D230A UAV Gamma-Ray Spectrometer

The D230A is a lightweight gamma-ray spectrometer designed for small payload UAVs. Its main applications are to measure and map the total intensity of gamma radiation and the intensity of the energy windows corresponding to potassium, uranium and thorium. Spectrometers use an advanced method of automatic gain stabilization using natural background radiation. This unique stabilization method eliminates the need for an additional radioactive check source.

The D230A utilizes two 1024 channel gamma-ray spectrometers, and a small lightweight data acquisition and control unit. Spectra of both detectors are accumulated and saved separately, with a scanning rate adjustable from one second up to one minute. Additionally, both detectors contribute an integrated spectrum during monitoring activities, including dose rate.

D230A with UAV

D230A Being Calibrated on Reference Pad

The D230A records data onto an SD card, enabling monitoring for many hours. The standard size of 2 x 20,000 full spectra samples can be stored. The memory size is upgradeable to record larger records.

A PC or laptop is required to interface with the D230A. A software package is delivered with the system for online communication with the spectrometer, log the data into the computer, and to setup the system's operation parameters.

The D230A is available with 2"x2" BGO or NaI/Tl gamma-ray detectors. A single detector option is available to lower the system's weight. The housing is made from thin aluminum, and includes four hoisting points on its upper side to couple the system to a UAV.

The D230A electronics are powered from a small Li-Ion battery located in a slot in the front panel. A fully charged battery holds for minimum 4 hours of operation and can be quickly replaced.

A single button is used to both turn the spectrometer on and off, as well as to start and stop the measurements.

The D230A is delivered with an external GPS module and connecting cable. The GPS module must be mounted in a suitable location on the UAV. A laser altimeter is available as an option.

D230A Gamma-Ray Spectrometer

Terraplus Inc.
52 West Beaver Cr. Rd. #12, Richmond Hill, ON. Canada L4B 1L9
Tel: 905-764-5505
Fax: 905-764-8093
Email: sales@terraplus.ca
Website: www.terraplus.ca

D230A Technical Data

Detector:

- **2 x BGO:** BGO, volume 104 cm^3, dia.51 x 51 mm (2" x 2"), with bi-alkal PMT Sensitivity 2 x 160 cps / MBq/ m (Cs-137).
  Resolution max 11.5% FWHM (661 keV)

Or

- **2 x NaI/TI:** NaI/TI, volume 104 cm^3, dia.51 x 51 mm (2" x 2"), with bi-alkal PMT.
  Resolution max 8% FWHM (661 keV)

Spectrometer: Full Digital 2x1024 channel, 40 MHz DSP, Linear Energy corrected, Pile-up Rejecter, 200 ns Resolution, Max throughout 250,000 cps per detector.

Sampling Rate: User selectable minimum one per second.
Each spectrum in separate data file and total accumulated spectrum.

Energy Range: 25 keV – 3000 keV

Display: LCD 2 x 20 characters

Control: Single button operation

Data Storage: Min. 2x 20000 samples with full spectra, including GPS coordinates
Stabilization spectra and system messaged log.
Memory size extendable

GPS: Navigate down to -162 dBm and -148 dBm coldstart, prec. 2m.

Communication: Data transfer, remote control and diagnostic by USB 2.0

Power: Rechargeable Li-ion 7.2V/2200 mAh – minimum four hours of operation at 20°C.
External charger and battery pack.

Size: 145mm x 78mm x 260mm

Weight:
2 x BGO 3.5 kg

Environmental: Operation temperature range: -10°C to +50°C.
Protection IP-40, no dust and water resistant.

Terraplus Inc.
52 West Beaver Cr. Rd. #12, Richmond Hill, ON. Canada L4B 1L9
Tel: 905-764-5505
Fax: 905-764-8093
Email: sales@terraplus.ca
Website: www.terraplus.ca