FARO® Laser Tracker
Productivity by Design
The FARO Laser Tracker Vantage
A breakthrough in laser tracker technology

As the world’s leading three-dimensional measurement and imaging company, FARO has reinvented high accuracy, large volume measurement with the FARO Vantage. Offering a breakthrough in laser tracker technology, the FARO Vantage offers the world’s most complete laser tracking solution.

The FARO Laser Tracker is an extremely accurate, portable coordinate measuring machine that enables you to build products, optimize processes, and deliver solutions by measuring quickly, simply and precisely.

- **Compact Size**
  The smallest and lightest FARO Laser Tracker ever built is incredibly easy to transport between job sites.

- **SmartFind**
  Quickly and efficiently locates and locks on to the correct target.

- **Water and Dust Resistant IP52 Rating**
  The Vantage can be used in demanding industrial conditions without effecting its performance.

- **TruADM**
  Patented 5th generation ADM system provides the accuracy needed for everyday, real-world applications.

- **MultiView Cameras**
  This patent pending integrated two-camera system can automatically point to a specific target and quickly and efficiently locate the target when it is not in the normal position.

- **QuickComp**
  Optimizes measurements based on specific ranges to maintain high system accuracy.

- **TriMap Encoders**
  Three read head system that is self-mapping; Enables faster service time in more convenient locations.
Quality Control

In the quality control of incoming goods the Laser Tracker is used to verify complex supply parts, and document and optimize manufacturing processes.

Robot Calibration

FARO Vantage performs the calibration of robots by absolute measurement during the so-called In-Process-Inspection. This allows the robot to detect possible production errors saving costs and rework time.

Machine Fixture

The FARO Laser Tracker supports the construction process and the fixture of complex machining devices. These undergo then periodical inspections.

Assembly

The FARO Laser Tracker measurement technology offers on-site assembly and inspection of large, individual segments with complex interfaces in relation to one another. The Laser Tracker is an integral part of modern manufacturing plants.

Part Inspection

Flexible, mobile measurement and inspection of large components during the assembly phase. FARO’s user-friendly CAD-based software makes the evaluation and reporting simple and accurate.

FARO Vantage

World’s most complete laser tracking solution

The FARO Laser Tracker accurately performs measurements within many applications throughout a wide range of industries. It offers improved methods of measurement and makes entirely new manufacturing methods possible.
**Distance Measurement**

The Laser Tracker sends a laser beam to a mirrored probe which functions as a target. The reflected beam returns to the tracker and its precise distance is recorded.

**3D Measurement**

Two angle encoders measure the elevation and rotational angles while a highly accurate absolute distance meter is used to determine the 3D position of the target. This position is shown in the software as an X, Y, Z value.

**Tracking**

The target returns the reflected laser beam parallel but offset back to the tracker where it hits the position detector, which calculates the offset between the outgoing and incoming beam. Servo motors continuously (thousands of times per second) steer the tracker’s head to minimize the offset between the two beams, resulting in high-speed, dynamic measurements.

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**Measurement Method**

- **Point to Point Accuracy***
- **Horizontal Scale Bar Measurement (2.3m)**
- **In-Line Distance Measurement**
- **3D Measurement**
- **Tracking**
- **System Specifications**

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**Specifications**

- **Dimensions**
  - **Head size (w x h)**: 224mm x 416mm
  - **Head weight**: 12.6kg
  - **Controller size (l x d x h)**: 290 x 158 x 214mm (without filters), 316 x 158 x 214mm (with filters)
  - **Controller weight**: 4.8kg

- **Environmental Laser Emission**
  - **653-663nm Laser**: 1mW max./cw Class II Laser Product

- **Angle Measurement***
  - **Max. radial acceleration**: 30m/sec²
  - **Max. angular velocity**: 180°/sec
  - **Precision level accuracy**: ±2 arcseconds

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**Accuracy Specifications**

- **MPE (mm)**
  - **Horizontal Scale Bar Measurement (2.3m)**
    - Range (m) 2 3 10 20 30 60 80
    - MPE (mm) 0.044 0.064 0.099 0.17 0.24 0.312 0.432 0.594
    - Typical (mm) 0.023 0.032 0.049 0.085 0.12 0.156 0.191 0.291

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**Multiview Cameras**

- **30° - 130° (+77.9° to –52.1°)**
- **Maximum working range**: 80 m
FARO Vantage
Innovative Enhancements

Instant-On Laser
Begin taking measurements faster since no warm-up of the laser tube is required. Available exclusively with the Vantage, this feature can result in a setup time savings of 20 to 30 minutes!

MultiView Cameras
The Vantage is the only laser tracker available with MultiView technology – a patent pending fully-integrated two-camera system. This technology allows you to automatically point to a specific target that may be difficult to reach. It is also beneficial for automated assembly applications where the variation from part to part can cause the target to not be in its normal position. In these cases MultiView quickly and efficiently locates that target.

SmartFind
Thanks to FARO’s exclusive SmartFind technology, you now have a faster and easier way of measuring around complex tooling and structures where tracking the SMR between locations is difficult or impossible. When you break or lose the Vantage’s beam while in MultiView’s field of view, you can simply gesture to the Laser Tracker and it will aim the beam back to your target.

TruADM
The Vantage’s TruADM technology provides the accuracy you need for everyday, real-world applications where the differences between absolute distance measurement (ADM) and interferometer (IFM)-based measurement are, for the most part, insignificant. TruADM is FARO’s 5th generation patented ADM system. Unlike technologies that require an IFM system to assist their ADM system, FARO’s TruADM simplifies the process.

TruADM uses patented predictive algorithms to compensate for the acceleration and velocity of a moving target. This results in a technologically advanced system, where the ADM is so fast that dynamic measurements can be taken by scanning with the SMR. With FARO Laser Trackers you have the ability to scan complex surfaces, flatness of planes and diameters of circles. You can quickly and easily characterize the form of features to better understand the geometry of your parts and make informed decisions.

TriMap Encoders
TriMap is a patent pending encoder system exclusive to the FARO Vantage. It features a three read head system that is self-mapping, enabling faster service time in more convenient locations to ensure you are maximizing the use of your Laser Tracker and getting the most from your investment.

Internal Systems
Features you’ve come to rely on

Integrated WLAN
Embracing the latest standards in wireless technology, the Vantage’s integrated WLAN means there is no need to plug the Laser Tracker into the laptop computer. You can simply measure anywhere within the wireless network’s range, enhancing the unit’s portability and convenience.

Integrated Weather Station
Temperature, air pressure, and humidity can affect the speed at which light travels through air. The integrated weather station monitors these and compensates for these variables to ensure the accuracy of the measurement results.

Water & Dust Resistant IP52 Rating
With the Vantage you can now use your Laser Tracker in conditions you never thought possible. The Vantage is designed for reliability; and durability is of no concern with its water and dust resistant IP52 rating, making it FARO’s highest IP-rated device.

Product Comparison

<table>
<thead>
<tr>
<th>FARO Vantage</th>
<th>FARO ION</th>
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<tr>
<td>✓ TruADM</td>
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FarO® ION®
High Precision IFM-Based Laser Tracker

**Point to Point Accuracy***

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<td>0.032</td>
<td>0.049</td>
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**System Specifications***

- **Head size (w x h)**: 311 mm x 556 mm
- **Head weight**: 19.3 kg
- **Controller size (l x d x h)**: 282 x 158 x 214 mm
- **Controller weight**: 5.2 kg
- **Altitude**: -700 to 2450 m
- **Humidity**: 0 to 95%, non-condensing
- **Operating temperature**: -15°C to 50°C (5°F to 122°F)
- **Laser Emission**: 633-635 nm, Laser 1 mW max./cw, Class II Laser Product
- **Resolution**: 0.5 μm
- **Sample rate**: 10,000 points/sec
- **Accuracy (MPE)**: 4 μm
- **R0 Parameter (MPE)**: 16 μm
- **Angular accuracy (MPE)**: 20 μm
- **Maximum radial velocity**: 4 m/sec
- **R0 Parameter (MPE)**: 16 μm
- **Precision level accuracy**: ±2 arcseconds
- **Maximum angular velocity**: 180°/sec

**Measurement Method**

- **Distance Measurement**
  - The Laser Tracker sends a laser beam to a mirrored probe which functions as a target. The reflected beam returns to the tracker and its precise distance is recorded.

- **3D Measurement**
  - Three coordinates are calculated to locate the SMR in 3D space: the horizontal and vertical angles and the radial distance to the tracker. These three values, the X, Y, Z coordinates, enable the tracker to calculate the precise position of the SMR target on selected measurement points.

- **Tracking**
  - The target is a spherically mounted retroreflector (SMR) which the operator manually places on measurement points. In the tracker, a position-sensing device drives servo motors which follow the position of the SMR. This closed loop updates 1,000 times per second, allowing the tracker to instantly relocate the beam if interrupted.

**FARO® ION® High Precision IFM-Based Laser Tracker**

**Dimensions Environmental Laser Emission**

- **Distance Measurement Agile ADM**

- **Distance Measurement IFM**

- **Angle Measurement**

**Note:** All specifications and data are subject to change without notice. Always consult FARO for the latest information.
Accurate, Durable and Affordable
Break Resistant SMRs

- Standard Accuracy (Black Ring), Long Range (Green Ring), High Performance (Blue Ring)
- High performance model is 80% more accurate than previous FARO break resistant SMRs
- Combination of the sphere properties and the centering of the optics make the high performance model the world’s most accurate break resistant SMR
- Lower cost than previous break resistant models
- Single element retroreflector with a gold coating (no separate glass panels that can shift or break over time)

Break Resistant Window SMRs

- Ultimate performance in harsh environments
- Window covering is designed to keep the reflective optics clean
- Replaceable window collar
- Single element retroreflector with a gold coating

Heavy Duty Break Resistant SMRs

- Solid stainless steel ball
- Integrated retroreflector with a gold coating
- Ability to operate at optimum performance at extreme temperatures

Glass Panel SMRs

- Protected silver coating
- Standard and high accuracy models

Repeatability Targets

- Ensures repeatability regardless of the pointing angle from the laser tracker
- Perfect target for ADM repeatability surveys
- Standard and long range models
- Optional protective window covering

RetroProbes

- Measure in recessed areas or small features such as holes, slots and machine faces
- Proves the functionality of an articulated arm or fixed CMM-style probing
- Minimize laser tracker repositioning
- One-inch and four-inch extension models

Roller Board*

- Innovative design
  - The innovative roller board design revolutionizes the way you transport your Laser Tracker. This case not only protects the head unit, but it also pulls as easily as a standard travel suitcase!

Backpack*

- Comprehensive transportation system
  - The Vantage’s backpack holds the master control unit (MCU) along with other required accessories, providing you with a comprehensive transportation system. Its ergonomic design is comfortable enough to wear on your back, or it can easily be set on top of the roller board, allowing you to transport the entire system as a single unit.

Shipping Cases

- Heavy-duty cases
  - When you prefer to ship your tracker, the heavy-duty cases hold both the roller board and backpack and provide the necessary protection for transport. The cases also include extra space for storing items such as extension cords, power supplies, or other accessories needed to complete your job.

Tripod options

- Mount it where you need it
  - FARO offers diverse mounting options that allow for easy setup and high flexibility.

*Vantage only
Software for the FARO Laser Tracker
3D measurement software

CAM2 Measure 10 meets customer demands. Our hardware and software were designed to make measuring processes easier. Features like Remote Measurement, Repeated Part Measurement, Shortcuts or the Easy Move Wizard improve every process where 3D measuring is needed.

FARO CAM2 Measure 10

Remote Measurement
With the CAM2 Measure 10 Remote Apple App, iPhone, iPod Touch and iPad owners can communicate with their CAM2 Measure 10 via WLAN and thus conduct remote measurement.

Repeated Part Measurement with QuickTools
Quick, simple and reliable repeated part measurement.

Shortcuts
The new Shortcuts feature allows users to create new commands to measure features that are only available through combining measurements and constructions. Shortcuts empower you to record all steps of a complex measurement into a single command that can later be accessed with a single mouse click.

Easy Move Wizard
The Easy Move Wizard is a great assistance for measuring large parts when the need to reposition the device is often necessary to complete a measurement. The complexity of finding the correct target correspondence is taken away from the operator, cutting down on the time required for the repositioning and removing the risk of human errors.

Compatible with numerous software solutions
All FARO measurement systems can be used in conjunction with a broad range of third party software.

Some of our software partners

Customer service
Training and worldwide service

FARO has worldwide customer support offices. Thus we can offer training and on-site services close to our customers. We are also ISO 9001:2001 certified and ISO-17025 laboratory registered.

Training

Courses for your employees
A measurement system is only as good as its user. That’s why FARO offers training courses and workshops to ensure your operators make the most out of our products’ features and benefits.

Whether you require basic or advanced training – we adapt our courses to the individual needs of the participants. Training is carried out in small groups at FARO or – if you wish – at your facilities to guarantee the individual attention our customers deserve.

Customer service

Always there for you
On the phone:
Our customer service staff are available from 8am to 5pm (GMT +1) from Monday to Friday.
Freecall number: 00 800 3276 7378
Tel: +49 7150 9797 400

Online:
Tips and tricks are accessible in our Online Support Centre where you can also ask questions. Further information can be found at www.FARO.com/uk/customerservice
Email: support@faroeurope.com

On-site:
Our application engineers will help you on-site.

Advantages of the service contract
The service contract includes maintenance, inspection and calibration of your measuring device by our experts. In addition you will receive a 10% discount on all accessories and free re-certification, repair and advice.
FARO’s customers include automotive manufacturers and their suppliers, companies from the aerospace sector, tool and mould making, mechanical engineering, metalworking, heavy equipment, consumer goods, power generation enterprises, countless small businesses, public authorities, and monument conservation firms. In total we care for more than 15,000 customers.

“We use several FARO Laser Trackers and we are highly satisfied with the results.”
Dr. Dietmar Tscharnuter, Project Manager, KUKA Robotics