Frequently Asked Questions (FAQ) on the Radiological Detection System:

If your questions are not answered by the information below, please refer to https://www.dtectsystems.com/support-rds or call the support line at +1-801-260-4069.

- General

    a) What is the Radiological Detection System?

    The Radiological Detection System is a suite of equipment that is used for detection, classification, and quantification of gamma (photon), beta, alpha, x-ray, and neutron radiation. The equipment utilizes Geiger-Mueller (GM) tube, scintillation, photomultiplier tube (PMT), and solid-state semiconductor-based technology to detect the various forms of radiation. Detection capabilities are found in the Base Unit and in six different probes, each suited to different missions or purposes.

    Top row left to right,
    - Field Instrument for Detection of Low Energy Radiation (FIDLER) Probe (DT-724/PD PROBE RADIAC)
    - Neutron Probe (DT-725/PD PROBE RADIAC)

    Middle row left to right,
    - Sensitive Gamma Probe (DT-726/PD PROBE RADIAC)
    - Beta Photon Probe (DT-728/PD PROBE RADIAC)
    - Alpha-Beta Probe (DT-727/PD PROBE RADIAC)
    - Small Area Gamma Probe (DT-729/PD PROBE RADIAC)

    Bottom row left to right,
    - Common Probe Cable (connects probe to Base Unit)
    - Base Unit (IM-281/PD RADIACMETER)

    b) Is there an operator or technical manual?

    The initial systems fielded to U.S. Army came with compact disc (CD) containing two draft manuals, TM 3-6665-381-13&P Operator and Field Maintenance manual Including Repair Parts and Special Tools List for Base Unit Radiological Detection System , NSN 6665-01-671-4539 and TM 3-6665-382-13&P Operator and Field Maintenance manual Including Repair Parts and Special Tools List for Probes, Radiological Detection System.

    The final manual, to be published late 2024 or early 2025 will be Army TM 3-6665-383-14&P; Air Force TO 11H4-2-22-1; Marine Corps TM 00385A-13 Technical Manual Operator, Field and Sustainment Maintenance Manual Including Repair Parts and Special Tools List for Base Unit Radiological Detection System (RDS) AN/PDR-83. This manual will include the Base Unit and all Probes as well as ancillary equipment that is a part of the RDS System.

    For US manuals, log in to the Joint Acquisition CBRN Knowledge System (JACKS) at https://jacks.jpeocbrnd.army.mil/ to find the draft manuals. Once published please access them through https://armypubs.army.mil/.

    The US Navy is producing a separate technical manual, refer to the organization in your Service that fielded the RDS to you for receipt of the proper technical manual.

Canada military units shall receive both an English and Canadian French version of Operator Manual for Canadian Radiological Detection System (CRDS) Base Unit and Probes. English CRDS Operator Manual is manufacturer part number V062904, Canadian French CRDS Operator manual is manufacturer part number V072065.

For Canada manuals, please submit a request to your First Line Maintenance provider.

c) Does the RDS contain any radioactive sources or hazardous materials?

The Base Unit and probes do not contain internal radioactive sources. The configuration issued may contain individual check sources, a button check source of less than 1 microCurie (µCi) of cesium (Cs)-137 and some sets may contain a check source of less than 30 nanoCurie (nCi) of thorium (Th)-232. Please refer to the following Warning statements when using a check source:

WARNING: Avoid prolonged use of Check Sources, return them to case or other protective location promptly after each use to minimize exposure. Do not ingest source. Do not attempt to open or crush source housing. Do not handle damaged sources. The cesium (Cs-137) check source contains less than 1 microCurie (µCi) of Cs-137. Coordinate disposal with unit Radiation Safety Officer (RSO). Failure to follow precautions may result in injury or death.

WARNING: Avoid prolonged use of Check Sources, return them to case or other protective location promptly after each use to minimize exposure. Do not ingest source. Do not attempt to open or crush source housing. Do not handle damaged sources. The thorium (Th-232) check source contains less than 30 nanoCurie (nCi) of Th-232. Coordinate disposal with unit Radiation Safety Officer (RSO). Failure to follow precautions may result in injury or death.

The only hazardous materials, other than the check sources, used in operation of the RDS are batteries. These are standard commercial batteries. Internally and not handled by the operator is one button cell BR2032 battery that maintains the clock in the Base Unit. Changing of the internal clock battery is done by qualified maintainers only. Operators will be required to change the batteries that power the system while operating the RDS. It requires four (4) AA batteries. Although Nickel Metal Hydride (NiMH) are recommended for longer operating time, and they are rechargeable, alkaline AA batteries may be used as well. Do not mix battery types. Please refer to the following WARNING statement for handling of batteries:

WARNING: Batteries, under normal conditions of use, are hermetically sealed. Potential for exposure should not exist unless the battery leaks, is exposed to high temperature, is accidentally swallowed or is mechanically, physically, or electrically abused. Batteries should not be opened or burned. Exposure to the ingredients contained within or their combustion products could be harmful causing respiratory irritation, skin irritation, eye irritation and chemical burns. Do not handle leaking or damaged batteries without neoprene or rubber gloves. Do not puncture, mutilate, or attempt to disassemble batteries. Do not heat them above 212°F (100°C). Failure to follow precautions may result in injury or death.

Maintainers may encounter additional hazardous chemicals such as solvents, adhesives, and lubricants while conducting maintenance, please ensure to follow all WARNING and CAUTION statements found in the technical manual.

d) Why does my transit case not have everything listed as part of the system in the technical manual?

The Radiological Detection System is a versatile suite of equipment and not all operators may need the capability of every probe or piece of ancillary equipment. The US Military Services and Canada Department of Defense have analyzed the needs based on the unit's mission and operating parameters and created different configurations based on their needs.

For USMC and USA, configurations are laid out in the Introduction to Repair Parts and Special Tools List (RPSTL), Chapter 12. Both Services have National Stock Numbers (NSN) assigned and type designators for their configurations.

For USAF and USN, multiple configuration types have been defined. Please refer to the organization in your Service that fielded the RDS to you for additional details on those configurations.

For Canada, the CRDS Operator's Manual, Chapter 1 provides a picture and table of all items found in each of the types of kits that are fielded.

Please note for all Services, there are some configurations that contain multiple transit cases, your FIDLER Probe, Neutron Probe and for Canada Sensitive Gamma Probe may be in a separate transit case from the rest of your configuration. Transit cases and their labeling also vary for each of the US Services and Canada.

e) How do I get additional items?

The procurement of additional RDS equipment must go through your Military Service following the proper channels for your requests based on the Service you are a part of. If you are unsure of who to contact,

For US – Place an inquiry at Joint Acquisition CBRN Knowledge System (JACKS) at https://jacks.jpeocbrnd.army.mil/ through the CBRN-Information Resource Center. All military personnel may sign in to the CBRN-IRC using their Common Access Card (CAC).

For Canada please contact your First Line Maintenance provider.

f) How do I replace something that is damaged?

All RDS operational and maintenance items are assigned a National (or NATO) Stock Number (NSN) and are available through military supply channels. NSNs can be found in TM-3-6665-383-14&P, Chapter 12 and 13 or CRDS Operator's Manual, Chapter 1.

Follow all proper channels for your Military Service. Each Service has their own maintenance concept, please ensure you follow the guidance in your technical manual, technical bulletin, or operator's manual.

Some ancillary equipment and consumables such as the mylar window for the Alpha-Beta Probe may be ordered at the operational unit level. Please refer to the source, maintenance, and recoverability (SMR) codes in TM-3-6665-383-14&P, Chapter 12 for US Army, US Air Force, and US Marine Corp to determine if the item is orderable at the

operational unit level and work with your supply and maintenance personnel assigned or supporting your unit.

g) How do I know if my RDS is working?

There are two parts to ensuring your Base Unit or Probe is working correctly.

(1) Performing a quick exterior inspection can rule out damage that might prevent the item from working properly, following the Before Preventive Maintenance Checks and Services (PMCS) will walk you through the inspection process ensuring you check all important items on the exterior.

(2) The last step in the Before PMCS will take you to the right Work Package/Section for preparation for use of the item. This will include applying power (batteries or AC/DC Power Adapter), turning it on, attaching a probe to the Base Unit, checking units and thresholds to ensure they are set correctly, and finally a functional check of the detectors in the system. Follow the procedure as written in the technical manual/operator's manual using the proper check source to see the readings per the given range and performance of the RAD test. Follow the proper troubleshooting steps should the item not meet the requirements given in your technical manual/operator's manual and seek the next level of maintenance as necessary should it be indicated.

For TM-3-6665-383-14&P, Operator PMCS can be found in Chapter 4.

For CRDS Operator's Manual, Chapter 10, Section 1 contains the Operator PMCS.

- Power

a) What type of batteries do I use for the RDS?

The Base Unit requires 4 AA commercial batteries. Both non-rechargeable alkaline batteries or rechargeable Nickel Metal Hydride (NiMH) may be used. NiMH are recommended for longer operational use, specifically in cold temperatures.

b) How long will my batteries last?

Probes, Sensor Network Adapter Cable (SNAP) or Rad Extender, alarms, temperature, and certain settings will all affect battery life.

The system will provide continuous operation from an internal power source for 8 hours under the highest-draw usage scenarios.

Nickel Metal Hydride (NiMH) and alkaline batteries are manufactured in various charge capacities measured in millampere-hour (mAh). Usually the higher the mAh rating, the longer the battery can be used. One exception is cold temperatures where rechargeable NiMH AA batteries will provide the longest operational period. In cold temperatures AA alkaline batteries may only last several hours.
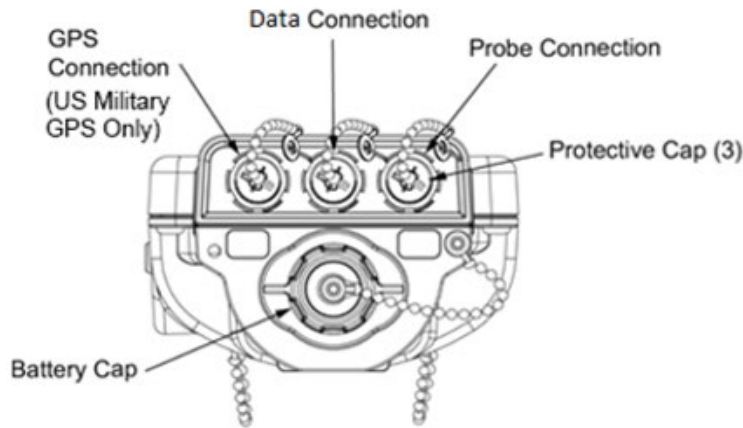
c) Can I use rechargeable batteries in the Base Unit?

Rechargeable Nickel Metal Hydride (NiMH) AA batteries may be used with the Base Unit, but they must be removed from the Base Unit for recharging. Batteries can be left
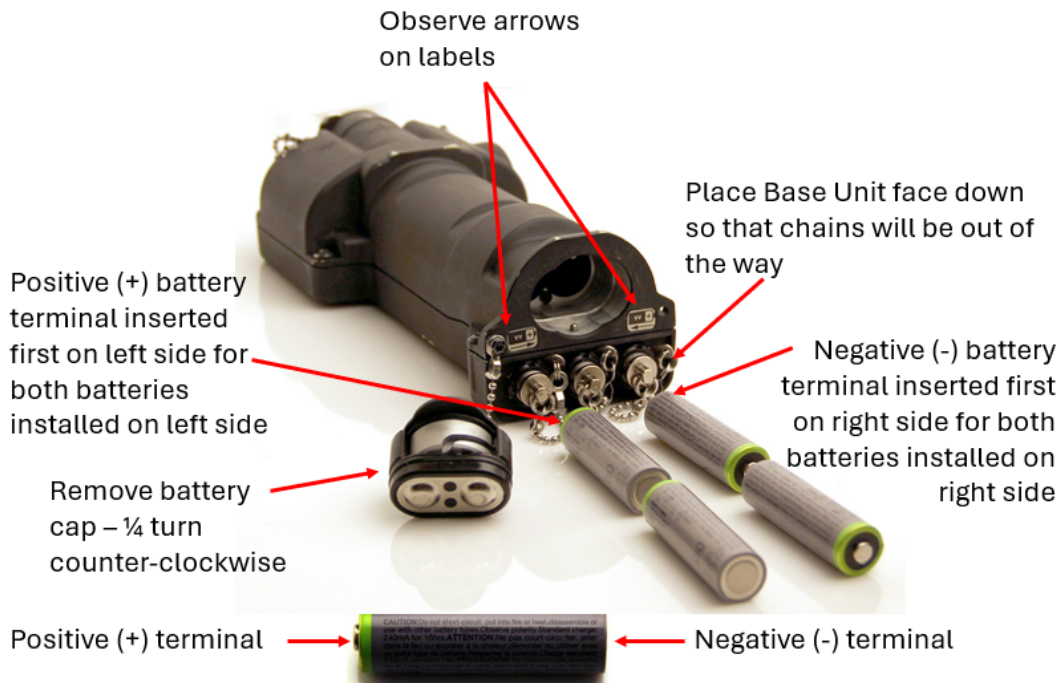
in the Base Unit while the AC/DC Power Adapter is attached and being used, but it will not charge the batteries in the system.

A battery charger may be a part of your kit or is found on the Additional Authorization List (AAL) in your technical manual available per National Stock Number through your military supply chain.

d) How do I insert the batteries?

GPS Connection (US Military GPS Only)

Data Connection

Probe Connection

Protective Cap (3)

Battery Cap

Base Unit Bottom View

Observe arrows on labels

Place Base Unit face down so that chains will be out of the way

Positive (+) battery terminal inserted first on left side for both batteries installed on left side

Negative (-) battery terminal inserted first on right side for both batteries installed on right side

Remove battery cap – ¼ turn counter-clockwise

Positive (+) terminal

Negative (-) terminal

e) Is there an adapter that I can plug in the Base Unit for power instead of using batteries?

Yes, there is an AC/DC Power Adapter that connects to the Base Unit to a working 110-130 Volt (60 Hertz) power outlet for operation. Batteries can be removed or left in the Base Unit while the AC/DC Power Adapter is attached and being used, but it will not charge the batteries in the system.

The AC/DC Power Adapter is useful when performing maintenance or using the RDS system in a lab environment.

The AC/DC Power Adapter is a part of some configurations or is found on the Additional Authorization List (AAL) in your technical manual available per National Stock Number through your military supply chain.
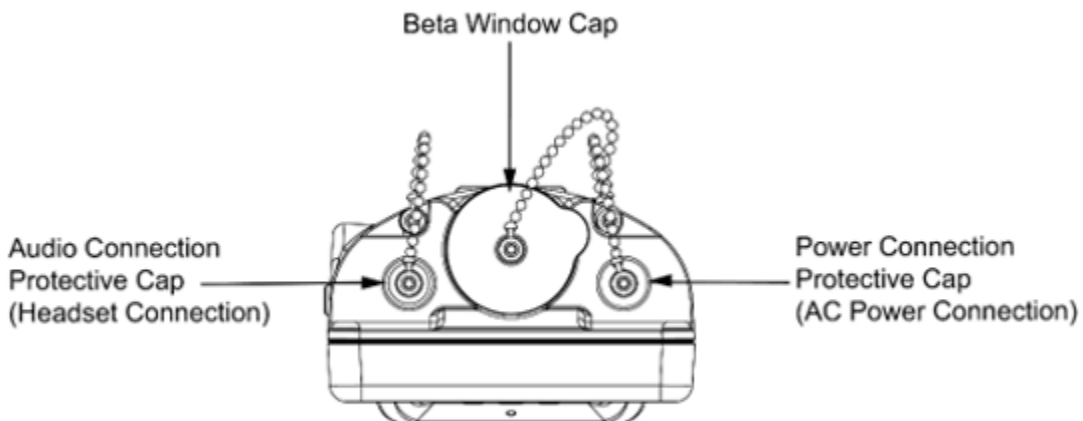
Base Unit Top View

To connect the AC/DC Power Adapter:

1) Remove power connection protective cap by rotating counterclockwise.
2) Attach AC/DC power adapter by inserting it into the AC power connection and then threading adapter collar onto Base Unit AC power connector.
3) Plug AC/DC power adapter into working 110V power outlet.

NOTE: If no batteries are installed and Base Unit is powered off, Base Unit will power on automatically when AC/DC power adapter is inserted into a power outlet.

4) Power Base Unit on, if necessary, by pressing the Home/Power key.

f) Do I need to remove the batteries before plugging it in using the AC/DC Adapter?

Batteries can be left in the Base Unit while the AC/DC Power Adapter is attached and being used, but it will not charge the batteries in the system. When the AC/DC Power Adapter is attached, the system will bypass the batteries and draw all power from the AC/DC connection.

g) Will plugging in the AC/DC Power Adapter charge the batteries inside the Base Unit?

Rechargeable Nickel Metal Hydride (NiMH) AA batteries may be used with the Base Unit, but they must be removed from the Base Unit for recharging. Batteries can be left in the Base Unit while the AC/DC Power Adapter is attached and being used, but it will not charge the batteries in the system.

A battery charger may be a part of your kit or is found on the Additional Authorization List (AAL) in your technical manual available per National Stock Number through your military supply chain.

h) Where is the power button?

The Home/Power 🔋 key is the power button; it is used to turn on the Base Unit, return to the Home screen, and to turn off the Base Unit. When turning off the Base Unit, hold for approximately 3 seconds, then acknowledge the display "Are you sure you want to power off the device?" by pressing the Enter ☑ key for yes.
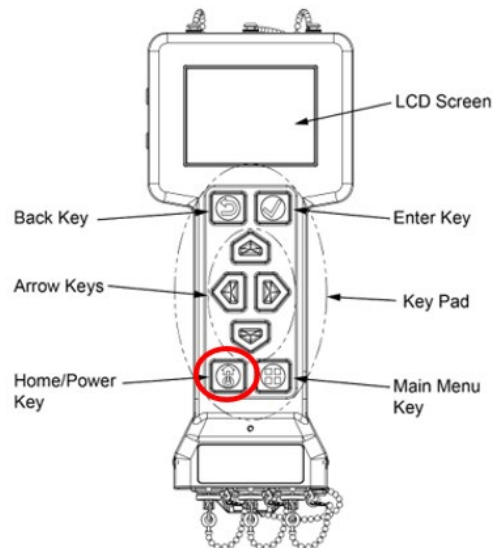
i) How do I turn on the Base Unit?

After inserting batteries or connecting the AC/DC Power Adapter, press the Home/Power 🔋 key. Wait for approximately 10 seconds for the Home screen to display.
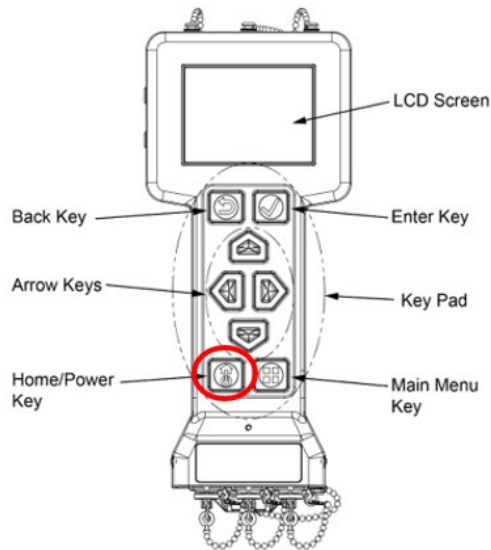
For TM-3-6665-383-14&P, Operator PMCS can be found in Chapter 4.

- Base Unit Install Batteries, Work Package 0007
- Connect/Disconnect Base Unit with AC/DC Power Adapter, Work Package 0008
- Base Unit Power On/Off, Work Package 0010

For CRDS Operator's Manual, Chapter 10, Section 1 contains the Operator PMCS.

- Battery Installation and Removal, Chapter 3, Section 4
- Connect/Disconnect Base Unit with AC/DC Power Adapter, Chapter 3, Section 5
- Powering Base Unit On and Off, Chapter 3, Section 6

j) How do I turn on a probe?

RDS Probes are powered by the Base Unit. Power on the Base Unit, then attach the Probe to the Base Unit using the common probe cable. Both ends of the common probe cable are the same connector, it does not matter which end is attached to the probe or Base Unit.

(1) Remove the connector protective cap from the Base Unit "PROBE" connector.

(2) Align red dot on "PROBE" connector to red dot on common probe cable and insert until an audible click is heard (or connector is fully seated).

(3) Remove connector protective cap from probe.

(4) Align red dot on probe's connector to red dot on common probe cable and insert unit an audible click is heard (or connector is fully seated).

(5) Observe that a second reading panel appears on the Home screen and the probe icon appears in the footer bar.

To power off the probe, remove the connection by disconnecting each end of the common probe cable.


(1) Grasp the sleeve at the end of the common probe cable and pull, do not pull on the cable or cable strain relief.

(2) Disconnect the common probe cable from the base Unit and the attached probe.

(3) Install the connector protective caps on the probe and Base Unit connectors.

The Sensor Network Adapter Cable and Rad Extender are both powered by the Base Unit as well. They are powered on once they are attached to a powered-on Base Unit.

- Ports/Buttons

  - What do the icons on the keypad mean?
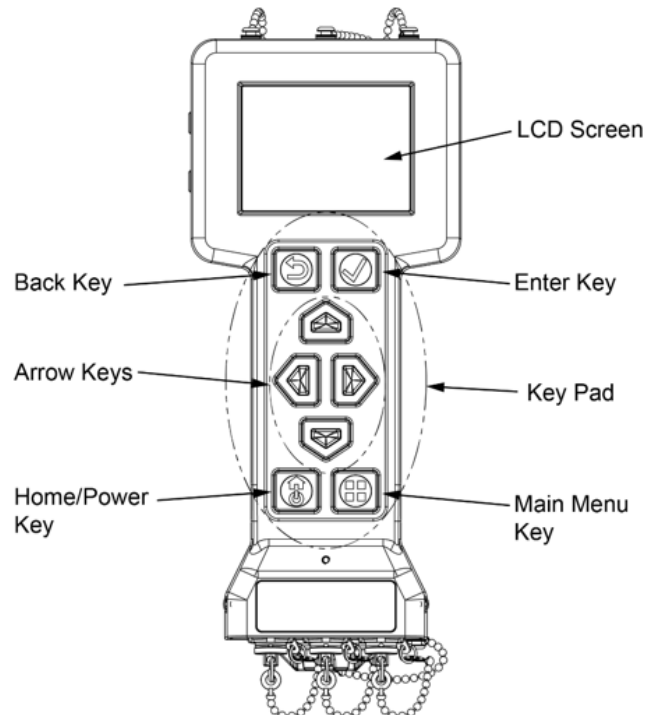
Key		Function	Comment
Home/Power		(a) Power on	Short press
		(b) Return to home screen	Short press
		(c) Power off	Press and hold for 3 seconds. Acknowledge power off prompt.
Back		Return to previous screen	Short press
Arrows (4)		Navigate the screens	Short press
Enter		Choose selected item	Short press
Main Menu		Go to Main Menu	Short press
Stealth Mode		enter/exit Stealth Mode	Press enter and Back keys together until the screen goes dark or returns to normal (approximately 3 seconds).

- What is the USB port (labeled as DATA on Canada systems) used for?

Base Unit Bottom View
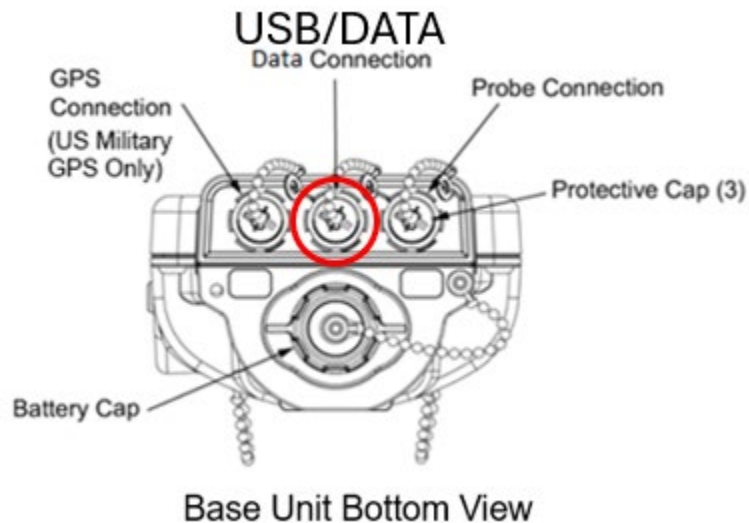
United States RDS Systems: The USB port, center port on the bottom of the RDS, is used to connect the Base Unit to the Sensor Network Adapter (SNAP) Cable. The label USB refers to the connector as it is a military hardened USB connector that attaches here to enable a secure connection when used in operational environment.

Canadian RDS Systems: The DATA port, center port on the bottom of the RDS, is used to connect the Base Unit to the Rad Extender using a military hardened connector.

SNAP Cable/Rad Extender is a self-contained system consisting of a single board computer that provides a web server interface using cybersecurity protocols. This connection is used for downloading or transfer of data log files from the Base Unit to a computer for analysis and decision making.

Instructions on downloading or transfer of data files can be found in your technical/operator manuals.

- What are the ports on the top of the Base Unit?
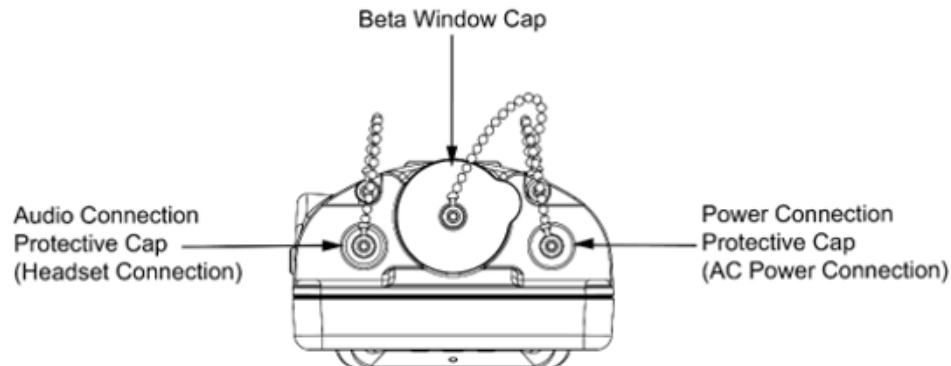
Base Unit Top View

Audio/Headset connection is a standard 3.5mm audio plug with an added threaded collar for solid connection to the Base Unit audio port to prevent it from being dislodged during movement. The connection will allow any commercial headset/earphone with a standard 3.5mm audio plug to be used. For a secure connection during a mission though, the RDS headset/earphone provides the added threaded collar to keep this in place. If it is not included with your configuration, check your Additional Authorization List (AAL) for the National Stock Number (NSN) for ordering. Volume settings for your headset/earphone are located on the Base Unit Settings Menu. Once the headset is connected, the buzzer (speaker) will be bypassed and all audio will come through the headset. When using stealth mode, the volume will automatically switch to the audio port for headset, bypassing the buzzer (speaker). Activating mute on the Settings screen will remove all sound from both the buzzer (speaker) and the headset. To remove audio connection protective cap, turn counterclockwise and install by turning clockwise.

Beta Window is used when determining the presence of beta radiation. Since beta radiation has a limited range in air, opening the beta window cap will allow beta radiation to be detected along with gamma (photon) radiation for both the Base Unit and Beta Photon Probe. The Geiger-Mueller tubes in the Base Unit and Beta Photon Probe are not calibrated for beta dose, therefore quantitative measurement of beta radiation must be done with the Alpha-Beta probe. To remove the beta window cap, push up on the small thumb piece and place it on the side of the Base Unit that is magnetized to hold the beta window cap. Install beta window cap by pushing it back into the beta window, ensuring the thumb piece for removal is toward the outside for use in later removal. For determining presence of beta radiation see:

- US TM-3-6665-383-14&P, Base Unit Preparation for Use and Orientation, Work Package 0011

- Canada CRDS Operator's Manual, Chapter 3, Section 11 (3.11.1).

AC Power Connection port is used to connect the AC/DC power adapter for powering the Base Unit via a working 110V outlet. When attached power is drawn from the AC source. Batteries can be left in while using the AC/DC power adapter, but it will not charge internal batteries. To remove power connection protective cap, turn counterclockwise and install by turning clockwise. This is commonly used during maintenance, a fixed sample station, or in a laboratory environment. For instructions on attaching the AC/DC power adapter please see:

- US TM-3-6665-383-14&P, Connect/Disconnect Base Unit with AC/DC Power Adapter, Work Package 0008

- Canada CRDS Operator's Manual, Chapter 3, Section 5 (3.5.1).

- What is the beta window cap used for?

Beta Window Cap is used when determining the presence of beta radiation. Since beta radiation has a limited range in air, opening the beta window cap will allow beta radiation to be detected along with gamma (photon) radiation for both the Base Unit and Beta Photon Probe. The Geiger-Mueller tubes in the Base Unit and Beta Photon Probe are not calibrated for beta dose, therefore quantitative measurement of beta radiation must be done with the Alpha-Beta probe. For determining presence of beta radiation using the Base Unit see:

- US TM-3-6665-383-14&P, Base Unit Preparation for Use and Orientation, Work Package 0011

- Canada CRDS Operator's Manual, Chapter 3, Section 11 (3.11.1).

- What are the ports on the bottom of the Base Unit?
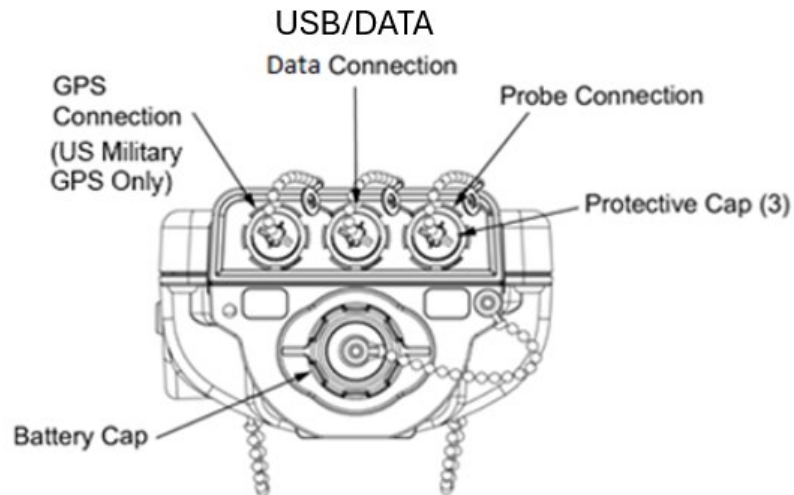
Base Unit Bottom View

Global Positioning System (GPS) Connection allows the connection of the United States Defense Advanced Global Positioning System Receiver (DAGR) to the Base Unit for incorporation of Positioning, Navigation, and Timing (PNT) information into the data logs for use during analysis. At this time it does not allow connection to other GPS devices, but additional capabilities are being added, contact D-tect for additional information on new capabilities under development (+1-801-260-4069).

Data Connection is the center top port on the bottom of the Base Unit. This connection may be labeled "USB" or "DATA". The connection is a ruggedized military USB connection used to send data to a computer via the Sensor Network Adapter (SNAP) Cable or the Rad Extender. Instructions for use of the SNAP Cable or Rad Extender to download or transfer data files can be found in your technical/operator manuals.

Probe Connection is the port used to connect the Common Probe Cable to the Base Unit while the other end of the Common Probe Cable is connected to any of the RDS Probes. This allows the data flow to and from the RDS Probes.

All three top connections have protective caps attached to the Base Unit with chains. The protective caps on the bottom of the Base Unit are simple pull caps, not threaded, no turning required. To install the bottom protective caps just push them in. Keep protective caps in place to avoid water, dirt, or debris from collecting in the connector and causing damage.

Battery compartment holds the four (4) AA batteries used to power the Base Unit and connected probes and ancillary equipment. The battery cap is removed by turning it a quarter turn counterclockwise before it pulls out. To install the battery cap after placing in the batteries, push in and turn a quarter turn clockwise. Not all AA batteries are the same length, some brands can be slightly longer causing the battery cap to be difficult to close or remove, change battery brands if necessary to allow the battery cap to function correctly.

- What are the numbers shown on the top row of the display?

The top row of the display is the Home Screen Status Bar. This displays the time, date, send data function, headset connectivity, alarms, and power as they are applicable. The format for the date time group is shown in the graphic below. This format is prescribed by the NATO CBRN-4 messaging as dictated by the Allied Technical Publication (ATP)-45.

The RDS will only show the "Z" for Zulu time in the date time group, so it is important for later analysis of the data logs for the Zulu time to be set, not local time. Zulu is also known as Greenwich Mean Time (GMT) or now referred to as Coordinated Universal Time (UTC).

- What format is displayed if a compatible GPS is attached and where?

  Currently the only compatible Global Positioning System is the United States Defense Advanced GPS Receiver (DAGR). Contact D-tect for additional information on new capabilities under development (+1-801-260-4069).

  The bottom row of the display is the Home Screen Footer Bar. This displays GPS information, image of attached probe, and data logging controls, as applicable.

  When a GPS(DAGR) is not attached the ⬇ (black tear drop with red line through it) icon will be displayed in the bottom left corner of the Home Screen Footer Bar.

  When a GPS(DAGR) is attached the 📍 (blue tear drop) icon will be displayed in the bottom left corner of the Home Screen Footer Bar.

  When 📍 (blue tear drop) icon is displayed, to the right of the icon will be the words "No Location" if the GPS(DAGR) is still searching for a satellite connection and current location.

  Once a location is found it will be displayed to the right side of the icon with a location shown in Military Grid Reference System (MGRS).

  📍**12TVK24258772**

 The location format for MGRS is shown in graphic below:

  This location of each data point will be collected and displayed with the data log when the GPS(DAGR) is attached. When data is downloaded or transferred, the data is then displayed as Latitude and Longitude in the data files for analysis and messaging as

prescribed by the NATO CBRN-4 messaging as dictated by the Allied Technical Publication (ATP)-45.

- Settings/Graphic User Interface (GUI)

  a) How do I get to the menu?

 Press the Main Menu key located as shown below:
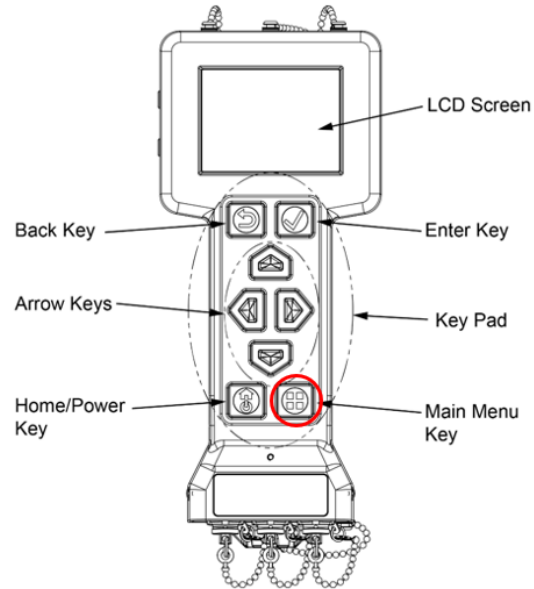
The following graphical tree shows the Graphical User Interface (GUI). From anywhere in the Base Unit menu, press Main Menu Key to return to the top level of the menu, press Home/Power Key to immediately return to the Home Screen with live radiation readings. The Back Key will take you back one menu level.
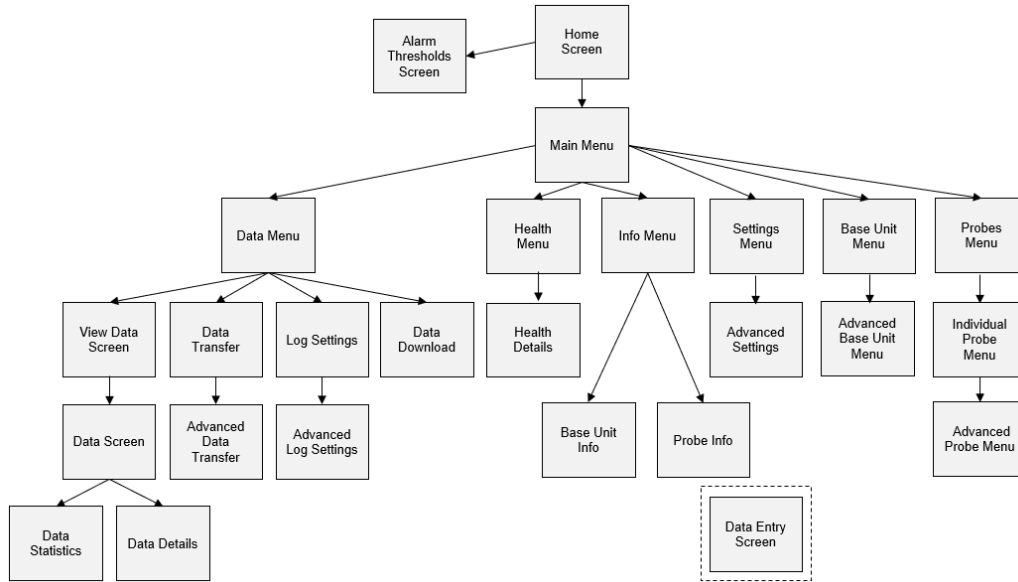
b) What is "Tick Mode"?

The "Tick Mode" provides the user with an audible indication of the intensity of the current readings. Ticking will occur faster and faster as a detected dose rate or counts increase. When only using the Base Unit the selection to the right of "Tick Mode" will display as either On or Off based on operator choice using the left and right arrow keys.
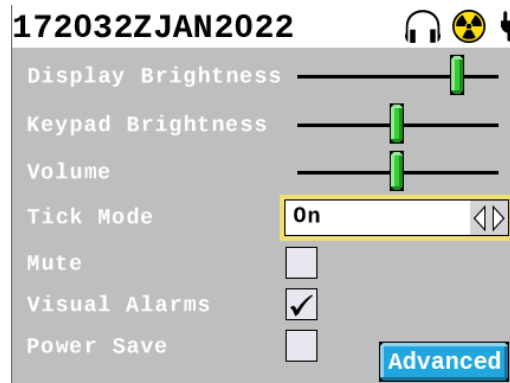
When a probe is attached to the Base Unit the selection to the right of "Tick Mode" will display Right Panel, Left Panel, or Off (panels are displayed on the Home Screen), allowing the user to select what they would like to tie the ticking to, the Base Unit or Probe (or channel of that probe if more than one channel available for the probe) attached. The Settings Menu, Advanced screen allows the user to select what is displayed in the right and left panels on the Home Screen when a probe is attached.

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Display Brightness ———————▮———

Keypad Brightness ———————▮————

Volume ———————▮————

Tick Mode   ┌─────────────────┐
                │ Left Panel   ◁▷│
                └─────────────────┘

Mute   ☐

Visual Alarms   ☑

Power Save   ☐   **Advanced**
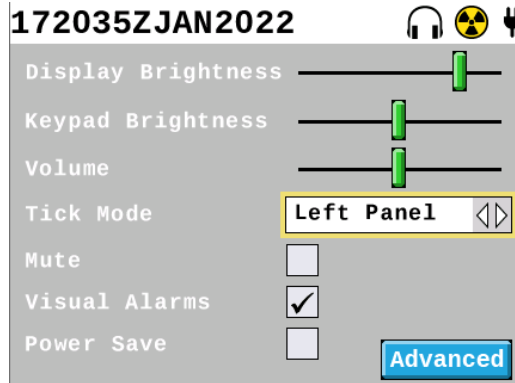
c) Is there a way to turn off sound and light completely quickly?

Yes, use Stealth Mode. Stealth mode lets the operator continue to use the Base Unit but in a darkened, silent mode by turning off the backlighting for both the screen and keyboard as well as the audio alarm from the buzzer. Audio can still be heard through a headset if connected.

- To enter Stealth Mode, press the Back ↩ and Enter ✔ keys at the same time and hold for 3 seconds until screen backlight turns off to enter Stealth Mode.

- Repeat pressing the Back ↩ and Enter ✔ keys at the same time and hold for 3 seconds until the screen backlight turns on to exit Stealth Mode.

Menu can not be accessed during Stealth Mode, but radiation detection continues with audible alarm heard through a headset and the screen can still be seen in dark mode (depending on the environment around you), but the backlight will be completely shut off.

The Stealth Mode will be maintained until the exit key press (Back ↩ and Enter ✔ keys at the same time and hold for 3 seconds) has been completed even if the Base Unit has been turned off and back on.

d) What is "Power Save" and does it turn off radiation detection when it goes into Power Save mode?

The option to activate or deactivate the Power Save mode is located in the Settings Menu. When Power Save mode has a check mark in the box to the right of the words it is active. Power Save mode is activated/deactivated by highlighting the box and pressing the Enter key adding or removing the check mark. Power Save mode is used to lower the draw in the batteries during operation when no alerts or alarms are present.

Power Save mode will cause the screen and keypad backlighting to go to sleep after two minutes of inactivity. The Base Unit continues to monitor the radiation level during Power Save mode and will immediately turn the backlighting on if there is an alarm or alert. It can also be woken up by pressing any key. This key press will not be acted upon but will restore the Base Unit backlighting. The Base Unit will not enter Power Save mode while in an alarm or alert state. If the tick mode is on, the Base Unit will continue to tick while in Power Save mode with the backlighting off.

e) How do I set the time and date?

If you have a Defense Advanced Global Positioning System (GPS) Receiver (DAGR), issued by the United States Department of Defense (DoD), attaching the DAGR to the Base Unit will automatically synchronize the time to the current Zulu Time (Greenwich Mean Time (GMT) or Universal Coordinated Time (UTC) are the same as Zulu Time).
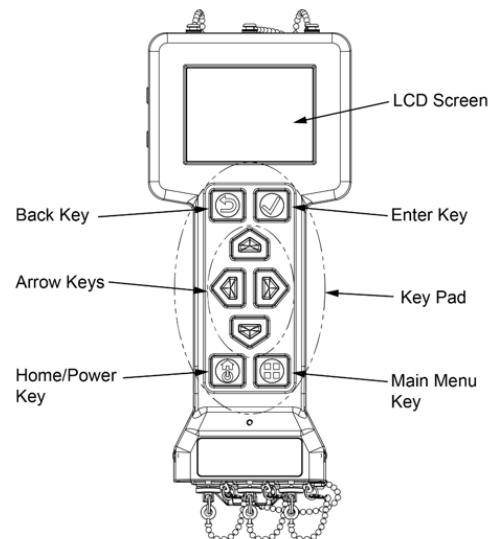
When using the Base Unit without a DAGR, the time can be set on the Advanced Settings menu.

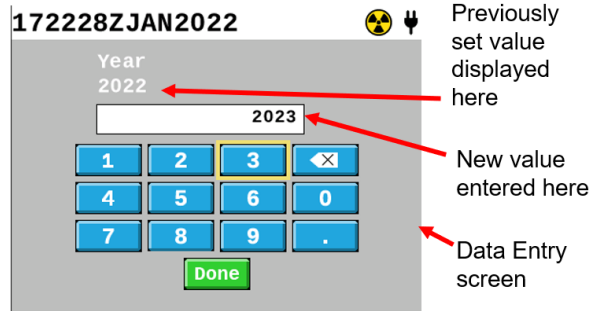Date entries are "Y" for year, "M" for month, and "D" for day.

Time entries are "H" for hour, "M" for minute, and "S" for second.

To get to this menu with the Base Unit already powered on follow the procedure:

1. Press the Menu key.
2. Use the Arrow keys to highlight "Settings" button.
3. Press Enter key to select the Settings Menu.
4. Use the Arrow keys to highlight the "Advanced" button at the bottom of the screen.
5. Press Enter key to select the Advanced Menu.
6. Use the Arrow keys to highlight the box beside the item you want to change.
7. Press Enter key to select the box to make changes.

LCD Screen
Back Key
Enter Key
Arrow Keys
Key Pad
Home/Power Key
Main Menu Key

Once you have selected the item to be updated, use the data entry screen to enter the desired number.

172228ZJAN2022

Year
2022

2023

Previously set value displayed here

New value entered here

Data Entry screen

1. Use the Arrow keys to highlight the number, space, or action to be performed.

2. Press the Enter key to activate that number, space, or action adding it to the number field.

3. Enter key must be pressed after each selection is highlighted.

4. When the entry in the box is complete, use the Arrow keys to highlight the "Done" button.

5. Press the Enter key.

6. Observe that the number desired is now in the box chosen on the Settings Advanced screen.

When the date and time has been successfully updated, pressing the Home/Power key will return you to the live reading screen to continue your mission.

f) I clicked on "Reset" next to the word "Clock" but nothing happened?

Clock "Reset" function does not update the time or date, it is used to reset the circuit in the Base Unit that allows the clock battery to keep time. This circuit will disconnect upon detection of a prompt gamma event given off by a nuclear explosion. In order to use the Base Unit with correct time and date following exposure to a nuclear detonation, the procedure to reset the clock must be conducted, resetting this circuit (see operator manual references below). Once you have completed the procedure in your manual for operation following a nuclear detonation, you will need to reset the time and date using the data entry screen. It will be important to reset the total dose as well prior to use, also found on the Settings Advanced screen.

- US TM-3-6665-383-14&P, Operation Under Unusual Conditions, Work Package 0045

- Canada CRDS Operator's Manual, Chapter 7, Section 1 (7.1.3).

g) Why is Total Dose not showing on my home screen?

The total dose function is always monitored on the Base Unit and available for all probes that measure dose (Beta Photon Probe, Sensitive Gamma Probe, and Neutron Probe). Display of the total dose on the home screen depends on the settings chosen for the display in Settings, Advanced menu and in the units of measure chosen for the Base Unit or probe being displayed.

Display of total dose can be set to on for the home screen or off. The ability to change it to display or not display when measuring dose is located on the Settings, Advanced menu.

1. With a powered on Base Unit, press the Menu key.

2. Use the Arrow keys to highlight the Settings button.

3. Press the Enter key.

4. Use the Arrow keys to highlight the Advanced button.

5. Press the Enter key.

6. Use the Arrow keys to highlight the box in front of the words "Total Dose".

7. Press the Enter key to place or remove the check mark. Placing a check mark in the box turns on the display of total dose on the home screen. Removing the check mark turns off the display of total dose on the home screen.
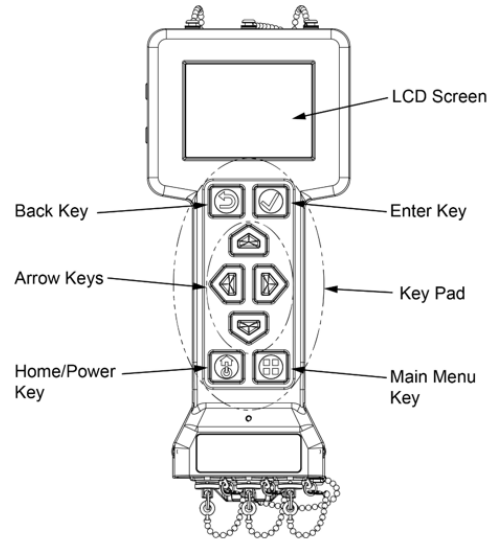
The total dose may also be reset to zero at the beginning of a mission. Using the procedure above, locate the red "Reset" button located to the right of the words "Total Dose" on the Settings, Advanced screen. When you have highlighted the "Reset" button and press the Enter key to activate the Total Dose Reset, the screen will display the message "Are you sure you want to reset the total dose?". The user can select no using the Back key or yes using the Enter key.

The Base Unit and probes with dose measurement capability have a default value in the total dose alarm that will provide an audible and visual alarm (if visual alarms are turned on) when that total dose reading has been reached, regardless of whether the total dose is set to display or not. The RDS is always monitoring total dose even if not displaying it on the home screen. This alarm is user settable so it may be adjusted as appropriate to your mission. To change the alarm, go to either the Base Unit or Probes Menu, select the probe as appropriate, select Advanced button (for the advanced menu). The total dose alarm is the bottom alarm setting. This may be changed by highlighting the box, press enter, and use the data entry screen to enter the desired alarm value. Units of measurement are set at the top of this screen and the alarm values will only display units of measurement chosen. Please note that if you choose units of measure that are not dose rate, such as cpm or cps, total dose is not longer available as it does not apply to those units of measure.

The total dose reading on the RDS may not be used as your medical dose or record. The Base Unit is not a dosimeter and should not be used for monitoring or recording medical dose of record for operators. Use only approved dosimeters for medical dose of record.

h) Can I reset the Total Dose showing on my home screen?

Total Dose may be reset to zero at the beginning of a mission.

1. With a powered on Base Unit, press the Menu key.

2. Use the Arrow keys to highlight the Settings button.

3. Press the Enter key.

4. Use the Arrow keys to highlight the Advanced button.

5. Press the Enter key.

6. Use the Arrow keys to highlight the red "Reset" buttin to the right of the words "Total Dose".

7. Press the Enter key to activate the red "Reset" button.

8. The screen will display the message "Are you sure you want to reset the total dose?". The user can select "no" using the Back key or "yes" using the Enter key.
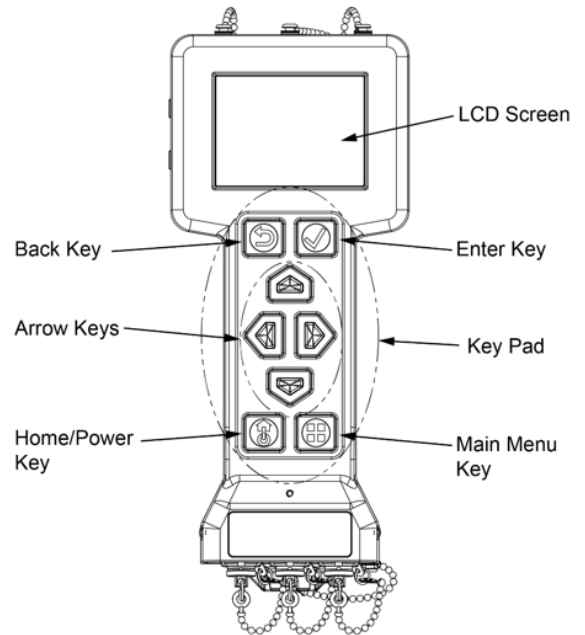
The Base Unit is not a dosimeter and should not be used for monitoring or recording medical dose of record for operators. Use only approved dosimeters for medical dose of record.

i) What does "Reset to Depot Settings" mean?

"Reset to Depot Settings" resets all operator-entered settings to the settings saved as "Depot Settings" for your user group by the maintainer. Calibration is NOT impacted by resetting to depot settings. Resetting to Depot Settings can be used as a troubleshooting step and to quickly change any operator-entered settings to the default "depot" settings (set by your maintainer). "Reset to Depot Settings" can also be used to bring all Base Units back into the same settings at the end of a mission.

Resetting the Base Unit also resets all the thresholds and units of measure for the probes, as these are stored in the Base Unit, not the probe.

From the Advanced Settings screen, use the Arrow keys to highlight the Reset box to the right of Reset to Depot Settings and press the Enter key.

Once prompted with confirmation message, confirm reset by pressing the Enter key for Yes or pressing the back key to cancel.

j) Will I lose my data if I "Reset to Depot Settings"?

Using the "Reset to Depot Settings" will not impact your data. It will reset all user settable settings back to where they were set by the maintainer for your user group, but it will not erase any data, calibration, or system stored records.

"Reset to Depot Settings" is often used at the end of the mission to return all systems back to your specified user group settings (set by a maintainer) or as a troubleshooting step.

k) Can I reset my settings to what they were when delivered/fielded?

The operator can perform a "Reset to Depot Settings" which will bring the Base Unit and Probe user settable settings to where they were when fielded to your user group.

From the Advanced Settings screen, use the Arrow keys to highlight the Reset box to the right of Reset to Depot Settings and press the Enter key.

Once prompted with confirmation message, confirm reset by pressing the Enter key for Yes or pressing the back key to cancel.

Using the "Reset to Depot Settings" will not impact your data. It will reset all user settable settings back to where they were set by the maintainer for your user group, but it will not erase any data, calibration, or system stored records.

l) What does "Health" mean in the menu?

The Health menu when chosen will provide:

- Base Unit health Details
- Attached Probe health Details
- Base Unit Temperature
- Probe Temperature
- Main Battery
- Clock Battery
- Memory Usage
- Perform Rad Test

When the details button has been selected, the user will see any current radiation alarms, systems alarms, notifications, or faults. Only current items show on this screen, once an alarm is no longer present, it will not show as historical data.

An icon in front of the details button also provides an indication as to the status of the Base Unit or Probe attached.

Icon	Meaning
☢	Radiation Alarm
🛑	System Alarm
⚠	System Warning
✅	All Okay

m) Why doesn't the "Details" screen show anything when I had an alarm during my source check?

The "Details" button on the Health Menu only provides current radiation alarms, system alarms, or warnings. These correspond to the icon in the status bar (top of screen) on the Home screen. When the alarm or warning is no longer occurring, the icon will change back to green check mark on the status bar, health screen, and the details screen will report "No health entries."

Previous radiation alarms can be viewed by downloading data for the timeframe it occurred if data logging had been initiated and recording at the time of the alarm. To see any radiation alarms, system alarms, or warnings that occurred in the past (other than data logged radiation alarms) a system log must be downloaded to a computer. In the system log you will be able to see these items with their time stamps. System logs cannot be transferred by radio but must be downloaded while connected to the computer.

n) What type of things should show on the "Details" screen for the Base Unit or attached probe?

The Details screen located on the Health menu will provide a list of current radiation alarms, systems alarms, and system warnings. It only lists the alarm or warning while it is occurring, once the alarm or warning ends the screen will no longer list the past event.

The Details screen will list Low, Medium, High, and Overload radiation alarms. It will list all System Fault Messages (correspond to System Alarms, red stop sign) and all System Notification Messages (correspond to System Warnings, yellow yield sign).

For a listing of System Fault and Notification messages please see:

- US TM-3-6665-383-14&P, Operator Troubleshooting, Error Message Faults Troubleshooting, Work Package 0052

- Canada CRDS Operator's Manual, Chapter 9, Section 9.2.1, System Fault and Notification Messages Troubleshooting.

o) What is a RAD Test?

The Rad Test evaluates the functionality of the detector(s) in the Base Unit or Probe being tested.

When no probe is attached, it tests the Base Unit, looking at functionality of both the low dose rate Geiger-Mueller (GM) tube and the high dose rate GM tube to verify their functionality in the Base Unit.

If a probe is attached, the Rad Test is used to evaluate the detector(s) in the attached probe only. Probes must be detached to test the Base Unit detectors.

The Rad Test is to run for up to one minute:

- If either detector count remains at zero for more than one minute, perform the appropriate troubleshooting located in your manual.
- If on the Base Unit or the Beta Photon Probe, the L Cnt (for the Low Dose GM Tube) is below 250 or above 5000 counts, send to maintenance for replacement of the Low Dose GM Tube.

p) Where do I go to change what my threshold values are?

To view the current thresholds for radiation alarms, while on the Home screen, press the Back key. This will display what the current settings are for 5 seconds then return to the Home screen.

To change the thresholds on the Base Unit:

1. With a powered on Base Unit, press the Menu key.
2. Use the Arrow keys to highlight Base Unit button in the main menu.
3. Press the Enter key to select.
4. Ensure the attenuation is set to 1.000, do not change this unless specifically instructed to for your mission to use inside a shelter or vehicle.
5. Use the Arrow keys to highlight the blue "Advanced" button.
6. Press Enter key to select the "Advanced" menu.

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Base Unit

Units   uGy/Hr ◁▷

Alarm Thresholds
Low   2.000
Medium   10.0
High   100.0
Total Dose   10.00 mGy
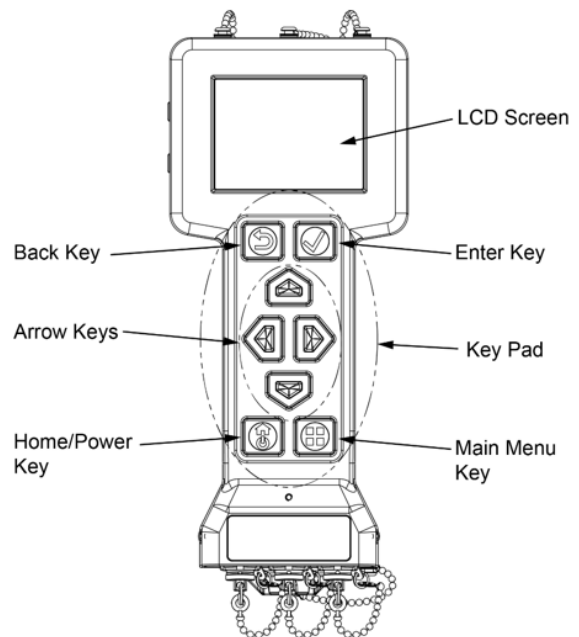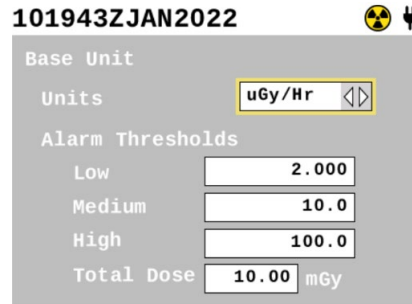
7. Change the units of measure to the desired units of measure for your mission.
8. View the Alarm Thresholds for Low, Medium, High, and if set to dose rate units of measure the Total Dose threshold.
9. Use the Arrow keys to highlight the threshold you would like to change, noting that you cannot change a lower threshold to a number above a higher threshold, you may need to change the higher thresholds first.
10. Press Enter once the box you desire to change is highlighted.
11. Use the Data Entry screen to enter the new number.
    - Use the arrow keys to highlight each desired number and press Enter key once selected.
    - Repeat until all numbers have been selected.
    - Use the Arrow keys to highlight the green "Done" key.
    - Press Enter key to complete the entry of that number.
    - Observe the entry to ensure it was completed correctly.
12. Repeat this process for all thresholds desired to be changed.
13. Press the Home/Power key to return to the Home screen.
14. Press the Back key to view the set thresholds and verify they are now set to the desired thresholds.

Thresholds for each Probe are stored in the Base Unit, not the probe. This allows any probe that is attached to your Base Unit to use the settings already in that Base Unit. It also allows you to set the units of measure and thresholds pre-mission without needing to attach a probe to the Base Unit.
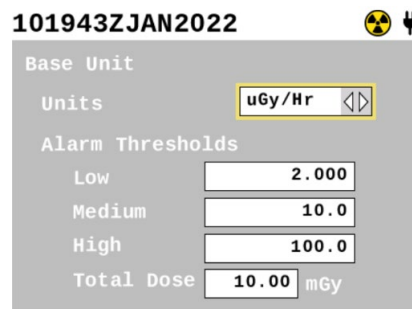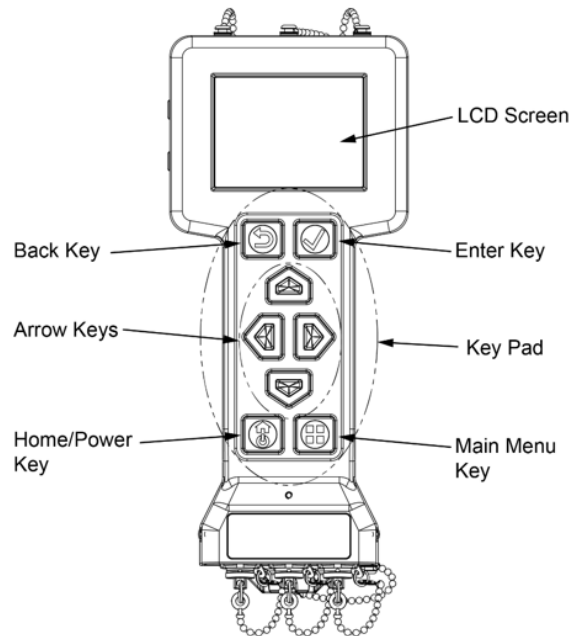
To change the thresholds for a probe follow the above instructions with the following changes:

- From the Main menu, select the Probes button, then select the probe you would like to work with.
- For multi-channel probes, ensure you have selected the channel for that probe that you want to work with on the advanced screen before proceeding to the Advanced button.

q) How do I change the units of measure on my Base Unit?

To change the thresholds on the Base Unit:

1. With a powered on Base Unit, press the Menu key.
2. Use the Arrow keys to highlight Base Unit button in the main menu.
3. Press the Enter key to select.
4. Ensure the attenuation is set to 1.000, do not change this unless specifically instructed to for your mission to use inside a shelter or vehicle.
5. Use the Arrow keys to highlight the blue "Advanced" button.
6. Press Enter key to select the "Advanced" menu.

LCD Screen

Back Key

Enter Key

Arrow Keys

Key Pad

Home/Power Key

Main Menu Key

101943ZJAN2022

Base Unit

Units   uGy/Hr ◁▷

Alarm Thresholds
   Low   2.000
   Medium   10.0
   High   100.0
   Total Dose   10.00 mGy

7. Change the units of measure to the desired units of measure for your mission.
8. Press the Home/Power key to return to the Home screen and verify the correct units of measure are now stated on the Home screen.

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Base Beta/Photon

123.4 uSv/Hr   Units of Measure

Total 1.9
   mSv

Home Screen
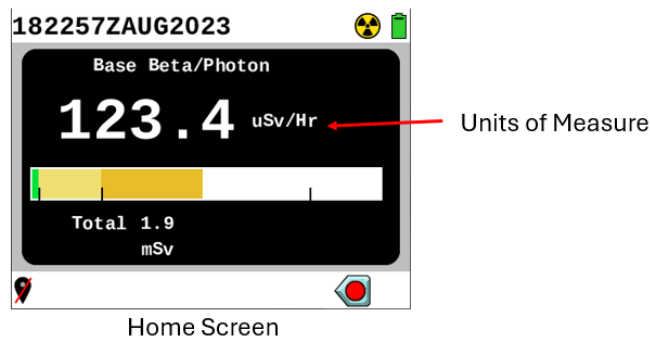
To change the units of measure for a probe follow the above instructions with the following changes:

• From the Main menu, select the Probes button, then select the probe you would like to work with.

- For multi-channel probes, ensure you have selected the channel for that probe that you want to work with on the advanced screen before proceeding to the Advanced button.

r) How do I turn off the audio on my Base Unit?

Audible sound can be heard from the speaker and through the audio connection for the headset.

The Settings menu allows you to adjust the volume up or down using the Arrow keys. This applies to both the speaker and headset when attached. Turning volume all the way to the left will not fully turn off the audible sound though.

To turn off the audible sound completely, place a check mark in the box to the right of the word "Mute". You can accomplish this by using the Arrow keys to highlight the box to the right of the word "Mute" on the Settings menu, then press Enter to toggle the check mark to appear or remove it. A check mark in this box indicates the system has been muted for both the speaker and the headset. Toggling again to remove the checkmark will turn audio back on and then can be adjusted by the sliding bar above on this same menu.

Stealth mode will also turn off all external audible sounds quickly but will allow the audible sounds to be heard through the headset attached to the Base Unit. This also turns off backlighting to the keypad and screen.
- To enter Stealth Mode, press the Back and Enter keys at the same time and hold for 3 seconds until screen backlight turns off to enter Stealth Mode.

- Repeat pressing the Back and Enter keys at the same time and hold for 3 seconds until the screen backlight turns on to exit Stealth Mode.

s) How much memory is available?

Memory percentage can be found on the Health menu. The percentage represents how much memory is left available. With a powered on Base Unit, press the Menu key, highlight the Health button using the Arrow keys, then press Enter key to display the Health menu. The Memory Usage percentage is found near the bottom of this screen, above the "Rad Test" button.

The memory will only hold 100 logged surveys or two 72-hour long data logs. Surveys can range from several minutes to many hours of data in each depending on the mission and the chosen logging settings. The percentage that will display represents the Memory Left available for use. The percentage is a balance of the two metrics 1)number of logs, and 2) hours of data recorded. The percentage of memory left will represent the lower of the two metrics based on the recorded data logs present.

The operator will receive a notification "Low memory" as the number of surveys approach 100 individual surveys, or the length of the data logs cause it to reach capacity sooner. Once the memory reaches 0 percent left, the operator will receive a notification of "No memory, deleting old logs". The Base Unit will delete the oldest data log to save the current one each time. Best practice is for the operator to delete logs once they have been successfully documented, by download or hand copied from the Base Unit following the end of the mission.

t) What does the percentage by the memory mean?

Memory percentage can be found on the Health menu. The percentage represents how much memory is left available. With a powered on Base Unit, press the Menu key, highlight the Health button using the Arrow keys, then press Enter key to display the Health menu. The Memory Usage percentage is found near the bottom of this screen, above the "Rad Test" button.

The memory will only hold 100 logged surveys or two 72-hour long data logs. Surveys can range from several minutes to many hours of data in each depending on the mission and the chosen logging settings. The percentage that will display represents the Memory Left available for use. The percentage is a balance of the two metrics 1)number of logs, and 2) hours of data recorded. The percentage of memory left will represent the lower of the two metrics based on the recorded data logs present.

The operator will receive a notification "Low memory" as the number of surveys approach 100 individual surveys, or the length of the data logs cause it to reach capacity sooner. Once the memory reaches 0 percent left, the operator will receive a notification of "No memory, deleting old logs". The Base Unit will delete the oldest data log to save the current one each time. Best practice is for the operator to delete logs once they have been successfully documented, by download or hand copied from the Base Unit following the end of the mission.

u) Why does the clock battery not show a percentage?

The clock battery maintains the date and time when the Base Unit is powered off. It will typically last for 3 to 10 years before needing to be replaced although when operated often in cold temperatures the life can be less than 3 years.

It will display 2 statuses, Good and Low. The clock battery is a lithium button battery, BR2032. Due to the lithium chemistry, the battery does not display a gradual change in voltage as it is discharged. To measure for a percentage, it would need to see the gradual change in voltage that is not present in this type of battery. Lithium battery voltage remains relatively constant for most of their capacity then drops at the end, in this case the user will see the "Low" status when it drops off and know that it is ready to be changed.

It is suggested that the internal clock battery be changed either before each calibration or at other decided regular intervals.

Should the clock battery fail, it will not affect radiation detection of the system or the storage of data, but will require the user to set the time and date each time they turn on the base unit for operation in order to have accurate time and date stamps on the data logs

v) Why is the temperature displayed on the Health menu?

The Base Unit and probes have temperature operating ranges and storage ranges. When operated outside of the range, the system can no longer provide accurate readings and will display a warning instead telling you if it is too hot or cold based on the temperature reading from inside the system. The temperature is displayed on the Health

menu. Storing them in temperatures outside of the storage temperature range may cause damage to the system.

The Operating Temperature Range for the Base Unit and all probes is -30° to 50°C (-22° to 122.7°F). The Storage Temperature Range for the Base Unit and all probes is -50° to 60°C (-58° to 140°F).

In cold environments {-30°C (-22°F) to 0°C (32°F)}, operate the Base Unit with Nickel Metal Hydride (NiMH) AA rechargeable batteries for the best battery life. The Base Unit will operate in cold environments using standard alkaline AA batteries, but battery life will be reduced to 2 hours or less.

The Base Unit is not designed to be operated in temperatures above 50°C (122.7°F); when the Base Unit detects a temperature above 50°C, a system notification will display If notification is displayed, move Base Unit to a cooler location.

The temperature in which the Base Unit is operated affects the battery life indicator. For example, the battery life indicator might read 10% in freezing temperatures, but then jump to 90% if the Base Unit is moved to a warmer area. Options for continuation of operation in cold temperatures would include:

- Operate the Base Unit using NiMH AA rechargeable batteries to remain operational in temperatures from 0°C (32°F) to -30°C (-22°F).
- Operate the Base Unit using standard alkaline AA batteries for only 2 hours or less in temperatures of 0°C (32°F) to -30°C (-22°F).

Information on Operation Under Unusual Conditions can be found in your manual as follows:

- US TM-3-6665-383-14&P, Operator Troubleshooting, Operation Under Unusual Conditions, Work Package 0048
- Canada CRDS Operator's Manual, Chapter 7, Section 7.1.1, Extreme Temperatures.

w) How do I find out what version of firmware is currently on my Base Unit or Probe?

To view the current Base Unit Firmware version:

1. With a powered on Base Unit, press the Main Menu key.
2. Use the Arrow keys to highlight Info Menu icon in the main menu.
3. Press the Enter key to select.
4. Use the Arrow keys to highlight the Base Unit icon.
5. Press the Enter key to select.
6. The Firmware version will be listed to the right of the word "Firmware" on the Info screen.
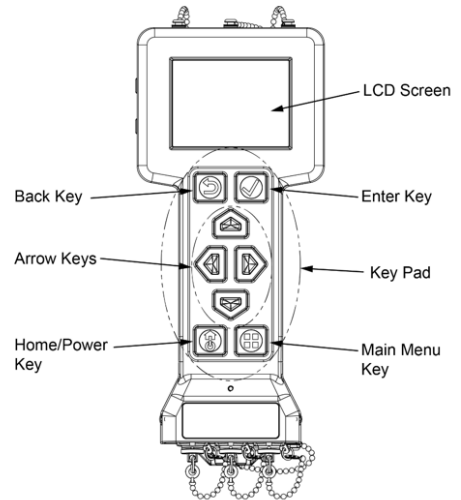
To view the current Firmware version for a connected probe, use the same steps, except highlight and select the probe icon instead of the Base Unit icon. This icon will only appear under the Info menu if the probe is attached to the Base Unit
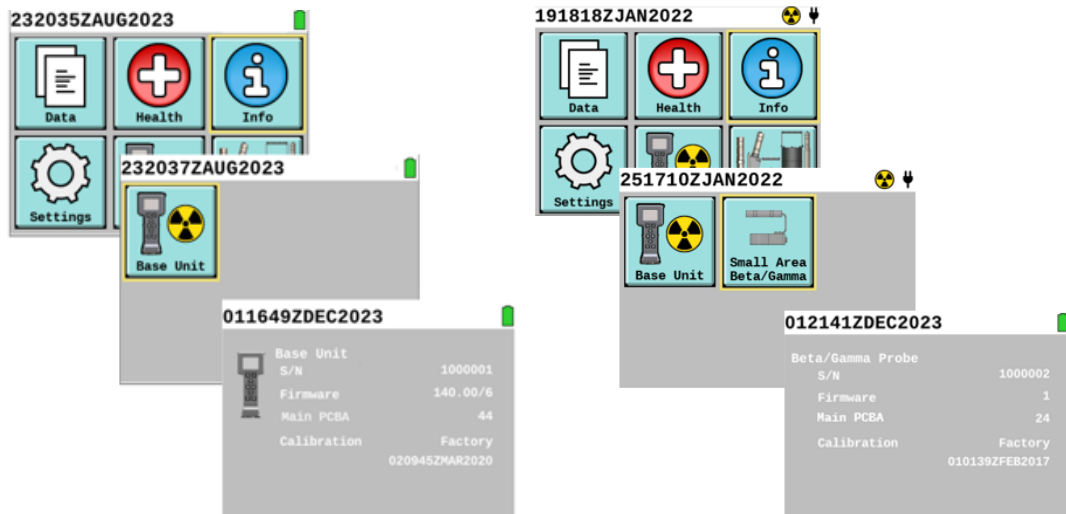
- Data

a) What does transfer mean?

Transfer of data is when data radios are used to move the data from the Base Unit to a computer for analysis and reporting. Transfer requires that the receiving computer has the approved software to receive the data. At this time transfer has been successfully demonstrated using Mobile Field Kit – Chemical, Biological, Radiological, and Nuclear (MFK-CBRN). To request information in future interfaces contact the support desk, https://www.dtectsystems.com/support-rds.

Compatible radios include:

- Trellisware, TW-950 Data Radio
- MPU-5 Dat Radio
- Radio Set AN/PRC 152A
- Radio Set AN/PRC 154A
- Radio Set AN/PRC 154C
- Additional radios are added as determined appropriate by the US RDS Program Office.

A transfer via an ethernet connection is also possible on specific platforms. This requires specialized installation to be done as well as requiring the software for receiving the data. To inquire about the use of ethernet transfer on a platform contact the support desk https://www.dtectsystems.com/support-rds.

b) Is there a difference between "transfer" and "download"?

Yes.

Transfer of data requires compatible radios or an installed Ethernet connection and appropriate receiving software on the computer it is sent to. When established, the transfer option can provide near real-time data transfer during a mission.

Download occurs following a mission when the Base Unit is directly connected to a computer. When using download, the data is transferred into a comma separated value spreadsheet format and can be viewed by any spreadsheet software such as Microsoft Excel or in Notepad. Download of data logs provides the ability to analyze and form reports after the mission without any specialized software in the computer.

c) Is all data recorded in the system?

Radiation readings are not automatically recorded. Data is only recorded when data logging has been established and records the data based on the settings that have been chosen. See your manual for setting up data logging on your system, there are many options allowing you to customize it to your mission or survey.

- US TM-3-6665-383-14&P, Base Unit Operation Under Usual Conditions and Settings, Work Package 0034, starting with task "Perform Data Logging".

- Canada CRDS Operator's Manual, Chapter 3, Section 18, Data Logging.

d) Where can I see the data logs?

To view data logs, use the "View Data" icon from the Main Menu.

1. With a powered on Base Unit, press the Main Menu key.
2. Use the Arrow keys to highlight Data Menu icon in the main menu.

3. Press the Enter key to select.
4. Use the Arrow keys to highlight the View Data icon.
5. Press the Enter key to select.
6. Use the Arrow keys to select the data log you would like to view, press Enter key to select.
7. View the information about the data log in this screen.
8. Select Statistics to see the Initial Reading, Average, Peak, and Total accumulated radiation readings recorded in the log file.
9. Select Details to see each reading recorded as a part of this data log.

See your Operators Manual for more details:

- US TM-3-6665-383-14&P, Base Unit Operation Under Usual Conditions and Settings, Work Package 0034, starting with task "Perform Data Logging".

- Canada CRDS Operator's Manual, Chapter 3, Section 18, Data Logging.
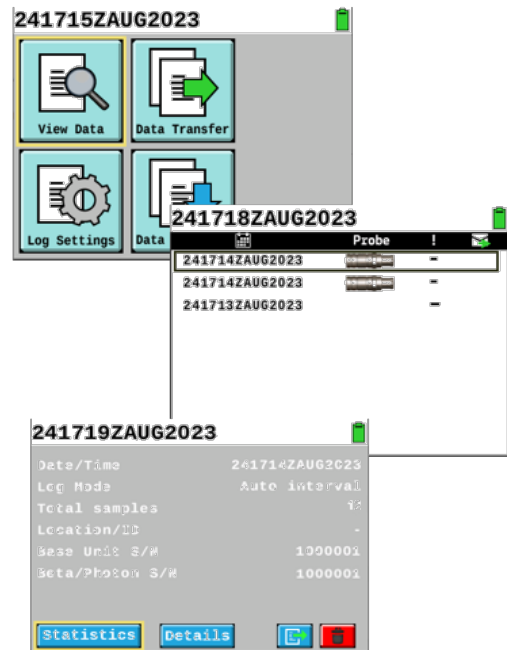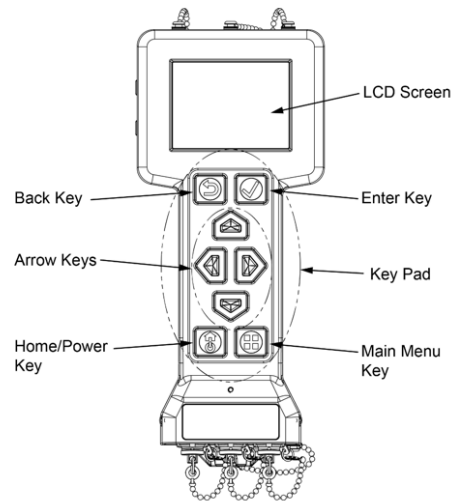
e) How do I get the data logs off my Base Unit onto my computer?

Transfer – via Radios or Ethernet

191820ZFEB2022
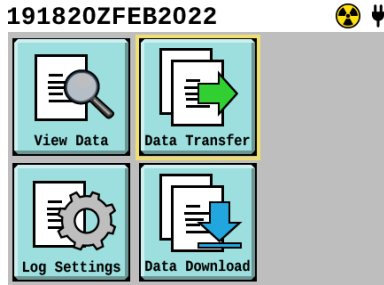
The transfer of data can be done through data radios or with an installed Ethernet capability on a platform. Data transfer allows the data to be sent to a computer for analysis and reporting in near real-time. Both require the use of the Sensor Network Adapter (SNAP) cable with the appropriate connections and receiving software that is compatible to receive RDS data and display it on the dashboard. Current software that is compatible is the Mobile Field Kit – Chemical, Biological, Radiological, and Nuclear (MFK-CBRN).

Compatible radios include:

- Trellisware, TW-950 Data Radio
- MPU-5 Dat Radio
- Radio Set AN/PRC 152A
- Radio Set AN/PRC 154A
- Radio Set AN/PRC 154C
- Additional radios are added as determined appropriate by the US RDS Program Office.

Download – Direct Connection to a Computer
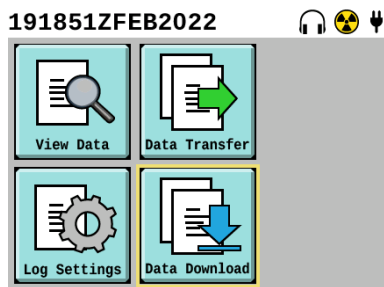
191851ZFEB2022

Download occurs following a mission when the Base Unit is directly connected to a computer. Download requires the SNAP Cable (or Rad Extender) to connect from the Base Unit to the receiving computer. When using download, the data is transferred into a comma separated value spreadsheet format and can be viewed by any spreadsheet software such as Microsoft Excel or in Notepad. Download of data logs provides the ability to analyze and form reports after the mission without any specialized software in the computer.

f) What radios can I use to transfer data to a computer during a mission?

Compatible radios include:

- Trellisware, TW-950 Data Radio
- MPU-5 Dat Radio
- Radio Set AN/PRC 152A
- Radio Set AN/PRC 154A
- Radio Set AN/PRC 154C
- Additional radios are added as determined appropriate by the US RDS Program Office.

To request information in future interfaces contact the support desk, https://www.dtectsystems.com/support-rds.

g) Can I retrieve data logs that I accidentally deleted?

No, once data is deleted, it can not be retrieved. When you initially press Enter on a Delete or "Trash Can" icon, the system will ask you if you are sure that you want to delete it. If you do not want to delete it, use the back button to return to the previous screen.

h) How do you log your data for later retrieval?

Radiation readings are not automatically recorded. Data is only recorded when data logging has been established and records the data based on the settings that have been chosen.

The following symbols will appear in the Home screen footer bar when they are applicable to the data logging mode that has been set. The controls will indicate the Arrow key to use for activating that icon/setting. Start, pause, resume, and stop data using the indicated Arrow key.

Symbol	Description	Function
🔴	Data Logging Controls Start Data Logging	Indicates that pressing the Left Arrow key on the keypad starts data logging (or recording of data logs).
⏸	Data Logging Controls Pause Data Logging	Indicates that pressing the Left Arrow key on the keypad will pause data logging.
▶	Data Logging Controls Resume Data Logging	Indicates that pressing the Left Arrow key on the keypad will resume data logging after it has been paused.
⊕	Data Logging Controls Take Data Log Snapshot	Indicates that pressing the Left Arrow key on the keypad will take a data log snapshot. A new entry in the data log file will be recorded each time this key is pressed.
◼	Data Logging Controls Stop Data Logging	Indicates that pressing the Right Arrow key on the keypad will stop data logging. No icon is displayed if the Base Unit is not logging data.
✍	Pen and Paper Logging Icon	Indicates that the Base Unit is logging data.

When the start data logging is used, a data log will begin, this data log will not end when paused but it will close out as an individual data log when the stop data logging is used. Each time you start and stop creates a separate data log in the memory.

To set up data logging, go to the Log Settings, in the Data menu.
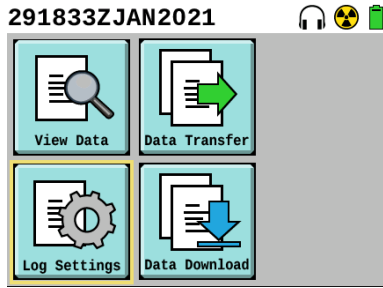
291833ZJAN2021

View Data Data Transfer

Log Settings Data Download

See your manual for additional information on data log settings, there are many options allowing you to customize it to your mission or survey.

- US TM-3-6665-383-14&P, Base Unit Operation Under Usual Conditions and Settings, Work Package 0034, starting with task "Perform Data Logging".

- Canada CRDS Operator's Manual, Chapter 3, Section 18, Data Logging.

i) Will I lose my data when the Base Unit is turned off?

No, data is stored in non-volatile memory. The data will be maintained regardless of battery or power source.

j) Will I lose my data if the clock battery dies?

No, data is stored in non-volatile memory. The data will be maintained regardless of battery or power source.
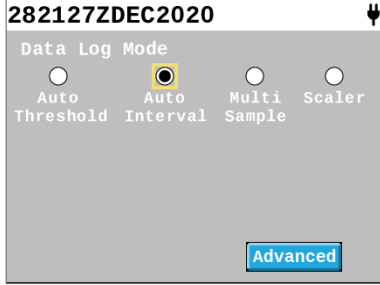
k) Why are there so many data logging modes and what are the differences between them?

The RDS is used by many different user communities, therefore the many options for Data logging modes allow you to optimize the data recorded specifically to your mission.

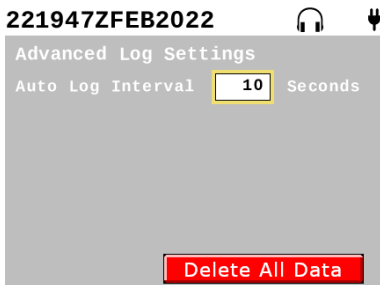To set up data logging, go to the Log Settings, in the Data menu.

291833ZJAN2021

View Data Data Transfer

Log Settings Data Download
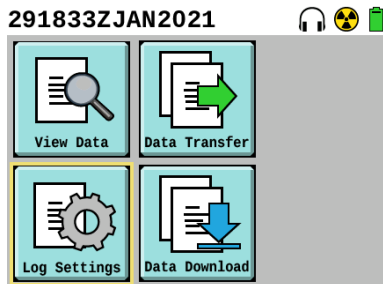
The first item is to pick the data logging mode that is to be used:

```
282127ZDEC2020                    ⚡
Data Log Mode
   ○           ◉        ○        ○
  Auto        Auto     Multi   Scaler
Threshold   Interval   Sample


                          [Advanced]
```

Data Log Mode	Function	Purpose
Auto Threshold	Automatically logs data whenever the alarm threshold is exceeded.	Used when moving through an area to automatically identify radiation levels that are above a pre-determined threshold.
Auto Interval	Automatically logs data once at each interval based on the operator set time for the interval.	Used when moving through an area to regularly record data on a fixed time interval.
Multi Sample	Records data selected by the operator. One data set will be recorded each time the operator presses the Left Arrow key.	Used when identifying specific levels of radiation in an area or on a piece of equipment.
Scaler	Records total counts received by the Base Unit over a duration of an operator-set period of time.	Used when quantifying contamination levels. Statistically useful set of counts. Used for finding very low levels of radiation.

Once you have chosen the appropriate mode, if you are using Auto Threshold, Auto Interval, or Scaler you will need to go to the Advanced screen, by using the Arrow keys to highlight "Advanced" button and pressing the Enter key to select it. Here you will set the time interval. You can set the time interval from one second to 3600 seconds (1 hour).

```
221947ZFEB2022          🎧    ⚡
Advanced Log Settings

Auto Log Interval    [  10 ]  Seconds




             [ Delete All Data ]
```
(Example)

- Auto Threshold: The time set will be the time between recording of readings only when the system is in a Radiation Alarm with values above the lowest threshold set. For example, once a radiation alarm occurs, if the time is set to 5 seconds, the Base Unit will record a reading every 5 seconds until the radiation reading levels are below the lowest threshold. It will record one final reading below threshold. Even when the data log has been started, the Base Unit will not record anything unless the radiation readings go above the lowest alarm threshold set.
- Auto Interval: The time set will be the number of seconds between each reading recorded. If using the Base Unit and set the time for 5 seconds, the data log will show a reading recorded at each 5 seconds after the data log has been started on the Home screen. When using the Base Unit and a

probe, at each 5 second mark there will be a reading for the Base Unit and the probe recorded. If the probe has multiple channels (Alpha-Beta Probe and FIDLER Probe) each five second interval will have a set of readings for the Base Unit and each channel for that probe. For example when the FIDLER is connected the set will include 5 readings at each interval, one for the Base Unit and one for each of the FIDLER channels.

- Scaler: Scaler mode is used for capturing counts to interrogate a sample or low level reading at a particular indicated spot. The interval set will be for how long you want the count to be for that interrogation. For example when performing source checks on contamination probes (Alpha-Beta Probe and Small Area Beta Gamma Probe) you will set the scaler mode to 30 seconds. Be sure when done with the Scaler mode that you change the data logging mode back to Auto Interval or Auto Threshold in order to view live readings in the Home screen.

Multi-Sample mode does not have a time interval to set. When using Multi-Sample mode, once you press the left Arrow key to start the data log, it will only record a set of readings (Base Unit or Base Unit and Probe (channels)) each time you press the right Arrow key again, until you stop the data log and close it by pressing the right Arrow key. The timing is completely based on the user pressing the Arrow key to collect the reading at that location.

See your manual for additional information on data log settings, there are many options allowing you to customize it to your mission or survey.

- US TM-3-6665-383-14&P, Base Unit Operation Under Usual Conditions and Settings, Work Package 0034, starting with task "Perform Data Logging".

- Canada CRDS Operator's Manual, Chapter 3, Section 18, Data Logging.

l) Can I use WiFi, Bluetooth, or near field RFID to transfer the data?

Not currently, but it is a capability that Ludlum d.b.a. VPI is looking into for the future and commercial markets. Use of it for military Services will depend on approval for this type of transfer based in your government cybersecurity regulations and processes.

m) Do I need software on my computer to see the data after I download or transfer it to a computer?

For download of data, no. When directly connected to a computer via Sensor Network Adapter (SNAP) cable (or Rad Extender), data will download to a common separated value (csv) format that is compatible with any spreadsheet software, usually viewed in Microsoft Excel. It can also be viewed in Notepad.

For transfer via data radio or Ethernet, the data needs to be received by compatible software in order to be viewed. Current software that is compatible is the Mobile Field Kit – Chemical, Biological, Radiological, and Nuclear (MFK-CBRN).

n) Does the RDS have a record log of alarms, faults, and notifications?

While a radiation alarm (radiation symbol icon), system alarm (faults – red stop sign icon), or system warning (notifications – yellow yield sign icon) is occurring, it will be listed on the Details screen of the Health menu. See example below:
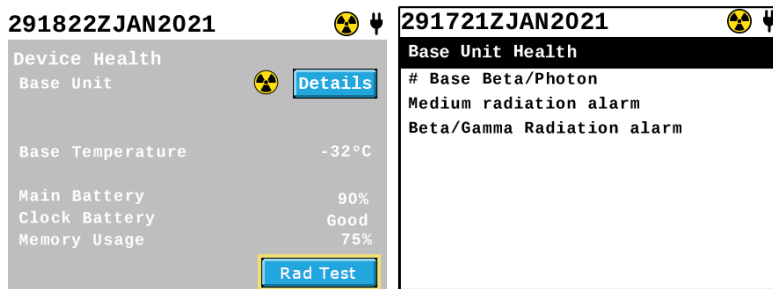
Once the alarm or warning is no longer occuring, it no longer is displayed.

Radiation alarms that were recorded as part of a Data Log can be viewed in the Data Menu, View Data, by selecting the data log and viewing its statistics or details.
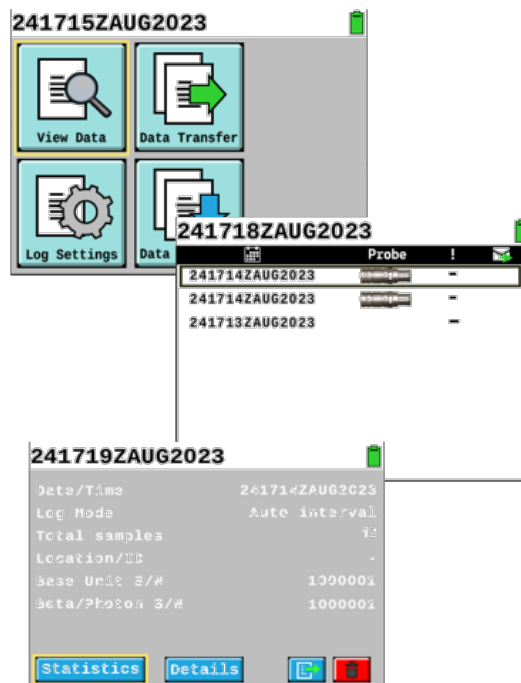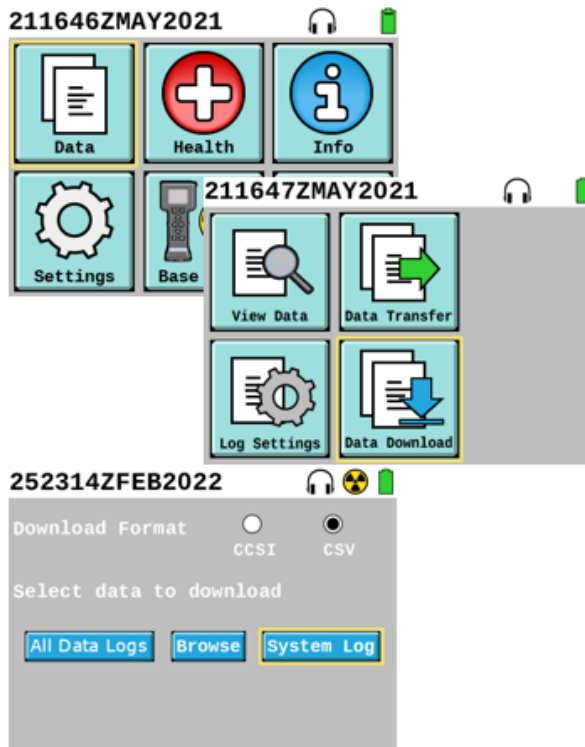
Radiation alarms, system alarms (faults), and system warnings (notifications) can be seen by downloading a System File. This file will be a listing in text (txt) format of everything that has occurred on that Base Unit since it was last reset to Factory Settings. This can be done from the Data menu, Data Download menu, choose format as "CSV" and "System Log". Below is a sample of what a system log will look like.

Example of a system log.

- Environment

a) At what temperatures will the RDS operate?

The Base Unit and probes have temperature operating ranges and storage ranges. When operated outside of the range, the system can no longer provide accurate readings and will display a warning instead telling you if it is too hot or cold based on the temperature reading from inside the system. The temperature is displayed on the Health menu. Storing them in temperatures outside of the storage temperature range may cause damage to the system.

The Operating Temperature Range for the Base Unit and all probes is -30° to 50°C (-22° to 122.7°F). The Storage Temperature Range for the Base Unit and all probes is -50° to 60°C (-58° to 140°F).

In cold environments {-30°C (-22°F) to 0°C (32°F)}, operate the Base Unit with Nickel Metal Hydride (NiMH) AA rechargeable batteries for the best battery life. The Base Unit will operate in cold environments using standard alkaline AA batteries, but battery life will be reduced to 2 hours or less.

The Base Unit is not designed to be operated in temperatures above 50°C (122.7°F); when the Base Unit detects a temperature above 50°C, a system notification will display If notification is displayed, move Base Unit to a cooler location.

The temperature in which the Base Unit is operated affects the battery life indicator. For example, the battery life indicator might read 10% in freezing temperatures, but then jump to 90% if the Base Unit is moved to a warmer area. Options for continuation of operation in cold temperatures would include:

- Operate the Base Unit using NiMH AA rechargeable batteries to remain operational in temperatures from 0°C (32°F) to -30°C (-22°F).
- Operate the Base Unit using standard alkaline AA batteries for only 2 hours or less in temperatures of 0°C (32°F) to -30°C (-22°F).

Information on Operation Under Unusual Conditions can be found in your manual as follows:

- US TM-3-6665-383-14&P, Operator Troubleshooting, Operation Under Unusual Conditions, Work Package 0048

- Canada CRDS Operator's Manual, Chapter 7, Section 7.1.1, Extreme Temperatures.

b) Can I operate the RDS in cold temperatures?

The Base Unit and probes have temperature operating ranges and storage ranges. When operated outside of the range, the system can no longer provide accurate readings and will display a warning instead telling you if it is too hot or cold based on the

temperature reading from inside the system. The temperature is displayed on the Health menu. Storing them in temperatures outside of the storage temperature range may cause damage to the system.

The Operating Temperature Range for the Base Unit and all probes is -30° to 50°C (-22° to 122.7°F). The Storage Temperature Range for the Base Unit and all probes is -50° to 60°C (-58° to 140°F).

In cold environments {-30°C (-22°F) to 0°C (32°F)}, operate the Base Unit with Nickel Metal Hydride (NiMH) AA rechargeable batteries for the best battery life. The Base Unit will operate in cold environments using standard alkaline AA batteries, but battery life will be reduced to 2 hours or less.

The Base Unit is not designed to be operated in temperatures above 50°C (122.7°F); when the Base Unit detects a temperature above 50°C, a system notification will display If notification is displayed, move Base Unit to a cooler location.

The temperature in which the Base Unit is operated affects the battery life indicator. For example, the battery life indicator might read 10% in freezing temperatures, but then jump to 90% if the Base Unit is moved to a warmer area. Options for continuation of operation in cold temperatures would include:

- Operate the Base Unit using NiMH AA rechargeable batteries to remain operational in temperatures from 0°C (32°F) to -30°C (-22°F).
- Operate the Base Unit using standard alkaline AA batteries for only 2 hours or less in temperatures of 0°C (32°F) to -30°C (-22°F).

Information on Operation Under Unusual Conditions can be found in your manual as follows:

- US TM-3-6665-383-14&P, Operator Troubleshooting, Operation Under Unusual Conditions, Work Package 0048

- Canada CRDS Operator's Manual, Chapter 7, Section 7.1.1, Extreme Temperatures.

c) Can I operate the RDS in hot and/or humid temperatures?

The Base Unit and probes have temperature operating ranges and storage ranges. When operated outside of the range, the system can no longer provide accurate readings and will display a warning instead telling you if it is too hot or cold based on the temperature reading from inside the system. The temperature is displayed on the Health menu. Storing them in temperatures outside of the storage temperature range may cause damage to the system.

The Operating Temperature Range for the Base Unit and all probes is -30° to 50°C (-22° to 122.7°F). The Storage Temperature Range for the Base Unit and all probes is -50° to 60°C (-58° to 140°F).

The Base Unit and Probes will operate in humidity from 3-100% as well as in rain. The Base Unit is capable of immersion in water and saltwater to a depth of one (1) meter for

a period of 30 minutes and still operates correctly afterward. Therefore if dropped accidentally in a puddle, dry off as much as possible and continue the mission.

The RDS Probes are sealed except for the Alpha-Beta Probe but should not be immersed. If accidentally immersed in water, allow it to dry completely and ensure you complete a full before PMCS (include source check and Rad Test) on the item before operational use. For the Alpha-Beta Probe you will need to change the mylar once dry, let the scintillator settle for 2 hours then perform PMCS (include source check and Rad Test). If after PMCS (include source check and Rad Test), the probe is non-functional perform Operator Troubleshooting, if still non-functional, turn in to your next authorized level of maintenance.

In cold environments {-30°C (-22°F) to 0°C (32°F)}, operate the Base Unit with Nickel Metal Hydride (NiMH) AA rechargeable batteries for the best battery life. The Base Unit will operate in cold environments using standard alkaline AA batteries, but battery life will be reduced to 2 hours or less.

The Base Unit is not designed to be operated in temperatures above 50°C (122.7°F); when the Base Unit detects a temperature above 50°C, a system notification will display If notification is displayed, move Base Unit to a cooler location.

The temperature in which the Base Unit is operated affects the battery life indicator. For example, the battery life indicator might read 10% in freezing temperatures, but then jump to 90% if the Base Unit is moved to a warmer area. Options for continuation of operation in cold temperatures would include:

- Operate the Base Unit using NiMH AA rechargeable batteries to remain operational in temperatures from 0°C (32°F) to -30°C (-22°F).
- Operate the Base Unit using standard alkaline AA batteries for only 2 hours or less in temperatures of 0°C (32°F) to -30°C (-22°F).

Information on Operation Under Unusual Conditions can be found in your manual as follows:

- US TM-3-6665-383-14&P, Operator Troubleshooting, Operation Under Unusual Conditions, Work Package 0048
- Canada CRDS Operator's Manual, Chapter 7, Section 7.1.1, Extreme Temperatures.

d) Is the RDS waterproof?

The Base Unit and Probes will operate in humidity from 3-100% as well as in rain.

The Base Unit is capable of immersion in water and saltwater to a depth of one (1) meter for a period of 30 minutes and still operates correctly afterward. Therefore if dropped accidentally in a puddle, dry off as much as possible and continue the mission.

The RDS Probes are sealed except for the Alpha-Beta Probe but should not be immersed. If accidentally immersed in water, allow it to dry completely and ensure you complete a full before PMCS (include source check and Rad Test) on the item before operational use. For the Alpha-Beta Probe you will need to change the mylar once dry,

let the scintillator settle for 2 hours then perform PMCS (include source check and Rad Test). If after PMCS (include source check and Rad Test), the probe is non-functional perform Operator Troubleshooting, if still non-functional, turn in to your next authorized level of maintenance.

e) How do I decontaminate the RDS system?

The RDS system can be decontaminated using standard non-corrosive decontaminants such as hot soapy water and M295. Units should follow the same decontamination procedures for the RDS as used with other sensitive electronic equipment.

The Base Unit is capable of immersion in water and saltwater to a depth of one (1) meter for a period of 30 minutes and still operates correctly afterward.   Therefore, if in an environment where liquid chemical or biological contamination is present in more than discreet amounts it could be immersed in hot soapy water, rinsed and dried as needed.

The RDS Probes are sealed except for the Alpha-Beta Probe but should not be immersed. Clean with a damp cloth and hot soapy water, rinse with clean damp cloth, wipe with a clean cloth to remove soap and allow the item to thoroughly dry. Do not use corrosive chemicals or decontaminants on the RDS system. Decontaminant wipes meant for electronic equipment may be used to absorb and remove contamination.

Treat a contaminated mylar window from the Alpha-Beta Probe as contaminated waste that cannot be decontaminated. Remove and dispose of in accordance with your units SOP. Once the Alpha-Beta Probe has been decontaminated, place a new mylar window on the Alpha-Beta Probe.

- Troubleshooting

a) Why does the Base Unit tick when I turn it on?

Tick Mode is a setting that can be turned on or off. The default is off. If a previous user set the Tick Mode to on, when the Base Unit is powered on next it will automatically have Tick Mode still turned on. All settings will be maintained in the Base Unit when powered down and powered back on. Tick Mode will even persist when the Base Unit is set to allow power save, continuing to tick even when the backlighting on the screen and keypad are turned off.

Tick Mode provides a ticking sound that will occur faster and faster as detected dose rate or counts increase. It can be used with the Base Unit or any probe. If both Mute and Tick Mode settings are selected, Mute will cancel out Tick Mode and no sound will be heard. Mute will cancel all audio to both the speaker and the headset.

To turn Tick Mode on or off:

1. With a powered on Base Unit, press the Main Menu key.
2. Use the Arrow keys to highlight Settings Menu icon in the main menu.
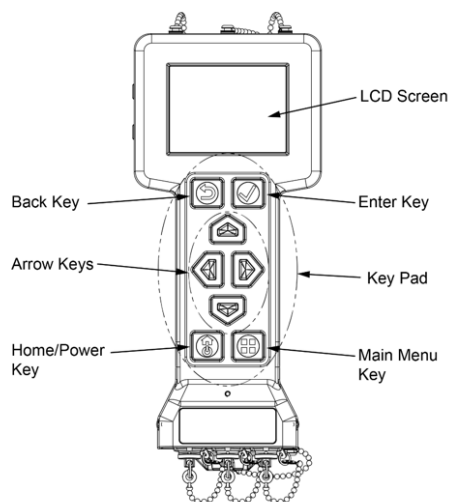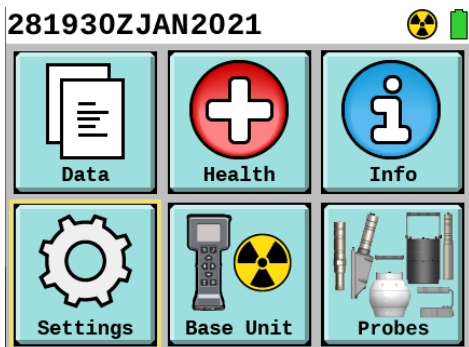
3. Press the Enter key to select.
4. Use the Down Arrow key to highlight the box to the right of "Tick Mode".
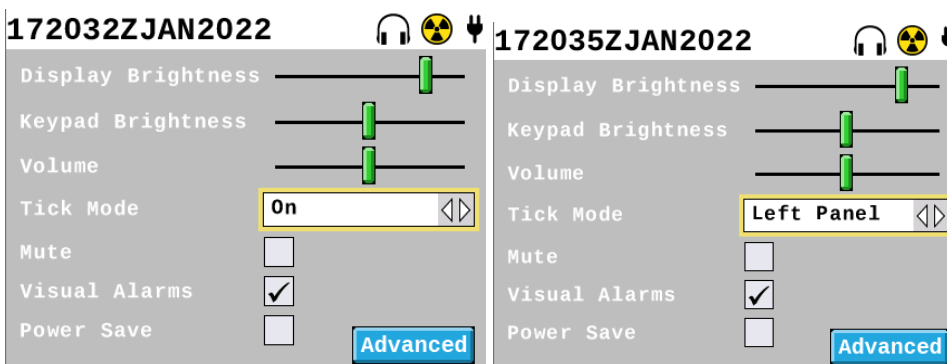

5. Use the Left and Right Arrow keys to turn the Tick Mode on or off if only the Base Unit is being used by itself. If a probe is attached, use the Left and Right Arrow keys to turn the Tick Mode Off, Right Panel, or Left Panel. The panel will correspond to the item you have set to view in that panel on the Home Screen, which is user settable on the Settings, Advanced screen.
6. Return to the Home Screen by pressing the Home/Power Key.

See your Operators Manual for more details:

- US TM-3-6665-383-14&P, Base Unit Operation Under Usual Conditions and Settings, Work Package 0034, starting with task "Settings Menu".

- Canada CRDS Operator's Manual, Chapter 3, Section 17, Settings Screen.

b) Why is there no audible sound coming from my Base Unit?

There can be several settings that may lower or eliminate sound from the speaker, headphones, or both such as the volume being turned low or the Mute button being

activated. There will also be no audible sound from the speakers if the system is in Stealth Mode, all audio is routed to the headset. When the headset is attached you will not hear any audio from the speaker, it is routed only to the headset at the current volume setting.

For Operator Troubleshooting there are two separate troubleshooting procedures in your manual, one if there is no audio from the speaker (referred to as "buzzer") and a different procedure focused on whether there is audio from the headset.

Here are a few initial steps you can take, please refer to the manual references below for the full procedure of each and follow the manuals guidance if you are unable to solve the issue.

- The Base Unit holds all settings unless a "Depot Reset" has been performed. Someone else may have changed a setting prior to your use. Settings do not revert to default when the Base Unit is powered on, they continue in the last settings that were used before it was powered off.
- Ensure you are not in Stealth Mode – the screen and keys have backlighting, and the Main Menu Key is active when pushed. If you are in Stealth Mode, press the Enter and Back keys together at the same time and hold for approximately 3 seconds. The same procedure will enter Stealth Mode and exit Stealth Mode.
- Remember there is only audible sound when an alarm (radiation or system) is activated or if Tick Mode is turned on. While determining what the issue is, either lower the low threshold to be able to cause a continuous low alarm, keep the check source with the Base Unit to set off the low alarm (you still may have to adjust the low alarm threshold if it has been changed to higher then the check source you are using), or turn on the Tick Mode on the Settings Screen to cause audible sounds.
- Determine if audio is available by speaker or headset to decide which path in the manual to follow. If audio is not heard in either the speaker or headset, start with the speaker (buzzer) troubleshooting procedure and ensure that you have disconnected the headset and replaced the audio protective cap.

1. With a powered on Base Unit, press the Main Menu key.
2. Use the Arrow keys to highlight Settings Menu icon in the main menu.
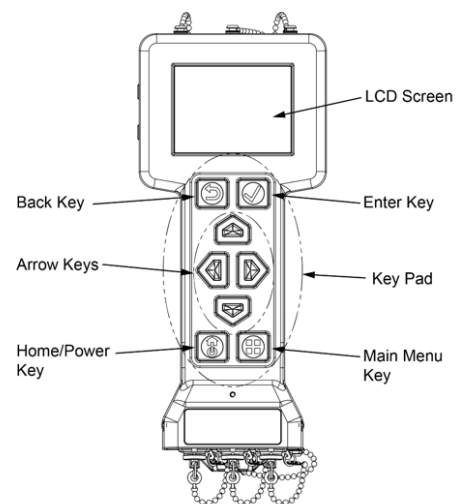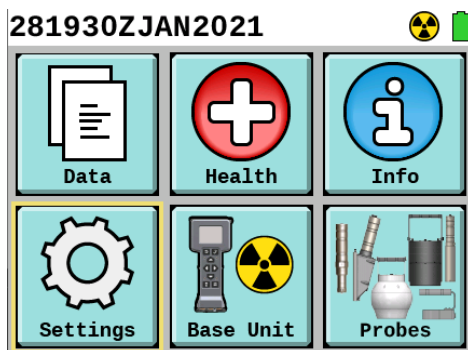
3. Press the Enter key to select.
4. Use the Down Arrow key to highlight the green slider to the right of "Volume".

5. Ensure the green slider is not located all the way to the left. Although the lowest setting will not eliminate audio, the sound may be low enough that you have not noticed it. Move the green slider toward the right to see if you can begin to hear the audio as the volume is set higher.
6. Next look at the same settings screen, two items lower below "Volume" and ensure that there is not a check mark in the box to the right of the word "Mute". A check mark indicates Mute has been enabled. Remove the checkmark if one is present by pressing the Enter key while the Mute box is highlighted.
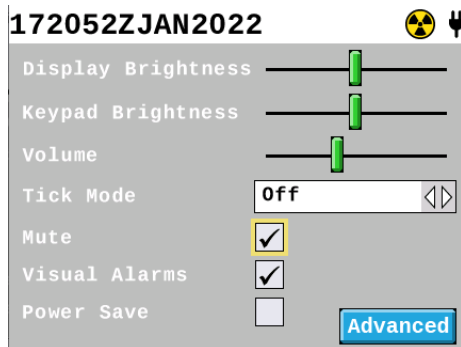
7. If there is still no audio when an alarm occurs or Tick Mode is activated, return to the Home screen by pressing the Home/Power button.
8. Power off the Base Unit by pressing and holding the Power/Home button then acknowledging the pop up by pressing the Enter key.
9. Remove the battery cap by turning ¼ turn counter-clockwise, to ensure all power has been removed from the system.
10. Replace the battery cap by turning ¼ turn clockwise. (If you removed the batteries during this procedure, please ensure they are placed back in the correct orientation, use the battery labels on the right and left side of the battery compartment to determine which end of the battery goes in first.)
11. Perform a Depot Settings Resent by key press: (Depot Settings Reset will not affect the data logs, system log, or calibration, it will only reset the user settings back to their default.)
    a. Press the Back, Menu, and Home/Power keys simultaneously (must be at same time or the Home/Power key must be the last to push while holding the other two).
    b. Hold all three for 10 seconds or until the Base Unit powers on.
12. Check to see if audio is now available by activating Tick Mode or using a check source to cause an audible radiation alarm. If you do not have a check source you can also lower the low threshold down to or below background to cause an audible alarm.
13. Check the headset by attaching a known working headset to the Audio Port and listening.
14. If there is still no audio coming from the speaker (buzzer), headset, or both follow the instructions in your manual on disposition of the Base Unit for further maintenance at the next authorized level.

Hopefully by checking the settings, doing a power reset, and performing a depot reset has returned everything to where audio is now available on both the speaker (buzzer) and headset. If not, please follow the instructions in your manual. It is advised to follow

all procedures directly from your issued manual when performing troubleshooting and determining the guidance of your Service for disposition of the item.

See the Troubleshooting procedures in your manual for steps to follow:

- US TM-3-6665-383-14&P, Operator Troubleshooting, Chapter 3, WP-0057 (Base Unit No Buzzer Audio) and WP-0058 (Base Unit No Audio with Headset).

- Canada CRDS Operator's Manual, Chapter 9, Sections 9.2.5 (Base Unit No Buzzer Audio) and 9.2.6 (Base Unit No Audio with Headset).

c) What do I do if my Base Unit will not turn on?

If your Base Unit does not turn on when you push the Home/Power key the first thing you should do is go to your manual and proceed with the operator troubleshooting steps listed. Operator Troubleshooting references are:

See the Troubleshooting procedures in your manual for steps to follow:

- US TM-3-6665-383-14&P, Operator Troubleshooting, Chapter 3, WP-0053 (Base Unit Does Not Power On with Batteries) and WP-0054 (Base Unit Alternating Current/Direct Current (AC/DC) Power Adapter No Power).

- Canada CRDS Operator's Manual, Chapter 9, Sections 9.2.2 (Base Unit Does Not Power On with Batteries) and 9.2.3 (Base Unit Alternating Current/Direct Current (AC/DC) Power Adapter No Power).

As an operator there are limited items you can fix, but the first thing that should be checked is that you have four AA batteries that are good with charge still left and that they are installed in the correct orientation. The troubleshooting procedure will lead you through those steps first. Check the orientation, replace with new batteries, etc…

The next step is to do a Depot Settings Reset using the keypad in case any settings are keeping the screen from being lit.

1. Perform a Depot Settings Resent by key press: (Depot Settings Reset will not affect the data logs, system log, or calibration, it will only reset the user settings back to their default.)
   a. Press the Back, Menu, and Home/Power keys simultaneously (must be at same time or the Home/Power key must be the last to push while holding the other two).
   b. Hold all three for 10 seconds or until the Base Unit powers on.

If you have an Alternating Current/Direct Current (AC/DC) Power Adapter for your RDS, attach this to the power connection port and a working 110 V outlet and determine if the RDS has power using AC/DC power. If not, follow the steps in your manual for "Base Unit AC/DC Power Adapter No Power" as well to see if you can establish power in this method. This will not fix the battery power issue, but it may provide you with a current solution in some instances and the addition of this information when you send it for maintenance will provide the maintainer with needed information for their work on the RDS to bring it back to operational status.

Hopefully by fixing any battery issues or performing the Depot Reset you now have power. If not, please follow the instructions in your manual. It is advised to follow all procedures directly from your issued manual when performing troubleshooting and determining the guidance of your Service for disposition of the item.

d) What do I do if I plugged in a probe and the icon and reading panel is not showing?

If you have connected a probe and the icon for that probe does not show on the footer bar or the reading panel does not go from just one reading panel to two reading panels on the Home screen, the probe has not been recognized by the Base Unit.

As an operator your options for fixing this issue are to check and make sure the Common Probe Cable is properly connected to the Base Unit on one end and the probe on the other end. Please see the below references for the Base Unit and the probe you are working with below on proper connection of the Common Probe Cable.

Connection of Common Probe Cable:

- US TM-3-6665-383-14&P, Operator Instructions, Chapter 2, WP-0014 (Operation for Connect/Disconnect of Common Probe Cable to Base Unit) and WP-0015 Beta Photon Probe, WP-0018 Alpha-Beta Probe, WP-0022 SABG Probe, WP-0025 Sensitive Gamma Probe, WP-0028 FIDLER Probe, and WP-0031 Neutron Probe.

- Canada CRDS Operator's Manual, Chapter 4, Section 4.1.1 Base Unit, Section 4.2.1 Beta Photon Probe, Section 4.3.1 Alpha-Beta Probe, Section 4.4.1 SABG Probe, Section 4.5.1 Sensitive Gamma Probe, Section 4.6.1 FIDLER Probe, and Section 4.7.1 Neutron Probe.

As with all items for the RDS, please be sure to follow your manual's instructions. References to the proper troubleshooting procedures are below. If you are unable to remedy the situation with the Operator Troubleshooting, follow the proper Service specific instructions for the next authorized level of maintenance for your item.

See the Troubleshooting procedures in your manual for steps to follow:

- US TM-3-6665-383-14&P, Operator Troubleshooting, Chapter 3:

  o WP-0063 (Beta Photon Probe Plugged In and Beta Photon Icon Not Displayed)

  o WP-0065 (Alpha-Beta Probe Plugged In and Alpha-Beta Icon Not Displayed)

  o WP-0068 (Small Area Beta Gamma (SABG) Probe Plugged In and SABG Icon Not Displayed)

  o WP-0070 (Sensitive Gamma Probe Plugged In and Sensitive Gamma Icon Not Displayed)

  o WP-0072 (FIDLER Probe Plugged In and FIDLER Icon Not Displayed)

- o WP-0074 (Neutron Probe Plugged In and Neutron Icon Not Displayed)

- Canada CRDS Operator's Manual, Chapter 9:

  - o Section 9.2.10 (Beta Photon Probe Plugged In and Beta Photon Icon Not Displayed)

  - o Section 9.2.12 (Alpha-Beta Probe Plugged In and Alpha-Beta Icon Not Displayed)

  - o Section 9.2.15 (Small Area Beta Gamma (SABG) Probe Plugged In and SABG Icon Not Displayed)

  - o Section 9.2.17 (Sensitive Gamma Probe Plugged In and Sensitive Gamma Icon Not Displayed)

  - o Section 9.2.19 (FIDLER Probe Plugged In and FIDLER Icon Not Displayed)

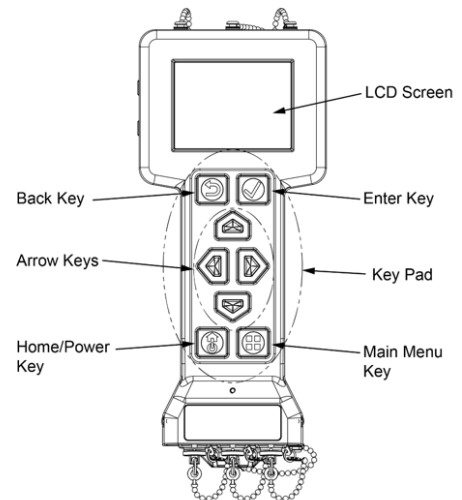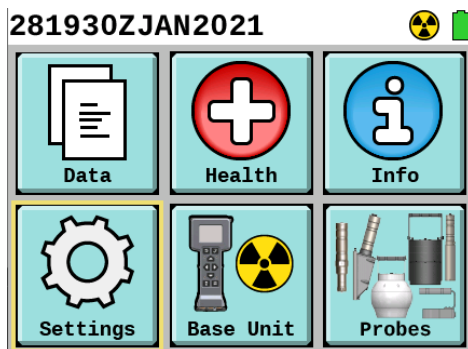 - o Section 9.2.21 (Neutron Probe Plugged In and Neutron Icon Not Displayed)

e) Can I reset my settings?

Yes. A "Reset to Depot Settings" can be done by two different methods outlined and referenced below.

"Reset to Depot Settings" resets all operator-entered settings to the settings saved by your maintenance or calibration facility based on your user group. Calibration is NOT impacted by resetting to depot settings. Resetting to Depot Settings can be used as a troubleshooting step and to quickly change any operator-entered settings to the default "depot" settings.

Perform a "Reset to Depot Settings" from the Settings > Advanced menu:

1. With a powered on Base Unit, press the Main Menu key.
2. Use the Arrow keys to highlight Settings Menu icon in the main menu.

3. Press the Enter key to select.
4. Use the Down Arrow key to highlight the "Advanced" button.

282039ZDEC2020 🎧 🔋

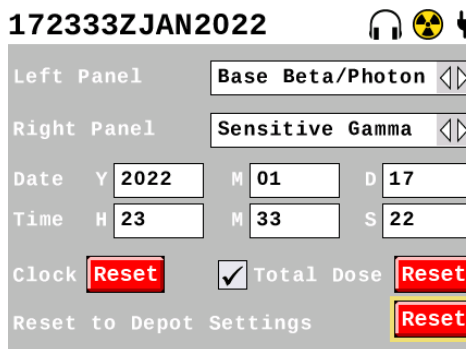|	
Display Brightness	——————▮————
Keypad Brightness	——————▮————
Volume	—————▮——————
Tick Mode	Off ◁▷
Mute	☐
Visual alarms	☑
Power Save	☐ **Advanced**
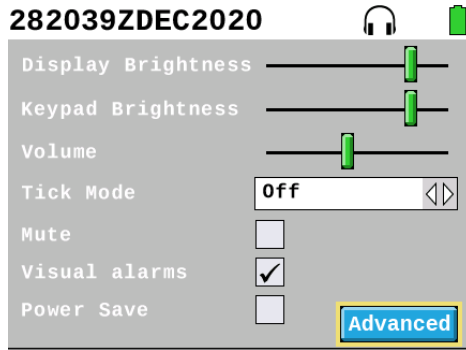
5. Press the Enter key to select.
6. Use the Arrow keys to highlight the "Reset" button to the right of the words "Reset to Depot Settings".

172333ZJAN2022 🎧 ☢ 🔌

Left Panel	Base Beta/Photon ◁▷
Right Panel	Sensitive Gamma ◁▷

Date	Y 2022	M 01	D 17
Time	H 23	M 33	S 22

Clock **Reset** ☑ Total Dose **Reset**

Reset to Depot Settings **Reset**

7. Press the Enter key to select.
8. Acknowledge the pop-up stating, "Are you sure you want to reset to depot settings?" by pressing the Enter key.

291715ZJAN2021 🎧 ☢ 🔌

Are you sure you want
to reset to depot
settings?

No ↺   **Yes** ✓
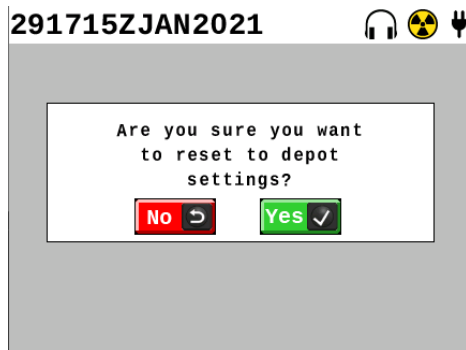
9. Observe that settings are now reset to depot settings, which are the locked in settings for your user group set by the maintainers.

Perform a "Reset to Depot Settings" using a key press

1. Perform a Depot Settings Resent by key press: (Depot Settings Reset will not affect the data logs, system log, or calibration, it will only reset the user settings back to their default.)

a. Press the Back, Menu, and Home/Power keys simultaneously (must be at same time or the Home/Power key must be the last to push while holding the other two).
b. Hold all three for 10 seconds or until the Base Unit powers on.

See your manual for additional information:

- US TM-3-6665-383-14&P, Operator Troubleshooting, Chapter 2, WP-0034, Advanced Settings Menu.

- Canada CRDS Operator's Manual, Chapter 3, Sections 3.17.5 (9).

f) Why does the screen go dark without turning off the Base Unit?

If your screen goes dark while on the setting for "Power Save" has been activated. The default is de-activated for this option, but if an operator has placed a check mark activating it, this setting will stay in place until the check mark is removed or a depot reset has been done.

Power Save mode will cause the screen and keypad backlighting to go to sleep after two minutes of inactivity.
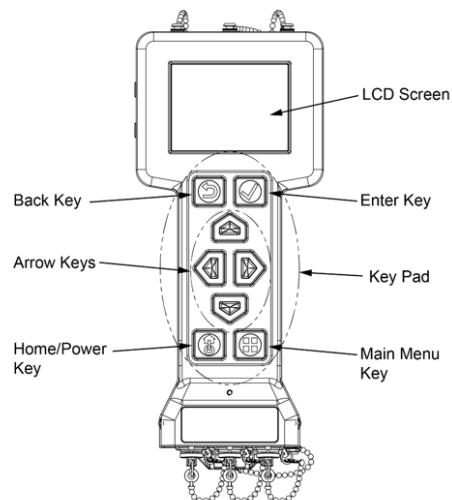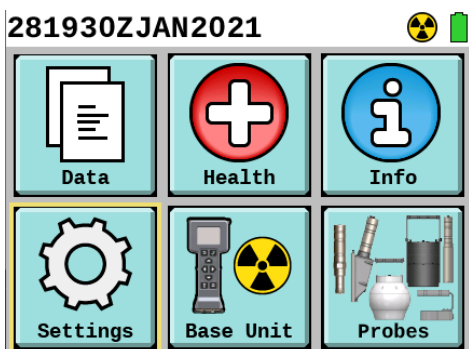
Press any key to wake the Base Unit up. The key press will only wake the Base Unit up and not perform any other function.

If there is an alert, the Base Unit will not go to sleep, even if it has been acknowledged. If Tick Mode is selected and the Base Unit goes to sleep, the audio tick will continue.

Even in Power Save mode, the Base Unit will continue to monitor the radiation level. Any alert or alarm will cancel sleep mode and display the alert or alarm screen.

To Activate/Deactivate "Power Save":

1. With a powered on Base Unit, press the Main Menu key.
2. Use the Arrow keys to highlight Settings Menu icon in the main menu.

3. Press the Enter key to select.
4. Use the Down Arrow key to highlight the box to the right of the words "Power Save".

```
282037ZDEC2020                    ⏻
  Display Brightness  ——————————▮——
  Keypad Brightness   ——————————▮——
  Volume              —————————▮—————
  Tick Mode           Off            ◁▷
  Mute                □
  Visual alarms       ✓
  Power Save          ✓          Advanced
```

5. Press the Enter key to place or remove the check mark in that box. A check mark indicates it is activated. No check mark in the box means it is deactivated. The default is deactivated.
6. Return to the Home screen by pressing the Home/Power key.

See your manual for additional information:

- US TM-3-6665-383-14&P, Operator Troubleshooting, Chapter 2, WP-0034, Settings Menu.

- Canada CRDS Operator's Manual, Chapter 3, Sections 3.17.4 (11).

g) When the screen goes dark while on, does the system still detect radiation?

Yes, in Power Save mode the Base Unit will continue to monitor the radiation level. Any alert or alarm will cancel sleep mode and display the alert or alarm screen.

Power Save mode will cause the screen and keypad backlighting to go to sleep after two minutes of inactivity. The default is de-activated for this option, but if an operator has placed a check mark activating it, this setting will stay in place until the check mark is removed or a depot reset has been done.

Press any key to wake the Base Unit up. The key press will only wake the Base Unit up and not perform any other function.

If there is an alert, the Base Unit will not go to sleep, even if it has been acknowledged. If Tick Mode is selected and the Base Unit goes to sleep, the audio tick will continue.
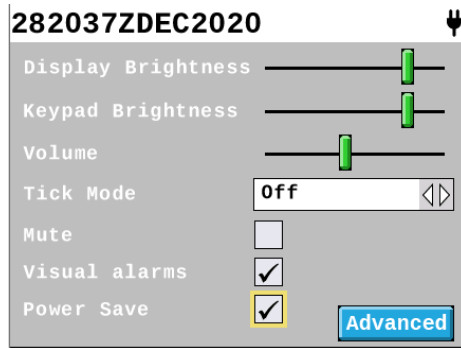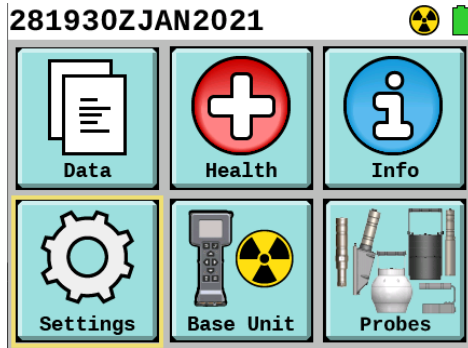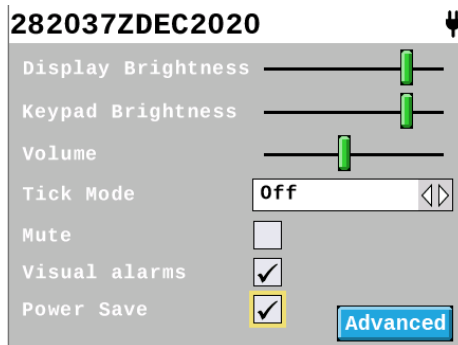
To Activate/Deactivate "Power Save":

1. With a powered on Base Unit, press the Main Menu key.
2. Use the Arrow keys to highlight Settings Menu icon in the main menu.

3. Press the Enter key to select.
4. Use the Down Arrow key to highlight the box to the right of the words "Power Save".

5. Press the Enter key to place or remove the check mark in that box. A check mark indicates it is activated. No check mark in the box means it is deactivated. The default is deactivated.
6. Return to the Home screen by pressing the Home/Power key.

See your manual for additional information:
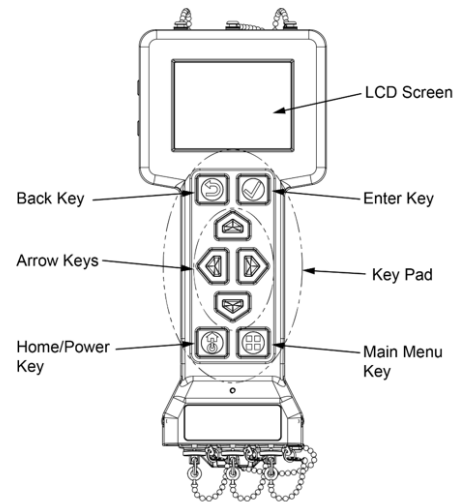
- US TM-3-6665-383-14&P, Operator Troubleshooting, Chapter 2, WP-0034, Settings Menu.

- Canada CRDS Operator's Manual, Chapter 3, Sections 3.17.4 (11).

1. Maintenance

a) What do I do when my system requires calibration?

Calibration will be unique to your country and service. Please refer to your user manual for details on the process for getting your item calibrated.

All Ludlum RDS items are built to hold their calibration for a period of 3 years. Your service or country guidance may require you to calibrate your device more often.

Items that go for maintenance may also require calibration before being placed back into operational usage. Your maintainer will send it on to calibration and then perform the proper checks once calibrated to ensure it is operational before returning it to your unit.

If unsure of current guidelines for your RDS equipment, please reach out to the website at https://www.dtectsystems.com/support-rds or call the support line at +1-801-260-4069. The support line will be able to look up your item by serial number and provide you with guidance of where to send it or point you toward the issued guidance documents at that time. Please keep in mind each country and each US Service has different guidelines for where and when calibration is required.

See your manual for guidance:

- US TM-3-6665-383-14&P, Operator Preventive Maintenance Checks and Services (PMCS), Chapter 4, WP-0079, Operator Guidance when inspecting the calibration label for any of the RDS items: "Missing, not legible, or out of date. Notify Unit Maintenance."

- Canada CRDS Operator's Manual, Chapter 10, Table 10-1 Operator Guidance when inspecting the calibration label for any of the RDS items: "Missing, not legible, or out of date". Section 10.1.1 "Contact first line maintainer immediately if a fault is found that degrades the equipment operation or makes it unavailable for the mission". Work with you First Line Maintenance facility (In-Service Support (ISS) Contractor) for maintenance and calibration information.

b) How do I get the firmware updated?

Any time your item goes to the maintainer for maintenance or calibration, the maintainer will check to see if any updates are required for the latest firmware available and install that firmware before returning the item to the operational unit. It is in their procedures for Maintainer Preventive Maintenance Checks and Services as well as a part of the Calibration Instructions for that level to perform this each time they receive your equipment. For most countries and services this means that when you send it for annual calibration, any firmware updates will be applied making this a yearly cycle.

If you have been notified that a critical firmware update is available or you have a mission need that requires a newly released version of firmware outside of your calibration cycle, contact your next level of maintenance to arrange for the firmware update to be done at the maintainer level.

See your manual for guidance:

- US TM-3-6665-383-14&P, WP-0230 Maintenance allocation Chart (MAC). With current Interim Contractor Support (ICS) in place please contact the website at https://www.dtectsystems.com/support-rds or call the support line at +1-801-260-4069.

- Canada: Contact first line maintainer facility (In-Service Support (ISS) Contractor) to schedule the firmware for update and follow their guidance.

c) How long does it take to get my system back when I send it for calibration or maintenance?

The time for a system to be sent, calibrated and/or maintenance actions performed, and then returned to the operation unit will vary greatly between countries and services.

- United States:

    o Under the current Interim Contractor Support (ICS) agreement Ludlum will return items within 90 days of the items receipt at our facility. On average the turnaround is under 30 days from our receipt to shipping it back to your operational unit. If you have questions about a specific item that has been shipped to Ludlum, please contact the website at https://www.dtectsystems.com/support-rds or call the support line at +1-801-260-4069.

    o Once the maintenance and calibration become organic to your specific service (2027 or later), please refer to you maintainer or calibration facility for specific timelines and processes.

- Canada: Refer all questions to your First Line Maintainer facility (In-Service Support (ISS) Contractor) and they will seek out the answers to your questions from the correct military office as those actions have been solidified into the processes for RDS.

2. Ancillary Equipment

a) What type of headphones do I need?

Any standard headphones with a 3.5mm audio plug will work with the RDS Audio Port. In the classroom we demonstrated it with the free earphones received on an airline flight and they work just fine.

Some customer configurations come with earphones and receive Part V067724 Earpiece, Base Unit, 3.5mm Jack (NSN 5965-01-713-8545). This part number/NSN is located in your manual listed in the Additional Authorization List.

The advantage of using this set of earphones with your RDS is that they come with an added threaded collar for solid connection to the Base Unit audio port to prevent it from being dislodged during movement. The earphone is for one ear only, hooking over the ear for secure attachment, allowing the operator to have full awareness of their surroundings. The earphone cable has several built-in clips to hold the cable to your uniform or tactical vest, keeping the cable from being a snag hazard. The earpiece insert itself can be removed to be cleaned in as needed.

See your manual for additional information:

- US TM-3-6665-383-14&P, Chapter 13, WP-0232, Additional Authorization List (AAL).

- Canada CRDS Operator's Manual, Chapter 3, Sections 3.16.1 and 3.16.2.

b) How do I attach headphones?

Any headphones with a standard 3.5mm audio plug will work with the RDS Audio Port.

It is recommended if available to use the issued or Additional Authorized List (AAL) listed earphones that are specific for the RDS. The advantage of using this set of earphones with your RDS is that they come with an added threaded collar for solid connection to the Base Unit audio port to prevent it from being dislodged during movement. The earphone is for one ear only, hooking over the ear for secure attachment, allowing the operator to have full awareness of their surroundings. The earphone cable has several built-in clips to hold the cable to your uniform or tactical vest, keeping the cable from being a snag hazard. The earpiece insert itself can be removed to be cleaned in as needed.

To Connect the Headset:

1. Remove the audio connector protective cap by rotating counterclockwise.

Audio Connector

Audio Connector
Protective Cap
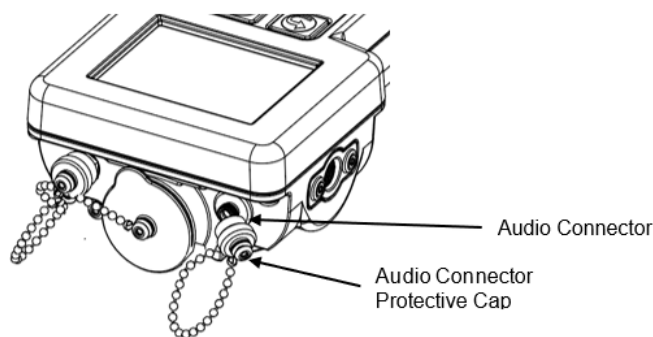
2. Attach the audio headset by inserting the connector plug and threading the collar clockwise onto the audio connection port.

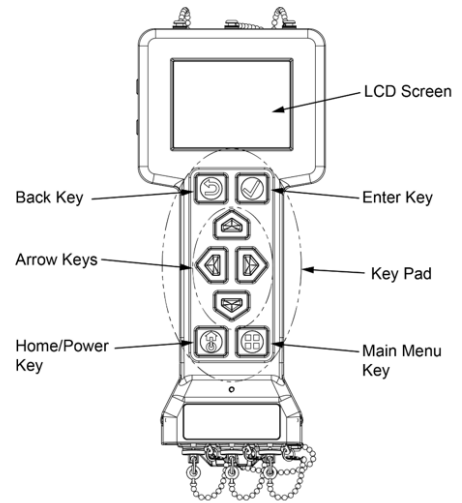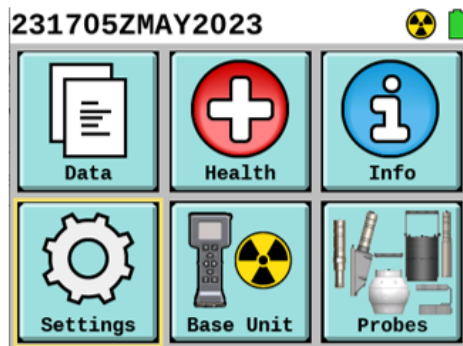Headset Connector Plug

Headset
Threaded
Collar

Base Unit
Audio Port
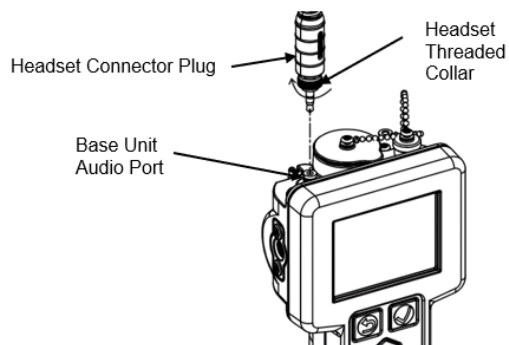
3. Arrange the headset's earpiece over the desired ear and insert it into that ear securely.

Earpiece ⟶
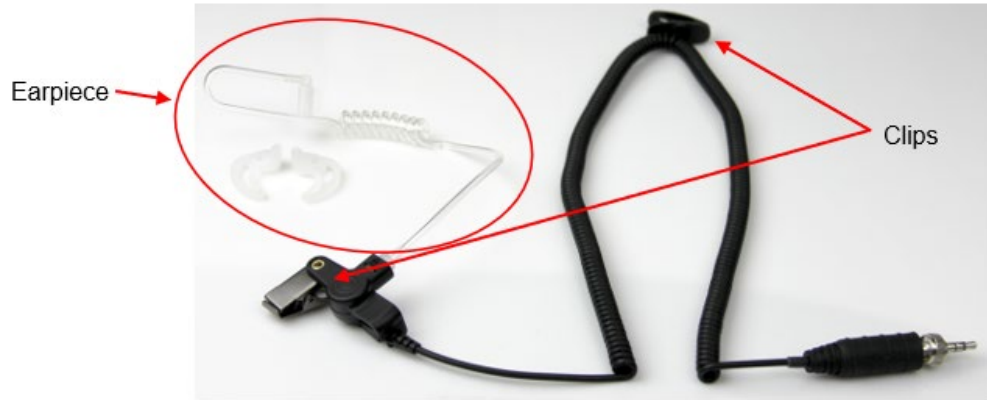
Clips

4. Attach clips as needed along uniform to secure the attachment and prevent movement from dislodging the headset from the ear or being a snag hazard.
5. Adjust the volume using the settings screen.
   a. With a powered on Base Unit, press the Main Menu key.
   b. Use the Arrow keys to highlight Settings Menu icon in the main menu.

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| Data | Health | Info |
| Settings | Base Unit | Probes |

LCD Screen

Back Key — — Enter Key

Arrow Keys — — Key Pad

Home/Power Key — — Main Menu Key

   c. Press the Enter key to select.
   d. Use the Up and Down Arrow keys to highlight the green slider bar to the right of the word "Volume".

280005ZSEP2023

Display Brightness
Keypad Brightness
Volume
Tick Mode   Off   ◁▷
Mute
Visual Alarms   ✓
Power Save   Advanced

   NOTE: The lowest volume setting is still audible. The volume slider bar adjusts both the speaker volume for when the headset is not attached and

the headset volume. When the headset is attached, all audio is routed to the headset only.

    e. Adjust volume setting with headset on to the desired level using the Left and Right Arrow keys.

6. Press the Home/Power key to return to the Home screen to complete your mission.
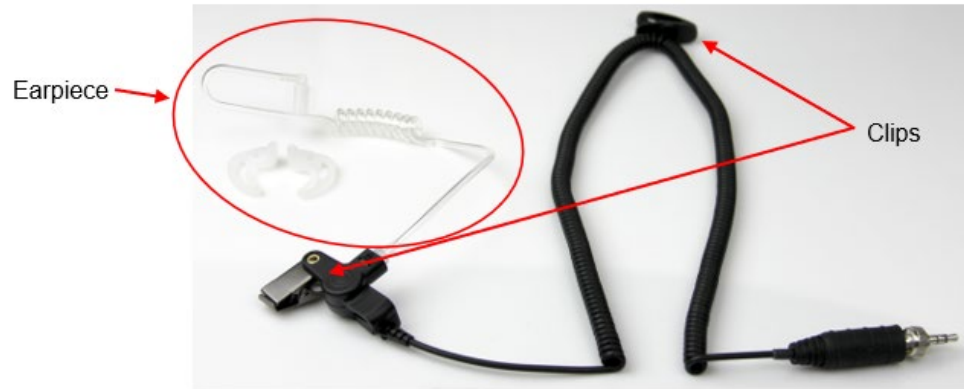
To Disconnect the Headset:

1. Disconnect the headset audio plug by unthreading counterclockwise and removing the collar from the audio connector on the Base Unit.
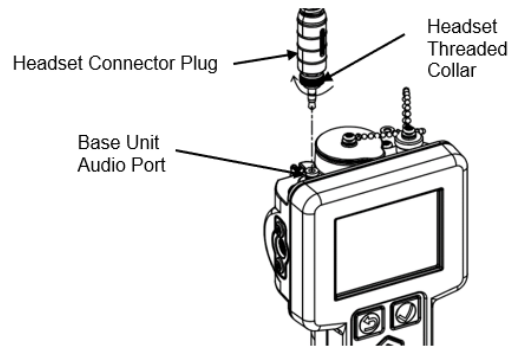
2. Install the audio protective cap on the Base Unit audio connection by rotating clockwise.
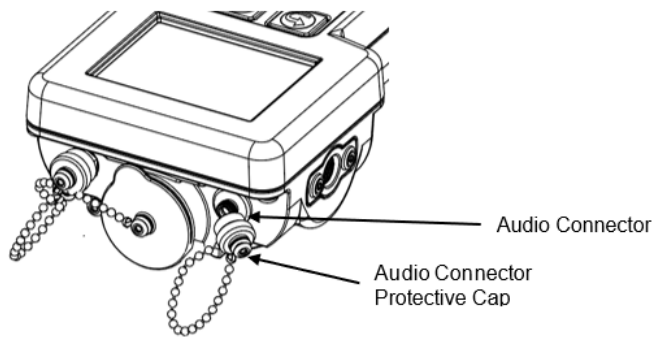
3. Disconnect the clips from the uniform.

4. Remove earpiece from ear.
5. Disconnect earpiece from the rest of the headset.
6. Clean earpiece with alcohol wipes or warm soapy water, rinse thoroughly, and ensure earpiece is fully dried.
7. Reconnect earpiece to the headset.
8. Store in case.

See your manual for appropriate references:

- US TM-3-6665-383-14&P, Chapter 13, WP-0232, Additional Authorization List (AAL).

- Canada CRDS Operator's Manual, Chapter 3, Sections 3.16.1 and 3.16.2.

c) Where is the volume for the headphones controlled?

The volume for the headphones and speaker is controlled by the same setting. Audio will play at the set volume through the speaker if no headset is attached and thorugh the headset only if it is attached.

To adjust the volume for the speaker or headset:

1. With a powered on Base Unit, press the Main Menu key.
2. Use the Arrow keys to highlight Settings Menu icon in the main menu.
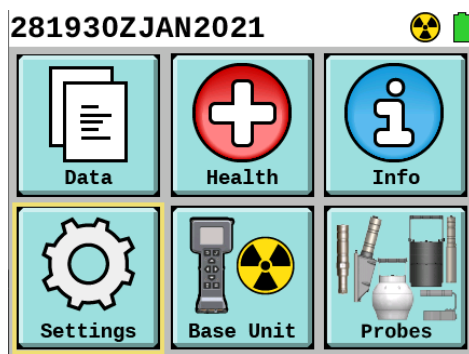
3. Press the Enter key to select.
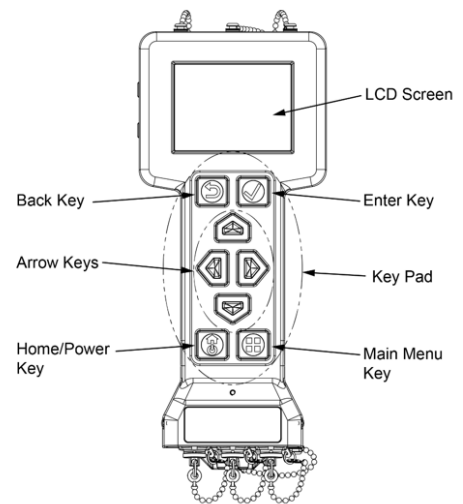
4. Use the Down Arrow key to highlight the green slider bar to the right of the word "Volume".

NOTE: The Volume adjustment is for both the speaker and the headset. The lowest setting is still audible.

5. Use the Right and Left Arrow keys to adjust the green slider bar to the left to decrease the volume and to the right to increase the volume.
6. When audio has been adjusted correctly press the Home/Power button to return to the Home screen.

Some additional notes about the RDS audible sounds:

- If the box to the right of the word "Mute" on the Settings screen has a checkmark then all audio has been turned off. Uncheck "Mute" by highlighting the box and pressing Enter key to remove the check mark.
- When in Stealth Mode all audio is routed to the headset only and the speaker is turned off.
- Audible sounds are only heard when there is a radiation alarm, system alarm, system notification, or Tick Mode has been activated. If you are trying to adjust the volume either adjust the low threshold to create a radiation alarm with background or a source check or activate Tick Mode on the settings screen to hear an audible and continuous ticking sound.

If no audio is heard via speaker or headset, perform Operator Troubleshooting per your manual:

- US TM-3-6665-383-14&P, Operator Troubleshooting, Chapter 3, WP-0057 (Base Unit No Buzzer Audio) and WP-0058 (Base Unit No Audio with Headset).

- Canada CRDS Operator's Manual, Chapter 9, Sections 9.2.5 (Base Unit No Buzzer Audio) and 9.2.6 (Base Unit No Audio with Headset).

d) What GPS devices are compatible with the Base Unit?

The Base Unit at this time only receives Global Positioning System (GPS) data from a United States Defense Advanced GPS Receiver (DAGR) when attached via a Base Unit to DAGR Cable and able to communicate with the satellite (signal is not blocked by natural (trees, mountains) or artificial (buildings, tunnels) means).

To set up the Base Unit to operate with the DAGR, US TM-3-6665-383-14&P, Chapter 2, WP-0041 (Configure Base Unit to Receive Defense Advanced Global Positioning System (GPS) Receiver (DAGR) Location Data).

For requesting D-tect to work towards capability of commercial GPS, contact https://www.dtectsystems.com/support-rds or call the support line at +1-801-260-4069 and inquire about opportunities to work with D-tect for your specific needs. They will provide you with the information for RDS Sales who will be able to inform you of upcoming capabilities and what it would take for starting a project to add a capability that you may need.

e) Why do I have all these cables and what are they for?

RDS Ancillary Equipment Cables
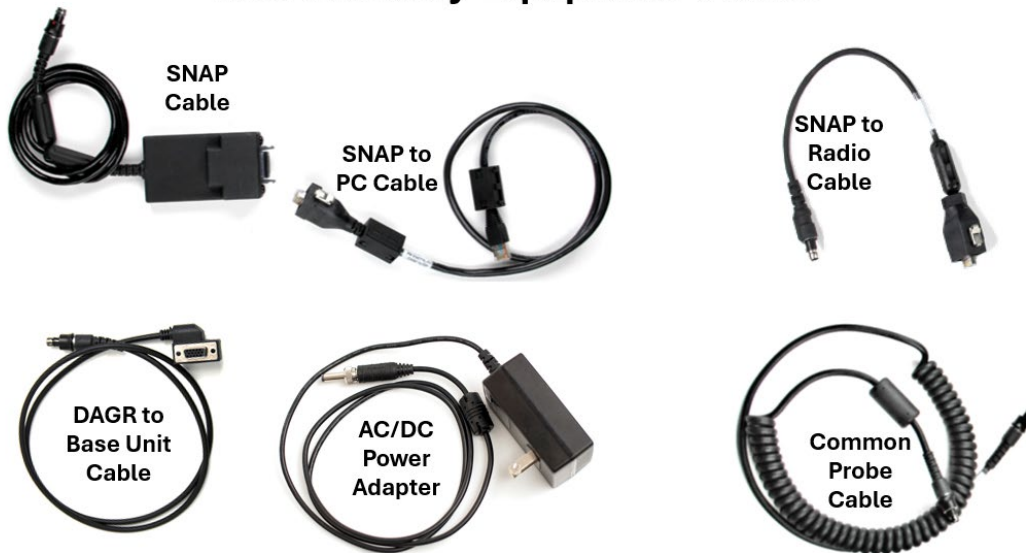
Common Probe: (NSN 6150-01-672-7428)
- Allows for connection and communication between Base Unit and any attached probe.

Alternating Current (AC)/ Direct Current (DC) Power Adapter Cable (6130-01-685-2752):
- Provides AC/DC Power option instead of using batteries.
- Typically used by maintenance personnel or in a laboratory environment.

Defense Advanced Global Positioning System (GPS) Receiver (DAGR) Cable (NSN 6150-01-685-2754):
- Connects the Base Unit and DAGR
- DAGR is used to obtain Positioning, Navigation, and Timing (PNT) data.
- The PNT data is attached to the individual radiation reading within the data logs.
- The RDS system does not include a DAGR but does some configurations do contain the DAGR cable in order to connect to a DAGR already assigned to the unit.

Sensor Network AdaPter (SNAP) Cable:

- Has three sections, the main SNAP Cable and two interface cables, only one interface can be used at a time.
    - SNAP Cable is a self-contained system consisting of a single board computer that provides a web server interface using cybersecurity protocols. (NSN 6150-01-687-6652)
    - SNAP to Personal Computer (PC) (NSN 6150-01-685-6072):
        - SNAP to PC is used to connect from the SNAP cable to a PC for the purpose of downloading data or a system log to that non-networked PC without a need for any specialized software.
        - Downloading uses the most common browsers such as Edge and Chrome to download a '.csv' spreadsheet or '.xml' text file.
        - This cable can also be used to connect from the SNAP Cable into a platform's network. Sending data via Ethernet through a platform's network requires software to receive the incoming data, such as Joint Warning and Reporting Network (JWARN), Mobile Field Kit - Chemical Biological Radiological Nuclear (MFK-CBRN), or Joint Effects Model (JEM).
        - The SNAP to PC Cable can also connect from the SNAP Cable into the sidepan connector of the following radios: Radio Set TW-950 (NSN 5820-01-668-5120) and Radio Set MPU5 (NSN 5895-01-670-7308). Sending data via radio to a receiving computer requires software to receive the incoming data, such as JWARN, MFK-CBRN, or JEM.
    - SNAP to Radio Cable (NSN 6150-01-685-6073):
        - This cable is used to connect the SNAP Cable to the following tactical radios: Radio Set AN/PRC 152A (NSN 5820-01-566-0746); Radio Set AN/PRC 154A (NSN 5820-01-620-7668); and Radio Set AN/PRC 154C (NSN 5820-01-666-7413).
        - Sending data via radio to a receiving computer requires software to receive the incoming data, such as JWARN, MFK-CBRN, or JEM.
- When connected via SNAP Cable and appropriate interface cable through a radio set near real time data can be streamed to the chosen software such as JWARN, MFK-CBRN, or JEM.
- SNAP Cable with SNAP to PC is used for maintenance to update firmware and for calibration of the Base Unit and probes.

For other US configurations, commercial, or Canada Radiological Detection System (CRDS), you may have the following cabled ancillary equipment in addition to items above:

Additional Ancillary Equipment
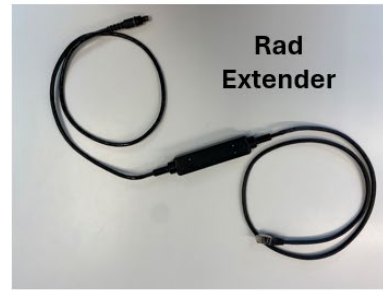
Headset (Earpiece):

- This may be part of your configuration or listed as an Additional Authorized List (AAL) item which can be ordered under National Stock Number (NSN) 5965-01-713-8545.
- Single sided earpiece allowing the operator to hear the audible alarms but also be alert of their surroundings.
- It is a 3.5 mm jack that plugs into the Base Unit audio connector with a collar that twists down on the connection to keep it solidly connected for wear during missions.
- Worn over the ear to prevent slippage or loss during movement in missions.
- The extended length allows its use when the Base Unit is in the Base Unit Carrying Pouch worn at the hip on the belt or using the shoulder strap.
- It has several clips to hook it on to the duty uniform to prevent snags.

Rad Extender:

- The Rad Extender is the commercial and Canada version of the sensor network adapter (SNAP) cable. (NSN not yet assigned)
- Rad-Extender Cable with military-grade quick-fit connector on one end and Ethernet/RJ45 connection on the other.
- Rad-Extender contains a single board computer that acts as a web server for managing data downloads and updates for connected equipment.
- Connection to a PC allows download of data as well as upload of firmware updates by maintainers. Also used for maintenance and calibration.

Battery Charging Station:

- May or may not be the charging station shown above.

- Can be ordered as an AAL Item using NSN 6130-01-413-3929.
- Charges the preferred rechargeable Nickel Metal Hydride batteries, NSN 6140-01-413-3926.

Ethernet Cable: (not shown in pictures)

- An Ethernet Cable may be purchased via the AAL list as well if needed in order to attach the receiving radio to the PC, such as with the TW-950 and MPU-5 radios if it does not come with your radio set.
- NSN for an Ethernet cable is 5995-01-625-1999.

f) How do I get my DAGR to work with the Base Unit?

To set up the Base Unit to operate with the DAGR, US TM-3-6665-383-14&P, Chapter 2, WP-0041 (Configure Base Unit to Receive Defense Advanced Global Positioning System (GPS) Receiver (DAGR) Location Data).

If unable to connect, go to US TM-3-6665-383-14&P, Chapter 3, WP-0060 (Global Positioning System (GPS) (Defense Advanced GPS Receiving (DAGR)) Not Attached Indicator Present on Screen with DAGR Attached).

g) Can the RDS be mounted on a platform or vehicle?

Yes, there are currently two mounts available for the RDS system, both are based off existing platform mounts with the Platform Interface Kit (PIK) added to that existing mount.

The PIK will mount to the same vehicle mount as was created for the Joint Chemical Agent Detector (JCAD) Interface Kit (NSN 6665-01-557-4013).

For the Vehicle Mount, US TM-3-6665-383-14&P:
- Operation of the PIK Mount: Chapter 2, WP-0047 (Vehicle Mount (Platform Interface Kit (PIK) Mount) For Base Unit.
- Installation of the PIK Mount: Chapter 5, WP-0084 (Vehicle Mount (Platform Interface Kit (PIK) Mount for Base Unit).

The PIK can also mount to a Ship Mount Plate used on US Navy assets. This is a metal plate that is currently used for their legacy systems to fit into the same places they are currently installed. The PIK simply mounts in the same holes already on the metal plate.

For additional details on the PIK mount and tailoring it to your needs, contact https://www.dtectsystems.com/support-rds or call the support line at +1-801-260-4069 and inquire about opportunities to work with D-tect for your specific needs. They will provide you with the information for RDS Sales who will be able to inform you of upcoming capabilities and what it would take for starting a project to add a capability that you may need.