OT-4040

Portable Alignment Laser System.

ON-TRAK®
Photonics, Inc.

The OT-4040. Portable, Two Dimensional Alignment.

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.

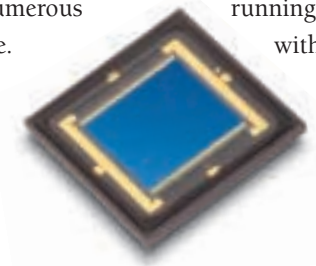
Dynamically monitor your project as it unfolds. Simply drop a "transparent" measurement target into any standard NAS tooling sphere along the reference line, and take your reading with the attached central processing unit.

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.

A typical system consists of a single Model OT-4040 LL Alignment Laser, OT-4040 TTS4 Transparent Target, OT-4040 TS4 Reference Target, and two OT-4040 Central Processing Units (one CPU for each target). Numerous options are also available.

0.001-Inch Resolution At 300 Feet.

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.



Silicon Position Sensing Detector.

Anyone Can Operate It.

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-and-running in less than five minutes with hardly a glance at the instruction manual. The system is that simple and intuitive.

Industrial Strength.

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.

An Ideal Laser Tracking/Optical Telescope Alternative.

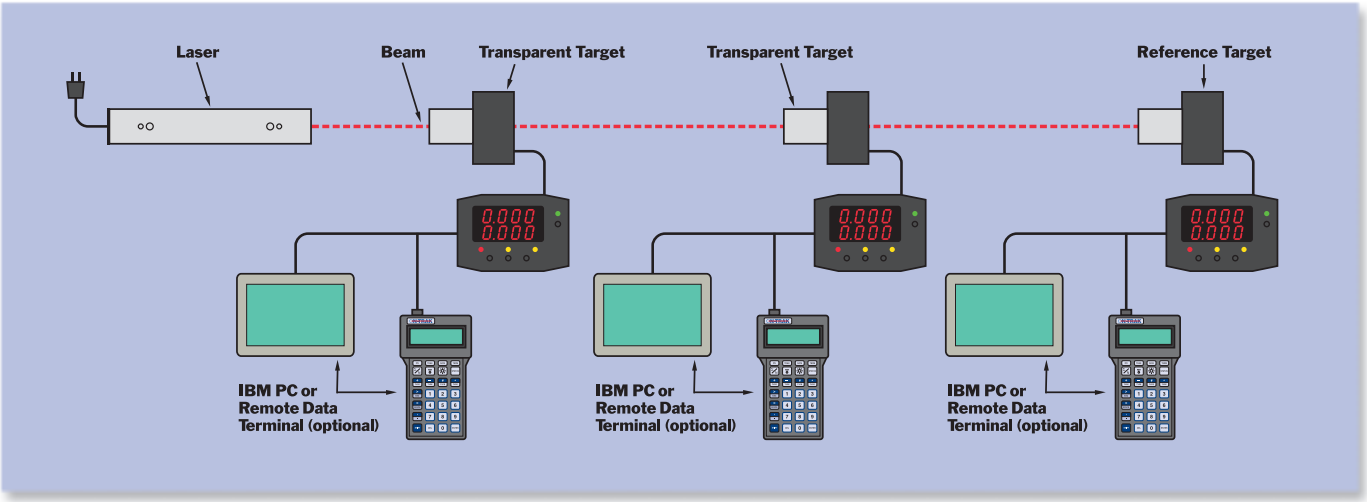
Many consider laser trackers “too much solution” for alignment applications alone. Conversely, optical telescopes, with their slow and subjective performance, are often considered “too little solution”.

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 multi-point, dynamic, objective measurement — something neither laser trackers nor optical telescopes individually offer.

1. *Carrying Case*
2. *Transparent Target*
3. *Reference Target*
4. *Optional Reference Target*
5. *Optional Reference Target*
6. *Laser*
7. *Central Processing Unit*
8. *Remote Data Terminal*
9. *Reflector Plate*
10. *Calibration Wedge*

Laser Alignment At A Glance.



How Laser Alignment Works.

The principle of linear laser alignment is simple. A stationary laser, aimed at a reference target up to 300 feet away, creates a "line in space" that serves as a rock-solid measurement reference.

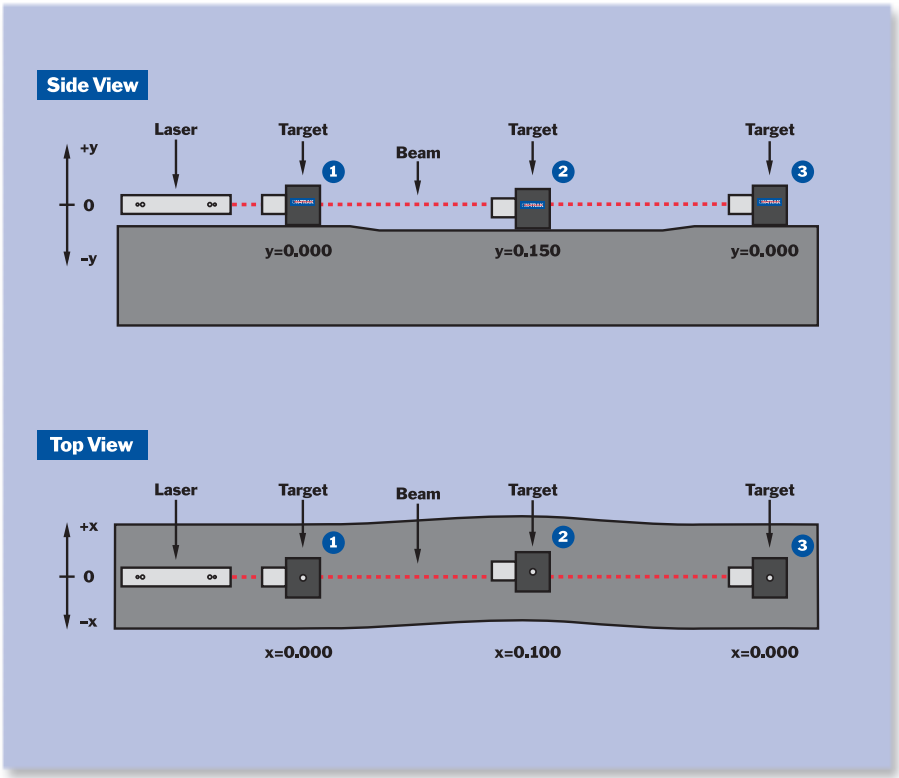
Next, one or more transparent targets are placed directly in the beam path. As the laser light passes through each transparent target, the target is able to determine the X-Y deviation of the laser beam with respect to the center of the tooling sphere.

Finally, this positioning information is output, in real-time, to a CPU for control, display and analysis. (An optional Remote Data Terminal or computer can be used for data collection or remote operation.)

The Line Laser Advantage.

Laser based alignment provides significant advantages over competing alignment techniques.

- **Cost Effective.** Outperforms laser tracking systems in this specific application, at a fraction of the price.
- **Ultra Precise.** Eliminates margin of error associated with subjective manual approaches.
- **Real-Time Feedback.** Enables user to make on-the-spot alignment adjustments.
- **Faster Measurement.** Reduces man hours and facilitates project efficiency.
- **Maximizes Range.** Perform measurements at distances up to 300 feet.
- **Simultaneous Measurement.** Enables simultaneous measurement from multiple targets.
- **Data Analysis.** Position data can be monitored, stored and analyzed by a computer.



Two points in space define a line: position the laser so the beam is centered on targets #1 and #3. Now, move target #2 anywhere along the beam path to read X,Y deviation. The side view shows deviation in the vertical (Y) direction; the top view shows deviation in the horizontal (X) direction.

OT-4040 LL | ULTRALIGN LASER

INTERNAL FIBER-COUPLED LASER DIODE.

- No-compromise performance to 300 feet.
- Beam centration of ± 0.002 inches.
- Pulsed at 10 Hz — allows target to be totally unaffected by ambient light.

POWER. An internal rechargeable NiMH battery pack provides 24 hours of continuous use. You can also power the laser using the standard AC wall charger (which simultaneously recharges the batteries).

LOW POWER INDICATOR. Illuminates when the battery pack is low and recharging is necessary.

TAPERED NAS MOUNT. A chrome-plated stainless steel NAS Mount, slightly tapered near the front of the laser, ensures instant integration into any standard NAS tooling sphere mount.

OT-4040 CW 0.010-Inch Calibration Wedge (option). Instantly verify target calibration, in real time, right on the factory floor. The CW Calibration Wedge conveniently attaches to the front of all NAS compatible targets.

OT-4040 RP Reflector Plate (option). Facilitate initial target setup with the RP Reflector Plate. This option makes it easy to ensure the target face is normal to the incoming laser beam.

OT-4040 TTS4 | TRANSPARENT TARGET

PROPRIETARY TRANSPARENT DESIGN. A proprietary beam-splitting pellicle design with internal compensation wedges eliminates beam deviation associated with laser beams passing through glass.

(Rear View Of The TTS4.)
The laser beam passes directly through the target.

1-INCH DIAMETER SENSOR AREA. A large active area makes it easy to place the target into the reference beam path.

INTELLIGENT SENSOR DESIGN. When mounted in a standard NAS tooling sphere, the target's internal PSD is perfectly centered within the sphere to ensure repeatability and insensitivity to errors in angular measurement.

MULTI-TARGET CAPABILITY. Use up to seven TTS4 transparent targets. When used with the OT-4040 CPU, they provide simultaneous, real-time display and data analysis.

POSITIVE MAGNETIC MOUNTING. Integral magnets firmly lock the target into any standard NAS tooling sphere.

LEVELING BUBBLE. An integral 30-minute level bubble provides convenient, ultra-precise target positioning.

LASER INDICATOR. A red LED illuminates continuously while laser light passes through the target.

OT-4040 TS4 | REFERENCE TARGET

1-INCH DIAMETER SENSOR AREA. A large active area makes it easy to place the target into the reference beam path.

(Rear View Of The TS4.)
This target fully absorbs the laser beam (no pass through).

INTELLIGENT SENSOR DESIGN. When mounted in a standard NAS tooling sphere, the target's internal PSD is perfectly centered within the sphere to ensure repeatability and insensitivity to errors in angular measurement.

POSITIVE MAGNETIC MOUNTING. Integral magnets firmly lock the target into any standard NAS tooling sphere.

LEVELING BUBBLE. An integral 30-minute level bubble enables convenient, ultra-precise target positioning.

LASER INDICATOR. A red LED illuminates continuously while laser light strikes the target.

OT-4040 CTS4 Reference Target (option). The CTS4 features a low-profile sensor head completely packaged in a 2.2498-inch diameter, 1.6-inch long housing. Ideal for limited-space applications, the CTS4 delivers identical performance to the TS4.

OT-4040 RS4 Reference Target (option). The RS4 offers the same performance as the TS4 in a rectangular housing that measures 2 x 2.75 x 1.4 inches (W x H x D). A precision dowel pin on the back of the housing provides a location for the center of the target.

OT-4040 CPU | CENTRAL PROCESSING UNIT

DISPLAY. Dual four-digit red LED displays make it easy to read X and Y position — even from several feet away. What's more, seven levels of display brightness helps conserve battery life.

PULSE AVERAGING. Average any number of pulses, from 1 to 100.

ZERO OFFSET ADJUST. Instantly set the zero at any point on the detector other than the mechanical/electrical zero.

POWER. The internal rechargeable NiMH battery pack provides 10 to 12 hours of continuous use, depending on user-selected LED brightness. You can also power the system with the standard AC wall charger (which simultaneously recharges the batteries). A yellow LED flashes continuously when the batteries are low.

SLEEP MODE. This battery-saving feature automatically shuts off the CPU after ten minutes of inactivity (ie., laser pulse, key entry or serial port activity). All current settings are saved.

LASER INDICATOR. A red LED illuminates continuously while the laser strikes the detector.

SERIAL COMMUNICATIONS. An RS-232 serial communications port makes remote operation easy. Connect your computer or optional OT-4040 RDT Remote Data Terminal to collect data, address targets or perform calibration tasks.

OT-4040 RDT Remote Data Terminal (option). This unit enables remote, hand-held operation up to 100 feet from CPU. View status, pulse average, and zero offset over its 4-line x 20-character supertwist backlit display.

Since 1992, On-Trak Photonics, Inc. has provided advanced position sensing and alignment solutions to companies ranging from Fortune 500 corporations to small industry start-ups. We pride ourselves not only on superior product, but exemplary service and support that goes the extra mile. Before, during, and after the sale.

Please contact us today for more information on the OT-4040 Alignment Laser System, and for details on our complete line of solutions for laser-based alignment.

OT-4040 System Specifications

OT-4040 LL Ultralign Laser

Power Output	Class IIA (<1 mW visible red)
Wavelength	635 nm
Beam Diameter	8 to 12 mm
Beam Profile	Circular gaussian, TEM_{00}
Modulation Frequency	10 Hz
Operating Distance	0 to 300 feet (100 m)
Centering	± 0.002 inches (0.05 mm)
Controls	On/off switch
NiMH Battery Lifetime	24 hours continuous operation
Power Requirement	12V/1A DC wall charger
Weight	8 lbs. (3.64 kg.)
Overall Length	14.5 inches (368.3 mm)
Enclosure	NAS standard 2.2498 inches (57.15 mm) diameter

OT-4040 CPU Central Processing Unit

Resolution	0.001 inches
Power	Rechargeable NiMH batteries DC wall charger
Battery Life	10-12 hours, depends on brightness
Display	LED ± 4 digit, programmable
Communications	RS-232 ASCII format
Weight	32 oz.
Dimensions	6 x 5 x 1.75 inches (H x W x D)

OT-4040 TTS4 Transparent Target

Position Sensing Area	25 mm diameter
Resolution	0.001 inches (0.01 mm)
Centering	± 0.002 inches (0.05 mm) to NAS mount
Weight	2.75 lbs. (1.25 kg.)
Size	NAS mount: 2.2498 x 3.0 inches (57.15 x 76 mm) Housing: 3.5 x 3.5 x 3.1 inches (89 x 89 x 78 mm)
Laser Acquisition Indicator	Red LED flashes simultaneously with laser pulse

OT-4040 TS4 Reference Target

Position Sensing Area	25 mm diameter
Resolution	0.001 inches (0.01 mm)
Centering	± 0.002 inches (0.05 mm) to NAS mount
Weight	2 lbs. (0.9 kg.)
Size	NAS mount: 2.2498 x 2.75 inches (57.15 x 76 mm) Housing: 3.5 x 3.5 x 1.6 inches (89 x 89 x 40 mm)
Laser Acquisition Indicator	Red LED flashes simultaneously with laser pulse

ON-TRAK® Photonics, Inc.
26782 Vista Terrace, Lake Forest, CA 92630 Phone: 949-587-0769 Fax: 949-587-9524

www.on-trak.com