

UltraRadiac Plus

Personal Radiation Monitor



FEATURES

- Personal radiation monitor designed for the needs of first responders
- Measures and displays radiation dose rate and total dose
- Presettable two level audio, visual and vibrating alarms for rate and dose
- Designed to operate in extremes of temperature, shock, humidity, dust, immersion and radiation
- Large, easy-to-read backlit LCD display
- Intuitive six button user interface
- Operable/readable by personnel in fire fighting or HAZMAT protective gear
- Uses standard AAA batteries
- Can be powered by NiMH rechargeable batteries (optional DC charger)
- Ultra-small size (12.8 in.3) and weight (9.5 oz)
- CANBERRA's unique time-to-count technology for wider dynamic range
- Data logging capability to 999 points
- "Stay time" display shows time remaining to dose alarm
- Source finder mode Derived from military qualified Radiac Set

The potential threat of a radiological terrorism incident requires that first responders are equipped with a radiation monitor that is designed to address the radiation hazards they may face. CANBERRA's UltraRadiac-Plus is the perfect unit for firefighters, HAZMAT teams, paramedics and other first responders. It offers the small size and light weight needed to avoid interference with the critical work of first responders while providing continually updated information to the wearer.

Most electronic dosimeters on the market were intended for laboratory use, and not for the rugged environments that first responders may encounter. CANBERRA's UltraRadiac-Plus – based on a US Military design – is a small, rugged, simple to operate radiation monitor that displays both the radiation levels and the total dose that is received. A large, backlit LCD display ensures that the unit can be read in any light conditions. Alarms are annunciated by a flashing display, loud audible signal and vibration of the unit itself, when user-set dose rate or total dose alarm levels are exceeded.

There are two separate alarm levels for both dose rate and total dose. The first alarm would generally be set at a level somewhat above natural background to alert the wearer that radiation is present. The second would then be set at a higher level, indicating a significant hazard that requires action. The UltraRadiac-Plus also has a unique "stay time" feature that shows the wearer how much time (at the current dose rate) he/she can remain in place before a high dose alarm is reached.



UltraRadiac-Plus Personal Radiation Monitor

The unit is designed to withstand extreme environmental hazards of temperature, shock, humidity, dust, immersion and high radiation fields. The extreme ruggedness of the design has been time tested – over 60 000 of the military and civilian versions have been shipped world-wide. This is critical for the first responder operating in the hostile conditions of a disaster site!

When used with a host computer, the optical RS-232 port of the UltraRadiac-Plus enables real time data to be provided to the computer such that dose rate mapping can be generated.

Personnel Dose Management



Utilizing the included infrared RS-232 port and the equipment's significant storage capability, the UltraRadiac-Plus can greatly assist in the efficient dose

management of personnel in field situations. The total accumulated daily or weekly dose can be "read" by a computer and assigned to the user's records. Various safeguards (such as control key function restrictions) against accidental erasing of accumulated dose or erroneous setting of alarm levels can be configured by optional software through the infrared port.

Specifications

FEATURES

- DOSE RATE – URAD-PLUS-S: 0.01 $\mu\text{Sv/h}$ to 2 Sv/h; URAD-PLUS-R: 1.0 $\mu\text{R/h}$ to 200 R/h. Meets ANSI-N42.33-2006 standard above 1 $\mu\text{Sv/h}$ (100 $\mu\text{R/h}$). Dose rate alarm will function to 5.0 Sv/hr (500 R/hr).
- DOSE – URAD-PLUS-S: 0.001 μSv to 999 Sv; URAD-PLUS-R: 0.1 μR to 999 R.
- PRESETTABLE AUDIBLE, VISUAL AND VIBRATING ALARMS – User-defined and -set dose and dose rate alarms.



- INITIALIZATION TIME – Operational in less than five seconds.
- SETUP TIME – Less than one minute for all checks and alarms.
- ACCURACY – Within $\pm 30\%$ of the actual dose rate from 1 $\mu\text{Sv/h}$ (100 $\mu\text{R/hr}$) to 2.0 Sv/h (200 R/hr).
- DATA RECORDING – Local data logging to 999 data points. Data downloadable via optical (IR) communications port.
- SELF MONITORING – Continual self-monitoring for the instrument's state of health.
- CASE – Die-cast aluminum; available in black or yellow.
- EMI SUSCEPTIBILITY – Will not be affected, or cause other equipment to be affected, by its use.
- OPERABLE AND READABLE – By persons wearing protective clothing.

DETECTOR

- DETECTOR – Energy compensated GM detector.
- GAMMA ENERGY DEPENDENCE – $\pm 40\%$ from 60 keV to 1.5 MeV (measured following section 6.3.2 – test method for Photon Energy Response – from ANSI 42.33-2006).
- TOTAL (CUMULATIVE) DOSE READ OUT – Will not be erased when read; resettable to zero as desired.
- RESPONSE TIME – Achieves 90% of final reading in one second; subject to step change from 1 mR/hr (10 $\mu\text{Sv/hr}$) to 55 mR/hr (550 $\mu\text{Sv/hr}$); updates display every second.*

DISPLAY

- LCD – Readable at 3 ft (1 m); can be backlit for night use.
- UNITS – URAD-PLUS-S provides data in units of μSv , mSv, Sv, $\mu\text{Sv/h}$, mSv/h and Sv/h; URAD-PLUS-R provides data in units of μR , mR, R, $\mu\text{R/h}$, mR/h and R/h.

ALARMS

- SELECTABLE ALARMS – Has selectable Visual and Audible indicators for day or night use. Alarm levels are settable over entire dynamic range.
- ALARM TYPES – Alarm on dose rate and total cumulative dose.
- ALARM LEVELS – Two alarm levels available for each type to indicate minor or severe hazards.
- AUDIBLE ALARM – >85 dB at 30 cm.
- VIBRATION ALARM.*

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POWER

- BATTERIES – Four AAA 1.5 V alkaline batteries.
- MINIMUM BATTERY LIFE – 150 hr during continuous monitoring (approximately one month at normal operating duty cycles) and 1500 hr during inactive (sleep) mode.
- LOW BATTERY INDICATION – 10 hours of battery life remaining allows display of remaining time.
- Accept standard off the shelf rechargeable NiMH batteries with DC charger to URAD-PLUS power connector (check applicable model).



ENVIRONMENTAL PARAMETERS

- OPERATING TEMPERATURE – -22 °F to 141 °F (-30 °C to +61 °C). Vibrating and audible alarms functional to -50 °C.
- STORAGE/TRANSPORT TEMPERATURE – -40 °F to 158 °F (-40 °C to +70 °C).
- HUMIDITY – Functions correctly over RH 40% to 93% at 95 °F (35 °C).
- WATER IMMERSION (including salt water) – 3 ft (1 m) for at least 2 hr.
- SAND/DUST – Operates in winds with exposure to fine dust and sand particles.
- FUNGUS – Built from fungus resistant materials.
- VIBRATION AND SHOCK – Withstands vibration associated with transport and shocks of dropping in use.
- ALTITUDE – 40 000 ft (12 000 m).

PHYSICAL

- DIMENSIONS – 3.94 x 2.62 x 1.24 in. (100 x 66 x 31 mm) (H x W x D).
- WEIGHT – (without pouch): 8.9 oz (252 g).
- VOLUME – 12.8 in.³ (210 cc).

QUALIFICATION TESTING

UltraRadiac-Plus has been type-tested to meet ANSI-N42.33-2006.*

ORDERING INFORMATION

- URAD-PLUS-S/Y – UltraRadiac-Plus, Yellow, Sv unit, alkaline batteries, DC connector for rechargeable NiMH batteries.
- URAD-PLUS-S/B – UltraRadiac-Plus, Black, Sv unit, alkaline batteries, DC connector for rechargeable NiMH batteries.
- URAD-PLUS-R/Y – UltraRadiac-Plus, Yellow, R unit, alkaline batteries, DC connector for rechargeable NiMH batteries.
- URAD-PLUS-R/B – UltraRadiac-Plus, Black, R unit, alkaline batteries, DC connector for rechargeable NiMH batteries.
- URAD-PLUS-DCCHARG – DC charger with cigarette lighter connector (needs NiMH rechargeable batteries to operate).
- URAD-PLUS-S/Y/NC – UltraRadiac-Plus, Yellow, Sv unit, alkaline batteries, no DC connector.
- URAD-PLUS-S/B/NC – UltraRadiac-Plus, Black, Sv unit, alkaline batteries, no DC connector.
- URAD-PLUS-R/Y/NC – UltraRadiac-Plus, Yellow, R unit, alkaline batteries, no DC connector.
- URAD-PLUS-R/B/NC – UltraRadiac-Plus, Black, R unit, alkaline batteries, no DC connector.
- URAD-PLUS-MOUNT – Vehicle mount for URAD-PLUS (allows the use of DC charger).

*Minor exceptions: Sec. 6.4, Sec. 5.12 and Sec. 5.7 (optional). See detailed specs.



UltraRadiac™-Plus Training CD



This interactive CD-based training course provides the new user of CANBERRA's UltraRadiac-Plus Personal Radiation Monitor with step-by-step instruction in the proper set up and use of the monitor. Through virtual 'hands on', the student will perform all necessary tasks and receive immediate feedback. The CD also includes an UltraRadiac-Plus simulator for extended practice with the monitor. The CD-based training is also useful as a refresher to those previously trained in the UltraRadiac-Plus's use.

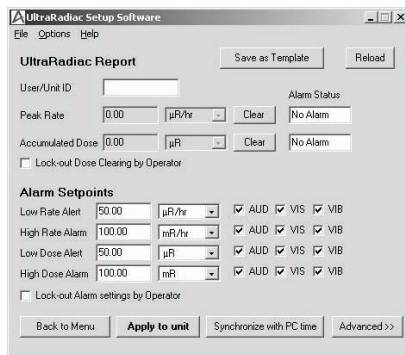
S900: Powerful setup software for your UltraRadiac-Plus

Description

S900 brings security and flexibility to CANBERRA's UltraRadiac-Plus. It helps users set up a large quantity of instruments without using the keypad. Connection to a PC is achieved with the Infrared-to-Serial (IR) adapter. Thus, the user only has to position the UltraRadiac-Plus's IR cells facing the IR adapter to allow wireless communication (no need to remove the instrument pouch). S900 is available for the roentgen and sievert versions of the UltraRadiac-Plus.

Security

S900 can lock-out the Alarm Setting by the operator using the UltraRadiac-Plus keypad. This guarantees that all workers will use predefined alarm set-



points. The same feature keeps a user from clearing Accumulated Dose, and therefore allows a supervisor to monitor dose received by a worker in the field, without losing any data.

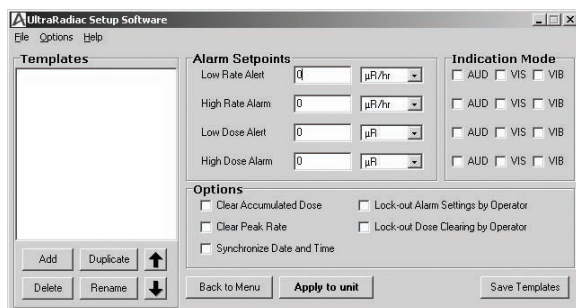
Data-Logging

S900 downloads up to 999 data-points saved in the UltraRadiac-Plus's memory and generates a MS-Excel or text file on the PC.

	A	B	C	D	E	F	G	H
1	Rate [R/hr]	Date	Time	Latitude	Longitude	Dose [R]		
2	1.1E-05	3/25/2004	11:20:36	N 00°00.000'	E 000°00.000'	0		
3	1E-05	3/25/2004	11:20:50	N 00°00.000'	E 000°00.000'	0		
4	7E-06	3/25/2004	11:21:08	N 00°00.000'	E 000°00.000'	0		
5	7E-06	3/25/2004	11:21:54	N 00°00.000'	E 000°00.000'	1E-07		
6	5E-06	3/25/2004	11:22:14	N 00°00.000'	E 000°00.000'	1E-07		
7								
8								
9								
10								
11								

Flexibility

S900 lets you set each parameter manually or with Manage Templates: a group of settings defined for a particular group of workers. The user selects one template and immediately makes the UltraRadiac-Plus available for the worker. Only a few seconds are necessary to set up an instrument this way!



Monitoring Mode

S900 includes a monitoring mode that utilizes the IR link to log data. Every two seconds a list of measured data is generated, providing this selection is made prior to the start of the monitoring application.

