

**SINGLE-FREQUENCY LASER** *for enterprise*

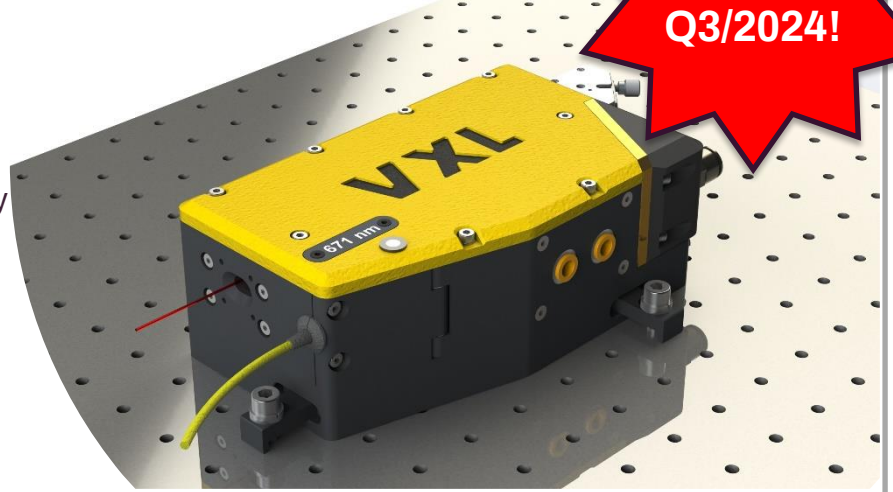


**Key benefits**

- ▶ High-output power
- ▶ Broad-wavelength coverage
- ▶ Narrow-linewidth single frequency
- ▶ Excellent beam quality

**For system integration**

- ▶ Compact modular design
- ▶ Rugged sealed laser cavity
- ▶ Unparalleled SWaP-C for watt-level output
- ▶ Improved system performance
- ▶ High fiber coupling efficiency



*Vertical-external-cavity surface-emitting laser (VECSEL)  
a.k.a. Optically pumped semiconductor laser (OPSL)*

|   | <b>VXL™ SF</b>  | <b>VXL™ SHG</b>   |
|---|---|---|
| Architecture                            | Direct emitting VECSEL                                  | Intracavity doubled VECSEL                                |
| Gain                                    | Optically-pumped semiconductor                          |   |
| Wavelength <sup>1</sup>                 | 700 – 2150 nm   | 350 – 750 nm  |
| Power <sup>2</sup>                      | 0.5 – 12 W  | 0.1 – 5 W   |
| Additional output <sup>3</sup>          | -   | Secondary fundamental output for frequency-/phase locking |
| Beam quality                            | $M^2 < 1.1 \text{ TEM}_{00}$                            | $M^2 < 1.2 \text{ TEM}_{00}$                              |
| Free-running linewidth                  | < 10 kHz (100 μs)                                       |   |
| Mode-hop free tuning range <sup>4</sup> | > 1 GHz   |   |
| Coarse tuning                           | +/- 1 THz   |   |
| Frequency locking                       | Piezo actuator, 10 kHz bandwidth                        |   |
| Phase locking                           | Intra-cavity electro-optical modulator, 1 MHz bandwidth |   |
| Laser size                              | <b>176 mm x 102 mm x 65 mm (1.2 L)</b>                  |   |
| Control electronics <sup>5</sup>        | Improved control electronics for CW operation           |   |
| Cooling <sup>5</sup>                    | <b>Air-cooling or water-cooling</b>                     |   |

<sup>1</sup> Center wavelength can be selected within the provided wavelength range.

<sup>2</sup> Output power is wavelength and cooling dependent. See next page for example power levels with water cooling.

<sup>3</sup> Both outputs can be fiber coupled to polarization maintaining single-mode fiber with high (>75%) coupling efficiency.

<sup>4</sup> Mode-hop free tuning range corresponds to the laser cavity free-spectral range.

<sup>5</sup> The control unit and chiller are 19" rack installable.

## Compact single-frequency laser for system integration



### Next generation VECSEL platform

- ▶ Designed for system integration and for 24/7 operation
- ▶ Reduced system size, weight, power consumption and cost (SWaP-C)
- ▶ Modular design for easy and fast servicing with spares
- ▶ Fiber-in & fiber-out geometry with remote control for fieldable applications

### Selected output powers

