

aoLED





The **aoLED** device combines a linear, stable LED driver with a fiber-coupled LED, providing a compact and powerful all-in-one solution for optogenetic stimulation.

It delivers high-bandwidth (up to 1 MHz) and high-intensity light signals (approaching 500 mW/mm²) through a 200 μm core fiber with a 0.66 numerical aperture (NA).

Its electronic design supports high-precision analog signal modulation, enabling advanced light shaping techniques such as ramps, sinusoids, and modulated waveforms, as well as fast digital modulation for generating sharp and stable stimuli.

An embedded light power sensor provides accurate monitoring of the emitted light, allowing users to track signal stability and detect any optical output degradation over time. This complements the analog current feedback system, which monitors the current flow through the LED.

The **aoLED** is the **only device in its class** that integrates both a **light power sensor** and a **current feedback loop**, offering an unprecedented level of **control, stability, and diagnostic insight** in optogenetic stimulation.

-  **Optical Power Feedback**
 Real-time monitoring of emitted light intensity ensures consistent optical output—even during long stimulation protocols—by compensating for thermal drift, aging of components, or environmental fluctuations.
-  **Analog Current Feedback from the LED**
 Continuously tracks the actual current driving the LED, enabling precise waveform fidelity and safe operation across a wide dynamic range.


Together, these feedback mechanisms form a **redundant, high-precision regulation system**, making aoLED uniquely capable of **true optical signal reproducibility**, **real-time diagnostics**, and **stable long-term operation**. Competing systems rely on current control *alone*, missing the crucial insight provided by optical output monitoring.

Why It Matters:

Main features



Output to monitor the actual light power

 **Confidence in Results:** Trust your stimulus. No guessing, no hidden decay




Output to monitor the real current on LED

 **Accuracy:** What you program is exactly what you deliver



Colors for optogenetics applications: Blue (460nm) and Amber (590nm) and many others are available on request

 **Designed for Neuroscience & Photonics Research:** Ideal for sensitive, high-resolution optogenetic experiments.



0-5V/TTL

Plug and play without any parameter setting: 0-5V analog or TTL 5V compatible MCX input



Optimized passive thermal design for high stability for short and long period alike



Very low electromagnetic emissions (EMC) to minimize noise in experimental environments

aoLED SPECIFICATIONS	
Max LED current	<i>Up to 8A</i>
Feedback control	<i>Current flow trough the LED + Light output power</i>
Bandwidth	<i>1 MHz max</i>
INPUT signals	<i>0-5V analog or TTL compatible</i>
Fibre cable OUT	<i>FC connector</i>
Fiber dimension and NA	<i>Borosilicate fiber, 0.66NA, 200µm core, 230µm cladding</i>
Power supply	<i>24V – 1.5A max</i>
Wavelengths available	<i>459nm (Blue), 617 (Amber), others on request</i>
Operating temperature	<i>0-40 °C</i>
Dimensions	<i>Diameter 67 mm, height 35 mm</i>
Weight	<i>Approx. 150 g</i>

RELATED PRODUCTS	
0FOP0040001	<i>aoLED controller USB PD</i>

STANDARS MODELS	
0FOP0030001	<i>aoLED Blue Fiber 459nm</i>
0FOP0020001	<i>aoLED Blue Vitro 459nm</i>