MDL 300
Modulated Diode Laser

- Linear modulation, any waveform
- Internal sine wave generator for 6 predefined frequencies
- Modulation frequencies up to 1.8 GHz (external source required)
- Adjustable modulation depth
- External Bias control / LF modulation
- Wavelengths from 375 to 1550 nm
- Power levels from 10 to 70 mW peak / 5 to 35 mW average

Applications

- Phase fluorometry
- Diffuse optical imaging
- Testing and analysis of optoelectronic components
- Fiber optic communications

The MDL 300 modulated diode laser driver provides modulation frequencies up to 1.8 GHz and generates sinusoidal waveforms for 6 predefined frequencies. It is an ideal ultrafast excitation source for phase modulation fluorescence lifetime measurements in a compact set-up. The MDL 300 consists of a driver/controller and interchangeable laser heads for GHz applications. In addition, pulse mode is possible by overdriving the modulation level.

The MDL 300 features easy to use controls for modulation frequency and laser power level. Predefined modulation frequencies of 250, 100, 25, 5, 1 and 0.25 MHz are derived from the internal crystal oscillator. Alternatively, the laser intensity can be modulated by either an external RF or DC/LF signal. The maximum frequency is dependent on the laser wavelength (see table below). A sync output allows the modulation signal to be monitored externally.

Laser heads with wavelengths from 375 to 1550 nm are available and wavelengths can be changed quickly by simply plugging in a different laser head. The laser heads can emit light pulses with peak powers up to 50 mW with nearly 100 % modulation. These laser heads come with collimator optics and can be fitted to single- or multi-mode optical fibers.
### Available Laser Heads

<table>
<thead>
<tr>
<th>Type</th>
<th>Wavelength (±10 nm)</th>
<th>Average power (mW)</th>
<th>f max at -3 dB (MHz)</th>
<th>f max at -10 dB (MHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDH-M-C-375</td>
<td>375</td>
<td>5</td>
<td>900</td>
<td>1400</td>
</tr>
<tr>
<td>LDH-M-C-405</td>
<td>405</td>
<td>20*</td>
<td>900</td>
<td>1500</td>
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<td>LDH-M-C-440</td>
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<td>20</td>
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<td>LDH-M-C-470</td>
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<td>7.5</td>
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<td>1500</td>
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<tr>
<td>LDH-M-C-485</td>
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<td>4</td>
<td>800</td>
<td>1100</td>
</tr>
<tr>
<td>LDH-M-C-635</td>
<td>640</td>
<td>8</td>
<td>600</td>
<td>1200</td>
</tr>
<tr>
<td>LDH-M-C-650</td>
<td>660</td>
<td>7</td>
<td>600</td>
<td>1000</td>
</tr>
<tr>
<td>LDH-M-C-650B</td>
<td>660</td>
<td>20*</td>
<td>900</td>
<td>1300</td>
</tr>
<tr>
<td>LDH-M-C-670</td>
<td>670</td>
<td>8</td>
<td>800</td>
<td>1600</td>
</tr>
<tr>
<td>LDH-M-C-780</td>
<td>780</td>
<td>30</td>
<td>700</td>
<td>1200</td>
</tr>
<tr>
<td>LDH-M-C-805</td>
<td>808</td>
<td>30</td>
<td>700</td>
<td>1400</td>
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<tr>
<td>LDH-M-C-830+</td>
<td>830</td>
<td>15</td>
<td>700</td>
<td>1300</td>
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<tr>
<td>LDH-M-C-840</td>
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<td>35</td>
<td>650</td>
<td>1100</td>
</tr>
<tr>
<td>LDH-M-C-850</td>
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<td>1800</td>
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<tr>
<td>LDH-M-C-905</td>
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<td>35</td>
<td>600</td>
<td>1000</td>
</tr>
<tr>
<td>LDH-M-C-930</td>
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<td>30</td>
<td>800</td>
<td>1400</td>
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<tr>
<td>LDH-M-C-980</td>
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<td>600</td>
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<tr>
<td>LDH-M-C-1060</td>
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<tr>
<td>LDH-M-C-1310</td>
<td>1310</td>
<td>10</td>
<td>800</td>
<td>1400</td>
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<tr>
<td>LDH-M-C-1550</td>
<td>1550</td>
<td></td>
<td>on request</td>
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</tbody>
</table>

Other wavelengths and optical power levels are available on demand. Please ask PicoQuant for more information.

Typical output power fluctuations 3 %

* Output power fluctuations 10 %

‡ Transversal multi-mode structure, reduced coupling efficiency into single-mode fibers.

All measurements may be subject to a 10 % calibration error.

All laser heads include peltier cooling and collimation optics. Optionally for most wavelengths single- and multi-mode optical fibers can be fitted through appropriate fiber couplers.
## Specifications

<table>
<thead>
<tr>
<th>Internal oscillator</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Modulation frequencies</td>
<td>250, 100, 25, 5, 1 and 0.25 MHz</td>
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<tr>
<td>Waveform</td>
<td>sinusoidal</td>
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<table>
<thead>
<tr>
<th>RF modulation input</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Amplitude</td>
<td>50 mV&lt;sub&gt;rms&lt;/sub&gt; typ., 2 V&lt;sub&gt;rms&lt;/sub&gt; max.</td>
</tr>
<tr>
<td>Impedance</td>
<td>50 Ohms (100 kHz to 2 GHz), 200 Ohms (static)</td>
</tr>
<tr>
<td>Frequency range</td>
<td>100 kHz up to 2 GHz</td>
</tr>
<tr>
<td>Connector</td>
<td>SMA female</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>DC/LF modulation input</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Amplitude</td>
<td>0 to +5 V&lt;sub&gt;rms&lt;/sub&gt; max.</td>
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<tr>
<td>Impedance</td>
<td>10 kOhms pull up</td>
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<tr>
<td>Frequency range</td>
<td>DC to 1 kHz</td>
</tr>
<tr>
<td>Connector</td>
<td>SMA female</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sync output</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Amplitude</td>
<td>0.3 V&lt;sub&gt;rms&lt;/sub&gt; max.</td>
</tr>
<tr>
<td>Impedance</td>
<td>50 Ohms</td>
</tr>
<tr>
<td>Connector</td>
<td>SMA female</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Power supply</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Line voltage</td>
<td>220/240 or 110/120 VAC, 50/60 Hz</td>
</tr>
<tr>
<td>Power consumption</td>
<td>45 Watts max.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Dimensions</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver unit</td>
<td>237 × 310 × 97 mm (w × d × h)</td>
</tr>
</tbody>
</table>