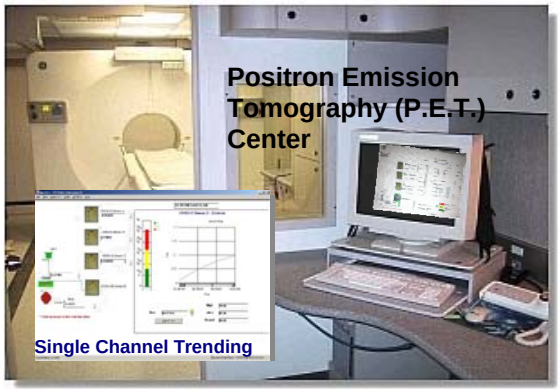
P.E.T. APPLICATIONS

Radiation Detection & Control

INTERNET READY | **ETHERNET TCP/IP**



Radiation Detection for P.E.T.

Positron Emission Tomography (P.E.T.) is a non-invasive, diagnostic imaging technique for measuring the metabolic activity of cells in the human body. It is useful clinically in patients with certain conditions affecting the brain and the heart as well as in patients with certain types of cancer. A PET Scan is a simple procedure involving the use of a small amount of a radioactive material, similar to what is used in other nuclear medicine procedures. The radioactivity is attached or tagged to a compound that is familiar to the body. The presence of this radioactivity requires the proper monitoring instrumentation to measure area and airflows associated with this radioactivity. Apantec provides standard radiation instrumentation for area and air monitoring in all types of P.E.T. Centers including:

- Air Monitoring
- Area Monitoring
- Software Control (tracking, trending, reporting)

AIR MONITORING

For measuring the air released into the atmosphere through the P.E.T. Center's vent duct or stacks Apantec a gamma sensitive scintillation detector (Apantec Model #SD220N) that goes inside the piping used to ventilate the air to the atmosphere (on the roof usually) so we can detect any radioactive gamma particles being released.

The SD220N detector offers many attributes because it is gain-stabilized to prevent the need for compensating for shifts due to drifting, has a built-in multi-channel analyzer for identifying the istotope, and a thermister (for temperature compensation. All of this "self-protection" significantly increases reliability and allows our detector to be calibrated over an **18 month** time frame instead of more frequently (as is common).

AREA MONITORING

Apantec area monitors are configured to give you a choice of local display, esthetics, and space. Most commonly used is Apantec's D.O.R.A. (Detector Of Radiological Activity) Area Monitor which is small and lightweight, and offers real-time ethernet capability.

FEATURES:

- High-speed embedded microprocess
- Energy compensated G-M Tube
- Time-to-count G-M tube control circu
- Built in high-voltage power supply
- RS-485 serial communications port
- TCP/IP Ethernet port for networking
- LED status indicators (Normal/Alarm)
- Audible alarm indicator with acknowl
- High alarm solid-state relay output, r 0.15A @28 VDC
- 0-5V analog input
- One (1) 0-10VDC analog output.
- xD card stores 16MB via serial Ethernet ports
- Local trend display
- Optional extended range 10 µR/h to 1,000 R/h
- Optional extended range 0.1 to 100 Sv/hr.
- External 'Smart' probe port

5"H x 4"W x 3"D
2 lbs.

APANTEC

Typical D.O.R.A. Area and SD220N Stack Configuration

DORA provides highly accurate ambient Gamma activity over a wide range including rate, dose and status information locally and to a remote computer system or display unit through a high speed Ethernet TCP/IP network. It is built around a high-speed microprocessor core that handles all measurement, indication, communication, and historical record retention.

D.O.R.A. SPECIFICATIONS

Detector:	Halogen quenched energy compensated GM tube
Sensitivity:	1700 cpm/mR/h.
Range:	10 µR/hr to 10 R/hr.
Indicators:	Alarm: Red Normal: Green Audible:80Db at 3ft w/acknowledge
Outputs:	Digital: (1) TCP/IP Ethernet (1) RS-485 serial Analog: (1) 0-10VDC Alarm Relay: (150 mA @120 VAC, 150 mA @ 28VDC)
Inputs:	0-5 VDC analog input
Power:	12 VDC, 0.5A nominal, (9 VDC to 15 VDC) (110/220 VAC 50/60 Hz available)
Temp:	-20 to +50 °C
Humidity:	0-95% RH, non-condensing
Dimensions:	5” high x 4” wide x 3” deep
Weight:	2 pounds

FMA913 Air Flow (velocity) Sensor (optional)

10-5,000 SCFM (the speed of air through the duct

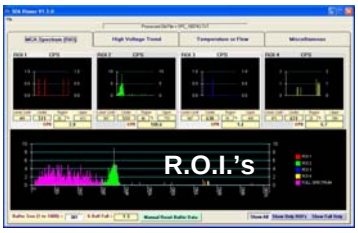
The use of the FMA913 allows the “rate” of release into the atmosphere to be determined in “real time” and can be used with either Model SD220N gamma scintillation probe, or Model FTIC100 flow through ion chamber. Depending upon the P.E.T. Centers' requirements, an air flow sensor may be necessary. The FMA913 requires an enclosure and must be mounted directly onto the duct pipe. It also needs a probe mount and separate DC power supply.

TYPE	MODEL NUMBER	APPLICATION	DETECTOR CONFIGURATION	RANGE (SI UNITS AVAILABLE)	LOCATION
AIR	FTIC100	IN-LINE	Flow-Through Ion Chamber	10^{-7} µCi/cc to 10^{-1} µCi/cc	Vent Stack Monitor
AIR	SD220N	IN-LINE	NaI(TI) Scintillator	5 mR/hr or up to 50,000 cps	Vent Stack Monitor
AREA	AM100PF	OFF-LINE	Beta NE102 Plastic Scintillator	10^{-7} µCi/cc to 10^{-1} µCi/cc	Vent Stack Monitor
AREA	DORA	N/A	Gamma Detector	10 µr/hr – 10,000 R/hr	Rooms, Doors, etc.
AREA	ID100	N/A	Ion Chamber Detector	100 µR/hr - 10 R/hr	Cyclotron Vault

D.O.R.I.S. (Display of Radiological Information Software)

Apantec’s Display of Radiological Information Software (**DORIS)** System provides real-time data reporting and control through a user-friendly graphics display with an easy to use operator interface system. Data is collected, analyzed, displayed and recorded in real-time while posting alarms for operator notification. The operators will be able to display and/or control the data at either the display unit or **DORIS** hardware platform in real time.

D.O.R.I.S. FEATURES



- **Current readout activity**
- **Detector information**
- **High/Alert/Fail alarm status**
- **Detector status (fail, normal, etc)**
- **Status & Trend information**
- **Graphic trending data**
- **Collecting, Converting, Storing,**
- **Integrating, & Analyzing data**
- **Detecting, Annunciating, &Storing Alarms**
- **Provides Current, & Historical, Displays**
- **Generates System and Graphic Displays**
- **Provides On-line Data base and Display**
- **Provides On-line Diagnostic Displays**

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