

# Mini Rad-D

## Product Guide



### Mini Rad-D

Detector	1.3 cm diam x 3.8 cm Cesium Iodide - CsI (Na) Scintillation detector with high-sensitivity photo-multiplier tube
Display	Intense, large LED display
Power	Two AA batteries
Battery Life	5,000 hours
Alarm	Audio, vibrate, visual
Response Time	< 1 second
Background Compensation	Automatic
Energy Range	50 Kev to 3 Mev
Dimensions	3.7 x 2.5 x 1.2 in (94 x 64 x 30.5 mm)
Weight	6.5 oz (184 gr)
Environment	Driving Rain, operates in high RF environment
Temperature	10° to 122° F (-20° to 50° C)
Humidity	93% RH non-condensing at 95° F (35° C)
Drop Test	No Holster – 5 ft (1.5 m) drop onto a concrete floor
Warranty	2 year parts and labor

Figure 1



Alarm Level Equivalents

Alarm Level	mRem/Hr	uSv/Hr
1	0.035	0.35
2	0.04	0.40
3	0.055	0.55
4	0.065	0.65
5	0.1	1.00
6	0.2	3.00
7	0.35	3.50
8	0.6	6.00
9	1.1	10.10

## MINI RAD-D

### Generation 3 Updates

The Mini Rad-D Generation 3 builds upon the solid foundation of the Mini Rad-D product incorporating key improvements around product reliability and ruggedness in harsh environments. These improvements include:

- Improved Sensor System provides improved operation in higher temperature and humidity environments
- Improved Saturation Detector maintains the ability of identifying high radiation fields while expanding operation conditions
- Improved mechanical protection of the sensor provides extreme survivability to shock including drop shock\*
- Marker indicating the location of the detector
- Modern style design and color scheme
- New message indicators, levels “H” and “O”

\* In laboratory testing, units exhibited average survivability of 100 drops at 3' height onto concrete. Actual results may vary.

### General Description of Operation

The Mini Rad-D is a highly portable, rugged, all-weather radiation detector that's small enough to wear on a belt, yet powerful enough to quickly locate low-level radioactive sources, even in a warehouse full of boxes. Designed to discreetly monitor any environment without intrusion or disruption of civilian activities, the Mini Rad-D can be set to notify the user by vibration or audible alarm whenever gamma radiation exceeds natural background levels. The Mini's simple operation and highly readable display provide an automatically updated strength indicator in less than 1 second, allowing a rapid area sweep to identify the exact location of any radiation source.

When activated, the Mini Rad-D measures the background radiation count for 30 seconds and then uses that value to establish background radiation levels. Any radiological isotope that comes within range of the Mini Rad-D will activate the audio or vibration alarm and the display will show a value from “1” to “9” to indicate the radiation detected. The audio and vibration alarms increase in repetition rate the closer the Mini Rad-D is brought to the radiation source.

The source of the radiation (package, vehicle, etc.) can be quickly found by waving the Mini Rad-D around and using the alarm as a hot/cold indicator.

### OPERATOR INSTRUCTIONS

The Mini Rad-D is shipped with batteries ready to be installed for immediate use (see battery management section). Operating instructions can be found on the back of the unit. To begin operation, move the Mini Rad-D power switch from the “Off” position to SPK or (the “on” position) and the unit will begin a power-up and calibration sequence.

During the 30 second calibration interval, the unit will measure naturally occurring background radiation and will calculate a threshold above which a radiological alert will be indicated to the operator. The LED display will flash during the sequence. Following completion of calibration, a beep is sounded, indicating the threshold level has been successfully calculated for that particular environment. Every 15 seconds thereafter, a small LED in the lower right-hand corner of the main display window will flash, indicating the unit is operating properly and is in detection mode. Because the Mini Rad-D auto-calibrates to the ambient radiation level, maximum sensitivity will be obtained if you turn the Mini Rad-D on at the location where you are planning to inspect.

If the Mini Rad-D stops detecting normal background radiation levels for a period of time (such as if it is taken into a concrete building), the mini rad-D will recalibrate itself. The device will beep and the LED will show a “racetrack” pattern for 30 seconds. When complete, the Mini Rad-D will beep once more and go into detection mode. This keeps the Mini Rad-D at maximum sensitivity levels in all environments.

### Alarm

The Mini Rad-D will alarm (either audibly in SPK mode or by vibration in VIB mode) when the presence of gamma radiation exceeds normal background levels. Alarms are visually displayed (LED window on top left of unit) in levels from 1 to 9. The intensity of the audible alarm (in SPK mode) or vibration alarm (in VIB mode) will increase proportionately as the level of gamma presence increases.

In the event the operator changes work location during the course of his/her duties, it is recommended that the Mini Rad-D be turned off and turned back on. This allows the unit to automatically re-calibrate to the natural background radiation in the new location which can vary significantly from place to place. This insures the unit will be the most effective detecting unusual levels of gamma radiation.

### Battery Management

The Mini Rad-D is powered by two AA alkaline batteries (installed at the factory) which under a normal duty cycle (on 8 hours a day in detection mode, off 16 hours) will operate in detection mode for up to two years without replacement. This time decreases with frequent alarm indications. A low battery indicator (LED will display “L”) will inform the operator that batteries should be replaced. While a certain reserve is designed into the Mini Rad-D once a low battery alert is displayed, batteries should be replaced as soon as possible. Use a small Phillips head screwdriver to release battery door on the back of unit.

The Mini Rad-D is designed to Mil Spec environmental standards for rain, shock, and vibration. The unit is sealed to reduce intrusion from dust, humidity, and salt fog. The unit, including top display, may be cleaned safely with mild soap and water using a warm, wet cloth.

### Failure Mode

If the unit is unable to achieve detection mode for any reason, a FAIL indicator will be displayed. The Mini Rad-D will continually display each character in sequence - “F”, then “A”, then “I”, and then “L”. If failure mode occurs (most likely due to a significant change in location of operation), turn power off to the mini rad-D and then turn unit back on and allow it to re-calibrate (in new location). If the Mini Rad-D continues to go into failure mode, contact D-tect Systems for assistance.

### High Radiation Mode

If the unit is exposed to radiation levels high enough to overload the radiation detector and cause it to “saturate”, then the LED display will display an “H”.

### Outside of Environmental Conditions Mode

A level “o” mode (shown as a lower case o) indicates the Mini Rad-D is exposed to environmental conditions greater than 40°C and 92% humidity.

### Detector location

On the back side of the unit there is a small “+” sign to indicate the location of the detector.

## CUSTOMER SERVICE AND WARRANTY ASSISTANCE

The design, engineering, and manufacturing teams at D-tect Systems strive to provide the most reliable and technologically advanced detection and identification products available at affordable prices. All D-tect Systems products are designed, engineered, and manufactured in the USA.

In an effort to ensure that the user receives the utmost in value and productivity in the use of D-tect Systems products, we have established a knowledgeable, trained distributor network with a specific background in these types of products. Please contact your distributor if you would like additional information about D-tect products or warranty assistance. Please reference model, serial number, and date of purchase. We also provide direct technical support resources at [www.dtectsystems.com](http://www.dtectsystems.com).

## LIMITED WARRANTY FOR PRODUCTS

### 1. What This Warranty Covers and for How Long

D-tect Systems ("D-tect Systems") warrants this device (the "Product") against defects in materials and workmanship under normal use for a period of two years from the date of purchase. This warranty extends to the first end-user purchaser only, and is not transferable. This warranty does not extend to other ancillary and/or consumable products including but not limited to batteries, calibration sources, straps, and shipping cases. D-tect Systems, at its option, will at no charge either repair, replace, or refund the purchase price of any Products that do not conform with this warranty. Repair may include the replacement of parts with functionally equivalent reconditioned or new parts. Replacement may include providing a functionally equivalent Certified Reconditioned/Pre-owned or a new Product. Products that have been repaired or replaced are warranted for the balance of the original warranty period or for 90 days from the date that the repaired or replaced Product is received by you, whichever is longer. All Products for which replacements have been provided will become D-tect Systems property.

### 2. Other Warranty Conditions

This warranty is D-tect Systems' complete warranty for the Product. D-tect Systems assumes no obligation or liability for changes to this warranty unless made in writing and signed by an officer of D-tect Systems.

If D-tect Systems agrees to perform services requested and approved by the customer that are not included in either the Limited or Extended Warranty, these services will be billed to the customer at D-tect Systems' standard prices and terms.

D-tect Systems does not warrant any installation, maintenance, or service that it did not perform. SERVICE WORK PERFORMED BY SERVICE CENTERS NOT AUTHORIZED BY D-TECT SYSTEMS TO PERFORM SUCH WORK WILL VOID THIS WARRANTY.

### 3. What This Warranty Does Not Cover

a. Defects or damage resulting from: collision of the Product with hard surfaces, contact with water, rain or extreme humidity, contact with sand, dirt or the like, contact with extreme heat or cold, spills of food or liquid, improper testing, operation, maintenance, installation, adjustment; or any alteration or modification of any kind.

- b. Normal "wear and tear" of the Product such as scratches, scuffs, and marks on the LCD, case and other external features.
- c. Cracked or broken displays, buttons, or damage to other externally exposed parts caused by abnormal use and/or abuse of the Product.
- d. Products disassembled or repaired in such a manner as to adversely affect performance or prevent adequate inspection and testing to verify any warranty claim.
- e. Products on which serial numbers or date tags have been removed, altered or obliterated.

### 4. How to Get Warranty Service

To get warranty service, please contact your distributor or D-tect Systems at [www.dtectsystems.com](http://www.dtectsystems.com). You will receive directions on how to mail the Product to D-tect Systems. All Products shipped to D-tect Systems must be shipped with freight and insurance prepaid. Along with the Product you must include a receipt, bill of sale, or some other comparable proof of purchase, a written description of the problem and, most importantly, your address and telephone number. If additional information is needed, please contact D-tect Systems at the web address indicated above.

### 5. General Provisions

THIS IS THE COMPLETE WARRANTY FOR THIS PRODUCT BY D-TECT SYSTEMS AND SETS FORTH YOUR EXCLUSIVE REMEDIES. THIS WARRANTY IS GIVEN IN LIEU OF ALL OTHER EXPRESS WARRANTIES. IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE GIVEN ONLY IF SPECIFICALLY REQUIRED BY APPLICABLE LAW. OTHERWISE, THEY ARE SPECIFICALLY EXCLUDED. IN NO EVENT SHALL D-TECT SYSTEMS BE LIABLE FOR DAMAGES IN EXCESS OF THE PURCHASE PRICE OF THE PRODUCT OR FOR ANY INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PRODUCT, TO THE FULL EXTENT THESE DAMAGES MAY BE DISCLAIMED BY LAW.

### 6. Patent and Software Provisions

D-tect Systems will defend at its own expense, any suit brought against you to the extent that it is based on a claim that the Products infringe a United States patent. D-tect Systems will pay those costs and damages finally awarded against you in any such suit which is attributable to any such claim. The defense and payments by D-tect Systems are conditioned on the following: (a) that you will notify D-tect Systems promptly in writing any notice of the claim; and (b) that D-tect Systems will have sole control of the defense of the suit and all negotiations for its settlement or compromise; and (c) should the Products become, or in D-tect System's opinion be likely to become, the subject of a claim of infringement of a United States patent, that you will permit D-tect Systems, at its option and expense, either: to procure for you the right to continue using the Products or parts; to replace or modify them so that they become non-infringing; or to grant you a credit for such Products or parts as depreciated and accept their return.

The depreciation will be an equal amount per year over the lifetime of the Products, accessories, battery or parts as established by D-tect Systems.

D-tect Systems will have no liability to you with respect to any claim of patent infringement which is based upon the combination of the Products or parts furnished under this limited warranty with software, apparatus or devices not furnished by D-tect Systems. D-tect Systems will have no liability for the use of ancillary or peripheral equipment or software not furnished by D-tect Systems which is attached to or used in connection with the Products. The foregoing states the entire liability of D-tect Systems with respect to infringement of patents by the Products, accessories, batteries or any parts of them.

Laws in the United States and other countries preserve for D-tect Systems certain exclusive rights for copyrighted D-tect Systems software such as the exclusive rights to reproduce in copies and distribute copies of the D-tect Systems software. D-tect Systems software may be copied into, used in and redistributed with only the Products associated with such D-tect Systems software. No other use, including without limitation disassembly, of such D-tect Systems software or exercise of exclusive rights in such D-tect Systems software is permitted.

#### **7.State and Jurisdiction Law Rights**

Some states and jurisdictions do not allow limitation or exclusion of incidental or consequential damages, so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state or from one jurisdiction to another.

**D-tect Systems**  
11814 South Election Road,  
Suite 200Draper, UT 84020  
(801)495-2310

