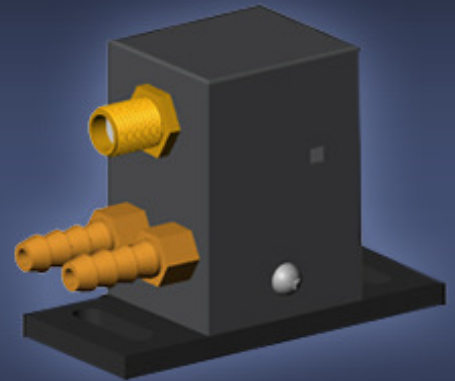
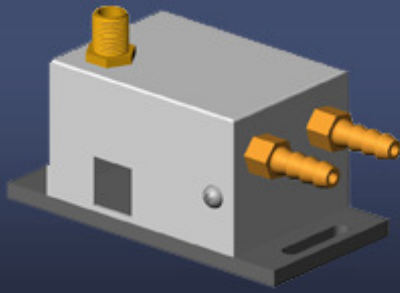


## Free Space Acousto-Optic Mode Lockers



### KEY FEATURES

- Good Modulation Depth
- Small Size
- UV/VIS Optical Range
- Suitable for High-Powered Lasers
- Good Operating Stability of the Laser
- Lower Noise Performance
- High Modulation Bandwidth
- Analog Light Intensity Modulation
- Air, Water or Thermoelectrically Cooled
- Laboratory Version
- Custom Configurations Available

### APPLICATIONS

- Photonic Sampling
- Femtosecond Laser Micromachining
- Corneal Surgery
- Nonlinear Optics
  - Optical parametric oscillators
- Optical Data Storage
- OEM Designs

### Free Space Acousto-Optic Mode Lockers



The Brimrose Free Space Acousto-Optic (AO) Standing Wave Mode Lockers, with corresponding RF Variable Frequency drivers, are designed so the frequency matches the customer's laser resonant cavity longitudinal mode frequencies. It is necessary to adjust the resonant laser cavity mode spacing frequency to be equal to twice the original acoustic wave frequency to achieve mode locking.

The mode-locking technique is actually a phaselocking process, connecting the various longitudinal modes by fixing the relative phase differences among them.

The Brimrose Mode Locker (ML) Driver system consists of two pieces of hardware: the ML Driver Unit containing the RF Amplifier, and the AO Device. The ML Driver is an RF generator utilizing a micro-controller-based, phase-locked loop (PLL) synthesizer. The frequency can be varied within the RF bandwidth of the AO Mode Lockers.



**Brimrose Corporation of America**



## Free Space Acousto-Optic Mode Lockers Specification

Model #	FSML-40-20-BR-800	FSML-80-20-BR1064	FSML-125-30-BR800	FSML-125-30-BR1064
<b>Substrate</b>	Fused Silica			Fused Silica (Uncoated)
<b>Laser Wavelength</b>	Brewster Cut optimized for horizontal polarization at:			
	800 nm	1064 nm	800 nm	1064 nm
<b>Active Aperture</b>	Up to 5 x 5 mm			
<b>Carrier Frequency</b>	40 MHz	80 MHz	125 MHz	125 MHz
<b>Modulation Rate</b>	80 MHz	160 MHz	250 MHz	250 MHz
<b>3dB Bandwidth</b>	± 50	± 10	± 15	±15
<b>Optical Transmission</b>	99.7%			
<b>Resonant Modulation Depth</b>	70%	60%	50%	30%
<b>Acoustic Velocity</b>	5.96E+3 m/sec			
<b>Wave Front Distortion</b>	$\lambda/10$			
<b>Input Impedance</b>	50 ohms			
<b>Maximum Electric Input Power *</b>	5 – 7 Watts			
<b>V.S.W.R.</b>	N/A			
<b>Case Type</b>	Water cooled			

\* The exact amount of RF power will be defined during final testing of fabricated device.

Wavelength range is from 600 to 1550 nm or Broadband AR Coating and RF Frequency Ranges are available upon request.

For more information, please check the Brimrose website or contact us at [office@brimrose.com](mailto:office@brimrose.com).



## Variable Frequency Driver Specification

The VFE-XX-YY-DSP1kHz-B2-F7-X is a variable frequency driver operating from 40 MHz to 60 MHz. The frequency adjustment is done via front panel switches with a 1 KHz step size. The output RF power is ~7 Watts optimized for maximum performance of the AO device. A TTL-compatible modulation input is provided to turn "off" the mode-locking function. Also, using the "return voltage read-out" output can identify the resonant or non-resonant frequencies. At resonant frequency, most of the RF energy entering the crystal is absorbed and the minimal back reflection is monitored using this port.

Driver Model #	VFE-XX-YY-DSP1kHz-B2-F7-X
<b>Frequency Range</b>	XX MHz (compatible with the AO device)
<b>Frequency Resolution</b>	1 - 2 KHz
<b>Harmonic Content</b>	≤ - 20 dBc
<b>Frequency Stability</b>	15 minute warm-up, temperature stabilized, Crystal Oscillator referenced
<b>Output Power (Watt)</b>	Power is optimized for peak efficiency with supplied A-O device.
<b>Output Protection</b>	Power amplifiers used will tolerate an infinite V.S.W.R. without damage. Rated power is available only when a proper RF load is connected.
<b>Rise/Fall Time</b>	To match AO Frequency Shifter requirements
<b>Modulation Input</b>	To match AO Frequency Shifter requirements
<b>Modulation Input</b>	Analog amplitude modulation 50 Ω; 0-1 V or TTL-compatible 330 Ω; 0-5 V
<b>Operating Power</b>	90-240 VAC, 50-60 Hz, 55 Watts max.
<b>Enclosure</b>	The unit will be packaged in a 190 mm (7.5 inch) wide by 100 mm (4 inch) high by 220 mm (8.75 inch) deep instrument case. The rear panel heat sink increases the depth to a maximum of 270 mm (10.5 inches). The size is exclusive of connectors.
<b>Environmental</b>	Nominal Laboratory Conditions: The maximum temperature is +35° C. The unit is not sealed against moisture or condensing humidity.

In addition to the standard product shown, customer configurations are available for specialized applications.

For questions, please contact Brimrose at [office@brimrose.com](mailto:office@brimrose.com).

