

# M412 OPERATING MANUAL

---



## Product Overview

The Model 412 is a dual, linear, high voltage, amplifier designed to drive a number of different Conoptics Electro-Optic Beam Deflectors. The amplifier is fully DC coupled and is designed to accept a number of different input signal formats. Each amplifier has separate input and output connectors which allow any input combination of signal to be used for the desired output result. Each amplifier within the cabinet is independent of the other while utilizing a common power supply. Each amplifier in the system is capable of amplifying a low level signal (2v, p-p) to an output level of 750v p-p while driving the capacitive load of the deflector. The common application of the system is the X-Y deflection of a single laser beam. The amplifiers will accept both Unipolar (either negative or positive) or bipolar input signal. Each amplifier can be set to accept any input format independent of the other. Each amplifier has a switch on the rear panel to set the input impedance to either 50 ohms or 1K. Each amplifier has an input signal format switch for unipolar +, unipolar - , or bipolar.

ConOptics, Inc. 19 Eagle Road, Danbury, CT 06810 Phone 800-748-3349 Fax 203-790-6145

Email: [sales@conoptics.com](mailto:sales@conoptics.com), or visit [www.conoptics.com](http://www.conoptics.com)

## CAUTION: BEFORE APPLYING POWER



Please review this manual and become familiar with all safety markings and instructions.

Insure that the equipment mains (line) voltage as specified on the rear panel is in accordance with desired AC source. Safe operation of this equipment may be jeopardized by use other than specified by Conoptics.

## INTENDED USE

This equipment is designed for general laboratory use. It is intended to be used with a number of Conoptics Electro-Optic Beam Deflectors only. The Model 412 amplifier is designed to drive a capacitive load that is floating with respect to ground. Any use other than in direct connection with supplied optical deflectors can result in severe damage to the amplifier and potentially hazardous voltages to external equipment and personnel. This amplifier must only be used in accordance with the detailed instructions provided in the manual.

## WARNING: HAZARDOUS VOLTAGES



Hazardous AC and DC voltages are present on the center pins of the BNC connectors on the rear panel marked J3, J4, J5, and J6 “AMPLIFIER OUTPUT”. No attempt should be made to come into contact with these pins or to attempt to verify operation of the amplifier by monitoring these connectors with an oscilloscope or other test equipment. In addition, the equipment should be turned off before any of the supplied cables are connected to or disconnected from the driver or deflector.

## **SAFTEY GROUND**

This equipment is equipped with a protective earth terminal. This terminal is provided by a common or ground wire in the power cord. The main power source must supply an uninterrupted return to an earth ground. The equipment must not be used if this earth return is not supplied.

## **SERVICE CAUTION**



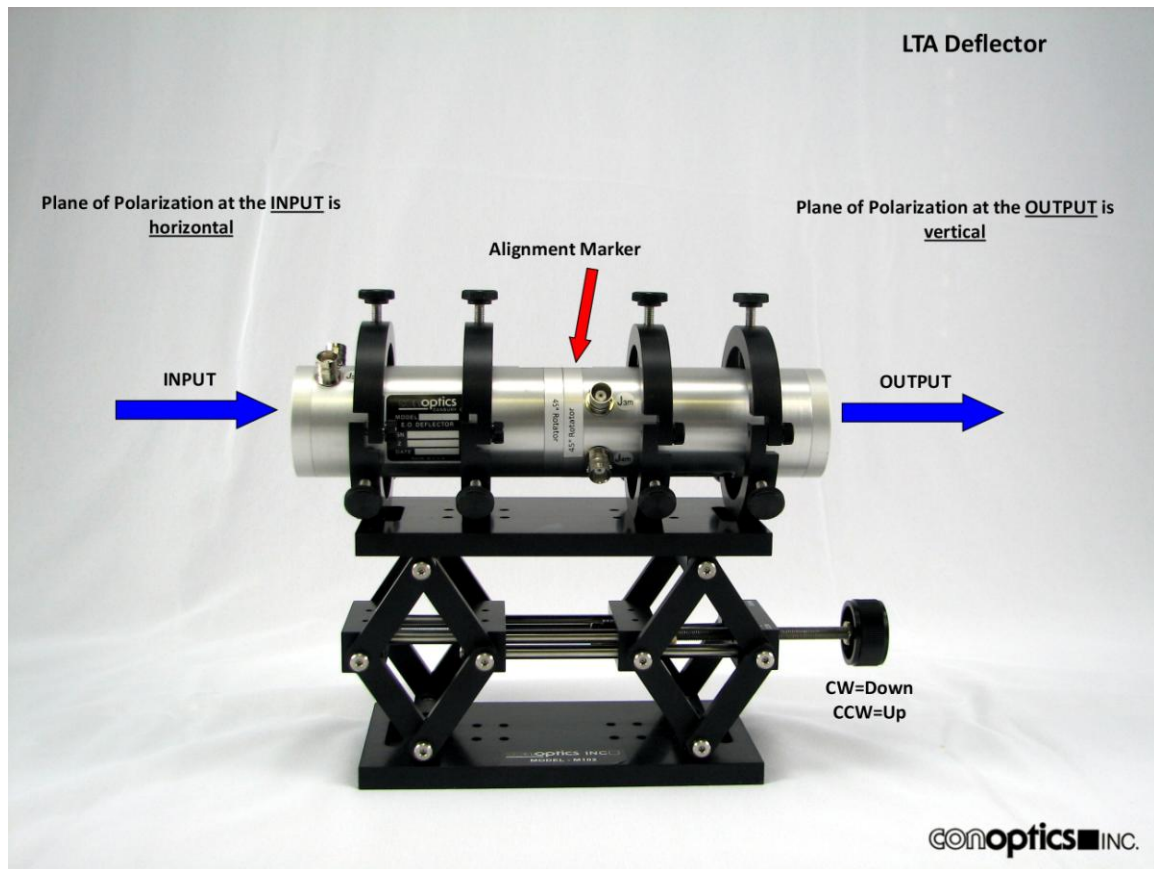
Only qualified personnel must perform adjustment, maintenance, or repair of the equipment. Hazardous voltages are present within the instrument and contact may result in personal injury. Any attempt to trouble shoot or adjust any controls within the system should be discussed with Conoptics first at [support@conoptics.com](mailto:support@conoptics.com).

## M412 SYSTEM SPECIFICATIONS

Cabinet	Driver and power supply in single cabinet
Input Impedance	Choice of amplifier input impedance by rear panel switch (50ohm/1K ohm)
Gain	375V/V Each Amplifier
Max. Output Drive Level	750V P-P, each amplifier, driving 60pf load, 3m RG-62 cables
Detected Rise/Fall Time	Typically 2.5us driving 60pf with 3m RG-62 coax
Input Signal Format	Options include Unipolar POS/NEG or bipolar set by rear-panel slide switch
Input Power (AC)	Typically 70W (load and frequency dependent)
Dimensions	19" Rack Mountable, 5.25"H(133mm) (3U) x 14"D (356mm)
Cooling	Forced air
Operating Environment	Designed for laboratory use (indoor only) Temperature range +5deg C to +50deg C ambient Humidity 20%-80% RH up to 32deg C, Altitude <3000M
Weight	20lbs (9.07kg)

## Deflector Input/Output Configuration

### LTA Deflector

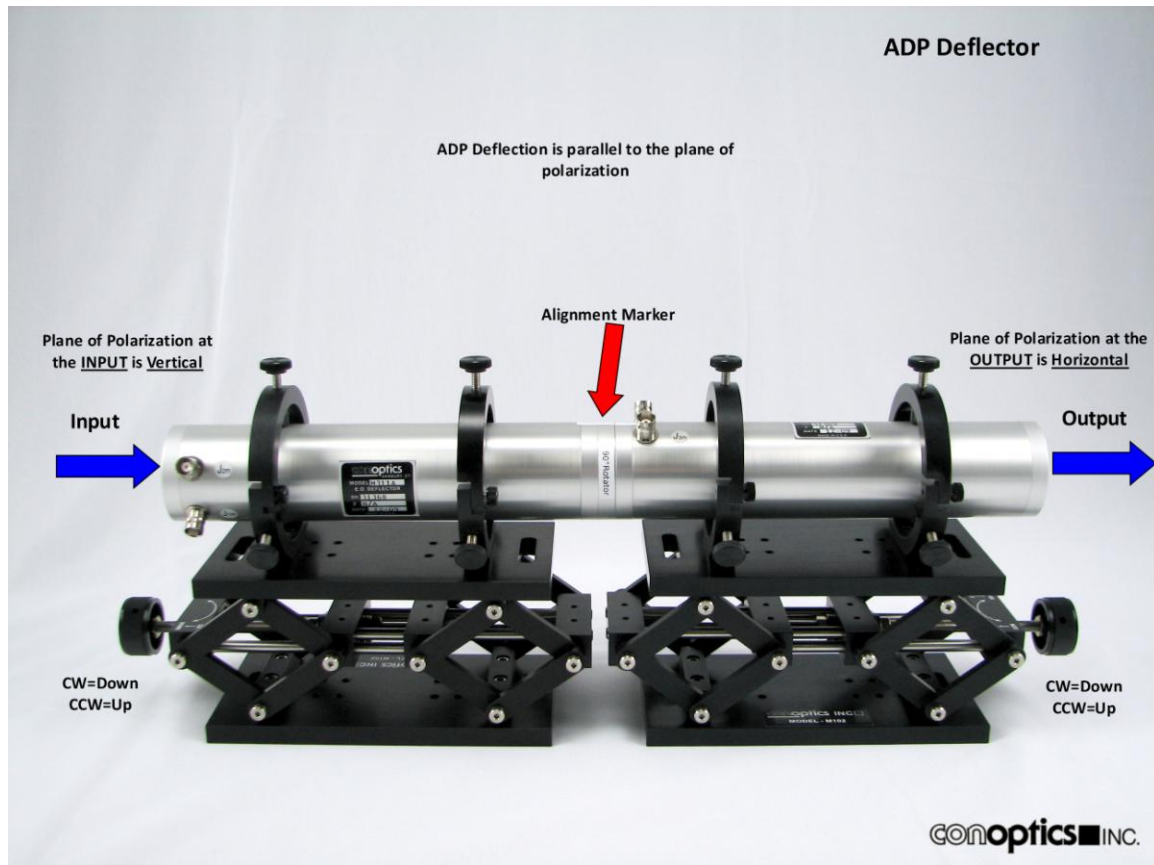


Note: As viewed from the INPUT end of the Deflector

- Positive going input to Channel 1 input deflects the beam up
- Positive going input to Channel 2 input deflects the beam to the right

ConOptics, Inc. 19 Eagle Road, Danbury, CT 06810 Phone 800-748-3349 Fax 203-790-6145 Email:  
[sales@conoptics.com](mailto:sales@conoptics.com), or visit [www.conoptics.com](http://www.conoptics.com)

## ADP Deflector

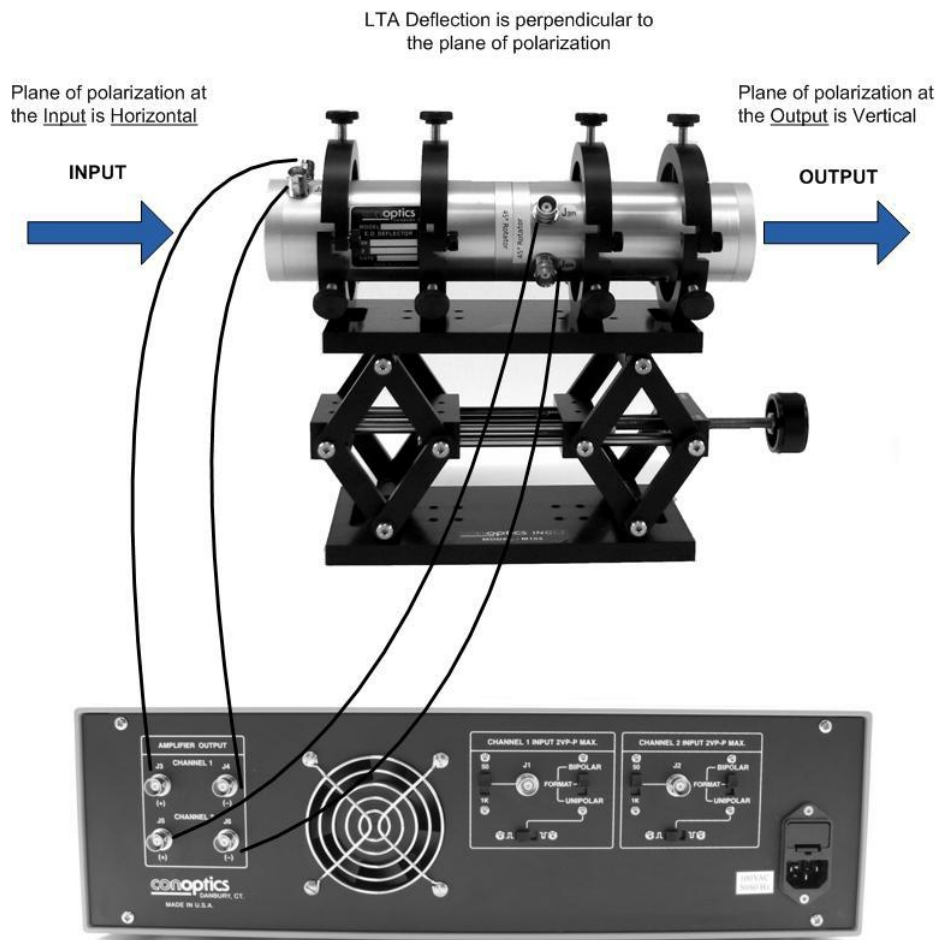


Note: As viewed from the INPUT end of the Deflector

- Positive going input to Channel 1 input deflects the beam up
- Positive going input to Channel 2 input deflects the beam to the right

## Model 412 2-Axis LTA Deflector Connection Diagram

Model 412 2-Axis  
LTA Deflector



**Connection Key:**

- J3 (+) connects to J1m (+)
- J4 (-) connects to J2m (-)
- J5 (+) connects to J3m (+)
- J6 (-) connects to J4m (-)

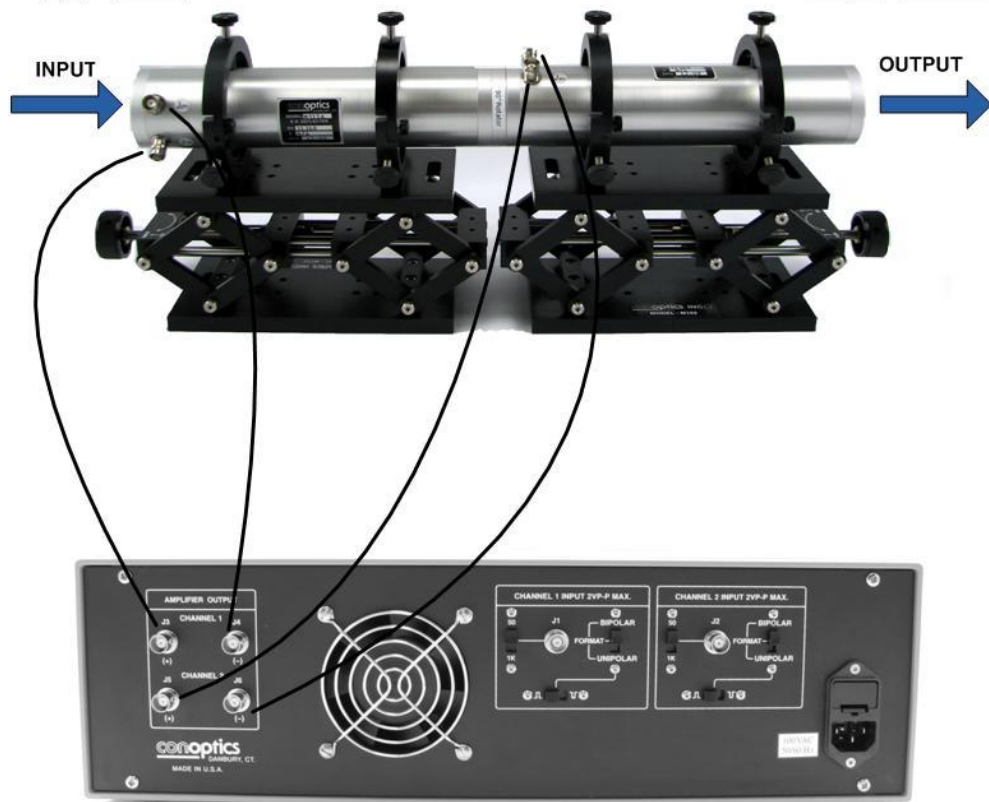
## Model 412 2-Axis ADP Deflector Connection Diagram

Model 412 2-Axis  
ADP Deflector

ADP Deflection is parallel to the  
plane of polarization

Plane of polarization at  
the Input is Vertical

Plane of polarization at  
the Output is Horizontal



**Connection Key:**

- J3 (+) connects to J1m (+)
- J4 (-) connects to J2m (-)
- J5 (+) connects to J3m (+)
- J6 (-) connects to J4m (-)