

# microPulser™

## Programmable Pulse Generator

### Highlights

- Designed specifically for testing and calibrating radiation monitoring instruments
- Computer programmable scripts via USB cable with the Assistant PC software
- Includes all 3 common output connectors:
  - BNC
  - MHV
  - Type C
- Dual analog and digital displays provide both visual feedback and accurate readings
- Measures and displays high voltage readings of connected instrument
- Simple menu-driven setup and calibration
- 6-hour battery backup

### Description

The Bladewerx microPulser™ is a small lightweight programmable pulse generator designed to assist in testing and calibrating radiation monitoring instruments. It supports precision control of pulse rate and pulse amplitude, as well as choice of one of three user-defined pulse shape profiles. In addition, the microPulser can measure and display the connected instrument high voltage output. The microPulser has an ABS housing designed to take abuse in the field.

### Display and Control

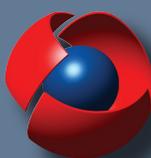
The microPulser provides both analog and digital displays. The analog meter provides visual feedback for adjustments of count rate or pulse amplitude, while the digital meter displays the actual setting values, giving accurate values of the current settings. The digital display is also used for setup and calibration of the pulser through a user-friendly menu system.

Four controls are on the front face of the microPulser, grouped in two pairs. The Count Rate pair consists of a rotary switch to select the count rate range, and a linear potentiometer to adjust the rate within the selected range. Through an integrated push/pull switch in the potentiometer, the user can toggle between a 'snap' mode—stepping readings by fixed increments—or a continuously-adjustable rate mode. A front panel LED indicates when the analog meter is displaying the count rate while being adjusted.

The other pair of knobs control the pulse Amplitude and operate in a similar manner. The rotary switch selects the amplitude range, and the potentiometer adjusts the amplitude within the selected range. A 'snap' and fine amplitude adjustment is available on the Amplitude setting as well. Like the Count Rate LED, an Amplitude LED indicates that the meter is showing the amplitude setting.

A Menu/Select rocker switch in the upper right corner of the microPulser cycles through the simple list of user menu options and selections.

A momentary power button on the side of the case turns the unit on or off.



## Outputs

Pulse output is duplicated on three different coax connectors on the side of the case: a BNC, an MHV, and a Type C connector preventing the need to search for cable adapters constantly. Each signal is isolated from the other two pulse output signals to prevent unintended loading of the signal.

The connected instrument high voltage output is also measured on each of the connectors—choosing the highest voltage found to display. This circuitry is utilized only when measuring the high voltage from the user menu. During normal pulse output mode, the high voltage measurement circuitry is switched off to prevent loading of the signal through the high impedance voltage divider.



## Theory of Operation

Output pulses are generated digitally by a dedicated pulse processor in the microPulser. Each pulse consists of a sequence of up to sixteen values which define the pulse shape or 'profile' to be output. These values are output through a digital-to-analog converter and additional shaping circuitry before being scaled down to the appropriate amplitude range and output to the coax connectors. Both positive- and negative-going pulses are possible.

The use of the digital pulse profile also allows the creation of fast double-pulses for determining instrument deadtime behavior.

Three pulse profiles are stored in the microPulser and the active profile can be chosen through the user-menu.

## Ranges

The Count Rate ranges run from 0.5, 5, 50, 500, 5K, 50K, 500K, and 5M counts per minute. The upper 5M range is limited to 3,000,000 cpm by design.

The Amplitude ranges are 5, 50, 500, and 5000 millivolts.

## Specifications

### Count Rate

- Total Range: 0 -- 3,000,000 cpm
- Ranges: 0.5, 5, 50, 500, 5K, 50K, 500K, 5M
- Adjustments: 0 -- 5 fine and course controls

### Amplitude

- Total Range: 0 -- 5,000 millivolts
- Ranges: 5, 50, 500, 5K
- Adjustments: 0 -- 5 fine and course controls

### Pulse Shape

- Polarity: positive or negative pulse
- Leading edge: 0.4 microseconds
- Profile width: programmable, 16 steps (2  $\mu$ sec)
- Profile height: programmable, 0 -- 255

### Pulse Output

- BNC Connector
- MHV Connector
- Type-C Connector

### High Voltage Measurement

- Range: 50 -- 3,000 Vdc @ 2.5 gigaOhm
- Linearity:  $\pm$  3% of true value

### Physical

- Weight: 3.84 lbs (1.74 kg)
- Size: 6.5" w x 11" h x 4" d (16.5 x 28 x 10 cm)
- Temperature: 0 to 122 °F (-20 to 50°C)
- Power: A/C Adapter with 12 vdc @ 3.5 A

## Base Models

BIN-UPULSER-PLUS microPulser Precision Pulse Generator *with* remote programmability option and Assistant PC software

BIN-UPULSER microPulser Precision Pulse Generator (*without* remote programmability option and Assistant PC software)

## Spare Parts

BPT-LION-6300 6300 mA-h Li-Ion Battery  
 BPT-ACADP-1222 AC adapter/charger  
 BPT-ACADP-NUS Non-US AC adapter/charger  
 BSP-UPULSER-PCB Internal PCB set (3 boards)  
 BSP-UPULSER-LCD Front panel OLED display  
 BSP-METER1 Front panel meter assembly

