

1. Product Introduction



EP-DPMCA3103 Integrated Digital Spectrometer is a high-performance spectrometer with an 8192-channel spectrum output, integrating the high-voltage power supply, pre-amplifier, main amplifier, and multichannel analyzer in a single unit. It only needs a simple connection to a PMT detector to form a portable nuclear spectrometry system. Together with the PC software, it is easy to use yet powerful. Besides spectrum analysis, it also provides a built-in oscilloscope mode and a shaped-pulse viewing mode. The spectrometer employs a high-speed, high-precision ADC for analog-to-digital conversion, and achieves pulse filtering, noise reduction, and accurate amplitude extraction based on fast/slow dual-channel digital trapezoidal shaping filters, a digital baseline restorer, digital pile-up rejection, and count-rate correction. The unit has a built-in 14-pin voltage-divider socket, and supports a wide range of PMTs such as R6231, CR160, CR119, XP5032, and can also be widely used with NaI, LaBr₃, CeBr₃, CsI, and BGO detectors.

2. Functional Indicators

- ▶ 1 A charge-sensitive preamplifier ensures excellent energy resolution.
- ▶ 2 Multiple data-transfer modes: raw-pulse viewing mode, shaped-pulse viewing mode, and spectrum viewing mode.
- ▶ 3 14-bit high-precision ADC sampling.
- ▶ 4 High time and energy resolution, high-throughput support.
- ▶ 5 Digital filter shaping, automatic baseline subtraction, ballistic-deficit correction, low-frequency noise suppression, etc.
- ▶ 6 Programmable high voltage.
- ▶ 7 Programmable hardware gain.
- ▶ 8 Works with GammaAnt spectrum analysis and processing software to enable nuclide identification and sample activity measurement among other functions.
- ▶ 9 Supports Ethernet, USB, and serial-port data transfer simultaneously.

3. Performance Parameters

- ▶ Spectrum channels 256, 512, 1024, 2048, 4096, or 8192 channels (selectable).
- ▶ Hardware gain $\times 1.0, \times 2.0, \times 4.0, \times 8.0$
- ▶ Software gain $\times 0.1$ to $\times 10$.
- ▶ Detector high voltage 0 to 1000 V positive (negative optional), programmable in 1 V steps.
- ▶ Shaping rise time 0.1 μ s to 25 μ s, adjustable in 0.1 μ s steps.
- ▶ Shaping flat-top time 0.1 μ s to 5 μ s, adjustable in 0.1 μ s steps.
- ▶ Typical power consumption 2.0W.
- ▶ MCA dimensions $\Phi 66\text{mm} \times \text{H}66\text{mm}$.
- ▶ Communication Ethernet, high-speed USB, RS485 serial port.
- ▶ Power supply PoE via Ethernet, supporting both 48V–52V active-PoE and passive-PoE modes; USB power; DC 5V power.
- ▶ Other functions Oscilloscope mode, shaped-pulse viewing mode, and multi-device networked measurement.

4. Electrical and Mechanical Interfaces

- ▶ Communication interface RJ45, USB-TypeC, aviation connector.
- ▶ Power interface RJ45, USB-TypeC, aviation connector.
- ▶ Reset button Pinhole reset button for restoring factory defaults.
- ▶ Operating environment Temperature -20 to +50°C; humidity 20 to 90%RH (non-condensing).

5. GammaAnt Spectrum Analysis and Processing Software

● EP-DPMCA3103, when used together with the GammaAnt spectrum analysis and processing software, enables all additional functions provided by the spectrometer, including but not limited to:

- ▶ 1 Spectrum acquisition and storage.
- ▶ 2 Setting and saving of all spectrometer parameters.
- ▶ 3 Energy calibration, efficiency calibration, spectrum analysis, activity reports, nuclide library viewing and editing, etc.
- ▶ 4 Digital spectrum stabilization.
- ▶ 5 Threshold measurement.