

nanoRaider™

HIGH RESOLUTION RADIATION DETECTION & IDENTIFICATION IN THE PALM OF YOUR HAND



When radiation detection capabilities are necessary, operators must rely on the accuracy and dependability of their instruments. With the highest detector resolution available in a pager-sized device, the nanoRaider™ virtually eliminates the false alarms and false positives that are so common to personal radiation detectors. With both detection and identification capabilities available in a single, rugged device, those on the front lines of homeland security can trust the nanoRaider to make their job easier.

About the same size as a cell phone, the belt wearable nanoRaider provides continuous detection capability with visible, audible and tactile alerts. Once radiation has been detected, the fast identification capability of the instrument provides essential information to the user in the field, enabling them to make a next step determination. The One Touch Reachback™ feature integrated into the nanoRaider allows the user to immediately send a notification to team members, superior officers, situation management personnel, and expert analysts – all with a single push of a button.

The nanoRaider uses uniquely constructed Cadmium Zinc Telluride (CZT) detectors that enable exceptional sensitivity and identification capabilities never before seen in a spectroscopic personal radiation detector (SPRD). The characteristic design of FLIR CZT detectors is more rugged than scintillation-based detectors and does not require temperature stabilization. The nanoRaider is also available with an optional neutron detector as well as a full range of accessories.

To reduce the training burden, the nanoRaider uses the same easy to understand and navigate user interface common to the entire family of FLIR radiation detectors. With two-button controls, operators can pick up a nanoRaider and begin using it simply and quickly. With the nanoRaider, FLIR continues to provide the most technologically advanced radio isotope identification devices in the industry.



BENEFITS

- Designed and built to meet the most rugged field environments
- Easy to read display, even in bright sunlight
- High resolution in a small device
- Ease of use in high background environments
- Highly reliable, accurate results
- Small enough to be carried on a belt or in a pocket
- User interface almost identical to other FLIR radiation detectors, such as the identiFINDER®
- Virtually eliminates the false alarms and false positives inherent in other personal radiation detectors

ONE TOUCH REACHBACK™

Like other FLIR radiation instruments, the nanoRaider enables the most advanced communications features available in any class of radiation detector. With One Touch Reachback, users can immediately provide full spectroscopic data as well as detailed device information, time, and GPS location to as many people as necessary with the push of a button.

No longer do users have to physically connect their device to a computer, install secondary software, or use external email to provide alarm notifications. Through a simple Bluetooth® connection, such notifications are all but automatic. This unique capability provides added security by retaining all detection and identification data on the instrument itself and not on a local computer.



NEXT GENERATION CZT

Cadmium Zinc Telluride (CZT) detectors are known for better resolution in a smaller detector without the need for temperature stabilization. Through ongoing research and development, FLIR has optimized this material for radiation detection and accurate source identification. In the nanoRaider, this ability virtually eliminates the inconvenience and expense associated with false alarms and false positives, not to mention the time involved in obtaining secondary inspections necessary to clear an alarm. In addition, the CZT material is naturally more rugged than typical scintillation detectors and is able to survive the general abuse typical of field deployments.

A FAMILY OF INSTRUMENTS

Unlike other companies, FLIR takes the approach that one size doesn't fit all. We understand how important it is to have an instrument that meets the specific requirements of the mission at hand. To that end, the nanoRaider provides the same high quality results as much larger instruments, but with an inconspicuous, compact design.

The entire family of FLIR radiation instruments has been developed to address the specific sensitivity, resolution, size, and weight requirements of a variety of applications. Furthermore, each of these instruments, including the nanoRaider, employs the same simple to use and understand interface, which in turn reduces the training burden. With more than 14,000 radiation instruments deployed worldwide, the well-known and trusted FLIR user interface has become industry standard.

FEATURES

- Transflective color display
- 24 hour battery life
- IP63 compliant enclosure protection
- Data storage for up to 600,000 identifications and spectra and over 1 million alarms
- ANSI N42.48 compliant
- Standard ANSI N42.42 data output format as preferred by triage teams as well as the government and scientific communities

Technical Data

General

About the same size as a cellphone, the belt wearable nanoRaider provides continuous detection capability with visible, audible and tactile alerts. Once radiation has been detected, the fast identification capability of the instrument provides essential information to the user in the field, enabling them to make a next step determination. The One Touch Reachback™ feature integrated into the nanoRaider allows the user to immediately send a notification to team members, superior officers, situation management personnel, and expert analysts – all with a single push of a button.

Detectors

Gamma CdZnTe	Three crystals; 15 mm (0.59 in) × 13 mm (0.51 in) × 5 mm (0.20 in); ±5 %
Neutron ³ He Proportional Counter Tube ^{*(B)}	15 mm (0.59 in) × 54 mm (2.13 in); net: 14 mm (0.55 in) × 29 mm (1.14 in); 8 atm (8.106 bar)
GPS	66-channel MediaTek MT3329 receiver; tracking sensitivity >-165 dBm

Performance

Energy Range (Gamma); Dose Rate Channel	51 keV – 3 MeV
Energy Range (Gamma); Identification Channel	30 keV – 3 MeV
Throughput; Dose Rate Channel	≤250 kcps
Throughput; Identification Channel	≤180 kcps
Sensitivity (¹³⁷ Cs); Identification Channel	≤0.47 cps per 10 nSv/h
Sensitivity (¹³⁷ Cs); Dose Rate Channel	≤0.81 cps per 10 nSv/h
Gamma Spectrum	1024 channels; 3 MeV
Dose Rate Range	≤100 nSv/h – 10 mSv/h; ±30 %
Overload Threshold	5 mSv/h
Neutron Sensitivity ^{*(B)}	2.6 cps/nv; ±20 %
Nuclide Identification	According to ANSI N42.48
Typical Resolution	≤3.5 % FWHM at 662 keV at 25 °C (77 °F) ambient temperature

Service

Recommended Interval	5 a
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Physical

Dimensions (W × D × H)	70.3 mm (2.77 in) × 33.8 mm (1.33 in) × 125.5 mm (4.94 in)
Weight ^{*(A)}	340 g (11.99 oz)
Weight ^{*(B)}	370 g (13.05 oz)
Housing Material	Aluminium

Environmental

Operating Temperature	-20 °C – +50 °C (-4 °F – +122 °F)
Storage Temperature	+10 °C – +35 °C (+50 °F – +95 °F)
Temperature Change	Temperature change must not exceed 8.4 °C (15.1 °F)/min
Relative Humidity	10 % – 93 %, non condensing
Shock Resistance	According to ANSI N42.48-2008
Protection Rating	

Battery

Type	Internal (Li-ion, single cell, rechargeable)
Capacity	1950 mAh; 3.7 V; 25 °C (77 °F)
Battery Life	300 – 500 full charge-discharge cycles; 3 a – 5 a
Charging Duration	≤3 h at 25 °C (77 °F) when instrument off and connected to DC power charger and >5.5 h when powered via USB.
Operating Duration	≥24 h at 25 °C (77 °F) in dose rate mode with dimmed display back light and GPS switched off

Display

Type	Transflective color LCD
Size	55.88 mm (2.20 in); 320 pixel × 240 pixel
Central Luminance	400 cd/m ² typically

Annunciators

Blue LED ^{*(B)}	Neutron detection and alarm
Red LED	Gamma alarm
Green LED	Power status
Vibrator	Alarm reporting
Beeper	Alarm reporting

Memory

Data Storage Capacity	2 GB internal memory; 1800 MB available for the user
Identifications incl. Spectrum	≈600000
Screenshots	≈2500
Alarms	≈1000000

Input/Output

USB	USB 2.0; mini-B socket
Bluetooth	≤50 m (164.04 ft) range

Software

Embedded Software	Microsoft Windows CE Operating System
Web Interface	TCP/IP emulated via USB
Download File Formats	ANSI N42.42 and spc files compatible with third-party analysis software applications such as GADRAS, Cambio, or PeakEasy
Reachback	ANSI N42.42 data via Bluetooth to DUN compatible cell phone

Standards

ANSI N42.48	Performance Requirements for Spectroscopic Personal Radiation Detectors (SPRDs) for Homeland Security
IEC 60529	Degrees of Protection Provided by Enclosures (IP Code)
EMC - Directive 2004/108/EC	Regulations concerning electromagnetic compatibility
FCC Part 15	Regulations concerning electromagnetic compatibility
ANSI N42.42 2006	Data format standard for radiation detectors used for Homeland Security

