Prizmatix

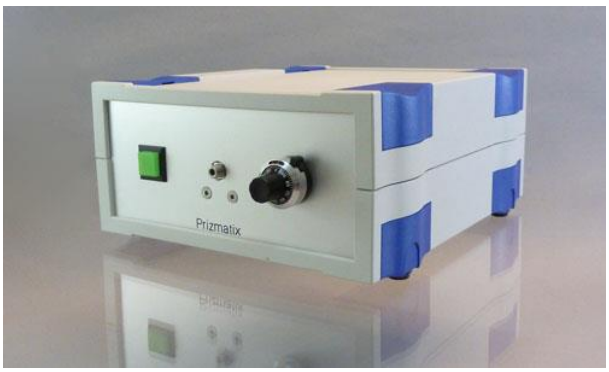
Optogenetics-LED-Yellow

Yellow Fiber-Coupled LED for Optogenetics in Freely Moving Animals

Ver. 4

Introduction

The Prizmatix Optogenetics-LED-Yellow light source is a Fiber-Coupled LED specially designed to provide Yellow light (~595nm) for Optogenetics silencing in freely moving mammals. The Yellow LED emission fits Halorhodopsin (NpHR, eNpHR3.0) Yellow light inhibition opsin. This LED light source provides powerful light irradiance of >85 mW/mm^2 at fiber-optic cannula tip following all fiber-optic connections including fiber optic Rotary Joint.



Key Features

- High power density (>85 mW/mm^2) at cannula's fiber's tip following all connections
- Extremely low torque LED-compatible rotary joint suitable for even the smallest animals
- Precisely adjustable power by 10 turns potentiometer
- TTL and Analog Inputs are Opto-Isolated to eliminate ground-loops
- Analog input (0-5V) for power control
- USB control (optional)
- Instant warm up time

Optogenetics Toolbox for Free Moving Animals Experiments:

Prizmatix offers a wide range of standard and customized items comprising the Optogenetics Toolbox. The most useful items for Optogenetics experiments in free-moving animals are:

[1] Optogenetics-LED

[2] Extremely low friction Rotary-Joint

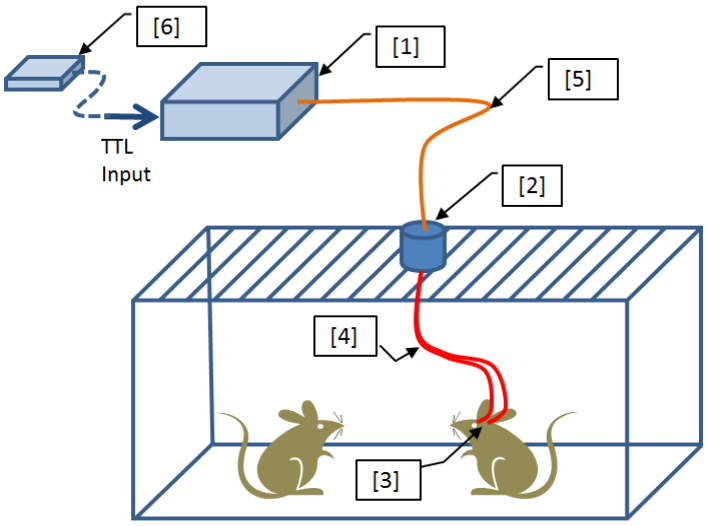
[3] Fiber Optics Cannulae

[4] Single or Dual Fiber for bilateral activation

[5] Fiber patch cord

[6] Pulser / PulserPlus pulse generator module with Windows software

For more information on items 2-6 please see Optional Accessories section below.



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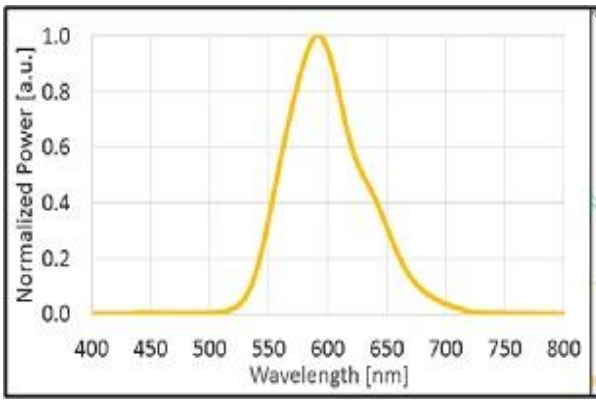
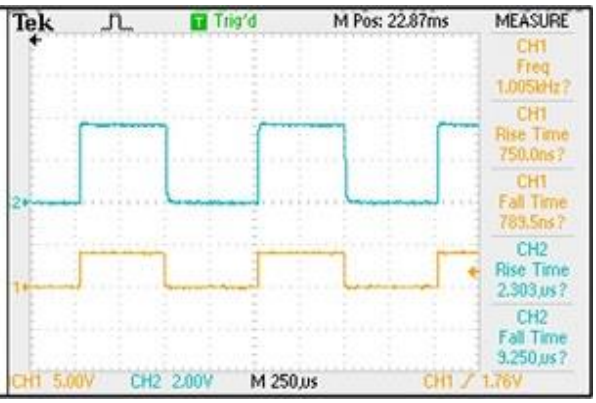
Optical Specifications:

Wavelength	nm	595
Peak Wavelength range	nm	±7
Spectrum half width	nm	~70
Optical Power from 200um NA0.66 fiber (1m)	mW	>4.7
Optical Power from 250um NA0.66 fiber (1m)	mW	>7.5
Optical Power from 500um NA0.63 fiber (1m)	mW	>27
Optical Power from 1000um NA0.63 fiber (1m)	mW	>105

Optical power and irradiance data for full Optogenetics system including Optogenetics-LED-Yellow, fiber patch cord, Rotary Joint, Dual / Single fiber and fiber optic cannula (implant):		
Optical Power from 200um cannula	mW	>2.7
Optical Power from 250um cannula	mW	>4
Optical Power from 500µm cannula	mW	>16
Irradiance from 200um cannula	mW/mm^2	>85



- Optogenetics-LED-Yellow spectrum



- Optogenetics-LED-Yellow Rise/Fall Time. Ch1 – TTL input , Ch2 Photodiode measurement

Electrical Specifications:

Connector for TTL and Analog Input		Optically isolated BNC
Digital modulation frequency	Hz	DC-30000
Rise / Fall time (10% - 90%)	µs	<3 / <10
Analog input voltage range	V	0-5
Input Voltage	V	12
Power Adaptor Input		85-264 VAC, 47-63Hz, 1.5A

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General Specifications

Operation temperature range	°C	10 - 35
Storage temperature range	°C	-10 - 55
Operating relative humidity (Non-condensing)	%	<90
Dimensions (L x W x H)	mm	197 x 174 x 80
Weight	g	750
Power adaptor dimensions (L x W x H)	mm	125 x 50 x 31.5
Power adaptor weight	g	300
Power Adaptor Safety		
Fan noise	dBA	28.4

Optional Accessories

For more details on optional accessories please see:
https://www.prizmatix.com/optogenetics/Prizmatix-in-vivo-Optogenetics-Toolbox.htm
Please refer to the in-vivo Optogenetics system diagram at 1st page:

Rotary Joint [2]:

Prizmatix's Rotary Joint has very low torque and friction, with minimal impact on behavior. Prizmatix's Rotary Joint is specially designed for Optogenetics experiments with High NA detachable fibers equipped with FC connectors. Rotary Joint can be used with single or multiple output fibers simultaneously, enabling concurrent delivery of light to separate areas of the brain without loss of power or brightness. For more details please see: https://www.prizmatix.com/optogenetics/rotary-joint.htm

Fiber Optic Cannulae [3]:

Prizmatix Implantable Fiberoptic Cannulae / Ferrules allow direct light stimulation of certain deep brain regions in living animals. Each Cannula (implant) consists of a zirconia ferrule accommodating a high NA Silica/POF fiber, protruding from the zirconia ferrule at the specified length. Prizmatix offer standard cannulae for Mice and Ret and customized products including customized fiber protruding lengths without additional customization fees. For more details please see: https://www.prizmatix.com/optogenetics/OG-Cannulae.aspx

Single or Dual Fiber for bilateral activation [4] and Fiber Patch cords [5]

Prizmatix provides diverse fiber optics solutions for Optogenetics in-vivo. Made of silica, glass or polymer, these high NA fibers can be constructed to fit any research set-up with various combinations of connectors, ferrules, core diameters and lengths. Examples include single stainless steel coverings of bare tipped fibers, or Y-shaped fibers for simultaneous stimulation of two hemispheres. For more details please see:
https://www.prizmatix.com/optogenetics/Fiberoptics-for-Optogenetics.htm

Pulser / PulserPlus pulse train generator module with Windows software [6]:

The Pulser - USB pulse train generator with user friendly software is an easy way to generate trains of pulses for Optogenetics activation directly from your computer. The Trigger-In input enables synchronization of Optogenetics activation with various experimental events. For more details please see:
https://www.prizmatix.com/optogenetics/PulserPlus.htm

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