



# NOKI

TECHNOLOGIES

*Noki Technologies, a privately-owned family business operating through two decades in the Nuclear Medicine and Nuclear Energy. Leveraging our expertise, we bring to the fore, Advanced Measurement & Automation Instruments. Our focus on innovation and precision drives us to deliver solutions tailored to the evolving demands of our clients.*

# X-SPEC

(Gamma Spectrometer)

## Description

The X-Spec is a compact digital Multi-Channel Analyzer (MCA) designed for performing Pulse Height Analysis (PHA) on signals generated by standard 14-pin photomultipliers connected to scintillation detectors such as NaI(Tl), LaBr<sub>3</sub> (Ce), LaCl<sub>3</sub>(Ce), and CeBr<sub>3</sub>. The X-Spec is ideal for obtaining energy spectra from photon radiation detected by scintillators. It offers seamless connectivity to PCs or notebooks via USB, enabling efficient data transfer and analysis. The system includes basic software for device control, energy spectrum acquisition, and visualization. The software's advanced "discovery" function detects available X-Spec devices (USB or Ethernet) for quick connections, and a set of programming libraries is available for integration into existing radiation systems.



# Key Features

## Portable Design

Lightweight and portable with up to 8 hours of continuous operation on a rechargeable lithium-ion battery, making it ideal for field use.

## IP67 Rating

The X-Spec is dust-proof and water-resistant, ensuring safe operation in rugged outdoor conditions.

## High Sensitivity and Resolution

Supports scintillation detectors like NaI(Tl), LaBr<sub>3</sub>(Ce), and CeBr<sub>3</sub> with a wide energy range and high sensitivity.

## Optional GM Integration

Supports a wide range of GM Detectors to perform additional Surveying Operations.

## Geotagging Capability

Includes automated and manual modes for geotagging radiation data. Users can record counts or dose rates along with precise geographical coordinates.

## Data Aggregation

Ability to combine geotagged data from multiple devices into a single centralized database for comprehensive analysis.

## Remote Access & Monitoring

Data can be accessed remotely via cloud or on-premise servers, allowing for real-time monitoring and collaboration.

## Two Acquisition Modes

Pulse Height Analysis (PHA) for detailed energy spectrum analysis.

Multi-Channel Scaling (MCS) for timing and frequency analysis.

## Integrated High Voltage Power Supply

Advanced, low-noise high voltage power supply that supports up to 1500V, ensuring compatibility with a wide range of detectors.

## Easy Integration

Compatible with existing radiation systems through USB or Ethernet connections, with programming libraries available for both Windows and Linux.

# Technical Specifications

## Detection Modes

- **PHA Acquisition Mode** Supports 256, 512, 1024, 2048, or 4096 channels, allowing for detailed spectrum analysis.
- Memory presets for live time, real time, or counts on a region of interest (ROI). Adjustable Upper and Lower Level discriminator settings.
- **MCS Acquisition Mode** Allows dwell time from 0.1 seconds to indefinite counting, with easy ROI setup.
- Memory configurations: 256, 512, 1024, 2048, or 4096 channels.

## Digital Settings

- **Rise Time** Adjustable from 0.1 to 12  $\mu\text{sec}$  in steps of 0.2  $\mu\text{sec}$ .
- **Flat Top** Adjustable from 0.1 to 8.0  $\mu\text{sec}$  in steps of 0.1  $\mu\text{sec}$ .
- **Threshold** Adjustable between 1 and 255 for better signal discrimination.
- **Base Line Restorer (BLR)** Digital functionality to maintain signal accuracy during low count rates.
- **Pile-Up Rejection (PUR)** Reduces errors during high count rates, enhancing measurement accuracy.

## High Voltage Power Supply

- **Voltage Range** Supports up to 1500V with fine adjustment in 4096 steps.
- **Connection** USB 2.0 or Power-over-Ethernet (PoE) for versatile power and data transfer.

## Gain Settings

- **Amplification Factors** Gain settings with values of 1, 2, 4, and 8.
- **Fine Gain** Adjustable fine gain from 1 to 2 in steps of 1/4096 for enhanced precision.

## Software Capabilities

- **Energy Calibration and Peak Search** Tools for efficient energy calibration and peak identification.
- **Data Processing** Generates reports, saves spectral data in ASCII format, and includes nuclide library management.
- **External Application Support** Allows integration with external applications for further data processing.

## Geotagging Software Features

- **Automated/Manual Geotagging** Allows for automated or manual tagging of radiation data with location coordinates.
- **Counts & Dose Rates** Records counts or dose rates with geolocation for precise mapping.
- **Data Aggregation** Combines geo-referenced data from multiple devices into a centralized database.
- **Remote Monitoring** Data can be monitored remotely via cloud-based or on-premise servers.

## Physical Specifications

- **Dimensions** H: 142mm W: 227mm
- **Weight**  $\approx$ 1.5 Kg (without Pb shielding)
- **Operating Temperature** -40°C to +85°C.
- **Battery Life** Up to 8 hours with a rechargeable lithium-ion battery.
- **IP Rating** IP67 for dust and water protection, allowing use in harsh environments.

## Additional Features

- **Indicators** Red for detector high voltage, Yellow for incoming count rate, and Green for power and communication.
- **Geiger-Muller Counter Integration** Provides additional detection capabilities for low-level radiation monitoring.
- **Scintillation Detectors Supported** Includes NaI(Tl), LaBr<sub>3</sub>(Ce), CeBr<sub>3</sub>, and others, with a typical energy resolution of 3.2% at 662 keV for Cs-137.

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