

DIGITAL MULTI CHANNEL ANALYZER

MCA527



DESCRIPTION

The MCA527 is a high performance 16k Multi-Channel Analyzer/Multi-Channel Scaler module with the performance of a laboratory grade MCA. High voltage supply for detector and preamplifier power supply are integrated as well as an internal coarse amplifier and 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 MCA527 supports a vast number of different detectors and its 16k resolution is adequate to support high resolution gamma spectrometry with HPGe detectors. As the MCA527 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 from our MCA software family are free of charge and allow operating the device as a general purpose multi channel analyzer, multi channel scaler, universal counter, or oscilloscope. As an option we offer the possibility to use the MCA527 as a multiplicity or neutron coincidences counter, operating in List Mode.



KEY FEATURES	BENEFITS
Up to 16k channel resolution	<ul style="list-style-type: none"> High performance gamma spectroscopy with HPGE detectors
Very low power consumption of 0.7W On board μ SD-card holder	<ul style="list-style-type: none"> Capability to perform long time autonomous field measurements
Equipped with high capacitive Li-Ion batteries	<ul style="list-style-type: none"> 10h–25h operation time without external power (depends on detector)
Dimensions in compact format, Easy-view front panel layout	<ul style="list-style-type: none"> Excellent operability and mobility
High Voltage up to (+) or (-) 5000V supported	<ul style="list-style-type: none"> Large types of HPGE detectors can be applied
Optionally firmware extension on list modes	<ul style="list-style-type: none"> The MCA527 can be used as a multiplicity or neutron coincidence counter.

Technical Specification

MCA527

Spectrometric Performance		Amplifier Unit	
<u>Example:</u> Resolution: 16k channels Detector: HPGE 500mm ² planar, Count rates <10kcps Source: Am241 @ 59keV	(FWHM) @ 2μs shaping time <460eV	Amplifier Type	DC coupled, offset adjustable
Throughput into memory (input rate 150kcps, 0.2μs shaping time)	>100.000cps	Bandwidth (3dB)	0 -1.4Mhz
Operation Modes		Linearity	< 0.1%
PHA (Pulse Height Analysis)	✓	Temperature Stability	TK50
MCS (Multichannel Scaling)	✓	Course Gain Steps	2, 5, 10, 20, 50
Sample Mode (Transient Record)	✓	Full Scale Input Ranges / Volt	12.5, 5, 2.5, 1.25, 0.5
Oscilloscope Mode	✓	DC Offset Adjustment Range	(-10% to 90%) of full scale for positive input signals (-90% to 10%) of full scale for negative input signals
Gate Mode (by state)	✓	Analog Digital Converter	
Gate Mode (by time)	✓	Sample Rate	10MS/s
Firmware Repeat Mode	✓	Resolution	14bit
Autonomous Repeat Mode	✓	Integral non-linearity	≤0.05%
List Modes (optional)	✓	MCA Power Supply	
Digital Signal Processing		Input Voltage DC	9V - 14V
Trigger Filter	single and double differential filtering	Li - Ion rechargeable batteries	31.2Wh
Differential non-linearity (@4K and 1μs shaping time)	< 1 %	Power consumption (running, without detector, HV off)	0.7W
Pile Up Rejection	✓	Power supply for Detector	
Pulse Pair Resolution	~400ns	Preamp Power Supply	±12V, ±60mA ±24V, ±60mA
Trigger Threshold Adjustment	automatically / manually	HV Supply	up to (+) or (-) 3600V up to (+) or (-) 5000V (optional)
Shaping Time	0.1μs to 25.5μs, step 0.1μs	Mechanical	
Flat Top Time	0μs to 15μs, step 0.1μs	Dimensions L x W x H (mm)	181 x 111 x 45
Fine Gain Adjustment	0.5 to 6.5, step 0.0001	Weight	820g
Channel Splitting	128, 256, 512, 1024, 2048, 4096, 8192, 16384	Housing Material	eloxed aluminum
Max counts in a channel	2 ³² - 1	Communication	
Base Line Restorer	BLR with adjustable averaging	Computer Interfaces	USB, Ethernet, RS232
Pole Zero Adjustment	Decay time down to 40μs can be compensated	<u>Sockets & connections</u> SHV for HV, BNC for signal, Lemo (00) for gate Input, SUB_D9 for preamp supply and AUX-IN, μSD holder power supply connector (bayonet lockable) Lemo 9pin (extension port), 6pin (RS232)	<u>Extra connections:</u> SUB_D9/ pin3: aux analog input SUB_D9/ pin5: HV inhibit or ohmmeter SUB_D9/ pin8: 1-wire for temp.- sensor Bluetooth (adapter @ext. port, optional) GPS (adapter @ext. port, optional)
Peak Stabilization Modes	standard mode LED mode	Environmental Conditions	
		Operation Temperature Range	0°C – 50°C
		Humidity	≤ 90%, non-condensing
		IP Protection Class	IP42