LASER ALIGNMENT SOLUTIONS

peo PHOTONICS

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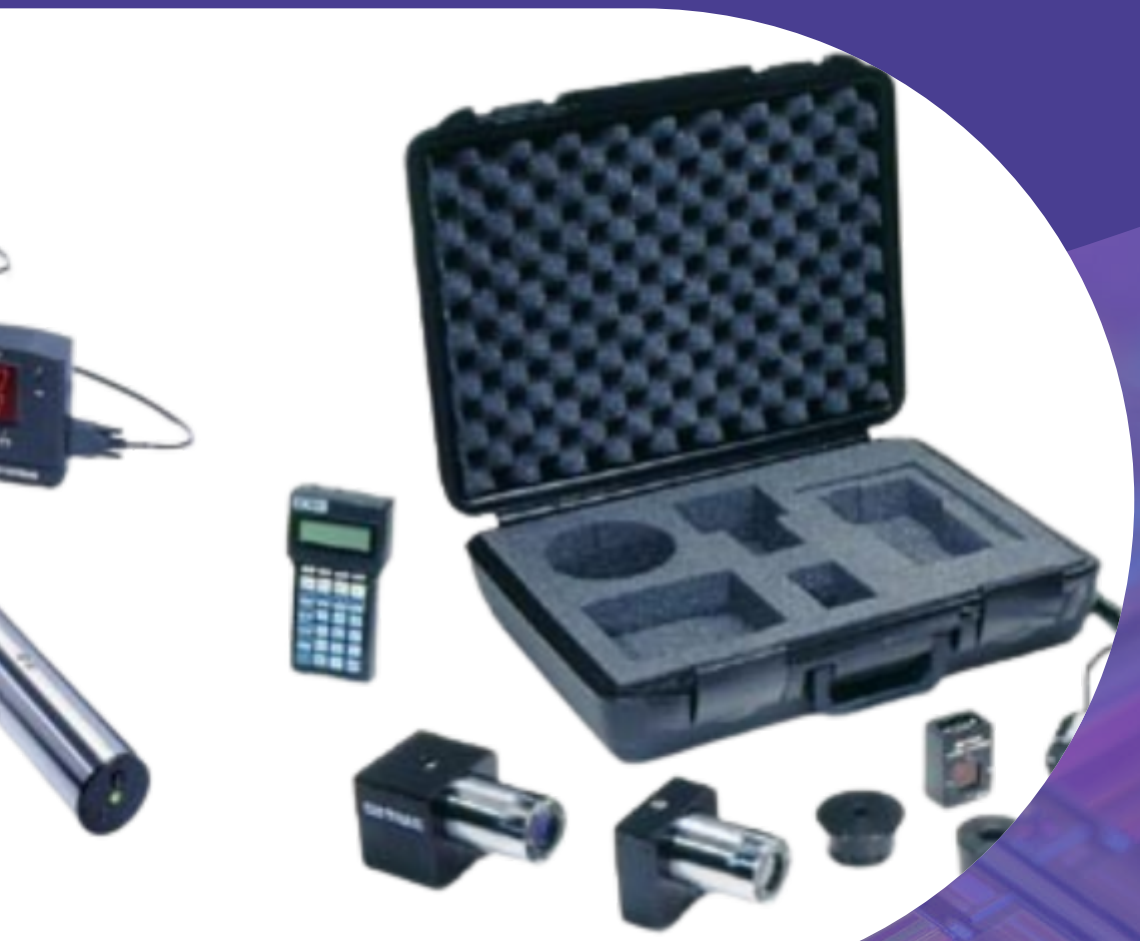
LINE LASER SYSTEMS



PEO PHOTONICS

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Partner On-Trak

On-Trak Photonics is a U.S.-based leader in precision alignment and optical measurement technologies, specializing in Position Sensing Detector (PSD) systems for the photonics industry. Their solutions are designed for real-time, high-resolution position feedback across a wide range of optical and laser-based applications.

Product offering

Laser Alignment System (OT-7000)

Alignment Laser System (OT-4040)

Laser Alignment Solutions › Line Laser Systems

Laser Alignment System (OT-7000)

Now, the most powerful way to measure alignment at distances up to 300 feet is more convenient and flexible than ever. On-Trak Photonics' OT-7000 Laser Alignment System provides an autocentering and wireless solution for performing real-time measurement of multiple targets along a single reference laser line.

Dynamically monitor work as it progresses. The OT-7000 displays X-Y deviation of each measurement target simultaneously-over your Windows based computer, at the RF controller module, or via LED displays located on each target's dedicated CPU.

Used by leading aircraft manufacturers, shipbuilders and the automotive industry, On-Trak Laser Alignment technology is proven to streamline efficiency and significantly reduce man hours. The OT-7000, with its auto-align and wireless capability, will only boost this productivity further.

Loading stress and thermal changes during the manufacturing process can cause conventional alignment systems to move out of center on the reference target. The OT-7000 compensates for this with an automatic feedback loop that constantly monitors and re-centers the laser via internal motion controllers. User-programmable settings enable you to adjust centering sensitivity levels and feedback sampling rates. Store these values into memory for future recall.

No more cabling hassles-tangling, storage, damage, routing headaches, etc. The OT-7000's wireless design makes it easy to instantly add or remove measurement targets anywhere along the laser line. RF spread-spectrum technology (902-928 MHz) provides rock-solid wireless communications between key components.

Collect and process measurement data with your Windows-based computer. Beam-Trak 7000 software displays X-Y deviation of all targets, enabling you to dynamically monitor work in progress. 0.001-Inch Resolution At 300 Feet. Optimize precision and gain a greater measure of confidence. The OT-7000 provides 0.001-inch resolution at distances up to 300 feet. A third generation fiber-coupled laser diode delivery system ensures exceptional beam quality over long distances.

Key Advantages:

- Cost Effective
- Ultra Precise
- Real-Time Feedback
- Faster Measurement
- Maximizes Range
- Simultaneous Measurement
- Data Analysis

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.

Laser Alignment Solutions › Line Laser Systems

Alignment Laser System (OT-4040)

Introducing an easy, powerful way to perform accurate alignment measurements on the go. The OT-4040 Alignment Laser System enables instant measurement of X-Y deviation, in real-time, at any point on a visible laser reference line – a line extending up to 300 feet long. Dynamically monitor your project as it unfolds. The OT-4040 Alignment Laser System is extensively proven by aircraft manufacturers, shipbuilders, and the automotive industry. It has significantly streamlined efficiency and reduced man hours in a varied range of challenging alignment applications.

Simply drop a “transparent” measurement target into any standard NAS tooling sphere along the reference line, and take your reading with the attached central processing unit.

Optimize precision and gain a greater measure of confidence. The OT-4040 provides conservatively specified 0.001-inch resolution at distances up to 300 feet. A third generation fiber-coupled laser diode delivery system ensures exceptional beam coherence over long distances – even in demanding outdoor environments.

Concentrate on your work, not your alignment system. The OT-4040 couldn’t be easier to operate. In fact, even first-time operators can be up-andrunning in less than five minutes with hardly a glance at the instruction manual. The system is that simple and intuitive.

Extreme industrial environments? No problem. The OT-4040 CPU and OT-4040 Target are built to withstand the rigors of day-to-day, on-the floor use.

Many consider laser trackers “too much solution” for alignment applications alone. Conversely, optical telescopes, with their slow and subjective performance, are often considered “too little solution”. The OT-4040 provides the best of both worlds: it’s exceptionally accurate, yet simple-to-operate and cost effective. Moreover, the OT-4040 system is optimized for instant, drop-in replacement of optical telescope systems via NAS standard housings. The overriding advantage is multipoint, dynamic, objective measurement – something neither laser trackers nor optical telescopes individually offer.

Key Advantages:

- Cost Effective
- Ultra Precise
- Real-Time Feedback
- Faster Measurement
- Maximizes Range
- Simultaneous Measurement
- Data Analysis

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.

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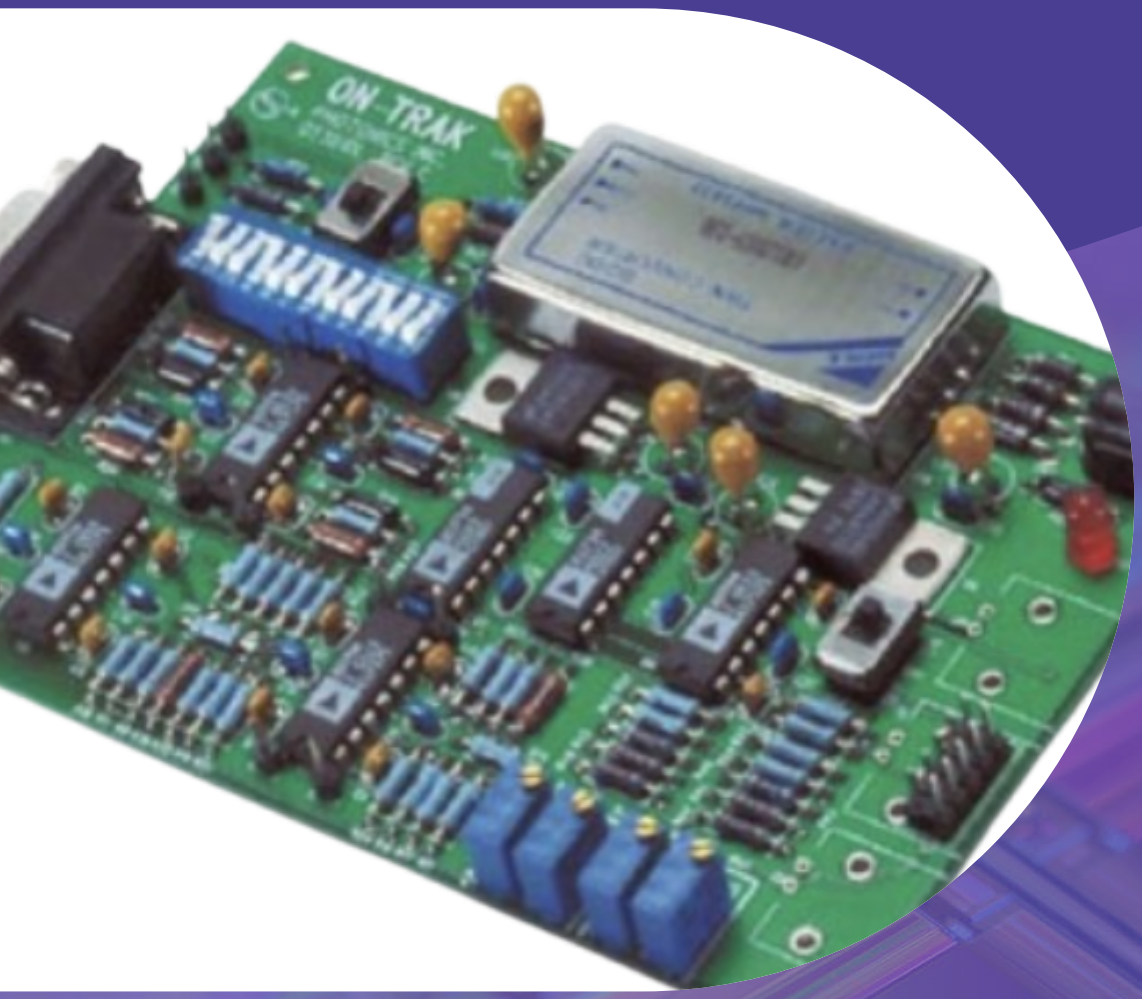
POSITIONING TOOLS AND MODULES



peo PHOTONICS

Partner On-Trak

On-Trak Photonics is a U.S.-based leader in precision alignment and optical measurement technologies, specializing in Position Sensing Detector (PSD) systems for the photonics industry. Their solutions are designed for real-time, high-resolution position feedback across a wide range of optical and laser-based applications.

Product offering

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

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

Display Module (OT-302D)

Position Sensing Amplifier (OT-301)

Collimated Laser Diode Module (CPS-180)

Position Sensing Modules (PSM)

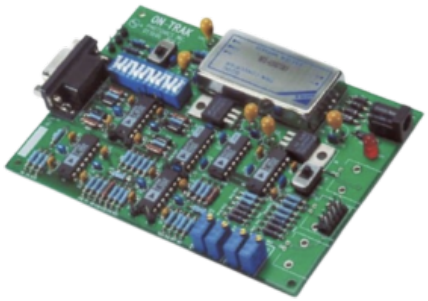
High Speed Position Sensing Module (SPC PSM)

High Speed Position Sensing Amplifier (OT-100)

Laser Alignment Solutions › Positioning Tools 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

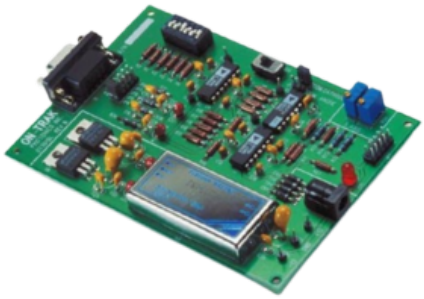
Applications include a broad range of alignment and measurement tasks, such as shaft, accelerator, assembly line, bore, catapult, engine and engine mount, escalator, fixture, machine tool, propeller, rail, roller, spindle, surface, and turbine alignment. The system also supports precision straightness, 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.

Laser Alignment Solutions › Positioning Tools 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 ±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.

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Laser Alignment Solutions › Positioning Tools and Modules

Display Module (OT-302D)

The OT-302D Display Module brings a new level of ease and sophistication to display and analysis of position sensing data collected from the OT-301 Position Sensing Amplifier. Utilize the module in three ways: as a standalone readout system, in tandem with Beamtrak data processing software (included), or with user-programmable routines via RS-232 communication.

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.

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Position Sensing Amplifier (OT-301)

The OT-301 Position Sensing Amplifier is the easiest, most precise way to process the current output from any position sensing detector (PSD) on the market.

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 µA 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.

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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: ≤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.

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 Positron 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.

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Laser Alignment Solutions › Positioning Tools 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.

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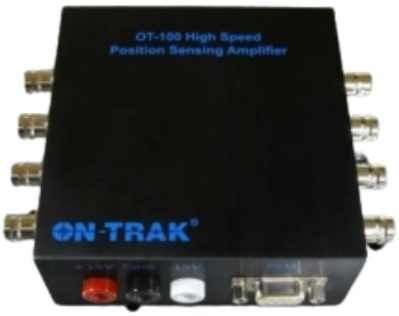
Laser Alignment Solutions › Positioning Tools and Modules

High Speed Position Sensing Amplifier (OT-100)

The OT-100 High Speed Position Sensing Module contains a fully packaged SiTek Electro Optics Signal Processing Circuit (SPC) in a convenient and durable package.



The OT-100 is designed to output bipolar voltages representing the position and intensity of a light spot on the PSD at bandwidths of up to 400 kHz. BNC outputs allow simple and fast connection to voltmeters and oscilloscopes. Banana jacks are provided for easy connection to most common power supplies. Plug and play connection to PSM modules and PSDs are made via the DB9 input and supplied DB9 cable.

Key Features:

- DC to 400 kHz bandwidth response
- dynamic range 25 to 300 µW (635 nm)
- BNC output voltages: Amplified X1, X2, Y1 and Y2
- differential X and Y
- SUM X and Y
- adjustable SUM and differential offsets
- ± 15 volt input (nominal)
- DB9 PSM input (cable included)
- compatible with silicon linear and silicon duo lateral PSDs

Key Specifications:

- transimpedance gain (V/A): 100.000
- input voltage (max): ±18 V
- input voltage (nominal): ±15 V
- input current (max): 23 mA
- output voltage (nominal): ±12V
- output noise: 3 mV p-p
- bandwidth: DC- 400 kHz
- slew rate: 13 V/S
- voltage input connectors: 4mm banana
- output connectors: BNC (f)
- PSD input connector: DB9 (f)
- weight: 24 ounces

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.

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ROTATING LASER SYSTEMS

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Partner On-Trak

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Product offering

Rotating Laser Target System (OT-5000)

Rotating Laser Target System (OT-2020)

Laser Alignment Solutions › Rotating Laser Systems

Rotating Laser Target System (OT-5000)

The OT-5000 RLT Rotating Laser Target System, in tandem with a rotating laser, is the most comprehensive way to measure flatness, squareness and straightness at distances up to 100 feet.

The OT-5000 RLT enables you to monitor the position of up to twenty targets from the convenience of your laptop or desktop computer – simultaneously, and in real time.

Extensively proven in a wide range of applications worldwide, the OT-5000 is an ideal way to streamline efficiency and reduce man hours.

A compact carrying case (standard) houses the entire system: the OT-5000 RLT Rotating Laser Targets that detect and display the position of the rotating laser, the OT- 5000 DIM Digital Interface Module that provides power for up to twenty OT-5000 RLTs, and the cables.

Specify as few – or as many – RLT targets required for the job. Each DIM accommodates up to twenty targets in a multidrop configuration.

Optimize precision and gain an added measure of confidence. The OT-5000 provides conservatively-specified 0.001-inch resolution and accuracy via a leading-edge silicon position sensing detector.

Beam-Trak 5000 software makes it easy to dynamically monitor work in progress. This rich graphical interface displays the position information of all targets simultaneously. One glance at the screen, and you know the precise measurement profile of your entire project. Oversize fonts enable easy readability over great distances.

Moreover, Beam-Trak software enables you to address, control and customize each target from your computer. In fact, the complete range of software commands built into each target is fully controllable via computer.

The OT-5000 System is plug-and play compatible with all rotating lasers on the market. Four-level autoranging from 0.5mW to 5.0mW and compatibility with all laser tracking speeds from 1 RPM to 1,000 RPM make compatibility instantaneous. Simply plug-in the laser, adjust your targets and begin taking measurements.

Key advantages:

- Ultra Precise
- Real-Time Feedback
- Faster Measurement
- Greater Range
- Simultaneous Measurement
- Data Analysis

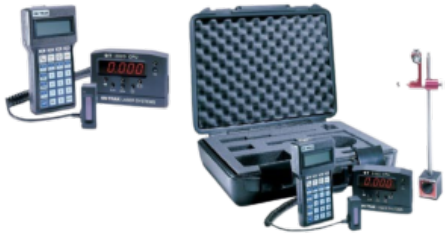
Applications include flatness, squareness, and straightness measurements across a wide range of alignment tasks, such as machine tool alignment, steel and process mill alignment, horizontal flatness

alignment, turbine pad leveling, surface leveling, and roller alignment. It is also widely used in aircraft assembly applications, including fuselage alignment, storage bin alignment, seat track alignment, floor beam alignment, and body join alignment.

For more information, simply complete the contact form, and a member of our team will be in touch shortly.

Rotating Laser Target System (OT-2020)

The OT-2020 Rotating Laser Target System, in tandem with a rotating laser, provides the fastest, most accurate way to measure flatness, squareness and straightness at distances up to 100 feet.



Battery operated for maximum field portability, the OT-2020 is proven in a wealth of applications – many by Fortune 100 companies.

A compact carrying case (standard) contains the entire system: the Model OT-2020 RS1 Remote Sensor that detects the position of the rotating laser light, the Model OT-2020 CPU Central Processing Unit that provides real-time readout of the measurement value, plus several options for additional flexibility and convenience.

Optimize precision and gain an added measure of confidence. The OT-2020 RS1 Remote Sensor provides conservatively-specified 0.001-inch resolution and accuracy via a leading-edge silicon position-sensing detector.

Place the RS1 Remote Sensor into the optional OT-2020 BK Bracket Kit, and conveniently make instantaneous measurements anywhere along the laser beam path. Featuring a heavy magnetic base that activates/deactivates at the flip of a switch, the bracket can be firmly – and instantly – secured anywhere on the measurement surface or tool.

Concentrate on your work, not your rotating laser system. The OT-2020's CPU is refreshingly simple to operate. Minimized, straightforward controls enable you to be up-and-running with barely a glance at the instructions. Yet, there is no sacrifice to performance. The CPU provides all key functionality, including pulse averaging, zero offset and a serial communications port.

Encased in robust, custom machined aluminum housings, the OT-2020 CPU and RS1 readily withstand the rigors of extreme industrial environments. We've seen systems scratched, dented and covered in grime – yet perform flawlessly after years of continuous service.

The OT-2020 System is plug-and play compatible with all rotating lasers on the market. Four-level autoranging from 0.3mW to 3.0mW and compatibility with all laser tracking speeds from 1 RPM to 1,000 RPM make compatibility instantaneous. Simply plug-in the laser, adjust your targets and begin taking measurements.

Key advantages:

- Ultra Precise
- Real-Time Feedback
- Faster Measurement
- Greater Range
- Simultaneous Measurement
- Data Analysis

Applications include flatness, squareness, and straightness measurements across a wide range of

alignment tasks, such as machine tool alignment, steel and process mill alignment, horizontal flatness alignment, turbine pad leveling, surface leveling, and roller alignment. It is also widely used in aircraft assembly applications, including fuselage alignment, storage bin alignment, seat track alignment, floor beam alignment, and body join alignment.

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