

## Extracting Position Information from Single Dimension Position-Sensitive Detectors

Two types of position-sensitive detectors are discussed here. The ORTEC solid state Position-Sensitive Detector (PSD) and a gas proportional detector with a resistive wire.

The ORTEC PSD is a rectangular N-type Silicon detector with a Boron ion implanted front contact. This front contact is the p-n junction contact for this detector. There are three contacts for signal extraction from this detector. One is the ohmic contact providing the total energy peak out from this detector. The other two outputs are endpoints of the detector front contact. Typically one of these two endpoints is connected to ground and the other provides a signal whose height is proportional to the distance from the grounded endpoint of the detector surface. A method for getting this data from the detector is shown in Fig 1. The shaping time for the amplifier must be set to 2.0 microseconds or greater to insure ballistic deficit does not affect the position information.

The model 142A preamplifiers and the model 572A spectroscopy amplifiers are good choices for this application. The model AD413A allows both the energy and position information to be correlated in time by using the busy output of the energy channel to gate both ADC's. The data will need to be analyzed and presented by your program using the CAMAC for communication with your computer.

Another type of Position Sensitive Detector is the Proportional detector with a resistive wire. There are two methods for determining the position of the event along the wire. Fig. 2 shows a method of comparing the pulse heights (as with the ORTEC PSD) that will give relative position information. It will be important to insure the reference is determined in order to avoid mirror images with this system. A timing method is shown in Fig. 3.

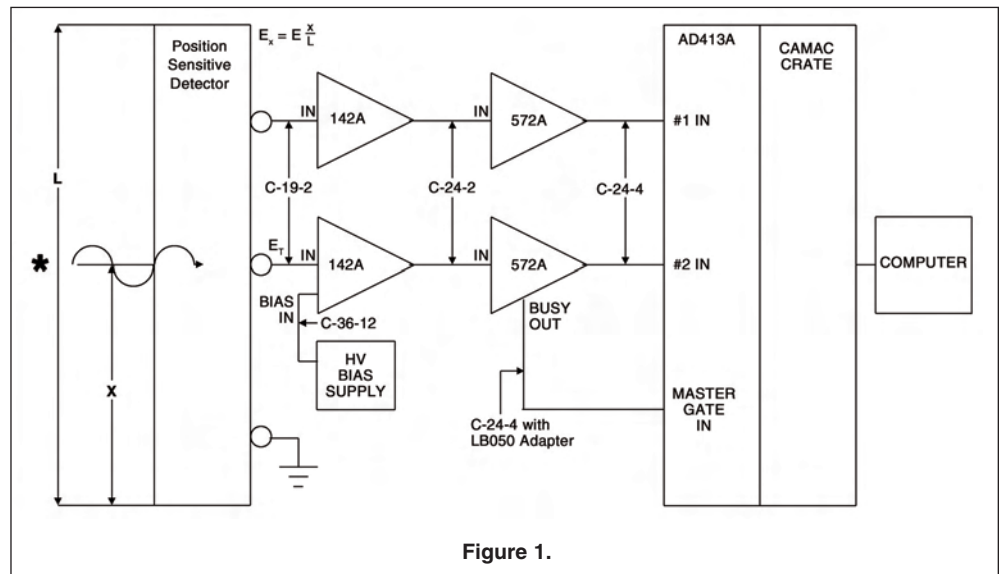
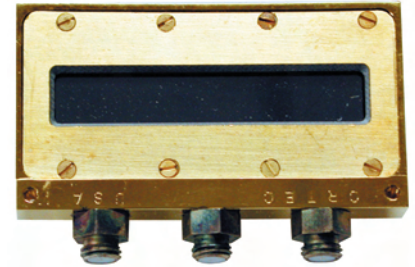


Figure 1.

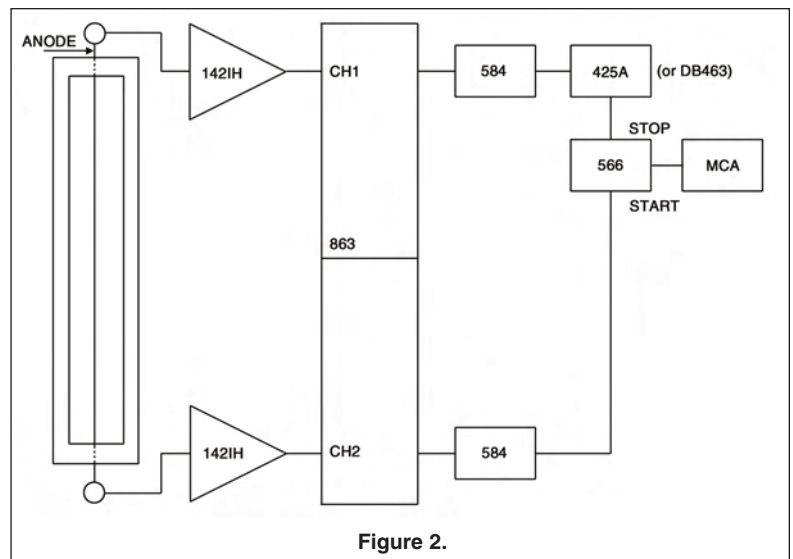
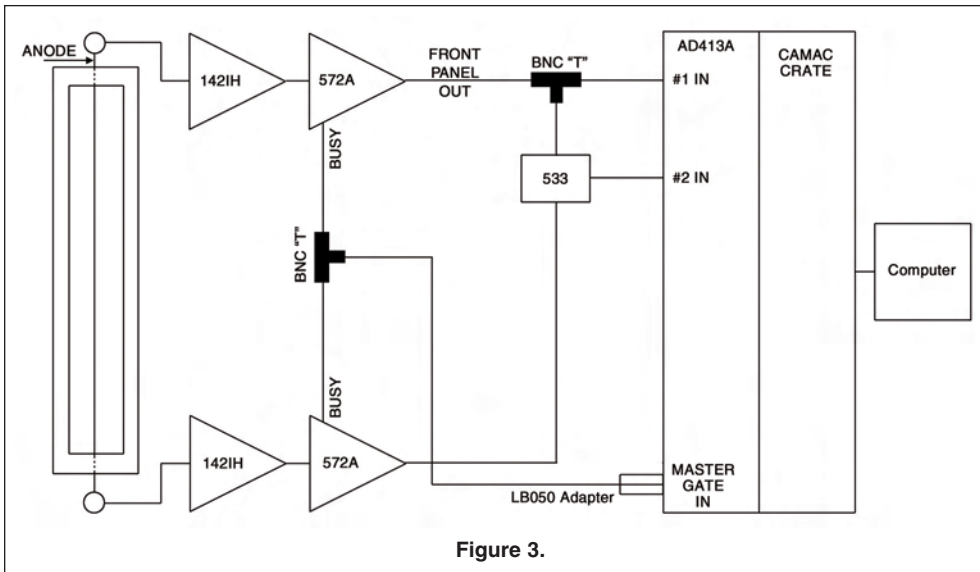


Figure 2.

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Specifications subject to change 011810

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