# High Voltage Pulse Modulator Driver ±4kV

## ± 4kV, 1MHz, 8ns Rise/Fall, Pulse Width 25ns

DATASHEET

Return to the Webpage

The HVPD Series Bipolar High-Voltage Driver is a turnkey unit that delivers sharp electrical pulses of up to ±4kV with a 1 MHz bandwidth, ideal for driving large aperture electro-optic (EO) modulators. The unit includes a manual voltage adjustment knob, BNC pulse trigger input with two control modes — normal and analog —selectable via a switch. For high-voltage and high-repetition-rate operation, integrated water-cooling ports ensure thermal stability and reliable performance. It comes with cables for connecting to Agiltron EO modulators.

## Features

- ±4kV High Voltage
- 10 ns Rise/Fall
- 1 MHz Bandwidth

## Applications

- EO Device Control

## Specifications

| Parameter | Min | Typical | Max | Unit |
|---|---|---|---|---|
| Output Voltage | 0 | ± 4 | | kV |
| Rise/Fall Time [1] | 8 | 10 | 15 | ns |
| Pulse Width | 25 | | 5000 | ns |
| Modulation Frequency | 0.001 | 0.5 | 1 | MHz |
| Output Wave Form | | pulse | | |
| Load Capacitance | | | 10 | pF |
| Operating Temperature | -5 | | 40 | °C |
| Power Input | 100 | | 240 | ACV |
| Power Consumption | | | 100 | W |
| Control Trigger Level | 3 | | 5 | V |
| Control Trigger Impendence | | | | |
| Humidity 90% | | noncondensing | | |
| Storage Temperature | -40 | | 85 | °C |

**Notes**:

[1]. At 10-90% level. Also affect by amplitude and capacitor load. For 400V output, 0.5MHz repetition rate

RoHS COMPLIANT



Rev 05/05/26

P +1 781-935-1200 E sales@agiltron.com W www.agiltron.com

# High Voltage Pulse Modulator Driver ±4kV

## ± 4kV, 1MHz, 8ns Rise/Fall, Pulse Width 25ns

DATASHEET

## Mechanical Footprint Dimensions 2U (mm)

*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

## Ordering Information (Part Number) System

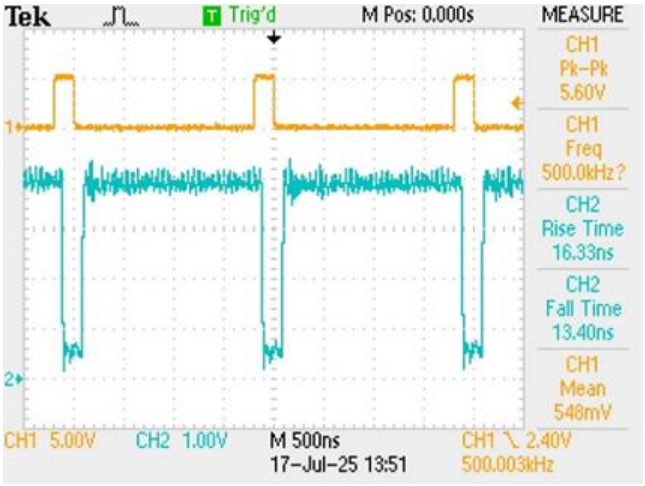
| | ☐☐ | ☐ | ☐ | 1 | ☐ | ☐ | 1 |
|---|---|---|---|---|---|---|---|
| **Prefix** | **Max Voltage** | **Package** | **Configuration** | | **Repetition *** | **Chiller** | |
| **HVPD-** | ±4kV = 44<br>Special = 00 | 2U Benchtop = 1<br>Special = 0 | Standard = 1<br>Special = 0 | | 1MHz = 1 | Non = 1<br>Yes = 2 | |

# High Voltage Pulse Modulator Driver ±4kV

**± 4kV, 1MHz, 8ns Rise/Fall, Pulse Width 25ns**

DATASHEET

## Typical Response (yellow is trigger input, green is optical output)

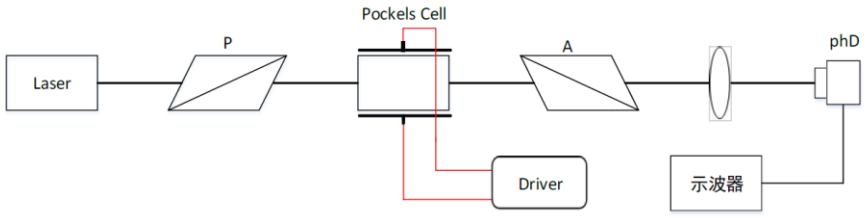



## Set Up

Due to the circuit characteristics of the driver, its high-voltage output is highly sensitive to load conditions, requiring careful setup during testing.

1.The driver should be placed as close as possible to the Pockels cell, with a recommended cable length of only 5–7 cm. This is especially critical in applications requiring fast rise/fall times or high frequencies.
2.The output cable must not be twisted or brought near metal parts to avoid interference and signal degradation.
3.For voltage measurement, a differential high-voltage probe is recommended. Standard oscilloscope probes or single-ended attenuators must not be used. The driver's built-in voltage monitor interface may be used for rough voltage readings.
4.Indirect method 2: through the optical platform for verification, can be built in accordance with the following schematic diagram, the specific optical part of the debugging method refer to Pockels cell instructions; In the process of optical debugging, confirm the working condition of the system by observing the received waveform of phD, and the detected waveform may have burr or distortion due to the interference of high voltage and high frequency signal, please check if the connection between phD and oscilloscope is anti-interference, or if the response time of phD meets the requirements.

Note that any direct contact with the high-voltage output—even with differential probes—introduces parasitic capacitance that distorts the waveform. Therefore, waveform and timing measurements should be done indirectly. For example, use a ≥300 MHz bandwidth oscilloscope probe to lightly touch the insulation (not the metal) of the output cable and detect the signal via capacitive coupling.



## Operation Instruction

**Preparation**

1. Connect the high-voltage output of the high-voltage power supply to the high-voltage input of the modulator. Please ensure that the high-voltage power supply HV+ is connected to the modulator HV+, and the high- voltage power supply HV- is connected to the modulator HV-;
2. Connect the signal generator to the external trigger signal port D2 of the modulator, and set the output parameters of the signal generator to meet the following requirements:
   a)The external trigger signal port of the modulator has an input impedance of 50 Ω, which meets the TTL control standard;
   b)The frequency and pulse width set should meet the range indicated in the product specification to avoid irreversible damage to the driver ;( Duty cycle setting does not exceed 50%)
   c)For initial use, it is recommended to use low frequency (<10kHz) for testing;
3. Connect the modulator output to the Pockels cell, which can use wires distributed with driver or can be made according to the actual installation situation; The wire should be as short as possible to avoid affecting the performance and final effect of the driver;
4. Connect the water-cooled equipment (the temperature of the water- cooled plate should be below 40 ℃).

Start working:Turn on the water cooling equipment for pre cooling, check if all cables are correct and there are no short circuits or open circuits;

5. After ensuring the normal output of the high-voltage source, start the signal source and the modulator will start outputting high-voltage pulses;
6.Rotate the high voltage adjustment P4 potentiometer of the high voltage power supply to change the output high voltage. The current output high voltage can be monitored through the P3 feedback interface pin1 of the high voltage power supply;

**During operation** ：

1.During use, the output high voltage can be adjusted, and the output frequency and pulse width can also be changed ；
2.Ensure the heat dissipation during the use of the drive, and during the process of adjusting the pitch of the Pockels cell, pay attention not to entangle or touch the output wire with metal components;
3.If there is any ignition or abnormal phenomenon during the process, please immediately disconnect the 24V DC power supply;
4.If it is necessary to move or adjust the position of the installed driver, please disconnect the power and complete the discharge work before

**Turn Off**：

1. Turn off the trigger signal of the signal source ；
2. Turn off power ；
3. To prevent high voltage caused by the charging and discharging of the capacitor (Pockels cell), wait for 20-30 minutes before disconnecting the connection cable between the Pockels cell and the driver.

# High Voltage Pulse Modulator Driver ±4kV

## ± 4kV, 1MHz, 8ns Rise/Fall, Pulse Width 25ns

DATASHEET

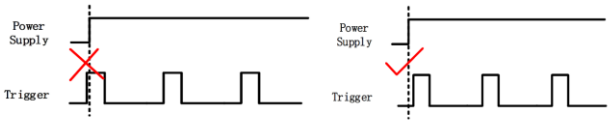
## PRECAUTIONS

**■The Pockels cell drive will generate high voltage. Please follow the principle of safe electricity use to avoid potential hazards such as leakage and electric shock.**

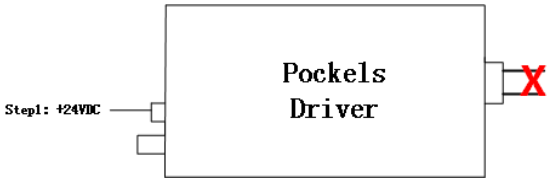
**■Ensure the heat dissipation of the high-voltage power supply and modulator.**

**■Due to the time required for capacitor discharge, do not immediately touch the high-voltage output interface of the drive after turning off the Pockels cell drive until it is completely discharged.**

**■Please carefully read the usage steps and follow them for use; Make sure to turn on the power supply first before inputting the trigger signal.**




**■Do not turn on the drive without load.**




**■Do not use both the normal control mode and analog voltage control mode of the driver at the same time。**