



HOW TO MAKE SMALL AO FREQUENCY SHIFTS?

Variable, accurate and stable?

NEW

DC -Fibre pigtailed

AO frequency shifter

MPDS1C2X

Dual outputs RF driver



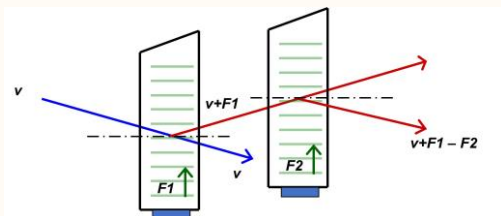
Based on DDS and consists of a single box delivering two phased lock outputs and hence ensuring a highly stable frequency shift : MPDS1C2X

Principal of operation:

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 positive (+) shift (upshift) or a negative (-) 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, atom cooling, atomic clocks... 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 side sketch for a better idea:



- Input frequency: ν
- 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 (new DC- Fibre pigtailed), hence a compact solution. Below are few examples:

(Other specifications on request)

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

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](#)



Highlights for the dual outputs RF driver:

- 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.