

DMA52x/G/A/N series digital multichannel analyzer

Introduction:

The DMA52x series digital MCA is a compact desktop digital multichannel measurement System integrating single-channel or 2 independent channels Digital MCA and HV/LV power supply capabilities for Gamma and X-ray spectrometry. Series product is suited for gamma, alpha and neutron spectrum measurement analysis. DMA521G is the ideal choice for a PMT-based detector, Such as NaI (Tl) , LaBr3 (Ce) , CeBr and other high-resolution scintillation detector; DMA521A can be connected with PIPS detector for α spectrum and intensity measurement; The DMA521N has embedded digital Pulse Shape Discrimination (PSD) is an ideal choice for n/γ measurement and discriminating. The DMA522 is equipped with 2 Channel signal input and HV/LV power output, can be used as a 2-way digital multi-channel, can also be used For coincidence - anticoincidence measurement system.

DMA52x is equipped with Xilinx's high-performance FPGA, which has pulse amplitude Multiple nuclear pulses such as Pulse Height Analysis (PHA), Multichannel scaler (MCS), Pulse Shape Discrimination (PSD),etc. The digital signal processing IP core makes this series of devices the core data acquisition equipment for nuclear physics and other radiation detection system applications.

The DMA52x series digital multi-channel analyzers are equipped with RS232, USB 2.0, and Ethernet (10/100M) communication interfaces for convenient data transmission.

Functions and features:

- Suited for high resolution digital nuclear Spectroscopy.
- Selectable Input Dynamic Range and adjustable Digital Fine Gain.
- Features DPP-PHA firmware for energy and time stamp calculation.
- Digital oscilloscope function for an easy setup and signal monitoring.
- Suited for high count rate applications.
- Drivers, libraries and API for Windows and Linux 32/64-bit.

System specifications

■ Acquisition section

- 1-2CH 40/65/80/125Msps 14bit acquisition.
- 1-2CH analog signal input, with input impedance supporting 50 Ω .
- Four input programmable gear adjustments, 500mVpp, 1Vpp, 2Vpp, 4Vpp.
- The baseline software is adjustable.
- Direct current (DC) coupling, supporting positive



DMA522 Equipment appearance diagram





and negative pulse signal input.

- Automatic pole/zero adjustment, programmable gating.
- DC-45MHz input bandwidth.
- BNC interface.

■ Trigger section

- Support software triggering.
- Support channel triggering.
- Supports external triggering.

■ Preamplifier Power Supply

- DB9-F output
- $\pm 5\text{V}$, 200mA output
- $\pm 12\text{V}$, 100mA output
- $\pm 24\text{V}$, 50mA output
- Output voltage ripple less than 1mVrms

■ High voltage power output

- Two outputs.
- SHV connector.
- High voltage output voltage, polarity, and current are optional.
- DAC controls the high voltage output value.

■ Digital IO

- Synchronous clock input CLK-IN, TTL level, 1.
- External trigger TRG-IN (SMA), TTL level, 2.
- High voltage prohibited input INH (SMA), TTL level, 2.
- 1 universal digital input GPI, TTL level.
- Universal digital output GPO, TTL level, 1.

■ Interface

- USB 2.0 (Type-B).
- 10/100M Ethernet (RJ45).
- RS232/RS485 (DB9).

■ Software support

- Supports drivers and APIs under Windows.
- Upper computer GammaAnalysis energy spectrum analysis software.

■ Power supply input

- 12VDC/2A.

■ mechanical part

- Size: 175mm (L) * 180mm (W) * 65mm (H).
- Weight: 1.3kg.

Technical Parameters:

	DMA521G	DMA521A	DMA521N	DMA522
usefulness	γ/β spectrometry	α spectrometry	neutron measurement, n/ γ discrimination	2-way multi-channel or coincidence anti coincidence measurement
Number of signal channels	1	1	1	2
HV output channel	1	1	1	2
LV output channel	1	1	1	2
conversion gain	1k/2k/4k	256/512/1k/2k/4k	1k/2k/4k	1k/2k/4k
ADC	14bit@40Msps	14bit@40Msps	14bit@40Msps	14bit@80Msps
HV	range	$\pm 1500\text{V}$	$\pm 500\text{V}$	$\pm 2000\text{V}$
	output current	0.5mA	2mA	1mA
	ripple wave	$<40\text{mVpp}$	$<30\text{mVpp}$	40 mVpp (Typical value)
DNL	$\leq \pm 1\%$			
INL	$\leq \pm 0.05\%$			
Maximum pulse pass rate	$\geq 100\text{kps}$			
communication interface	RS232、USB2.0、Ethernet (10/100M)			
Digital Signal Processing IP Core	PHA/MCS	PHA/MCS	PHA/MCS/PSD	PHA/MCS

