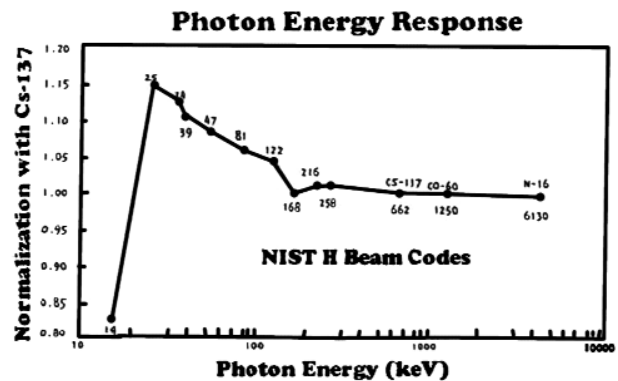
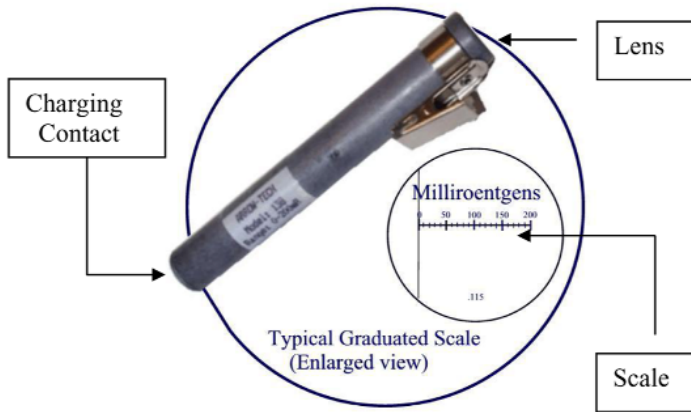


# DOSIMETERS, MONITORS & METERS

## DIRECT READING DOSIMETER



The Direct Reading Dosimeter is a pocket-size, carbon fiber electroscop with an ion chamber for detecting and indication of integrated exposure to gamma and x-ray radiation. It has a thin wall which permits the penetration and detection of radiation. A yearly calibration of the Direct Reading Dosimeter is recommended, and is generally consistent with good health physics practices. More frequent calibration may be necessary should the user's license require a shorter calibration interval.

The way to read a dosimeter is to point it at a light source so that you can look through it and see the scale. The conductive fiber moves across a very clear, well-marked scale that produces the reading. Because the dosimeter scale is linear, it is possible to determine the total amount of radiation exposure for any selected period of time by merely subtracting the reading taken at the end of the selected period. It is not necessary to recharge the dosimeter after each reading unless the instrument reads close to full scale.

These dosimeters use an extremely sensitive fiber electrometer type voltmeter and a small volume of air to measure the total amount of radiation to which the instrument has been exposed. A reading may be made at any time by looking at the light source through the eyepiece end of the instrument.

Dosimeters are extremely sensitive instruments. Although they are constructed for rugged use and have a protective sapphire window, they should receive the same care as a wristwatch. Since dosimeters are hermetically sealed at the factory, they cannot be repaired or adjusted in the field. Therefore, if the instrument malfunctions in any way it should be returned to the dealer.

Dosimeters may be maintained in operating condition simply by cleaning the eye piece lens and the charging switch insulator with water and a lint-free cloth that is free of grit.

**Do not use any alcohol-based products to clean the dosimeter.** Make sure the charging switch insulator is free of lint and moisture at all times.

**Caution: Do not insert any sharp objects into the charging switch recess or tamper with its parts in any way.**

### Specifications

- Radiation Detected:** Gamma and X-ray from 16 keV to 2 MeV
- Ranges:** 0-200 mR to 0-500 R
- Detector:** Fiber electrometer mounted in an electrically conductive plastic ion chamber
- Detector Housing:** Very low permeability plastics - hermetically sealed
- Accuracy:** Within  $\pm 10\%$  of true exposure
- Rate Response:** Dose rate independent for gamma and X-ray
- Electrical Leakage:** Less than 1% of full scale for 24 hours at 50°C
- Temperature Range:** -20°C to +50°C
- Relative Humidity:** Up to 90%
- Dimensions:** 0.6" Dia. x 4.5" (1.5 x 12.4 cm)
- Weight:** 1.0 oz (28.4 g)
- Finish:** Barrel and end caps are natural matte black with metal clips
- Shelf Life:** 20 years
- Warranty:** 2 year limited warranty
- Specifications:** ANSI N13.5 and ANSI N322-1997

Item	Description	Range
343-490	Direct Reading Dosimeter	0 - 200 mR
343-495	Direct Reading Dosimeter	0 - 2 mSv
343-500	Direct Reading Dosimeter	0 - 500 mR
343-505	Direct Reading Dosimeter	0 - 5 mSv
343-750	Battery Powered Dosimeter Charger	

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# DOSIMETERS, MONITORS & METERS

## 909B DOSIMETER CHARGER



The charger's LED reading light reduces re-zeroing time and effort by eliminating the need to remove the dosimeter from the charger for reading. Simply view the scale while the dosimeter is resting lightly on the charger contact after re-zeroing. Reading in the same orientation as charging also minimizes the effect that gravitational induced fiber movement has on dosimeter accuracy and precision. The 909B Dosimeter Charger charging contact is spring-loaded and has a positive mechanical stop. This design feature makes it virtually impossible to damage dosimeters through excessive charging force.

The patented "kick" feature found on the 909B Dosimeter Charger automatically removes residual static charge from the dosimeter's charging pin every time the dosimeter is re-zeroed. This eliminates a major source of erroneous fiber movement (up to 5% full scale).

### Specifications

**Weight:** 10.6 oz (302 g)  
**Size:** 4" L x 4" W x 3.5" H (10.2 x 10.2 x 8.9 cm)  
**Case:** ABS Plastic  
**Controls:** One turn potentiometer  
**Reading:** Spring-loaded push rod  
**Power:** 1.5V "AA" Batteries  
**Charging Voltage:** 40 V to 220 V  
**Operating Temperature:** 0° to 120°F (-18° to 49°C)  
**Lamp:** LED

Item #	Description
343-750	909B Dosimeter Charger

- Capable of charging any direct-reading dosimeter
- Conforms to ANSI N42.6-1980
- Operates on two 1.5 V "AA" batteries
- Has the ability to "kick" or remove all residual charge from dosimeters properly, preventing spurious upscale fiber movement
- LED Reading light to allow for easy charging/viewing
- Residual static charge removed for improved accuracy

Easier charging, viewing, dosimeter protection and improved accuracy are the biggest reasons the battery operated 909B Dosimeter Charger is the best value on the market today.

# DOSIMETERS, MONITORS & METERS

## PDM-122 ELECTRONIC POCKET DOSIMETER



- Light and compact to fit in a pocket
- Wide measurement range from 1 $\mu$ Sv to 10 Sv
- Accumulated dose and dose rate measuring
- Data holding function
- Simple operation of only one button

A highly sensitive, compact dosimeter to measure Gamma and X-rays. This direct-reading dosimeter displays an accumulated dose as well as dose rate and is suitable for measuring above 100kVp of X-ray tube voltage.

**Item 343-122 PDM-122 Electronic Pocket Dosimeter Includes** Main unit, Battery, Strap, Instruction manual, Calibration and Inspection certificate.

### Specifications

**Radiation Detected:** Gamma and X-ray

**Energy Threshold:** 40 KeV

**Detector:** Silicon Semiconductor

### Measurement Range:

**Dose:** 0.1 mrem - 1000 rem (1 $\mu$ Sv to 10 Sv)

**Dose Rate:** 0.1 mrem/h - 100 rem/h (1 $\mu$ Sv/h to 1Sv/h)

**Accuracy:** Within  $\pm$  10% 1 mrem - 1000 rem (10 $\mu$ Sv to 10 Sv; Calibrated by Cs-137 using slab phantom)

**Linearity:** Within  $\pm$  20% 1 mrem/h - 100 rem/h (10  $\mu$ Sv/h to 1Sv/h)

**Energy Dependence:** Within  $\pm$  30% from 50 keV - 1.5 MeV

**Display:** 4 digit LCD with unit and battery indications

**Switch:** Power on/off (including reset operation) and dose rate display

**Immunity:** 150V/m: 0.15MHz - 200MHz; 100v/M: 200MHz - 1000MHz (IEC61326-1:2006)

**Power:** One CRC2450 Lithium Battery (conforming to IEC60086-2)

**Battery Life:** Approx. 700 hrs of continuous use (at room temp 20°C)

**Environmental Requirements:** -10° to +50° C: relative humidity up to 90% non-condensing

**Dimensions:** 30 W x 11 D x 108 H mm excluding clip

**Weight:** 40 g

**Please Note:** Nonconforming battery may cause a malfunction of the instrument

Item #	Description
343-122	PDM-122 Electronic Pocket Dosimeter

## PDM-127 ELECTRONIC POCKET DOSIMETER



- Light and compact to fit in a pocket
- Wide measurement range from 1 $\mu$ Sv to 10 Sv
- Accumulated dose and dose rate measuring
- Data holding function
- Simple operation of only one button

A highly sensitive, compact dosimeter for measurement of gamma X-ray. With an energy threshold that goes down to 20 keV, it is best suited for applications in X-Ray. The PDM-127 displays both accumulated dose and dose rate.

**Item 343-127 PDM-127 Electronic Pocket Dosimeter Includes** Main unit, Battery, Strap, Instruction manual, Calibration and Inspection certificate.

### Specifications

**Radiation Detected:** Gamma and X-ray

**Energy Threshold:** 20 KeV

**Detector:** Silicon semiconductor

### Measurement Range:

**Dose:** 0.1 mrem - 100 rem (1 $\mu$ Sv to 1Sv)

**Dose Rate:** 0.1 mrem/h - 10 rem/h (1 $\mu$ Sv/h to 100mSv/h)

**Accuracy:** Within  $\pm$  10% 1 mrem - 100 rem (10  $\mu$ Sv to 1Sv; Calibrated by Am-241 using a slab phantom)

**Linearity:** Within  $\pm$  20% 1 mrem/h - 10 rem/h (10  $\mu$ Sv/h to 100 mSv/h)

**Energy Dependence:** Within  $\pm$  30% from 30 keV - 200 keV

**Display:** 4 digit LCD with unit and battery indications

**Switch:** Power on/off (including reset operation) and dose rate display

**Immunity:** 150V/m: 0.15MHz - 200MHz; 100v/M: 200MHz - 1000MHz (IEC61326-1:2006)

**Power:** One CRC2450 Lithium Battery (conforming to IEC60086-2)

**Battery Life:** Approx. 350 hrs of continuous use (at room temp 20°C)

**Environmental Requirements:** -10° to +50°C: relative humidity up to 90% non-condensing

**Dimensions:** 30 W x 11 D x 108 H mm excluding clip

**Weight:** 40 g

**Please Note:** Nonconforming battery may cause a malfunction of the instrument

Item #	Description
343-127	PDM-127 Electronic Pocket Dosimeter

# DOSIMETERS, MONITORS & METERS

## DMC 2000S - ELECTRONIC PERSONAL DOSIMETER

### Gamma



- Features display of dose, dose rate and programmable alarms
- The DMC 2000S is user friendly, lightweight and waterproof
- Can be used as a Stand-alone device or integrated into a dosimetry system
- Audible and visual alarms
- Large internal histogram memory
- Self-testing diagnostics (battery, detector and parameters)
- Hands-free communication, pass-by exchange an incident

### Specifications

**Display Units:** mrem, mSv or iSv

### Measurement Range:

**Dose:** 0.1 mrem to 1000 rem (1iSv to 10 Sv)

**Dose Rate:** 0.01 mrem/h to 1000 rem/h (0.1 iSv/h to 10 Sv/h)

**Display Rate:** 01 mSv/h to 10 Sv/h or 0.001 mSv/h to 10 Sv/h (extended option)

**Linearity:** < ± 20% up to 100 rem/h (1 Sv/h); < ± 30% up to 1000 rem/h (10 Sv/h)

**X and Gamma Energy Range:** 50keV to 6MeV

**Accuracy:** <± 10% (137Cs, ~ 25 mSv/h including ± 5% extended uncertainty K=2)

### Environmental:

**Temperature:** 14°F to 122°F (-10°C to 50°C)

**Humidity:** < 90% at 108°F (42°C)

**Storage:** -22°F to 160°F (-30°C to 71°C)

**Shock, Vibration, and Drop Resistant**

**Waterproof IP67**

**Power:** Standard calculator battery LiMnO2 CR2450, one year battery life (typical, 8 hrs/day in run mode)

**Dimensions:** 3.4" L x 1.9" W x 1.1" T (8.7 x 4.8 x 2.8 cm)

**Weight:** < 1.9 oz (56 g) with battery

**Worn by a Replacable Clip**

**EMC:** complies and exceeds standards by a large margin

Compliant to IEC 1283, ANSI 4220A

PTB approved version, compliant with IEC1526 ed2

Factory calibration approved under ISO/CEI 17025

The DMC 2000 Series Electronic Dosimeters are small, lightweight, cost effective personnel radiation monitoring devices. They are designed to be worn on the body and keep a live record of both dose and dose rate. The DMC 2000 Series Electronic Dosimeters are simple to use and have a top mounted LCD display.

The DMC 2000S - Personal Electronic Dosimeter - Gamma

The DMC 2000S features flat energy response to X-rays and gamma field from 50keV to 6Mev and linear response to dose rate fields from natural background up to more than 10 Sv/h. The pass-by data exchange feature gives unequal operational flexibility. In-motion reading allows dose management by sub-zone as well as real-time location tracking of personnel.

Item #	Description
343-2000	DMC 2000S Electronic Personal Dosimeter

## DMC 2000X - ELECTRONIC PERSONAL DOSIMETERS

### Low-Energy X-Ray and Gamma



- X-ray and Gamma detection dosimeter
- Featuring dose rate and programmable alarms
- User friendly, lightweight and waterresistant.
- Can be used in autonomous mode or integrated into a dosimetry system
- Audible and visual alarms
- Detection active self-test
- High autonomy
- Integrated history
- Hand free communiation, pass-by data exchange
- Compact, rugged, economical

### Specifications

**Display units:** mrem, mSv or iSv

### Measurement Range

**Dose:** 0.1 mrem to 10 rem (1 iSv to 10 Sv)

**Dose Rate:** 0.01 mrem/h to 1000 rem/h (0.1 iSv/h to 10Sv/h)

**Display Rate:** 0.01 mSv/h to 10 Sv/h or 0.001 mSv/h to 10 Sv/h (extended option)

**Linearity:** < ± 20% up to 100 rem/h (1Sv/h); < ± 30% up to 1000 rem/h (10Sv/h)

**X and Gamma Energy Range:** 20 keV to 6 MeV

**Accuracy:** < ± 10% (Cs-137, 30 mrSv/h, including ± 5% ) of extended uncertainty K=2)

### Environmental

**Temperature:** 14°F to 122°F (-10°C to 50°C)

**Humidity:** < 90% at 108°F (42°C)

**Storage:** -22°F to 160°F (-30°C to 71°C)

**Shock, Vibration, and Drop Resistant**

**Water Resistant IP 42**

**Power:** LiMnO2 CR2450 battery: battery life > 9 months (8 hrs/day in run mode)

**Dimensions:** 3.4" L x 1.9" W x 1.1" T (8.7 x 4.8 x 2.8 cm)

**Weight:** < 2 oz (59 g) with battery

**Worn by a Replacable Clip**

**EMC:** complies and exceeds CE standards by a large margin

Compliant to IEC 1283, ANSI 4220A

PTB approved

The DMC 2000X is perfect for radiation monitoring in a medical environment (radiology, nuclear medicine). It features excellent response to Gamma and low energy XRay radiation. The best applications for the DMC 2000X is for personnel in Nuclear Medicine, Radiology and Lab Personnel.

For operational dosimetry in medical environment (radiology, nuclear medicine,...), the DMC-2000X has become the reference due to the quality of its response to X and Gamma radiations associated with its real immunity to electromagnetic fields. The DMC-2000X is also the best choice for industrial operators working with ionizing sources, and in certain cases for the nuclear industry or civil defense.

Item #	Description
343-2005	DMC 2000X Electronic Personal Dosimeter

# DOSIMETERS, MONITORS & METERS

## DMC 2000XB - ELECTRONIC PERSONAL DOSIMETER



- X and gamma: 20 keV to 6 MeV
- $\beta$ :  $E_{\text{mean}} > 60$  keV
- Can be used in autonomous mode (stand alone device) or integrated into a dosimetry system
- Tracking by RCA or sub-zone
- Audible and visual alarms
- Self-testing (battery, detector and parameters)
- Remote dosimetry can be used as an area monitor
- Backwards compatible with previous MGPI equipment
- Internal memory "Histogram"
- Uses standard calculator battery with one year (2000 hrs) life

The DMC 2000XB simultaneously measures, stores and displays both deep dose equivalent Hp(10) and shallow dose equivalent Hp(0.07). It features a flat response over all practical X-rays and gamma rays range and a unique beta range, down to the theoretical limit of penetration, including Co60 beta, major threat in plants. The units top mounted LCD clearly displays dose or dose rate for shallow or deep dose equivalent.

### Applications

- Operational dosimetry for commercial, research, civil and defense personnel working w/ionizing radiation source.
- Operational dosimetry of medical personnel during X-rays monitoring and isotopic preparations
- The Histogram enables events to be reconstructed in detail, allowing the circumstances surrounding incident situations to be analyzed
- In motion reading allows dose management by sub-zone, as well as real-time location tracking of personnel, all without placing any restrictions on the dosimeter wearer

### Specifications

#### Measurement Range

- Dose:** 0.1 mrem to 1000 rem (1  $\mu$ Sv to 10Sv)
- Rate:** 0.01 mrem/h to 1000 rem/h (0.1  $\mu$ Sv/h to 10Sv/h)
- Linearity:**  $< \pm 10\%$  up to 100 rem/h (1Sv/h)  
 $< \pm 25\%$  up to 1000 mrem/h (10Sv/h) for X and gamma  $> 60$  keV
- Energy Response:** X and Gamma from 20 keV to 6 MeV
- Accuracy:**  $< \pm 5\%$  (Cs 137, 20 mrem/h; 0.2 mSv/h)

#### Environmental

- Temperature:** 14°F to 122°F (-10°C to 50°C)
- Humidity:**  $< 90\%$  at 108°F (42°C)
- Storage:** -22°F to 160°F (-30°C to 71°C)
- Shock, Vibration, and Drop Resistant**
- Waterproof**

**Dimensions:** 3.3" L x 1.9" W x 0.7" T (8.3 x 4.8 x 1.7 cm)

**Weight:**  $< 2.5$  oz with battery

**Worn by detachable clip**

Item #	Description
343-2010	Personal Electronic Dosimeter - DMC 2000XB

## DOSIMETER READER - LDM 220



### Features

- No directional alignment required
- Indicator lamps for operation and access control
- Manageable digital inputs/outputs
- DSP based digital process
- Compatible with DMC 2000S, DMC 2000X, DMC 2000XB
- Compatible with DosiMass, DosiMed, and DosiFast operating software

The LDM 220 Dosimeter Reader is a wireless interface reader for the DMC 2000 family of electronic dosimeters. The LDM 220 Reader operates using a software package installed on your computer and communicates with the dosimeters in a pass-by data exchange mode.

### Specifications:

- Length:** 70 mm
- Width:** 80 mm
- Thickness:** 32 mm
- Weight:** 120 g
- Electrical Characteristics:**
  - Self-powered through USB port
  - EMC: Complies with and exceeds CE standards
- Operating Temperature:** 0 C to +50 C
- Storage Temperature:** -10 C to +60 C
- Humidity:** 90% RH (without condensation)
- Nominal Range:** Between 20 cm and 30 cm
- Reduced Range Setting:** Between 5 cm and 20 cm



Item #	Description
343-2020	Dosimeter Reader - LDM 220



# DOSIMETERS, MONITORS & METERS

## RAD-60 PERSONAL ELECTRONIC DOSIMETER



- Gamma and X-Ray Detected from 60 keV to 6 MeV
- Individual Personal Alarming Dosimeter
- Digital Display for Integrated Dose or Alternatively Dose Rate
- User Selectable Alarm Levels for both Dose and Dose Rate

With a push of a button you can:

- Turn the unit on/off
- Change the digital display to read dose or dose rate
- Select from several Dose and Dose Rate Alarm levels
- Turn the Chirp function on/off
- Reset Integrated Dose
- Perform a Battery Test

The RAD-60 Personal Electronic Dosimeter is a precise and reliable instrument for ensuring the personal safety of the user. Ideally, the RAD-60 is used in everyday radiation monitoring, in stand-alone conditions. If your needs grow for a more sophisticated system, the versatile RAD-60 can also be integrated into an Access Control System. The RAD-60 can be switched into System Mode, for the purpose of tracking Personnel Dose records and generating compliance reports. The design includes state-of-the-art technology with built in memory for retrieving dose, even during power-down. It eliminates outside interference from shock and RF. The RAD-60 is easily programmed by the user, has a digital display, and operates with a single AAA alkaline battery.

This small, lightweight unit can accompany the user anywhere recording the accumulated dose constantly and reliably all the time. The pre-settable alarms alert the user when exposure limits are being exceeded.

The most important working parameters are stored in non-volatile EEPROM memory securing vital information even in power down situations. The RAD-60 is battery-operated and utilizes a single standard AAA size alkaline cell. The smooth and ergonomic design of RAD-60 casing is splash-proof and easy to decontaminate.

### Specifications

**Radiation Detected:** Gamma and X-Ray

**Detector Type:** Energy-Compensated Si-Diode

#### Measurement Range

Dose: 1 microSv - 9.99 Sv or 0.1 mrem-999 rem

Dose Rate: 5 microSv/h - 3 Sv/h or 0.5 mrem/h - 300 rem/h

**Calibrations:** Better than  $\pm 5\%$  (Cs137, 662 keV at 2 mSc/h), Hp(10)

**Energy Response:** Hp(10), 60 keV - 3 MeV, better than  $\pm 25\%$ , up to 6 MeV, better than  $\pm 35\%$

**Dose Rate Linearity:** Better than  $\pm 15\%$ , up to 3 Sv/h (300 rem/h)

**Audible Alarms:** Seven separate alarms, sound level typically better than 85 dBA at 30 cm

Integrated dose

Dose rate

Dose overflow

Dose rate overflow at 3 Sv/h or 300 rem/h

Low battery 1 and 2

Defect

**Alarm Thresholds:** Six preset values each for integrated dose and dose rate, manually selectable.

**Power Supply:** One triple-A alkaline cell, life typically 1800 hrs in background field (dose mode)

**Reader Communication:** By infrared through bottom part; by using ADR-1 Reader Head in combination with RASDOS PC Software

**Push-Button functions:** Front panel push-button has the following selectable functions

Change display priority (dose/dose rate)

Switch ON/OFF

Chirp ON/OFF

Reset Integrated Dose

Change Alarm Thresholds

Activate Battery Test

**Temperature Range:** -20 to +50°C operational, humidity up to 90% RH, noncondensed; -20 to +70°C storing

**Dimensions:** 3.06" x 2.63" x 0.86" (78 x 67 x 22 mm)

**Weight:** 2.82 oz (80 g) including battery

**Note:** The active alarm thresholds and configurations of push button functions can be changed by using ADR-1 Reader in combination with RADOS PC software.

Item #	Description
343-600	RAD-60 Personal Electronic Dosimeter

# DOSIMETERS, MONITORS & METERS

## ADR-1 / 60 READER FOR RAD-60 DOSIMETERS



With the ADR-1/60 Reader for RAD-60 Dosimeters the user can:

- Change Dosimeter Settings
- Perform Calibration
- Assign Dosimeters
- Assign a User ID and Name

ADR-1/60 Reader for RAD-60 Dosimeters Includes:

- ADR-1 Reader
- Configuration Software
- Manual

The Reader connects to any PC via 9 Pin Serial port.

The configuration window is presented in the figure above. The window displays the configuration information of the dosimeter. You can change the configuration to meet the users requirements by choosing the options you want to include in the dosimeter.

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Item #	Description
343-605	ADR-1/60 Reader for RAD-60 Dosimeters

# DOSIMETERS, MONITORS & METERS

## PRIMALERT™ DIGITAL AREA MONITORS



- LED digital display
- Low and high alarm indicators
- Programmable alarm indicators
- Optional remote
- Detector fail indicator
- Battery backup
- Data output / RS-232
- Two configurations available with internal energy compensated GM detectors
- CE tested. Meets applicable standards

### Features

- Simple installation and setup
- Anti-jam circuitry prevents erroneous readings at tube saturation
- Calibration controls easily accessed through front panel

The Primalert Digital Area Monitors are completely self-contained units with energy compensated GM detectors, AC powered with internal battery backup and have both low and high setting alarms. An optional remote alarm is available for added security.

The Primalert Digital Area Monitors can be used wherever there is a need to detect and warn personnel of increasing radiation levels and to control the exposure of personnel to gamma radiation.

### Specifications

#### Internal GM Detector Range:

**Item 337-443:** 0.1 mR/hr to 1 R/hr

**Item 337-444:** 1 mR/hr to 4 R/hr

**Display:** 4 digit LED display with 0.8 in (2 cm) character height

**Display Range:** 000.0 to 9999

**Display Units:** Can be made to display in  $\mu$ R/hr, mR/hr, R/h,  $\mu$ Sv/h, mSv/h, Sv/h, cpm, cps and others

**Linearity:** Reading within  $\pm$  10% of true value with detector connected

**Response:** Typically 3 seconds from 10% to 90% of final reading

**Status:** (green light) Indicates the instrument is functioning properly

**Low Alarm:** Indicated by a yellow light and slow beep (1 per sec) audible tone (can be set at any point from 0.0 to 9999)

**High Alarm:** Indicated by a red light and fast beep (4 per sec) audible tone (can be set at any point from 0.0 to 9999)

**Note:** Audible indicators can be configured as a single beep if desired.

**Detector Fail:** (red light and audible tone: > 68 dB at 2 ft) Indicates detector overload, no count from detector, or instrument failure

**Low Battery:** (yellow) Indicates < 2 hours of battery power remaining

**Calibration Controls:** Accessible from front of instrument (protective cover provided)

**High Voltage:** Adjustable from 200 to 2500 V

**Threshold:** Adjustable from 2 to 100 mV

**Dead Time:** Adjustable to compensate for dead time of the detector and electronics (can be read on the display)

**Overload:** Senses detector saturation (indicated by display reading "OL")

**Overrange:** Indicates the radiation field being measured has exceeded the counting range of the instrument (indicated by display reading "- - -")

**Data Output:** 9 pin connector providing 5 decade log output, RS-232 output, signal ground connection, FAIL and Alarm signals (current sink), and direct connection to battery and ground

**Power Requirements:** 95 to 135 VAC, 50 to 60 Hz single phase (<100 mA), 6V sealed lead acid rechargeable battery (built-in)

**Battery Life:** Typically 48 hours in non-alarm condition, 12 hours in alarm condition

**Battery Charger:** Battery is continuously trickle charged when instrument is connected to line power and turned on

**Construction:** Aluminum housing with white polyurethane enamel paint

**Temperature Range:** -4° to 122° F (-20° to 50° C). May be certified for operation from -40° to 150° F (-40 to 65° C)

**Size:** 9.7" W x 2.5" D x 7.4" H

**Weight:** 6.5 lb

#### Optional Remote Display

**Status:** (green light) Indicates the instrument is functioning properly

**High Alarm:** (red LED) Indicates the radiation level exceeds the high alarm point

**Detector Fail:** (red LED) Indicates detector overload, no count from detector, or instrument failure

**Audio:** Unimorph type with ON/OFF switch (> 68 dB at 2 ft)

**Power Requirements:** Provided by PRIMALERT (20 ft cable included)

**Construction:** Aluminum housing with ivory polyurethane enamel paint

**Temperature Range:** -4° to 122° F (-20° to 50° C)

**Size:** 6" W x 2" D x 7" H

**Weight:** 1.5 lb



Item #	Description
337-443	Primalert™ Dig. Area Monitor (0.1 mR/hr to 1R/hr GM Detector)
337-444	Primalert™ Dig. Area Monitor (1 mR/hr to 4 R/hr GM Detector)
337-446	Optional Remote Display



# DOSIMETERS, MONITORS & METERS

## RADIATION AREA MONITOR SYSTEM, MODEL 375/2



337-100



337-106

- **Affordable Area Monitor**
- **1 $\mu$ Sv/h-10 mS/h (0.1 mR/hr-1 R/hr)**
- **Integrated Design**
- **Built-in Rechargeable Backup Battery Backup**
- **Networkable**
- **Audio & Visual Alarms and Indicators**
- **Audible Alarm may be disabled**
- **4-Digit LED display**
- **Alarm level may be preset in 0.1 mR/h increments**

The Model 375/2 Digital Wall-Mount Area Monitor is designed for visibility and ease of use. This monitor incorporates an internally housed energy compensated GM detector with a dual range digital display from 1 $\mu$ Sv/h-10 mS/h (0.1 mR/hr-1 R/hr). The monitor features audible and visual alarms, low alarm and high alarm indicators, alarm setpoint adjustability over the entire range, and self diagnostic functions such as low battery, overrange, detector saturation and detector failure conditions. It features a wall-mount chassis and a four-digit LED display that is readable from 30' (9 m) away. It is designed to operate continuously from an AC power line. In the event of power failure, the built-in, continuously trickle charged sealed lead acid battery automatically switches in to begin supplying power immediately; assuring interruption-free operation at all times. The backlit indicators warn of low radiation (yellow), high radiation (red), instrument failure (red), and low battery (yellow), along with an alarm. A green status light is a positive indication of instrument operation.

A flashing red light with 180° visibility and a red LED indicator next to the digital display provide the visual alarm. The audible alarm (which may be disabled with a switch) consists of a single short beep at the beginning of the alarm mode. Optional features include SI units and 220 V operation.

Parameters are protected under a calibration cover. Calibration is easily accomplished by moving the cal dipswitch to the right, and using the pushbuttons to increment or decrement the calibration constant, dead time correction, and alarm point parameters. Parameters are stored in non-volatile memory (retained even with power disconnected). A five-decade logarithmic analog output is provided. A battery backup provides 48 hours of additional use after the primary power is removed

With the addition of the optional Remote Alarm, Item 337-105 or 337-106, the Model 375/2 can be used to provide continuous monitoring of (normal) background radiation in radioactive material preparation and work areas (ie. Nuclear Medicine Hot Labs). The system can also be used for monitoring of Teletherapy (Cobalt) Treatment rooms, notifying personnel that the source is exposed and in-use.

### Remote Alarm (Item 337-105 or 337-106)

The optional Remote Alarm unit duplicates the alarm indication functions of the main unit at a remote location up to 1000 feet. It features a green status light, a red light for high alarm, and Sonalert for audible alarm with a disable switch. The remote unit is powered by the monitor and available with either a 20 ft or 50 ft cable.

### Specifications:

#### Item 337-100 Radiation Therapy Area Monitor, Model 375/2

**Indicated Use:** General purpose area monitor

**Detection Range:** 0.1 mR/hr to 999.9 mR/h

**Detector:** Internally mounted energy compensated GM

**Display:** Four- digit LED, 0.8" H (2 cm) digits

**Alarm:** May be preset in 0.1 mR/h (1  $\mu$ Sv) increments

**Visual:** Red light

**Audio:** Sonalert, single beep, may be disabled

**Data Output:** Nine-pin connector providing five-decade logarithmic output, RS-232 output, signal ground connection, FAIL, and ALARM signals (current sink), and direct connection to battery and ground

**Calibration Controls:** Accessible from front of instrument (protective cover provided)

**Power:** 95-135 Vac, 50-60 Hz single phase

**Battery:** Built-in 6-volt rechargeable battery

**Battery Life:** Typically 48 hours in non-alarm condition; 12 hours in alarm condition

**Battery Charger:** Battery is continuously trickle charged when instrument is connected to line power and turned on

**Construction:** Wall mount aluminum housing with ivory powder coat paint

**Size:** 7.4" H x 9.7" W x 2.5" D (18.7 x 24.6 x 6.4 cm)

**Weight:** 6.5 lb (2.9 kg)

### Remote Alarm (Item 337-106)

**Indicated Use:** Remote display/annunciator for the Model 375 Digital Area Monitors

**Audio:** Sonalert-type speaker with enable/disable switch (greater than 68 dB at 0.61 m [2 ft])

**Radiation Readout Display:** None

**Status Indicators:**

**Status OK:** Green LED

**High Alarm:** Red LED

**Det Fail:** Red LED

**Controls: Audio:** ON/OFF

**Power Supplied By:** Model 375/2 instrument

**Construction:** Aluminum with powder coat finish

**Temperature Range:** -4 to 122°F (-20 to 50°C), may be certified to operate from -40 to 150°F (-40 to 65°C)

**Size:** 7" H x 6" W x 2"D (17.8 x 15.1 x 5.1 cm)

**Weight:** 1.5 lb (0.7 kg)

Item #	Description
337-100	Radiation Therapy Area Monitor - GM Tube
337-105	Remote Alarm Unit with 20' (6.1 m) Cable
337-106	Remote Alarm Unit with 50' (15.24 m) Cable

N

## RADIATION AREA MONITOR SYSTEM, MODEL 7008RT



337-110 and 337-112

- Built-in rechargeable back-up battery
- Radiation rate indicated on an 8-digit LCD display
- Alarm level may be preset in 0.1 mR/h increments
- Visual and audible alarm indication
- Audible alarm may be disabled

### Item 337-110

#### Radiation Area Monitor - Internal Solid State Detector

The Radiation Area Monitor, Model 7008RT is a wall-mounted radiation monitor designed to meet the specific needs of radiation therapy. It is designed to operate continuously from an AC power line. In the event of power failure, the built-in, continuously trickle charged NiMH battery automatically switches in to begin supplying power immediately, assuring interruption-free operation at all times. The monitor features a digital display of radiation rate, audible and visual alarms, and alarm indicator, alarm setpoint adjustability over the entire range, and self diagnostic functions such as low battery, overrange, detector saturation and detector failure conditions. A green status light is a positive indication of normal instrument operation.

A flashing red light with 180° visibility and a red LED indicator below the digital display provide the visual alarm. The audible alarm (which may be disabled with a switch) consists of a single short beep at the beginning of the alarm mode. Optional features include SI units.

### Item 337-111 and 337-112 Remote Alarm

The optional Remote Alarm unit duplicates the alarm indication functions of the main unit. It features a green status light, a red light for high alarm, and Sonalert for audible alarm with a disable switch. Item 337-111 is supplied with a 100' (30.5 m) cable and Item 337-112 is supplied with a 50' (15.25 m) cable. An optional 100' (30.5 m) cable is available if additional cable length is needed.

### Specifications

#### Item 337-110 Radiation Area Monitor - Internal Solid State Detector

**Detector:** Internal solid state detector

**Display:** 8 digit, 12 mm high (0.5 in) LCD

**Range:** 0.1 to 999.9 mR/h (1 to 9999  $\mu$ Sv optional)

**Alarm:** May be preset in 0.1 mR/h (1  $\mu$ Sv) increments

**Visual:** Red light

**Audio:** Sonalert, single beep, may be disabled

**Battery:** Built-in rechargeable NiMH battery supplies 48 hours of non-alarm use under line power failure conditions. Low battery yellow LED on front panel

**Power:** 95 – 230 VAC, 50/60 Hz

**Dimensions:** 7.6" x 4.5" x 2.7" (19.4 x 11.5 x 6.8 cm)

**Weight:** 1.5 lb (0.7 kg)

### Item 337-111 and 337-112 Remote Alarm

**Alarm:** Red lamp indicates, Sonalert provides audio for alarm and failure, toggle switch disables audio

**Status OK:** Green light indicates correct monitor operation

**Power:** 95 – 230 VAC, 50/60 Hz, 12 VDC from main unit

**Cable:** 50' (15.25 m) or 100' (30.5 m) length cable

**Dimensions:** 7.6" x 4.5" x 2.7" (19.4 x 11.5 x 6.8 cm)

**Weight:** 1.0 lb (0.5 kg)

Item #	Description
337-110	Radiation Area Monitor, Model 7008 RT
337-111	Remote Alarm Unit with 100' (30.5 m) Cable
337-112	Remote Alarm Unit with 50' (15.25 m) Cable
337-113	100' (30.5 m) Cable for 337-111 or 337-112

N

# DOSIMETERS, MONITORS & METERS

## PRIMALERT™ 35 AREA RADIATION MONITOR



Fail-safe operation is assured by a light which continuously indicates background radiation and provides visual proof that the unit is functioning. The monitor will not jam or show false readings in high radiation fields.

The PRIMALERT™ 35 contains an energy-compensated GM detector, and features a convenient automatic alarm reset.

An optional PRIMALARM™ Remote Alarm (Item 337-138) provides the same audible and visible signals as the PRIMALERT™ 35, up to 100 feet from the monitor. The PRIMALARM™ allows personnel located away from the radiation area to be alerted the instant the preset radiation limits have been exceeded.

### Item 337-137 Includes

- PRIMALERT™ 35 Monitor
- Self-Stick Wall-Mounting Bracket
- AC Adapter/Power Converter
- Informational CD
- Calibration Report

### Additional Items Sold Separately

- PRIMALARM™ Remote Alarm (Item 337-138)
- Emergency Power Line Operated PRIMAPAK™ II Battery Back-up (Item 337-140)
- Check Source (Item 337-141)

### Specifications

**Power:** Line operated with UL listed converter: 100-240 VAC, 50-60 Hz to 12VDC, 0.5 Amp

**Size:** 3.5" W x 6" H x 1.5" T (9 x 15 x 4 cm)

**Weight:** 2 lb (1 kg)



Item #	Description
337-137	PRIMALERT™ 35 Area Radiation Monitor with AC Adapter

N

- **Calibrated**
- **Monitor for Radioactive Material**
- **Compact**
- **Lightweight**
- **Optional PRIMALARM™ Remote Alarm**

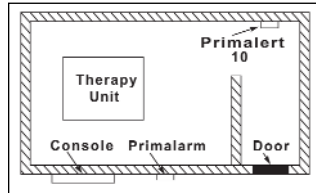
The PRIMALERT™ 35 assures reliable, continuous monitoring wherever radioactive materials are present. It displays the radiation level in bright color-coded lights, and it emits audible and/or visible signals whenever the gamma radiation exceeds a user-preset alarm level.

Six range indicators (1, 2, 4, 8, 16 and 32 mR/hr) clearly display an increase or decrease in radiation levels. The alarm can be set at any of the six levels by a front-panel, screwdriver-adjustable control. The light for each level goes on when the radiation intensity reaches that level and goes out when the rate drops below the level. This permits instant radiation-level recognition not readily distinguishable on meter-type instruments.

When the preset level is exceeded, personnel are alerted by bright flashing red lights (visible over a 180° field) and a loud intermittent audio signal. The alarms stop automatically when the radiation level falls below the preset value. A front-panel switch permits the selection of both the visible and audible alarms or just the visible alarm.

# DOSIMETERS, MONITORS & METERS

## PRIMALERT™ 10 RADIATION MONITOR



- **Calibrated**
- **Monitor for Treatment Room**
- **Flashing Light Indicates Source is Exposed**
- **Optional Line Operated Emergency Battery Back-Up**

The NRC requires that every teletherapy room have a permanently-mounted, continuous, radiation monitoring device with an emergency back-up battery power source. The PRIMALERT™ 10 with a PRIMAPAK™ II Battery Back-Up (Item 337-140), meets this requirement.

The PRIMALERT™ 10 is a compact monitor that responds to scatter radiation and can be mounted anywhere in the teletherapy room. A pair of bright red lamps on the instrument face flash a warning when the source is exposed and continues to flash until safe conditions are re-established.

The PRIMALERT™ 10 is a compact monitor that responds to scatter radiation and can be mounted anywhere in the teletherapy room. A pair of bright red lamps on the instrument face flash a warning when the source is exposed and continues to flash until safe conditions are re-established.

The flashing green "Operation Indicator" light continuously monitors the background radiation and provides visible indication that the instrument is functioning.

The range of the PRIMALERT™ 10 may be modified from 2.5/20 mR/h which is the standard for the range switch LOW and HIGH positions. The customer can make the modification to provide any of the following two range positions: 2.5, 5, 10, 20 or 40 mR/h.

An optional PRIMALARM™ Remote Alarm (Item 337-138) provides the same audible and visible signals as the PRIMALERT™ 10, up to 100 feet from the monitor. The PRIMALARM™ allows personnel located away from the radiation area to be alerted the instant the preset radiation limits have been exceeded.

### Item 337-139 Includes

- PRIMALERT™ 10 Monitor
- Self-Stick Wall-Mounting Bracket
- AC Adapter/Power Converter
- Informational CD
- Calibration Report

### Additional Items Sold Separately

- PRIMALARM™ Remote Alarm (Item 337-138)
- Emergency Power Line Operated PRIMAPAK™ II Battery Back-up (Item 337-140)
- Check Source (Item 337-141)

### Specifications

**Detector:** Energy compensated GM tube

**Accuracy:** ±20% from 60 KeV to 2 MeV

**Alarm Trip Level:** Switch-selectable at 2.5 or 20 mR/hr

**Alarm:** Two flashing red lamps with 180° field of view, alarm ceases when radiation falls below trip level

**Power:** Line-operated with UL listed converter: 100-240 VAC, 50-60 Hz to 12 VDC, 0.5 Amp

**Size:** 3.5" W x 6" H x 1.5" T (9 x 15 x 4 cm)

**Net Weight:** 2 lb (1 kg)



Item #	Description
337-139	PRIMALERT™ 10 Radiation Monitor with AC Adapter

N

# DOSIMETERS, MONITORS & METERS

## PRIMALARM™ REMOTE ALARM



Mounts up to 100' (30.5 m) away  
from either PRIMALERT™ 35 or PRIMALERT™ 10

The PRIMALARM™ also serves as an additional safeguard because it will flash if power to the PRIMALERT™ Monitors (Item 337-137 or Item 337-139) is lost or if the cable from the latter is disconnected. The PRIMALARM™ Remote Alarm is ideal for mounting outside the therapy room entrance.

### Item 337-138 Includes

- PRIMALARM™
- Self-Stick Wall-Mounting Bracket
- AC Adapter/Power Converter
- 100' (30.5 M) Cable
- Informational CD

### Additional Items Sold Separately

- PRIMALERT™ 35 Area Radiation Monitor (Item 337-137)
- PRIMALERT™ 10 Radiation Monitor (Item 337-139)
- Emergency Power Line Operated PRIMAPAK™ II Battery Back-up (Item 337-140)

### Specifications

**Alarm Trip Level:** Controlled by PRIMALERT™ Monitor

**Alarms:** Two flashing red lamps with a 180° field of view. The aural alarm is switch-selectable.

**Power:** Line operated with UL listed converter: 100-240 VAC, 50-60 Hz to 12VDC, 0.5 Amp. Can also be powered by Item 337-140 PRIMAPAK™ II.

**Dimensions:** 3.5" W x 6" H x 1.5" T (9 x 15 x 4 cm)

**Weight:** 1 lb (0.5 kg)



Item #	Description
337-138	PRIMALARM™ Remote Alarm with AC Adapter

## PRIMAPAK™ II BATTERY BACK-UP



PRIMAPAK™ II consists of rechargeable gel cells and circuitry that switches any PRIMALERT™ Monitor to battery operation if line power is lost. When AC is present, the battery is automatically recharged. Fully charged cells provide about eight hours of operation under alarm conditions or more than 32 hours of quiescent, no-alarm operation.

### This unit works with the following instruments

- Item 337-137 PRIMALERT™ 35 Radiation Monitor
- Item 337-138 PRIMALARM™ Remote Alarm
- Item 337-139 PRIMALERT™ 10 Radiation Monitor.

### Item 337-140 Includes

- PRIMAPAK™ II
- Specify AC Adapter/Power Converter
  - USA/Japan: 110 VAC 12 VDC 500 mA
  - Europe: 230 VAC 12 VDC 500 mA
  - UK: 230 VAC 12 VDC 580 mA
  - Australia: 230 VAC 12 VDC 580 mA
- Interconnect Cable
- Informational CD

### Specifications

**Power:** Line operated with UL listed converter: 100-240 VAC, 50-60 Hz to 12VDC, 1 Amp

**Size:** 4.5" W x 6" H x 2.75" T (11.5 x 15.25 x 7 cm)

**Weight:** 4.5 lb (2 kg)



Item #	Description
337-140	PRIMAPAK™ II Battery Back-Up with AC Adapter

Specify AC Adapter/Power Converter



## RAD ALERT 200 AREA MONITOR



- Displays Integrated Time, Dose Rate, Integrated Dose
- Dual Independent Trigger Levels
- Linear Range 1-30,000 mR/hr
- Audible Buzzer with Adjustable Volume
- NiMH AA Battery Backup with Trickle Charge

### Item 337-210 RAD ALERT 200 Area Monitor Includes

- RAD ALERT 200 Area Monitor
- Remote Alarm and Battery Backup
- 100' (30 m) Cable
- 12 VDC Universal Power Supply

RAD ALERT 200 is the next generation area monitor that includes a built in GM Gamma detector for monitoring rooms where radio nuclides may be present or where devices producing radiation may be located. This unit includes separate panels to display exposure rate (mR/hr), total integrated exposure (mR) and total exposure time on a remote alarm that is tethered to the primary alarm. The primary alarm includes a digital timer that counts time when radiation is present and a room door is open. This feature can be useful for routing patient safety QA or as a stopwatch in the event of an emergency. The monitor has a backup powered by either rechargeable NiMH or alkaline AA batteries. The rechargeable batteries are maintained on a trickle charge. The detector unit has an adjustable trigger level with the level displayed on a digital display. The slave unit contains an audible buzzer with an adjustable volume control that can be turned on or off with a switch mounted on the side of the unit. A separate dose trigger is also included that can be set by the user. When the dose exceeds this level a separate yellow light turns on.

### Specifications

#### RAD ALERT 200

**Indicated Use:** Radiation area monitoring

**Internal Detector:** Dual Halogen quenched GM detector. Basic sensitivity 100 cpm/mR/hr (Cs-137) Internal Operating Voltage 550 VDC

**Internal GM Detector Range:** 0.5 mR/hr to 30,000 mR/hr (utilizes 2 separate GM Tubes) Internal Detector

**Display:** 4 digit LCD display with 0.4" (1 cm) character height; Emergency counter 8 digit LED display with 0.8" (2 cm) character height

**Display Range:** 000.0 to 200

**Display Units:** mR/hr

**Range:** 0-1,000,000 sec, 1-30,000 mR/hr

**Resolution:** 1 sec

**Linearity:** Reading within  $\pm 10\%$  of true value with detector connected

**Sensitivity:** Adjustable 1-100 mR/hr. User can adjust sensitivity via a small hole in the side of the unit. Trip level can be monitored by a digital display on the front of the unit.

**Response:** Typically 1 second from onset of radiation

**Calibration Controls:** Accessible from potentiometer on side of unit

**Status:** Green light indicates the instrument is functioning properly and power is on

**Alarm:** Indicated by a flashing red light and audible buzzer

**Dead Time:** <10% at max exposure rate

**Data Output:** Current sink and direct connection to battery and ground

**Operating Voltage:** 12VDC, 450mA

**Power Requirements:** 12 VDC universal adaptor may be plugged into either main detector unit or remote alarm

**Battery:** Indicated by red LED, 8 AA NiMH on trickle charge in remote station

**Battery Backup:** 8 AA (NiMH or Alkaline) batteries

**Battery Charger:** Battery is continuously trickle charged when instrument is connected to line power

**Battery Life:** 7-9 hours

**Construction:** ABS Plastic Enclosure

**Temperature Range:** 0° to 130°F (- 18° to 54°C)

**Size:** 4.4" W x 2.4" D x 8.5" H (11.2 x 6.1 x 21.6 cm)

**Cable Length:** 50-100'

**Wall Mounting:** #6 screw, 4/unit

**Weight:** 6.5 lb (2.3 kg)

#### Remote Station

**Indicated Use:** Remote display for RAD ALERT 100 and 200

**Status:** Green light indicates the instrument is functioning properly and power is on

**Alarm:** Flashing LED indicates the radiation level exceeds the alarm point; flashing yellow LED indicates exposure rate has exceeded the high alarm level.

**Detector Fail:** Indicated by red LED

**Audio:** Piezo Buzzer type with ON/OFF switch and adjustable volume

**Power Requirements:** 12 VDC universal adaptor

**Construction:** ABS Plastic Enclosure

**Temperature Range:** 0° to 130°F (- 18° to 54°C).

**Size:** 9.5" W x 2.5" D x 6" H (22.9 x 6.4 x 15.2 cm)

**Weight:** 1.5 lb (0.7 kg)

Item	Description
337-210	RAD ALERT 200 Area Monitor

N

# DOSIMETERS, MONITORS & METERS

## RAD ALERT 50 AREA MONITOR



- **Adjustable Trigger Level**
- **Remote Alarm with Buzzer**
- **Battery Backup AAA NiMH**
- **100' (30 m) Connection Cable**

### Item 337-200 RAD ALERT 50 Area Monitor Includes

- RAD ALERT 50 Room Monitor with Remote
- Alarm and Battery Backup
- 100' (30 m) Cable
- 12 VDC Universal Power Supply

### Specifications

#### RAD ALERT 50 Area Monitor

**Indicated Use:** Radiation area monitoring

**Internal GM Detector Range:** 0.5mR/hr to 1000 mR/hr

**Display:** NA

**Display Range:** NA

**Display Units:** mR/hr

**Linearity:** Reading within  $\pm 10\%$  of true value with detector connected

**Response:** Typically 3 seconds from 10% to 90% of final reading

**Status:** Green light indicates the instrument is functioning properly

**Alarm:** Indicated by 2 flashing red LED's (2 Hz) and audible buzzer (may be turned off)

**Calibration Controls:** Accessible from front of instrument (protective cover provided)

**Dead Time:** < 10% at maximum exposure rate

**Data Output:** Signals (current sink), and direct connection to battery and ground

**Power Requirements:** 12 VDC universal adaptor may be plugged into either main detector unit or remote alarm

**Battery Life:** 2 - 3 hours

**Battery Charger:** Battery is continuously trickle charged when instrument is connected to line power

**Construction:** ABS Plastic Enclosure

**Temperature Range:** 0° to 130°F (- 18° to 54°C)

**Size:** 5.8" W x 1.5" D x 3.7" H (17.7 x 3.8 x 9.4 cm)

**Weight:** 6.5 lb (2.3 kg)

### Remote Station

**Indicated Use:** Remote display for RadAlert 50

**Status:** Green light Indicates the instrument is functioning properly and power is on

**High Alarm:** Dual red flashing LED indicates the radiation level exceeds the high alarm point

**Detector Fail Audio:** Piezo Buzzer type with ON/OFF switch and adjustable volume

**Power Requirements:** 12 VDC universal adaptor may be plugged into either main detector unit or remote alarm

**Construction:** ABS Plastic Enclosure

**Temperature Range:** 0° to 130°F (- 18° to 54°C)

**Size:** 5.8" W x 1.5" D x 3.7" H (17.7 x 3.8 x 9.4 cm)

**Weight:** 1.5 lb (0.7 kg)

Item	Description
337-200	RAD ALERT 50 Area Monitor

# DOSIMETERS, MONITORS & METERS

## RAD ALERT 100 AREA MONITOR



- Adjustable Trigger Level
- Remote Alarm with Buzzer
- Battery Backup AA NiMH
- 100' (30 m) Connection Cable
- Remote Timer

### Item 337-205 RAD ALERT 100 Area Monitor Includes

- RAD ALERT 100 Room Monitor with Remote
- Alarm and Battery Backup
- 100' (30 m) Cable
- 12 VDC Universal Power Supply

### Specifications

#### RAD ALERT 100 Area Monitor

**Indicated Use:** Radiation area monitoring

**Internal GM Detector Range:** 0.5 mR/hr to 1000 mR/hr

**Display:** 4 digit LED display with 0.4" (1 cm) character height

**Display Range:** 000.0 to 200

**Display Units:** mR/hr

**Linearity:** Reading within  $\pm 10\%$  of true value with detector connected

**Response:** Typically 1 second from onset of radiation

**Status:** Green light indicates the instrument is functioning properly and power is on

**Alarm:** Indicated by a flashing red light and audible buzzer

**Battery:** Indicated by red LED 8 AA NiMH on trickle charge in remote station

**Calibration Controls:** Accessible from potentiometer on top of unit

**Dead Time:** < 10% at max exposure rate

**Data Output:** Current sink and direct connection to battery and ground

**Power Requirements:** 12 VDC universal adaptor may be plugged into either main detector unit or remote alarm

**Battery Life:** 7 - 9 hours

**Battery Charger:** Battery is continuously trickle charged when instrument is connected to line power

**Construction:** ABS Plastic Enclosure

**Temperature Range:** 0° to 130°F (- 18° to 54°C)

**Size:** 4.4" W x 2.4" D x 8.5" H (11.2 x 6.1 x 21.6 cm)

**Weight:** 6.5 lb (2.3 kg)

### Remote Station

**Indicated Use:** Remote display for RAD ALERT 100 and 200

**Status:** Green light indicates the instrument is functioning properly and Power is on

**Alarm:** Flashing LED indicates the radiation level exceeds the high alarm point

**Detector Fail:** Indicated by red LED

**Audio:** Piezo Buzzer type with ON/OFF switch and adjustable volume

**Power Requirements:** 12 VDC universal adaptor

**Construction:** ABS Plastic Enclosure

**Temperature Range:** 0° to 130°F (- 18° to 54°C)

**Size:** 9.5" W x 2.5" D x 6" H (22.9 x 6.4 x 15.2 cm)

**Weight:** 1.5 lb (0.7 kg)

Item	Description
337-205	RAD ALERT 100 Area Monitor

## CHECK SOURCE



338-122



338-120

### Specifications

#### Item 337-141 and 338-120

**Isotope:** 137Cs

**Size:** 1" Dia. x 0.1" T (2.5 x 0.3 cm (1 x 0.1 in.))

#### Item 338-122

- Typically Mounted to Side of Instrument
- Holds 1" Dia. (2.5 cm) Check Sources

Item #	Description
337-141	Check Source, Cs-137, 10uCi
338-120	Check Source, Cs-137, 1uCi
338-122	Holder for Check Source

# DOSIMETERS, MONITORS & METERS

## LEAD CASE FOR CS-137 CHECK SOURCE



### Specifications

#### Item 994-078 Lead Case for Cs137 Check Source

**Lead Wall:** 0.39" Thick (10 mm)  
**Inside Dimensions:** 1.22" Dia x 0.3" D (31 x 8 mm)  
**Overall Size:** 2.16" Dia. x 1.22" H (55 x 31 mm)  
**Weight:** 1.5 lb (0.7 kg)

#### Item 994-079 Lead Case for Cs137 Check Source

**Lead Wall:** 1.0" Thick (25.5 mm)  
**Inside Dimensions:** 1.25" Dia. x 5/8" D (31.9 x 16 mm)  
**Overall Size:** 3.35" dia. x 2.5" H (85.4 x 63.7 mm)  
**Weight:** 8.5 lb (3.9 kg)

Item #	Description	Lead Thickness
994-078	Lead Case for Cs137 Check Source	0.39" (10 mm)
994-079	Lead Case for Cs137 Check Source	1" (25.5 mm)

## SURFACE SURVEY METER



### Specifications

**Meter:** 2 1/2" (6 cm)  
**Ranges:** 3 ranges, linear - 0-500, 0-5,000, 0-50,000 cpm (0-.15, 1.5, 15 mR/hr)  
**Switch Position:** Off, Battery Test, x100, x10, x1  
**Audio:** Internally mounted speaker  
**Detector:** Halogen-quenched "Pancake GM tube"  
**Diameter:** 2" (5 cm)  
**Window Diameter:** 1 3/4" (5 cm)  
**Window Thickness:** 1.5 mg/cm<sup>2</sup>  
**Background:** Typical 50 cpm, Thin profile of tube (13 mm) gives low background  
**Efficiency:** 100% for all betas and alphas that have the energy to penetrate the thin window.  
**Voltage:** 900V nominal  
**Gamma Sensitivity:** Nominal is 150 cpm/mr/h (based on CS-137)  
**Physical Dimensions:** 3" W x 5 1/4" L x 2 1/4" T (8 x 13 x 6 cm) excluding meter and handle  
**Feet:** Replaceable neoprene feet for easy sliding on bench or desk top without contaminating bottom face of instrument or detector  
**Calibration:** Single master calibration pot as well as individual calibration pots for each scale  
**Power:** 9 volt nominal "transistor battery" Eveready 1222 carbon or Eveready E146X mercury or equivalent  
**Current Drain:** 3 mA typical  
**Handle:** Swivel Type polished anodized aluminum  
**Weight:** 22 oz (625 g.)  
**Battery Life:** 100 hours in normal operation

- Monitors alpha, beta and gamma
- Built-in pancake detector
- Built-in speaker

This small 3 range surface rate meter has a built-in 2" diameter pancake GM detector. Read-out is in counts per minute (and mR/hr). The detector window is recessed and protected by an aluminum grill. The instrument will monitor alpha, beta and gamma radiation with a built-in audio to immediately signal the presence of radiation contamination. Anti-saturation circuitry keeps meter needle at full scale in high radiation fields. Tested to 100 R/hr. The small size, light weight and large detector area make this a very useful monitor for surveying bench tops or checking hands, clothes and fingertips for almost any radioactive contamination including: I-125, I-131, P-32, C-14.

Item #	Description
343-055	Surface Survey Meter

# DOSIMETERS, MONITORS & METERS

## DIGITAL CUTIE PIE



- **Digital readout - 4 digit-rate, 6 digits integrate**
- **Small and lightweight**
- **TBM package**
- **Flat response - air ion chamber**
- **Sees axially below 5 keV gamma or x-ray**
- **Reads alpha, beta, gamma, x-ray**
- **Fast response**
- **Wide range**

The Digital Cutie Pie consists of a 3.25" dia. x 3.25" long air ion chamber coupled to a stable solid state MOSFET input electrometer with built-in A to D converter to read out directly in mR/h or mR. Range is 0.1 mR/h to 999.9 mR/h and 1 mR/h to 9.999 R/h. 200 mg/cm<sup>2</sup> graphite lined phenolic walls give accurate "air equivalence". A thin (0.5 mg/cm<sup>2</sup>) Mylar window allows high sensitivity readings for alpha and for low energy beta such as C-14 in addition to higher energy betas, gammas and x-rays.

### Specifications

**Dimensions:** 5 1/2" x 3 1/2" x 8" including handles

**Detector:** Air ion chamber 3.25" dia. x 3.25" long, Internal Volume 270 cc

**Wall & Cap:** Phenolic, graphite lined 200 mg/cm<sup>2</sup> walls and 400 mg/cm<sup>2</sup> cap

**Window:** 2.87" dia. x 0.5 mg/cm<sup>2</sup> mylar

**Readout:** LCD 6 digits

**Indicator Lamp:** Red LED 10 pulses/min per mR/h

**Range:**

**Rate:** Four digits 0.1mR/h to 999.9 mR/h switchable to 1 mR/h to 9.999 R/h

**Integrate:** 6 digits

**Electrometer:** Solid State MOSFET input

**Electronics:** A-D converter LCD drivers

**Batteries:** 10 each NEDA CR-1220 - shelf life 7 years 2 each Eveready E93, C cell or eq. - 1000 hours

**Weight:** 26 oz. complete with batteries (.75 kg.)

**Shipping Weight:** 4 lbs. (1.8 kg.)

Item #	Description
343-049	Digital Cutie Pie, mR/h

N



# DOSIMETERS, MONITORS & METERS

## RO-20 ION CHAMBER SURVEY METER

### Features

- Measures gamma or x-ray exposure rate
- Temperature compensated measurements
- Sliding shield for beta measurements
- Large, backlit display
- 5 ranges up to 50 R/h
- Extended battery life
- Non-mechanical range switching

The Model RO-20 is a portable air ionization chamber instrument, used to detect beta, gamma, and x-radiation, with five linear ranges of operation to measure exposure from background to 50 R/h full scale.

The ionization chamber is vented to atmospheric pressure and is specifically designed to have a flat energy response into the x-ray region. The detector is fully temperature compensated, eliminating any need for temperature correction. Each instrument is factory calibrated to gamma radiation.

A single rotary switch turns the instrument off, checks the batteries, checks the zero setting, and selects the range of operation. An ergonomically located switch illuminates the meter. Internal switching of ranges is accomplished with reed relays, eliminating the mechanical swing arms typically used with portable ion chamber survey instruments.

### Detector

The RO-20 detector is an air-filled ionization chamber. It has a diameter of 7.32 cm and a volume of 220 cm<sup>3</sup>. The detector has 640 mg/cm<sup>2</sup> phenolic walls inside a 1.6 mm aluminum wall case for a total thickness of approximately 1,000 mg/cm<sup>2</sup>. A 7.9 mm thick phenolic sliding beta shield with a positive friction lock is mounted on the bottom of the chamber. The shield thickness is approximately 1,000 mg/cm<sup>2</sup>. The chamber window is comprised of two layers (one on the chamber, one on the can) 25 micron (0.001") mylar, approximately 7 mg/cm<sup>2</sup> total.

### Energy Response

**Photon Response:** Reference to <sup>137</sup>Cs measured through the bottom with the slide closed, the energy response is:

- ± 30% from 8 keV to 1.3 MeV with the open slide facing the source.
- ± 15% from 33 keV to 1.3 MeV with the closed slide facing the source.
- ± 15% from 55 keV to 1.3 MeV through the side of the instrument

**Beta Response:** Uranium Slab: 30% of true mrad/h field behind 7 mg/cm<sup>2</sup> window with RO-20 resting on slab, slide open. <sup>90</sup>Sr-<sup>90</sup>Y: Approximately 93% of true mrad/h field at 30 cm with slide open.

**Fast Neutron Response (PuBe):** Reads approximately 8% in mR/h of true neutron field in mrem/h.

**Radiation Detected:** Beta, gamma, and x-ray.

**Ranges:** Five linear ranges: 0-5, 0-50, 0-500 mR/h and 0-5, 0-50 R/h

**Meter:** Scale length, approx. 7.6 cm (3"), 2% accuracy. Linear markings from 0 to 5 in 50 minor increments. The meter is backlit

**Response Time:** 90% of final reading within 5 seconds,

**Linearity:** Within ± 5% of full scale



**Battery Dependence:** Reading is independent of battery voltage when the battery check indication is in the green arc.

**External Controls:** Range switch, including Off, Zero, and Battery checking positions. Zero knob used to set meter to zero when Zero position of range switch is selected or when in no significant radiation field. Light switch, for meter light.

**Internal Control:** Five calibration controls- one for each range.

**Batteries:** Main Power: Five "C" cells

**Battery Life:** "C" cells, widely variable according to RO-20 usage and battery type. Typical ZnC: mR/h ranges, 2900 hrs. All other ranges, 150 hrs. Typical Alkaline: mR/h ranges, 6900 hours. All other positions, 350 hours. Frequent or continuous use of the light will reduce battery life significantly. Thirty volt chamber bias battery life: Totally dependent upon the usage of "Battery 2" position switch. The battery capacity should allow for at least 50,000 five second battery checks. The battery drain is negligible on all other positions of the range switch.

**Chamber Bias:** Ten 3 volt lithium coin cells, 30 volts

**Temperature:** Operable from -40 °C to 60 °C (-70 °F to 140 °F) For operation below -18°C (0°F), alkaline or nickel-cadmium "C" cells should be used.

**Temperature Compensation:** The detector is fully compensated over the operational temperature range for output accuracy within 10% ± 0.5 mR/h

**Moisture:** Seals used at openings for dust and water resistance. Detector is protected by a silica-gel dryer.

**Humidity:** Operable from 0 to 95%, non-condensing

**Weight:** Approximately 3.6 lbs with alkaline C cells

**Size:** 4.2" W x 7.9" L x 7.7" H

**Testing:** The RO-20 has been successfully tested to ANSI N42.17A and is CE Certified to European standard EN50082-1 (EN61000-4-2 & EN61000-4-3)



Item #	Description
343-150	RO-20 Survey Meter
343-155	5 Micro Curie Cs-137 Check Source

# DOSIMETERS, MONITORS & METERS

## 451B ION CHAMBER SURVEY METER WITH BETA SLIDE



- High sensitivity measurement of rate and dose simultaneously, with the capability to record peak rate
- Auto-ranging and auto-zeroing
- RS-232 communications interface with optional Windows-based Excel add-in for data logging
- Ergonomic, anti-fatigue handle with replaceable grip, wrist strap and tripod mount
- Programmable flashing LCD display and audible alarm
- Easily-accessible battery door (operated by two 9-volt alkaline batteries) on the outside of the bottom case

The auto-ranging 451B measures radiation rate and accumulated dose from beta, gamma and x-ray radiation sources. The 451B's site surveying capabilities make it well-suited for a wide range of end users, including: police and fire departments, x-ray manufacturers, government agencies, state inspectors, emergency response and HAZMAT teams, nuclear medicine labs, hospital radiation safety officers, and nuclear power workers. The ion chamber detector allows for a fast response time to radiation from leakage, scatter beams and pinholes. Additionally, the low noise chamber bias supply provides for fast background settling time. A sliding beta shield serves as an equilibrium thickness for photon measurements and enables beta discrimination. The digital display features an analog bar graph, 2.5 digit digital readout, low battery and freeze ("peak hold") mode indicators, and an automatic backlight function. User controls consist of an ON/OFF button and a MODE button. The case is constructed of lightweight, high strength materials and is sealed against moisture. The RS-232 interface can be connected directly to a computer for use with the Excel add-in for Windows (Item 343-460), enhancing the functionality of the instrument. This software allows for data retrieval, user parameter selection and provides a virtual instrument display with audible (requires sound card) and visual alarm indication.

### Specifications

#### Radiation Detected:

Alpha above 7.5 MeV  
Beta above 100 keV  
Gamma above 7 keV

#### Operating Ranges- Response Time:

0 to 5 mR/h - 8 seconds  
0 to 50 mR/h - 2.5 seconds  
0 to 500 mR/h - 2 seconds  
0 to 5 R/h - 2 seconds  
0 to 50 R/h - 2 seconds

**Accuracy:** Within 10% of reading between 10% and 100% of full scale indication on any range, exclusive of energy response. Calibration source is <sup>137</sup>Cs

#### Detector

**Chamber:** 349 cc volume air ionization

**Chamber Wall:** 246 mg/cm<sup>2</sup> thick phenolic

**Chamber Window:** 6.6 mg/cm<sup>2</sup> Mylar, protected by steel mesh, 46 cm<sup>2</sup> detection area

**Beta Slide:** 440 mg/cm<sup>2</sup>

**Controls:** ON/OFF and MODE

**Automatic Features:** Auto-zeroing, auto-ranging, and auto-back

**Power requirements:** Two 9 V alkaline, 200 hours operation

**Warm-up time:** One minute

#### Modes

**Integrate Mode:** Operates continuously 30 seconds after the instrument has been turned on. Integration is performed even if the instrument is displaying in mR/h or R/h

**Freeze mode:** Will place a tick mark on the bar graph display to hold on the peak displayed value. The unit will continue to read and display current radiation values

**Display:** LCD analog/digital with backlight

**Analog:** 100 element bar graph 2.5" (6.4 cm) long. Bar graph is divided into 5 major segments, each labeled with the appropriate value for the range of the instrument

**Digital:** 2.5 digit display is followed by a significant zero digit depending on the operating range of the instrument. The units of measurement are indicated on the display at all times. Digits are 0.25" (6.4 mm) high. Low battery and freeze indicators are also provided on the display

**Temperature Range:** -4° to +158°F (-20° to +70°C)

**Relative humidity:** 0 to 100%, @ +60°C

**Geotropism:** Less than 1%

**Size:** 4" W x 8" D x 6" H (10 x 20 x 15 cm)

**Weight:** 2.5 lb (1.11 kg)

☞ **Tested.** Meets applicable standards.

Item #	Description
343-451	451B Ion Chamber Survey Meter with Beta Slide, Standard Chamber (R)
343-453	Check Source, <sup>238</sup> Uranium 0.064 µCi, Impregnated 2" x 2" Yellow Card
343-458	Single Unit Carrying Case
343-460	451 Assistant for Excel

# DOSIMETERS, MONITORS & METERS

## 451P PRESSURIZED $\mu$ R ION CHAMBER SURVEY METER



- High sensitivity  $\mu$ R measurements of rate and dose simultaneously, with the capability to record peak rate
- Ergonomic, anti-fatigue handle with replaceable grip, wrist strap and tripod mount
- Programmable flashing LCD display and audible alarm
- Easily-accessible battery door (operated by two 9-volt alkaline batteries) on the outside of the bottom case
- RS-232 communications interface with optional Windows-based Excel add-in for data logging

The auto-ranging 451P features a pressurized ion chamber, providing enhanced sensitivity ( $\mu$ R resolution) and improved energy response to measure radiation rate and dose from x-ray and gamma sources. Originally designed to measure leakage and scatter around diagnostic x-ray and radiation therapy suites, the 451P's site surveying capabilities make it well-suited for a wide range of end users, including: x-ray manufacturers, government agencies, state inspectors, biomedical technicians, and maintenance technicians for airport baggage scanners.

The ion chamber detector allows for a fast response time to radiation from leakage, scatter beams and pinholes. Additionally, the low noise chamber bias supply provides for fast background settling time.

The digital display features an analog bar graph, 2.5 digit digital readout, low battery and freeze ("peak hold") mode indicators, and an automatic backlight function. User controls consist of an ON/OFF button and a MODE button. The case is constructed of lightweight, high strength materials and is sealed against moisture. The RS-232 interface can be connected directly to a computer for use with the Excel add-in for Windows (Item 343-460), enhancing the functionality of the instrument. This software allows for data retrieval, user parameter selection and provides a virtual instrument display with audible (requires sound card) and visual alarm indication.

### Specifications

#### Radiation Detected:

Beta above 1 MeV  
Gamma and X-Rays above 25 keV

Item #	Description
343-455*	451P Pressurized $\mu$ R Ion Chamber Survey Meter with Standard Chamber (R)
337-141	Check Source, $^{137}\text{Cs}$ , 10 $\mu$ Ci, Flat Disc, 1" (2.54 cm) Diameter
343-458	Single Unit Carrying Case
343-460	451 Assistant for Excel

\*Due to the pressurized ion chamber, the 451P is considered U.S. Department of Transportation (DOT) Dangerous Goods and must be shipped via IAW DOT special permit DOT-SP 13187.

#### Operating Ranges - Response Time:

- 0 to 500  $\mu$ R/h - 5 seconds
- 0 to 5 mR/h - 2 seconds
- 0 to 50 mR/h - 1.8 seconds
- 0 to 500 mR/h - 1.8 seconds
- 0 to 5 R/h - 1.8 seconds

**Accuracy:** Within 10% of reading between 10% and 100% of full-scale indication on any range, exclusive of energy response. Calibration source is  $^{137}\text{Cs}$

#### Detector

**Chamber:** 230 cc volume pressurized air ionization chamber to 8 atmospheres or 125 psi

**Controls:** ON/OFF and MODE

**Automatic Features:** Auto-zeroing, auto-ranging, and auto-backlight

**Response Time:** Analog response time from 10% to 90% of reading for a full scale step increase is dependent on operating range. Response time for a step increase in radiation exposure rate from background:

#### Step to Increase, Background to & Time to Reach 90% of Final Value:

- 400  $\mu$ R/h - 4.8 sec
- 4 mR/h - 3.3 sec
- 10 mR/h - 4.3 sec
- 40 mR/h - 4.5 sec
- 100 mR/h - 2.7 sec
- 1 R/h - 2 sec
- 4 R/h - 2.7 sec

**Power Requirements:** Two 9 V alkaline, 200 hours operation

**Warm-up Time:** Less than two minutes for initial operation when the instrument is in equilibrium with ambient temperature

**Display:** LCD analog/digital with backlight

**Analog:** 100 element bar graph 2.5" (6.4 cm) long. Bar graph is divided into five major segments, each labeled with the appropriate value for the range of the instrument

**Digital:** 2.5 digit display is followed by a significant zero digit depending on the operating range of the instrument. The units of measurement are indicated on the display at all times. Digits are 0.25" (6.4 mm) high. Low battery and freeze indicators are also provided on the display.

#### Modes

**Integrate Mode:** Operates continuously 30 seconds after the instrument has been turned on. Integration is performed even if the instrument is displaying in mR/h or R/h

**Freeze Mode:** Will place a tick mark on the bar graph display to hold on the peak displayed value. The unit will continue to read and display current radiation values .

**Temperature Range:** -4° to +122°F (-20° to +50°C)

**Relative Humidity:** 0 to 100%

**Geotropism:** Negligible

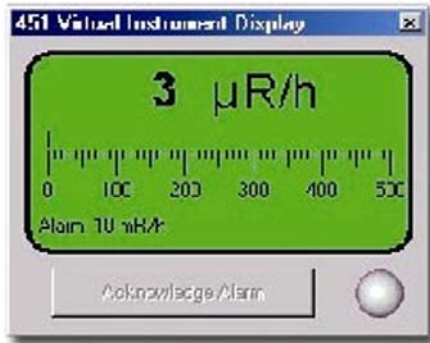
**Size:** 4" W x 8" D x 6" H (10 x 20 x 15 cm)

**Weight:** 2.4 lb (1.07 kg)

**CE Tested.** Meets applicable standards.

# DOSIMETERS, MONITORS & METERS

## 451 ASSISTANT FOR EXCEL



- Real time data logging and uploading of 451 internal data log into protected Excel worksheet
- Virtual instrument display with user-defined audible and visual alarm indication
- Compatible with Windows® 95, 98, ME®, NT® 4.0, 2000, XP® and Excel 97, 2000
- Package includes manual, diskette set, and 25 ft RS-232 cable

The 451EXL provides remote control for many of the 451B and 451P functions via a Microsoft® Excel-based user interface, including real-time data logging with user defined alarm parameters, upload of the internal data log into Excel worksheet, real-time virtual instrument display, and accumulated dose measurement over a user defined integration period. This information management software is ideal for the facility Radiation Safety Officer or anyone responsible for maintaining a permanent record of spills and accidents for adherence to state and NRC requirements.

The 451EXL's data logging function automatically records realtime measured data into an Excel worksheet. The 451 Assistant provides user configurable audible and visual alarms for the real time logged data, including the color-coding of each data entry for quick identification for radiation levels and alarm acknowledgment status. This 451EXL information management software program is ideal for the facility radiation safety officer or anyone responsible for maintaining a permanent record of spills and accidents for adherence to state and NRC requirements.

### Specifications

**Controls:** The 451 Assistant menu and toolbar provide an interface for the user to remotely control the 451, configure the 451, download the 451's internal data log and start / stop real time data logging and integrated dose measurements

**Connect / Disconnect:** Connects or disconnects the 451 to the computer's communication port

**Start / Stop:** Starts and stops computer data logging. When data logging is started, logged data is placed in the active Excel worksheet and the worksheet is protected to provide data security

**Logging:** Properties Allows the user specify computer data logging parameters. The data logging sample interval (2 seconds to 999 hours), total data logging period (2 seconds to 49 days) and computer data log alarms may be specified through this menu. These parameters are independent of the 451's internal data logging functions

**Integrate:** Allows the user to select timed integrated dose measurement or user controlled integrated dose measurement. The user may also specify the integration period for timed integration from 1 minute to 999 hours. When timed integrate mode is selected, the 451 Assistant for Excel stops the integrated dose measurement after the specified integration period has expired. When timed integrate mode is not selected, the user controls the integration period and the integration time is displayed in real time. The integrated dose and average dose rate are recorded in the active Excel worksheet when integration is complete

**Download Log:** The 451 is capable of internally logging data at a user defined interval from 1 to 255 seconds with a total capacity of up to 2700 data points. This feature allows the user to download the 451's internal data log into the active Excel worksheet

**Options:** Allows the user to change many properties of the 451 Assistant for Excel and several of the 451's properties. The user may configure the various visual and audio alarm features of the 451 Assistant for Excel for each data point that is logged. The 451 Assistant can be configured to use 2 or 4 alarm states. The four alarm states are acknowledged normal (below alarm level), unacknowledged normal, acknowledged alarm and unacknowledged alarm. The user may also select the communication port used by the 451 (default is COM1). The 451's internal data logging parameters and alarm settings may also be changed from the Options menu

### System Requirements:

Windows 95, 98, ME, NT 4.0, 2000, or XP

Microsoft Excel 97 or 2000

One serial port (COM1 through COM4)

Item #	Description
343-460	451 Assistant for Excel



# DOSIMETERS, MONITORS & METERS

## MODEL 9DP, PRESSURIZED ION CHAMBER METER



- 0-5 R/hr Range with uR/hr Sensitivity
- Sunlight Readable Color Display
- Auto Zeroing & Ranging
- Rechargeable Batteries
- Alarming Capability
- Rate, Integrate & Peak Hold Readouts
- Data Logging
- USB Connectivity
- Free Firmware Updates through Internet

The Model 9DP, pressurized ion chamber meter, provides highly sensitive measurements of exposure and exposure rate. It can simultaneously display the exposure rate, integrated value and highest rate seen by the instrument. The integrated value can be reset (if desired) using one of the four convenient front panel mounted buttons. The stunning 256 color, bit-mapped display provides an optimized presentation of the data and is accompanied with icons informing the user of the active functions and instrument status. All logged data are written in csv format to a plugged-in industry standard USB thumb drive for convenient retrieval by a PC spreadsheet or database program. Alarms are manifested using color changes on the display and an acknowledgeable audio output.

This meter is part of the new Dimension series of meters employing state-of-the-art technologies that deliver tremendous capability, user-friendliness, and convenient PC connectivity. Instrument users have access to personal preference type settings by connecting directly to any USB keyboard. An optional Dimension Interface Package is available which facilitates complete setup and calibration programming under administrator controlled password protection.

### Item 343-357 Carrying Case

The soft shell design is constructed from air-blown ABS plastic and utilizes a foam insert that provides good protection and a convenient place to store all your equipment

### Item 343-358 Stereo Headset

This headset offers comfort and excellent protection against noisy areas whenever it becomes necessary to listen to the audio output from portable survey meters. This headset plugs into any Ludlum survey meter equipped with an audio output jack.

### Item 343-355 Dimension Interface Package

Dimension Interface Package, Software and special USB cable for interfacing any Dimension series instrument to a PC to perform extensive setup or calibration.

### Specifications

**Radiation Detected:** Beta above 1 MeV; gamma & X-rays above 25 keV

**Operating Ranges:** With Sv/h units: 0-5 uSv/h, 0-50 uSv/h, 0-500 uSv/h, 0-5 mSv/h, 0-50 mSv/h; with R/h units: 0-500 uR/h, 0-5 mR/h, 0-50 mR/h, 0-500 mR/h, 0-5 R/h

**Chamber Volume:** 230 cc pressurized to 125 PSI

**Accuracy:** ±10%

**Response Time:** From five seconds in lowest range to under two seconds in highest range when measuring from 10% to 90% of final value

**Measurement Readouts:** Simultaneous display of dose rate, integrated dose, and highest dose rate (peak hold)

**Data Logging:** Stored to detachable USB thumb drive in csv format for easy retrieval by PC spreadsheet/database programs. Data points include real-time clock generated date and time with dose rate, integrated dose, and instrument status. Logging time intervals are set by PC interface program

**LCD Display:** 3.5" (8.9 cm) diagonal, 240 H x 320 W pixels, TFT active matrix, 262 colors, 220 cd/m<sup>2</sup>

**User Controls:** 4 push buttons: instrument on/off, peak rate/integrate mode, audio on/off, alarm acknowledge/meter reset/clearing integrated dose or peak rate

**Automatic Functions:** Auto ranging, auto zeroing, auto LCD backlighting

**Audio Outputs:** Built-in unimorph speaker, > 60 dB at 2' (0.6 m), audio jack for connection to optional headset

**Alarms:** Two levels of radiation alarms available, each are user programmable throughout entire readout range and set through a PC interface program. Other alarms include low battery and various detector failures

**Temperature Range:** -20 to 50°C (-4 to 122°F)

**Power:** Eight rechargeable AA NiMH batteries, supplied with wall charger for direct connection to instrument

**Battery Life:** Approximately 12 to 24 hours between charges depending upon use of backlighting

**PC Interface:** USB, free PC Windows™ interface program download or a more comprehensive Dimension Interface Package (Item 343-355) that additionally facilitates calibration and administrative control is sold as an option

**Construction:** Durable plastic accompanied by internal metal support

**Size:** 8.6" H x 4.6" W x 9.6" L (21.8 x 11.7 x 24.4 cm)

**Weight:** 3.15 lb (1.43 kg) including batteries

### Item 343-357 Carrying Case

**Carrying Case Size:** 17" L x 13" W x 7.5" H (43.2 x 33.0 x 19.1 cm)

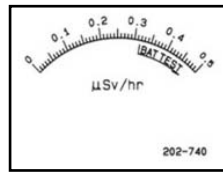
Item #	Description
343-350	Model 9DP, Pressurized Ion Chamber Meter
343-355	Dimension Interface Package
343-357	Carrying Case
343-358	Stereo Headset



## SURVEY RATEMETER AND GAMMA DETECTOR PACKAGE



338-001  
and  
338-002



338-122



338-120

The Survey Ratemeter and Gamma Detector Package includes everything needed to do radiation survey checks of X-ray security scanners. The Survey Ratemeter has a  $\mu\text{Sv/h}$  scale with a range of 0 to 0.5  $\mu\text{Sv/h}$ . The package also includes a coiled cable that connects the Survey Ratemeter to the Gamma Detector and can stretch up to 48" (122 cm), a 1.0  $\mu\text{Ci}$  Check Source inside a Check Source Holder mounted on the side of Survey Ratemeter provides for easy calibration of the Survey Ratemeter and helps prevent losing the Check Source.

### Survey Ratemeter and Gamma Detector Package Item 338-000

#### Includes:

- (1) Survey Ratemeter
- (1) Gamma Detector
- (1) "C" Series Coiled Cable
- (1) Check Source
- (1) Holder for Check Source

### 338-001 Survey Ratemeter -Model 3 - with a $\mu\text{Sv/h}$ Scale

- Rugged 4 Decade Analog Ratemeter
- Sensitive 1" x 1" (2.54 x 2.54 cm) NaI(Tl) Detector
- Easy to Use
- Easy Reach to Difficult Places
- Greater than 2000 Hour Battery Life

This instrument combines Ludlum's popular Model 3 Analog Survey Meter with a 1" x 1" (2.54 x 2.54 cm) NaI(Tl) gamma scintillator detector, Model 44-2, to create a very sensitive micro-R-meter. The advantage this instrument has over those with the detector housed inside the instrument enclosure is its ability to manipulate the detector into tight or difficult places. It has the additional benefit of keeping the meter conveniently in full view while performing an investigation. The design is very robust with a loud audio signal to facilitate noisy areas. The aluminum cast instrument housing with its separate battery compartment and accompanying metal handle offer an industrial robustness and quality that promote long lasting protection and instrument life. The front panel controls include a rotary switch for selecting the four-decade range, instrument shut-off, battery test, an audio on/off switch, a fast/slow response switch, and a count reset button.

### Specifications

#### 338-001 Survey Ratemeter -Model 3 - with a $\mu\text{Sv/h}$ Scale

**Meter Dial:** 0 - 0.5  $\mu\text{Sv/h}$ ; 0-500 kcpm, BAT TEST

**Meter:** 2.5" (6.4 cm) arc, 1 mA analog type

#### Controls:

**Rotary Selector:** Switches between instrument off, battery check, ranges: x0.1, x1, x10, x100

**Response Switch:** Toggles between FAST (4 seconds) or SLOW (22 seconds) from 10% to 90% of final reading

**Reset Pushbutton:** To zero meter

**Audio Switch:** For audio on/off, built-in unimorph speaker, greater than 60 dB at 2' (0.6 m)

**Calibration Controls:** Accessible from front of instrument (protective cover provided)

**Construction:** Cast and drawn aluminum with beige powder coat

**Connector:** Series "C"

**Temperature Range:** -4 to 122°F (-20 to 50°C), may be certified for operation from -40 to 150°F (-40 to 65°C)

**Power:** Two each "D" cell batteries (housed in externally accessible sealed compartment)

**Battery Life:** Typically greater than 2000 hours with alkaline batteries (battery condition can be checked on meter)

**Size:** 6.5" H x 3.5" W x 8.5" L (16.5 x 8.9 x 21.6 cm), including handle

**Weight:** 3.5 lb (1.6 kg), including batteries

#### Item 338-002 Gamma Detector - Model 44-2

**Detector Type:** Scintillator, 1" Dia x 1" L (2.54 x 2.54 cm) thick NaI

**Sensitivity:** Typically 175 cpm/ $\mu\text{R/hr}$  (137Cs gamma)

**Background:** 1900 cpm

**Recommended Energy Range:** 50 KeV-1.5 MeV

**Energy Response:** Energy dependent

**Photomultiplier Tube:** 1.125" (2.86 cm) diameter

**Operating Voltage:** 500-1200 volts

**Connector:** Series "C"

**Temperature Range:** 5 to 122°F (-15 to 50°C), may be certified for -40 to 150°F (-40 to 65°C)

**Size:** 2" Dia x 7.3" L (5.1 x 18.5 cm)

**Weight:** 1 lb (0.5 kg)

#### Item 338-003 Series C Coiled Cable

**Connector Type:** "C"

**Construction:** RG58 Shielded Low Noise Coiled Coaxial cable with strain relief

**Length:** 18" coiled to 48" stretched

#### Item 338-120 Check Source

**Isotope:** Cesium-137

**Activity:** 1.0  $\mu\text{Ci}$

**Size:** 1" Dia x 0.1" L (2.5 x 0.3 cm)

#### Item 338-122 Check Source Holder

- Typically Mounted to Side of Instrument
- Holds 1" (2.54 cm) Diameter Check Sources

Item #	Description
338-000	Survey Ratemeter & Gamma Detector Package
338-001	Survey Ratemeter, Model 3
338-002	Gamma Detector/ Scintillator, Model 44-2
338-003	Coiled Cable, "C" Series, 18" to 4' (46 to 122 cm)
338-120	Check Source, Cs-137, 1 $\mu\text{Ci}$
338-122	Holder for Check Source 338-120