

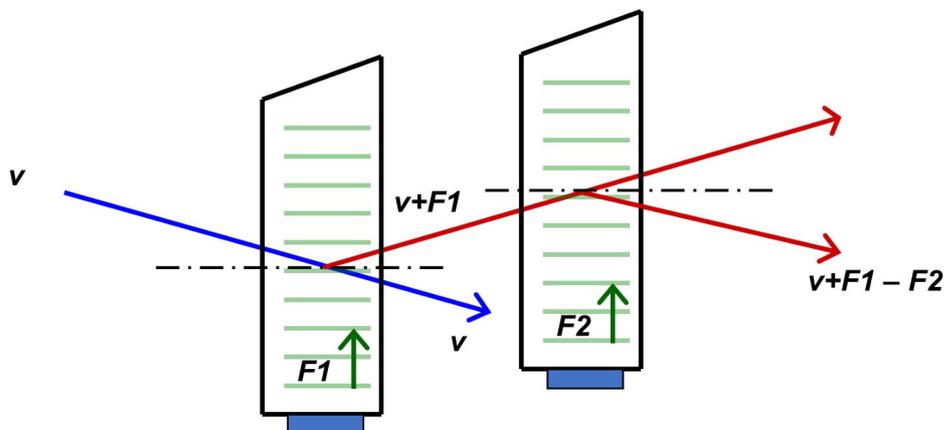
### +++ AO kHz frequency shift with single module +++

#### Small frequency shifting using AO devices

Frequency shifting is one among the many aspects of the acousto-optic interaction. It consists of introducing a frequency shift in the diffracted order and it can be either a +ve shift (upshift) or a -ve shift (downshift) depending on the selected order. With a single AO cell, one can reach barely few tenths of MHz as these are the limits of the AO technology.

For various applications, small frequency shifts (few MHz/KHz) are required. This includes namely Lidars, sensing application and many others. In order to achieve such small frequency shifts, a combination of two AO cells is required: it consists of reinjecting the diffracted order of the first cell into the second, please see the sketch below for a better idea:

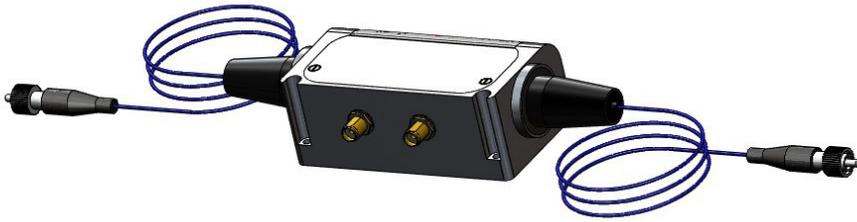
- Input frequency:  $\nu$
- Frequency after first AO cell (Upshifted):  $\nu + F1$
- Frequency after second AO cell (downshifted):  $\nu + F1 - F2$



At AA, we provide a complete system including the AO devices + associated RF drivers. The AO devices can be either freespace or fiber pigtailed. For the latter, we can provide a single package with the two AO cells inside, hence a compact solution. Below are few examples:

Wavelength *	Frequency shift*	Insertion losses	Extinction Ratio	Input optical power	Fiber Type*
633 nm	-2MHz to +2 MHz	≤5 dB	≥45 dB	≤400 mW	PM630
785 nm	-200KHz to +200 KHz	≤4 dB	≥45 dB	≤500 mW	PM850

\*others on request



For the freespace devices, below are a selection of our standard models:

[MT110-B50A1,5-VIS](#)

[MT80-B30A1,5-VIS](#)

[MT80-B30A1,5-IR](#)

[MT110-B50A1,5-IR](#)

[MT80-B42A0,7-1300.1600](#)



### Associated driver

In order to achieve these small frequency shifts, AA also provide the associated dedicated RF driver. It is based on DDS and consists of a single box delivering two phased lock outputs and hence ensuring a highly stable frequency shift : [MPDS1C2X](#)



## Highlights

- Two phased locked outputs
- Frequency range per output: 20-270 MHz
- Embedded amplifier up to 4W
- Frequency control through USB/RS232
- Amplitude control through USB/RS232 + external signals: analog/TTL
- Equipped with EEPROM to store frequency/power settings
- External synchronization on request.