Koheras BOOSTIK

High Power Low Noise Single-frequency Fiber Laser

- Up to 15W output power at 1 or 1.5 µm
- Single frequency, narrow linewidth
- Ultra low frequency and intensity noise
- Wide wavelength tuning & KHz modulation
- Excellent beam quality ideal for frequency conversion
- Optically isolated
- Robust, maintenance free fiber laser

Applications
- Optical length and frequency standards
- Quantum optics / computing & phenomena (optical trapping, optical lattice, Bose-Einstein condensate (BEC), atom interferometer, squeezing)
- Nonlinear optics pump source (SHG, DFG, OPO)
- Laser-based metrology (precision laser interferometry, spectroscopy)
- Optical heterodyning and coherent communication
- Coherent beam combining

The Koheras BOOSTIK is a maintenance-free single frequency fiber laser with a unique combination of narrow linewidth, excellent beam quality and high output power. The turn-key 19” rack system includes control electronics and power supply, and is ideal for laboratory work and experimental research e.g. in metrology.

<table>
<thead>
<tr>
<th>Model</th>
<th>Standard Wavelength</th>
<th>Other wavelengths</th>
<th>Output power</th>
<th>PM</th>
<th>Fast modulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>E15</td>
<td>1550.12 nm</td>
<td>1550 - 1570 nm</td>
<td>2, 5 or 10 W</td>
<td>Yes*</td>
<td>Yes</td>
</tr>
<tr>
<td>Y10</td>
<td>1064.00 nm</td>
<td>1050 - 1090 nm</td>
<td>2, 5, 10 or 15 W</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*) Available with non-PM output for 2W.

Full wavelength freedom

You can choose the operating wavelength of the BOOSTIK system freely in the 1 or 1.5 µm range, and the excellent beam quality enables efficient frequency conversion (see figure below for examples).
Features/Options:

- PM output: Fixed state of polarisation (linear) of the laser output
- Unlimited center wavelength selection in the ranges 1050-1090 nm & 1540-1570 nm
- Up to 1000 pm coarse wavelength tuning and KHz frequency modulation for frequency locking
- Optionally from 2 to 16 outputs for 1550 nm range

Reliability

The Koheras range of single frequency fiber lasers is based on telecom-grade fiber components and built to last thousands of hours with no service or maintenance.

With several thousand lasers installed in environments varying from fully climate controlled national standards laboratories to the demanding environment on oil rigs and submarines, the Koheras line is the most robust single-frequency laser range on the market with an unmatched reliability track record.

Features

Ultra low noise

The BOOSTIK offers both ultra low phase noise and low RIN. The plots below show typical RIN and phase noise levels.

Fast wavelength modulation

The BOOSTIK system is supplied with easy and user friendly fast wavelength modulation. This feature is typically used to lock the laser to an external stable reference to obtain an even higher wavelength stability than provided by the free running laser.

Thermal tuning

All Koheras fiber lasers are equipped with thermo electrical temperature controllers (TECs). The TECs not only stabilize the operation of the laser desensitizing it to environmental temperature fluctuations, but also make it possible to achieve considerable tuning of the center wavelength by changing the operating temperature of the laser. At standard room temperature (around 20-30°C or 68-86°F) the laser can be thermally tuned to an industry leading 1000 pm.
Service packages
- Koheras CARE service and warranty extension

Koheras ACOUSTIK
Need several wavelengths in one system? The ACOUSTIK integration rack can hold up to 16 channels. The ACOUSTIK provides power and control to all modules for easy integration and channels can be added or changed as needed.

Specifications

Optical

<table>
<thead>
<tr>
<th></th>
<th>E15</th>
<th>Y10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Center wavelength [nm]</td>
<td>1550-1570, optionally other</td>
<td>1050-1090, optionally lower</td>
</tr>
<tr>
<td>Laser emission</td>
<td>CW - inherently single frequency</td>
<td>CW - inherently single frequency</td>
</tr>
<tr>
<td>Beam quality (2W output)</td>
<td>M² &lt; 1.1</td>
<td>M² &lt; 1.1</td>
</tr>
<tr>
<td>Beam quality (≥5W output)</td>
<td>M² &lt; 1.3</td>
<td></td>
</tr>
<tr>
<td>Output power [W]</td>
<td>2.5 or 10</td>
<td>2, 5, 10 or 15</td>
</tr>
<tr>
<td>Output power regulation [%]</td>
<td>30-100</td>
<td>30-100</td>
</tr>
<tr>
<td>Linewidth [kHz]</td>
<td>&lt; 1</td>
<td>&lt; 20, optionally lower</td>
</tr>
<tr>
<td>Linewidth ([centisecond] [kHz]</td>
<td>&lt; 0.1</td>
<td></td>
</tr>
<tr>
<td>Phase-noise [μrad/√Hz] 1m opt. path</td>
<td>&lt;2@100Hz, 0.8@1kHz, 0.4@10kHz</td>
<td>NA</td>
</tr>
<tr>
<td>RIN peak [MHz]</td>
<td>app. 0.7</td>
<td>app. 1.5</td>
</tr>
<tr>
<td>RIN level [dBc/√Hz]</td>
<td>&lt; -100 @ peak/&lt; -135 @ 10MHz</td>
<td>&lt; -105 @ peak/&lt; -140 @ 10MHz</td>
</tr>
<tr>
<td>Long term stability [RMS, 1h@25°C [%]]</td>
<td>+/- 2 %</td>
<td>+/- 2 %</td>
</tr>
<tr>
<td>Optical S/N [dB] (50 pm res)</td>
<td>&gt; 50 (depending on wavelength)</td>
<td>&gt; 50 (depending on wavelength)</td>
</tr>
<tr>
<td>Polarization</td>
<td>Linear (PM)</td>
<td>Linear (PM)</td>
</tr>
<tr>
<td>Min. thermal wavelength tuning range [pm]</td>
<td>+/- 350</td>
<td>+/- 240</td>
</tr>
<tr>
<td>Total thermal wavelength tuning range [pm]</td>
<td>1000</td>
<td>700</td>
</tr>
<tr>
<td>Fast wavelength modulation range [GHz]</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Fast wavelength modulation [kHz]</td>
<td>Up to 20</td>
<td>Up to 20</td>
</tr>
<tr>
<td>Optical monitor output (from seed)</td>
<td>FC/APC</td>
<td>FC/APC</td>
</tr>
<tr>
<td>Output fiber termination (2W output)</td>
<td>FC/APC</td>
<td>FC/APC &amp; Collimator</td>
</tr>
<tr>
<td>Output fiber termination (≥5W output)</td>
<td>Collimator</td>
<td>Collimator</td>
</tr>
<tr>
<td>Typical beam diameter @ 1/e²</td>
<td>2W: FC/APC</td>
<td>2W: FC/APC / &lt; 2.2 mm</td>
</tr>
<tr>
<td></td>
<td>5, 10W: ~5mm</td>
<td>5, 10, 15W: &lt; 1 mm</td>
</tr>
<tr>
<td>Output isolation [dB]</td>
<td>&gt; 35</td>
<td>&gt; 30</td>
</tr>
</tbody>
</table>

1. The center wavelength is selectable within the specified range. For options outside range please ask.
2. Depends on the center wavelength.
3. Range can be larger depending on center wavelength and output power.
4. Shot-noise limited > 5 MHz.
5. After warm up (10-20 min).
**Koheras CARE**

**Service and warranty extensions**
The Koheras Care warranty and service package ensures trouble-free operation of your Koheras laser.
The Standard Package gives you a two-year warranty extension plus remote diagnostics of key laser parameters through an internet connection to the system. Our Premium Package adds a guarantee that we always stock a laser with your specifications - ready to ship should you need it.

**Standard package**
- Extension of warranty period to 2 years
- Remote diagnostics
- Preventive laser health checks

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**Specifications**

**Mechanical / Electrical**

**Seeder**
- **Power supply requirements [VAC]** 100-240, 50-60 Hz
- **Digital interface** USB 2.0, Ethernet 10/100
- **Frequency modulation** DB9 (male), differential 2x5 V
- **Fiber output type** FC/APC
- **Fiber pigtail length [m]** App. 1
- **Monitor output** Yes (FC/APC bulkhead)
- **Dimensions (HxWxD) [mm]** 49x447x386 (19” 1U)
- **Weight [kg]** App. 6

**Amplifier**
- **Power supply requirements [VDC]** 90-240 VAC; 50-60Hz
- **Fiber pigtail length [m]** > 1
- **Connectors** FC/APC or collimated
- **Dimensions (HxWxD) [mm]** 132x448x451 (19” 3U)
- **Operating temperature range [°C]** 15 - 35
- **Storage temperature range [°C]** 0 - 50
- **Weight [kg]** < 13

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All Koheras products are produced under our quality management system certified in accordance with the ISO 9001:2008 standard.