FaroArm and FARO Gage Accessories
January 2022

Includes Accessories for Quantum, Edge, Prime, Platinum, Fusion, and ScanArm Models

Legal Notices

Release Notice

This is the January 2022 revision of the FaroArm and FARO Gage Accessories User Manual. It applies to the FaroArm and FARO Gage Accessories Model 41000.

FARO TECHNOLOGIES, INC. MAKES NO WARRANTY, EITHER EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, REGARDING THE FAROARM AND FARO GAGE ACCESSORIES AND ANY MATERIALS, AND MAKES SUCH MATERIALS AVAILABLE SOLELY ON AN “AS-IS” BASIS.

IN NO EVENT SHALL FARO TECHNOLOGIES INC. BE LIABLE TO ANYONE FOR SPECIAL, COLLATERAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH OR ARISING OUT OF THE PURCHASE OR USE OF THE FAROARM AND FARO GAGE ACCESSORIES OR THEIR MATERIALS. THE SOLE AND EXCLUSIVE LIABILITY TO FARO TECHNOLOGIES, INC., REGARDLESS OF THE FORM OF ACTION, SHALL NOT EXCEED THE PURCHASE PRICE OF THE MATERIALS DESCRIBED HEREIN.

THE INFORMATION CONTAINED IN THIS MANUAL IS SUBJECT TO CHANGE WITHOUT NOTICE AND DOES NOT REPRESENT A COMMITMENT ON THE PART OF FARO TECHNOLOGIES INC. ACCEPTANCE OF THIS DOCUMENT BY THE CUSTOMER CONSTITUTES ACKNOWLEDGMENT THAT IF ANY INCONSISTENCY EXISTS BETWEEN THE ENGLISH AND NON-ENGLISH VERSIONS, THE ENGLISH VERSION TAKES PRECEDENCE.

Copyright Notice

Implementation Notes

This product includes third-party and open source resources. For license and copyright information pertaining to the use of these resources, refer to the following document in the FARO Knowledge Base:
https://knowledge.faro.com/Essentials/General/3rd-Party_Open_Source_License_Information_for_FARO_Products

Trademarks

FARO®, and CAM2®, are registered trademarks of FARO Technologies, Inc.
Acrobat® is a registered trademark of Adobe Systems, Inc.
Intel®, and Pentium®, are registered trademarks of Intel Corporation.

Table of Contents

Chapter 1: Introduction

The FaroArm® Accessories Manual describes the accessories available for the FaroArm, and the both generations of the FARO® Gage, and the instructions for their use. Order any accessory through your local sales representative or FARO Customer Service. If you have any questions or need further instructions about any procedure, contact your Customer Service Representative by Phone, Fax or E-Mail. *See "Technical Support" on page 85.*

Visit the FARO Customer Service area on the Web at *www.faro.com* to search our Knowledge Base. The Knowledge Base is available 24 hours a day, 7 days a week, and contains hundreds of solutions to product and application questions.

How to Use This Manual

Listed below are some visual and typographical conventions used in each of the sections.

Bold text	Indicates directory names, menu names, buttons, tabs, key names, dialog box names, dialog box items, acronyms, and modes.
`monospaced` text	Indicates alphanumeric characters or values you enter in a field on the screen. For example, "Type `0.005` for the tolerance setting."

It is important that you understand the meaning of the following words before proceeding.

digitize	Indicates the recording of XYZ coordinates of a point or location in 3D space. The word digitize is the same as the term *measure* when referring to points.
choose or select	Indicates that you are initiating an action. For example, "Select **File** > **Insert** > **CAD Parts**."
left-click, right-click, click, or press	Indicates that you press and release the corresponding mouse button or keyboard key. Also used when referring to the hardware device buttons. For example, "After selecting a file from the **Open File** dialog box, *click* **OK** to open the file" or *"Press* **ESC** at anytime to cancel a command."
drag	Indicates that you press and hold the **left mouse** button down and move the mouse. Release the mouse button to finish. This word is often used when changing the size of a window or toolbar.

Warning

WARNING: A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or event that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Caution

CAUTION: A CAUTION notice denotes a hazard. It calls attention to an operating procedure, practice, or event that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

Note

NOTE: A NOTE notice denotes additional information that aids you in the use or understanding of the equipment or subject. Specifically, they are not used when a WARNING or CAUTION is applicable. They are not safety related and may be placed either before or after the associated text as required.

Product Environmental Information

Legislation is now in place within the European Union (EU) that regulates waste from electrical and electronic equipment (WEEE). European Directive
2012/19/EU on Waste Electrical and Electronic Equipment (the WEEE Directive) stipulates that WEEE is now subject to regulations designed to prevent the disposal of such waste and to encourage design and treatment measures to minimize the amount of waste that is placed into the waste stream. The objective of the WEEE Directive is to preserve, protect and improve the quality of the environment, protect human health, and stimulate the practical use of natural resources. Specifically, the WEEE Directive requires that producers of electrical and electronic equipment be responsible for the collection, reuse, recycling and treatment of WEEE which the Producer places on the EU market after August 13, 2005.

FARO Technologies, Inc., as a producer of electrical and electronic equipment (EEE), has endeavored to meet these environmental responsibilities for managing WEEE. In so doing, FARO is providing the following to inform its customers about the WEEE collection process:

In order to avoid any potential dissemination of hazardous substances into the environment, FARO has labeled this product with the WEEE symbol (see below) in order to alert the end-user that it should be disposed of within the proper waste management system. That system will recycle, reuse, and dispose of materials from this product in an environmentally sound way.

The symbol represented below, and found on this FARO Technologies, Inc. product, indicates that this product meets the European Directive 2012/19/EU on Waste Electrical and Electronic Equipment. This symbol, only applicable in European Union countries, indicates that when this product reaches the end of its useful life it should not be disposed of with normal household or municipal waste, but in an established waste stream for WEEE.

Each EU Member State country has established a system for the collection, disposal, and recycling of WEEE. End-users in the EU should contact their local waste administration system for collection instructions concerning this product.

Refer to *www.faro.com/support/rohs-and-weee-statement/* for further environmental information concerning this product.

WEEE Symbol

This product is in compliance with the DIRECTIVE 2011/65/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHs).

Regulatory Information

European Union:

The FaroArm Quantum complies with the protection requirements of the Council Directives 2014/30/EU (Electromagnetic Compatibility), and 2014/35/EU (Low Voltage Directive on Electrical Safety) and 1999/5/EC (R&TTE applies to radio equipment) as per requirements of the laws of the Member States.

Chapter 2: Ball Probes

Two metric ball probes (one 3mm and one 6mm) ship for regular measurement with your FaroArm.

- Many probes have a 6M x 1 thread pattern that work with older FaroArm models (Gold, Silver, Sterling, Bronze). The Platinum and Fusion FaroArms, and the 1st generation FARO Gage have a 1.25” - 20 thread pattern.
- Prior to February 1998, the typical probe and arm thread pattern was 0.375” - 24 UNF.

Thread adapters are available to connect any probe to your FaroArm. *See “Probe Adapters” on page 27.*

Below is a list of the available imperial and metric ball probes. The dimension of the ball probe relates to the actual size of the ball itself (tip), not the adapter.

NOTE: FARO Technologies, Inc. only guarantees the accuracy of the FaroArm using standard Ball Probes.

Quantum Series

i-Probes are available for the FaroArm Quantum and Quantum Max, and the FARO Gage and Gage Max in a variety of ball diameter sizes.

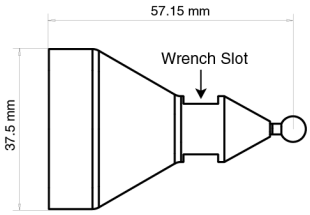
NOTE: The i-Probe does not connect to the 1st generation FARO Gage.

Ball Diameter	Part Number
1 mm	20540-003
2 mm	20540-004
3 mm	20540-001
6 mm	20540-002
8 mm	20540-005
10 mm	20540-006
12 mm	20540-007

Edge, Prime, and Fusion Series

The following probes are *only* for the Edge, Prime, or Fusion series FaroArm, or the 1st generation FARO Gage. Installing other probes requires an adapter. *See "Probe Adapters" on page 27.*

- 2 mm Zircon Ball Probe - Part # PROBE0089
- 3 mm Zircon Ball Probe - Part # 12453
- 6 mm Zircon Ball Probe - Part # 12454
- 5⁄16" Ball Probe Part # PROBE0083



Body: Stainless Steel
Stem: Tungsten Carbide
Ball: Zirconia
Thread: 1 ¼" 20 UN

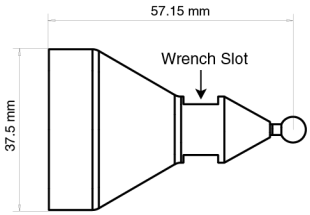
6mm Ball Probe

i-Probes

The Edge and Quantum series FaroArm uses the FARO i-Probe, an intelligent probe that automatically sends some configuration data to the FaroArm. Each of these probes has a serial number. Edge and Quantum series FaroArms also accept older, non-intelligent probes.

NOTE: FARO i-Probes are not compatible with Platinum or Fusion series FaroArms, or the 1st generation FARO Gage.

- 3 mm FARO i-Probe - Part # 11738
- 6 mm FARO i-Probe - Part # 11740
- 20mm FARO i-Probe - Part # 12550

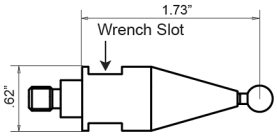


Body: Stainless Steel
Stem: Tungsten Carbide
Ball: Zirconia
Thread: 1 ¼" 20 UN

FARO i-Probe

Imperial Ball Probes

- 1⁄16” Ball Probe - Part # PROBE0028 (M6 x 1 threads)
- 1⁄8” Ball Probe - Part # PROBE0066 (M6 x 1 threads)
- 1⁄4” Ball Probe - Part # PROBE0068 (M6 x 1 threads)
- 1⁄2” Ball Probe - Part # PROBE0022 (M6 x 1 threads)
- 1” Ball Probe - Part # PROBE0029 (M6 x 1 threads)



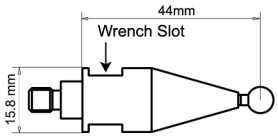
Holder: Stainless Steel
Stem: Tungsten Carbide
Ball: Zirconia
Thread: M6x1

¼" Ball Probe

Metric Ball Probes - M6

The following probes require the Quantum Extension Adapter i-Probe or the Platinum/Fusion/1st Generation FARO Gage to Metric Adapter to connect to the FaroArm. See *Quantum Extension Adapter i-Probe on page 27 and Platinum/Fusion/1st Generation FARO Gage to Metric Adapter on page 29.*

- 3 mm Zircon Ball Probe - Part # PROBE0069 (M6 x 1 threads)
- 4 mm Zircon Ball Probe - Part # 10420 (M6 x 1 threads)
- 5 mm Zircon Ball Probe - Part # 10421 (M6 x 1 threads)
- 6 mm Zircon Ball Probe - Part # PROBE0070 (M6 x 1 threads)
- 8 mm Ball Probe - Part # PROBE0034 (M6 x 1 threads)
- 10 mm Ball Probe - Part # PROBE0035 (M6 x 1 threads)
- 12 mm Ball Probe - Part # PROBE0036 (M6 x 1 threads)
- 16 mm Ball Probe - Part # PROBE0037 (M6 x 1 threads)
- 18 mm Ball Probe - Part # PROBE0039 (M6 x 1 threads)
- 20 mm Ball Probe - Part # PROBE0038 (M6 x 1 threads)



Holder: Stainless Steel
Stem: Tungsten Carbide
Ball: Zirconia
Thread: M6x1

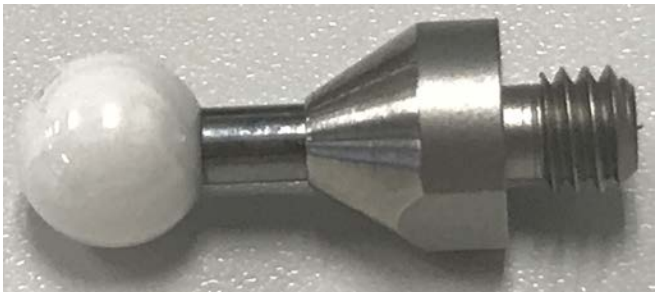
6mm Ball Probe

Metric Ball Probes - M4

The following probes require the Quantum Universal Adapter i-Probe to connect to the FaroArm. *See "Quantum Universal Adapter i-Probe" on page 28.*

The ball diameters may not certified.

NOTE: These probes are not available for use with the FaroArm Edge/Platinum/Fusion and 1st generation FARO Gage.



Diameter	Part Number
3 mm	21765-001
6 mm	21765-002
1 mm	21765-003
2 mm	21765-004
8 mm	21765-005
10 mm	21766-001
12 mm	21766-002
10 mm	21565-001
12 mm	21565-002

Metric Ball Probe Kit with Case (3mm - 20mm)

Part# KIT0007

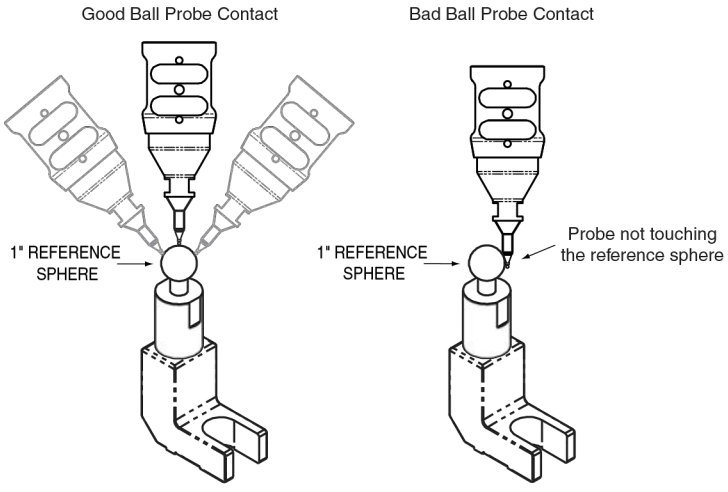
This kit consists of 3, 6, 8, 10, 12, 16, 18, and 20 mm steel ball probes (one of each) in a storage box. The measurement of the ball probe relates to the actual size of the ball (tooling sphere) itself, not the adapter.

1/64” Radius Carbide Probe

Part # PROBE0045

Use the 1⁄64” Radius Carbide Probe for scanning the edges of sheet metal or for tracing.

NOTE: Because the tip is so small, you must ensure that the actual tip of the probe makes contact with the object/edge you are measuring to get an accurate measurement. See the following drawing for an example of good and bad ball probe contact.

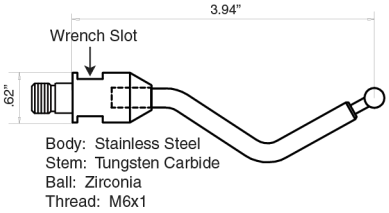


1/64" Radius Carbide Probe

¼” Curved Ball Probe

Part # PROBE0025

This steel ball probe has a ¼” sphere that is attached to an extension which is curved 60°. Use this probe to take measurements in tight areas.



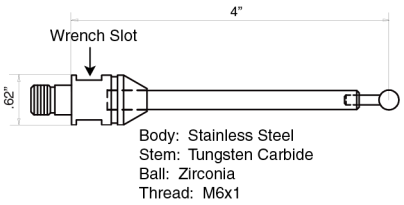
1/4" Curved Ball Probe

NOTE: FARO Technologies, Inc. does not guarantee the accuracy of the FaroArm with the use of this probe.

¼” Extended Ball Probe

Part # PROBE0021

The probe is a ¼” ball probe at the end of a solid 4" straight extension.



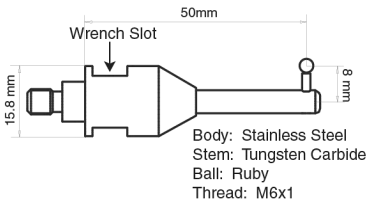
1/4" Extended Ball Probe

NOTE: FARO Technologies, Inc. does not guarantee the accuracy of the FaroArm with the use of this probe.

90° Angle Ball Probe

Part # PROBE0060

The probe is a 3 mm ball probe installed at a 90° angle to the straight extension.



3mm Ruby Ball - 90° Angle Probe

NOTE: FARO Technologies, Inc. does not guarantee the accuracy of the FaroArm with the use of this probe.

Delrin (Nonmarring) Ball Probes

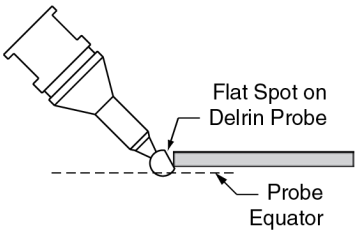
Part # PROBE0032

¼” Delrin (nonmarring) Ball Probe

Part # PROBE0030

⅛” Delrin (nonmarring) Ball Probe

These probes are made from Delrin, a hard plastic material that does not scratch an object being measured. They come in ¼” and ⅛” sizes. These Delrin probes wear much faster than steel probes, and with long-term use they may develop flat spots, which can cause measurement inaccuracies.



Hint: You can determine *flat* spots on a ball probe by high compensation results.

NOTE: FARO Technologies, Inc. does not guarantee the accuracy of the FaroArm with the use of this probe.

Chapter 3: Point Probes

Unlike larger ball probes, point probes are very small and sharp. When using point probes, take special care to ensure the tip of the point probe has direct contact with the sphere or object you are measuring.

NOTE: Use caution when handling point probes. Tungsten carbide is hard (9 on Moh's scale), scratch resistant and heat resistant but brittle and the tips may break if not handled with care.

Metric Point Probe - M4

Part # 21564

This probe is only for the Quantum and Quantum Max series FaroArms. It requires the Quantum Universal Adapter i-Probe to connect to the Quantum. *See "Quantum Universal Adapter i-Probe" on page 28.*

NOTE: FARO Technologies, Inc. does not guarantee the accuracy of the FaroArm with the use of this probe.

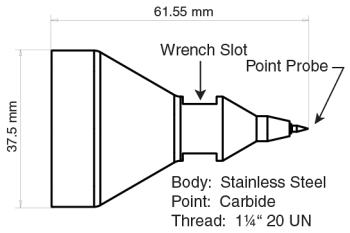
Platinum and Fusion Series, and 1st Generation FARO Gage

Part # PROBE0071

The following probe is only for the Platinum or Fusion series FaroArm, or the 1st generation FARO Gage. Installing other probes on the Platinum or Fusion series FaroArm, or the 1st generation FARO Gage requires an adapter. *See "Platinum/Fusion/1st Generation FARO Gage to Metric Adapter" on page 29.*

NOTE: FARO Technologies, Inc. does not guarantee the accuracy of the FaroArm with the use of this probe.

- Carbide Point Probe - Part # PROBE0071

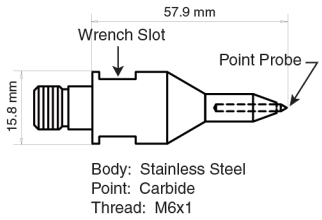


Carbide Point Probe

Carbide Point Probe

Part # PROBE0020

The Carbide Point Probe has a very sharp carbide steel point. This probe requires no compensation of the measured points. Because this probe is so small, you must take special care to ensure the point of the probe touches the sphere when calibrating.



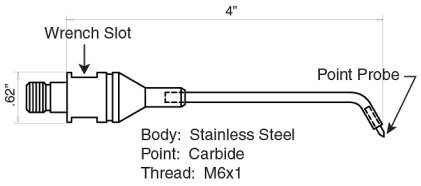
Carbide Point Probe

NOTE: FARO Technologies, Inc. does not guarantee the accuracy of the FaroArm with the use of this probe.

4” Extended 60 Degree Carbide Point Probe

Part # PROBE0041

This is a carbide steel point probe attached to a 4" extension that is curved 60°. Use this probe for measurements in tight areas.



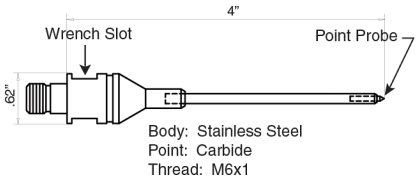
4" Extended, 60 degree Carbide Point Probe

NOTE: FARO Technologies, Inc. does not guarantee the accuracy of the FaroArm with the use of this probe.

4” Long Carbide Point Probe

Part # PROBE0046

This is a carbide steel point probe that is attached to a straight 4" extension.



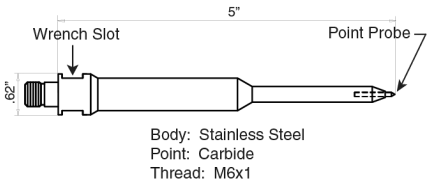
4" Long Carbide Point Probe

NOTE: FARO Technologies, Inc. does not guarantee the accuracy of the FaroArm with the use of this probe.

5” Long Carbide Point Probe

Part # PROBE0042

This is a carbide steel ball probe that is attached to a straight 5" extension.

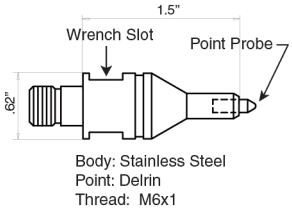


5" Long Carbide Point Probe

NOTE: FARO Technologies, Inc. does not guarantee the accuracy of the FaroArm with the use of this probe.

Delrin (Nonmarring) Point Probes

These point probes are made of Delrin, a hard plastic material that will not scratch an object being measured. Delrin point probes wear much faster than steel probes and the Delrin ball probe because it is so small. As with the Delrin (Nonmarring) Ball Probes, long-term use of the point probe may develop *flat* spots which can cause measurement inaccuracies.



1/4" Delrin (Nonmarring) Point Probe

Hint: You can determine *flat* spots on a point probe by high compensation results.

NOTE: FARO Technologies, Inc. does not guarantee the accuracy of the FaroArm with the use of this probe.

- ¼" Point Probe - Part # PROBE0032 (M6 x 1 threads)
- ⅛" Point Probe - Part # PROBE0030 (M6 x 1 threads)

Chapter 4: Laser Line Probes

The FAROLaser Line Probe (LLP) is a non-contact probe that collects digitized points using a line of projected laser light and a camera. The laser light is projected onto your part as a line, the camera takes a picture of the shape and position of the line, and several points are then sent to the computer. This is done many times in a second to quickly measure curved surfaces, or surfaces that can not be measured using a standard ball probe.

NOTE: The FARO Design ScanArm uses an LLP that is permanently attached.

There are many older generations of Laser Line Probes for older FaroArm models. This chapter covers the 6th and 7th generation that attach to the FaroArm Quantum and FaroArm Quantum Max. For information about older LLPs, see the FaroArm section of the FARO knowledge base. *http://knowledge.faro.com/Hardware/FaroArm_and_ScanArm/FaroArm_and_ScanArm*

NOTE: Refer to your current FaroArm User Manual for Safety, Installation, and operation instructions.

FARO Laser Line Probe - FaroArm Quantum Max

(Part # ACCS-LLP-0030-000) FAROBlu xR
(Part # ACCS-LLP-0010-000) FAROBlu xP
(Part # ACCS-LLP-0020-000) FAROBlu xS

The FARO Laser Line Probe (LLP) is a non-contact probe that collects digitized points using a line of projected laser light and a camera. The laser light is projected onto your part as a line, the camera takes a picture of the shape and position of the line, and several points are then sent to the computer. This is done many times in a second to quickly measure curved surfaces, or surfaces that can not be measured using a standard ball probe.

Figure 4-1 FAROBlu xR Laser Line Probe

Figure 4-2 FAROBlu xP Laser Line Probe

Figure 4-3 FAROBlu xS Laser Line Probe

NOTE: The FARO Laser Line Probe only connects to a 7-Axis Quantum.

There are three models of the FARO Laser Line Probe:

- FAROBlu xR: Suited for high-precision tasks or areas on a part with tight tolerances to capture data with up to 30% better accuracy and resolution.
- FAROBlu xP: Offers a balance of the xR for resolution and the xS for speed so coverage and accuracy blend together for overall productivity.
- FAROBlu xS: Best for large parts or expansive surface areas when data collection speed is top priority - extra-wide laser stripe delivers double the coverage in a single pass, allowing users to collect data over 65% faster.

Computer Requirements

The FARO Laser Line Probe will generate thousands of points in a short amount of scanning time. For best results, your computer must have a powerful Central Processing Unit (CPU) and a large amount of Random Access Memory (RAM). FARO recommends the following:

CPU - Intel® i7 with 4 Cores (Quad Core)

RAM - 16GB minimum, 64 GB recommended

NOTE: When using the Laser Line Probe, connect the Quantum to the computer using the USB cable. However, in ideal conditions, Ethernet and WLAN can support the data rates of the LLP.

FARO Laser Line Probe - FaroArm Quantum

(Part # 21022) FAROBlu^{HD}
(Part # 900-000012-000) FARO Prizm

The FARO Laser Line Probe (LLP) is a non-contact probe that collects digitized points using a line of projected laser light and a camera. The laser light is projected onto your part as a line, the camera takes a picture of the shape and position of the line, and several points are then sent to the computer. This is done many times in a second to quickly measure curved surfaces, or surfaces that can not be measured using a standard ball probe.

Figure 4-1 FAROBlu Laser Line Probe *Figure 4-2 FARO Prizm Laser Line Probe*

NOTE: The FARO Laser Line Probe only connects to a 7-Axis Quantum.

There are three models of the FARO Laser Line Probe:

- FAROBlu^{HD} (scan points only)
- FAROBlu^{SD} (scan points only) **NOTE:**: Discontinued October 2019.
- FARO Prizm (scan points with color values)

Computer Requirements

The FARO Laser Line Probe will generate thousands of points in a short amount of scanning time. For best results, your computer must have a powerful Central Processing Unit (CPU) and a large amount of Random Access Memory (RAM). FARO recommends the following:

CPU - Intel® i7 with 4 Cores (Quad Core)

RAM - 8GB minimum, 32 GB recommended

NOTE: Connect the Quantum to the computer using the USB cable. The Ethernet, WLAN, or Bluetooth connections do not support the data rates of the LLP.

Chapter 5: Probe Accessories

There are many probe accessories available for your FaroArm. In addition to standard ball probes, *Ball Probes on page 5*, thread adapters and probes for specialized measurement add to the flexibility of your FaroArm.

Probe Adapters

The thread patterns for probes and FaroArms are not all the same size. You may need to purchase a probe adapter to install a differently-threaded probe onto your FaroArm.

Quantum Extension Adapter i-Probe

Part # 21460

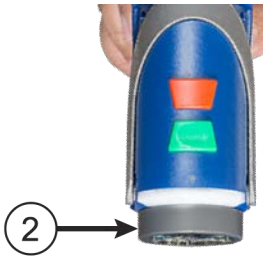
The Extension Adapter i-Probe is an adapter with a standard M6 threaded hole at the end. It will accept any extension or probe with a M6 thread. This adapter is also included in the Probe Extension Kit. *See "Probe Extension Kit" on page 30.*

NOTE: This adapter only installs on the front probe mount of the 7-Axis Quantum Max FaroArm.

Installation

This adapter threads onto the end of the FaroArm Quantum and Quantum Max. To install the adapter:

1. Remove any probe from the FaroArm.
2. Remove the thread guard. Unthread the guard by turning it counter-clockwise.



3. Open the probe locking lever.
4. Slide the probe onto the end of the FaroArm. Rotate the probe until the marks on the probe and the handle match.
5. Close the probe locking lever.
6. Thread the adapter clockwise until hand tight. Tighten the adapter using a 12 mm wrench.

CAUTION: Only *hand-tighten* the probe with the 12 mm wrench. Do not over-tighten the probe.

NOTE: The FaroArm driver automatically recognizes the Extension Adapter i-Probe. You only need to enter the correct probe diameter before compensation.

CAUTION: After removing this adapter, install the thread guard to protect the threads.

Quantum Universal Adapter i-Probe

Part # 20780

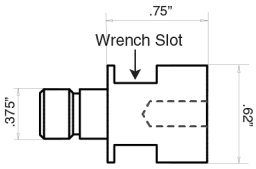
The Universal Adapter i-Probe is an adapter with a standard M4 threaded hole at the end. It will accept any Stylus with a M4 thread. *See "Metric Ball Probes - M4 " on page 10.*

NOTE: The FaroArm driver automatically recognizes the Universal Adapter i-Probe. You only need to enter the correct probe diameter before compensation. If you switch the tip, you must compensate again.

English to Metric Adapter

Part # PROBE0018

This adapter connects a new probe (metric thread pattern) to an older FaroArm (imperial thread pattern).

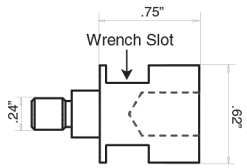


English to Metric Adapter

Metric to English Adapter

Part # PROBE0019

This adapter connects an older probe (imperial thread pattern) to a newer FaroArm (metric thread pattern).



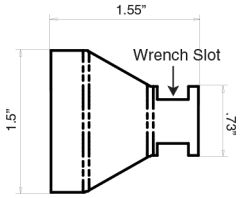
Body: Stainless Steel
Thread in: M6x1
Thread out: 3/8 - 24

Metric to English Adapter

Platinum/Fusion/1st Generation FARO Gage to Metric Adapter

Part # 2712

This adapter connects a new probe (metric thread pattern) to a Platinum or Fusion series FaroArm, or to a 1st generation FARO Gage.



Body: Stainless Steel
Thread in: 1 ¼" 20 UN
Thread out: M6x1

Platinum/Titanium to Metric Adapter

Probe Extensions

Probe extensions are threaded inserts that attach to the FaroArm and any probe extending the distance between the FaroArm and the probe.

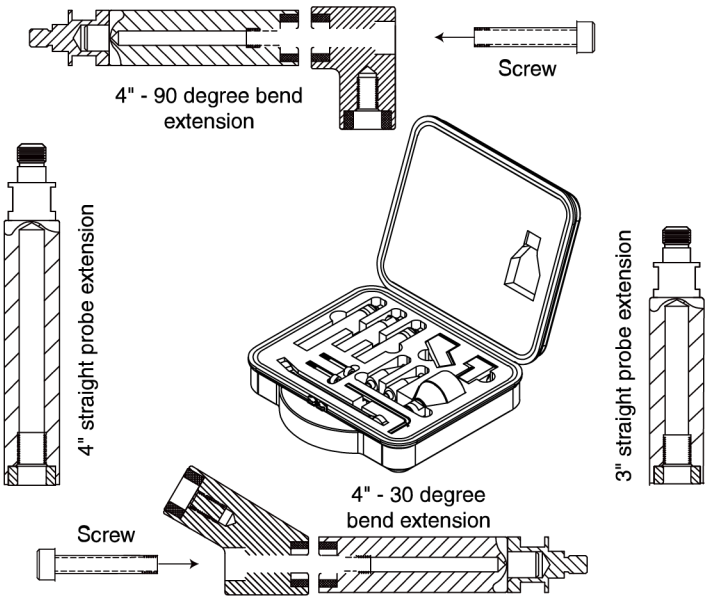
NOTE: FARO Technologies, Inc. does not guarantee the accuracy of the FaroArm with the use of any probe extension.

Probe Extension Kit

Part # PROBE0073 and 21604

NOTE: Part # 21604 for FaroArm Quantum and Quantum Max, Part # PROBE0073 for FaroArm Edge/Platinum/Fusion and 1st generation FARO Gage.

The kit contains two 3" straight extensions, one 4" straight extension, one 4" 30° bend extension, one 4" 90° bend extension, two Allen screws, two ball probes, one FaroArm to Metric (M6) adapter, a 12 mm wrench, and an Allen wrench in a case.



For more information on installing the adapter onto your FaroArm, see *Quantum Extension Adapter i-Probe on page 27*.

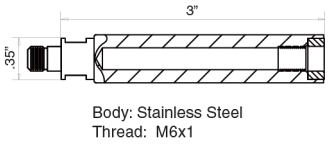
The FaroArm driver automatically recognizes the FaroArm Quantum Adapter. You only need to enter the correct probe diameter before compensation. If you create an angled probe with this kit, select the check box to record a rotation position point during the probe compensation. This rotation angle is sent to your measuring software so you will see the correct position and rotation of your probe on screen. For more information, see the probe compensation commands in your *FaroArm user manual*.

NOTE: FARO Technologies, Inc. does not guarantee the accuracy of the FaroArm with the use of any part in this extension kit.

3” Straight Probe Extension

Part # PROBE0074

The 3" Straight Probe Extension is a straight, threaded insert that increases the distance from the FaroArm handle to the probe end.



3” Straight Probe Extension

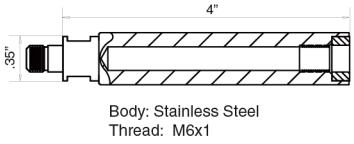
NOTE: This part is *only* available with metric threads.

NOTE: FARO Technologies, Inc. does not guarantee the accuracy of the FaroArm with the use of this extension.

4” Straight Probe Extension

Part # PROBE0010

The 4" Straight Probe Extension is a straight, threaded insert that increases the distance from the FaroArm handle to the probe end.



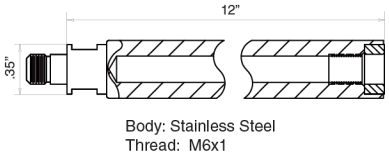
4” Straight Probe Extension

NOTE: FARO Technologies, Inc. does not guarantee the accuracy of the FaroArm with the use of this extension.

12” Straight Probe Extension

Part # PROBE0011

The 12” Straight Probe Extension is a straight, threaded insert that increases the distance from the FaroArm handle to the probe end.



12” Straight Probe Extension

NOTE: FARO Technologies, Inc. does not guarantee the accuracy of the FaroArm with the use of this extension.

M4 Probe Extensions

The following probe extensions have standard M4 threads and require the Quantum Universal Adapter i-Probe to connect to the FaroArm. *See "Quantum Universal Adapter i-Probe" on page 28.*

Length	Material	Part Number
30 mm	Ceramic	21563-005
50 mm	Ceramic	21563-001
100 mm	Ceramic	21563-002
50 mm	Carbon Fiber	21563-003
100 mm	Carbon Fiber	21563-004

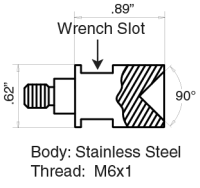
NOTE: The M4 Probe Extensions are not available for use with the FaroArm Edge/Platinum/Fusion and 1st generation FARO Gage.

NOTE: FARO Technologies, Inc. does not guarantee the accuracy of the FaroArm with the use of this extension.

½" Ball/Cone Probe

Part # 1835

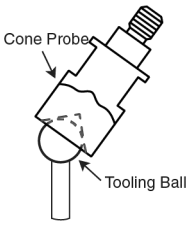
This probe is designed for quickly measuring tooling balls.

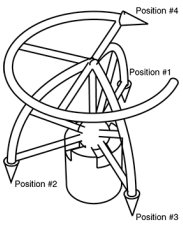


1/2" Ball Cone Probe

NOTE: The Ball/Cone Probe does not come with a tooling sphere; it is used to measure the center of tooling balls.

To calibrate the Ball/Cone Probe and obtain a best-fit point, use the single-point method on a tooling ball of the same diameter to be measured.





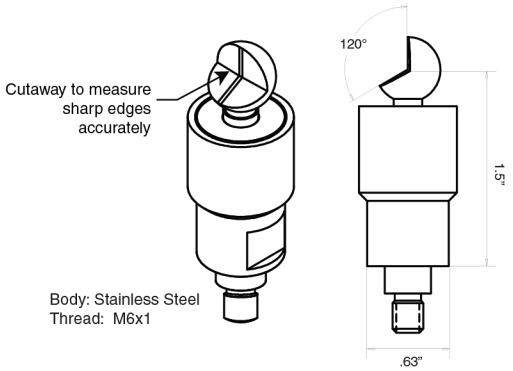
Swiveling Edge Probe

Part # PROBE0044

This ½" diameter probe has 120° cut out of the ball enabling sharp, thin edges to be measured accurately.

Calibrate a swivel probe using the Sphere Compensation technique in the application software (work with the round side of the probe). A new probe will need to be created the first time this probe is used with the software.

NOTE: Be sure to calibrate the probe in Inches (0.5 in); otherwise, the software will read the probe diameter as 0.5 mm and the probe will not calibrate properly.



Swiveling Edge Probe

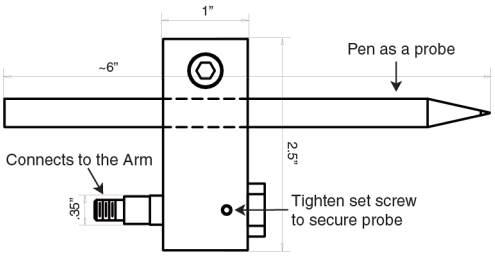
NOTE: FARO Technologies, Inc. does not guarantee the accuracy of the FaroArm with the use of this probe.

Penholder Probe

Part # PROBE0047

This probe is designed to hold a pen which is calibrated as a point probe and used to mark measured points. This is very useful for point location for drilling or cutting.

When the Pen Probe is in the correct location, tighten the set screw to secure the penholder probe to the FaroArm.



Penholder Probe

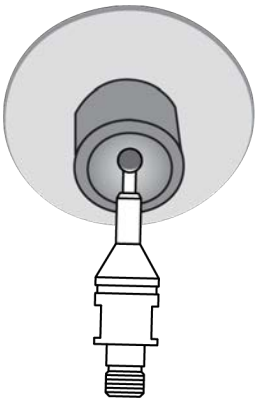
NOTE: FARO Technologies, Inc. does not guarantee the accuracy of the FaroArm with the use of this probe.

Magnetized Probe

Part # XH15-0089

The Magnetized Probe is a disk that mounts to a standard 1⁄4” steel ball probe and is used on foam parts. The disk decreases the surface pressure of the probe on the part, which reduces part deflection.

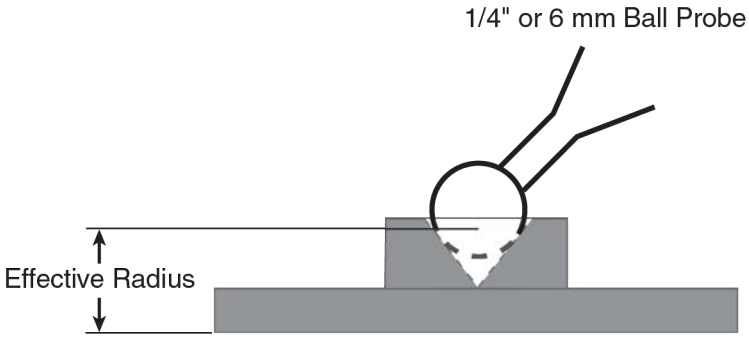
Magnetized Probe



Magnetized Probe
with 1/4" Ball Probe

To use the Magnetized Probe, first determine the effective probe radius using the following procedure.

1. Calibrate the 1⁄4” or 6mm ball probe as you normally would.
2. Measure a plane on a hard flat surface.
3. Measure a point in the cone of the Magnetized Probe. Digitize multiple points in the same location to get a best-fit point.
4. Dimension the distance between the point and the plane.
5. Twice this value should be entered in the Probe menu and the Probe Diameter when the magnetized probe is in use and also when correct probe compensation is required.

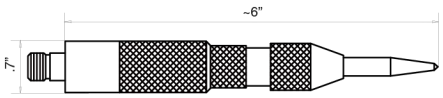


NOTE: FARO Technologies, Inc. does not guarantee the accuracy of the FaroArm with the use of this probe.

Center Punch Probe

Part # PROBE0049

The Center Punch Probe is a standard punch with an internal spring used for locating and marking points for drilling. This probe should be calibrated like a Point probe.



Body: Stainless Steel
Thread: M6x1

Center Punch Probe

NOTE: FARO Technologies, Inc. does not guarantee the accuracy of the FaroArm with the use of this probe.

Renishaw Touch Trigger Probes

The Renishaw Touch Trigger Probe collects automatic digitized points, allowing for the measurement of flexible parts without part deflection. It is not recommended for use with the Bronze/Sterling series FaroArm. For more information on assembly and operation of the TP20, see the *TP20 probe Installation and user's guide* on the CD-ROM inside the case.

TP20 Probe

Platinum/Fusion Series and 1st Generation FARO Gage TP20 Probe Kit

Part # PROBE0072

The Platinum/Fusion series TP20 Probe kit contains:

- One Renishaw (S1) C Spanner wrench
- One Renishaw (S9) double-ended C Spanner wrench
- Two Renishaw (S7) stylus tools
- One Renishaw (CK200) cleaning kit
- One magnetized TP20 probe body
- Three separate magnetized TP20 probe modules which connect to the TP20 probe body.

NOTE: The product numbers in the parentheses are Renishaw part numbers. For more information on assembly and operation of the TP20, see the *TP20 probe Installation and user's guide* on the CD-ROM inside the case.

CAUTION: On both the probe body and probe module there are triangle, half-moon, and square markers that must be matched together for the probe to work properly.

TP20 Probe

Quantum Series TP20 Probe Kit

Part # 11769

The Quantum series TP20 Probe kit contains:

- One Renishaw (S1) C Spanner wrench
- One Renishaw (S7) stylus tool
- One Renishaw (CK200) cleaning kit
- One magnetized TP20 probe body
- One medium force module

- One Renishaw probe tip: 2mm (M2 D2R L10)
- One Renishaw probe tip: 6mm (M2 D6R L10)

NOTE: The product numbers in the parentheses are Renishaw part numbers. For more information on assembly and operation of the TP20, see the *TP20 probe Installation and user's guide* on the CD-ROM inside the case.

CAUTION: On both the probe body and probe module there are triangle, half-moon, and square markers that must be matched together for the probe to work properly.

Probe Modules

Probe modules are available from Renishaw in three trigger force ratings.

- Standard Force Probe Module (Black cap)
- Medium Force Probe Module (Gray cap)
- Extended Force Probe Module (Brown cap)

For more information on assembly and operation of the TP20, see the *TP20 probe Installation and user's guide* on the CD-ROM inside the case.

FaroArm Adapters

Some FaroArm models require an additional adapter to connect the TP20 probe.

Quantum, and Quantum Max Series

The TP20 Probe Part # 20735 connects the TP20 probe to the Quantum and Quantum Max series FaroArms.

Gage, and Gage Max Series

The TP20 Probe Part # 20735 connects the TP20 probe to the Quantum and Quantum Max series FaroArms.

Edge Series

The TP20 Probe Part # 11713 connects the TP20 probe to the Edge series FaroArm.

Installation

Quantum, Quantum Max, and Edge Series

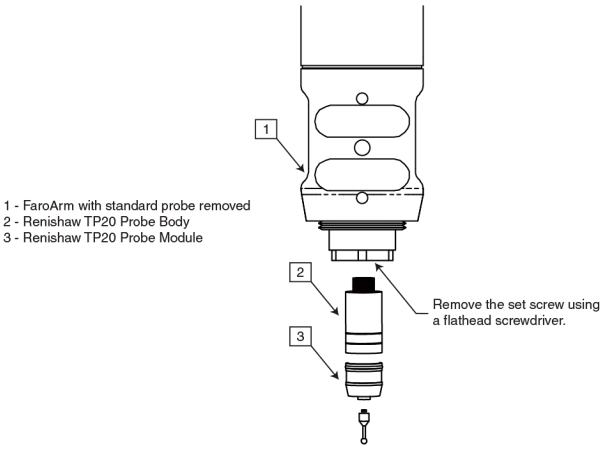
Install the FaroArm adapter like any other probe and thread the TP-20 body into the adapter.

Gage, and Gage Max

Install the FaroArm adapter like any other probe and thread the TP-20 body into the adapter.

Platinum/Fusion Series and FARO Gage

NOTE: The Renishaw option port is an optional feature for Platinum and Fusion FaroArms, and the 1st generation FARO Gage. In order to use the TP20 probe, this option must be selected at the time of order. If your FaroArm does not have an option port and you require it, contact your Customer Service Representative by Phone, Fax or E-Mail for retrofitting options. *See "Technical Support" on page 85.*



For more information on assembly and operation of the TP20, see the *TP20 probe Installation and user's guide* on the CD-ROM inside the case.

Software Setup

Renishaw probes have been modified for use with the FaroArm. They are used the same way as any other FaroArm probe, although you must enable the Options/Aux. Port to use them.

NOTE: The Quantum Series TP-20 adapter is automatically recognized by the FaroArm driver. You only need to enter the correct probe diameter before compensation.

To enable the Options/Aux. Port in CAM2 2021 or CAM2 SmartInspect:

1. Go to the **Devices** menu and select **Probes**.
2. From **Accessories**, place a check mark in the Aux Switch box.
3. Select the Probe type and click OK.
4. Calibrate the probe.

NOTE: When you are finished using the Renishaw Touch Trigger Probe, go back to the **Devices** < **Accessories** menu and deselect the Aux Switch box.

If your Renishaw Touch Trigger Probe does not operate, check the following:

1. AUX. Switch (port) to <ON>
2. All LED's are <OFF>
3. Does the **front** button work?

NOTE: The LED on the handle of the FaroArm lights **green** if it successfully communicates with the computer, and the encoders are referenced.

Probe Settings

To connect a Renishaw probe:

1. Go to **DEVICES** < **PROBES.**
2. Choose **Custom Probe** and click EDIT.
3. On the **Modify Probe** window, input a name for the Probe.
4. Enter the ball diameter in the Probe Diameter box.
5. Place a check mark in the Aux Switch box.
6. Set the De-bounce time to 1000 and the Assert time to 1.0.

NOTE: These are the recommended settings. They can be adjusted to suit your preferences.

Handling/Storage/Warranty

When using a Renishaw probe, be sure not to apply excessive pressure on the tip as it may damage the delicate parts inside the probe and may not be covered under the Renishaw warranty plan. When the probe is not in use, disconnect it from the FaroArm and store it in the Renishaw case to help prevent potential damage.

FAQ

How do I adjust the sensitivity of the Renishaw touch probe?

These are medium force TP20's directly from Renishaw. The sensitivity is not adjustable.

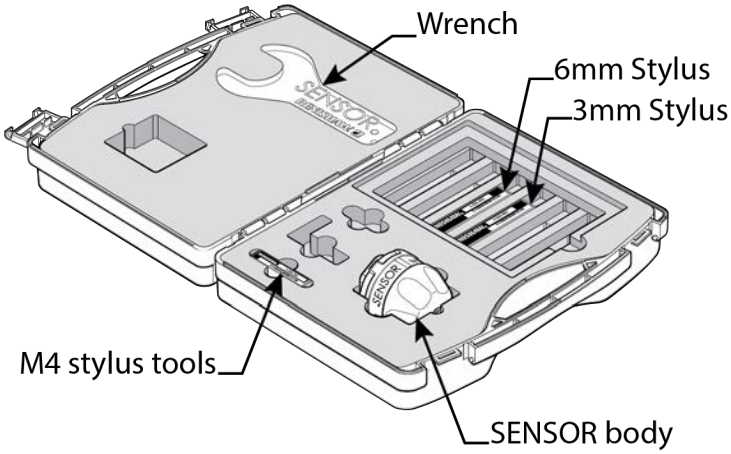
For more information, visit Renishaw's website at *https://www.renishaw.com/en/tp20--6670*

Renishaw's Contact Information - Website: *www.renishaw.com* or Telephone: 1-847-286-9953 (USA)

FARO Sensor

Part # 11903

The FARO SENSOR is a dual function touch-trigger probe/scanning probe. For more information on assembly and operation of the FARO Sensor, see the *FARO Sensor Installation and user's guide* on the CD-ROM inside the case.



Additional Items:

- Cleaning kit
- User Manual CD

NOTE: The FARO SENSOR is not compatible with Platinum or Fusion series FaroArm, or the 1st generation FARO Gage.

Chapter 6: Stands and Mounts

This chapter covers the rolling stands, portable tripods, and other accessories that help you setup and support your FaroArm to measure your part.

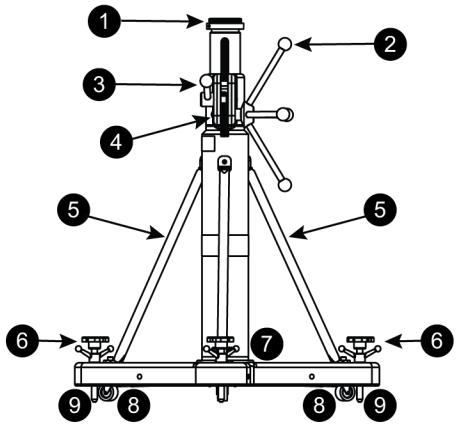
Heavy-Duty Rolling Stands

Part # IG-18
Part # IG-10
Part # IG-24
Part # IG-9

Heavy-duty rolling stands come in four sizes. They are designed for maximum portability and stability and have retractable wheels that can be raised and lowered. The stands' heights are adjustable and lockable and the legs of the heavy-duty stands do not fold.

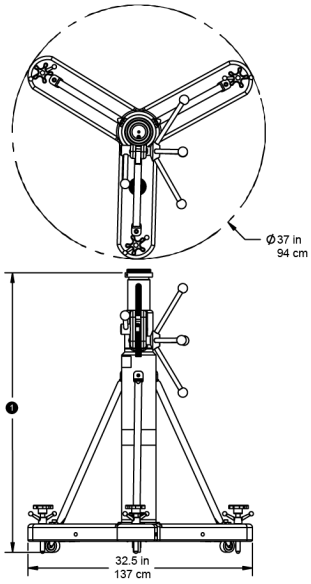
Heavy-duty rolling stands are available in the following sizes:

- 21½" - 27" (54.6 - 68.5 cm) - Part # IG-18
- 30"- 43" (76-109 cm) - Part # IG-10
- 37"- 56.5" (94-143.5 cm) - Part # IG-24
- 43" - 68.5" (109 - 174 cm) - Part # IG-9



1. 3½” Mounting Ring
2. Tripod Tube Height Adjustment Handle
3. Collar Locking Handle
4. Locking Tripod Brake
5. Tripod Base Stabilizers (3)
6. Leveling Screws (3)
7. Foot Pedal
8. Casters (3)
9. Trivet (3)

Dimensions



1

21½" - 27" (54.6 - 68.5 cm) - Part # IG-18

30"- 43" (76-109 cm) - Part # IG-10

37"- 56.5" (94-143.5 cm) - Part # IG-24

43" - 68.5" (109 - 174 cm) - Part # IG-9

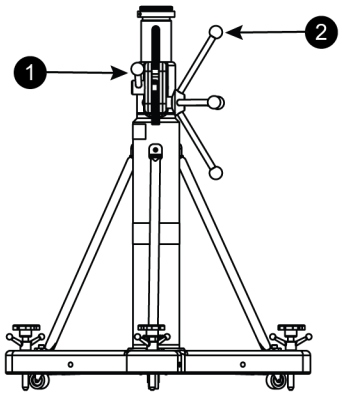
Adjusting the Stand

To raise the stand’s main tube:

1. Loosen the locking collar. This loosens the spring-loaded clamp and allows for movement of the main tube.

2. Turn the four-sided handle counterclockwise and extend the height of the stand’s main tube.

3. When the tube has reached the desired height, tighten the locking collar. This prevents the tube from moving.



❶ Collar Locking Handle
❷ Tripod Tube Height Adjustment Handle

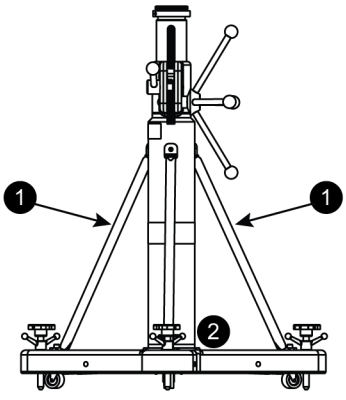
To lower the stand's main tube:

1. Loosen the locking collar.
2. Turn the four-sided handle counterclockwise about an inch and depress the spring-loaded clamp.
3. Allow the four-sided handle to rotate clockwise. This lowers the height of the main tube.
4. Tighten the locking collar.

Adjusting the Stand's Base for Transport

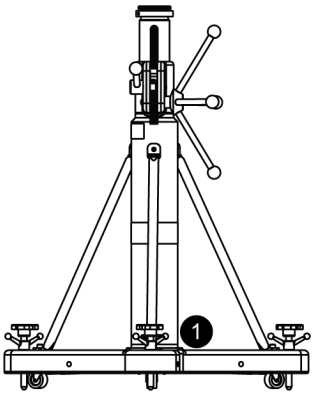
To raise the stand's base:

1. Step on the foot pedal and push it down and toward the center of the stand while simultaneously grasping and lifting the stand's stabilizer rods. This raises the base of the stand so that you can use the wheels to roll the stand to where it is needed.
2. Remove your foot from the foot pedal and the pedal should lock in position.

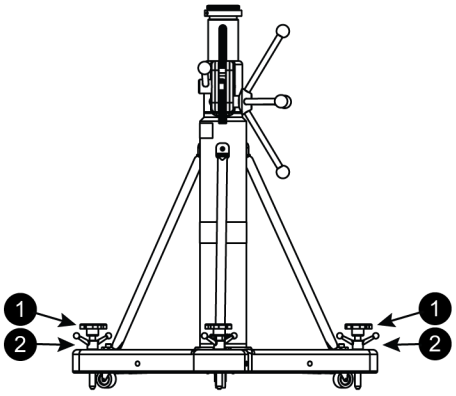


To lower the stand base:

1. Step on the foot pedal and push it down and away from the center of the stand. This drops the base of the stand, causing the wheels to retract. The pedal then pops up.



Adjusting the Stand for Stability



❶ Leveling Screws (3)
❷ Locking Collars (3)

To stabilize the stand on an uneven space:

1. Adjust the three leveling screws with your hand. This keeps the stand from rocking back and forth on an uneven surface.

2. Tighten the three locking collars located at the base of the stand. This keeps the stand from rocking back and forth on an uneven surface.

Folding Tripod

Part # 15531

The Folding Tripod is a lightweight portable instrument stand for the FaroArm with collapsible legs.

To use the Folding Tripod:

1. Remove the Folding Tripod from its case.
2. Spread the legs from the center and place the pads flat on the floor. Fully extend the tripod legs.
3. Tighten the center knob to provide further support to the legs.

To adjust the Folding Tripod height:

1. Loosen the handle on each of the three legs.
    - Each leg has etched lines to help adjust the height of the tripod.
2. Tighten all three handles to ensure that the tripod remains stable.
3. Attach the optional stability arms to the tripod and your part or table.

For more information, see the *Folding Tripod Assembly Instructions* document in the case.

Trivet Point Foot

Part # C-ACC-03545-002

The Trivet Point Foot replaces the pad on each of the three legs on the folding tripod.

To install the Trivet Point Foot:

1. Loosen the threaded locking collar at the base of the tripod leg.

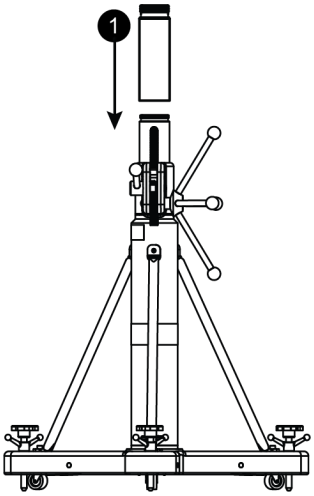
2. Remove the pad and replace it with the Trivet Point Foot.
3. Hand tighten the threaded locking collar.

Tripod Tube Extensions

The Tripod Tube Extensions are available for both heavy-duty tripods. The extensions come threaded at both ends.

1. Thread one end of the extension into the main tube on the tripod.

2. Mount the FaroArm directly on top of the extension.



NOTE: Two holes are drilled into the tube extensions for tightening the extension to the main tube. Using a metal rod or a similar object, insert the rod into the holes and twist to tighten the tube extension.

The following tube extensions are available:

- 3” Tripod Tube Extension - Part # XH14-0139
- 5” Tripod Tube Extension - Part # XH14-0140
- 10” Tripod Tube Extension - Part # XH14-0141
- 20” Tripod Tube Extension - Part # XH14-0153
- 200mm Tripod Tube Extension - Part # XH14-0166
- 400mm Tripod Tube Extension - Part # XH14-0167
- 600mm Tripod Tube Extension - Part # XH14-0168

Control Station Computer Platform Arm

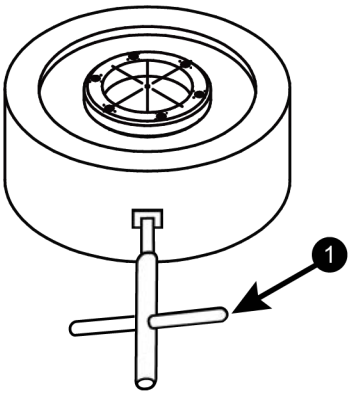
Part # ACCS0213

The Control Station Computer Platform Arm is an adjustable platform that holds laptop computers. It attaches to the Control Station Base Plate or to other measuring surfaces. Refer to the instructions sheet for more information on using the additional parts to setup the arm on other measuring surfaces.

Magnetic Mount

Part # 11516

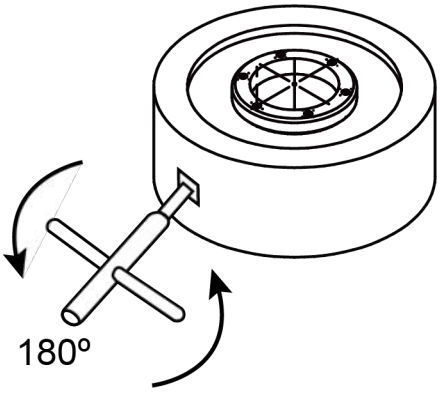
The FARO Magnetic Mount consists of a magnetic base that allows your FaroArm to be mounted to surface plates, tools, and other ferrous surfaces. There is a 3½” ring on top to attach the FaroArm and a tool to turn the magnet on and off.



❶ Tool that turns the magnet

Figure 6-1

Turn the magnet on or off by placing the tool in the hole on the side of the mount. Turn the tool clockwise 180° to activate the magnet, and counterclockwise 180° to turn off the magnet.



- Turn the tool 180º to the left to turn off the magnet

Figure 6-2

Surface Requirements

Magnetic power is often pictured as lines of magnetic force flowing from north pole to south pole. Anything that limits the flow of these magnetic lines of force reduces the magnet’s capacity. The following is a list of important factors which limit the flow of these lines of force.

1. **Surface Conditions**
   Anything that creates an air gap between the magnet and the mounting surface reduces the magnet’s capacity.

- The bottom surface of the Magnetic Mount must be clean, smooth, and free of nicks and burrs. This minimizes the air gap between the magnet and the mounting surface. This mount has been designed with low carbon steel in order to maximize the capacity; therefore, use special care to protect the surface. Do not attach or weld other materials to the magnet in order to reduce wear. This reduces the magnet's capacity.
- Paper, dirt, rags, dust, paint, and scale act the same as air. Also, a rough surface finish creates air gaps between the magnet and the surface.

2. **Surface Thickness**
   - Thin material means less iron is available, reducing the magnet's capacity.
   - Thick steel surfaces are preferred.

3. **Surface Area Alloy**
   Low carbon steels, such as SAE 1020 steel, are nearly as good conductors of magnetic force as pure iron. However, many other alloys contain non-magnetic material which reduces the ability of magnetic force to flow into the surface area. Alloys such as SAE 300 series stainless steel are poor conductors.

4. **Portion of the Magnetic Mounts Surface in Contact with Surface Area**
   To achieve maximum magnetic force, the full surface of the mount must contact the mounting surface.

Magnetic Mount Operation Instructions

To operate the Magnetic Mount:

1. The mounting surface and the bottom surface of the Magnetic Mount must be clean, perfectly flat, and free of burrs. Check both surfaces. If they are not flat, imperfections can be removed by lightly stoning with a hand-held grinding stone.
2. The full area of the Magnetic Mount must be in contact with the mounting surface for maximum holding stability.
3. The mounting surface should be at least 0.50" (12.7mm) thick. The better the surface condition (flat and smooth), the higher the holding force and stability. The ideal material is mild steel (low carbon steel, SAE 1020). Other materials may result in lower holding force and thinner material may also decrease holding and stability. For more information, see the table below.
4. Before mounting, make sure that the Magnetic Mount is in the "OFF" position. Place it on a good base material.
5. Turn the handle to the "ON" position. This will take 1.25 turns to go from fully "OFF" to fully "ON".

CAUTION: This Magnetic Mount is a strong magnetic device. Make sure that loose metal items are not near the mount when it is "ON".

The reduction factors in the following table represent a percentage of the total holding force of a magnet when used on SAE 1020 steel. For example, 416 stainless steel has a reduction factor of 0.50 (50%). This means that the total holding force for this material is half of SAE 1020 steel.

Material	Reduction Factor
Cast Steel	.90 (90%)
3% Silicon Steel	.80 (80%)

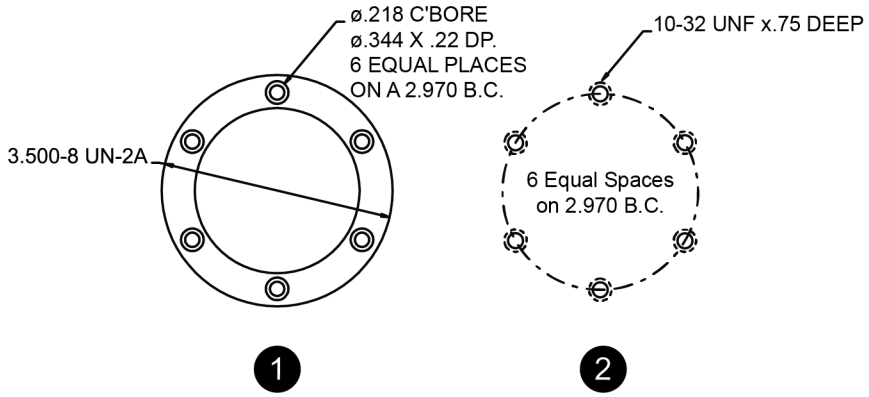
Material	Reduction Factor
SAE 1095 Steel	.70 (70%)
416 Stainless Steel	.50 (50%)
Cast Iron (non-chilled)	.45 (45%)
Pure Nickel	.10 (10%)
4140 Steel	.90 (90%)
P20	.80 (80%)
H13	.70 (70%)

This is a random sampling of materials. Contact your Customer Service Representative by , or with any questions for a reduction factor for a particular material that you need to use as a base.

3½” Mounting Ring

Part # IG-27

The 3½” Mounting Ring is a portable mounting ring that can be attached to a surface to mount the FaroArm. The ring has six holes, allowing it to be mounted to any flat surface. The outside of the ring is threaded to accept the locking collar of your FaroArm.



❶ Threaded Ring

❷ Ring Mounting Hole Pattern

Vacuum Mount

Part # 13402-001, Imperial
Part # 13402-002, Metric

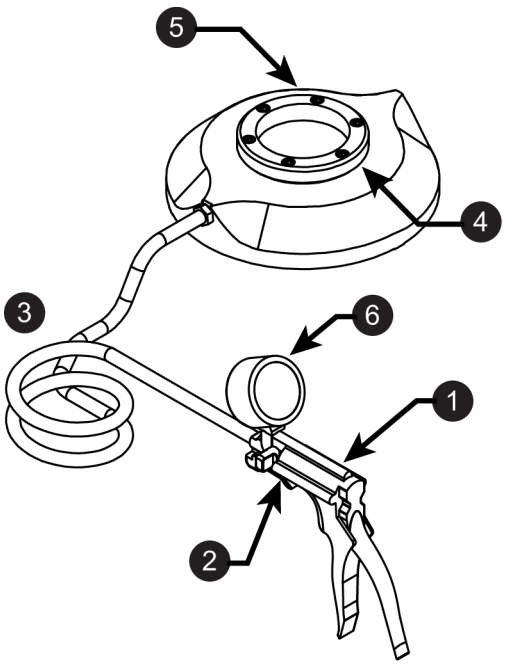
The FARO Vacuum Mount quickly, easily, and rigidly mounts the FaroArm to granite surfaces without a degradation in accuracy. The kit includes the mount, hand pump, oil, and case.

NOTE: A smaller model, part # 13403-001 (Imperial) part # 13403-002 (Metric) is available for the 4 Ft. or 1.5 M models of the FaroArm or the FARO Gage.

CAUTION: Always disconnect the FaroArm from the Vacuum Mount before moving. Moving the FaroArm and Vacuum Mount together may cause damage to the FaroArm.

A bottle of Vacuum Oil for the vacuum mount is included in the kit. Use the oil to create the vacuum seal between the mount and the granite surface. The reorder part number is XH26-0030.

NOTE: *Do not* apply oil to any metal part of the mount, to the granite surface. Any oil on the metal may cause the mount to slide.



❶ Vacuum Pump
❷ Pressure Relief Valve
❸ Flexible Tubing
❹ 3½” Mounting Ring
❺ Vacuum Mount

❻ Pressure Gauge

To use the Vacuum Mount:

1. Make sure the granite surface is clean and free of debris.

2. Attach the FaroArm to the 3½" Mounting Ring ❹ , and tighten the threaded collar clamp.

3. Tighten the knob ❷ to close the Pressure Relief Valve.

4. Squeeze the handle ❶ and pressurize the vacuum base the initial pressure, 30 in Hg. This is the **Blue** area of the pressure gauge.

NOTE: Check the vacuum pressure gauge ❻ periodically. Re-pressurize to 25 in Hg if the vacuum falls below 15 in Hg. On the pressure gauge the **Green** area is the normal range, 15 to 25 in Hg, and the **Red** area is below the normal range, 0 to 15 in Hg.

---

5. When you finish measuring, loosen the knob ❷ to open the Pressure Relief Valve and release the vacuum.

Battery-Operated Vacuum Mount

Part # 15320

The Battery-Operated Vacuum Mount secures your FaroArm to granite and other air-impermeable surfaces. A battery-powered mini vacuum pump creates a vacuum between the FaroArm base and the surface to secure the Vacuum Mount via suction. Adapters secure the FaroArm to the mount's upper plate.

❶ Charging connection
❷ Upper plate
❸ Ventilation
❹ Vacuum manometer
❺ On/Off switch
❻ Surface
❼ Base
❽ Charging level LEDs
❾ Double seal

Components

Upper Plate

There are six large and nine small threaded holes in the upper plate. The threaded holes accommodate the FaroArm adapter.

Base

There are two sintered filters on the bottom of the base. The air is evacuated through one of the sintered filters, producing the vacuum. The sintered filters are also sound-absorbing. The seal seals the area under the base. Three state feet ensure the safe state of the Vacuum Mount.

Housing

A buzzer makes a sound as soon as the pressure falls below the minimum level set by the manufacturer. The rechargeable batteries power a miniature vacuum pump. The vacuum pump creates a vacuum between the base and surface to hold them together.

The vacuum pump is controlled using the pressure switch. When the vacuum of -11.60 psi (-0.8 bar) is reached, the automatic pressure switch turns off the vacuum pump. If the pressure goes below the minimum value, the pressure switch turns the vacuum pump back on.

Structure and Function

Operating Elements

Charging level LEDs show the charging level of the batteries. The LEDs indicate the following:

- **Red**: batteries depleted, charge needed
- **Yellow**: batteries half charged, charge soon
- **Green**: batteries fully charged, optimal conditions for use

The Vacuum Mount is switched on at the On/Off switch.

The vacuum manometer gives the current pressure in bar. The measuring range is 0 to -14.50 psi (0 to -1 bar).

The ventilation lets air in to fill the vacuum.

Transport, Packing, and Storage

Transport

Upon receipt, immediately verify complete delivery and that the Vacuum Mount has not been damaged in transit.

Packing

Always transport the device in the aluminum case in which it was delivered. The aluminum case should be used to protect, store, and transport the Vacuum Mount and any accessories for its entire service life. The aluminum case and device can be transported by hand.

Storage

Store the Vacuum Mount as follows:

- Always store the device and accessories in the aluminum case in which the device was supplied.
- Do not store outside.
- Store in a dry and dust-free area.
- Do not expose to any aggressive medium.
- Keep out of the sun.
- Prevent mechanical vibration.
- Storage temperature: 15-35 °C (59-95 °F).
- Relative humidity: maximum 60%.
- If storing for more than 3 months, regularly check the general condition of all components and the packaging. If necessary, renew or replace packaging.

Operation

Safety

CAUTION: Improper operation may result in injury!

The vacuum must be constant and there must be a pressure of -11.60 psi (-0.8 bar).

Constantly check the pressure on the vacuum manometer during operation.

Ensure that the leverage forces of the measuring arm are always less that the holding force.

If the holding force does not suffice, the vacuum base may break free of the surface causing injury and damage to property.

Preparation

Make sure that the mounting surface is air-impermeable, smooth, clean, and flat.

Ensure that the batteries are at least halfway charged (yellow or green LEDs must be illuminated). If necessary, charge the batteries by connecting the charger to the charging connection.

Operation

To operate the Vacuum Mount:

1. Place the Vacuum Mount onto the mounting surface.
2. Turn the Vacuum Mount on.
3. Check at the vacuum manometer to ensure a vacuum of -12.32 psi (-0.85 bar) has been reached. The vacuum is reached after five seconds on an optimal surface. If the surface is not optimal, the vacuum is reached after approximately 10 or 15 seconds.
4. Secure appropriate adapters to the threaded holes.
5. Secure the FaroArm to the adapter.

Maintenance

After use, wipe the Vacuum Mount with a damp, clean cloth and let it dry.

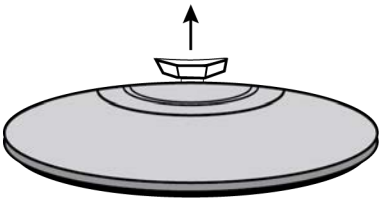
If the Vacuum Mount is not used for extended periods, store it in the aluminum case.

Clean the Vacuum Mount at regular intervals, depending on requirements, purpose of use, and actual soiling. Clean it as needed using a damp, clean cloth.

Tripod Feet, Rubber (Set of 3)

Part # XH15-0127

The Tripod Rubber Feet screw into the tripod leveling screws and prevent slippage on very smooth surfaces.



Chapter 7: Miscellaneous

This chapter covers the miscellaneous accessories available for the FaroArm.

All-In-One Workcart

Part # ACCS0164

The All-In-One Workcart is a convenient workcenter for the FaroArm or FARO Gage operator. The workcart includes convenient storage spaces for your computer, monitor, printer, tools, probes, and extension cords (all sold separately).

Using the Threaded Inserts

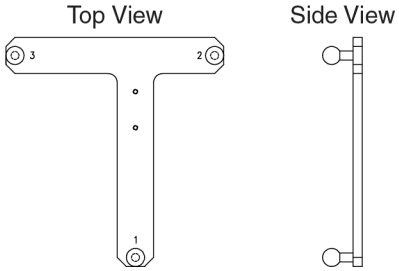
Across the granite top there are threaded inserts that accept the tooling hardware threaded rods. You can also remove the 3½" ring and use the six threaded inserts with other tooling to hold your part.

CAUTION: To avoid cracking the granite top, *DO NOT* tighten any fasteners in the threaded inserts beyond 50 in/lbs (6 N/m).

Leapfrog Jig

Part # IG-1

The Leapfrog Jig is a set of three tooling spheres mounted in a triangular shape on a single piece of steel. Use this jig with the **Move Device** command and increase the measuring volume of the FaroArm.



Leapfrog Magnetic Spheres

Leapfrog Magnetic Spheres and the Leapfrog Magnetic Cone Tips are used to protect the part you are measuring. They come with an adjustable magnetic base and can be ordered as a single sphere or cone tip, as a kit with three

spheres, or a kit with three cone tips. You also receive an Allen wrench and an open-ended wrench to adjust the height of the feet on the magnetic base.

Adjusting the Height

To adjust the height of the feet:

1. Place the Allen wrench in the socket of the Allen screw and turn the Allen screws until the desired height of the feet is obtained.

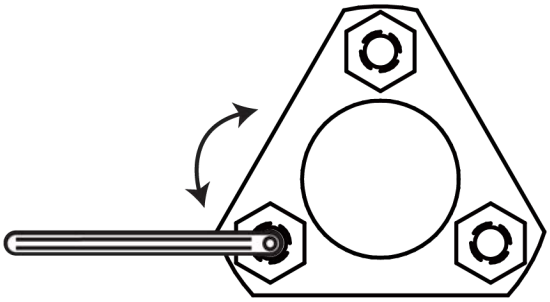


Figure 7-1 Top View

2. Tighten the lock nuts with the open-ended wrench.

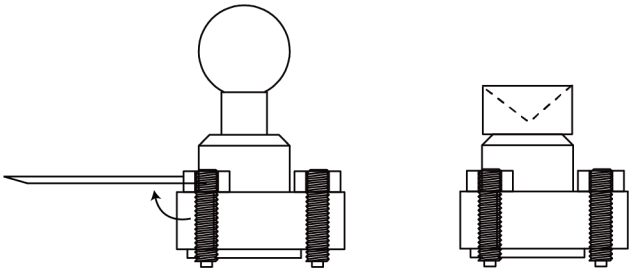


Figure 7-2 Side View

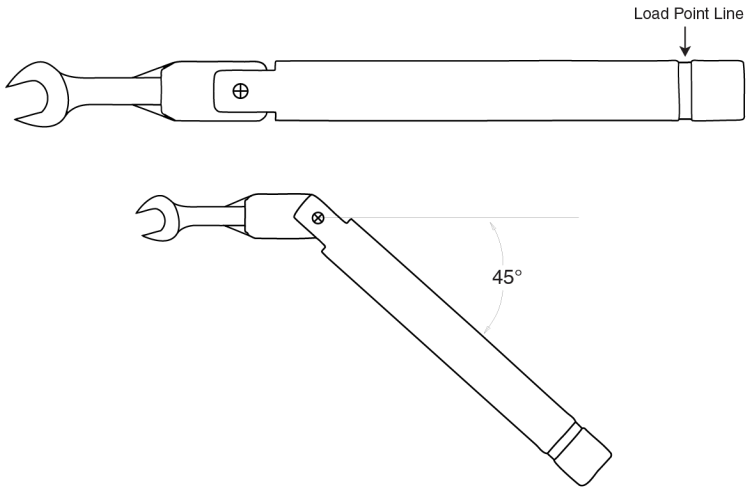
Listed below are the part numbers of the single sphere, single cone tip, the sphere kit, and magnetic cone tip kit.

- Leapfrog Magnetic Sphere (single sphere) - Part # ACCS0023
- Leapfrog Magnetic Sphere Kit (includes three spheres) - Part # ACCS0078
- Leapfrog Magnetic Cone Tip (single cone) - Part # ACCS0026
- Leapfrog Magnetic Cone Tip Kit (includes three cone tips) - Part # ACCS0039

12 MM Break-Away Torque Wrench

Part # 11739

The 12 mm Break-Away Torque Wrench “breaks away” once reaching a preset torque setting, making it impossible to over-tighten beyond the preset load. This compact and well-balanced wrench has a fixed head attached.



NOTE: Torque is preset to 50in/lb. Use only to tighten probes.

1. Grip the wrench toward the end of the handle at the Load Point to apply torque.

NOTE: Gripping the handle closer to the head will apply more torque than the wrench has been adjusted for.

2. Tighten the probe by applying steady pressure. The wrench should be kept at 90 degrees to the axis of the probe during tightening.

NOTE: When the pre-set torque has been reached, the wrench will “break away”. Stop tightening when the 45º break angle is achieved.

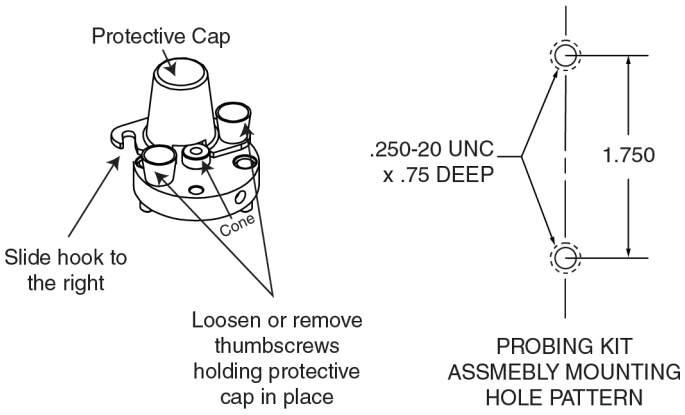
3. Reset the wrench for the next application.

Probing Kit Assembly

Part # ACCS0027

The Probing Kit Assembly is a cup-shaped probing target kit that can be permanently mounted to tools and fixtures for use in alignment.

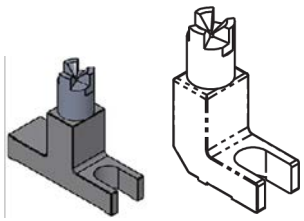
Two thumbscrews hold the protective cap in place over the cone probe. To remove the cap and reveal the cone probe, loosen or remove both thumbscrews, and either slide the cap to the side or remove the cap completely.



FaroArm Probe Compensation Cone

Part # 12722 and 10308

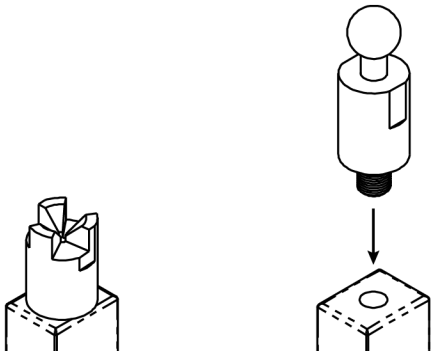
The Probe Compensation Cone is a portable cone used to calibrate a ball probe using the Single Hole Compensation method. Securely attach the compensation cone base to any surface with a screw or clamp.



Part # 12722 Part # 10308

NOTE: This part may also be used for the Single Point Articulation Test (SPAT).

The Compensation Cone is removable and the Compensation Sphere, part # 2766, may be attached to the base. Calibrate the ball probe using the Sphere Compensation method.



NOTE: Use a 12 mm wrench to tighten the cone or sphere to prevent movement during probe compensation.

Quantum and Quantum Max Battery Pack and Charging Base

Quantum Battery Pack

Part # 20147

Only for the Quantum and Quantum Max series FaroArms, and the Gage and Gage Max.

Charging the Battery Pack

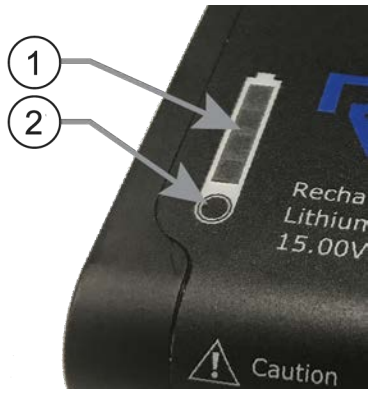
Install the battery pack and connect the FaroArm to a power outlet and the battery pack will begin to charge. The battery pack will charge if the On/Off button is set to the *OFF* position. Charging automatically stops when the battery pack is completely charged.

- The Battery Power Indicator show the battery pack power level.
- The **Hardware Configuration** dialog box displays the current battery pack power level.

WARNING: Only use the rechargeable battery pack supplied with your FaroArm. For information on ordering additional or replacement battery packs, contact FARO's Customer Service by Phone, Fax or E-Mail. *See "Technical Support" on page 85.*

Status LED Display

The battery can display the capacity information by using the push button.



① LED Display
② Push Button

Each LED segment represents 25 percent of the full charge capacity. The LED pattern definition is given in the table below. The LED's illuminate for 4 seconds following switch activation. If the battery voltage is to low or the battery is inoperable (permanent fault), there will be no LED indication.

Capacity	LED Indicators #				Notes
	1	2	3	4	
< 10%					Blinks
10% - 25%					Lit for 4 seconds
26% - 50%					Lit for 4 seconds
51% - 75%					Lit for 4 seconds
76% - 100%					Lit for 4 seconds

Quantum Battery Pack Charging Base

Part # 20654 and # 20623

The Quantum Battery Charging Base is an external charging base for the Quantum batteries. Part # 20654 charges a single battery and part # 20623 will charge two batteries. An instruction sheet is included with the part; please refer to this instruction sheet for proper operation.

WARNING: *Do Not* attempt to charge any battery but the Quantum battery in this charging base.

Edge Battery Pack and Charging Base

The battery and charging base for the FaroArm Edge are sold separately. This battery is only for use with the FaroArm Edge.

Edge Battery Pack

Part # 14705

The FaroArm Edge Battery Pack has a charge meter on the side of the battery. Push the **Check** button to see the charge status.

Edge Battery Pack Charging Base

Part # 14815

The FaroArm Edge Battery Charging Base is an external charging base for FaroArm Edge batteries. You can charge two FaroArm Edge batteries together. An instruction sheet is included with the part; please refer to this instruction sheet for proper operation.

WARNING: *Do Not* attempt to charge any battery but the FaroArm Edge battery in this charging base.

Platinum/Fusion FaroArm Battery Pack Kit

Part # ACCS0146

Only for the Prime, Platinum, Fusion, and Quantum FaroArms, and the 1st generation FARO Gage.

The Platinum/Fusion/Quantum/FaroArm Battery Pack Kit includes an extra battery, charging base, and power cord. An instruction sheet is included with the kit; please refer to this instruction sheet for proper operation.

WARNING: *Do Not* attempt to charge any battery but the FaroArm battery in this charging base.

Temperature Sensor

Part # 15167

The Temperature Sensor works directly with the USB port on your PC, and has a measurement accuracy up to ca. 0.1°C. The calibrated digital sensor head is capable of high speed measurements (about 20 measurements per

second) and features an integrated USB 1.1 interface with all electronics completely integrated into the USB connector. No external power supply is needed.

NOTE: You will need to obtain the temperature sensor driver from FARO. Contact your Customer Service Representative by Phone, Fax or E-Mail. *See "Technical Support" on page 85.*

The temperature range is -10°C to +60°C. To prevent damage to the sensor, do not expose it to temperatures below -20°C and over +60°C.

Cable length is 2 meters.

Barcode Scanner

Part # 15168

The Barcode Scanner is hand-held and utilizes area imaging technology to read popular linear (1D), stacked linear, and matrix (2D) bar codes.

The scanner has a view finder that projects a bright green aiming beam corresponding to the scanner's horizontal field of view. To read single or multiple symbols (on a page or on an object), hold the scanner at an appropriate distance from the target, pull the trigger, and center the aiming beam on the symbol.

Connecting the Scanner

To install the Barcode Scanner:

NOTE: Install the latest barcode scanner driver before you connect the scanner to your computer. You will need to obtain the driver from FARO. Contact your Customer Service Representative by Phone, Fax or E-Mail. *See "Technical Support" on page 85.*

1. Power the computer down.

2. Connect the interface cable to the scanner.

NOTE: For the scanner to work properly, you must have the correct cable for your type of terminal/computer.

3. Plug the USB connector into a USB port on your computer.

4. After you have connected the scanner to your computer, turn on the computer.

5. Your computer will recognize the scanner, and you can begin scanning.

Maintenance

The scanner provides reliable and efficient operation with a minimum of care. Although specific maintenance is not required, the following periodic checks ensure dependable product operation:

Cleaning the Scanning Window

Reading performance may degrade if the scanner's window is not clean. If the window is visibly dirty, or if the scanner isn't operating well, clean the window with a soft cloth or lens tissue dampened with water (or a mild detergent- water solution). If a detergent solution is used, rinse with a clean lens tissue dampened with water only.

Cleaning the Scanner Housing

The scanner is IP54 rated when the cable is attached, meaning that means that liquids and dusts will not penetrate into the housing; however, the scanner should never be submerged in water or other liquids. It is also good practice to dampen the cleansing cloth vs. spraying the scanner directly.

Interface Cable

Inspect the scanner's interface cable and connector for wear or other signs of damage. A badly worn cable or damaged connector may interfere with scanner operation. Should the cable be damaged, the cable can be replaced in the field.

FARO 8-Axis

This chapter describes the setup, compensation, and operation of the optional 8-Axis and 8-Axis Max turntable. The 8-Axis is a manually rotated turntable that allows you to turn your part and continue to measure in the same coordinate system.

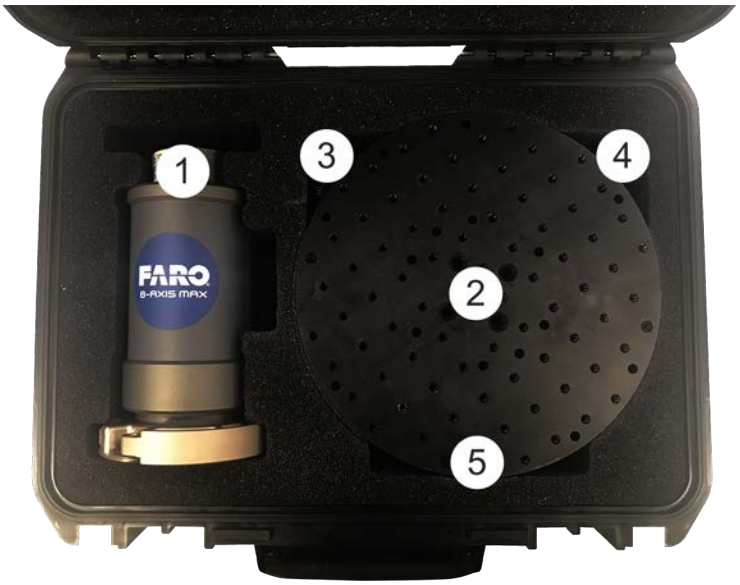
- FARO 8-Axis Max(Part # Part # 900-000025-400)
- FARO 8-Axis(Part # Part # 900-000025-000) FaroArm Quantum (Part # 900-000025-100) Design ScanArm

FARO 8-Axis Max (Part # Part # 900-000025-400)

This section describes the setup, compensation, and operation of the optional 8-Axis Max turntable. The 8-Axis Max is a manually rotated turntable that allows you to turn your part and continue to measure in the same coordinate system.

Figure 7-1 FARO 8-Axis Max

Shipping Case



① FARO 8-Axis
② Table

Underneath Table:

③ 8-Axis Cable
④ Four Screws and Hex Wrench
⑤ Surface Mount Plate

Figure 7-1 FARO 8-Axis Shipping case

NOTE: Some items are packed below the ② Table.

Hardware Setup

The following sections describe the proper setup of the 8-Axis. This includes attaching the 8-Axis to your work surface or tripod, and connecting it to your Quantum.

NOTE: Setup your Quantum. Complete all cable connections between your 8-Axis, Quantum, and computer before applying power to your Quantum and computer.

Mounting the Base

Setup your Quantum. Complete all cable connections between your 8-Axis, Quantum, and computer before applying power to your Quantum and computer. To setup the base:

1. If you are not using a tripod, remove the ⑤ Surface Mount Plate from the Shipping Case and attach it to a surface.
2. Remove the ① 8-Axis base from the shipping case.
3. Place the 8-Axis onto the 3½” ring of your tripod or surface mount plate. Thread the collar onto the ring and hand tighten.

Figure 7-1 FARO 8-Axis Base

4. Tighten the collar using the attached handles.

Figure 7-2 Tighten the Collar

5. Attach the table to the base and secure using the four screws. Tighten each screw with the hex wrench.

Figure 7-3 Attach the Table

Cable Connections

Connect the cables:

1. Connect the 8-Axis cable to the base of the 8-Axis.

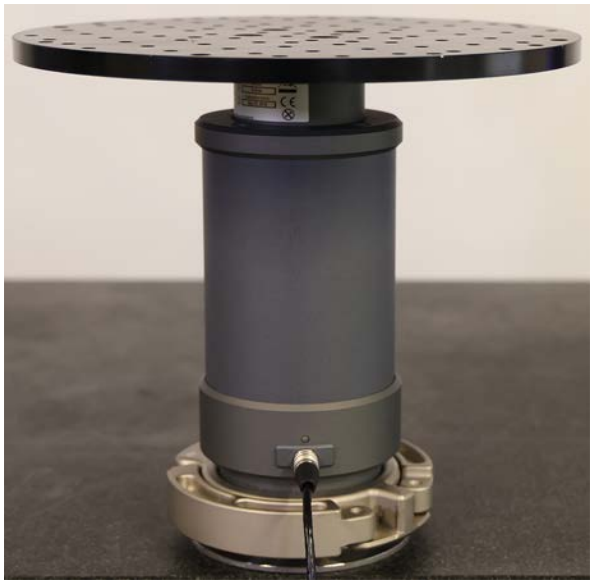


Figure 7-4 Connect the 8-Axis Cable

2. Connect the 8-Axis cable to the Quantum Auxiliary port.

Figure 7-5 Connect the 8-Axis Cable

3. Connect both power supplies to your source of power. Switch on the computer and the Quantum.

Reference the Encoders

You must first reference each of the six (seven) encoders in the Quantum before the system can output data. Pull the handle and each tube out of the rest position and move to make each encoder move. Each encoder must move to reference. The Reference Encoders dialog box shows all seven encoders in error until each is referenced. In a systematic manner, rotate links 1 through 6 (7) until each warning clears.

Then reference the encoder in the 8-Axis by rotating the turntable top until the warning clears.

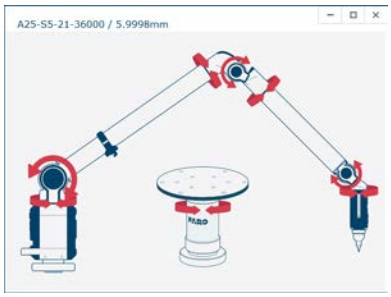


Figure 7-6 Referencing the Encoders

Before you can measure accurately with the 8-Axis, you must compensate it.

Compensation

Before you can measure accurately with the 8-Axis, you must compensate the position to your Quantum. If the physical position between the two devices changes, simply repeat this compensation.

Position the 8-Axis so that when you place the FARO i-Probe in one of the four table compensation holes, you can rotate the table 360°, or 180°.

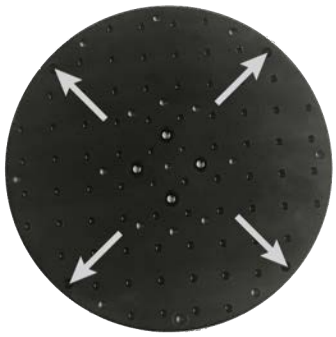


Figure 7-1 Compensation Holes

This is necessary for the compensation of the 8-Axis. before the system can output data. Rotate the turntable top until the warning clears.

Figure 7-2 8-Axis Compensation

In CAM2 2021, click **Device Center** in the **Devices** tab. Click your Quantum and then click **Hardware Configuration** to compensate your 8-Axis.

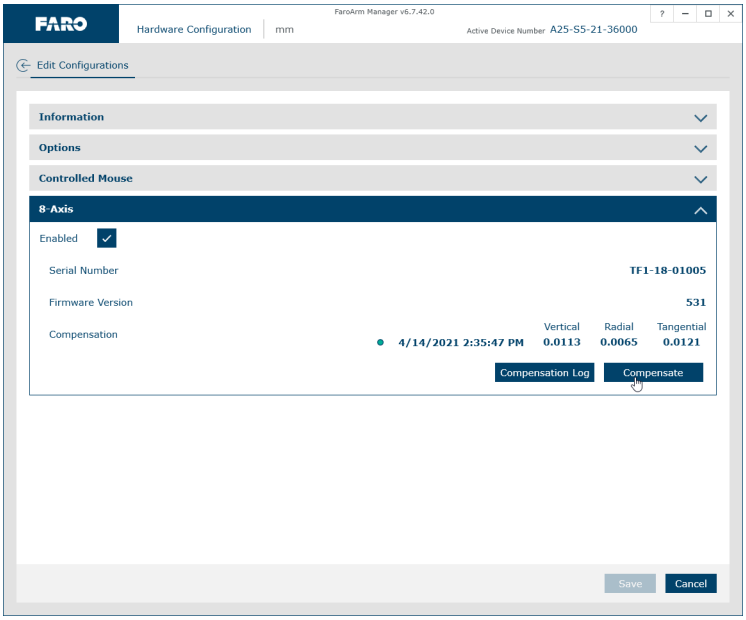


Figure 7-3 8-Axis Hardware Configuration

1. In the **8-Axis** group, select the **Enabled** check box.

2. Click **Compensate**.

3. Choose a Compensation method.

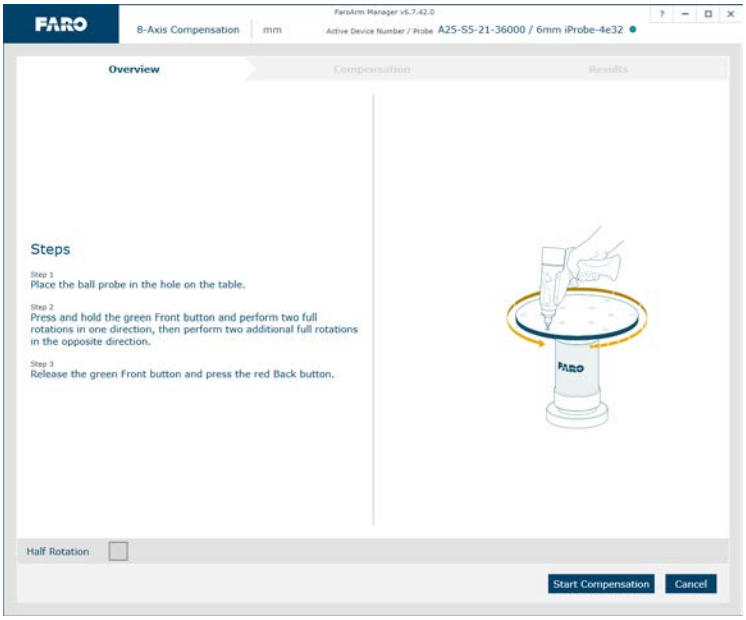


Figure 7-4 8-Axis Compensation

- Select the **Half Rotation** check box if you can only rotate the table 180°.

4. Click **Start Compensation**.

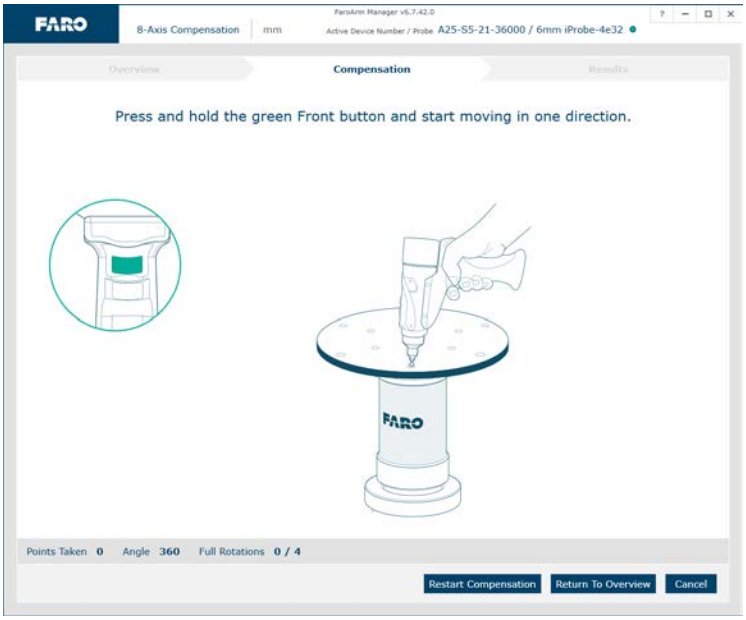


Figure 7-5 8-Axis Compensation

- Place the probe in any compensation hole.
- Press and hold the **green Front** button and move the turntable in one direction. Rotate around twice (720°).

NOTE: Release the **green Front** button to pause.

- Press and hold the **green Front** button and move the turntable in the opposite direction. Rotate around twice (720°).
- Release the **green Front** button and press the **red Back** button.

5. Look at the compensation results. Click **Save and Exit** to store the compensation, or click **Restart Compensation** to discard the data and start again.

Repeat this compensation three times. Click the **Log** button and look at the compensation results.

FARO 8-Axis (Part # Part # 900-000025-000) FaroArm Quantum (Part # 900-000025-100) Design ScanArm

This section describes the setup, compensation, and operation of the optional 8-Axis turntable. The 8-Axis is a manually rotated turntable that allows you to turn your part and continue to measure in the same coordinate system.

Figure 7-1 FARO 8-Axis

Shipping Case

① FARO 8-Axis
② Table

Underneath Table:

③ 8-Axis Cable
④ Four Screws and Hex Wrench
⑤ Surface Mount Plate

Figure 7-1 FARO 8-Axis Shipping case

NOTE: Some items are packed below the ② Table.

Hardware Setup

The following sections describe the proper setup of the 8-Axis. This includes attaching the 8-Axis to your work surface or tripod, and connecting it to your Quantum.

NOTE: Setup your Quantum. Complete all cable connections between your 8-Axis, Quantum, and computer before applying power to your Quantum and computer.

① FARO 8-Axis
② Table

Underneath Table:

③ 8-Axis Cable
④ Four Screws and Hex Wrench
⑤ Surface Mount Plate

Figure 7-1 FARO 8-Axis Shipping case

Mounting the Base

Setup your Quantum. Complete all cable connections between your 8-Axis, Quantum, and computer before applying power to your Quantum and computer. To setup the base:

1. If you are not using a tripod, remove the ⑤ Surface Mount Plate from the Shipping Case and attach it to a surface.
2. Remove the ① 8-Axis base from the shipping case.
3. Place the 8-Axis onto the 3½" ring of your tripod or surface mount plate. Thread the collar onto the ring and hand tighten.

Figure 7-2 FARO 8-Axis Base

4. Tighten the collar using the attached handles.

Figure 7-3 Tighten the Collar

5. Attach the table to the base and secure using the four screws. Tighten each screw with the hex wrench.

Figure 7-4 Attach the Table

Cable Connections

Connect the cables:

1. Connect the 8-Axis cable to the base of the 8-Axis.

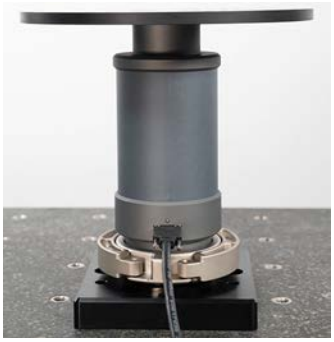


Figure 7-5 Connect the 8-Axis Cable

2. Connect the 8-Axis cable to the Quantum Auxiliary port.

Figure 7-6 Connect the 8-Axis Cable

3. Connect the 8-Axis cable to the Quantum USB power port.

Figure 7-7 Connect the 8-Axis USB Cable

4. Connect both power supplies to your source of power. Switch on the computer and the Quantum.

Reference the Encoders

You must first reference each of the six (seven) encoders in the Quantum before the system can output data. Pull the handle and each tube out of the rest position and move to make each encoder move. Each encoder must move to reference. The Reference Encoders dialog box shows all seven encoders in error until each is referenced. In a systematic manner, rotate links 1 through 6 (7) until each warning clears.

Then reference the encoder in the 8-Axis by rotating the turntable top until the warning clears.

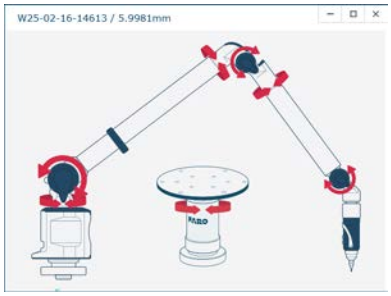


Figure 7-8 Referencing the Encoders

Before you can measure accurately with the 8-Axis, you must compensate it.

Compensation

Before you can measure accurately with the 8-Axis, you must compensate the position to your Quantum. If the physical position between the two devices changes, simply repeat this compensation.

Position the 8-Axis so that when you place the FARO i-Probe in one of the four table compensation holes, you can rotate the table 360°, or 180°.

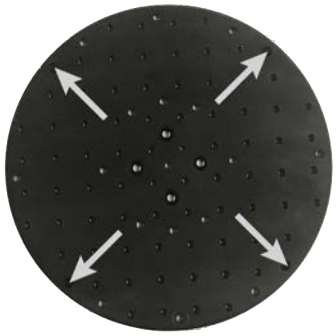


Figure 7-1 Compensation Holes

This is necessary for the compensation of the 8-Axis. before the system can output data. Rotate the turntable top until the warning clears.

Figure 7-2 8-Axis Compensation

In CAM2 2021, click **Device Center** in the **Devices** tab. Click your Quantum and then click **Hardware Configuration** to compensate your 8-Axis.

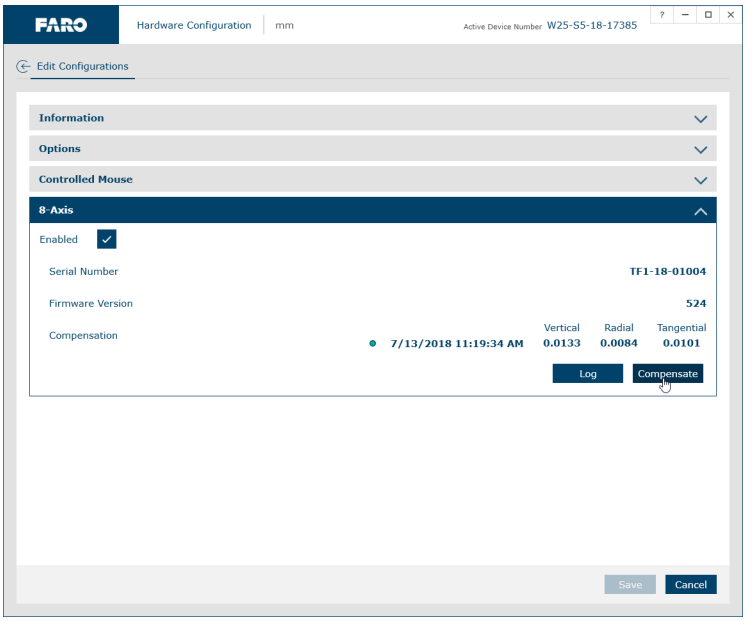


Figure 7-3 8-Axis Hardware Configuration

1. In the **8-Axis** group, select the **Enabled** check box.
2. Click **Compensate**.
3. Choose a Compensation method.

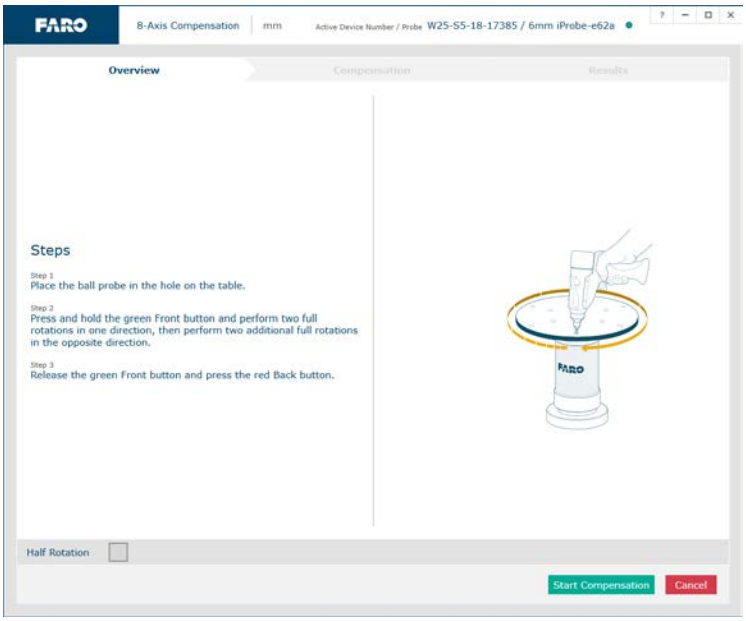


Figure 7-4 8-Axis Compensation

- Select the **Half Rotation** check box if you can only rotate the table 180°.

4. Click **Start Compensation**.

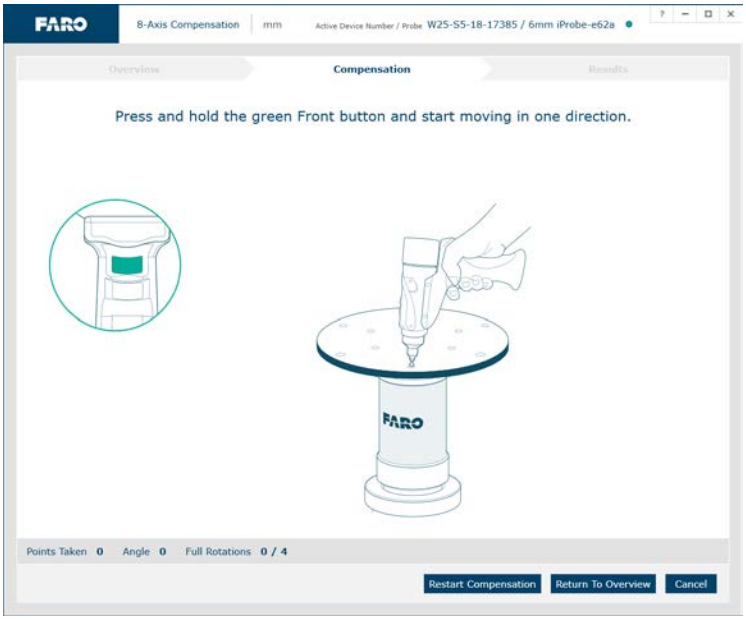


Figure 7-5 8-Axis Compensation

- Place the probe in any compensation hole.
- Press and hold the **green Front** button and move the turntable in one direction. Rotate around twice (720°).

NOTE: Release the **green Front** button to pause.

- Press and hold the **green Front** button and move the turntable in the opposite direction. Rotate around twice (720°).
- Release the **green Front** button and press the **red Back** button.

5. Look at the compensation results. Click **Save and Exit** to store the compensation, or click **Restart Compensation** to discard the data and start again.

Repeat this compensation three times. Click the **Log** button and look at the compensation results.

Measuring

CAUTION: Ensure your part is mounted in the center of the 8-Axis to avoid injury and/or damage to the 8-Axis.

Once the 8-Axis has been successfully compensated, the FaroArm readings are adjusted for the rotation of your part on the 8-Axis. Secure your part to the table and start measuring:

- Start any measurement command
- Add readings
- Turn the part and add more readings

You will see the measured readings in the feature adjusting for the rotation of your part on the 8-Axis.

NOTE: You can measure with any probe connected to the Quantum. The FARO 8-Axis will speed up your measurement time.

8-Axis Work Holding Kit

Part # 900-000034-00

This kit is a set of rails, corner brackets, flat plates, and hardware to build a holding fixture for your part on the table.

8-Axis 500 mm Table

Part # 443-000140-000

The 500 mm Table is a larger table that you can attach to the base of the 8-Axis to replace the standard table.

Technical Support

FARO Technologies, Inc. is committed to providing the best technical support to our customers. If you have any problem using one of our products, please follow these steps before contacting our Technical Support Team:

- Be sure to read the relevant sections of the documentation to find the help you need.
- Visit the FARO Customer Care area on the Web at *www.faro.com* to search our Knowledge Base. This is available 24 hours a day 7 days a week.
- Document the problem you are experiencing. Be as specific as you can. The more information you have, the easier the problem will be to solve.
- If you still cannot resolve your problem, have your device's Serial Number available *before calling*.

Support Hours (Monday through Friday)

North America:
8:00 a.m. to 7:00 p.m. Eastern Standard Time (EST).

Europe:
8:00 a.m. to 5:00 p.m. Central European Standard Time (CET).

Asia:
8:30 a.m. to 5:30 p.m. Singapore Standard Time (SST).

Japan:
9:00 a.m. to 5:00 p.m. Japan Standard Time (JST).

China:
8:30 a.m. to 5:30 p.m. China Standard Time (CST).

India:
9:30 a.m. to 5:30 p.m. India Standard Time (IST).

You can also e-mail or fax any problems or questions 24 hours a day.

Phone

North America:
800 736 2771, +1 407 333 3182 (Worldwide)

Mexico:
001-866-874-1154

Brazil:
0800-047-4271, +55 11 3500-4600

Europe:
+800 3276 7378, +49 7150 9797-400 (Worldwide)

Asia:
1800 511 1360, +65 6511 1350 (Worldwide)

Japan:
0120.922.927, +81 052.890.5011 (Worldwide)

China:
+86 400.677.6826, +86 21 6191 7600 (Worldwide)

India:
1800.1028456, +91-1146465656 (Worldwide)

Thailand:
+662.7441273-6 (Worldwide)

Korea:
+82.51.662.3413 (Worldwide)

Fax

North America:
+1 407 562 5294

Europe:
+800 3276 1737, +49 7150 9797-9400 (Worldwide)

Asia:
65 65430111

Japan:
+81 052.890.5012

China:
+86 21 64948670

India:
+91-11-46465660

Thailand:
+662.7443178

Korea:
+82.51.941.8170

E-Mail

North America:
support@faro.com

Brazil:
supporte@faro.com

Europe:
support.emea@faro.com

Asia:
support.asiapacific@faro.com

Japan:
support.japan@faro.com

China:
support.china@faro.com

India:
support.india@faro.com

Thailand:
support.thailand@faro.com

Korea:
support.korea@faro.com

E-Mails or Faxes sent outside regular working hours usually are answered before 12:00 p.m. the next working day. Should our staff be on other calls, please leave a voice mail message; calls are always returned within 4 hours. Please remember to leave a description of your question and your device's Serial Number. Do not forget to include your name, fax number, telephone number and extension so we can reach you promptly.

End User Documents

All documents related to the Software End User License Agreement, Purchase Conditions, and FARO Products Service Policy can be found on the FARO Knowledge Base at the following URL:
https://knowledge.faro.com/Essentials/General/FARO_End_User_License_Agreement_Location.

Glossary

3

3D
Three dimensional

A

Accuracy
The deviation between the measured value and the nominal or actual value.

B

Best Fit
Creating a feature that fits a set of points so each point is the shortest distance to the feature.

Bluetooth
Bluetooth is a wireless technology standard used for exchanging data between fixed and mobile devices over short distances using short-wavelength UHF radio waves in the industrial, scientific and medical radio bands,and building personal area networks (PANs).

Button
Refers to the switches on the FaroArm.

C

Calibration
A series of measurements that check the accuracy of the FaroArm against known standards.

Capture (of data)
Digitizing or Scanning. Storing data points in the computer system. See also "Digitizing." See also "Scanning."

Circle
A closed planar curve in which every point on the curve is equidistant from the center.

Circularity
Circularity measures the form deviation of a circle.

CMM
Coordinate Measuring Machine

Collinear
Data points which lie on the same line.

Compensated points
Refers to the compensation for the radius of the ball probe.

Compensation
The procedure by which the FaroArm is optimized to perform accurate measurements. Thousands of data points are captured to determine the true geometry and kinematics of each FaroArm. This electronic “finger print” is stored on the device.

Coordinate Measuring Machine (CMM)
These machines capture 3D data from objects to give the position (XYZ) of the object.

Coordinate System
A system of representing points in a space of given dimensions by coordinates, such as the Cartesian coordinate system or the system of celestial longitude and latitude. A coordinate system is a system by which

uses one or more features, or coordinates, to uniquely determine the position of a point or other geometric element as a frame of reference.

Counter-balance
The internal system which supports the weight of the FaroArm allowing for greater operator control and reduced operator fatigue.

Custom probes
Probes other than those that are supplied with the FaroArm as a standard. Customers can manufacture their own probes, and compensate them using the compensation cone or sphere.

Cylinder
A geometric feature formed by extruding a circle along its centerline in a direction normal to its plane.

Cylindricity
Cylindricity measures the form deviation of a cylinder.

D

Datum
A datum (plural datums or data) is a reference from which measurements are made. In engineering and drafting, a datum is a reference point, surface, or axis on an object against which measurements are made.

Datum Coordinate
The XYZ values of a feature used to establish an alignment.

Degrees of Freedom (DOF)
TheFaroArm is termed to have 6 or 7 degrees of freedom. Each axis of rotation is defined as a degree of freedom.

Device
A piece of equipment or a mechanism designed to serve a special purpose or perform a special function. Measurement device; CAM2 2021.

Dial indicator
Dial indicators are instruments used to accurately measure a small distance. They may also be known as a Dial Gauge, Dial Test Indicator (DTI), or as a “clock”.

Diameter
The width of a circular of cylindrical feature.

Digitizing
Storing data points in the computer system. See also "Scanning."

DRO
Digital ReadOut. The display of XYZ coordinates on the screen.

E

Elbow
Refers to the joint of the FaroArm at the intersection of the two long tubes.

Electrostatic Discharge (ESD)
Electronic pulses generated by the discharge of loaded objects and/or people.

End Click
To accept collected readings by clicking the FaroArm red BACK button or the H keyboard shortcut.

ESD
Electronic pulses generated by the discharge of loaded objects and/or people.

Ethernet
Ethernet is a family of computer networking technologies commonly used in local area networks (LAN), metropolitan area networks (MAN) and wide area networks (WAN).

F

Flatness
Flatness measures the form deviation of a plane.

Form
The maximum bandwidth (Max. Error added to the Min. Error) of error that a set of measured points deviates from the true form of the resultant feature calculated from that set of points.

H

Handle
Refers to the pistol style handgrip of the FaroArm.

Hardware
Refers to the mechanical portion of a computer-based system. Opposite of Software.

Hot Keys
See also "Keyboard Shortcuts."

I

Inputting
Refers to the keying in of data.

Intersection
A meeting or crossing at a point.

ISO
International Organization for Standardization

J

Joint
The meeting place of two adjacent articulating units. Refers specifically to the transfer cases on the FaroArm.

Jump drive
See also "USB Drive."

K

Key-in
To manually enter data using a keyboard.

Keyboard Shortcuts
One keystroke commands which invoke a software function.

M

Max. (Maximum) Error
The largest distance from a reading above or outside a best-fit feature.

Maximum Permissible Error (MPE)
The extreme value of measurement error, with respect to a known reference quantity

value, permitted by specifications or regulations for a given measurement, measuring instrument, or measuring system.

Measure
To capture data points to determine the size, position, and form of feature. See also "Digitizing" and "Scaning."

Min. (minimum) Error
The largest distance from a reading below or inside a best-fit feature.

N

NIST
National Institute of Standards and Technology

Non-Contact Probe
A probe that records readings without touching the surface of the part. Mostly done with a laser beam and a camera.

O

Origin
The point from which the axes of a coordinate system emanate.

Orthogonal coordinates
Coordinates which are perpendicular.

P

Plane
A geometric feature defined by a point and a vector. A flat surface.

Plane Compensation
The movement of a measured plane in a direction the distance of the probe radius.

Probe
End effector or stylus. The part of the FaroArm that touches the measurement piece. The FaroArm can use a variety of probes including hard probes, touch-trigger, and laser probes.

Probe Compensation
A FaroArm procedure by which the position of the center of a ball probe is determined in relation to the last joint of the FaroArm. The ability of the software to account for the distance between the ball probe point of contact with the surface being measured and the center of the ball probe. Measured readings are moved this distance in a specific direction during the calculation of a feature. Gross errors can result if this is not done correctly.

R

Readout
The visual display of data on a computer screen. See also "Digital ReadOut."

Repeatability
The ability of a device to obtain consistent results. Although the terms are generally used interchangeably, repeatability differs from accuracy in that a device can consistently obtain the wrong result.

Resolution
The number of decimal places that a measurement device can reliably display.

Right Hand Rule
A coordinate system where the positive direction of each axis is described by three fingers of the right hand.

Rotation
Angular motion about a specified point or axis.

Roundness
The deviation of the measured data points from the true form of the resultant circle.

S

Scanning
To capture large quantities of data points quickly and storing the points in the computer system. See also "Digitizing."

Software
Refers to the application of a computer-based system. Opposite of Hardware.

Stream
A continuous input of data points.

T

Temperature Compensation
The ability of a measurement device to adjust to changes in ambient temperature. A measurement device that is temperature compensated will maintain its accuracy through a wide range of temperatures. A device that is not temperature compensated cannot.

Thread
A screw thread. A machined surface with a helical shape. Normally parts are fastened together with a screw and a threaded hole or a threaded bolt and nut.

Thread mount
A metal piece that is used as an interface between a mating thread and a tripod or a mating thread and a table mountable device.

Tolerance
A zone of accuracy in both size and placement of a feature. For example, a hole of a diameter of 1.00 ± 0.01 located at the x, y, z of 1.000, 1.000, 0.000 ± 0.005 means a 1 unit diameter hole can be between 1.01 and 0.99 in size and the location can be plus or minus 0.005 units from the specified nominal location. You determine the quality of a part by comparing your actual values to the nominal values within a tolerance range.

Touch trigger probes
An electromechanical device that has a hard ball probe on the end of a pivoting straight shaft. When any movement of shaft is sensed at the pivot, an electrical message is sent to command the CMM to take a data point.

Traditional CMM
There are many types of CMMs that fall into this category. These include the bridge type, cantilever type, gantry type, etc. These are floor-mounted machines that require you to bring the parts to the CMM, unlike FARO’s “portable” CMM, the FaroArm.

U

Unit Vector
A directional line with a non-dimensional magnitude of one. The line may be associated with the normal vector of a surface at a specific location. The vector is described in relation to the current alignment using the letters I, J, and K that are associated to X, Y, and Z.

Universal Serial Bus (USB)
Universal Serial Bus (USB) is an industry standard that establishes specifications for cables and connectors and protocols for connection, communication and power supply (interfacing) between computers, peripherals and other computers.

USB
Universal Serial Bus (USB) is an industry standard that establishes specifications for cables and connectors and protocols for connection, communication and power supply (interfacing) between computers, peripherals and other computers.

USB Drive
A storage device integrated with the USB interface.

V

Vector
A term used to describe the direction of a line or object that may or may not have a magnitude. The line may be associated with the normal vector of a surface at a specific location. The vector is described in relation to the current alignment using the letters I, J, and K that are associated to X, Y, and Z.

Volume
The amount of space occupied in three dimensions.

W

Wrist
Refers to the last grouping of joints on the end of the FaroArm.

X

X, Y, Z
Refers to the Cartesian Coordinate System for three-dimensional space.

Index

B

C

D

E

F

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

V

W

FARO Technologies, Inc.
250 Technology Park
Lake Mary, FL 32746
800-736-2771 U.S. / +1 407-333-3182 Worldwide
Email: support@faro.com

FARO Brazil
Rua San José, 360
Cotia, SP 06715-862
Phone: 0800-047-4271 / +55 11 3500-4600
Email: suporte@faro.com

FARO Europe GmbH & Co. KG
Lingwiesenstrasse 11/2 D-70825
Korntal-Münchingen, Germany
FREECALL +800 3276 73 78 / +49 7150/9797-400
FREEFAX +800 3276 1737 / +49 7150/9797-9400
Email: support.emea@faro.com

FARO Singapore Pte. Ltd.
No. 03 Changi South Street 2
#01-01 Xilin Districentre Building B
SINGAPORE 486548
TEL: +65 6511.1350
Email: supportap@faro.com

FARO Japan,c.
716 Kumada, Nagakute-City,
Aichi, 480-1144, Japan
Tel: 0120-922-927, 052.890.5011
FAX: 052.890.5012
Email: supportjapan@faro.com

FARO (Shanghai) Co., Ltd.
1/F, Building No. 2,
Jux Information Technology Park
188 Pingfu Road, Xuhui District
Shanghai 200231, China
Tel.: 400.677.6826
Email: supportchina@faro.com

FARO Business Technologies India Pvt. Ltd.
E-12, B-1 Extension,
Mohan Cooperative Industria Estate,
New Delhi-110044, India
Tel.: 1800.1028456
Email: supportindia@faro.com