

# POSITION SENSING INSTRUMENTS AND MODULES



# Table of contents

<b>On-Trak</b> .....	<b>3</b>
Position Sensing Amplifier For Duolateral PSDs (OT-301DL) .....	4
Position Sensing Amplifier For Single Axis PSD (OT-301SL) .....	5
OT-302D Display Module - On-Trak .....	6
OT-301 Position Sensing Amplifier - On-Trak .....	8
Collimated Laser Diode Module (CPS-180) .....	10
Position Sensing Modules (PSM) .....	11
High Speed Position Sensing Module (SPC PSM) .....	13
OT-100 High Speed Position Sensing Amplifier - On-Trak .....	14



## Partner **On-Trak**



On-Trak Photonics is een Amerikaanse leider in precisie-uitlijning en optische meettechnologieën, gespecialiseerd in Position Sensing Detector (PSD)-systemen voor de fotonica-industrie. Hun oplossingen zijn ontworpen voor realtime positieterugkoppeling met hoge resolutie voor een breed scala aan optische en lasergebaseerde toepassingen.

### Product offering

**Position Sensing Amplifier For Duolateral PSDs (OT-301DL)**



**Position Sensing Amplifier For Single Axis PSD (OT-301SL)**



**OT-302D Display Module - On-Trak**



**OT-301 Position Sensing Amplifier - On-Trak**



**Collimated Laser Diode Module (CPS-180)**



**Position Sensing Modules (PSM)**



**High Speed Position Sensing Module (SPC PSM)**



**OT-100 High Speed Position Sensing Amplifier - On-Trak**



← [Back to partner](#)



## Position Sensing Instruments and Modules

# Position Sensing Amplifier For Duolateral PSDs (OT-301DL)

The OT-301DL printed circuit board amplifier is designed for direct integration into OEM instrumentation. Optimized for duolateral Position Sensing Detectors (PSDs) with selectable bias voltages and three gain ranges, the OT-301DL's circuit elements add, subtract and divide detector signals with exceptional accuracy.



Precision op amps and precision resistor networks provide the final ratio. The analog dividers provide the utmost in linearity over a very wide signal range.

The final stages provide +10% reading adjustment of the X and Y outputs and serve as a high-performance output buffer for driving long cables. The sum signal equals the total detector signal and is proportional to the incident beam power.

The OT-301DL includes a DC-DC converter that can be removed and replaced with an external power source for reducing cost in high-volume OEM applications.

Beam position is calculated from the ratio of signals generated by the PSD's two cathode connections (designated X1 and X2) and two anode connections (Y1 and Y2). Four transimpedance amplifiers on the OT-301DL accurately measure all cathode and anode signal currents.

### Key Features:

- X, Y Analog Position Output Voltage
- Sum Output
- Wide Dynamic Range — Three Decades 103V/A, 104V/A, 105V/A
- DC to 15kHz
- Calibration Adjust X, Y
- Zero Offset Adjust X, Y
- Automatic Detector Bias
- Position Independent of Beam Intensity

**Applications** include a broad range of alignment and measurement tasks, such as shaft, accelerator, assembly line, bore, catapult, engine and engine mount, escalator, fixture, machine tool, propeller, rail, roller, spindle, surface, and turbine alignment. The system also supports precision straightness, flatness, and linear measurements, along with machine leveling and research & development applications.

**For more information**, simply complete the [contact form](#), and a member of our team will be in touch shortly.

← [Back to partner](#)



## Position Sensing Instruments and Modules

# Position Sensing Amplifier For Single Axis PSD (OT-301SL)

The OT-301SL printed circuit board amplifier is designed for direct integration into OEM instrumentation. Optimized for single-axis Position Sensing Detectors (PSDs) with selectable bias voltages and three gain ranges, the OT-301SL's circuit elements add, subtract and divide signals with exceptional accuracy.



Precision op amps and resistor networks perform addition and subtraction operations; optimized analog dividers provide the final ratio. The analogue divider ensures the utmost in linearity over a very wide signal range.

The final stages provide  $\pm 10\%$  reading adjustment of the position output and serve as a high performance output buffer for driving long cables. The sum signal equals the total detector signal and is proportional to the incident beam power.

The OT-301SL includes a DC-DC converter that can be removed and replaced with an external power source for reducing cost in high-volume OEM applications.

Beam position is calculated from the ratios of signals generated by the PSD's two anode connections (designated Y1 and Y2). Dual transimpedance amplifiers on the OT-301SL accurately measure the PSD's anode signal currents. The exact relationship between PSD signal and beam position is as follows: the total detector signal and is proportional to the incident beam power.

### Key Features:

- Analog Position Output Voltage
- Sum Output
- Wide Dynamic Range - Three Decades 103V/A, 104V/A, 105V/A
- DC to 15kHz
- Calibration Adjust
- Zero Offset Adjust
- Automatic Detector Bias
- Position Independent of Beam Intensity

**Applications** include a broad range of alignment and measurement tasks, such as shaft, accelerator, assembly line, bore, catapult, engine and engine mount, escalator, fixture, machine tool, propeller, rail, roller, spindle, surface, and turbine alignment. The system also supports precision straightness, flatness, and linear measurements, along with machine leveling and research & development applications.

**For more information**, simply complete the [contact form](#), and a member of our team will be in touch shortly.

← [Back to partner](#)



## Position Sensing Instruments and Modules

# OT-302D Display Module - On-Trak

De OT-302D displaymodule brengt een nieuw niveau van gemak en verfijning voor de weergave en analyse van positedetectiegegevens verzameld door de OT-301 positedetectieversterker. Gebruik de module op drie manieren: als zelfstandig uitleessysteem, in combinatie met Beamtrak-gegevensverwerkingssoftware (meegeleverd), of met door de gebruiker programmeerbare routines via RS-232-communicatie.



## Funcities van de OT-302D displaymodule

- LCD-scherm van absolute positie
- LCD-achtergrondverlichting
- X-, Y-positie en somweergave
- metrisch (mm) of Engels (in)
- RS-232-interface
- drukknop nul-offset
- computergestuurd of stand-alone
- drukknopbediening op het voorpaneel
- hoge resolutie 0,1 micron (0,0001")
- updatecontrole weergeven Updatesnelheid van 0,1 tot 25,5 seconden
- kalibratiefuncties voor detectoren van elk formaat
- snelle/langzame middeling

The OT-302D is an ideal stand alone display. The simple two-button front panel allows you to quickly set-up the OT-302D for your individual measurement applications. Press both buttons simultaneously to enter the configuration mode. Select the size of your position sensing detector, measurement units, and display update speed. Press the FAST / SLOW button to exit. The OT-302D is ready to display position data.

### Key Features:

- LCD Display of Absolute Position
- LCD Backlight
- X, Y Position and Sum Display
- Metric (mm) or English (in)
- RS-232 Interface
- Push Button Zero Offset
- Computer Controlled or Stand Alone
- Front Panel Push Button Control
- High Resolution 0.1 Micron (0.0001")
- Display Update Control 0.1 To 25.5 Second Update Speed

- Calibration Features for all Size Detectors
- Fast/Slow Averaging

**Applications** include a broad range of alignment and measurement tasks, such as shaft, accelerator, assembly line, bore, catapult, engine and engine mount, escalator, fixture, machine tool, propeller, rail, roller, spindle, surface, and turbine alignment. The system also supports precision straightness, flatness, and linear measurements, along with machine leveling and research & development applications.

**For more information**, simply complete the [contact form](#), and a member of our team will be in touch shortly.



## Position Sensing Instruments and Modules

# OT-301 Position Sensing Amplifier - On-Trak

De OT-301 Positiedetectieversterker is de eenvoudigste en meest nauwkeurige manier om de stroomuitvoer van elke positiedetectiedetector (PSD) op de markt te verwerken.



## Plug-and-play... uit de doos

De OT-301 is echt plug-and-play en elimineert het gedoe van het ontwerpen en bouwen van een aangepaste versterkingsoplossing. Sluit gewoon de detector aan, schakel de stroom in en u bent klaar om te gaan. Het voordeel is meer gemak, efficiëntie en productiviteit... plus 100% compatibiliteit met uw toekomstige behoeften op het gebied van positiedetectie. De OT-301 betaalt zichzelf binnen een mum van tijd terug.

## Elke toepassing... elke detector

Van laserstraaluitlijning tot straalcentrering en spiegelstabilisatie, de OT-301 is ideaal voor een- en tweedimensionale absolute optische positionering of precisiecentrering en nulstelling. Lees de X-Y positie-uitvoer en SUM-uitvoer van duolaterale, tetralaterale, enkele as-, kwadrant- en tweecellige PSD's.

## Vier transimpedantieversterkers

Vier transimpedantieversterkerkanalen en precisiesignaalverwerkingselektronica leveren de prestaties die nodig zijn voor hoek-, oppervlakte-uniformiteit-, vlakheid-, paralleliteit- en rechtheidsmetingen met nauwe toleranties.

## X, Y analoge uitgang die direct proportioneel is aan de straalpositie

De door de positiedetectiedetector gegenereerde fotostrøm wordt verwerkt door het vierkanaalsversterkersysteem met behulp van een positiedetectiealgoritme. Het resultaat zijn analoge X- en Y-uitgangen die direct proportioneel zijn aan de straalpositie, onafhankelijk van veranderingen in de straalintensiteit.

## Zes versterkingsinstellingen: 0,1 $\mu$ A tot 1,5 mA

Zes versterkingsinstellingen zijn geschikt voor ingangsstroombereiken van 0,1  $\mu$ A tot 1,5 mA met een frequentierespons tot 15 kHz. Met een handige ZERO-aanpassing kunt u de nul elektronisch naar een relatieve positie op de PSD verplaatsen. Een CAL-aanpassing maakt kalibratie naar de absolute positie mogelijk.

## Funcities

- X, Y analoge positie-uitgangsspanningen
- som output
- groot dynamisch bereik: 0,1  $\mu$ A tot 1,5 mA
- Gelijkstroom tot 15 kHz
- compatibel met alle positiedetectiedetectoren

- nul-offset/nulstelling
- kalibratie aanpassen
- automatische detectorbias
- positie onafhankelijk van de straalintensiteit

Truly plug-and-play, the OT-301 eliminates the hassle of having to design and build a custom amplification solution. Simply plug in the detector, switch on the power, and you're ready to go.

The benefit is greater convenience, efficiency and productivity and 100% compatibility with your future position sensing needs. The OT-301 pays for itself in no time.

From laser beam alignment, to beam centering, to mirror stabilization, the OT-301 is ideal for one- and two-dimensional absolute optical positioning or precision centering and nulling requirements. Read the X-Y position output and SUM output from duolateral, tetralateral, single axis, quadrant and bi-cell PSDs.

Four transimpedance amplifier channels and precision signal processing electronics deliver the performance necessary for close-tolerance angle, surface uniformity, flatness, parallelism and straightness measurement.

The photocurrent generated from the position sensing detector is processed by the four-channel amplifier system using a position sensing algorithm. The result is X and Y analog outputs that are directly proportional to beam position-independent of changes in beam intensity.

### **Key Features:**

- X, Y Analog Position Output Voltages
- Sum Output
- Wide Dynamic Range: 0.1  $\mu$ A to 1.5 mA
- DC to 15kHz
- Compatible With All Position Sensing Detectors
- Zero Offset/Nulling
- Calibration Adjust
- Automatic Detector Bias
- Position Independent of Beam Intensity

**Applications** include a broad range of alignment and measurement tasks, such as shaft, accelerator, assembly line, bore, catapult, engine and engine mount, escalator, fixture, machine tool, propeller, rail, roller, spindle, surface, and turbine alignment. The system also supports precision straightness, flatness, and linear measurements, along with machine leveling and research & development applications.

**For more information**, simply complete the [contact form](#), and a member of our team will be in touch shortly.

← **Back to partner**



## Position Sensing Instruments and Modules

# Collimated Laser Diode Module (CPS-180)

The CPS-180 is a turn-key laser kit which includes a laser, power supply, and kinematic mount providing exceptional power and beam-drift stability with very small beam-divergence.



This class 3R visible laser emits at 635 nm and can be finely adjusted for precise positioning via adjustment actuators with the supplied kinematic mount.

This 1mW laser diode setup is ideal for use with the 1L and 2L series Position Sensing Detectors or the PSM modules.

### Key Specifications:

- Wavelength: 635 nm
- Power: 1 mW
- Safety Class: 3R
- Beam Diameter: 3mm
- Beam Shape: Round
- Divergence:  $\leq 1.8$  mrad

### Key Features:

- Complete Kit Includes 635 nm Laser, Power Supply, and Mounting Mechanics.
- Kinematic Mount for Tip/Tilt Adjustment
- Adjustable post and stand

The CPS-180 collimated laser diode module is commonly used as a stable reference beam for precise alignment and position sensing with PSD-based measurement systems.

**For more information**, simply complete the [contact form](#), and a member of our team will be in touch shortly.

← **Back to partner**



## Position Sensing Instruments and Modules

# Position Sensing Modules (PSM)



On-Trak Position Sensing Modules are fully packaged position sensing detectors that, when used with an On-Trak position sensing amplifier, provide an analogue output directly proportional to the position of a light spot on the detector active area. Yet, what truly sets them apart is their proprietary, plug-and-play design. Never has position sensing been so convenient or accurate.

No more hassling with breadboards, soldering, cutting and wiring. Instead, all On-Trak Position Sensing Modules (PSMs) incorporate a sub miniature 9-pin connector that plugs directly into any On-Trak Position Sensing Amplifier. Just plug it in and go. It's that simple.

Select from several distinct configurations; each module contains a linear, duo lateral, tetra lateral, or quadrant position sensing detector. All modules are conveniently packaged to allow simultaneous monitoring of position and light intensity.

Position Sensing Modules come in two package sizes: Standard and Compact. The standard measures 2.8" x 2.45" x 1.125". The compact measures 1.25" x 1.25" x 0.975".

Harsh ambient lighting conditions? No problem. Each module readily accepts a complete range of optional filters to reduce the effect of noise caused by ambient light. Moreover, a filter holder is included with each module at no extra cost.

All PSMs feature standard mounting holes for easy mounting with your existing lab equipment. Whether your post and stands are 1/4 - 20 or 8/32, you'll be up and running in a matter of minutes.

On-Trak Position Sensing Modules are encased in rugged aluminium housings to protect your investment.

### Key Features:

- Fully Packaged Position Sensing Detectors
- Silicon Linear : 400-1100 nm
- Silicon Duolateral : 400-1100 nm
- Silicon Quadrant : 400-1100 nm
- Germanium Tetra-Lateral : 800-1800 nm
- Removable Filter Holder Adapter
- Standard Mounting Holes
- Plug and Play Compatibility with all ON-TRAK Position Sensing Amplifiers

**Applications** include a broad range of alignment and measurement tasks, such as shaft, accelerator, assembly line, bore, catapult, engine and engine mount, escalator, fixture, machine tool, propeller, rail, roller, spindle, surface, and turbine alignment. The system also supports precision straightness, flatness, and linear measurements, along with machine leveling and research & development applications.

**For more information**, simply complete the [contact form](#), and a member of our team will be in touch shortly.



← [Back to partner](#)



## Position Sensing Instruments and Modules

# High Speed Position Sensing Module (SPC PSM)

The SPC PSM High Speed Position Sensing Module is a fully packaged SiTek Electro Optics PSD with an integrated high speed signal processing circuit.



The PSD outputs bipolar voltages representing the position and intensity of the centroid of a light spot on the PSD at bandwidths up to 400kHz. Inputs are available for external adjustment of offset voltages. The SPC PSM is offered in a variety of one dimensional or two dimensional sizes.

### Key Features:

- Integrated Electronics with 400kHz Bandwidth Response
- Silicon Linear: 400nm - 1100nm
- Silicon Duolateral: 400nm - 1100nm
- Removable Filter Holder Adapter
- Standard 1/4 - 20 Mounting Holes
- Adjustable Offsets: Diff X, Diff Y, Sum X, Sum Y
- HD15 Connector (5' molded HD15 cable included)

**Applications** include a broad range of alignment and measurement tasks, such as shaft, accelerator, assembly line, bore, catapult, engine and engine mount, escalator, fixture, machine tool, propeller, rail, roller, spindle, surface, and turbine alignment. The system also supports precision straightness, flatness, and linear measurements, along with machine leveling and research & development applications.

**For more information**, simply complete the [contact form](#), and a member of our team will be in touch shortly.



## Position Sensing Instruments and Modules

# OT-100 High Speed Position Sensing Amplifier - On-Trak

De OT-100 hogesnelheidspositiedetectiemodule bevat een volledig verpakt SiTek Electro Optics Signal Processing Circuit (SPC) in een handig en duurzaam pakket. De OT-100 is ontworpen om bipolaire spanningen uit te voeren die de positie en intensiteit van een lichtvlek op de PSD vertegenwoordigen met bandbreedtes tot 400 kHz. BNC-uitgangen maken een eenvoudige en snelle aansluiting op voltmeters en oscilloscopen mogelijk. Er zijn banaanstekkers voorzien voor eenvoudige aansluiting op de meest gangbare voedingen. Plug-and-play-verbinding met PSM-modules en PSD's wordt gemaakt via de DB9-ingang en de meegeleverde DB9-kabel.



## Funcities van de OT-100 hogesnelheidspositiedetectieversterker

- DC tot 400 kHz bandbreedterespons
- dynamisch bereik 25 tot 300  $\mu$ W (635 nm)
- BNC-uitgangsspanningen: versterkt X1, X2, Y1 en Y2
- differentieel X en Y
- SOM X en Y
- instelbare SOM- en differentiële offsets
- $\pm 15$  volt ingang (nominaal)
- DB9 PSM-ingang (kabel meegeleverd)
- compatibel met silicium lineaire en silicium duo laterale PSD's

## Specificaties

- transimpedantieversterking (V/A): 100.000
- ingangsspanning (max):  $\pm 18$  V
- ingangsspanning (nominaal):  $\pm 15$  V
- ingangsstroom (max): 23 mA
- uitgangsspanning (nominaal):  $\pm 12$  V
- uitgangsrui: 3 mV p-p
- bandbreedte: DC- 400 kHz
- zwenksnelheid: 13 V/S
- spanningsingangsconnectoren: 4 mm banaan
- uitgangsconnectoren: BNC (f)
- PSD-ingangsconnector: DB9 (f)
- gewicht: 24 on

De OT-100 hogesnelheidspositiedetectiemodule bevat een volledig verpakt SiTek Electro Optics Signal Processing Circuit (SPC) in een handig en duurzaam pakket. De OT-100 is ontworpen om bipolaire spanningen uit te voeren die de positie en intensiteit van een lichtvlek op de PSD vertegenwoordigen met bandbreedtes tot 400 kHz. BNC-uitgangen maken een eenvoudige en snelle aansluiting op voltmeters en oscilloscopen mogelijk. Er zijn banaanstekkers voorzien voor eenvoudige aansluiting op de meest gangbare voedingen. Plug-and-play-verbinding met PSM-modules en PSD's wordt gemaakt via de DB9-ingang en de meegeleverde DB9-kabel.

## **Functies van de OT-100 hogesnelheidspositiedetectieversterker**

- DC tot 400 kHz bandbreedterespons
- dynamisch bereik 25 tot 300  $\mu$ W (635 nm)
- BNC-uitgangsspanningen: versterkt X1, X2, Y1 en Y2
- differentieel X en Y
- SOM X en Y
- instelbare SOM- en differentiële offsets
- $\pm 15$  volt ingang (nominaal)
- DB9 PSM-ingang (kabel meegeleverd)
- compatibel met silicium lineaire en silicium duo laterale PSD's

## **Specificaties**

- transimpedantieversterking (V/A): 100.000
- ingangsspanning (max):  $\pm 18$  V
- ingangsspanning (nominaal):  $\pm 15$  V
- ingangsstroom (max): 23 mA
- uitgangsspanning (nominaal):  $\pm 12$  V
- uitgangsruis: 3 mV p-p
- bandbreedte: DC- 400 kHz
- zwenksnelheid: 13 V/S
- spanningsingangsconnectoren: 4 mm banaan
- uitgangsconnectoren: BNC (f)
- PSD-ingangsconnector: DB9 (f)
- gewicht: 24 ons