Avalanche Photodiode Detector heads

The Cyberstar APD (avalanche photodiode) system is an ultra fast detector suitable for experiments up to 20 keV with a large dynamic ranges, time resolved measurements and where fast photon counting are required.

Specifications

Maximum count rate	100 MHz *
Window	70 µm Kapton
Photon efficiency	50% that of NaI up to 10keV *
Noise	below 1Hz *
Diode gain	200x at 370 V bias
Preamplifier gain	60 dB per stage at 100 MHz
Rise time 10%-90%	<2 ns *
FWHM	<4 ns *

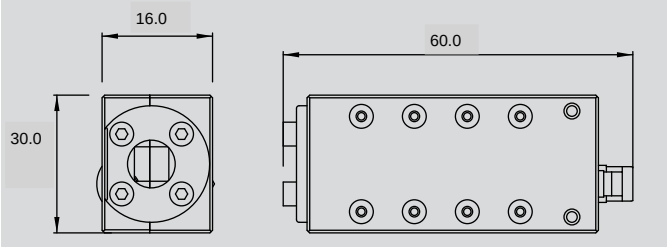
**Indicative performance figures obtained at the National Synchrotron Light Source, Brookhaven National Laboratory*

Features*

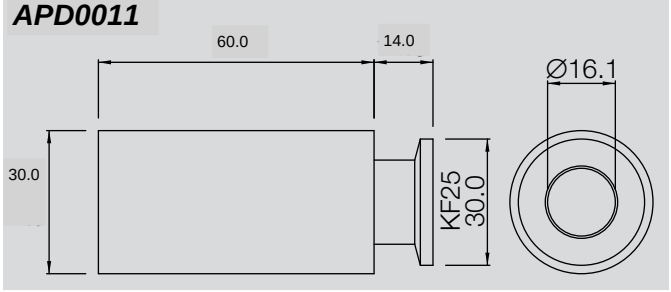
- excellent pulse pair time resolution - 5.6 ns
- very low noise
- wide dynamic range and linearity - seven decades
- rapid recovery from pulses
- high photon efficiency - 95% at 6 keV; 45% at 12 keV

APD Bodies

APD0010



APD0011



APD ACE

The ACE electronics package, built to a design developed at the European Synchrotron Radiation Facility offers the user maximum flexibility; it supplies the bias voltage to the detector head, and has an integrated counter/timer which can be operated in local (front panel) or remote (computer controlled) mode.

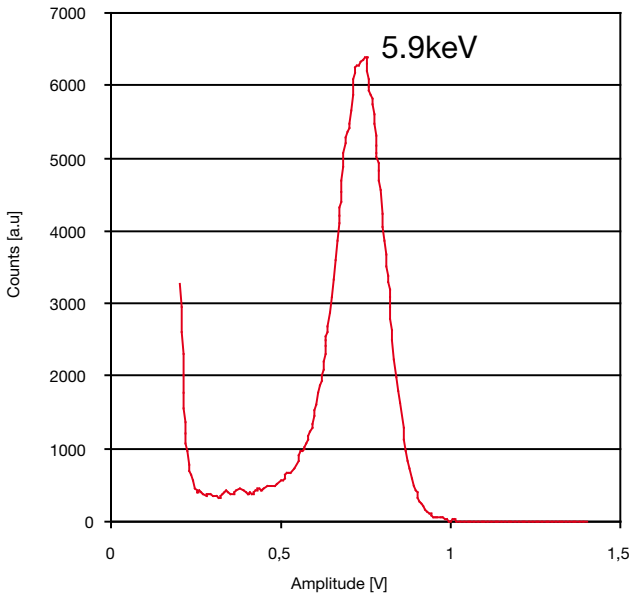
Features

- front panel operation through a user-friendly LCD graphic display with touch panel
- easy user interface for remote operation mode
- up to 500 V diode bias
- very low noise
- rugged, reliable package
- wide dynamic range and linearity - seven decades
- Labview software is provided and can be utilised with the rs232 communication port for remote configuration and data retrieval

Specifications

NIM module	two units wide
Selectable modes	local (front panel,) remote
Remote connection	serial or parallel
Maximum count rate	up to 100 MHz
HV APD bias	up to 500 V
Remote mode	software included
Energy resolution	20% to 35% at 25 keV

APD Performance



The graph to the left shows a pulse height distribution of a 55Fe source (5.9 KeV) recorded using the ACE APD electronics.

The electronics module was set in window mode - to resolve the distribution a window of 10 mV was used for a good compromise between count rate and resolution. The high voltage photodiode bias was set to 300 V, the integration time 1 s and the lower level discriminator threshold 0.2 V.

APD Ordering information

APD Detector Heads

5x5 mm 110µm sensor, 60x30x16 mm body (in-air)	APD0010
5x5 mm 100µm sensor, 60x30x16 mm body with DN25KF vacuum compatible head	APD0011

APD Electronics

APD pulse processing unit ACE, NIM 1 channel	APD0002

APD PPU Cables

5 m APD PPU cable	CBY01501
10 m APD PPU cable	CBY01502
15 m APD PPU cable	CBY01503
20 m APD PPU cable	CBY01507