DIGITAL MULTI CHANNEL ANALYZER

MCA527L

DESCRIPTION

The MCA527L is a cost-effective 2k Multi-Channel Analyzer/ Multi-Channel Scaler module. High voltage supply for detector and preamplifier power supply are integrated as well as a digital filter. Together with a detector it forms a small-size gamma spectroscopy system, which is well suited to the demands of field measurements for international safeguards, environmental monitoring, nuclear waste treatment facilities, radioactive transport control and similar applications.
Furthermore, the MCA527L supports a vast number of different detectors and its 2k resolution is adequate to support all kind of detectors in the 2k class.
As the MCA527L works with digital filtering, it allows setting a broad range of filter time constants and it is also tolerant to largely differing preamplifier signal shapes.

The application programs form our MCA software family is free of charge and allow operating the device as a general purpose multi channel analyzer, multi channel scaler, universal counter or oscilloscope.

The MCA527L offers best possible performance with NaI, CZT, LaBr and other similar detectors.

KEY FEATURES	*BENEFITS*
Up to 2k channel resolution	• *Best spectroscopy performance with NaI, CdZnTe, LaBr detectors*
Very low power consumption of 0.6W	• *long time field measurement potential*
Equipped with one high capacitive Li-Ion battery	• *6–12h operation time without external power (depends on detector)*
Dimensions in compact format *Easy-view front panel layout*	• *Excellent operability and mobility*
Digital filtering technology	• *Allows a wide range of different filter settings*
Eloxed aluminum housing with rubber seating	• *Excellent electrical shielding and robustness*

Technical Specification
MCA527L

Spectrometric Performance	
Example: Resolution 2k channels Detector: CZT 500mm³ (hemispherical) Count rate <10kcps Source: CS137 @662keV	(FWHM) @ 1µs shaping time 2.2%
Throughput into memory (input rate 150kcps, 0.2µs shaping time)	> 100.000cps

Operation Modes	
PHA (Pulse Height Analysis)	✓
MCS (Multichannel Scaling)	✓
Sample Mode (Transient Record)	✓
Oscilloscope Mode	✓
Firmware Repeat Mode	✓

Digital Signal Processing	
Trigger Filter	single and double differential filtering
Differential non-linearity	<1% (for 2k, @ 1µs shaping time)
Pile Up Rejection	✓
Pulse Pair Resolution	~400ns
Trigger Threshold Adjustment	automatically / manually
Shaping Time	0.1µs to 2µs, step 0.1
Flat Top Time	0µs to 15µs, step 0.1
Fine Gain Adjustment	0.5 to 6.5, step 0.0001
Channel Splitting	128, 256, 512, 1024, 2048,
Max counts in a channel	2^{32} - 1
Base Line Restorer	BLR with fixed averaging
Pole Zero Adjustment	Decay time down to 40µs can be compensated
Peak Stabilization Modes	standard mode

Amplifier Unit	
Amplifier Type	DC coupled, offset adjustable
Bandwidth (3dB)	0 - 1.4Mhz
Linearity	<0.1%
Course Gain Steps / Volt	10
Full Scale Input Ranges / Volt	2.5
DC Offset Adjustment Range	(-10% to 90%) of full scale for positive input signals (-90% to 10%) of full scale for negative input signals

Analog Digital Converter	
Sample Rate	10 MS/s
Resolution	14 bit
Integral non-linearity	≤0.05%

MCA Power Supply	
Input Voltage DC	9V - 14V
Li - Ion Rechargeable batteries	16Wh
Power consumption (running, without detector, HV off)	0.6W

Power supply for Detector	
Preamp Power Supply	±12V, ±60mA
HV Supply	up to (+) or (-) 1000V

Mechanical	
Dimensions L x W x H (mm)	181 x 111 x 45
Weight	700g
Housing Material	eloxed aluminum

Communication & Connections	
Computer Interfaces	USB, Ethernet
Sockets	SHV Plug for HV, BNC for signal, SUB_D for preamp supply and AUX-IN

Environmental Conditions	
Operation Temperature Range	0°C – 50°C
Humidity	≤90%, non condensing
IP Protection Class	IP42

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