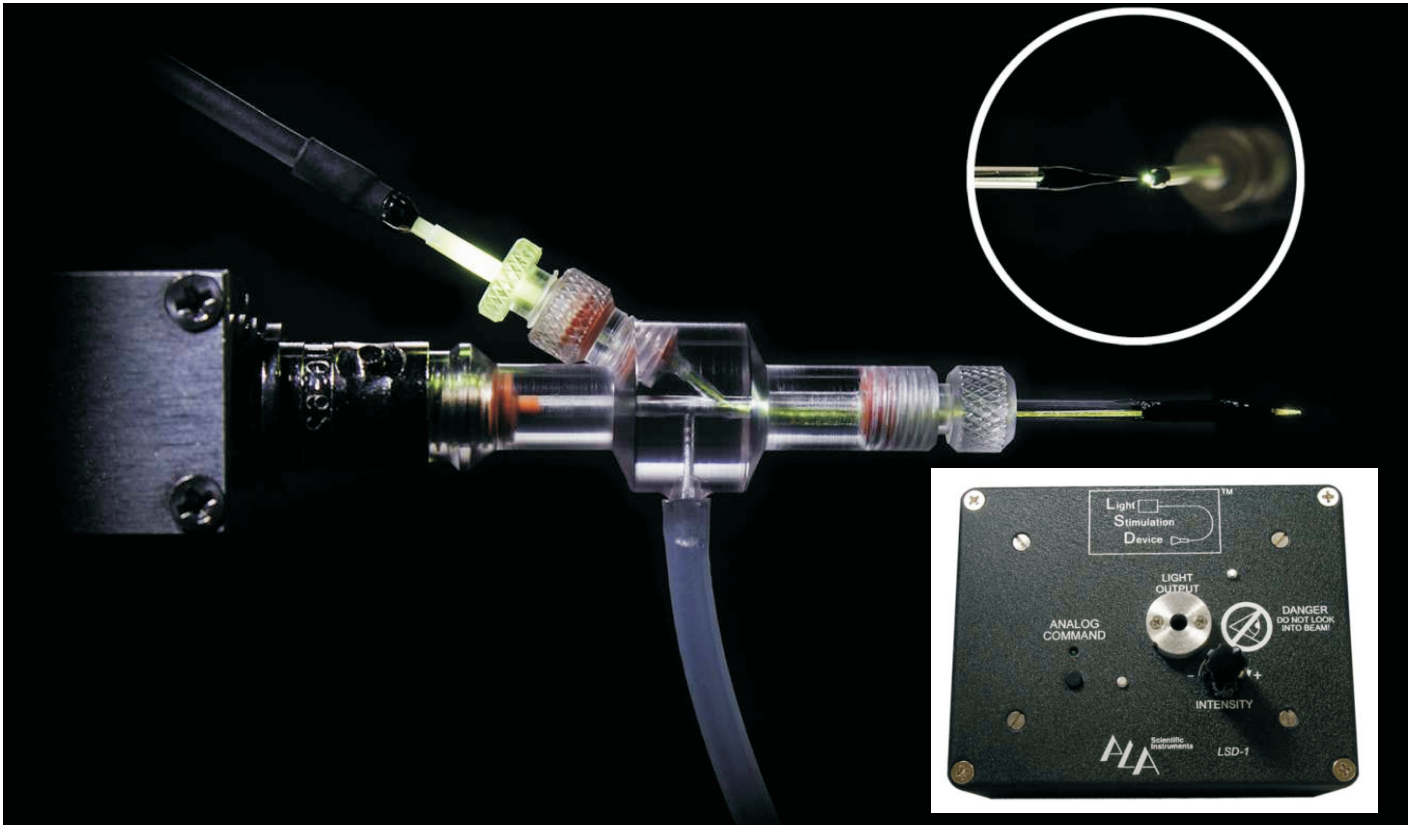


# OptoPatcher System



The Optopatcher is a new micropipette holder with integrated optical fiber to allow simultaneous patch-clamp recording and optogenetic activation. The design eliminates the need for a separate manipulator for optical stimulation. When combined with ALA's LSD Light Stimulation Device a complete economical optogenetics system is formed.

The optopatcher was developed by A-M Systems under the guidance of its inventors, I. Lampl, Y. Katz, O. Yizhar (Weizmann Institute, Israel) and J. Staiger (Göttingen University, Germany). In their paper (J. Neurosci. Methods 214:113-7, 2013) they concluded:

*"...we designed an electrode holder for simultaneous intracellular patch-clamp recording and optical stimulation, and showed examples of recorded cortical neurons in anesthetized mice. The optopatcher prevents the need for a second manipulator and for insertion of the optical fiber into the tissue. It can be also used for any other type of recordings that make use of glass capillaries, such as LFP recording and single unit recording. Without any modifications, the optopatcher can be utilized for in vitro recordings in brain slices or organotypic cultures and can be also used for discrete or concurrent photolysis of caged compounds."*

The optopatcher is available with the most common connectors used on patch clamps:

Axon's threaded collar or universal headstage connector and standard BNC used by Heka, npi and others.

It can accept just about any capillary glass diameter between 1.2 mm and 2.0 mm OD, and custom diameters can be ordered.

## References:

Katz Y, Yizhar O, Staiger J & Lampl I (2013) Optopatcher - an electrode holder for simultaneous intracellular patch-clamp recording and optical manipulation. *J Neurosci Methods* 214:113-7.

Munoz W, Trembley R & Rudy B (2014) Channelrhodopsin-assisted patching: in vivo recording of genetically and morphologically identified neurons throughout the brain. *Cell Reports* 9:2304-16.

npi electronic GmbH, Bauhofring 16  
D-71732 Tamm, Germany

Tel.: +49-7141-9730230, Fax: +49-7141-9730240  
[www.npielectronic.com](http://www.npielectronic.com), [support@npielectronic.com](mailto:support@npielectronic.com)



# LSD-1

# Optopatcher

## Light Stimulation Device

## Micropipette Holder

### LSD-1, Light Stimulation Device

Optogenetics is becoming an increasingly important research method in the neuroscience community. ALA Scientific's Light Stimulation Device (LSD-1), can be incorporated into existing electrophysiology setups where light sensitive ion channels are being studied. Optical stimulation over standard electrical stimulation techniques affords researchers the advantage of non-invasively stimulating targeted areas.

#### Key features of the LSD-1 include:

- LED intensity control via manual knob or via analog signal for computer control
- Changeable LED for different wavelength use
- Low-noise electronics for integration into electrophysiology setups
- Field illumination when light guide connected to microscope optics
- No warm-up period needed
- OptoPatcher fiber optic connection option for use with OptoPatcher electrode holder



Wavelengths (nm)	Color	*These are the wavelengths available at this time due to the LED manufacturer in a state of flux with regard to power and light output. New wavelengths will be listed as they become available.
465	Blue	
520	Green	
624	Amber	

#### Specifications

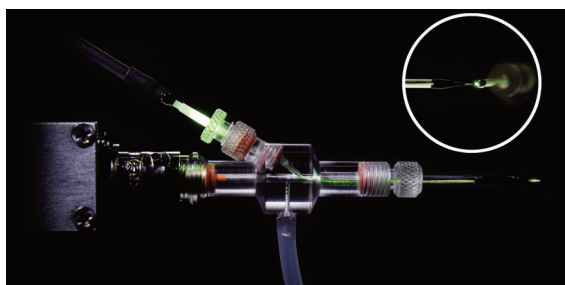
Controller Power	4.6"/11.6cm x 3.6"/90.5cm x 2.25"/57.3cm; 0.8lbs/0.36kg/ 6VDC/2A
Analog voltage input	0 – 5 VDC
Intensity control	Manual control via knob or analog input 2 to 5V via BNC

### Optopatcher, Micropipette Holder

The Optopatcher is a new micropipette holder with integrated optical fiber to allow simultaneous patch-clamp recording and optogenetic activation. The design eliminates the need for a separate manipulator for optical stimulation.

When combined with ALA's LSD-1 Light Stimulator Device a complete economical optogenetics system is formed.

The optopatcher is available with the most common connectors used on patch clamps.



#### Specifications

Controller	13.2 x 9.4 x 8.1 cm (5.20 x 3.7 x 3.2 in)/0.36 kg (0.8 Lbs.)
Power	6 VDC @ 2.5 A
Analog voltage input	0 – 5 VDC
Light Guide	300-560nm, 0.12in Core, 1.6in bend radius, 39.4in length
Intensity control	Manual control via knob or analog input 2 to 5V via BNC

#### Ordering Information

LSD-1	One channel light stimulating device using high power LED w/3mm light pipe adapter- specify wavelength when ordering,
LSD-LED-XXX	Replacement LED module for LSD-1, includes heat sink, LED, PCB and connectors. XXX is specified wavelength
LSD-LG	3mm Standard liquid light guide
LSD-LG-Opto	OptoPatch light guide without light guide ferrule and set screw holder to LSD-1
LSD-Opto-Adapt-Set	200um light guide ferrule and set screw holder to adapt LSD-1 to OptoPatcher
OPTOPATCHER-AXU	Fiber optic light guide electrode holder for Axon Universal headstages, specify glass OD
OPTOPATCHER-BNC	Fiber optic light guide electrode holder for Heka, npj and all BNC type headstages, specify glass OD

distributed by: **npi**  
Electronic Instruments  
for the Life Sciences  
*made-to-measure*

npi electronic GmbH  
Bauhofring 16  
D-71732 Tamm, Germany

Tel.: +49-7141-97302-30  
Fax: +49-7141-97302-40  
www.npielectronic.com  
support@npielelectronic.com



Web: [www.alascience.com](http://www.alascience.com)  
E-Mail: [sales@alascience.com](mailto:sales@alascience.com)