OT-301
POSITION SENSING
AMPLIFIER

USERS MANUAL

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1.0 Introduction

The ON-TRAK OT-301 is designed to provide an X-Y position output and sum output from duolateral, tetralateral, single axis, quadrant, and bi-cell position sensing detectors. The OT-301 has four transimpedance amplifiers and signal processing electronics to provide a normalized position and sum output. It has six gain settings to accommodate input current ranges from 0.1uA to 1.5mA with a frequency response to 15kHz.
The ZERO adjust allows the user to electrically move the zero to a relative position on the PSD. The CAL adjust allows calibration to absolute position.

2.0 Specifications

Transimpedance Gain (V/A) Four Input Channels	4x10^6 to 4x10^3 (Six Ranges)
Input Current Range	1.5uA to 1.5mA
Output Voltage - position X, Y - Sum	 +/- 10V 0-6V
Zero Offset (Offset Null)	+/- 1V Each Axis
Calibration Adjust	+/- 10% Full Scale (+/- 1V)
Detector Bias	0V, +/- 5V
Frequency Response	DC to 15kHz (range dependent) G1 16kHz G2 16kHz G3 5kHz G4 1.25kHz G5 310Hz G6 80Hz
Output Connectors	BNC
Input Connector	Sub Min. DB9 female receptacle
Power Requirement	12V, 500mA AC Adapter
Dimensions	5.57 x 1.52 x 6.00 inches

3.0 INITIAL SET-UP

1. Configure Internal Dip Switch Settings

Configure the OT-301 for the PSD type in use by setting the two 10-position DIP switches on the OT-301 circuit board. The OT-301 will be factory preset if ordered with an ON-TRAK detector or Position Sensing Module.

INTERNAL SWITCH SETTINGS

	DIP SW 8 ON	**DIP SW 7 ON**	**BIAS**	**POL (SW1)**
One-dimensional PSD				
Common Cathode	1,4,6,9	2,4,8,10	+5V (JP1)	POS
Common Anode	1,4,6,9	2,4,8,10	-5V (JP2)	NEG
Two-dimensional PSD				
Duo-lateral	1,4,6,9	1,3,7,9	-5V (JP2)	NEG
Tetra-lateral (common cathode)	1,4,6,9	2,4,8,10	+5V (JP1)	POS
Tetra-lateral (common anode)	1,4,6,9	2,4,8,10	-5V (JP2)	NEG
Pin Cushion Tetra-lateral (common cathode)	3,5,8,10	2,4,8,10	+5V (JP1)	POS
Quadrant				
Common Cathode	2,5,7,10	2,4,8,10	+5V (JP1)	POS

Note: Before attempting to make any internal adjustments to the OT-301, switch power off and unplug the AC adapter. To remove cover, loosen (2) rear panel screws and remove nuts from the BNC connectors (3 each). Carefully pull top slide cover off.

2. Connect PSD Detector to OT-301 Position Sensing Amplifier

The OT-301 is supplied with a detector cable that has a DB9 subminiature 9 pin plug at both ends. The ON-TRAK Position Sensing Modules have a DB9 receptacle and plug directly into the OT-301. If any other package type is used, the detector must be wired to appropriate pin on the DB9 9 pin connector.

	Detector Axis	Connector Pin Number
One-dimensional PSD		
Common Cathode	Y1	3
	Y2	4
	Bias	8
Common Anode	Y1	1
	Y2	2
	Bias	8
Two-dimensional PSD		
Duo-lateral	Cathode 1	1
	Cathode 2	2
	Anode 1	3
	Anode 2	4
Tetra-lateral/	X1	1
Quadrant	X2	2
(Common Cathode/Anode)	Y1	3
	Y2	4
	Bias	8

Note: For best performance, connect the metal of the detector housing to circuit ground (connector pin 5, 9, or the cable shield).

3. Set range switch to the minimum gain (G1) range.
4. Turn power switch on the back panel to "ON".
5. Illuminate the detector with light source.
6. Set the range switch to a position where both the HI/LO LED's are "OFF". When the HI indicator is "ON", the current gain is set too high. When the LO indicator is "ON", the current gain is set too low.
7. Measure the sum output on the back panel with a DVM. The sum should be approximately 5 volts for optimum performance. The maximum sum output is 6 volts.
8. Position output is measured from the X and Y BNC connectors on the back panel. The X and Y outputs have a +10V to –10V maximum swing. Zero volts is the detector center.
9. To trim or adjust the X and Y outputs, set the CAL/ZERO switch to "ON" (Rear Panel). The CAL POT can adjust the output signal by +/- 10% and the ZERO has a range of +/- 1V.

4.0 FRONT PANEL FUNCTIONS

FRONT PANEL

Range:	Transimpedance gain 4x10^3 to 4x10^6 V/A (Six Gain Ranges) Input current range 0.1uA to 1.5mA
H:	Input optical power exceeds range selected.
L:	Input optical power lower than range selected. Set range switch at a position where both HI/LO indicators are off.
X, Y ZERO:	ZERO potentiometers to allow an electronic offset of zero (+/- 1V each axis).
X, Y CAL:	Gain potentiometers to allow calibration of volts out in terms of displacement (+/- 10% full scale).

5.0 REAR PANEL FUNCTIONS

REAR PANEL

X OUT:	Normalized X axis output (+/- 10V)
Y OUT:	Normalized Y axis output (+/- 10V)
SUM:	Total amplified detector output (0-6V)
CAL/ZERO:	CAL/ZERO “ON” allows use of the X,Y, ZERO, and X, Y, CAL features.
ON/OFF:	CAL/ZERO “OFF” disables these features

6.0 SIGNAL CABLE

(9 PIN D CONNECTOR)

PIN #	PSD
1	X1
2	X2
3	Y1
4	Y2
5	Ground
6	NC
7	NC
8	Bias for Common Cathode/Anode
9	Ground

7.0 WARRANTY

ON-TRAK Photonics, Inc. warrants its amplifiers to be free of defects in material and workmanship for a period of one (1) year from date of shipment. This warranty extends only to the original owner of the product and is limited to repair or replacement of any parts which are defective in design, workmanship or material used in the manufacture, provided such amplifier, in the judgement of ON-TRAK Photonics, Inc. has not been damaged by accident, misuse, neglect , alteration or improper installation, repair or testing.

This warranty is exclusive or in lieu of any warranty of merchantability, fitness for purpose or other warranty of quality, whether expressed or implied, and of all other liabilities of ON-TRAK Photonics, Inc. for damages, including consequential damages occurring out of or in connection with the delivery, use or performance of the ON-TRAK Photonics, Inc. amplifiers.

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Specifications subject to change without notice.

ON-TRAK Photonics, Inc.
26782 Vista Terrace
Lake Forest, CA 92630
(949) 587-0769 Phone
(949) 587-9524
Internet: www.on-trak.com
E-mail: info@on-trak.com

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