

doric

# **Optogenetics TTL Pulse Generator**

User Manual

Version 1.2.2

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## General Overview



Figure 1.1: Optogenetics TTL Pulse Generator.

The *Doric Optogenetics TTL Pulse Generator* (OTPG) allows the modulation of pulse signal trains as well as their triggering. The generator connects to a computer using a USB-B cable, while each channel can be connected to a device using a BNC cable. The most commonly used devices are *LED Drivers*, *Laser Drivers* and *Shutters*. It can be used to coordinate between many input/output signal of different devices.

The generator comes in 4-channel (Fig. 1.1a) and 8-channel (Fig. 1.1b) models. For the 4-channel OTPG, all channels can either be used as an output, to deliver a pulse train, or as an input, to receive trigger signals. For the 8-channel OPTG, a maximum of four of any ports can be used as inputs and all ports all can be used as outputs. The OTPG is controlled using the *Doric Neuroscience Studio* (see chapter 2).

## Specifications

Table 2.1: *General Specifications*

<b>SPECIFICATIONS</b>	<b>VALUES</b>	<b>NOTES</b>
Maximum On/Off Time	5 hours/Infinity	
Maximum Sequence Duration	Infinity (continuous) or $10^7$ Pulses	
Minimum Pulse Duration	0.017 ms	
Time Resolution Accuracy	$\pm 1 \mu\text{s} \times \#$ of channels running	
Maximum Value of Repeat	4 294 967 296	
Maximum/Minimum Pulse Frequency	30 kHz / $5.47\text{e}^{-5}$ Hz	
Pulse Stability	0.1 $\mu\text{s}$	
Voltage Output	5 V	
Maximum Input Voltage	5 V	
TTL level	Hi > 3.3 V; Low < 1.5 V	
Current Consumption	<100 mA (4 ch)/ <200 mA (8ch)	Powered by computer USB port
Output Current	20 mA (Maximum)	
Dimensions		
4-channel OTPG	135 x 58 x 21 mm <sup>3</sup>	Depth includes connectors
8-channel OTPG	135 x 70 x 21 mm <sup>3</sup>	Depth includes connectors
Mass		
4-channel OTPG	174 g	
8-channel OTPG	199 g	

Table 2.2: *Recommended Environmental Specifications*

<b>DESCRIPTION</b>	<b>OPERATION</b>	<b>STORAGE</b>
Use	Indoor	Indoor
Temperature	0-40 °C	0-40 °C
Humidity	40-60 % RH, non condensing	40-60 % RH, non condensing

## Support

### 3.1 Maintenance

The product does not require any maintenance. Do not open the enclosure. Contact Doric Lenses for return instructions if the unit does not work properly and needs to be repaired.

### 3.2 Warranty

This product is under warranty for a period of 12 months. Contact Doric Lenses for return instructions. This warranty will not be applicable if the unit is damaged or needs to be repaired as a result of improper use or operation outside the conditions stated in this manual. For more information, see our [Website](#).

### 3.3 Disposition



Figure 4.1: WEEE directive logo

According with the directive 2012/19/EU of the European Parliament and the Council of the European Union regarding Waste Electrical and Electronic Equipment (WEEE), when the product will reach its end-of-life phase, it must not be disposed with regular waste. Make sure to dispose of it with regards of your local regulations. For more information about how and where to dispose of the product, please contact Doric Lenses.

### 3.4 Contact us

For any questions or comments, do not hesitate to contact us by:

**Phone** 1-418-877-5600

**Email** [sales@doriclenses.com](mailto:sales@doriclenses.com)

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