RADIATION DETECTION SYSTEM

Exploranium GR-820/3 **SPECIFICATIONS**

MANUFACTURER:	**EXPLORANIUM**
DETECTOR CONTROLLER:	**-maximum number of crystals 16. Crystals are software selectable as either up looking or down looking crystals. Each crystal has individual pole-zero cancellation, semi-Gaussian shaping and advanced base line restoration circuitry. In the 512 channel version maximum number of crystals is 8.** **-continuous, individual-crystal spectrum analysis ensures that optimum system stabilization is achieved. Resolution is calculated by sophisticated Gaussian curve fitting algorithm to perform an accurate centroid analysis of the selected stabilization peak.** **-high energy cosmic pulses are accumulated in a separate channel.** **-accurate pile-up rejection for simultaneous pulses allows qualitative gamma-ray spectrum analysis almost independent of the system count rate. Special circuitry analyses for pulse pile-up and permits only detevtor signals from single events to be analyzed. Simultaneous events in adjacent crystals are added to reduce the Compton effect.** **-residual pulse pile-up at 100,000 counts/sec are less than 2%.**
ANALOG TO DIGITAL CONVERTER:	**-50 MHz Wilkinson ramp ADC.** **-linearity –integral- less than 0.2% -Differential less than 1%.** **-average system dead-time is less than 5microSec/pulse.** **-live-time channel records the actual system live-time. This data is output with the digital data which allows post correction for system dead-time to an accuracy of 0.1%.** **-number of channels- selection of 256 channels or 512 channel operation.** **-maximum number of counts/channel- 65,535 (16 bits).** **-the lower treshold- manually selectable from channel2 to channel 20 (20-200 keV).** **-the upper treshold is set to 4 MeV. All pulses above this level are accumulated in the cosmic channel as adirect measure of cosmic ray activity.** **-ADC offset set from the keyboard.** **-the maximum input count rate is 100,000 counts/rate.**
SYSTEM OUTPUTS:	**-visual display- the front panel display is a 640 x 200 Electroluminescent high contrast graphics display which allows full spectrum display, system set-up and various parameter monitoring functions. In the spectrum display mode, the ROI and the cursor may be viewed bychannel number or directly in keV.** **-the internal channel number to energy level (keV) conversion table compensates for non-linearity of the detector´s light output.** **-the front panel has a 21 button keyboard for easy operator control.** **-the system´s operation is fully menu driven**
DIGITAL OUTPUTS:	**-RS-232 port (1200 to 19200 baud)** **-IEEE-488 bus output- talk lisn/talk only- 2 data formats supported.** **-INTEL-8255 and CENTRONICS 8-bits output format** **-"GEOMETRICS GR-800" 8-bit output format** **-some system functions can be controlled remotely by an external computer via the RS-232 and the IEEE-488 digital ports.**

ANALOG OUTPUT:	**-4 channel of ROI data can be selected for output for the analog port. The outputs have 10 bit resolution (0-10V). Scaling can be set from the keyboard (100-50 counts/sec FSD) and output data may be RAW or STRIPPED using internally stored calibration constants. Analog output wraps at FSD limits and is dead-time corrected.**
MISCELLANOUS:	**-regions of interest (R.O.I) 8 ROIs can be selected. The upper and lower tresholds can be individually set over the entire spectrum range. The first 4 ROIs are available for digital and analog output. The second 4 ROIs are available only for digital output on the RS-232 or the IEEE-48 ports.** **-sytem resolution. Detector resolution is automatically computed for each crystal (and summed crystals) during peak analysis and is displayed for operator monitoring when required. The summed down resolution is also output on the data stream.** **-system test. At power on, a full system test of all internal PCB handshaking is performed. Included in this testing the lithium back-up battery, the system RAM memory, display handshaking, the systems configuration (options installed) , the selected detectors (checked via ADC analysis) and peripherical handshaking response.** **-configuration menus. The configuration menus allow the selection of the number of the detectors in use, confidence levels for gain analysis, maximum crystal resolution levels for each detector (with operator warnings if levels exceeded), output configurations for analog and digital data and various special display/monitoring functions.** **-maintenance. A set of special menus allows the user to test and calibrate many system functions including system test, ADC offset, low level discriminator etc.**
mechanical size:	**19"wide x 5.25"high x 15"deep**
weight:	**15 lbs.**
power:	**28V – 1.25 Amps.**
DETECTORS:	**-the crystals are housed in specially designed ruggerized aluminium cases using low background material which is formulated for minimum signal attenuation. Full thermal and internal shock protection n allows the units to be directly mounted to the floor. A very loe noise, high voltage power supply is housed in each pack so high voltage is not present in the connecting cables. A unique preamplifier with specialnsignal processing for signal optimization is used. The GPX-1024 has a 4 crystals with a total volume of 1024 cubic.ins. The GPX-1024/256 has a 5 crystals with atotal volume of 1280 cu.ins. (1024 cu.ins down and 256 cu.ins up).**
outputs:	**Individual BNC connectors output each crystal´s signal separately**
size:	**GPX-1024 28.85 x 20 x 7.5" (73x51x19 cms)** **GPX-1024/256 28.85 x 20 x 12" (73x51x39cms)**
weight:	**GPX-1024 185 lbs. (84 kg)** **GPX-1024/256 215 lbs. (197 kg)**
power:	**28V @ 0.5A/xtal pack.**
temperature limitations:	**closed pack storage –20 to +60, operation –20 to +50 deg. C** **An open pack- not recommended**
temperature gradient:	**a closed pack from –20 to +20 (instantaneous). An open pack, a change of 1 deg C/hr.**