

GPTA HV-PLS 1000

High-Voltage-Pulse Generator



an ultrafast source for precision rectangular high voltage pulses



- Synchronous positive and negative HV output independently adjustable 50 V - 1000 V

- Maximum repetition rate 20 kHz
- Rise time < 15 ns
- Maximum duty cycles : 5 % permanent, 50 % burst
- External trigger HV-pulse delay < 120 ns
- Amplitude stability better than 1%
- Overshoot at leading edge < 10%
- Excellent reproducablility of the pulse shape under statistical triggering conditions
- Jitter < 0.5 ns
- Adjustable output pulse width 100 ns 10 μs



GPTA HV-PLS 1000 - Introduction

The GPTA HV-PLS 1000 is a high voltage pulse generator designed to drive high impedance capacitive loads. It provides two rectangular shaped pulses of opposite polarities, each with a maximum amplitude of 1kV to ground.

The GPTA HV-PLS 1000 is optimized for clean pulse shapes and a high stability of the amplitude as required by time-of-flight and charged particle imaging applications. Furthermore it is characterized by a short insertion delay between trigger input and pulse output and a high burst duty cycle of up to 50% making it well suited for coincident particle detection schemes with statistical trigger signals.

The following specifications are valid when operating the pulse generator under room temperatures between +20 C and +40 C and for capacitive loads smaller than 50pF. The capacitive loads are connected to the pulse generator by two 2 m long 75 Ohm RG-59 coaxial cables. Larger loads might be driven with modified specifications. Contact GPTA for additional information.

GPTA HV-PLS 1000 - Detailed Specifications

The following specifications are valid when operating the pulse generator under room temperatures between + 20 C and + 40 C and for capacitive loads smaller than 50 pF. The capacitive loads are connected to the pulse generator by two 2 m long 75 Ω RG-59 coaxial cables. Larger loads might be driven with modified specifications. Contact GPTA for additional information.

Input Signals

1. Trigger: 5 V TTL or -1.2 V negative NIM trigger signal.

Output Signals

- 1. **Polarity**: Positive and negative, provided simultaneously at two independent output connectors, amplitudes independently adjustable.
- 2. **Amplitude Ranges**: +50 V to +1000 V 5% and -50V to -1000V 5% for the respective output.
- 3. **Amplitude Stability**: Better than 2% over a sample of many pulses within the limits of the repetition rate and the duty cycle as stated below. Better than 1% within one single pulse after 200 ns from leading edge. See also **overshoot limits**.



GPTA HV-PLS 1000 - Detailed Specifications (continued)

- 4. **Rise Time**: Less than 15 ns between 10% and 90% of the output amplitude.
- 5. **Fall Time**: Less than 25 ns between 90% and 10% of the output amplitude.
- 6. **Overshoot**: Overshoot of pulse leading edge is less than 10% of the output amplitude for a maximum duration of 30 ns.
- 7. **Output pulse width**: 100 ns to 10 μ s When externally triggered, the output pulse width is independent of the width of the trigger signal.
- 8. **Insertion delay**: The delay between external trigger and leading edge of the output pulse is less than 120 ns.
- 9. Jitter: The jitter of the insertion delay is less than 0.5 ns.
- 10. Maximum repetition rate: 20 kHz for permanent operation and periodic signals.
- 11. **Maximum duty cycle** :5% for permanent operation and periodic signals. 50% for bursts of up to 3 successive pulses with 5 μ s pulse-to-pulse delay and a minimum burst-to-burst delay of 300 μ s.
- 12. **Stability** The pulse-to pulse varation of the output amplitude within one burst in the maximum duty cycle is less than 1%.



GPTA HV-PLS 1000 - Detailed Specifications (continued)

Connectors

- 1. Input 1 x 50Ω BNC coaxial connector.
- 2. HV Output 2 x 75 Ω LEMO 1S Series (12 mm) coaxial connectors for high voltage outputs.
- 3. **Monitor Output** 1 x 50 Ω BNC coaxial connector for pulse monitor output. The monitor signal is a 5V TTL signal with a pulse width equal to the high voltage output pulse width. 2 x banana connectors at DC voltage equal 1/100 of pulse amplitude.
- 4. **Power Supply** Internal wide range power supply for operation with external 90 VAC to 230 VAC, 50/60 Hz line voltage.

Miscellaneous

1. **Protection** The HV-PLS 1000 is protected against:

short circut at output thermal overload of power ampli er

- 2. **Physical Dimensions**: 19" rack unit: 43 cm x 43 cm x 13 cm (L x H x D)
- 3. Weight: About 10 kg
- 4. **Operating Conditions**: 10 C to 40 C

SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE