

**IMD80**

**INSTRUCTION MANUAL**

**ACOUSTO OPTIC MODULATOR INTEGRATED DRIVER**

**IMD80**

**\*\*\*\*\*P R E C A U T I O N S\*\*\*\*\***

**DO NOT ALLOW THE VIDEO INPUT LEVEL TO EXCEED +5V**

**DO NOT REVERSE SUPPLY POLARITY**

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## **1. GENERAL**

The IMD80 devices are lead molybdate acousto optic modulators integrated in a single package with the appropriate drive electronics.

The center frequency of the integral driver is determined by the free-running quartz-crystal oscillator at 80 MHz. This frequency is accurate to within +0.005% and its stability is better than +0.003%; the oscillator is not temperature stabilized.

A high speed semiconductor switch is used to gate the RF signal in response to externally supplied digital commands. The input is positive-logic, TTL compatible. The input is low impedance source such as a TTL 50ohm line driver or similar device. A positive signal of +2.7V or greater at the Video Input gates the RF output on; a ground level or slightly negative voltage gates the RF Output off. The video input must not exceed +5V.

Between the oscillator and the digital switch is an RF pre-amplifier. It isolates the oscillator from the load. It also includes a gain control for adjusting the RF power of the final output stage driving the AO crystal.

A low impedance source of d-c power is required for operation of the IMD80 series device. The required voltage is +12VDC (or + 15 VDC) at a current drain of 150mA. The external power source should be regulated to +2% and the power supply ripple voltage should be less than 25m V for best results.

**NOTE:**        Serious damage to the device will result if the polarity of the supply connections is reversed.

## **2. INSTALLATION AND ADJUSTMENT**

The optimum RF power level required for the modulator to produce maximum first order intensity will be different at various laser wavelengths. Apply RF power in excess of this optimum level will cause a decrease in first order intensity (a false indication of insufficient RF power), and make accurate Bragg alignment difficult. It is therefore recommended that initial alignment be performed at a low RF power level.

- a. With an insulated alignment tool or screw driver, rotate the recessed potentiometer fully CCW, then CW approximately  $\frac{1}{4}$  turn.

CCW rotation decreases RF power output  
CW rotation increases RF power output

- b. For the standard digital model connect the SMB Video Input connector to a TTL drive source (or to +4VDC) (For analogue version, apply 1.0V peak from a low impedance source).
- c. Apply + 12 VDC (or + 15 VDC) to the filtered DC feed thru of the IMD80 (Centre pin positive).
- d. From a position with either of the IMD80 optical apertures perpendicular to the laser beam, slightly rotate the unit (either direction). Observe the diffracted first order output from the Acousto-optic modulator and the undeflected zeroth order beam (higher orders may also be visible).

Adjust the Bragg angle to maximize the first order beam intensity.

- e. After Bragg angle has been optimized, slowly increase the RF power until maximum first order intensity is obtained.
- f. The device is now ready for use.

### **3. OPERATION**

The standard IMD80 Modulator/Driver is operated by applying +12 to + 15 VDC to the feed through terminal or flying supply leads, depending on the model type. Digital Modulation of the first order output beam is achieved via the video input (TTL active high).

### **4. MODEL VARIATIONS**

<b>IMD80-H-776</b>	<b>A/R coated specifically for 633 nm Flying supply leads</b>  <b>(Other coating available)</b>
<b>IMD80H-776A/B</b>	<b>A/R coated specifically for 633 nm feed through supply terminal</b>  <b>(Other coating available)</b>
<b>IMD80H-782A/B</b>	<b>As 776A, with no integral oscillator or RF switch (Designed for low resolution OEM deflector applications)</b>
<b>IMD80H-2</b>	<b>As 776B, with an increased active aperture of 2mm.</b>