



LEICA ABSOLUTE TRACKER AT960

Absolute portability. Absolute speed. Absolute accuracy.



ABSOLUTE ◀ PORTABILITY ▶

QUALITY AND PRODUCTIVITY ON THE MOVE

The Leica Absolute Tracker AT960 from Hexagon Metrology is the first truly portable dynamic six degrees of freedom (6DoF) laser measurement system providing a robust, all-in-one solution for even the most challenging large-scale metrology requirements.

With customers seeking better productivity while still demanding technical excellence, Hexagon Metrology offers pioneering solutions. The AT960 brings together the functionality of the hugely successful Leica Absolute Tracker AT901 and T-Cam with the usability of the compact Leica Absolute Tracker AT402, creating an ultra-portable coordinate measuring machine that fits in a single box.

Featuring independent hot-swappable battery operation and Wi-Fi as standard, the AT960's revolutionary integrated-technology design makes lengthy setup a thing of the past. With built-in levelling equipment, IP54 protection and a system weight of less than 14 kg, the AT960 can be taken almost anywhere.





“ The Leica Absolute Tracker is now a key piece of our metrology toolset when travelling to each and every race. The reduction in the weight of the tracker has significantly reduced shipping costs while guaranteeing the very best in precision. ”

Chris Charnley, Quality Manager, Infiniti Red Bull Racing

ABSOLUTE ◀SPEED▶

DYNAMIC FEATURES TO MEASURE AND GO

Metrology equipment should help complete a task quickly, not slow down the process.

The Leica Absolute Tracker AT960 offers high-speed probing, scanning and machine control solutions, as well as reflector measurements so inspections can be made using the most efficient method for the job. Intuitive controls save time in training and operations.

Automatic target lock

PowerLock provides intelligent targeting to automatically locate the reflector or probe for the easiest laser tracker operation yet. Now in its third generation, this patented active vision technology allows the AT960 to instantly re-establish an interrupted beam and continue the measurement without user intervention. Effective within the maximum working range of the tracker, PowerLock leaves operators to simply measure.


High-speed dynamic measurement

The Leica Absolute Interferometer (AIFM) enables the AT960 to measure a moving target with the fastest speed possible. In combination with a true real-time operating system, the AIFM and PowerLock allow the AT960 to continue measuring with a maximum uncertainty of just 10 µm after beam interruption and deliver a data rate of 1,000 points per second.

Easy-to-use controls

The wireless AT960 with battery option takes the difficulty out of setup, while color touch-screen controls enable operators to prepare the tracker without worrying about how to correct any problems. Proven Leica TrackerPilot check and compensation architecture means basic adjustments can be made in the field, while robust design guarantees on-specification operations with minimal calibration and servicing.





“ The portable Leica Absolute Tracker has enabled us to grow our metrology capabilities at the circuit, no matter where in the world we’re racing. Not only has it improved the precision of the car build, but it has also saved valuable time during the inspection process. ”

Chris Charnley, Quality Manager, Infinity Red Bull Racing



ABSOLUTE ◀ ACCURACY ▶

THE RIGHT WAY TO MEASURE —
WHATEVER THE APPLICATION

Driven by the absolute distancing capabilities of the AIFM, the Leica Absolute Tracker AT960 is capable of exceptional accurate readings across several inspection methods. This flexible functionality and customizable operation allow operators to select the best method for each application without compromising accuracy.

Built-in variozoom technology provides 6DoF measurement as standard, making the AT960 compatible with the latest Leica T-Product range, as well as traditional reflectors, to measure the right way every time. These four methods of measurement, along with versatile quick-release mounting options including inclined and inverted operations, ensure that the accuracy of the AT960 can always be applied to the task. With a completely sealed unit certified to IP54 and integrated environmental monitoring, the AT960 delivers reliable results in even the harshest conditions.

“ Microns and milliseconds are intrinsically linked. Using portable Leica Absolute Trackers to ensure the accuracy of car build on both sides of the garage results in increased quality and reliability for the car on the track. ”

Chris Charnley, Quality Manager, Infinity Red Bull Racing

Reflector measurements

With optical centering accuracy of $\pm 3 \mu\text{m}$, Leica reflectors offer a highly accurate solution for line-of-sight measurements. Automatically located and tracked by PowerLock, reflectors allow high-speed dynamic measurement in volumes of up to 120 m (\emptyset). Available in a range of types and sizes for various applications, they are compatible with any Leica Absolute Tracker including the AT960.



Hand-held probing solutions

Small, light and accurate, the Leica T-Probe is a wireless battery-operated probing solution for measuring even the hardest-to-reach points. Featuring user-assignable multi-function buttons and integrated measurement feedback along with automatically recognized changeable styli, it sets the benchmark for operator-friendly measurement applications in volumes of up to 40 m (\emptyset).



Hand-held scanning solutions

The faster, more accurate and less damaging alternative to scrubbing a reflector over a surface to record multiple points, the Leica T-Scan laser scanner records more than 200,000 points per second even on shiny metallic or dark surfaces. With no powdering required, preparation time is cut to a minimum, while automatic adjustments ensure the best possible readings in a single pass.



Automated solutions

A machine control sensor for automated 6DoF applications, the Leica T-Mac can be customized for specific purposes including tactile and non-contact inspection, monitoring and correcting robotic systems or controlling automated production elements. Generating not just positional data, but also the pitch, roll and yaw of an object, it can deliver up to 1,000 measurements per second.



HIGH-END ◀ TECHNOLOGY ▶ IN ULTRA-PORTABLE FORM

With a longstanding commitment to research and development, Hexagon Metrology provides innovative solutions that help customers to maximize and maintain productivity. The Leica Absolute Tracker AT960 – designed for quicker, more accurate results and a better user experience – is the latest product for this approach.

Augmenting proven technology with new innovations in the AT960, Hexagon Metrology has created a sophisticated yet user-friendly, walk-around CMM that fits in a single flight case.

Offering high-speed dynamic measurement, the AT960 is a single-unit solution for 6DoF probing, scanning and machine-controlled inspection. With the complete range of Leica laser tracker accessories built into the device, the AT960 can be transported easily, unpacked quickly and powered up in minutes to measure in any location.

Combining portability with usability, the AT960 makes operation intuitive, reducing user workload to minimize the margin for error and save time, effort and money. With applications spanning aerospace, automotive, shipbuilding, manufacturing and many more sectors, the AT960 is the new standard in portable industrial metrology.



FEATURES AND BENEFITS



All-in-one design

With all the equipment for measurement to a reflector, Leica T-Probe, Leica T-Scan or Leica T-Mac built in, the compact all-in-one unit is ultra-portable for easy transportation to measure anywhere.



PowerLock

Interrupted line of sight is automatically re-established in a ± 5 degree field of view without user interaction for ease of use and exceptional performance in even the most crowded measurement volumes.



Battery power*

Independent hot-swappable battery power supply allows a quick and easy cable-free setup in almost any location for better portability, offering a flexible solution that lasts up to a day's shift – wherever the tracker is needed.



Wi-Fi

Built-in Wi-Fi enables simple setup and communication with the PC for truly wireless operations, also providing remote control options via laptops, tablets or smartphones so the tracker can be operated by a single user.



IP54

The IEC-certified sealed unit guarantees ingress protection against dust and other contaminants, enabling the tracker to measure effectively in even the harshest environments.



MeteoStation

Integrated environmental unit monitors conditions including temperature, pressure and humidity to compensate for changes and ensure accurate measurements regardless of external factors.



Overview camera (OVC)

High-resolution color OVC enables operators to remotely view the tracker's field of vision, locating targets to measure to fixed reflectors – including multi-spot handling in a single image – ideal for static hidden-point devices or to supplement documentation.



Orient to gravity (OTG)*

The OTG function enables users to measure with the Z-axis aligned to gravity, ideal for levelling and alignment tasks such as build and inspect of tool and jig fixturing.



Absolute Interferometer (AIFM)

The AIFM single-distancing unit combines the accuracy of an absolute distance meter and the speed of an interferometer to give readings quickly and accurately without the need for a home point.



1 kHz data output

Real-time architecture with dynamic performance gives a measurement rate of up to 1,000 points per second, enabling more detailed data capture more quickly.



Integrated mini variozoom

With a constant field of view in any light conditions, mini variozoom provides 6DoF measurement capabilities for accurate probing, scanning and machine control applications.

* Available in 2015

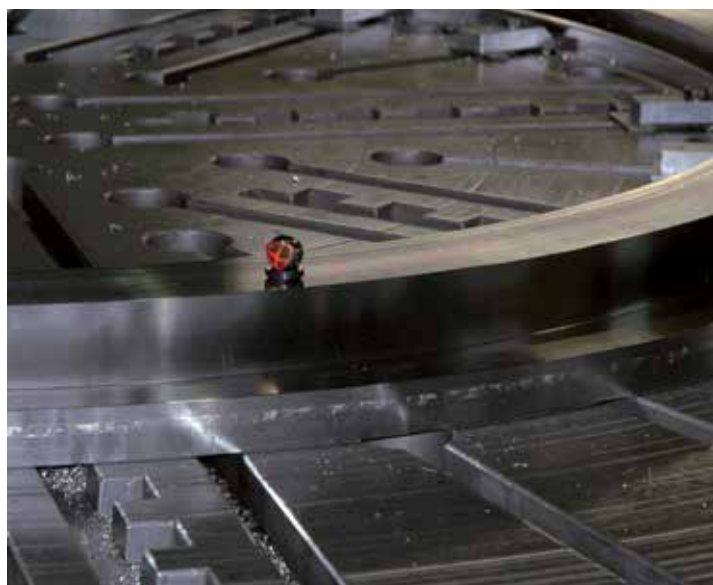
◀VERSATILE AND RELIABLE▶

FOR ANY INDUSTRY

Every industry has specific metrology requirements, yet the simple setup and adaptable operation of the Leica Absolute Tracker AT960 make it an outstanding solution for a whole host of applications.

With Hexagon Metrology's specialty software suites, the AT960 can be optimized for use in a range of industries – offering a full-system solution to make complicated measurement tasks quick and easy. For high-definition surface scanning and feature extraction, automation and machine control, hidden-point probing or traditional dynamic 3D reflector measurements, the AT960 is the go-to laser tracker system.





SPECIFICATIONS



Accuracy *

$$U_{x,y,z} = \pm 15 \mu\text{m} + 6 \mu\text{m/m}$$

* All accuracies are specified as maximum permissible errors (MPE) and calculated per ASME B89.4.19-2006 & draft ISO10360-10 using precision Leica 1.5" Red Ring Reflectors unless otherwise noted.

Angle accuracy

$$\pm 15 \mu\text{m} + 6 \mu\text{m/m}$$

Distance accuracy AIFM

$$\pm 0.5 \mu\text{m/m}$$

Dynamic lock on

$$\pm 10 \mu\text{m}$$

Environmental working conditions

Dust/Water

IP54 (IEC 60529)

Operating temperature

0°C to +40°C

Data output rate

1,000 points/sec

Laser safety

Class 2

IEC 60825-1 (2014-15) "Safety of laser products"

EN 60825-1 (2007-10) "Safety of laser products"

Leica T-Probe

$$\pm 35 \mu\text{m} *$$

* Additional T-Probe uncertainty to be added to the existing Leica Absolute Tracker AT960 "U_{xyz}" uncertainty for a complete "U_{xyz}" uncertainty.

Leica T-Scan

$$\pm 60 \mu\text{m}$$

210,000 points/sec

Leica T-Mac *

Position accuracy

$$\pm 15 \mu\text{m} + 6 \mu\text{m/m}$$

Typical rotation accuracy

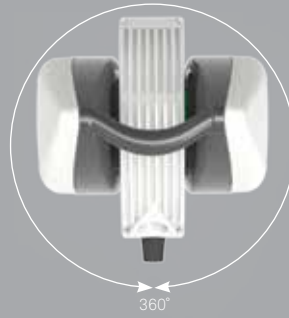
$$\pm 0.01 \text{ degree } **$$

Rotation accuracy of timestamp

< 5 microseconds

* All accuracies are stated in maximum permissible error (MPE). Typical results are half of MPE.

** Typical accuracy



Measurement volume (Ø)



AT960-LR

120 m

40 m

40 m

40 m

AT960-MR

40 m

20 m

20 m

20 m

AT930 *

120 m

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* Reflector only

GLOBAL PRESENCE

FOR FAST LOCAL RESPONSE

Hexagon Metrology's increasing global presence gives customers guaranteed aftermarket support and services, wherever they are in the world. With the largest dedicated service team of any metrology equipment manufacturer, the customer experience does not end at purchase.

Committed to providing local services that minimize costs and downtime for customers, a growing network of operations centers and partners on five continents enables Hexagon Metrology to offer a complete range of aftermarket support including service and repairs, certification and calibration, software maintenance and upgrades, contract inspection and programming, system upgrades and operator training.



DRIVING INNOVATION

FOR OVER 25 YEARS

The Leica Absolute Tracker AT960 is the latest innovation in Leica laser trackers. Drawing on mature technology from over 25 years of research and development to raise the bar once again, Hexagon Metrology offers the most advanced and accurate Leica portable tracker system ever to help customers measure their world in increasing detail.

Leica has an unrivaled pedigree for laser tracker technology, having introduced the original shop-floor tracker system to the market in 1990. Since then, Leica products have continued to revolutionize the technology, creating the first absolute distance meters, 6DoF trackers, absolute interferometers and the PowerLock active vision system. This continuing desire for progress ensures the Leica name always stands for quality.

1990



2015



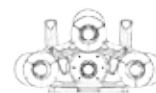
PRECISION MEASURING
INSTRUMENTS



PORTABLE MEASURING ARMS



LASER TRACKERS
& STATIONS



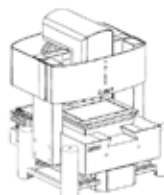
WHITE LIGHT SCANNERS



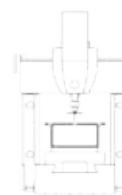
SENSORS



BRIDGE CMMS



MULTISENSOR & OPTICAL SYSTEMS



ULTRA HIGH ACCURACY CMMS



HORIZONTAL ARM CMMS



GANTRY CMMS



AUTOMATED APPLICATIONS



SOFTWARE SOLUTIONS



HEXAGON
METROLOGY

Hexagon Metrology offers a comprehensive range of products and services for all industrial metrology applications in sectors such as automotive, aerospace, energy and medical. We support our customers with actionable measurement information along the complete life cycle of a product – from development and design to production, assembly and final inspection.

With more than 20 production facilities and 70 Precision Centers for service and demonstrations, and a network of over 100 distribution partners on five continents, we empower our customers to fully control their manufacturing processes, enhancing the quality of products and increasing efficiency in manufacturing plants around the world.

For more information, visit
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Hexagon Metrology is part of Hexagon (Nordic exchange: HEXA B). Hexagon is a leading global provider of design, measurement and visualisation technologies that enable customers to design, measure and position objects, and process and present data.

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