



Product Information



MCA2100R/ MCA 2100EN Gamma Spectrometer

Introducing The World's Most Advanced Self-Contained Sodium Iodide Spectroscopy System!



- Patented QCC provides faster and more accurate isotopic identification
- Package includes all electronics. Just plug in NaI detector and connect the 2100R to your PC.
- Fast installation & setup
- Requires no computer reserved memory or internal access
- Includes 32-bit Quantum-MCA software CD
- Requires 12 volts DC to operate

PGT has incorporated the latest in modern electronics in the MCA 2100R in order to provide a complete gamma spectrometer for NaI. The MCA 2100R features a fast dual mode ADC and two standard modes of operation. This system will operate either as a standard 1000 channel MCA in linear mode, or as a 512 channel MCA in QCC™ mode.

The MCA 2100R is packaged as a peripheral to the PC. It does not require any internal PC interface slots or special memory reservations. This avoids problems upgrading to the newer PC's and operating systems. The MCA 2100R communicates via the RS232 port. Simply connect a serial cable to one of the COM ports on the PC and the other end to the RS232 connector on the MCA 2100R, and you are ready to go. Multiple units can also be connected to the PC by using a multiple-port RS232 interface or daisy-chain multiple units together with the built-in RS485 interface, or select the Ethernet option (MCA 2100EN only).

The MCA 2100R includes Quantum MCA software for qualitative analysis. All hardware setup and calibration functions are made through the software. No internal hardware access is required. For ease of setup the MCA 2100R can perform an automatic adjustment of the detector bias and amplifier gain. Simply place a Cs¹³⁷ source near the detector and click one software button. The unit performs all hardware adjustments.

If a more precise energy calibration is desired, the system can perform a quadratic energy calibration and resolution calibration based on a Eu¹⁵² spectrum. The MCA 2100R is now ready to use.

Some of the many MCA 2100R features are...

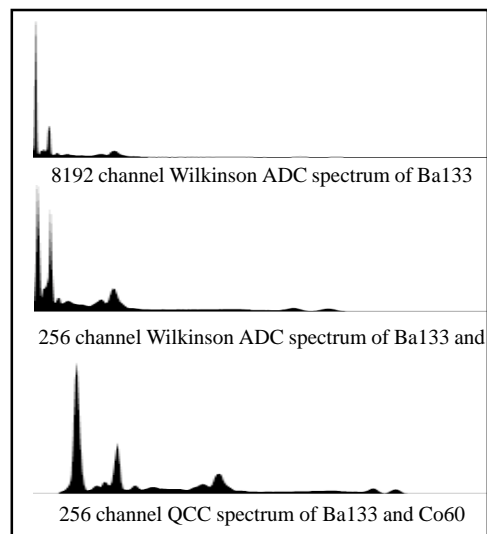
- Two MCA modes: QCC (Max 512 channels) and Linear mode (max. 1000 channels)
- Internal preamplifier for use with NaI detectors
- 3.5µs successive approximation ADC
- Three PC communication methods: RS-232, RS-485, and Ethernet option.
- Quantitative analysis software available

QCC™

The QCC system turns what is normally a disadvantage of NaI, the strong energy dependence of the FWHM, into an advantage by using a patented (U.S. Patent no. 5,608,222) compression scheme which simultaneously reduces the number of channels required and produces spectra where every peak has the same width in terms of channels. This bit of magic is accomplished by crafting an ADC where each channel has a width in terms of energy which is proportional to the resolution of the detector at that energy.

The result can be quite dramatic in terms of the spectrum appearance. The spectra below all contain exactly the same data. The 8192 channel Wilkinson spectrum shows all of the spectrum detail at low energies but appears to be empty over the high energy rate. The 256 channel Wilkinson spectrum shows the high energy peaks better but distorts the low energy region losing several peaks. The QCC spectrum provides full peak detail at all energies!

QCC technology is of particular importance in applications where a wide energy range must be monitored for unknown sources of radiation. The QCC process makes detection of peaks at all energies equally straight forward. Peaks at low energies are well resolved, while at high energies are compressed so that the peak to background ratio is dramatically improved for a given number of counts. This directly translates into shorter counting times with better identification and analysis.



MCA2100R Specifications

• ADC

- 3.5 μ s successive approximation
- 14-bit resolution
- Discriminators (computer adjusted): upper (105% full scale) and lower (0% full scale) in increments of 0.41%
- Zero adjustment via computer in increments of 0.41%
- Maximum throughput: 75,000 cps

• Spectrum Memory

- QCC mode: 256 or 512 channels
- Linear mode: 250, 500, or 1000 channels
- Maximum counts per channel: $2^{24} - 1$ (i.e. 16 million)

• Amplifier

- Bipolar shaping, 2 usec (fixed)
- Built-in dead time correction
- No pole-zero adjustment required
- Coarse gain settings: 1X, 2X, 4X, 8X (computer selectable)
- Fine gain settings: 1 to 2.5X (computer adjustable) in increments of 0.01X

• Counting Presets

- Real time
- Live time
- Integral of all ROI's
- Integral of selected ROI's
- Gross ROI statistics
- Net ROI statistics
- Total internal amplifier counts (ICR)
- Total SCA counts

• Computer Control

- RS-232 with the following available baud rates: 2400, 9600, 19200, 38400, 57600, and 115200
- RS-485 with baud rate 115,200
- Maximum number of units connected to PC: 8 total via RS-232 and/or RS-485
- Option: Ethernet communication (MCA2100R-EN)

• Digital Stabilizer

- Internal ADC and Gain stabilization

• Multichannel Scaling

- Input rate 5 Mhz
- Dwell time: 10 ms to 20,000,000 seconds.
- Dead time: 3 μ s between passes and 3 μ s between channels.

• Bias Supply

- 0 to +1200V in 1V increments (computer controlled)

• Preamplifier

- Charge sensitive
- Internal for use with detector PMTs

• Battery Backup for:

- Spectrum
- Setup parameters
- Clock memory

• Power

- 90 - 247 VAC, 50-60 Hz with the universal AC power converter (included).
- or 10-18V DC @ 1A for direct input
- Typical power consumption: 15 watts

• Weight:

2.6 lb. (1.2Kg)

• Dimensions:

10.9 inches (27.7cm) deep
7.63 inches (19.4cm) wide
2.88 inches (7.32cm) tall

• Front Panel Indicators

- Dead-time meter (3-color LED array)
- Acquire
- Pulse event detect
- Serial communication in progress
- High speed communications in progress
- Power on

• Rear Panel Controls and Connectors

- Power switch
- 9-pin 12 VDC power connector
- 9-pin D female auxiliary connector
- AUX I/O (auxiliary input/output) rear panel connector (female 9-pin D) with the following connections:
 - +5V DC output (100mA maximum output)
 - Multichannel scaling input (MCS)
 - Ground
 - SCA output (TTL)
 - ADC gate input (TTL signal with software selectable positive or negative polarity for coincidence or anti coincidence mode)
- 9-pin D male RS-232 connector
- BNC female connector for preamplifier input
- SHV female connector for detector bias
- Two RJ-11 connectors for use with RS-485
- Option-Ethernet Communications Port for Model MCA 2100EN

• Software

- 32-bit Quantum-MCA compatible with Windows 95/98/XP



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