Quantar Technology

MODEL 2502A POSITION ANALYZER

PRODUCT DESCRIPTION

The Model 2502A Position Analyzer is a complete pulse-position analyzer readout electronics designed for use with resistive-anode-based, pulse-counting, position-sensitive imaging detectors. It offers an increased maximum counting rate of approximately 1 MHz with a 400 ns dead-time per event. It is designed for use with Quantar Technology 3390 Series MCP/RAE (option SH) Sensors which are equipped with special, low-resistance, higher-speed resistive anode position encoders. It should be considered for applications where the Model 2401B Position Analyzer does not provide sufficient maximum counting rate and where 8-bit (256 channel) digitization on each spatial axis is sufficient. The Model 2502A consists of two modules; the Preamp/Processor module and a rack-mount control/FIFO/supply module.

For additional general information about Quantar position-sensitive detector systems, see the 3300/2400 Series Technical Description.

FEATURES/SPECIFICATIONS

\#   Imaged X, Y outputs: 400 ns dead-time per event (10X faster than Model 2401B Position Analyzer). Maximum imaged output count rate of approximately 1 MHz global. Translates to dead-time loss of approximately 20% at 500 KHz input rate, 40% at 1 MHz input rate and 67% at 2 MH input rate, assuming random event rate-of-arrival statistics (see Dead-Time Curves). Non-imaged RATE signal tracks to above 3 MHz input rates (enables dead time correction) Other limitations may occur for some intra-image details (focused spots, narrows lines) due to MCP count-rate limitations (high strip current HOT EDR-type MCP's are recommended for most high count rate applications).

\#   70 ns pulse-pair rejection (veto) capability. Rejects pulses from position processing as long as separation time is at least 70 ns to minimize double-event counting.

\#   All digital operation, using "flash" type ADCs for digitization of analog signal pulses and calculation of ratios to determine coordinate event position.

\#   8-bit (256 channel) spatial digitization included (maximum available) as standard. Strobe signal provided. TTL levels. Includes 16-event FIFO data buffer to handle pulse bursts (handshake with external data device required). Compatible with Model 2415C Histogramming Memory and Model 2251A MCA-Emulation Software.

\#   Output data above approximately 6 bits (64 channels on each axis, X and Y) requires flat-field normalization for accurate quantitation due to differential linearity of fast ADC (effective pixel count collection area can vary by +20%, -50% from average pixel count). Normally accomplished in software by user or using Model 2251A MCA/MCA2D Software normalization post-processing routines (signature correction file is supplied with Quantar software). Contact Quantar Technology for typical test data.

\#   Analog X and Y outputs available (primarily for XY real-time display only, not for digitization)) from built-in digital-to-analog converters.

\#   2-dimensional, both X and Y axes included (full 2D imaging). Can be used in 1D by ignoring other axis position information.

\#   Model 2502A does not include some features included on Model 2401B Position Analyzer/Computer such as analog Edge Gating (front-panel controls that determine "electronic active area,") or rear-panel-switched digital PHA mode (used to digitally collect pulse-height distribution). Data readout protocol differs slightly from Model 2401B due to FIFO handshaking requirements.

\#   PC-compatible version. An optional Model 2502/PC configuration version is also available for IBM-compatible PC-based operating environments. In this configuration, the rack-mount module is replaced by a full-length, ISA-bus PC-plug-in card. This card includes the FIFO/DAC function, but also includes a 16-bit input Histogramming Memory (65,000 counting channels, each 16 bits deep, one counting channel for each pixel in a 256 x 256 pixel image). Power for the entire detector system is derived from the PC bus (need minimum 250-300 watt PC power supply). Operation of this version is supported by Quantar Model 2251A MCA/MCA2D Software. The Preamp/Processor Module is the same as the standard version. Requires fully compatible ISA slot in users PC for operation.

\#   Physical size: Rack Module: Includes power supply, meter circuits and FIFO/DAC board: 5¼"H (133 mm) x 17" W (432 mm) x 18" D (458 mm). Preamp/Processor Module: 5"W (127 mm) x 2"H (51mm) x 9 1/4"D (235 mm) . All necessary cables provided. Order 3390 Series sensor (w/option SH (Low Resistance RAE), option SM for HOT MCP's) separately. Shipping weight: 30 lbs approx.