



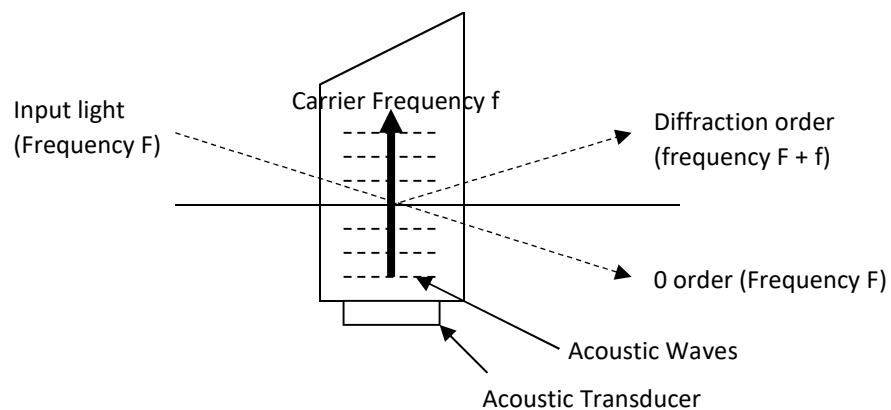
FIBER COUPLED AOM USER MANUAL

FIBER-Q®

APPLICATION NOTE

This short document provides some basic information on using and the G&H Fiber-Q®. Should you need further details please contact us and we will be happy to help.

Basic Principle:

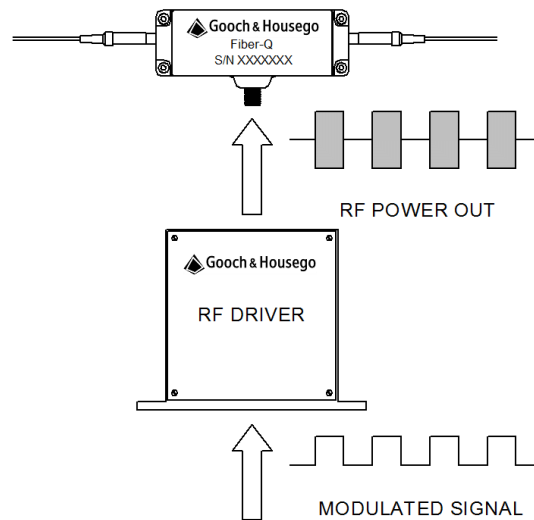


A radio frequency (RF) signal applied to the piezoelectric transducer generates a travelling acoustic wave in the bulk material. This acoustic wave produces a refractive index 'grating'. Incident light is diffracted from this grating.

The amplitude (intensity) of this diffracted light may be controlled by adjusting the applied RF power.

The acousto-optic interaction also generates an inherent frequency shift (Doppler Effect), such that the diffracted light has frequency = incident light + RF drive frequency as indicated in the diagram.

Operation Scheme:



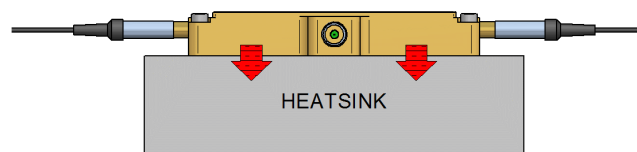
To use a fiber coupled acousto-optic modulator (AOM), connect the two fiber ports (reciprocal) into the light path, then connect the driver to the AOM SMA connector using a suitable RF cable.

Adjust the RF power level to optimise throughput (minimise insertion loss), taking great care not to exceed the maximum recommended RF power (as indicated in the specifications).

The diffracted light may be modulated via the analogue or digital modulation input on the RF driver.

Heat Sinking Fiber Coupled AOM

The stability of our fiber coupled AOM depends on efficient internal heat conduction. For long term use we recommend heat sinking the base of Fiber-Q® package housing as described in the figure below.



In order to aid thermal conduction, it is necessary that thermal contact is ensured at the contact surface between Fiber-Q® housing and the heat sink. To achieve this please;

- Use a thermally conductive interface layer; such as paste tape, or other interface materials (there are an extensive range of commercially available products).
- Bolt down the device to the heat sink through the four fixing holes on the package. M2 x 10 socket head cap screws are recommended for fixing the hermetic Fiber-Q®, recommended torque for fixing to a steel surface is 0.1 Nm.

During operation, it is inevitable, that over time the temperature of the heat sink may rise excessively if passive convection from the heat sink to its environment does not efficiently dump excess heat. Ways to combat this include fans and fins to aid convection, or water cooling. Certainly, a temperature probe on the heat sink during operation will show whether active heat sinking is necessary.