

AOモードロッカー セレクションガイド

Intra-Cavity AO Modulators Mode Lockers

The Gooch & Housego's Acousto-Optic standing wave Mode Lockers can obtain near theoretical mode locked laser pulse widths. The exceptional performance is due to the design and manufacture of the high Q acoustic resonator with very low spurious modes. The Mode Lockers can be used for the Nd:YAG, Nd:YLF, Ti:Sapphire and Argon Ion lasers.

Gooch & Housego's Acousto-Optic Mode Lockers are manufactured from high quality fused quartz with durable hard AR coatings. Brewster window models and other materials are available. The design permits the most efficient coupling of RF energy into acoustic energy.

A laser is mode locked when the longitudinal cavity modes of the laser are forced to maintain a fixed phase relationship with each other. This occurs by modulating the cavity losses at a frequency equal to the frequency difference between adjacent longitudinal modes. These modes are separated by a frequency f :





$$f = C/2L$$

C-Speed of Light
L-Cavity Length

The Mode Locker, when driven, sets up acoustic standing waves which modulates the cavity losses corresponding to a frequency of $C/2L$, (twice the acoustic drive frequency), the Mode Locker acts as a shutter that opens and closes during each round trip transit time of the laser light.

The Gooch & Housego's Mode Locker driver utilizes a crystal oscillator with extremely low phase noise as the driving source. The Mode Locker driver temperature tunes the Mode Locker Crystal to the frequency of the crystal oscillator automatically, or if desired the manual temperature tuning control mode can be selected. A front panel meter provides relative forward and reflected RF power reading, with a minimum reflected power indicating that the crystal is at resonance. All Gooch & Housego's Mode Locker and driver are designed to the frequency that matches the customers laser cavity length. It is necessary to adjust the laser cavity mode spacing frequency (length) to be equal to twice the acoustic frequency to achieve mode locking.





Gooch & Housego supply all Mode Lockers and Driver Systems custom designed.

Spectral Range (nm)	Mode Locker Specification page, by Model Number	Image	Loss Modulation % @ watts	Active Aperture (mm)	Center Frequency (MHz)	Mode spacing (KHz)	Optical Power Density /cm ² Ave/ Pk	Interaction Material
514 or 1060	76 MHz Resonate Cavity: 12038-3-TE		15 @ 1.2	3	38	300	50KW/50MW	SiO ₂
514 or 1060	12038-3-BR-TE		10 @ 1.2	3	38	364	500MW/2GW	SiO ₂
514 or 1060	82 MHz Resonate Cavity: 12041-3-TE		15 @ 1.2	3	41	300	50KW/50MW	SiO ₂
514 or 1060	12041-3-BR-TE		10 @ 1.2	3	41	364	500MW/2GW	SiO ₂



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514 or 1060	100 MHz Resonate 12050-3-TE		10 @ 1.2	3	50	300	50KW/50MW	SiO2
514 or 1060	12050-3-BR-TE		6.5 @ 1.2	3	50	364	500MW/2GW	SiO2
514 or 1060	160 MHz Resonate 12080-3-TE		10 @ 1.2	3	80	300	50KW/50MW	SiO2
514 or 1060	12080-3-BR-TE		6.5 @ 1.2	3	80	364	500MW/2GW	SiO2

Notes:

1. Brewster Window Device

Custom and OEM AO Devices and Drivers are available and Gooch & Housego will work with you to meet your needs.

Use the "Request Information Form" on the pull down menu on the main web page to submit your requirements for AO Devices and Drivers.