

# FARO® Quantum<sup>S</sup> FaroArm®

## The Global Standard for Arm Technology

# FARO®



### ACCURACY – “I CAN’T THRIVE WITHOUT MY ARM!”

The Quantum<sup>S</sup> is the most accurate FaroArm® ever produced and delivers the highest level of performance to meet even the most challenging of tolerances.

The system delivers best-in-class performance for both hard probing or laser scanning applications. Combined with the newest FAROBlu™ Laser Line Probe HD, the Quantum<sup>S</sup> ScanArm allows you to scan 5X faster than previous generations and provides unparalleled non-contact capabilities, offering high-speed point-cloud capture, superior resolution and high accuracy – all in a compact and easy-to-use system.

### ACCESSIBILITY – “I CAN’T DRIVE WITHOUT MY ARM!”

The FARO Quantum<sup>S</sup> is the right choice for advanced manufacturing, providing more efficiency across highly demanding factory environments like automotive, aerospace and others. The Quantum<sup>S</sup> features FARO kinematic smart probes, which provide unparalleled user experience allowing for quick probe replacement without the need to recalibrate. In addition, the Quantum<sup>S</sup> leverages robust WiFi®, the industrial grade wireless capability that delivers the best accessibility in a shop-floor environment.

The FARO Quantum<sup>S</sup> provides a safeguard to the highest quality standards for the world’s leading automotive manufacturers and the demanding safety tolerances for the world’s global aerospace providers, it also ensures that manufacturers of any size in almost any industry can optimize their manufacturing processes. The Quantum<sup>S</sup> provides an improvement increase to internal manufacturing processes.

### RELIABILITY – “I CAN’T SURVIVE WITHOUT MY ARM!”

The FARO Quantum<sup>S</sup> allows manufacturers to work faster and work smarter than ever before, delivering better quality products, with a significant reduction in waste. The Quantum<sup>S</sup> is also equipped with dual, hot swappable batteries, which allows you to leverage the Quantum<sup>S</sup> for multiple applications and extends its impact and efficiency anywhere you need on the factory floor, without the additional requirement for external power.

The Quantum<sup>S</sup> helps manufacturers stay ahead of their competitors in an increasingly global manufacturing marketplace by empowering better quality assurance and ensuring customer confidence in their products and processes. This focus can be shared by your entire production team, as the Quantum<sup>S</sup> is one of the most intuitive and easy-to-use Arms ever built.

### QUALITY – “I CAN’T LIVE WITHOUT MY ARM!”

The new FARO Quantum<sup>S</sup> Arm is the world’s most innovative portable coordinate measuring machine (PCMM) that allows manufacturers easy verification of product quality by performing 3D inspections, dimensional analysis, CAD comparison, tool certifications, reverse engineering, and more.

The Quantum<sup>S</sup> is the first Arm to meet the new and most rigorous ISO 10360-12:2016 international measurement quality standard. The Quantum<sup>S</sup> sets a new industry performance bar and extends FARO’s tradition of maximum measurement consistency and reliability in every working environment.

The repeatability and accuracy in the Quantum<sup>S</sup> is unparalleled and has been tested under the most extreme factory-stress testing to ensure consistent quality.

The FARO Quantum<sup>S</sup> is available in four working volumes and it is the most intuitive, ergonomic and accurate measuring Arm FARO has ever delivered. Perfectly suited for high accuracy measurement tasks, it helps manufacturers’ meet their most demanding specifications on parts and assemblies.

## FARO® QUANTUM<sup>S</sup> – “ARM STRENGTH”

### Innovative design for highest performance and reliability

An all-new design ensures superior performance and confidence in measurement results in most working environments, delivering high consistency and reliability, while the FAROBlu™ Laser Line Probe HD ensures best-in-class scanning capability (5X faster laser scanning).

### Excellent ergonomics and usability

New ergonomic design, overall weight optimization, combined with new features including FARO kinematic quick-change intelligent probes, which allow you to quickly and easily switch probes during inspection.

### High Speed Wireless Operation

Robust WiFi®- new sophisticated electronic design delivers superior reliability and guarantees optimal wireless operation for scanning and probing.

### Extended Battery Use

Dual hot swappable batteries support prolonged cable-free operation of the device, making it easy to go to the part without the need for external power.

### Compliance with international standard

The performance of the Quantum<sup>S</sup> is the first arm in the market that can be verified against the international certification standard, ISO 10360-12:2016, setting a new industry performance bar and ensuring maximum measurement consistency and reliability in a wide range of work environments.

## QUANTUM<sup>S</sup> WITH FAROBLU (QUANTUM SCANARM) – “ARM EXTENSION”

The Quantum<sup>S</sup> combined with the FAROBlu, Laser Line Probe HD, delivers unparalleled non-contact measurement capabilities by integrating the best laser scanner available in the market.

Through simple Plug and Play, users can attach the FAROBlu to the Quantum<sup>S</sup>, creating an all-in-one measurement solution.

The hard probe and the Laser Line Probe can digitize interchangeably without having to remove either component. Users can digitize simple features with the Arm's hard probe and seamlessly scan across diverse surface materials regardless of contrast, reflectivity or part complexity without any special coatings or target placement.

The Quantum ScanArm is ideal for inspection and quality control, offering capabilities such as point cloud comparison with CAD, rapid prototyping, reverse engineering, and 3D modeling of free-form surfaces.

The FAROBlu Laser Line Probe HD utilizes blue laser technology and state-of-the-art camera and optics to provide best-in-class scanning capability, responding to customer needs in terms of fast scanning speed for high productivity. It allows operators to scan challenging surfaces - including dark and reflective materials - and provides users with high resolution and accuracy.

The extra wide scan stripe and fast frame rate boosts productivity by increasing coverage and reducing scanning time. Intricate components can be captured in fine detail, as a result of the 600,000 points per second and the FAROBlu Laser Line Probe HD, featuring noise reduction technology. Users can dramatically reduce required training time with the crosshair feature and LED Rangefinder functionality, which provides real-time scanning feedback.



## FAROBLU LASER LINE PROBE HD

### Blue laser

The FAROBlu Laser Line Probe HD leverages an optically-superior blue laser technology. The blue laser has a shorter wavelength, which delivers improved scanning results with higher resolution thanks to its greater ability to discover smaller detail in an object. The blue laser also provides a 50% reduction in speckle noise compared to red laser.

### Advanced sensor

The FAROBlu Laser Line Probe HD camera uses the most advanced CMOS technology to deliver fast frame rate (the number of times per second that the camera gathers new data on the part being scanned) of up to 300 frames per second (fps).

### Custom optics

The FAROBlu Laser Line Probe HD boasts superior, large-diameter, custom optics that collect more light and more data to deliver better accuracy and sharper and brighter images. Utilizing a greater sweet spot, it supports a wider laser line width that scans a larger area, providing faster, more productive scanning.

### Laser line width

The FAROBlu Laser Line Probe HD features laser line width of 150mm. The extensive line width scans a larger area, delivering fast and efficient scanning. Additionally, the Laser Line Probe HD features a solid, blue laser beam generated without the use of moving components which can be sensitive to vibration, potentially inducing errors in accuracy and impacting productivity by forcing repeat scans.

## MOST COMMON APPLICATIONS – “ARM REACH”

- Alignment
- Dimensional Analysis
- CAD-Based Inspection
- First Article Inspection
- Incoming Inspection
- In-Process Inspection
- On Machine Inspection
- Part Inspection
- Final Inspection
- Reverse Engineering
- Tool Building & Setup

## TYPICAL INDUSTRIES – “ARM LENGTH”

- ▶ **Aerospace:** Part inspection and certification, alignment, tooling & mold certification and reverse engineering
- ▶ **Automotive:** Tool building & certification, alignment, part inspection and reverse engineering
- ▶ **Metal fabrication:** OMI, First Article Inspection, Periodic Part Inspection
- ▶ **Molding/tool & die:** Mold and die inspection, prototype part scanning
- ▶ **Woodworking:** Certification, alignment, tooling, part inspection and reverse engineering
- ▶ **Plastics:** Certification, alignment, tooling, part inspection and reverse engineering
- ▶ **Toy Manufacturing:** Certification, alignment, tooling, part inspection



## PERFORMANCE SPECIFICATIONS

Contact Measurement (Arm)*										
Measurement range	SPAT <sup>1</sup>		E <sub>UNI</sub> <sup>2</sup>		P <sub>SIZE</sub> <sup>3</sup>		P <sub>FORM</sub> <sup>4</sup>		L <sub>DIA</sub> <sup>5</sup>	
	6 axis	7 axis	6 axis	7 axis	6 axis	7 axis	6 axis	7 axis	6 axis	7 axis
Quantum <sup>S</sup> 1.5m (4.9ft.)	0.012mm (0.0005in.)		0.023mm (0.0009in.)		0.008mm (0.0003in.)		0.015mm (0.0006in.)		0.027mm (0.0011in.)	
Quantum <sup>S</sup> 2.5m (8.2ft.)	0.018mm (0.0007in.)	0.022mm (0.0009in.)	0.028mm (0.0011in.)	0.032mm (0.0013in.)	0.010mm (0.0004in.)	0.012mm (0.0005in.)	0.020mm (0.0008in.)	0.025mm (0.0010in.)	0.035mm (0.0014in.)	0.048mm (0.0019in.)
Quantum <sup>S</sup> 3.5m (11.5ft.)	0.036mm (0.0014in.)	0.045mm (0.0018in.)	0.056mm (0.0022in.)	0.070mm (0.0028in.)	0.020mm (0.0008in.)	0.024mm (0.0009in.)	0.040mm (0.0016in.)	0.045mm (0.0018in.)	0.070mm (0.0028in.)	0.100mm (0.0039in.)
Quantum <sup>S</sup> 4.0m (13.1ft.)	0.045mm (0.0018in.)	0.055mm (0.0022in.)	0.068mm (0.0027in.)	0.085mm (0.0033in.)	0.024mm (0.0009in.)	0.030mm (0.0012in.)	0.045mm (0.0018in.)	0.050mm (0.0020in.)	0.086mm (0.0034in.)	0.120mm (0.0047in.)

Non-Contact Measurement (ScanArm)**	
Measurement range	L <sub>DIA</sub> <sup>5</sup>
Quantum <sup>S</sup> 2.5m (8.2ft.)	0.048mm (0.0019in.)
Quantum <sup>S</sup> 3.5m (11.5ft.)	0.080mm (0.0031in.)
Quantum <sup>S</sup> 4.0m (13.1ft.)	0.092mm (0.0036in.)

All values represent MPE (Maximum Permissible Error)

\* Contact Measurement (Arm): In accordance with ISO 10360-12

\*\* Non-Contact Measurement (ScanArm): Full System performance in accordance with ISO 10360-8 Annex D

<sup>1</sup> SPAT – Single Point Articulation Test

<sup>2</sup> E<sub>UNI</sub> – Distance Error between two points comparing measured vs nominal values

<sup>3</sup> P<sub>SIZE</sub> – Sphere Probing Size Error comparing measured vs nominal values

<sup>4</sup> P<sub>FORM</sub> – Sphere Probing Form Error

<sup>5</sup> L<sub>DIA</sub> – Sphere Location Diameter Error (Diameter of the spherical zone containing the centers of a sphere measured from multiple orientations)

## HARDWARE SPECIFICATIONS

Operating temp range: 10°C - 40°C (50°F - 104°F)

Temperature rate: 3°C/5min. (5.4°F/5min.)

Operating humidity range: 95%, noncondensing

Power supply: Universal worldwide voltage; 100-240VAC; 47/63Hz

## FARO LASER LINE PROBE SPECIFICATIONS

Accuracy: ±25µm (±0.001")

Repeatability: 25µm, 2σ (0.001")

Stand-off: 115mm (4.5")

Depth of field: 115mm (4.5")

Effective scan width: Near field 80mm (3.1")  
Far field 150mm (5.9")

Points per line: 2,000 points/line

Minimum point spacing: 40µm (0.0015")

Scan rate: 300 frames/second, 300 fps x 2,000 points/line = 600,000 points/sec

Laser: Class 2M

Weight: 485g (1.1lbs.)

Accuracy and repeatability specified at Full Field of View (FOV)

**Certifications:** Meets OSHA requirements, NRTL TÜV SÜD C-US Listed, Complies with Electronic Code of Federal Regulations 47 CFR PART 15, 17 CFR Parts 240 and 249b – Conflict Material, 21 CFR 1040 Performance standards For Light-Emitting Products, and 10 CFR Part 430 – Department of Energy; Energy Conservation for External Power Supplies.

Complies with the following EC Directives: 93/68/EEC CE Marking; 2014/30/EU Electrical Equipment; 2014/53/EU Radio Equipment Directive; 2011/65/EU RoHS2; 2002/96/EC WEEE; 2006/66/EC WEEE; 2006/66/EC Batteries and Accumulators; 2014/35/EU Low Voltage Directive; 2009/125/EC Ecodesign requirement.

Conforms to the following standards: EN 61010-1:2010 / CSA-C22.2 No. 61010-1; EN 61326-1:2013 EMC; ETSI EN 300 328 V2.1.1; ETSI 301 489-1 V1.9.2; ETSI 301 489-17 V2.2.1; ETSI EN 62311:2008; IEEE 802.11 b/g; FCC Part 15.247 (WLAN and Bluetooth); Japanese Radio Law MPT No. 37 Ordinance (MIC classification WW); UN T1-T8; IEC 62133 2nd ed.; IEC 60825-1:2014 ed3.0; FDA (CDRH) 21 CFR 1040.10 / ANSI Z136.1-2007; EN 50581:2012; 21 CFR 1002 (Records & Reports); 21 CFR 1010 (Performance Standards).

Shock and Vibrations Testing per International Electrotechnical Commission (IEC) Standards: IEC 60068-2-6; IEC 60068-2-64; IEC 60068-2-27

Extreme Temperature Cycling (-20°C to 60°C). Based on: IEC 60068-2-1; MIL-STD-810G; ISTA



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