

fixed-wavelength mid-IR

ARIES™ HIGH-POWER LASERS



Introducing high-power mid-IR performance that is truly continuous wave from an air-cooled, single stage laser.

PERFORMANCE SPECIFICATION

Operation Mode	Pulsed or cw
Center Wavelength	4.0, 4.6, 8.5, 10.2 μm
Spectral Content	$< 120 \text{ cm}^{-1}$
Divergence	$< 10 \text{ mrad}$ (horizontal) $< 2 \text{ mrad}$ (vertical)
Spot Size	3 x 2 mm at 25 cm from output (h x v)
Pointing Stability (1 hr)	50 μrad
Polarization	Vertical, 100:1
Modulation Rate	10-2,000 kHz
Modulation Depth	Contact factory

PULSED SPECS

Max Peak Power	0.5, 1, or 2 W depending on model
Max Average Power	25, 50, 100 mW depending on model
Repetition Rate	0.1-100 kHz
Pulsewidths	40-500 ns (20 ns increments)
Max Duty Cycle	5%
Pulse-to-pulse Stability	$< 5\%$
Power Stability (1 hr)	$< 2\%$ rms, 4% p-p

CW SPECIFICATIONS

Max Power	0.5, 1, or 2 W depending on model
Power Stability (1 hr)	$< 2\%$ rms, 4% p-p

OPERATIONAL SPECIFICATIONS

Cooling	Forced air or water
Head Dimensions	5.5 x 8.375 x 3.875 inches
Beam Height	1.5 inches
Controller Dimensions	10.5 x 8.5 x 4.0 inches
Operating Temperature	15-35 $^{\circ}\text{C}$
Power Requirements	100-240 VAC, 50-60 Hz, 1 ϕ
Control Protocols	Front-panel, RS-232, GPIB, USB 2.0

All specifications subject to change without notice.

The Aries™ high-power fixed-wavelength laser is a radical departure from other high-power quantum cascade lasers on the market. It offers up to two full Watts of true continuous wave power in the mid-infrared for the laboratory. The Aries™ will generate 2 W hour after hour without cool-down time-outs. Designed for high-power fiber testing, scene generation, and free-space communications applications, this robust system allows for both cw and pulsed operation in the same platform.

A dedicated 1001-FLC controller with simplified electronics makes operation easy and straight-forward. Simply turn on and ramp the current to the desired output level. Control functionality is also available through all standard interface buses RS-232, GPIB, and USB 2.0 for integration of the Aries™ into automated stations.

The first product series, the AFL-046, provides up to 2 W at a wavelength of 4.63 μm (2,150 cm^{-1}). It provides broad bandwidth output ($\sim 120 \text{ cm}^{-1}$). High-power at other wavelengths will soon be available. Please contact the factory for your high-power needs.

Key to the design of high-power quantum cascade lasers is thermal management. Finite Element Analysis was used to model the heat dissipation and judicious placement of TECs, innovative choice of materials, and the use of high-efficiency fins and fans were all employed when delivering this compact, air-cooled 2 W device that operates in a true continuous wave mode. The Aries™ has the ability to operate continuously in laboratory environments up to 35 $^{\circ}\text{C}$ with only air-cooling. Dual high-volume, low-noise fans remove excess heat from the chassis. The system also has the ability to operate with water cooling (chiller sold separately) up to 45 $^{\circ}\text{C}$.

Now you can move from worrying about your laser to worrying about your experiment. The engineering team from Daylight Solutions® has its roots in external cavity development and our expertise has only grown from scientific products, to commercial telecom grade devices, to the mid-infrared, to military hardened sub-systems, to you. The Aries™ high-powered fixed-wavelength lasers are ready for your demanding application.

Aries™

- Fixed-wavelength
- High-power
- Air-cooled
- cw or pulsed operation
- No "cool-down" times

Daylight Solutions®, The Source for all Applications in the Mid-IR

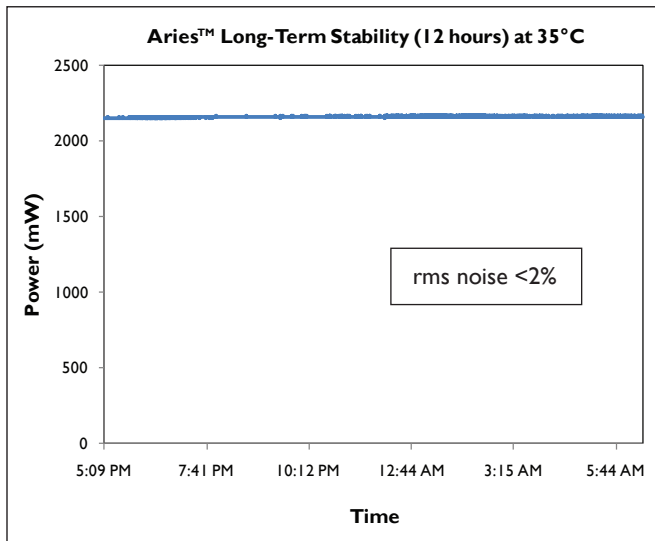
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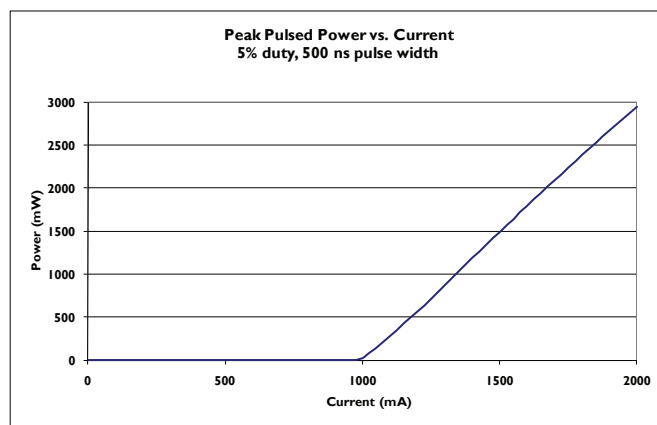
Reference Performance ARIES™ HIGH-POWER LASERS



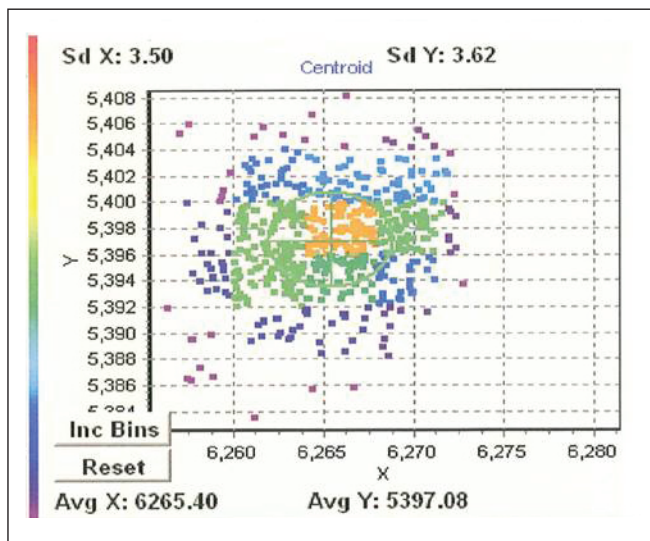
Long-term stability of the Aries™. Air-cooled for over 12 hours at 35 °C of true cw operation with no “cool-down” periods.



Aries™ Laser Heads



P-I curve for Aries™ laser.



Pointing stability of Aries™ laser. Maximum value is less than 25 μrad full-angle.



Simple, Robust
Fixed-wavelength
Controller



**DANGER: CLASS IV
LASER. AVOID EYE
OR SKIN EXPOSURE
TO DIRECT OR
SCATTERED RADIATION**

