



FARO® 8-Axis Quantum^S FaroArm®

The Global Standard for Arm Technology

The FARO 8-Axis Quantum^S FaroArm is the most innovative portable coordinate measuring machine (PCMM). Seamlessly integrating a Quantum^S FaroArm with an eighth-axis, it's the world's only eight-axis portable metrology solution. Quantum^S is the first Arm to meet the new and most rigorous ISO 10360-12:2016 international measurement quality standard for articulated arms. It sets a new industry benchmark and extends FARO's tradition of maximum measurement consistency and reliability in every working environment. Perfectly suited for high accuracy measurement tasks, Quantum^S is the most intuitive, ergonomic and accurate FaroArm ever delivered, helping manufacturers meet their most demanding quality specifications on parts and assemblies. The measurement speed and ergonomics of the 8-Axis Quantum^S are taken to an even greater level. The eighth-axis enables rotation of what is being measured in real-time – meaning no difficulty reaching around the object, and no need to move the Arm into different locations within the process. This eliminates wasted time and offers an easy-to-use measurement solution that allows users to focus on the actual measurement and not on the measurement processes.



Accuracy

The Quantum^S is the most accurate FaroArm ever produced and offers a high-level of accuracy that meets the most challenging tolerances. The system delivers best-in-class performance for both hard probing and laser scanning applications. Combined with the FAROBlu™ Laser Line Probe HD and FAROBlu Laser Line Probe SD, the Quantum^S ScanArm provides unparalleled non-contact capabilities, offering high-speed point cloud capture, superior resolution and high accuracy. Used in combination with the FARO Prizm™ Laser Line Probe, it delivers the same uncompromising levels of performance for all applications requiring accurate color point cloud data capture and analysis.

Accessibility

The Quantum^S is the right choice for advanced manufacturing, providing more efficiency across highly demanding factory environments. It features FARO kinematic smart probes, which provide unparalleled user experience allowing for quick probe replacement without the need to recalibrate. In addition, the Quantum^S leverages a new industrial-grade wireless capability that delivers the best accessibility in a shop-floor environment.

Reliability

The Quantum^S allows manufacturers to work faster and smarter, delivering better quality products and a significant reduction in rework and scrap. The repeatability and accuracy in the Quantum^S is unparalleled and has been tested under the most extreme conditions to ensure consistent quality. The Quantum^S helps manufacturers stay ahead of their competitors by empowering better quality assurance and ensuring maximum confidence in products and processes.

Features & Benefits

Compliance with International Standard

The Quantum^S is the first Arm in the market that is verified against the international certification standard, ISO 10360-12:2016, setting an industry benchmark and ensuring maximum measurement consistency and reliability in a wide range of work environments.

Innovative Design for Highest Performance and Reliability

Cutting-edge design ensures superior performance and confidence in measurement results in the most challenging working environments, delivering high consistency and reliability. The Quantum^S in combination with the FAROBlu Laser Line Probe offers best-in-class scanning capability while combined with the Prizm Laser Line Probe, it delivers high resolution, 3D color scanning. The 8-Axis Quantum^S allows for capture with only small movements, reducing repositioning needs and time capture measurements. Every Quantum is tested for ruggedness and is factory-ready to ensure accuracy and performance.

Excellent Ergonomics and Usability

New ergonomic design and overall weight optimization is combined with new features, including FARO kinematic intelligent probes, which allow you to quickly and easily switch probes during inspection. With the ability to rotate the component being measured in real-time, the 8-Axis Quantum^S dramatically improves ergonomic functionality and ease-of-use.

High Speed Wireless Operation

New sophisticated and robust 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.

Blue and Green Laser

The FAROBlu Laser Line Probe leverages an optically-superior blue laser technology. The blue laser has a shorter wavelength compared to red laser and delivers improved scanning results with higher resolution thanks to its greater ability to discover smaller details in an object. The blue laser also provides a 50% reduction in speckle noise compared to a red laser. In contrast, the Prizm Laser Line Probe takes advantage of green laser technology's ability to provide high color visual definition to deliver color scanning capabilities for high resolution color point cloud data capture and analysis.

Performance Specifications

Contact Measurement (Arm)*										
Measurement range	SPAT ¹		E _{UNI} ²		P _{SIZE} ³		P _{FORM} ⁴		L _{DIA} ⁵	
	6 axis	7 axis	6 axis	7 axis	6 axis	7 axis	6 axis	7 axis	6 axis	7 axis
Quantum ^S 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 ^S 2.5m (8.2ft)	0.018mm (0.0007in)	0.020mm (0.0008in)	0.028mm (0.0011in)	0.030mm (0.0012in)	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 ^S 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 ^S 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)

8-Axis System**			Non-Contact Measurement (ScanArm)***			
Measurement range	System Accuracy ⁶		Measurement range	FAROBlu HD	FAROBlu SD	Prizm
	6 axis	7 axis		System Accuracy ⁶	System Accuracy ⁶	System Accuracy ⁶
Quantum ^S 1.5m (4.9ft)	0.027mm (0.0011in)		Quantum ^S 2.5m (8.2ft)	0.048mm (0.0019in)	0.048mm (0.0019in)	0.055mm (0.0022in)
Quantum ^S 2.5m (8.2ft)	0.035mm (0.0014in)	0.048mm (0.0019in)	Quantum ^S 3.5m (11.5ft)	0.080mm (0.0031in)	0.080mm (0.0031in)	0.092mm (0.0036in)
Quantum ^S 3.5m (11.5ft)	0.070mm (0.0028in)	0.100mm (0.0039in)	Quantum ^S 4.0m (13.1ft)	0.092mm (0.0036in)	0.092mm (0.0036in)	0.106mm (0.0042in)
Quantum ^S 4.0m (13.1ft)	0.086mm (0.0034in)	0.120mm (0.0047in)				

All values represent MPE (Maximum Permissible Error)

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

** 8-Axis System (Arm + 8-Axis): Full system performance based on ISO10360-12 Sphere Location Diameter Error (L_{DIA})

*** Non-Contact Measurement (ScanArm and ScanArm + 8-Axis): Full System performance based on ISO 10360-8 Annex D

¹ SPAT – Single Point Articulation Test

² E_{UNI} – Distance Error between two points comparing measured versus nominal values

³ P_{SIZE} – Sphere Probing Size Error comparing measured versus nominal values

⁴ P_{FORM} – Sphere Probing Form Error

⁵ L_{DIA} – Sphere Location Diameter Error (Diameter of the spherical zone containing the centers of a sphere measured from multiple orientations)

⁶ System Accuracy – Based on Sphere Location Diameter Error

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%, non-condensing

Power supply:

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

Laser Line Probe & Color Laser Line Probe Specifications

	FAROBlu HD	FAROBlu SD	Prizm		
Accuracy	±25µm (±0.001in)	±25µm (±0.001in)	±30µm (±0.0012in)		
Repeatability	25µm, 2σ (0.001in)	25µm, 2σ (0.001in)	30µm, 2σ (0.0012in)		
Stand-off	115mm (4.5in)	115mm (4.5in)	115mm (4.5in)		
Depth of field	115mm (4.5in)	115mm (4.5in)	115mm (4.5in)		
Effective scan width	Near field 80mm (3.1in) Far field 150mm (5.9in)	Near field 80mm (3.1in) Far field 150mm (5.9in)	Near field 80mm (3.1in) Far field 150mm (5.9in)		
Points per line	2,000 points/line	1,000 points/line	2,000 points/line		
Minimum point spacing	40µm (0.0016in)	80µm (0.0031in)	40µm (0.0016in)		
Scan rate	300 frames/second, 300 fps x 2,000 points/ line = 600,000 points/sec	120 frames/second, 120 fps x 1,000 points/ line = 120,000 points/sec	Color	Grayscale	Monochromatic
			120 frames/second, 120 fps x 2,000 points/line = 240,000 points/sec	120 frames/second, 120 fps x 2,000 points/line = 240,000 points/sec	300 frames/second, 300 fps x 2,000 points/line = 600,000 points/sec
Laser	Class 2	Class 2	Class 2		
Weight	485g (1.1lb)	485g (1.1lb)	485g (1.1lb)		

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

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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