Technical Information

GENERAL DESCRIPTION

The LRS Model 2248 Multi-ADC contains eight complete eight-bit analog-to-digital converters in a single-width CAMAC module. These ADC's are specifically intended for digitization of photomultiplier pulses and similar fast transient signals. They are especially well suited to use in large systems because of their low cost, compactness, simplicity of operation, and system-oriented control and test features. They accept and digitize nanosecond pulses directly without need for prior stretching or preshaping of any kind. Input polarity is negative for photomultiplier anode pulses; however, positive pulses or negative pulses with positive undershoot can also be handled linearly. Inputs are direct-coupled for freedom from rate effects and highly stable with time and temperature. A common linear gate establishes the time window during which the analog inputs are active. This input is operated by standard NIM level signals from 10 to 200 nanoseconds in duration.

The Model 2248 offers a number of convenient and flexible features. A unique conversion mode control provides the choice of two linear modes with sensitivities of 0.25 pC/count or 1.0 pC/count, or three bilinear modes. (See curve.) The bilinear modes provide an effective increase in the dynamic range as compared with simple linear conversion by digitizing the lower portion of the output range at 0.25 pC/count and switching at one of three selected points to 1.0 pC/count. A simple CAMAC-controlled internal test checks all ADC's simultaneously, from input to output, providing a convenient and practical monitor of proper system operation with minimal interference with data-taking. Other flexible features include provisions for connecting two status commands (Active, end of conversion Flag) to CAMAC patch points, readout of two adjacent modules in the form of eight 16-bit words, and suppression of Q response for modules with less than a preselected number of counts in all of the eight channels.

The Model 2248 represents a very substantial advance in fast pulse ADC capability. In high energy physics, it will permit the use of ADC's for both measurement and monitoring purposes to an extent not previously practical, since for the first time the ADC cost becomes low compared to the existing experimental per-channel investment in the counter assembly and associated electronics and hardware.

ENGINEERING DEPARTMENT
LeCroy Research Systems
October 1972