

# NUCLEAR RADIATION DETECTOR MODEL RAD-7001

BULLETIN RAD7001



**RAD-7001 Nuclear Radiation Sensor.**

## Applications

The RAD-7001 is ideal for:

- Emergency nuclear event response for HAZMAT teams
- Military tactical and NBC teams
- Continuous safety monitoring at nuclear power or weapons facilities
- DOE and EPA environmental site compliance
- "Superfund" site work

## Principle of Operation

The Geiger tube used in the RAD-7001 has a conductive outer cathode shell held at ground potential, while the Anode is supplied with several hundred volts provided by an internal high voltage supply. A pulse output, retrieved off the anode, heralds a nuclear particle detection. A TMS-7200 accumulates these incoming pulses. Geiger counters are a form of gas amplifier tube in which ionizing radiation triggers an avalanche type discharge in a low pressure gas already under electrical stress. Amplification factors within the detector often exceed a factor of 10,000. The Geiger tube is evacuated and then filled to 50 torr pressure with neon.



YANKEE ENVIRONMENTAL SYSTEMS, INC.

$$p = \frac{\rho RT}{m}$$

$$S(\lambda) = S_0(\lambda) e^{-m \cdot \delta(\lambda)}$$

$$B(\tau) = bT^4$$

## General Description

The RAD-7001 *Nuclear Radiation Detector* provides nuclear emergency status monitoring across a metropolitan area. Wide area geographical monitoring is a critical element to any emergency response plan. The RAD-7001's G-M tube provides high sensitivity radiation detection. It continuously detects ionizing radiation events from alpha, gamma or beta particles. It can detect gamma radiation from such potential "dirty-bomb" candidates as Cobalt 60, Cesium 137 and Iridium 192 - substances which are highly radioactive, yet readily available as a result of their use in medical and industrial applications.

Radiation counts are sent via TMS-7200 systems via wireless RF communications to a central METHUB data receiver and displayed in real time via METDAS software. The system operates with or without AC grid power and is independent of the telephone network. For homeland security applications requiring continuous real time data, system provides turnkey remote nuclear radiation monitoring solution for HAZMAT teams.

If background radiation counts fall to zero for an extended period of time, the sensor alerts the system of a potential sensor or power/cable problem. A low level test source is provided to facilitate in-field testing and verification of detector sensitivity.

Optional METDAS software displays nuclear radiation levels on a local area map at each RAD-7001-equipped location. Accumulated counts are updated once a minute. METDAS also displays real time meteorological data from the TMS-7200. If nuclear events exceed a user-adjustable background threshold, the display at the location on the map changes.

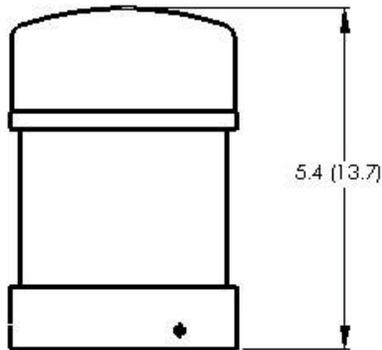
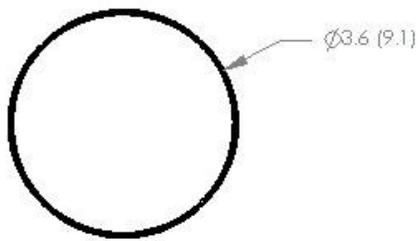
## Features

- Sensitive Geiger tube technology counts alpha, beta or gamma particles
- 16 bit counting rate per minute
- Automatic detection of sensor failure
- Interfaces to Model TMS-7200

$$e_w(T_d) = \frac{r}{0.62197 + r}$$

$$2\Omega v \sin \phi = 2\Omega w \sin \phi + F_x$$

$$\frac{dh}{dt} = \frac{1}{\rho} \frac{\partial p}{\partial x} + \frac{u \partial v}{\partial x} + \frac{v \partial w}{\partial x}$$



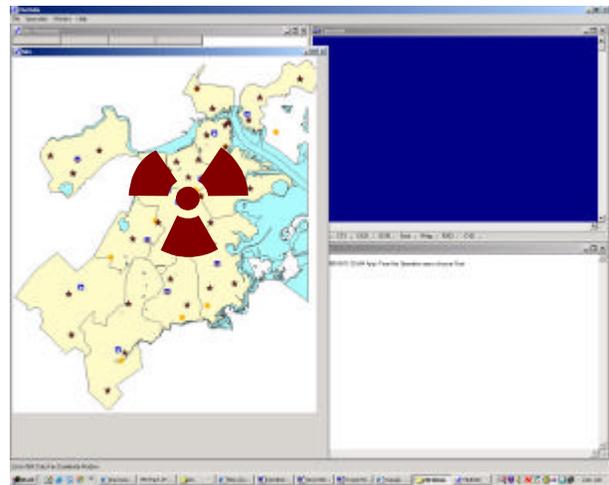
**Mechanical Interface, inches (cm)**

**Weight:** 4.4 lb (2 kg)

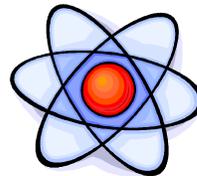
**Dirty Bomb Detection Applications**

RAD-7001 sensors can detect gamma emissions from nuclear fallout landing nearby or at levels consistent with a reasonably well shielded gamma source some distance away. As they provide continuous measurements of radiation values over a long period of time, they detect much lower actual radiation than other “short introduction” sensor types.

METDAS software traps data indicating for sensor failures or when values exceed programmed ranges. The RAD-7001 sensor is clamped to the bottom of mast of a TMS-7200 near the ground or rooftop where radioactive dust and fallout might accumulate. A data cable connects directly to a Model TMS-7200, which also provides DC power.



**METDAS real time view of radiation level in a metropolitan area. Data can be used by tools such as CATS/HPAC for emergency response planning.**



**YANKEE ENVIRONMENTAL SYSTEMS, INC.**  
 Airport Industrial Park  
 101 Industrial Blvd., Turners Falls, MA 01376 USA  
 Tel: (413) 863-0200 Fax: (413) 863-0255  
 E-mail: info@yesinc.com <http://www.yesinc.com>