

Protection Made Simple



Healthcare and Research Radiation Safety Product Guide

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The purpose of this product guide is to act as a guide or general summary for the Healthcare and Research industries relative to Thermo Scientific product offerings. The guide is organized by product family and includes a brief description and technical characteristics for each product. *The items listed in this product guide have more detailed technical specifications available upon request or visit thermo.com/rmp to search for a particular item.*

This guide is *not* all inclusive of the Healthcare and Research product solutions offered by Thermo Fisher Scientific, so please contact Customer Service in North America at (800) 274-4212. Worldwide inquiries may use the following email addresses:

United Kingdom based customers: customerservice.eid.beenham@thermofisher.com

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ViewPoint compatible

Items listed in this product guide compatible with Thermo Scientific ViewPoint software are identified with the ViewPoint software icon, shown above.

Cardiology	Emergency Department	Hospital Health Physics	Radiation Pharmacy	Research
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Dosimetry

TLD Family (Passive)

Suggested Applications

Monitor dose data in:

- Stereotactic Radio Surgery
- Fluoroscopy procedures
- Intensity Modulated Radiotherapy (IMRT)
- Brachy therapy
- Total Body Irradiations (TBI)
- Mammography
- Measurement of CT doses
 - Major concern for pediatric patients
- Whole body exposures for Radio Pharmacy programs

Thermo Scientific WinREMS

- Provides legal dose of record database for TLD personnel exposures used by departments requiring onsite “legal dose of record” historical data storage.

Loose TLD Materials—LiF:Mg,Ti (TLD100, TLD 600, TLD 700)

LiFMgTi is the most widely studied TLD material in the world. This nearly tissue-equivalent material has been the standard bearer for absorbed dose measurements in Radiation therapy and diagnostic radiology since the 1950s.

Technical Characteristics

- Nearly tissue-equivalent—effective atomic number 8.2
- 40% maximum response variation from 17 keV to >8 MeV
- Deterministic fade characteristics—5%/yr at 200°C (with anneal)
- Useful range—1000 μ Rad to 10,000 Rad (10 μ Gy to 100 Gy)
- Dose rate dependence—none or very low



Loose TLD Materials—LiF:Mg,Cu (TLD 100H, TLD600H, TLD 700H)

LiFMgCu is the most recent advancement in the world of TLD materials. This nearly tissue-equivalent material is becoming the standard bearer for absorbed dose measurements in Radiation therapy and diagnostic radiology.

Technical Characteristics

- Nearly tissue-equivalent—effective atomic number 8.2
- 20% maximum response variation from 17 keV to >8 MeV
- 10 to 25 times more sensitive than the standard LiFMgTi material
- Useful range—100 μ Rad - 10,000 Rad (1 μ Gy - 100 Gy)

Accessories for Loose TLD Materials

Accessories are optional items for storage/transfer, handling, annealing and calibration of loose TLD materials.

Technical Characteristics

- Storage/Transfer—Holders that can hold up to 50 or 120 dosimeters, and powder dispensers for powders.
- Handling—Vacuum and mechanical (Teflon tipped) tweezers
- Annealing—Annealing ovens, annealing trays and quench blocks
- Calibration—Table top irradiator



Harshaw 3500 TLD Reader

The Harshaw Model 3500 Manual TLD Reader is a PC-driven, manually-operated, tabletop instrument for thermoluminescent dosimetry (TLD) measurement. It economically provides both high performance and high reliability. The 3500 reads one dosimeter per loading and accommodates a variety of TL configurations, including chips, disks, rods, and powder.

Technical Characteristics

- Planchet heating incorporates welded thermocouple for best temperature reproducibility
- Heating profile includes pre-heat, acquire and anneal cycles
- Heating temperature capability up to +600°C (+1112°F)
- Seven-decade glowcurve acquisition range



Harshaw 5500 TLD Reader

The Harshaw Model 5500 Automatic TL Reader is a PC-driven, tabletop instrument for thermoluminescence dosimetry (TLD) measurement. This Reader is capable of reading 50 dosimeters per loading and accommodates TL chips, rods, and cubes in a variety of sizes.

Technical Characteristics

- Unattended automatic background subtraction capability
- Easy to operate, service and maintain
- Compact and attractive
- Unattended automatic operation for up to 50 dosimeters

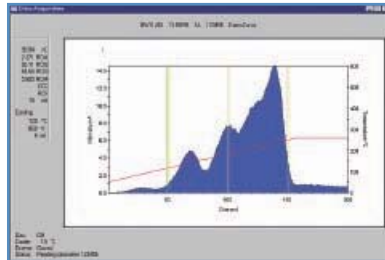


Windows Radiation Evaluation and Management System (WinREMS)

The Windows® Radiation Evaluation and Management System (WinREMS) is a software application that directs the operation of the Thermo Scientific Harshaw TLD reader; receives dosimetry data from the reader; stores, retrieves and processes the data; and then presents the data in a meaningful form.

Technical Characteristics

- Electronics QC test results display for use in recording important reader parameters.
- Response database search functions with multiple selection criteria such as dosimeter usage, date, dosimeter ID, response value and acquisition mode with responses displayable in either glow curve or standard report formats.
- Background subtraction and multi-point calibration capabilities, if desired.
- Computes and displays dosimeter calibration mean element response, standard deviation and reading acceptance statistics.
- Flexible reader calibration factor (RCF) determination with user-adjustable reader correction factor limits and user-selectable computed exposure units.
- Maintains multiple databases for response data, dosimeter element correction coefficient (ECC) data, reader operations data and reader QC data.
- Allows importation of records and reader data from previous versions of TLD reader software and exportation of data in configurable formats to other processing applications



Dosimetry

EPD Family (Active)

Suggested Applications

Thermo Scientific EPD Mk2+ / EPD-G

- Protects medical workers and patients from radiation fields encountered in hospital (dose & dose rate)
 - Fluoroscopy procedures: ensure staff stays below daily/weekly radiation limits
 - Radiation Therapy/Patient procedures: ensure patient receives desired dose; ensure staff stays below dose limits
 - Emergency Department operations: typically stored in kits; use if radioactive patient is brought to ED
 - Radiation pharmacy use: pharmacy technician wears when preparing radioactive product

Thermo Scientific EPD-N2

- Radiation Therapy/Patient procedures where neutron therapy is used: ensures the patient receives desired dose; ensure staff remains below dose limits.

Thermo Scientific EPD Readers

- Departments/sites that issue EPDs on a routine basis (i.e., for extent of specific procedure, etc.) require readers in order to turn on/off, modify parameter settings in EPD.

EPD Mk2+ (Electronic Personal Dosimeter)

The EPD[®] Mk2+ is a personal radiation monitor that detects and measures beta and gamma radiation. Radiation that is detected by the EPD is processed to give an indication of penetrating dose, superficial dose and the dose rates. This information is displayed to the user via an LCD display on the top of the unit.

Technical Characteristics

- Advanced radiological performance (15 keV to 10 MeV)
- Silicon diode detection array
- β/γ measurement capabilities
- AA battery, lithium or alkaline, interchangeable



ViewPoint compatible



EPD-G (Electronic Personal Dosimeter)

The EPD-G is the gamma-only variant of the original Mk2 beta/gamma electronic personal dosimeter; incorporating essentially the same design and features, but with the beta detector and window removed. The EPD-G is suitable for use where there is no requirement for beta detection and measurement.

Technical Characteristics

- Advanced radiological performance (15 keV to 10 MeV)
- Excellent response to gamma and X-radiation
- Loud configurable audible alarm
- Single AA battery powers the unit



ViewPoint compatible



EPD-N2 (Electronic Personal Gamma-Neutron Dosimeter)

The Thermo Scientific EPD-N2 combines excellent photon dosimetry with full-spectrum neutron response, making this dosimeter ideal for those working in mixed neutron/gamma fields.

Technical Characteristics

- Advanced radiological performance, 25 keV-10 MeV (photon), thermal – 15 MeV (neutron)
- Excellent performance in mixed gamma/neutron fields
- Multi-detector technology
- Direct display of Hp(10) for neutrons and for photons



ACT 4 Reader — EPD Mk2 Reader

To complement the EPD Mk2+/N2/G, we offer a range of readers. These readers connect directly to the PC via a serial or optional USB interface. They are compatible with the full range of Mk2 software products and require no external power supply. The ACT 4 is a desktop model with ruggedized keypad designed for computer access control.

Technical Characteristics

- PC Connection: Serial RS232 or USB 1.1 and 2.0 compatible interface direct to PC
- Keyboard Connection: PS/2 style mini-DIN. Accepts input from full keyboard.
- PS/2 cable provided to connect to PC system unit
Cable length: 2 m (6.5 ft)
- Power: No external power required—reader and keypad powered from PC.



ACT 5 Reader – EPD Mk2 Reader

To complement the EPD Mk2+/N2/G, we offer a range of readers. These readers connect directly to the PC via a serial or optional USB interface. They are compatible with the full range of Mk2 software products and require no external power supply. The ACT 5 is a desktop model, designed for stand-alone or computerized access control applications.

Technical Characteristics

- PC connection: Serial RS232 or USB 1.1 and 2.0 compatible interface direct to PC
- Cable length: Serial 1.2 m (3.9 ft); USB 1.0 m (3.3 ft)
- Size and Weight: 180 mm x 125 mm x 70 mm (7 in x 5 in x 3 in), 1.1 kg (2.5 lb)
- Power: None required, drives from PC



IrDA Reader – EPD Mk2 Reader

To complement the EPD Mk2, we offer a range of readers. These readers connect directly to the PC via a serial or optional USB interface. They are compatible with the full range of Mk2 software products and require no external power supply. The IrDA is designed to be used as a stand-alone reader, typically in an office or lab environment.

Technical Characteristics

- PC connection: Serial RS232 or USB 1.1 and 2.0 compatible interface direct to PC
- Cable length: Serial 1.2 m (3.9 ft); USB 1.0 m (3.3 ft)
- Size and Weight: 60 mm x 30 mm x 20 mm (2.5 in x 1 in x 0.8 in), 50 grams (0.1 lbs)
- Power: None required, drives from PC



Dosimetry

EPD Family (Active) continued

Suggested Applications

Thermo Scientific Dosimetry Solutions Kit

- Self-contained EPD kit
- Track radiation routine exposures in the following departments:
 - Fluoroscopy
 - Nuclear Medicine
 - Radio Pharmacy

Thermo Scientific Easy EPD Software

- Any department in facility that processes their own EPDs will require such a program.

Thermo Scientific EasyIssue Software

- Hospital Disaster Management or mass EPD issuance/return situations; photo ID is used to rapidly link EPD wearer to EPD dose/personnel information.

Thermo Scientific WebREMS

- For use in all areas where automatic logging and issuing of the EPD Mk2 is required.

Dosimetry Solutions Kit

The Dosimetry Solutions Kit comprises a rugged carry-case with foam insert to conveniently carry from 5 to 12 EPDs, with batteries, reader and user handbooks. The EasyEPD2 and EasyIssue software packages are included so, with the addition of the users Laptop PC, the EPDs can be fully configured and deployed.

Technical Characteristics are:

- Rugged plastic case supplied with 5 EPD Mk2+ but capable of holding up to 12 EPD Mk2+, EPD-N2 or EPD-G dosimeters.
- Infra-Red Reader integrated into case.
- “EasyEPD2” PC software included, providing access to all EPD features and data, and permitting the batch writing of EPD configuration data.
- “EasyIssue” software included, providing easy to use EPD Issue & Return functions, simple access control, dose report and data export. May be upgraded later for additional EPDs and multi-user network operation.

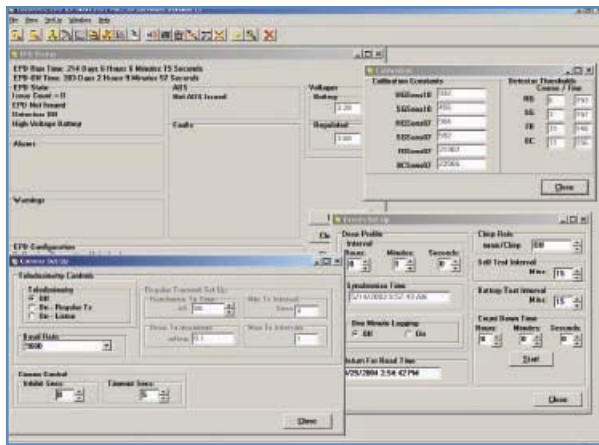


EasyEPD2 Software – Configuration of EPD

EasyEPD2 is the configuration software interface for the EPD Mk2+, EPD-G, and EPD-N2. It may be used for simple issue and return of dosimeters, with read/write logging of data. It also provides secure access to all dosimeter functions, offering the ability to set all parameters and carry out maintenance and diagnostic work.

Technical Characteristics

- Compatible with all Thermo Scientific EPD Readers
- Individual screen windows for each logical functional area of control
- Basic EPD Issue and Return functions are supported
- Reading of dose profile with data or graphic display of historical data



EasyIssue Software Rapid Database Entry/Exit

EasyIssue is primarily used as a tool for rapid issuance and return of EPDs—in and out of a database. The system provides a flexible, configurable and easy way to use an EPD database for rapid issue and electronic dose collection for the EPD Mk2 range of dosimeters.

Technical Characteristics

- Supports grab and go
- Self-diagnostics testing of EPD during issue
- Dose displayed in uSv, mrem and mSv
- Built in reports with selection criteria;
 - Dose – Individual dose records for wearers
 - Dose Summary – of wearers
 - Wearers
 - Tasks
 - Alarms
 - Current Issued EPDs



WebREMS Software – Computer Access Control for EPD Mk2

WebREMS is a client server computer application designed to track and monitor dosimeter (EPD Mk2) usage. WebREMS is termed an Access Control System; workers entering a Radiologically Controlled Area (RCA) must be electronically issued with a dosimeter to be allowed into the area, and then must return the dosimeter upon leaving.

Technical Characteristics

- Web browser access control
- Uses web standards
- Scalable from one site to anywhere in the world



Dosimetry

Real-Time Extremity Monitor

Suggested Applications

Thermo Scientific ED2 and ED2 Software

- Used by medical staff, pharmacy technicians, etc., when handling radioactive source material with hands.

ED2 Personal Extremity Monitor

The ED2 Personal Extremity Dosimeter (PED) is designed for monitoring the exposure of radiation to the user in the nuclear, industrial and medical fields. The ED2 PED monitors the radiation level (instantaneous dose rate and accumulated dose) and will sound an alarm if pre-set levels are exceeded.

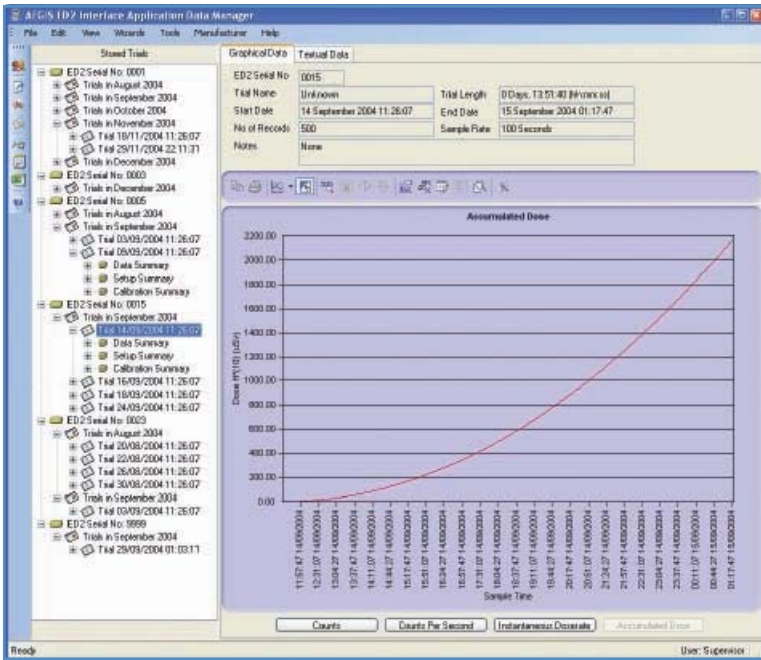
Technical Characteristics

- Real-time dose information
- ViewPoint Enterprise and wireless interface integration with other remote monitoring software.
- Real-time accumulated dose information
- Data logging facility to secure digital memory card



ViewPoint compatible





ED2 Software – Configuration for ED2 Extremity Monitor

The AEGIS ED2 Application Interface software is used to configure, manage and store data and settings for the ED2 Personal Extremity Monitor.

Technical Characteristics

The application can be split into three distinct parts, which are:

- The Interface Application Data Manager
- The Data Card Wizard
- The Report Wizards



Portables

RadEye Family

Suggested Applications

Thermo Scientific RadEye G

Provide dose rate readings during:

- Waste processing
- Fixed area monitoring
- Portable and personnel surveys
- Oncology/Nuclear Medicine procedures (operations monitoring)
- General Health Physics Departments for locating lost sources

Thermo Scientific RadEye B20

Conduct easy, one-handed β/γ contamination surveys of an area, item, or patient in applications such as:

- Quick frisk in nuclear medicine to ensure all products or property are contamination-free
- Contamination readings on waste and waste packages
- Contamination monitoring of radio-isotope production facilities to ensure no spread of contamination outside protected areas
- Part of Emergency Department response kit for handling contaminated patients

Thermo Scientific RadEye GX/ RadEye SX

Within the Medical and Research industries, these light weight and universal meters are used to:

- Provide count rate and surface contamination readings during routine operational, patient and waste surveys
- Provide dose rate readings for operational, personnel, and waste surveys
- Provide scaler functionality during research studies
- Personal contamination surveys, either initial or post-contamination monitor (RadEye SX model only)

RadEye G Personal Radiation Detector

The RadEye G is a lightweight and very rugged instrument designed for quick and reliable measurement of gamma dose rates. Modern electronic circuitry guarantees excellent linearity over six decades of radiation intensity: from background level to 10 R/h—with over range indication up to 1000 R/h (10 Sv/h).

Technical Characteristics

- Rugged and reliable
- Large, clear, backlit display for error-free readings
- High sensitivity to low energy gamma radiation in harsh environments
- 2 AAA batteries provide 600-hour operation life



 ViewPoint compatible

RadEye PRD Personal Radiation Finder Detector

The RadEye PRD represents a high performance measuring device for anyone responsible for finding radiation sources. The RadEye PRD is 5,000-100,000 times more sensitive than a typical electronic dosimeter and approximately 10-100 times more sensitive than the RadEye G. The RadEye PRD incorporates a high sensitivity NaI(Tl) scintillation detector.

Technical Characteristics

- High quality PMT for excellent response from 30 keV
- EMI immunity much better than photodiode instruments
- NaI(Tl)-Detector for high response to Special Nuclear Material (SNM) and Radiological Dispersal Devices (RDDs)
- True dose and dose rate calculation avoids significant overestimation of low gamma energies



 ViewPoint compatible

RadEye B20 Contamination Detector

The RadEye B20 is a modern, compact multi-purpose contamination meter for alpha, beta, gamma and X-ray radiation. By virtue of an optional gamma energy filter, gamma dose rate measurements from 17-1300 keV can be performed.

Technical Characteristics

- Lightweight (300 g), excellent grip with and without gloves
- One-handed use
- Rugged and compact design, thick rubber protective cover
- Low cost of ownership with >500 hours operation time with 2 AAA batteries—rechargeable NiMH-cells can be used



RadEye SX Survey Meter

The RadEye SX is a state-of-the-art, compact, multi-purpose survey meter for external Scintillator detector probes. General count rate, dose rate and surface contamination readings can be obtained from this device; it can be used in portable and fixed deployment.

Technical Characteristics

- Can operate with dual phosphor α , β , Na(Tl) and plastic probes
- Weighs only 160 grams (5.6 oz)
110 mm x 67 mm x 62 mm (4.3 in x 2.6 in x 2.4 in)
- Versatile operation modes
 - Scaler/timer with preset time for sample measurements
 - Continuous rate meter mode for frisker operation
 - Dose Rate Mode
 - AAA Batteries yield ~500 hours of life (assuming normal operation mode.)
 - Simultaneous α , β , and Region of Interest (ROI) operation with distinct audible indication for each measuring channel



RadEye GX Survey Meter

The RadEye GX is a state-of-the-art, compact, multi-purpose survey meter for external Geiger Mueller (GM) detector tubes. General count rate, surface contamination and dose rate readings can be obtained from this device; it can be used in portable and fixed deployment.

Technical Characteristics

- Can operate with virtually any manufacturer's GM detector probes
- Weighs only 160 grams (5.6 oz)
110 mm x 67 mm x 62 mm (4.3 in x 2.6 in x 2.4 in)
- Versatile operation modes
 - Scaler/timer with preset time for sample measurements
 - Continuous rate meter mode for frisker operation
 - Dose Rate Mode
 - AAA Batteries yield ~500 hours of life (assuming normal operation mode.)



Note: The RadEye GX, SX, and PX are new survey meter products that when combined with existing and future survey probes, will replace the Mini Family of survey instruments in the future.

Portables

Mini Family

Suggested Applications

Thermo Scientific Mini Ratemeter Monitors

- Useful in diagnostic imaging, radiation therapy, radioactive waste handling situations, radioactive material, and area monitoring requirements.

Mini 900 Ratemeter Scintillation Monitor with 44A Probe

The monitor is designed for use in teaching, research, hospital, and industrial laboratories. When fitted with a suitable probe, it will measure radioactive contamination down to the background levels; indicates γ or x-ray background intensity.

Technical Characteristics

- Designed for contamination monitoring of electron capture and isometric transition nuclides.
- Scintillation crystal is mounted close to the front of the probe to obtain a high collection efficiency.
- Unwanted radiation on the back of the crystal is reduced by a short lead shield.



Mini 900 Ratemeter Radiation Monitor Model D

The monitor is designed for use in teaching, research, hospital, and industrial laboratories. When fitted with a suitable probe it will measure contamination down to the accepted levels and indicate γ or x-ray background intensity.

Technical Characteristics

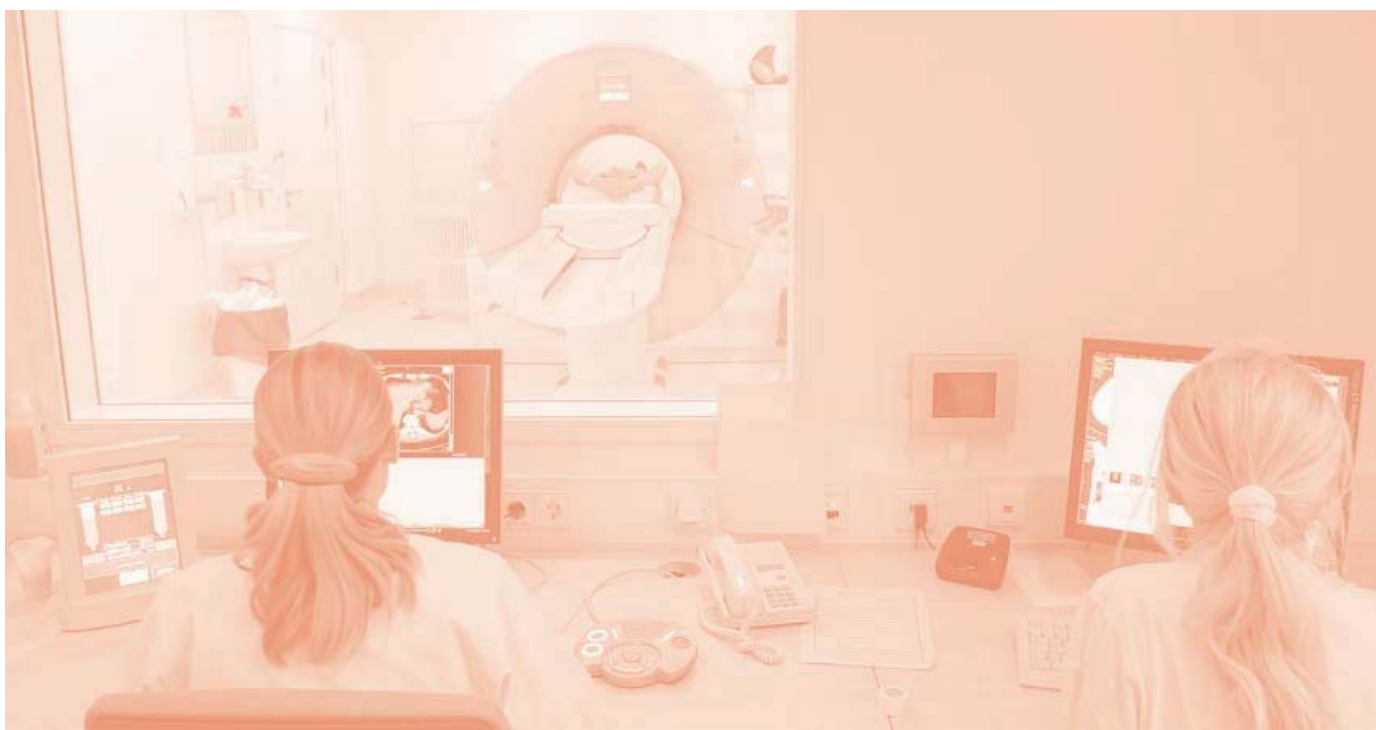
- Model D is scaled 0.1 to 1000 $\mu\text{Sv h}^{-1}$
- The GM tube is partially compensated to give a response from 30 keV to 1.25 MeV
- The detector is directional, particularly at low energies and must therefore only be used where the radiation is incident on the front face of the detector

Mini 900 Ratemeter Radiation Monitor Model EP-15

The monitor is designed for use in teaching, research, hospital, and industrial laboratories. When fitted with a suitable probe it will measure contamination down to the accepted levels and indicate γ or x-ray background intensity.

Technical Characteristics

- The EP-15 uses a halogen-quenched GM tube with an active area of 15 cm^2 and a window thickness of 1.5-2.0 mg cm^{-2}
- Recommended for soft β -monitoring
- Suitable for measuring the lower contamination limits for soft β -emitters such as C-14, S-35, Ca-45, P-32, and I-31
- Thin mica window makes it suitable for monitoring β particles above 3 MeV



Portables

Ion Chamber Instruments

Suggested Applications

Thermo Scientific Mini Ratemeter Monitors

- Useful in diagnostic imaging, radiation therapy, radioactive waste handling situations, radioactive material, and area monitoring requirements.

Mini SmartION Series

The SmartION is an advanced microprocessor-based instrument for the measurement of γ , β - and x-ray radiation. It provides functions previously not available in meters of this type, including data logging, alarm, remote calibration and security features. Operation is simple, reliable and maintenance-free, and the instrument is housed in a robust case.

Technical Characteristics

- Sensitive ion chamber
- Electrometer with minimal leakage and drift
- Measurement in Sv/h, Gy/h and mR/h
- Data logging by random or pre-ordered routes



Portables

Portable Spectroscopy (Interceptor)

Suggested Applications

Thermo Scientific Interceptor

Radionuclide location and identification is critical in many areas of the hospital, including:

- Identification of waste for planned shipments and investigations involving burial site visits
- General patient monitoring (when suspected radiation isotopes involved)
- Emergency Department triage of contaminated patient; determine specific radiation isotope on patient
- Search and find scenarios; rapidly locate and identify lost or hard-to-find radioactive sources.

Interceptor Gamma Spectroscopy Detector

The state-of-the-art Thermo Scientific Interceptor is a Spectroscopic Personal Radiation Detector (SPRD) combining the qualities of a Personal Radiation Detector (PRD) with radioisotope identifier capabilities (RIID). It offers superior sensitivity with on-the-spot, accurate identification.

Technical Characteristics

- CZT finder and identification detectors for superior sensitivity and more accurate identification without sacrificing efficiency
- He-3 neutron detector for high sensitivity to neutrons without gamma crosstalk
- Small and lightweight; can be worn safely and securely in a holster
- Optional digital camera, voice recorder to document suspicious objects, and can transmit info via optional Bluetooth communications



ViewPoint compatible



Installed Monitors

Area Monitors

Suggested Applications

Thermo Scientific RadEye and FHT 6020 Area Monitors

- Used in known high dose areas or to ensure safe levels in public areas.

Thermo Scientific CNET 1500 NDS

Fixed location, remote area radiation monitoring in:

- Nuclear medicine: mount on wall to ensure public areas are kept below regulatory limits
- Radiation Therapy: monitor areas in accelerator vicinity to ensure compliance to limits
- Radiation Pharmacy: monitor hot lab/production areas; identify source material if it “escapes” from controlled areas

Thermo Scientific FHT 59 C

- Ensure airborne areas either in hospital, university, or Radio Pharmacy (working zones or effluent release paths) are below site and regulatory release limits.

Thermo Scientific LFM-3

Within the Medical and Research industries, this rugged and robust, yet portable detection system is suitable to:

- Provide fast and accurate readings/detection for solid waste monitoring for shipments leaving a hospital or medical/research facility
- Provide a quick scan of Nuclear Medicine waste within the treatment center PRIOR to it entering into the general waste system of the hospital
- Provide an added layer of safety and defense in hospital general housekeeping departments by screening all bags of waste and serving to identify inappropriately marked/placed bags of radioactive waste.

RadEye Area Monitor

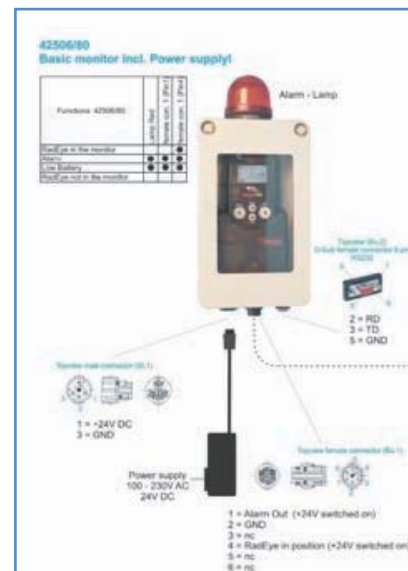
The RadEye Area Monitor is based on the Thermo Scientific RadEye family of personal radiation meters. The RadEye was developed in response to a growing need for smaller, more compact detectors which have even more sensitivity to unwelcome radioactive sources.

Technical Characteristics

- Highly sensitive Area Monitor for wall mounting
- Removable RadEye detector for localization of radiation sources or remote monitoring
- Housing with power supply unit and battery recharger
- RadEye with rechargeable batteries for permanent operation



ViewPoint compatible



FHT 6020 Display and Alarm Unit

The Thermo Scientific FHT 6020 display, with alarm and communication, is an industry-proven area monitor. It has audible and visible alarms for maximum protection against the threat of radiation.

Technical Characteristics

- Local display of measurements with up to 16 intelligent dose rate probes or amplifiers
- Local display of measurements with up to two probes of the FH40G probe range
- Measurement memory for probes of the FH40G range
- Local audible and visible alarms



ViewPoint compatible



CNET 1500 NDS (Network Docking Station)

The CNET 1500 NDS (Network Docking Station) is both an Area Radiation Monitor and a hub for connecting radiation and environmental monitoring devices to a wireless network. It has an internal Thermo Scientific EPD Mk2 radiation detector and built-in strobe and sounder alarm devices.

Technical Characteristics

Standard hardware features of the CNET 1500 Network Docking Station include:

- Internal Thermo Scientific CNET 1500 Data Router
- Internal Thermo Scientific EPD Mk2 personal radiation monitor
- Integral Thermo Scientific Mk2 Radio Transceiver
- Front panel LEDs indicate Power, Probe (radiation monitor), and Radio operation

 ViewPoint compatible



FHT 59 C – β-Aerosol Monitor

The FHT 59 C is a unique moving filter aerosol monitor that can operate for one year or longer without an operator having to change the sample filter.

Aerosol bound activity is collected on a moving filter tape and is simultaneously measured by the integrated detector.

Technical Characteristics

- Automatic measurement of gross natural β and artificial β-aerosol activity
- Measuring range for artificial β-aerosols approximately 2 Bq/m³ - 0.5 x 10⁶ Bq/m³
- Automatic compensation of the natural activity concentration making use of the α/β-ratio method
- Monitoring function with fast alarming



 ViewPoint compatible

LFM-3 Radiation Detection System

The Thermo Scientific LFM-3 product family has long been an industry standard in the industrial hospital waste monitoring fields. The LFM-3 Radiation Detection System is designed to maximize gamma sensitivity while minimizing background-induced nuisance alarms. The complete system consists of two shielded NaI(Tl) detectors, shock mounted in separate weatherproof PVC housings. Monitor display/readouts can be either local or remote via integrated monitoring system (i.e., ViewPoint™, etc.)

Technical Characteristics

- Low, medium and high energy gamma detectors (>20 keV);
Size: 50-mm (2-in) NaI (Tl) detectors;
- Detector housing Size: 114 mm x 444.5 mm x 177.8 mm (4.5 in x 17.5 in x 7 in)
- Weight: 6.67 kg (14.7 lbs)
- Operating Temperature: -20°C to +50°C (-4°F to +122°F)

Installed Monitors

Air Monitors

Suggested Applications

Thermo Scientific AMS4

- Radio Pharmacies, Research Hot Labs, and Medical Waste Facilities—used to alarm if airborne radiation alarm thresholds are exceeded.

Thermo Scientific Alpha 7A

- Handling of waste and specific hot lab applications where alpha contamination/emitting isotopes are present in the medical and research areas.

AMS-4 Continuous Air Monitor

The AMS-4 is a radiation-in-air detection system, designed to provide an early warning to workers exposed to potential airborne releases of beta emitting particulates, iodine or noble gases. Its lightweight and robust design accommodates both fixed and portable use applications.

Technical Characteristics

- Beta particulate, iodine and noble gas detection
- Radial inline noble gas detector heads available
- Accommodates portable and fixed applications
- Measures DAC & DAC-hours



ViewPoint compatible





Alpha-7A Alpha Particulate Continuous Air Monitor

The Alpha-7A is a Continuous Air Monitor (CAM) designed to provide early warning to workers exposed to airborne releases of alpha-emitting radionuclides to reduce the internal inhaled dose.

Technical Characteristics

- Simultaneously monitors up to eight isotopes
- Advanced peakshape algorithms
- Alpha spectral data updated every second
- Radial or inline smart detector heads
- Concentration, dose, and activity alarms



ViewPoint compatible



Installed Monitors

Personnel Contamination Monitor

Suggested Applications

Thermo Scientific FHT 65 LL/LLX

- Useful at step-off pad locations where research or medical radiation workers leave contaminated areas and re-enter clean areas.

Thermo Scientific HFM11-5C

- Used to provide rapid hand and foot monitoring for β/γ contamination at personnel exits from contaminated areas such as:
 - Nuclear Medicine hot isotope storage or patient treatment areas
 - Radiation Pharmacy radio-isotope production areas; ensure contamination stays on inside of hot cell

Thermo Scientific CM11

A fixed contamination monitoring system that can be used for:

- Simple hand and foot monitoring at controlled areas
- Survey of waste to be shipped offsite
- Monitoring of personnel contaminated in nuclear medicine and radiation pharmacy operations area

Thermo Scientific TPM-903B

- Waste go/no go monitoring during large scale radiation accident triage efforts
- Personnel exit from radio-pharmaceutical production facility
- Rapid clean/contaminated personnel monitor for mass radiation accident response

Thermo Scientific SAM12

- Used for doing quick and accurate surveys on tools/articles to be used at locations where research or medical radiation workers leave contaminated boundary areas and re-enter clean areas.

FHT 65 LL/LLX Hand and Foot Monitor

Automatic hand and foot monitor with flow type counter tubes or sealed xenon counter tubes for alpha/beta or gamma monitoring, utilizing proven FHT 6020 technology. Use in lab areas in order to ensure clean areas are maintained; economical solution to non-manual personnel frisking requirements.

Technical Characteristics

- Superior performance
- Rational, cost-effective design without loss of measuring quality
- Ease of installation by virtue of small foot print and flexible positioning of the FHT 6020 display unit
- Comfortable and easy configuration of the FHT 65 LL/LLX using the FHT 65 LL/LLX Windows configuration program



HFM11-SC Scintillation Hand and Foot Monitor

The HFM11-SC provides the world-class reliability and ease of use associated with the traditional gas flow HFM11-GF, but with the added benefit of not requiring counting gas, or the associated costs of gas detector change out. *A Hand-Monitor-only version of this is also available.*

Technical Characteristics

- Low power fan-less operation
- Large touch-screen color LCD display—no keyboard required
- Easy to maintain detector assemblies, minimal basic tools required
- Optional frisker probe



CM11 Frisking Monitor

The CM11 Contamination Monitor is a large area, gas flow detector designed for radiation workers to monitor themselves, their clothing and belongings effectively after a minimum of training and supervision. It has the versatility of advanced portable monitors without complexity. The following is a list of probes that can be used with the CM11:

- CM11E with BP19DD probe for low energy beta
- CM11E plus DP6DD or CM11F/1 with DP11A/1 for alpha and beta
- CM11D plus GP13A for low energy photon, also referred to as IBEXA

Technical Characteristics

- Radon recognition algorithm—eliminates nuisance alarms by distinguishing radon alarms from others
- Gas flow and scintillation detectors both use a standard coaxial cable
- Signal processing for smoother displays of changing count rate with better detection of contamination
- Internal power source gives at least 2.5 hours operation without main power



TPM-903B Transportable Radiation Portal Monitor

The Thermo Scientific TPM-903B, a large-volume plastic scintillation monitor, is designed for rapid radiation screening of personnel. It provides early warning of hot spots, (e.g., on protective clothing), and has design features suited for monitoring radiation workers, vehicles or the public.

Technical Characteristics

- Quick and easy setup
- Lightweight construction
- Very sensitive, highly uniform responses to gamma radiation
- Powered by AC or D-cell batteries



 ViewPoint compatible

SAM12 Object Contamination Monitor

The SAM12 builds on the rugged capabilities of the SAM11 to monitor articles for gamma emitting radionuclides. Readily measures down to clearance levels less than 5000 dpm (83 Bq), but adds sophisticated new electronics allowing dynamic discrimination between natural and man-made radiations, as well as a unique feature for Co-60 monitoring.

Technical Characteristics

- Measures fixed, smearable, internal and external gamma contamination simultaneously
- Measures down to 5000 dpm independent of methodology
- Excellent uniformity of response across the chamber
- Fast, easy and thorough with no special training or supervision required



 ViewPoint compatible

Installed Monitors

Stack Monitors

Suggested Applications

Thermo Scientific FHT3511

- Monitor air effluent release paths/stacks for positron emitting isotopes at a PET facility.
- Used in university, medical, or Radio Pharmacy PET facilities to ensure radiation safety of general public.

Thermo Scientific FHT 59 Si

- Air effluent stack monitoring for beta particulate, iodine, and noble gas.
- Used in Hospitals, PET, and Radiation Pharmacy facilities.

Thermo Scientific FHT 1701 S - 125

- Used in University, Medical or Radio Pharmacy release point monitoring applications to ensure radiation safety of the general public.

Stack Monitor—FHT3511 PET Monitor

The FHT3511 PET Monitor is a stack monitoring detector designed specifically for positron emitters (PET effluents).

Technical Characteristics

- The FHT3511 measures 511 keV annihilation photons to determine the concentration of positrons in the duct or stack
- Extremely low coincidence background
- Signal-to-back-ground ratio enhanced between one and two orders of magnitude (as compared to standard counting systems)
- Detection limits well below 1 kBq/m³



Stack Monitor— α/β -Aerosol Monitor FHT 59 Si

The aerosol monitor FHT 59 Si is applied for the continuous automatic detection and early warning of aerosol-bound radio nuclides in air. A special compensation method eliminates the influence of high concentration levels of natural aerosol-bound radioactivity on the measured values of artificial radioactivity in air. *A ZnS version of this monitor which provides increased efficiency for Beta monitoring is also available.*

Technical Characteristics

- Automatic measurement of natural and artificial alpha and beta aerosols
- Measuring range for alpha and beta aerosols 0.05/0.3 Bq/m³ - 0.5 x 10⁶ Bq/m³
- Automatic compensation of the natural activity concentration by special evaluation routines
- Reliable filter tape feed mechanism



Stack Monitor—Iodine Monitor FHT 1701 S - 125

The iodine monitor FHT 1701 S - 125 is applied for the automatic monitoring and early warning of I-125 in workplace air or stack gas.

Technical Characteristics

- Continuous measurement of I-125 activity concentration
- Dynamic background compensation by trapezoid method
- 4 π lead shielding of detector including the iodine cartridge
- Heating of sample air intake to reduce the relative moisture of the medium and thereby to enhance the degree of precipitation of I-125 by the filter granules.



Integrated Systems

Telemetry Hardware

Suggested Applications

Thermo Scientific EPD Mk2 Teleadapter

- Remote monitoring of EPDs in Research Hot Lab, Radio Pharmacy, and Medical Fluoroscopy areas
- EPDs are either mounted in position, or worn on workers in the radiation fields. Personal dose/rate and alarm data is automatically sent back to the ViewPoint™ monitoring system for real-time and historical data analysis.

Thermo Scientific CNET Telemetry Systems

- Site infrastructure monitoring, monitoring of key instruments and personnel around a hospital/university, and collection of personnel/monitor instrument readings during widespread radiation event.

EPD Mk2 Teleadapter

The EPD Mk2 Teleadapter is used to collect dosimetry data from a Thermo Scientific EPD Mk2, and to transmit that information back to a central control station running the ViewPoint Software System.

Technical Characteristics

- Dose and dose rate reporting
- Alarm conditions reporting
- Audible and visual local alarm via EPD
- AAA alkaline battery



CNET 1500W

MATRIX CNET1500W is wireless networking device that enables software, instruments and sensors to communicate in a seamless wired or wireless network. The CNET1500W design is based on the latest radio technology for improved reliability and increased functionality.

Technical Characteristics

- Simple user interface for fast connectivity
- Intelligent data routing for reliable backup communications
- Highly configurable: fixed, mobile or venue-driven



CNET 500

The CNET 500 wireless device transceiver is a reliable wireless transmitter for either point-to-point or multi-point remote sensor applications.

Technical Characteristics

- Operation in the 2.4 GHz ISM band allows license-free use and worldwide compliance.
- Mesh style platform
- Communicates with CNET 1500W, other CNET 500s, or CNET 1000 uplink devices to form a network
- Data transmission up to 100 feet (30.5 m)

 ViewPoint compatible



CNET 1000

The CNET 1000 wireless device transceiver is a reliable wireless transmitter for either point-to-point or multi-point applications, and contains a built-in GPS receiver to provide location awareness.

Technical Characteristics

- 2.4 GHz 100mW with worldwide compliance
- 900 MHz 500mW with USA (FCC) and Canadian (IC) compliance
- Repeater functionality
- Communicates with CNET 1500s, EPD Teleadapter, other CNET 1000s or CNET 1500Ws to form a network.

 ViewPoint compatible



Integrated Systems

Emergency Department Notification System (EDNS)

Suggested Applications

Thermo Scientific Emergency Department Notification System

- The Thermo Scientific EDNS has been designed to provide healthcare facilities with the insurance and confidence that vital areas of a hospital will be protected and remain unaffected during the situation where patients with dispersed radioactive contamination are being treated.

Emergency Department Notification System (EDNS)

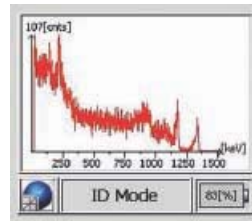
The Thermo Scientific EDNS is a scalable, real-time radiation notification system designed to protect vital healthcare assets at a hospital during a response to a known (or unknown) radiation dispersal event. Deployed in hospital Emergency Departments and/or other vital areas of the facility that require failsafe protection from indiscriminate and dangerous radiation contamination, the EDNS combines proven, state-of-the-art detection technology with an unmatched software enterprise system.

Hardware Technical Characteristics

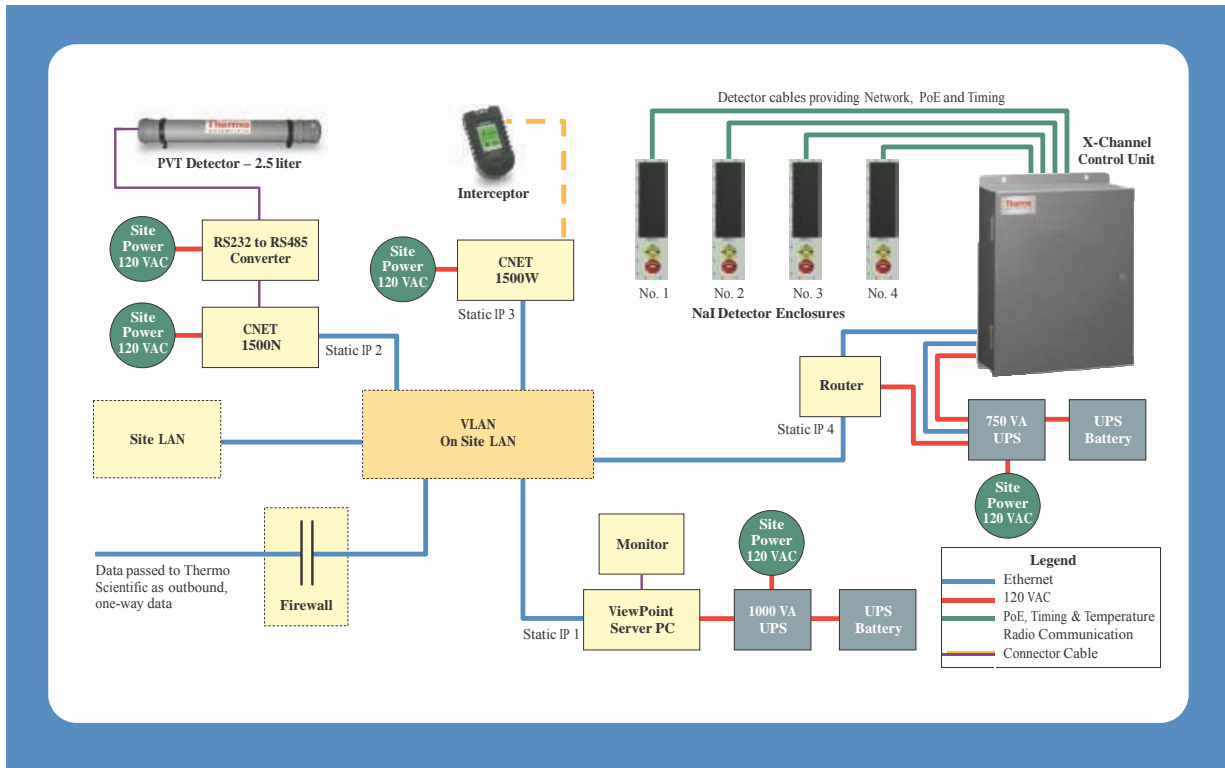
- 101.6 mm x 50.8 mm x 406.4 mm (4 in x 2 in x 16 in) NaI doorway/hallway detector enclosure
- Seven-liter plastic scintillation PVT detector (optional)
- X-channel control unit
- Thermo Scientific Interceptor hand-held spectroscopy unit
- CNET 1500 network device
- Thermo Scientific ViewPoint data server PC

Software Technical Characteristics

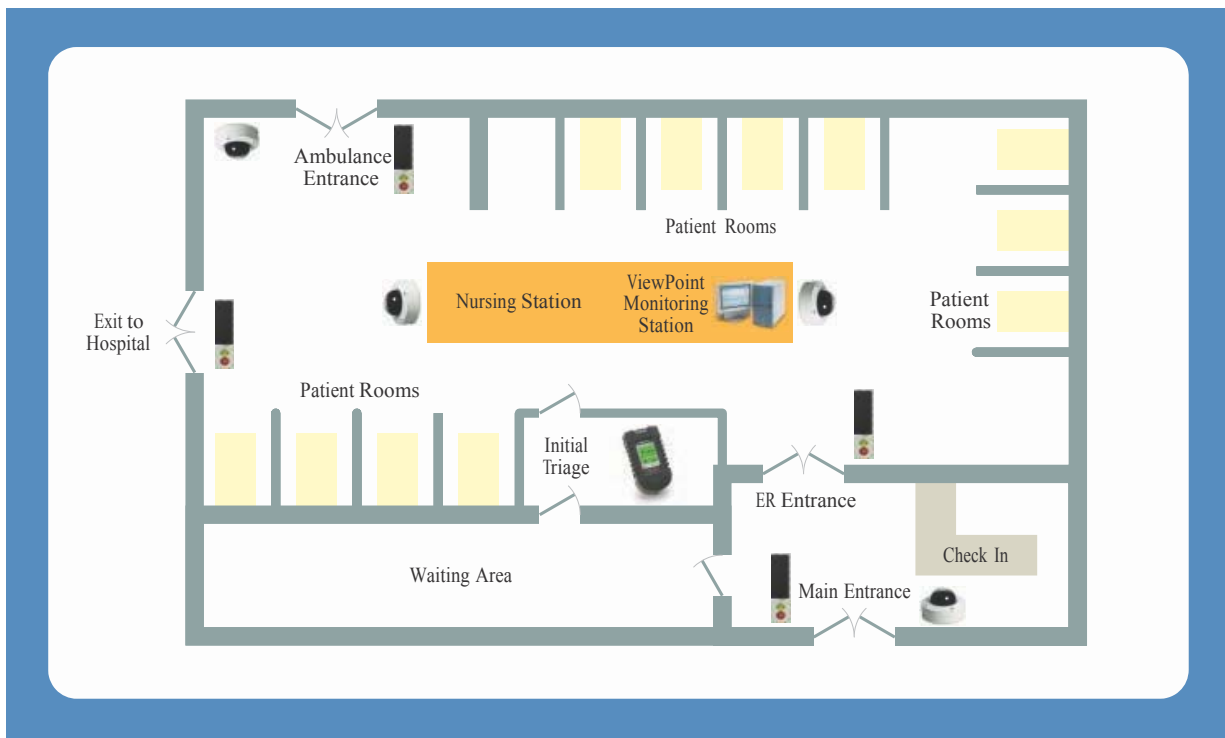
- Thermo Scientific ViewPoint Enterprise Monitoring System (Server)
- Thermo Scientific ViewPoint Enterprise Monitoring System (Client)
- Thermo Scientific ViewPoint Enterprise Monitoring System (Survey Client)



Thermo Scientific EDNS—Typical Architecture



Emergency department using radiation detection, monitored by PC interface with Thermo Scientific ViewPoint software



Integrated Systems

ViewPoint Enterprise Software System

Suggested Applications

Thermo Scientific ViewPoint Enterprise

- Provides real-time data collection, monitoring, and trending for day-to-day operational or remote/automatic needs. By linking ViewPoint to site-wide pager/emails, automatic notification and positive control is achieved.

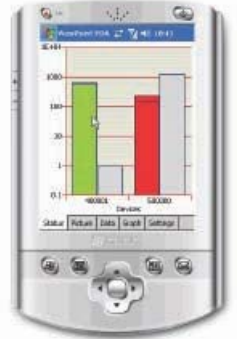
Integrated Systems – Software (ViewPoint Enterprise)

The ViewPoint™ Enterprise Software System is a real-time data collection, monitoring, and trending software system. The ViewPoint system has the capability to integrate radiation, non-radiation and general industrial sensors from Thermo Fisher Scientific's portfolio and other vendors. The ViewPoint system provides users the ability to centrally process and analyze instrument/detector data in a networked, client/server platform.

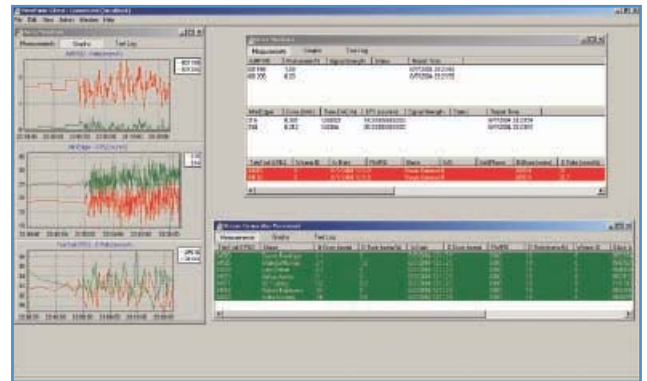
Technical Characteristics

Sophisticated real-time graphing/trending

- Historical data retention
- Robust system and network design
- Centralization of instrument and sensor data
- Scalable System Architecture
- User-friendly, highly customizable and configurable group management
- System self-diagnostic capabilities
- Compatible with most all relational databases



Viewing Real-Time Data with ViewPoint Enterprise



Example of Multi-Station Monitoring



ViewPoint Enterprise—Real-time Remote Updates of Critical Sensors and Monitors



Wireless Sensors at Hospitals



Wireless Sensors at Research Labs



Remote Data from Multiple Sites to a Central Location

ViewPoint's 'Watchful Eye' Monitors the Data



Remote Monitoring—Wireless or LAN



Department or Lab Radiation Monitoring (Personnel or Fixed)



Hospital or Facility Monitoring (of any sensor)



Hospital Emergency Department Notification System (EDNS)

Service

Extended Warranty

Extended Warranty and Software Maintenance Contracts

We can provide a wide array of services and support for the products used in the Healthcare and Research Industries. Our industry experience combined with our world class technical capabilities make us well suited to offer the following service capabilities:

- Instrument calibration and repair
- Extended warranty and software maintenance contracts
- Technical consultation/procedure writing
- Installation and commissioning of products and systems
- Onsite repair/maintenance visits
- Routine telephone support
- Software upgrades/enhancements
- Remote hosting of ViewPoint servers, etc.

Thermo Fisher Scientific is eager to partner with our customers to ensure timely delivery and a smooth installation. Please contact us to discuss your service options!



Thermo Fisher Scientific Inc. (NYSE: TMO) is the world leader in serving science, enabling our customers to make the world healthier, cleaner and safer. With annual revenues of \$10 billion, we have more than 30,000 employees and serve over 350,000 customers within pharmaceutical and biotech companies, hospitals and clinical diagnostic labs, universities, research institutions and government agencies, as well as environmental and industrial process control settings. The Radiation Measurement & Protection Business Unit, a \$170M business within the Environmental Instrument Division, has dedicated a functional organization towards supporting the Medical and Research markets with products and services that provide safety and regulatory compliance when dealing with radiation hazards.

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