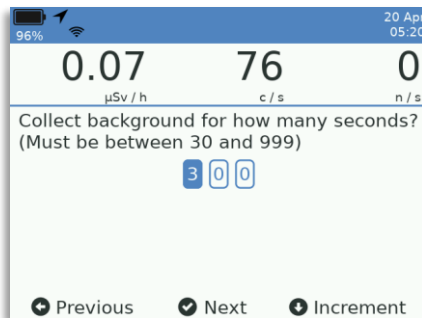


Figure 82: Background Collection Duration

3. To accept a new duration setting, press the Select  button.

3.12.5 Set Clock

The VeriFinder internal clock can be configured as required. To configure the internal clock:

1. From the Settings menu press the Down arrow  button to select the Set clock option, then press the Select  button.
2. From the 'Select clock value to change' screen that is displayed, press the Down arrow  button to select the clock setting you want to change (Year, Month, Day of month, Hour, Minute or Second), then press the Select  button.

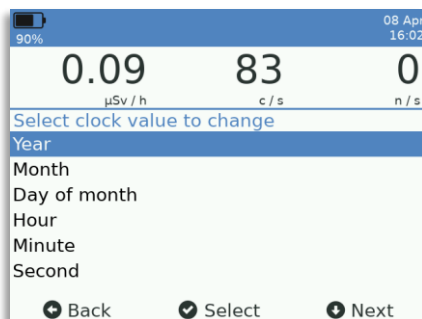


Figure 83: Select Clock Value to Change

3. From the numerical value screen that is displayed, change the highlighted box value using the Down arrow  button, accept the value and move to the next box by pressing the Select  button.
4. Once the new value is fully specified and you are at the last box, press the Select  button to store the new value and exit back to the previous page.
5. Repeat steps 2 and 3 for each clock value that you want to change.
6. Once you are happy with the updated clock values, press the Select  button.

3.12.6 Set Time Zone

The time zone used by the VeriFinder internal clock can be configured as required. Each time zone accounts for daylight savings differently, so it is important to set the time zone correctly in order for the internal clock to match that of local time.

To configure the time zone:

1. From the Settings menu select Set time zone.
2. From the Select time zone area screen that appears, press the Down  button to select the required area, and then press the Select  button.
3. Next, select the required time zone and then press the Select  button.

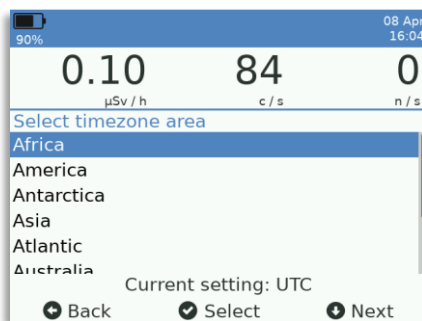


Figure 84: Select Time Zone

3.12.7 System Shutdown

To shut down VeriFinder from the Settings menu:

1. From the Settings menu select Shutdown.
2. From the screen that appears, press the Down  button to select Yes, then press the Select  button. After a short while VeriFinder shuts down.

Note: Pressing the Select  button for 5 seconds or more will shut down VeriFinder from any screen.

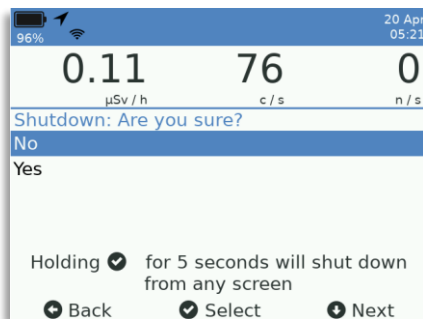


Figure 85: Settings – Shutdown

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SECTION 4 ADVANCED MODE OF OPERATION

Advanced operation of VeriFinder is available in one of two modes, **Default Mode** and **Alternate Mode 1**. Type of mode is determined from the Web Management Interface > User Interface Settings screen after logging in as Advanced user (refer to document 760-0363 – VeriFinder WMI Manual).

The main difference is that in Alternate Mode 1, there is no requirement for the user to input a password to enter advanced mode. In addition, several of the menu options are relocated, details of which are highlighted as applicable in the sections that follow.

4.1 Advanced Mode Login – Default Mode Only

Access the Advanced settings menu:

1. Access the Settings menu and select the Gear icon in the menu bar.
2. From the Settings menu, select Advanced Mode.

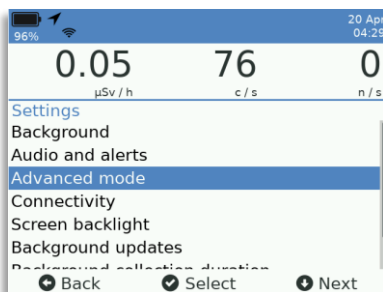


Figure 86: Advanced Mode Login

3. The Enter advanced mode password screen is displayed.

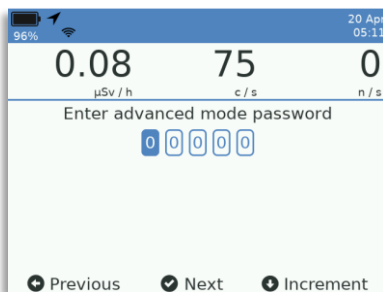


Figure 87: Advanced Mode Password

4. Enter each number of the advanced mode password by pressing the Down  button to change the value, and the Select  button to accept the value and move to the next box.
5. Once the advance mode password is fully specified, press the Select  button to enter Advanced Mode. When in Advanced Mode you will find that:
 - You no longer need to enter a password to review and modify Advanced Mode settings and events will display the certainty of isotope identifications.

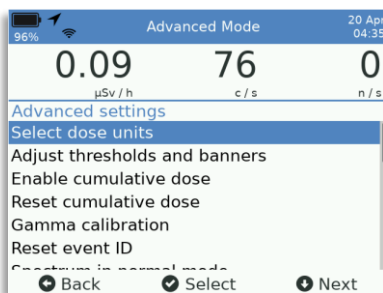


Figure 88: Advanced Settings Screen

4.2 Selecting Dose Units

VeriFinder can be configured to display either mrem/h and $\mu\text{Sv/h}$ dose units. The default dose unit setting is $\mu\text{Sv/h}$.

To adjust which dose unit VeriFinder displays:

1. From within the Advanced settings screen, press the Down  button to select the Select Dose Units option, then press the Select  button.
2. From the Select dose units screen that appears, press the Down  button to select your desired (mrem/h or $\mu\text{Sv/h}$) dose unit setting, then press the Select  button.

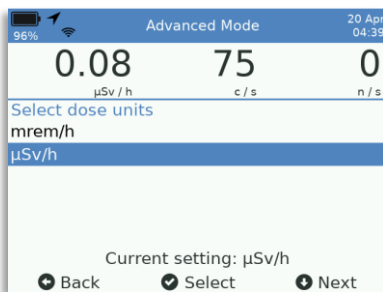


Figure 89: Selecting Dose Units

3. To accept the new dose unit setting, press the Select  button.

4.3 Adjust Alarm Thresholds and Banners

Note: If VeriFinder is set to operate in Alternate Mode 1, adjustment of Alarm Thresholds and Banners can be found in the Normal Settings menu.

Adjust of alarm thresholds is from the 'Adjust thresholds and banners' sub-menu in the Advanced Mode menu.

4.3.1 Gamma and Neutron Detection Alerts

Alert screens can be toggled to off for when VeriFinder detects an increased gamma or neutron source and only provide the count/dose rate outside the event collection.

To toggle gamma and neutron detection alerts:

1. From within the Advanced settings screen press the Down  button to select the 'Adjust thresholds and banners' option, then press the Select  button.
2. From the Adjust Thresholds screen that appears, press the Down  button to select the 'Gamma or Neutron alerts outside events' option, then press the Select  button to toggle between Yes and No as required.

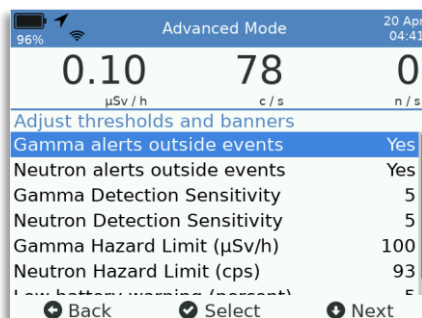


Figure 90: Gamma / Neutron Alerts Outside Events

Note: The status bar will still change color and provide detection information. Dose rate will continue to provide indications of increased radiation.

Disabling the alerts will only disable the full screen alert that requires you to acknowledge the alarm.

4.3.2 Gamma and Neutron Sensitivity

Changes can be made to the detection sensitivity for both the Gamma and Neutron detectors. The default value is set at 5, however this can be modified as required from 0 (disabled) through to 9 (very high).

To change the gamma or neutron sensitivity value:

1. From within the Advanced settings screen press the Down  button to select the 'Adjust thresholds and banners' option, then press the Select  button.
2. From the Adjust Thresholds screen that appears, press the Down  button to select the Gamma or Neutron Detection Sensitivity option, then press the Select  button.

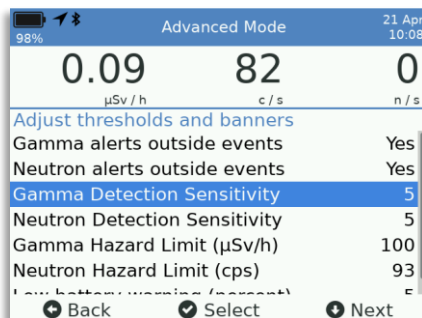


Figure 91: Gamma and Neutron Sensitivity Values

3. Change the sensitivity by using the Down  button to increment the integer value to the required setting.

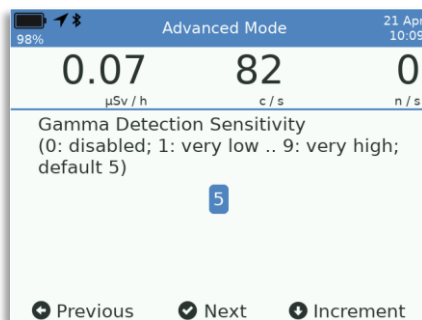


Figure 92: Changing the Sensitivity Value

4.3.3 Gamma and Neutron Personal Hazard Limits

Changes can be made to the count thresholds that trigger the Gamma and Neutron personal hazard alarms.

To change the neutron and/or gamma count threshold values:

1. From within the Advanced settings screen press the Down  button to select the 'Adjust thresholds and banners' option, then press the Select  button.

2. From the Adjust Thresholds screen that appears, press the Down  button to select the Gamma Hazard Limit option, then press the Select  button.

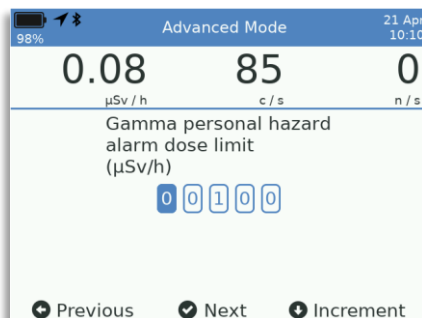


Figure 93: Gamma Personal Hazard Alarm Dose Limit

3. Enter numbers by changing the highlighted box value using the Down  button. Accept the value and move to the next box by pressing the Select  button.
4. Once the new Gamma Detection Limit is fully specified and you are at the last box, press the Select  button to store the new Gamma Detection Limit and exit back to the previous Adjust Thresholds screen.
5. Follow similar steps to adjust the neutron personal hazard limit. From the Adjust Thresholds screen that appears, change the neutron count threshold values by pressing the Down  button to select the Neutron Hazard Limit option, then press the Select  button.
6. Enter numbers by changing the highlighted box value using the Down  button. Accept the value and move to the next box by pressing the Select  button.

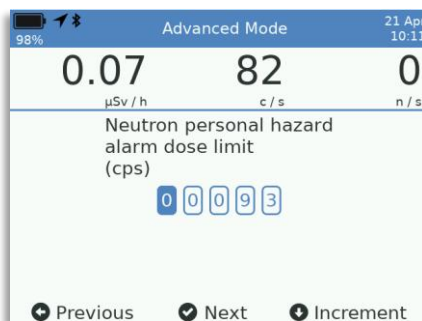


Figure 94: Neutron Personal Hazard Alarm Dose Limit

7. Once the new Neutron Detection Limit is fully specified and you are at the last box, press the Select  button to store the new Gamma Detection Limit and exit back to the previous Adjust Thresholds screen.

4.3.4 Low Battery Warning Threshold

Note: The Low Battery Warning Threshold is set at factory and should not be changed without first consulting Symetrica support.

The percentage threshold limit that causes VeriFinder to trigger the System Fault Low Battery warning can be configured from the default percentage threshold limit of 5%, which equates to approximately a 25-minute warning under standard battery test conditions.

To change the percentage threshold limit that triggers the System Fault Low Battery warning:

1. From within the Advanced settings screen press the Down  button to select the 'Adjust thresholds and banners' option, then press the Select  button.
2. From the Adjust Thresholds screen that appears, press the Down  button to select the Low battery warning (percent) and then push the Select  button.
3. Enter numbers by changing the highlighted box value using the Down  button. Accept the value and move to the next box by pressing the Select  button.

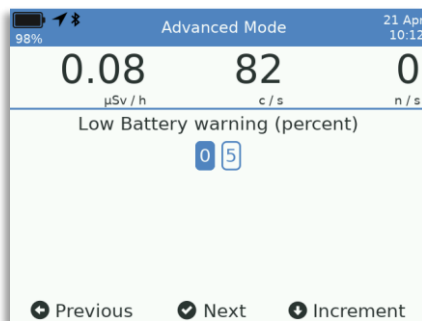


Figure 95: Low Battery Warning Threshold

4. Once the new percentage threshold limit is fully specified and you are at the last box, press the Select  button to store the new percentage threshold limit and exit back to the previous Adjust Thresholds screen.

4.4 Enable / Disable Mission Dose

Mission dose displays a summary value of the dose rate that VeriFinder is exposed to over a period of time. When enabled, it is displayed on the Dose screen (if selected) for the detection of radionuclides (refer to Section 3.4 – Detection of Radionuclide Sources).

To enable / disable mission dose:

1. From within the Advanced settings screen, press the Down  button to select the 'Enable mission dose' option, then press the Select  button.
2. The setting changes to 'Disable mission dose'. Press the Select  button to disable.

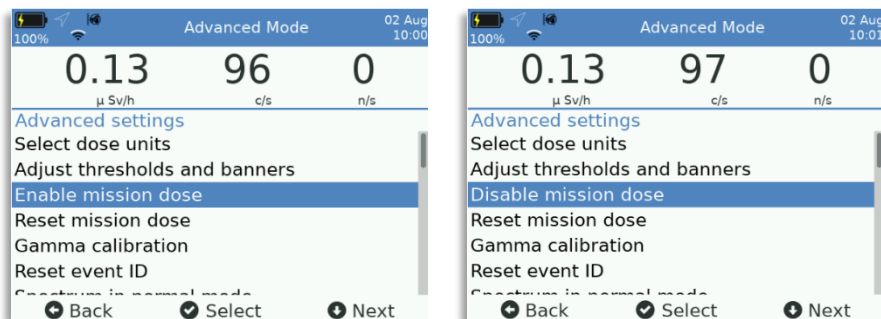


Figure 96: Enable / Disable Mission Dose

4.5 Reset Mission Dose

Reset mission dose resets the start of integer value for the mission dose displayed on the Dose screen.

To reset mission dose:

1. From within the Advanced settings screen, press the Down  button to select the 'Reset mission dose' option, then press the Select  button.
2. Mission dose reset is displayed.

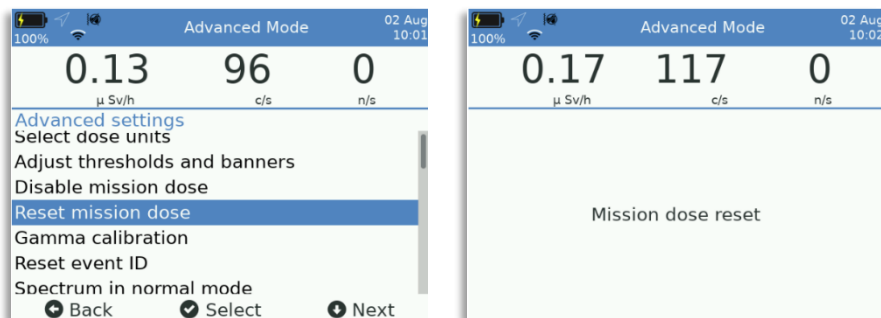


Figure 97: Reset Mission Dose

4.6 Gamma Calibration

Note: Gamma calibration of VeriFinder should only ever be performed by Symetrica personnel. Performing a gamma calibration by non-Symetrica personnel voids the warranty.

To view the existing gamma calibration on VeriFinder:

1. From the Advanced settings screen, press the Down  button to select the Gamma Calibration option, then press the Select  button.
2. A Gamma Calibration screen appears showing a calibration spectrum and date that the previous calibration was undertaken.

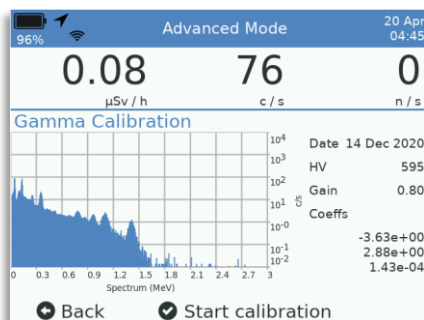


Figure 98: Gamma Calibration

3. Once you have finished reviewing the gamma calibration information, press the Back  button to return to the Advanced settings screen.

4.7 Reset Event ID

This option restarts the event counter, with the next event starting at event number 1.

To reset the event ID:

1. From within the Advanced settings screen, press the Down  button to select the Reset Event ID option, then press the Select  button.
2. From the Reset Event ID: are you sure? Screen, select Yes and press the Select  button.

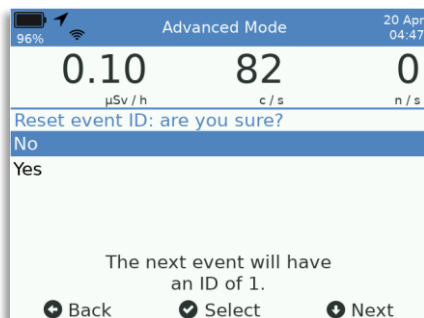


Figure 99: Reset Event ID

4.8 Spectrum in Normal Mode

VeriFinder can be configured to display the spectrum in normal mode when in operational use. The default setting is disabled (no spectrum in normal mode).

To configure the spectrum to display in Normal mode:

1. From the Advanced settings screen, press the Down  button to select the Spectrum in Normal Mode option, then press the Select  button.
2. From the 'Spectrum visible to normal user' screen that appears, press the Down  button to select the desired setting (Disable or Enable), then press the Select  button.

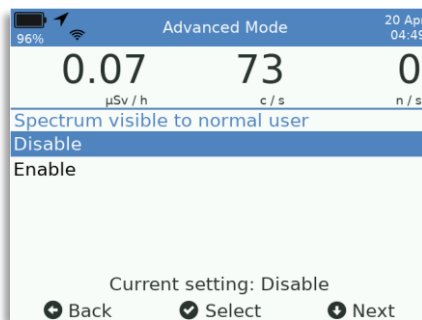


Figure 100: Spectrum Visible to Normal User

4.9 Simplify ID Results Display

VeriFinder can be configured to simplify the details shown on the isotope identification screen, minimising event information available to the normal user.

To configure a simplified display:

1. From the Advanced settings screen, press the Down  button to select the Simplify ID Results Display option, then press the Select  button.
2. From the screen that appears, press the Down  button to select the desired setting (Disable or Enable), then press the Select  button.

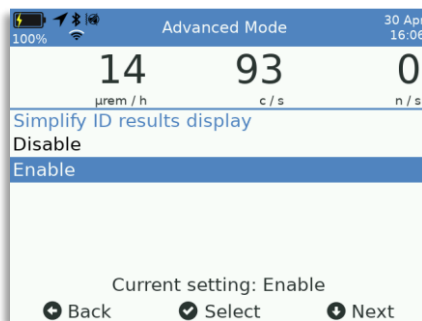


Figure 101: Simplify ID Results Display

4.10 Clicker on External Power

When the VeriFinder is connected to external power for charging, the clicker can be disabled to prevent audible sounds from emitting on detection of spurious background radiation.

To configure the clicker:

1. From the Advanced settings screen, press the Down ⬇ button to select the Clicker on External Power option, then press the Select ⏹ button.
2. From the screen that appears, press the Down ⬇ button to select the desired setting (Disable or Enable), then press the Select ⏹ button.

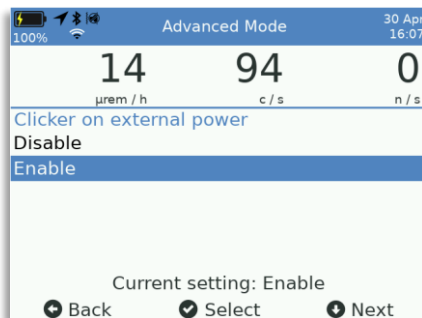


Figure 102: Clicker on External Power

4.11 Isotope Confidence in Normal Mode

VeriFinder can be configured to display an isotope confidence level when in operational use (see Section 4.12 – Isotope Confidence Display Range). When enabled, operators are presented with a level of confidence for a detected isotope, which is displayed in the identification screen after a detection has been made.

To enable isotope confidence:

1. From the Advanced settings screen, press the Down  button to select the Isotope Confidence in Normal Mode option, then press the Select  button.

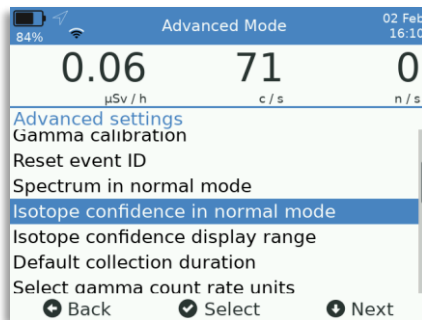


Figure 103: Isotope Confidence in Normal Mode Option

2. From the screen that appears, press the Down  button to select the desired setting (Yes or No), then press the Select  button.

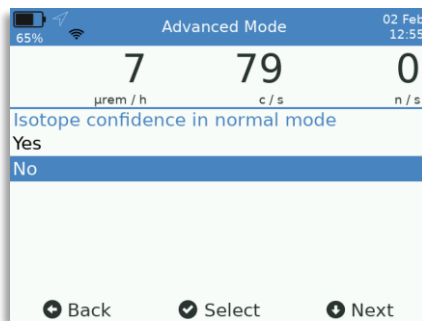


Figure 104: Options for Isotope Confidence Setting

4.12 Isotope Confidence Display Range

The isotope confidence range is selected from the Advanced settings and provides the operator with a visual level of confidence for a detected radionuclide isotope, by either a percentage or integer range.

To select the isotope confidence display range:

1. From the Advanced settings screen press the Down  button to select the Isotope confidence display range option, then press the Select  button.

- From the screen that appears, press the Down  button to select the desired display range (1 – 100 (%) or 1 – 10), then press the Select  button.

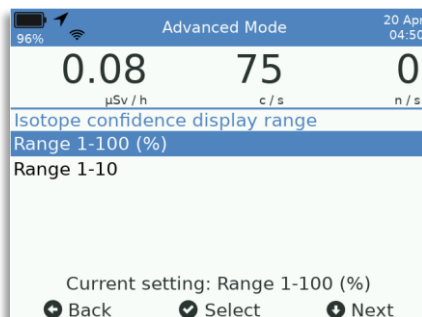


Figure 105: Isotope Confidence Display Range

4.13 Default Collection Duration

Note: If VeriFinder is set to operate in Alternate Mode 1, the Default Collection Duration option can be found in the Normal Settings menu.

Default Collection Duration determines the extent of data collection when the operator selects the identify function to detect and identify radionuclide sources.

VeriFinder can be configured to a collection duration of 30 seconds, 60 seconds, 2 minutes, 5 minutes, 10 minutes, or 15 minutes. The default collection duration is 30 seconds.

To adjust the default collection duration:

- From the Advanced settings screen, press the Down  button to select the Default Collection Duration option, then press the Select  button.
- From the Select collection duration screen that appears, press the Down  button to select the desired default collection duration then press the Select  button.

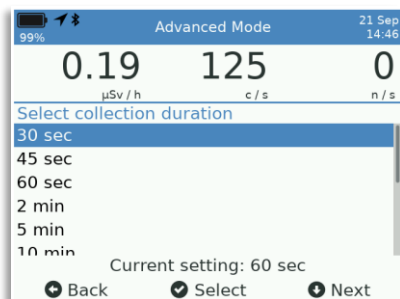


Figure 106: Start Collection Duration

4.14 Gamma / Neutron Count Rate Units

The rate unit used to display gamma count rates can be configured as either:

- Counts per second (c/s).
- Counts per minute (c/min).

Similarly, the neutron count rate can be configured as either:

- Neutrons per second (n/s).
- Neutrons per minute (n/min).

Note: The units will auto scale as the count rate increases.

To change the Gamma or Neutron Count Rate units:

1. Navigate to Advanced Settings.
2. Press the Down  button and select either the gamma or neutron count rate units as required.
3. The relevant select count rate units screen is displayed.
4. Choose either c/s or c/min (gamma) or n/s or n/min (neutron) and press the Select  button.
5. The new count rate setting is applied.

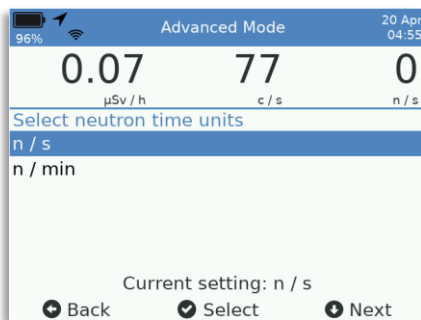
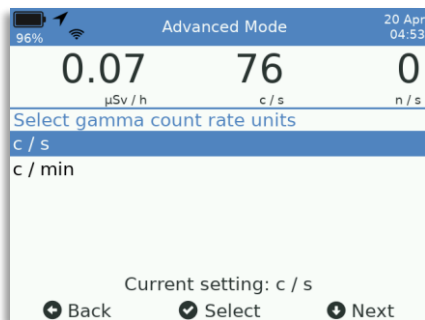


Figure 107: Count Rate Settings

4.15 System Log

The system log is written by the system at start-up. It contains a record of the current software running on VeriFinder along with all system messages, any alerts or alarms and configuration changes.

To view the system log:

1. From the Advanced Settings screen, select System log.

2. The System log screen appears.

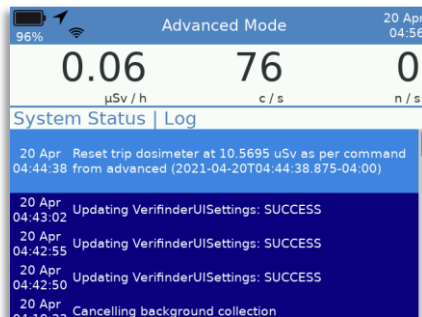


Figure 108: System Log

3. If necessary, scroll through the logs by pressing the Down  button and Select  button.
4. Press the Back  button to return to the Advanced Settings screen.

4.16 Check for Software Updates

Note: Prior to updating software, ensure the system is reliably connected to the network. If possible, connect the power cord to a mains power supply.

Software releases are created to add new functionality or features, improve performance / stability or correct any issues discovered.

To check for Software Updates:

1. From within the Advanced Settings press the Down  button to select the Check for Software Updates option, then press the Select  button.
2. From the 'Settings | Software update' screen that is displayed, press the Select  button to initiate a check.

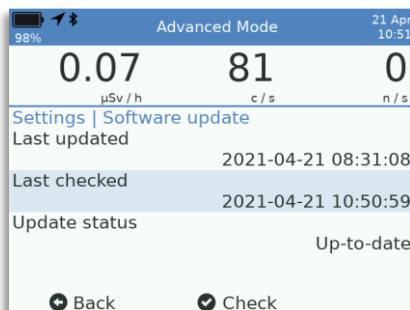


Figure 109: Settings / Software Update Screen

3. The System commences a check for any software updates. If new updates are available, 'Software updates are ready to be installed' is displayed. Press the Select  button to acknowledge.

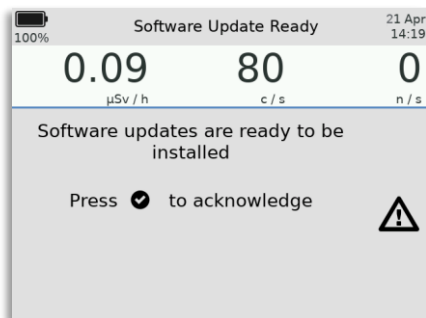


Figure 110: Acknowledge Software Updates Available

4. When the Update status changes to 'Updates ready' press the Down  button to install.

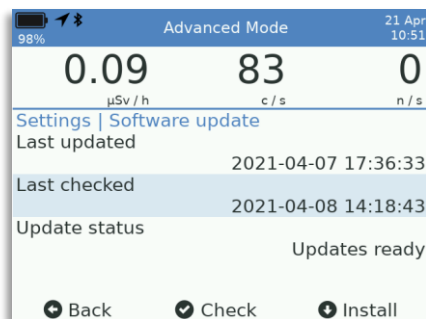


Figure 111: Updates Ready to be Installed

5. The system updates with the latest software. On completion, the status changes to 'Up-to-date'.

4.17 Self Test

Self test facilitates a series of tests that are run on the VeriFinder to confirm its functional status. After a test is completed, the operator confirms the results by selecting either Pass  or Fail  before proceeding to the next test. Results of all tests are recorded in the Log file (Log.xml), which can be viewed from the Artifacts screen on the Web Management Interface (refer to document 760-0363 – VeriFinder WMI Manual - Artifacts).

A self test can be stopped at any time by selecting the Cancel  button.

To conduct a self test:

1. From the Advanced Settings press the Down  button to select the 'Self test' option, then press the Select  button.
2. The 'Self test of device' screen is displayed with 'Start self test' highlighted. Press the Select  button to continue.

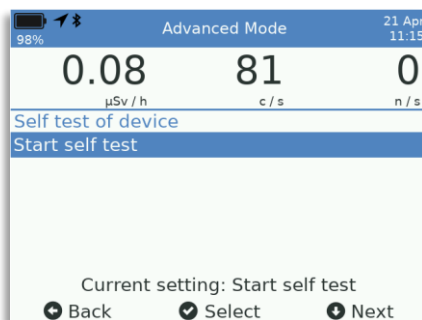


Figure 112: Self Test of Device Screen

3. From the 'Self test: Are you sure?' screen, press the Down  button to select 'Yes' then press the Select  button to continue.

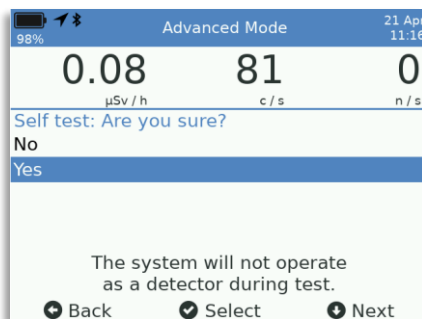


Figure 113: Confirm Start Self Test Screen

4. The self test sequence will start with a check on functionality of the VeriFinder buttons (Left, Middle and Right). Press each button when requested.

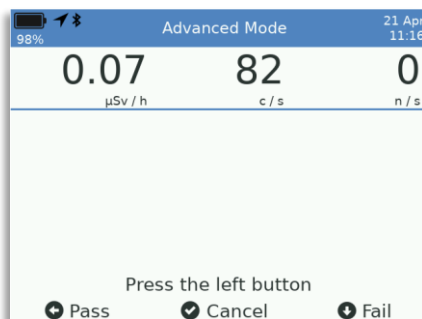


Figure 114: VeriFinder Buttons Test (Example)

5. For each test displayed thereafter, select either Pass ✓ or Fail ⬇ as appropriate. Test results will be recorded in the Log file.

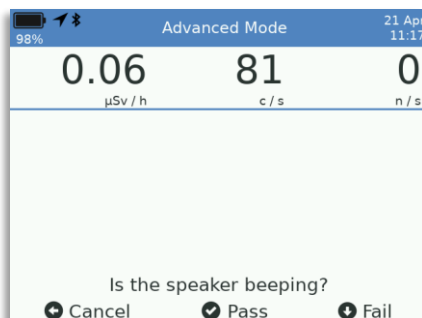


Figure 115: Example Test Screen

Self tests conducted are as follows:

- VeriFinder buttons (Left, Middle, Right).
- Is the speaker beeping?
- Is the buzzer buzzing?
- Are the lights flashing red?
- Are the lights flashing green?
- Are the lights flashing blue?
- Testing system display (a series of screen color tests are conducted).

On completion, select the Back ⬅ arrow to return to the self test screen.

4.18 Change Advanced Mode Password – Default Mode Only

The Advance Mode Password is required to access the Advanced settings menu.

To change the Advance Mode Password:

1. From the Advanced settings menu, select Change Advanced Mode Password.

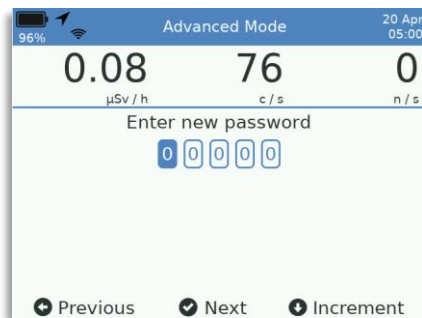


Figure 116: Enter New Password

2. From the Enter advanced mode password screen that appears, change the Advanced Mode Password, as follows:
 - a. Enter numbers by changing the highlighted box value using the Down  button. Accept the value and move to the next box by pressing the Select  button.
 - b. Once the new Advanced Mode Password is fully specified and you are at the last box, press the Select  button to store the new Advanced Mode Password and return to the previous menu.

4.19 Battery Information

It is important for both operators and maintenance personnel to monitor the life of the batteries. The battery health screen provides this information.

1. From the Advanced Settings screen, select Battery information.
2. The Battery Information screen appears displaying the battery information.
3. Use the Down arrow  button to scroll through the battery information.
4. Press the Back arrow  button to return to the Advanced Settings screen.

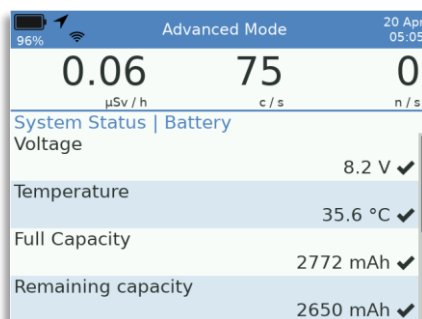


Figure 117: Battery Information

Battery Information:

Displayed Data	Description
Voltage	Actual battery voltage.
Temperature	Temperature of battery in degrees Celsius.
Full Capacity	Total battery capacity in mAh.
Remaining Capacity	Remaining battery capacity in mAh.
Time to empty	Remaining time before the battery is empty in minutes.
Percent Charge	Percent remaining on the charge.

4.20 Language Settings

The VeriFinder user interface supports various languages. The default language setting is English.

To configure the user interface language:

1. From the Advanced Settings menu select Language.
2. Press the Down  button to select your desired language, then press the Select  button.

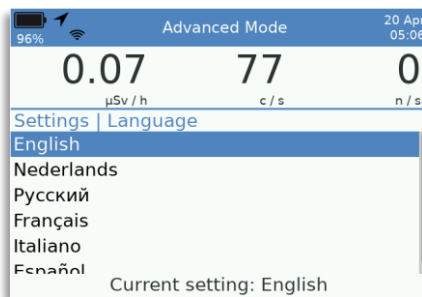


Figure 118: Advanced Settings – Language

4.21 Delete All Event Data

This option permanently removes all events from the device.

To delete all event data:

1. From within the Advanced settings screen, press the Down  button to select the Delete all event data option, then press the Select  button.
2. From the Delete all events: Are you sure? Screen, select Yes and press the Select  button.

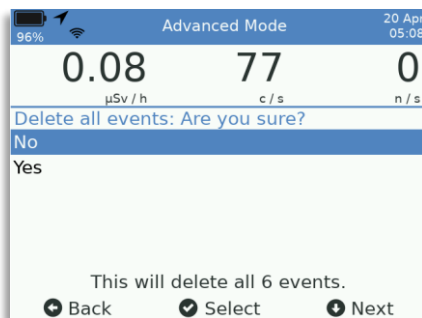


Figure 119: Delete All Event Data

4.22 Factory Reset – Default Mode Only

Performing a factory reset will reset all parameters of VeriFinder back to their factory settings, including the advance mode password and clears all events (refer to Section 8.2 - Default Settings).

To perform a factory reset:

1. From the Advanced settings screen, press the Down  button to select the Factory reset option, then press the Select  button.

2. From the Factory Reset: Are you sure? Screen that appears, press the Down  button to select Yes, then press the Select  button. VeriFinder takes approximately 30 seconds to reboot.

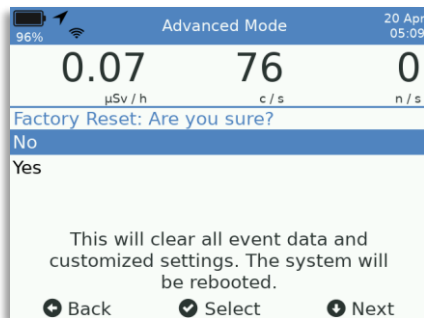


Figure 120: Factory Reset

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SECTION 5 PC CONNECTION AND THE WMI

5.1 Initial VeriFinder Setup on a PC

The first time you connect the VeriFinder device to a PC, it will be necessary to install the RNDIS driver. This is a one-time install per PC, which will require administrator privileges.

5.1.1 Installing the VeriFinder RNDIS Driver

To install the RNDIS driver:

1. Use the supplied USB cable to connect to a USB port on the PC.



Figure 121: Connecting VeriFinder to a USB Port on the PC

2. VeriFinder is recognized as a mass storage device and is displayed with a new drive letter.

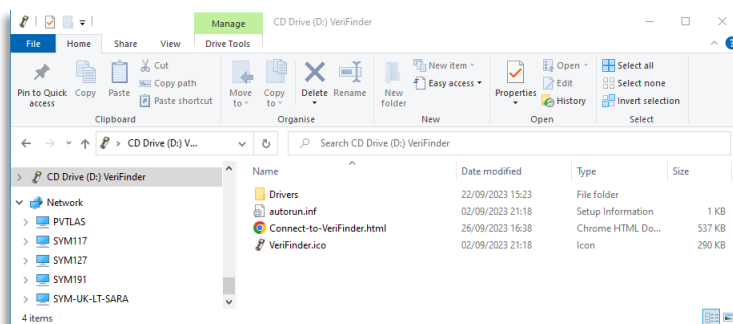


Figure 122: Windows Explorer

3. For the PC and the Deep Discovery to be able to connect to VeriFinder, the network drivers need to be installed. If the PC has never had the VeriFinder network drivers, an installation popup appears in the Windows tray.

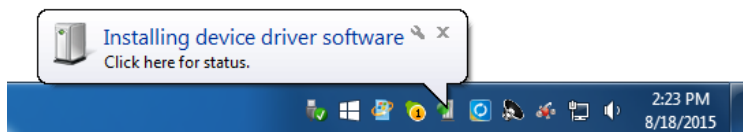


Figure 123: Installing Device Driver

4. In the Windows Explorer window, double-click the 'Connect to VeriFinder.html' link. The VeriFinder will now guide you through the RNDIS driver install procedure.

Note: If you have trouble during Step 5, you may use Steps 6 and 7 below to perform the task manually.

5. Double-click the status pop-up to display the status. A 'Driver Software Installation' dialog box appears.

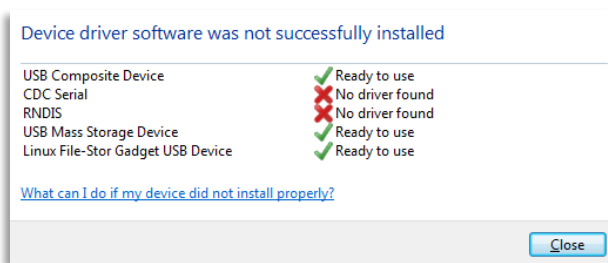


Figure 124: Driver Software Installation

Notes: It is normal that Windows cannot find all the necessary drivers for VeriFinder because it only searches the Microsoft database of drivers.

The CDC Serial driver is not used by VeriFinder and does not need to be installed.

6. Launch the Windows Device Manager (Start > Control Panel > Device Manager).
7. From the Device Manager window that appears, expand the other devices node to reveal the RNDIS device.

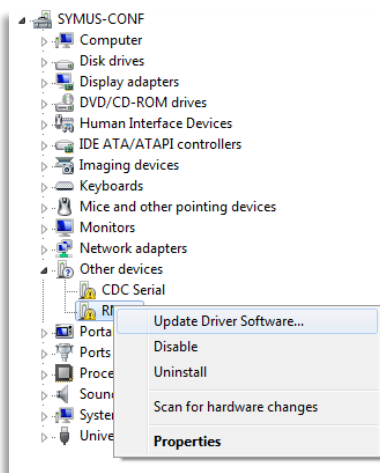


Figure 125: Device Manager

8. Right-click on the RNDIS device and select Update Driver Software from the pop-up menu that appears.
9. From the Update Driver Software – RNDIS dialog box that appears, select Browse my computer for driver software.

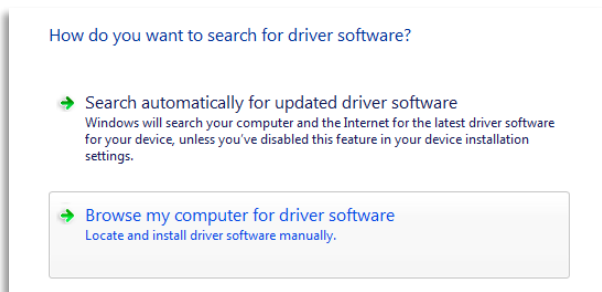


Figure 126: RNDIS Dialog

10. Click the Browse button and navigate to the drive letter assigned to VeriFinder, choose the VeriFinder Network Driver folder, and click Next.
11. Click Install. Windows will install the RNDIS device driver. Once the RNDIS device driver is complete, close the Device Manager window.

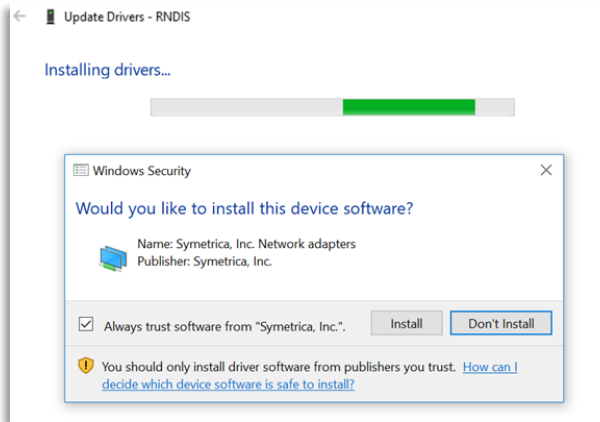


Figure 127: Installing Drivers

5.2 Offloading Events to the PC

Note: The VeriFinder stores up to 500 events on a first-in-first-out basis.

To offload events from VeriFinder to the PC:

1. Ensure that either the external power is connected to VeriFinder or that the battery is not fully depleted.
2. Ensure that the Offload Tool software on the PC is running and VeriFinder is powered on.
3. Use the supplied USB-C cable to connect to a USB-C port on the PC.



Figure 128: Connecting to PC

4. Once the USB cable is connected, click the Start menu and run Deep Discovery or double-click the Deep Discovery tray icon.

5. In the Symetrica Application Discovery window, select the detected VeriFinder unit and click Connect.

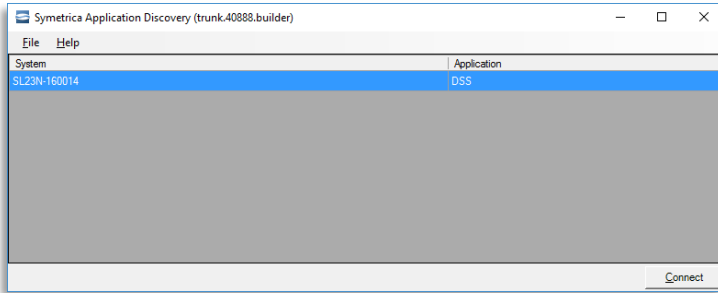


Figure 129: Symetrica Application Discovery

6. If this is the first connection, a Confirm Remote Identify dialog may appear. Click Accept to accept the certificate.
7. When asked to Log in, enter 'user' in the Username field. In the Password field, enter the current password; the default is 'symetrica'.
8. On successful connection the 'Offload data...' dialog appears with options to export only new events or export all events.

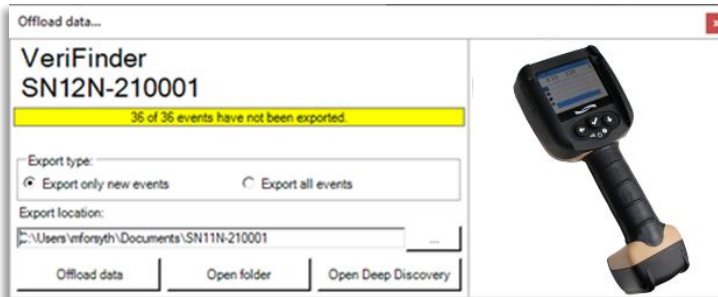


Figure 130: Offload Data Dialog

9. Enter an export location and click the 'Offload data' button. The progress bar populates with the offload status indicating number of event files offloaded.
10. Click the Open folder button to view the offloaded files.

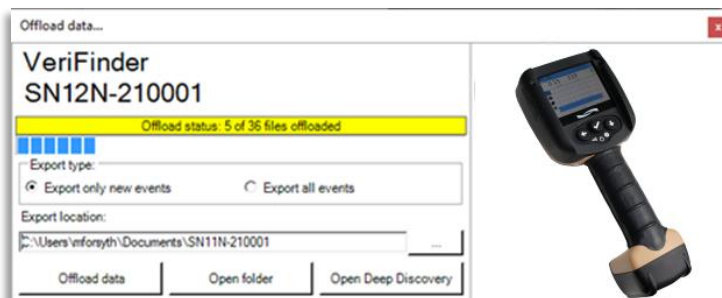


Figure 131: Progress Bar - Events Files Offloaded

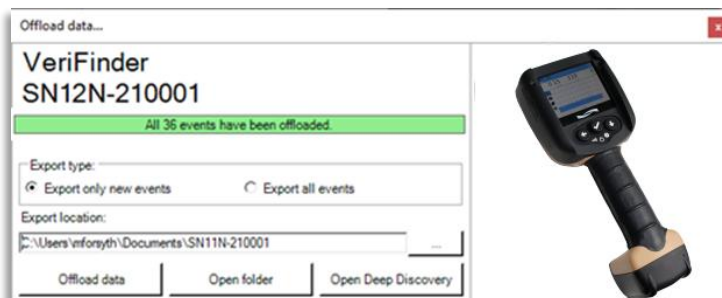


Figure 132: Progress Bar – All Events Offloaded

5.3 Web Management Interface (WMI)

VeriFinder contains a built-in web server, which hosts a set of **Web Management Interface (WMI)** screens that can be accessed using a PC Web Browser and / or Android device. The WMI enables remote operational control, for example, deployment into high radiation fields via a drone or mobile robot carrier. It also enables remote management of the VeriFinder as an alternative to using the advanced features on the device itself.

For further details, refer to document 760-0363 – VeriFinder WMI Manual.

SECTION 6 TROUBLESHOOTING

6.1 Troubleshooting Guide

Issue	Action
The VeriFinder device will not power on.	Connect to the AC mains supply and check for power (power icon on status bar). If necessary, recharge for 2.5 hours. If the problem persists, contact Symetrica support.
No Audio output on the device.	Check that the mute/disabled icon is not displayed in the status bar. If necessary, enable Speaker from the Audio and Alerts /Settings menu. If the problem persists, contact Symetrica support.
No Audible click on the device.	By default, the audible rate indicator is set to Off. If necessary, enable Sensitivity from the Audio and Alerts / Settings menu. If the problem persists, contact Symetrica support.
No Vibration on the device.	Check that the mute/disabled icon is not displayed in the status bar. If necessary, enable Vibrator from the Audio and Alerts / Settings menu. If the problem persists, contact Symetrica support.
Audio Subsystem Failure is displayed.	Acknowledge the status. Power off the VeriFinder, leave for 10mins and power back on again. If the problem persists, contact Symetrica support.

Issue	Action
Cannot connect to Wi-Fi.	Check that Wi-Fi is not set to Disabled. If necessary, enable Wi-Fi from the Settings / Connectivity menu. If the problem persists, contact Symetrica support.
Cannot connect Bluetooth to a paired device.	Check that Bluetooth is not set to Disabled. If necessary, enable Bluetooth from the Settings / Connectivity menu. If the problem persists, contact Symetrica support.
Cannot connect to GPS.	Check that GPS is not set to Disabled. If necessary, enable GPS from the Settings / Connectivity menu. If the problem persists, contact Symetrica support.
There is no Alert Screen displayed on detection of a Gamma / Neutron source.	Check that 'Gamma / Neutron Alerts outside events' option is not set to 'No'. If necessary, set to 'Yes' from Advanced Mode / Adjust Thresholds and Banners menu. If the problem persists, contact Symetrica support.
Mission Dose is not displayed on the Dose screen.	Check that Mission Dose is not set to 'Disable'. If necessary, set to 'Enable' from the Advanced Settings menu. If the problem persists, contact Symetrica support.
GPS Fault is displayed.	Acknowledge the status. Power off the VeriFinder, leave for 10mins and power back on again. If the problem persists, contact Symetrica support.

Issue	Action
Gamma / Neutron Detector Failure is displayed.	Acknowledge the status. Power off the VeriFinder, leave for 10mins and power back on again. If the problem persists, contact Symetrica support.
The display is not functioning.	Power off the VeriFinder, leave for 10mins and power back on again. If the problem persists, contact Symetrica support.
The navigation buttons are not functioning.	Power off the VeriFinder, leave for 10mins and power back on again. If the problem persists, contact Symetrica support.
SGP upload fails.	Check connection to enabled network. If the problem persists, contact Symetrica support.
The system will not power on.	Power off the VeriFinder, leave for 10mins and power back on again. If the problem persists, contact Symetrica support.
The system will not bootup.	Power off the VeriFinder, leave for 10mins and power back on again. If the problem persists, contact Symetrica support.
The system will not stabilize.	Power off the VeriFinder, leave for 10mins and power back on again. Wait at least 10mins for stabilization to complete. If the problem persists, contact Symetrica support.
The case is cracked.	Contact Symetrica support and arrange return of the unit.

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SECTION 7 MAINTENANCE

7.1 Preventive Maintenance

Preventive maintenance includes all scheduled maintenance actions required to keep the VeriFinder in good operational condition. Preventive maintenance actions include:

- Periodic inspections.
- Condition monitoring.
- Servicing (for example, cleaning).

7.1.1 Scheduled Maintenance Tasks

Recommended Schedule	Task
Monthly Actions.	▪ Inspect the unit for damage and functionality (see Note: below). ▪ Clean the unit monthly or as necessary, for example if the system has been used in harsh or contaminated environments. ▪ Clean the battery charger monthly or as necessary.
Seven Year Actions.	▪ Replace the Stabilization source. The system is labeled with the source installation/ initiation date. This date is also accessible through the user interface on the device. ▪ Replace the real time clock battery. Note: Arrange return of the unit to Symetrica support for these tasks.

7.1.2 Cleaning Materials

Recommended cleaning materials for the VeriFinder:

- Alcohol Wipes (or equivalent).
- Mild Detergent (or equivalent).
- Kim Wipes (or equivalent).

7.1.3 Cleaning VeriFinder

Clean the unit whenever possible or necessary, especially if it has been used in harsh or contaminated environments.

To clean VeriFinder:

1. Wipe VeriFinder with mild soap solution and a soft cloth on the case and handle. Avoid using caustic chemical cleaners.
2. Clean the LED display with an alcohol wipe.
3. Ensure that no dirt remains in any recessed areas such as the microphone, connector panel and screws.
4. Leave the detector to air dry.
5. If the detector is placed in the case the lid should be left open while drying.

SECTION 8 ADDITIONAL INFORMATION

8.1 Full Isotope Library

The following table details radiological/nuclear material categories and their attributes.

Some isotopes are always a threat and cannot be changed. This is indicated by the **Lock** icon.

ANSI Name	Display Name	Threat	Category	Locked
NORM	NORM	Innocent	NORM	
Unknown	UNKNOWN	Threat	Unknown	
H(n,g)	Neutron Capture	Threat	Suspicious	
Annihilation	Fluorine-18	Threat	Medical	
Scatter	X-Ray Scatter	Innocent	NORM	
Fluorescence	Fluorescence	Innocent	NORM	
Na-22	Sodium-22	Threat	Medical	
K-40	Potassium-40	Innocent	NORM	
Cr-51	Chromium-51	Threat	Medical	
Mn-54	Manganese-54	Threat	Industrial	
Co-57	Cobalt-57	Threat	Industrial	
Co-60	Cobalt-60	Threat	Industrial	
Ga-67	Gallium-67	Threat	Medical	
Se-75	Selenium-75	Threat	Medical	
Rb-81	Rubidium-81	Threat	Medical	
Sr-82/85	Strontium-82/85	Threat	Medical	

ANSI Name	Display Name	Threat	Category	Locked
Y-88	Yttrium-88	Threat	Industrial	
Sr-89	Strontium-89	Threat	Medical	
Sr-90	Bremsstrahlung	Threat	Industrial	
Mo-99	Molybdenum-99	Threat	Medical	
Tc-99m	Technetium-99m	Threat	Medical	
Pd-103	Palladium-103	Threat	Medical	
Cd-109	Cadmium-109	Threat	Industrial	
In-111	Indium-111	Threat	Medical	
I-123	Iodine-123	Threat	Medical	
I-125	Iodine-125	Threat	Medical	
I-131	Iodine-131	Threat	Medical	
Cs-131	Cesium-131	Threat	Medical	
Xe-133	Xenon-133	Threat	Medical	
Ba-133	Barium-133	Threat	Industrial	
Cs-134	Cesium-134	Threat	Industrial	
Cs-137	Cesium-137	Threat	Industrial	
La-138	Lanthanum-138	Innocent	NORM	
Eu-152	Europium-152	Threat	Industrial	
Sm-153	Samarium-153	Threat	Medical	

ANSI Name	Display Name	Threat	Category	Locked
Ho-166m	Holmium-166	Threat	Medical	
Lu-177	Lutetium-177	Threat	Medical	
Ir-192	Iridium-192	Threat	Industrial	
Tl-201	Thallium-201	Threat	Medical	
Tl-204	Thallium-204	Threat	Industrial	
Bi-207	Bismuth-207	Threat	Industrial	
Ra-223	Radium-223	Threat	Medical	
Ra-226	Radium-226	Innocent	NORM	
Th-228	Thorium-228	Innocent	NORM	
Th-232	Thorium-232	Innocent	NORM	
U-232	Uranium-232	Threat	SNM	
U-233	Uranium-233	Threat	SNM	
U-235	Uranium-235	Threat	SNM	
Np-237	Neptunium-237	Threat	SNM	
U-238	Uranium-238	Threat	Suspicious	
Pu-238	Plutonium-238	Threat	Suspicious	
Pu-239	Plutonium-239	Threat	SNM	
Am-241	Americium-241	Threat	Industrial	
Pu-241	Plutonium-241	Threat	SNM	

8.2 Default Settings

The following details the default settings when VeriFinder is delivered from factory.

Settings Menu:

Setting	Value
Sensitivity Volume	Medium
Volume (Alarms and Alert)	70%
Volume (Headphones)	30%
Vibrator (tactile alert)	Enabled
Background Updates (Automatic)	Disabled
Screen Backlight (Brightness)	Auto
Background Collection Duration	300 s

Connectivity in Settings Menu:

Setting	Value
Bluetooth*	Disabled
GPS	Enabled
WiFi	Disabled

Advanced Mode Menu:

Setting	Value
Advanced Mode Password	00000
Dose Units	μSv/h
Spectrum in Normal Mode	Disabled
Default ID Collection Duration	30s

Adjust Thresholds and Banners in Advanced Mode Menu:

Setting	Value
Gamma Alerts Outside Events (Banner)	Yes
Neutron Alerts Outside Events (Banner)	Yes
Gamma Sensitivity	9
Neutron Sensitivity	8
Gamma Hazard Limit *	100 μ Sv/h
Neutron Hazard Limit	93 cps
Low Battery Warning **	20%

* IAEA Protected Radiation Zone Threshold

** It is recommended that this setting is not changed.

8.3 Detector Location Points

Location of the Gamma and Neutron detector reference points.

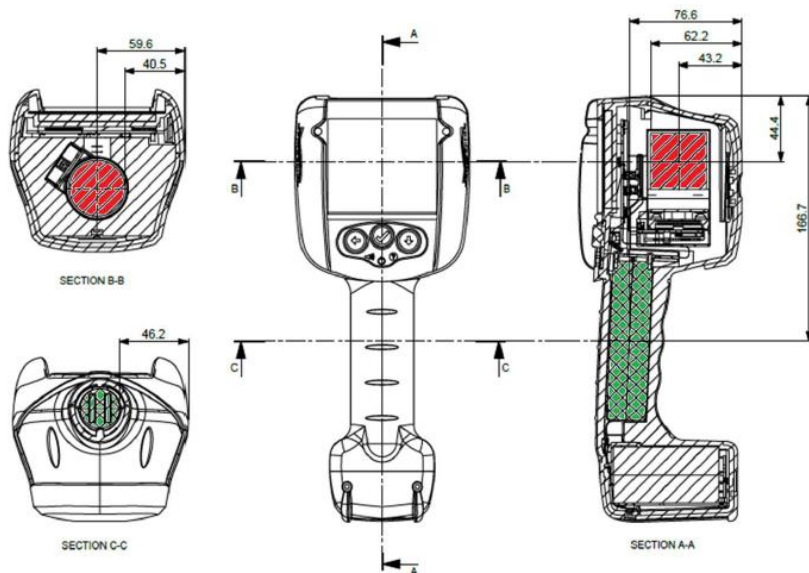


Figure 133: Gamma and Neutron Detector Location Points

SECTION 9 DEEP DISCOVERY SOFTWARE

Deep Discovery is an optional non-standard software, which provides management, analysis and configuration capabilities. If this software has been purchased, install following the procedures below.

For purchasing of Deep Discovery, contact Symetrica support for details.

9.1 Installing the Deep Discovery Software

To install the Deep Discovery software:

1. Open the protective boot cover on the rear of VeriFinder and use the supplied USB cable to connect to a USB port on the PC.



Figure 134: Connecting VeriFinder to a USB Port on the PC

2. VeriFinder is recognized as a mass storage device and is displayed with a new drive letter.

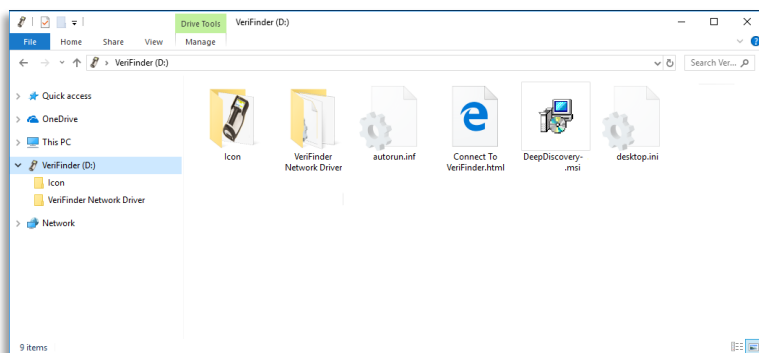


Figure 135: Windows Explorer

- Navigate to the drive, and double click on the Deep Discovery.msi file. Follow the installer instructions that appear to install the Deep Discovery software on the PC.

9.2 Using Deep Discovery

Deep Discovery is launched from the Offload Tool > Open Folder button.

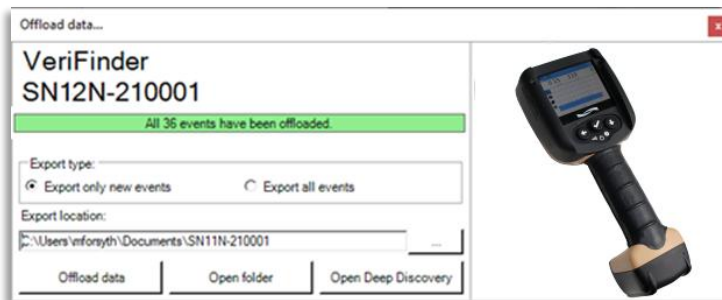
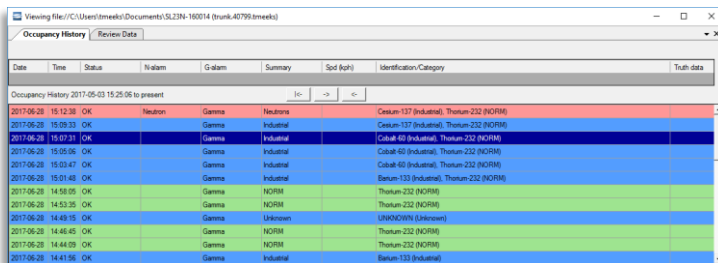


Figure 136: Offload Tool – Open Folder for Deep Discovery

- Click the ‘Open Folder’ button. Deep Discovery loads all the SMLGZ files in the folder and presents them in the Occupancy Tab.



Date	Time	Status	Isdam	Galam	Summary	Spd (g/h)	Identification/Category	Truth data
Occupancy History 2017-06-03 15:25:06 to present								
2017-06-28	15:12:30	OK	Neutron	Gamma	Neutrons		Cesium-137 (Industrial), Thorium-232 (NORM)	
2017-06-28	15:09:33	OK	Gamma	Industrial			Cesium-137 (Industrial), Thorium-232 (NORM)	
2017-06-28	15:07:31	OK	Gamma	Industrial			Cobalt-60 (Industrial), Thorium-232 (NORM)	
2017-06-28	15:05:06	OK	Gamma	Industrial			Cobalt-60 (Industrial), Thorium-232 (NORM)	
2017-06-28	15:03:47	OK	Gamma	Industrial			Cobalt-60 (Industrial), Thorium-232 (NORM)	
2017-06-28	15:01:40	OK	Gamma	Industrial			Bismuth-210 (Industrial), Thorium-232 (NORM)	
2017-06-28	14:58:05	OK	Gamma	NORM			Thorium-232 (NORM)	
2017-06-28	14:53:35	OK	Gamma	NORM			Thorium-232 (NORM)	
2017-06-28	14:49:15	OK	Gamma	Unknown			UNKNOWN (Unknown)	
2017-06-28	14:46:43	OK	Gamma	NORM			Thorium-232 (NORM)	
2017-06-28	14:44:09	OK	Gamma	NORM			Thorium-232 (NORM)	
2017-06-28	14:41:56	OK	Gamma	Industrial			Bismuth-210 (Industrial)	

Figure 137: Deep Discovery – Occupancy History

- Right-click an event to display the context menu and export options available.

Date	Time	Status	Alarm	Alarm	Summary	Spd Rpt	Identification	Category
2017-06-28	15:12:38	OK	Neutron	Gamma	Neutrons		Cesium-137 (Industrial), Thorium-232 (NORM)	
2017-06-28	15:09:33	OK	Gamma	Industrial			Cesium-137 (Industrial), Thorium-232 (NORM)	
2017-06-28	15:07:31	OK	Gamma	Industrial				
2017-06-28	15:05:06	OK	Gamma	Industrial				
2017-06-28	15:03:47	OK	Gamma	Industrial				
2017-06-28	14:56:09	OK	Gamma	NORM			Thorium-232 (NORM)	
2017-06-28	14:53:35	OK	Gamma	NORM			Thorium-232 (NORM)	
2017-06-28	14:49:15	OK	Gamma	Unknown			UNKNOWN (Unknown)	
2017-06-28	14:46:40	OK	Gamma	NORM			Thorium-232 (NORM)	
2017-06-28	14:44:09	OK	Gamma	NORM			Thorium-232 (NORM)	
2017-06-28	14:41:56	OK	Gamma	Industrial			Barium-133 (Industrial)	

Figure 138: Deep Discovery Export Options

or...

- Double-click the event to display the Review Data tab.

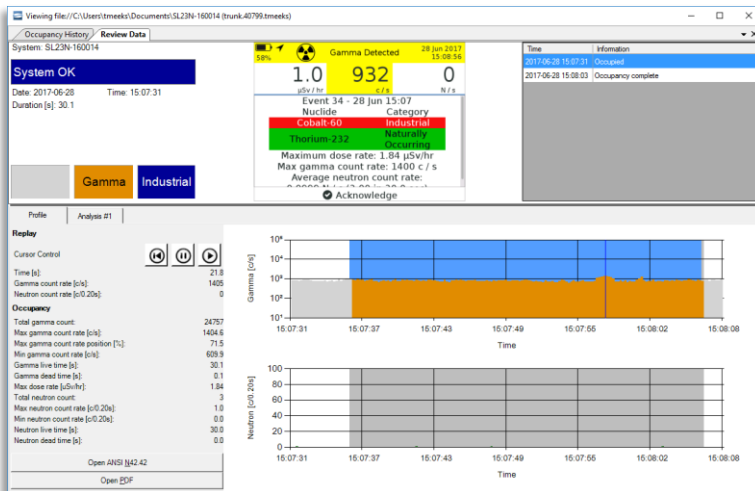


Figure 139: Deep Discovery Review Data

Note: You can export files using the Open ANSI N42.42 and Open PDF buttons on the bottom left of this screen.

- Click the Analysis #1 tab to review analysis data.

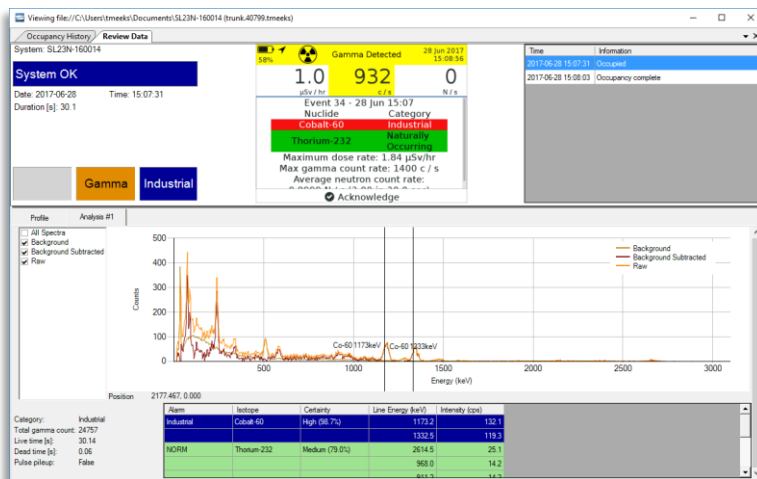


Figure 140: Deep Discovery Analysis Data

Note the following:

- Observe the percentage in the Certainty column.
- If multiple analyses / or no analyses were performed, there will be more or less Analysis tabs.
- If you click on a line, it will display it on the graph above.
- The graph can be zoomed and put into log mode using the mouse and the right-click menu.

5. Click Open PDF to display the PDF report.



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REVISION HISTORY

Revision	Reason for Revision	Date Revised
Rev 01	Initial release version	2025-02-19
Rev 02	Figure 79 – Connectivity Status Settings Updated to show GPS Enabled Addition of new statements for Regulatory Compliances	2025-05-01

Notes

Notes



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