

TECHNICAL SPECIFICATIONS

bPAD – a compact Single Channel Analyzer

INTRODUCTION

bPAD is a compact microcontroller-based Single Channel Analyzer. The device contains a Preamplifier-Amplifier-Discriminator with TTL digital output. The bPAD also includes its own high voltage power supply for operating standard 14-pin photomultiplier tubes, which are commonly used with scintillator-type radiation detectors (e.g. PVC, NaI(Tl), CsI(Tl), LaBr, CeBr, etc).

The device is therefore useful as a compact system to monitor the count rate in an energy region of interest. The detected signal is output as a TTL pulse, making it compatible with most industrial, environmental and laboratory counting systems. In contrast with traditional SCAs the bPAD is fully controlled by a microprocessor, providing easy setup and “smart” modes of operations. bPAD parameters can be conveniently set via USB with a PC and the provided configuration software.

DESCRIPTION

The bPAD is an advanced, microprocessor-based, compact electronic device that integrates a charge-sensitive preamplifier, a variable-gain amplifier and a window discriminator; all in a 14-pin photomultiplier tube base. This electronic device outputs a TTL pulse per photo-event detected by a scintillator detector in the energy range of interest. This type of device is also often referred to as a Single Channel Analyzer (SCA).

bPAD also includes a miniature, programmable and efficient high-voltage supply to provide the power necessary to operate the most widespread range of photomultipliers used with scintillator detectors. The output voltage can be set in the range from 0 to 1500 Volts with a resolution of 4096 steps.

Since the bPAD is a microprocessor-controlled device, it benefits from being easy to setup. The device connects to a PC via its USB interface, and by using the provided software all the operational settings can be configured and fine-tuned for any kind of scintillator detector. Once the setup is complete, all the settings are saved into the device's non-volatile memory.

The PC software also comes with a “pseudo-PHA” acquisition mode. In this mode, the software slides the single-channel window over the whole input range, constructing in such a way an energy spectrum. By using this spectrum, the user can visually identify the energy range of interest and immediately set the boundaries of the bPAD discriminator window. This represents a large improvement over the traditional “blind” method used with most other SCAs.

bPAD has two modes of operation:

- Integral, where counts are output for signals above a single energy threshold level
- Differential, where counts are output for signals within a defined energy window (SCA)

The output pulses correspond to counted events in the energy window of interest. They are 5-volt TTL signals with programmable duration (0.25 μ sec to 20 μ sec in 14 steps). The bPAD can be ordered to output pulses with a duration of 10 μ sec instead.

The bPAD can be powered via the USB connection or by an external DC power supply of 9 to 36 volts. Three color LEDs are used for status indications: Red for detector high voltage, Yellow for incoming count rate (ICR) and Green for power and communication status.

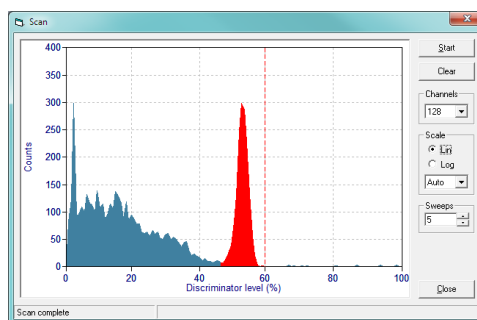
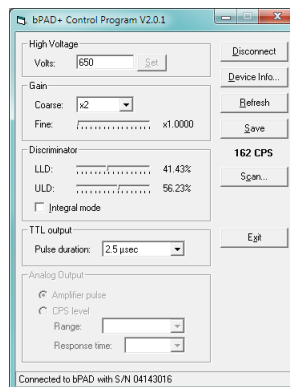
The bPAD is a compact device with a size of 55 mm diameter by 61mm high (51 mm not counting the TTL output connector) . bPAD weights less than 90 grams.

All the above-mentioned features make the bPAD a very attractive component for industrial and automated applications involving photon detection and counting.



FEATURES

- Compact Single Channel Analyzer with microprocessor control on a 14-pin photomultiplier tube base
- Integrates Preamplifier-Amplifier-Discriminator and HV power supply
- TTL output
- USB communications
- Device can be powered from USB and/or an external supply of 9 to 36 Volts via a pluggable terminal block
- Compact size of 55mm (D) x 61mm (H)
- Very low power consumption, 1 watt maximum.
- Miniature and efficient high voltage power supply
- Configuration software for easy setup and visualization of device operation, also implements a “pseudo-PHA” mode of operation
- LED indicators for communication status and device power, HV power and incoming count rate (ICR)



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is a dynamic technological and engineering company with novel designs and innovative solutions in the field of nuclear electronics and software development for radiation detection.

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Device and digital settings

- ◆ Acquisition modes: Integral and differential.
- ◆ Coarse gain: x1, x2, x4, x8 (optionally also x16, x32, x64, x128)
- ◆ Fine gain: x1...x2 in 4096 steps
- ◆ Upper and Lower Level discriminator resolution: 2048 steps
- ◆ Output: 5 Volts TTL signals of programmable duration (0.25 to 20 µsec in 14 steps).

High Voltage Power Supply

- ◆ Miniature HV power supply embedded into the device assembly
- ◆ Voltage: 0 to 1 500 Volts in 4096 steps

Data communication

- ◆ USB 2.0, cable included.
- ◆ TTL output via SMA connector, cable included.

Physical

- ◆ USB connector: type mini B, used for PC communications or powering.
- ◆ Power connector: pluggable terminal block, 9 to 36 Volts, plug included.
- ◆ Power consumption: 1 watt maximum
- ◆ Size: Height 61 mm, Diameter 56 mm
- ◆ Weight: Approximately 90 grams

Indicators:

- ◆ Red LED for detector high voltage
- ◆ Yellow LED for incoming count rate (ICR)
- ◆ Green LED for power and communication status

Other

- ◆ The device is supplied with Windows™ PC software for setup and pseudo-PHA, the software can also display the CPS value for the defined SCA region

Certifications

- ◆ The device is CE compliant

CE
CERTIFIED