FaroArm® and FARO® Gage Accessories Manual
February 2018

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

FARO®

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Chapter 1: Introduction

The FaroArm® and FARO® Gage Accessories Manual describes the accessories available for the FaroArm and the FARO Gage, and the instructions for their use. Order any FaroArm or FARO Gage 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 63.*

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.

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, 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."
SMALL CAPS text	Indicates dialog box names, and dialog box items.

You may also see a few new words. It is important that you understand the meaning of these 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

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

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

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 2002/96/EC 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

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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 2002/96/EC 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.

WEEE Symbol

Refer to *www.faro.com* for further environmental information concerning this product.

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).

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Chapter 2: Ball Probes

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

• 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 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 17.*

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 and FARO Gage using standard Ball Probes.**

Quantum Series

i-Probes are available for the FaroArm Quantum in a variety of ball diameter sizes.

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

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Edge, Prime, and Fusion Series

The following probes are *only* for the Edge, Prime, or Fusion series FaroArm, or the FARO Gage. Installing other probes these FaroArms, or the FARO Gage requires an adapter. *See "Platinum/ Fusion/FARO Gage to Metric Adapter Part # 2712" on page 20.*

- 3 mm Zircon Ball Probe - Part # PROBE0069
- 6 mm Zircon Ball Probe - Part # PROBE0070
- 5⁄16" Ball Probe Part # PROBE0083

57.15 mm

Wrench Slot

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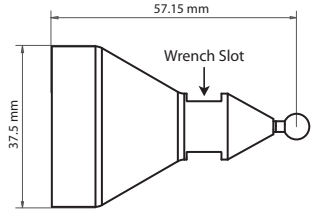
Body: Stainless Steel
Stem: Tungsten Carbide
Ball: Zirconia
Thread: 1 ¼" 20 UN

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 FARO Gage.

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

57.15 mm

Wrench Slot

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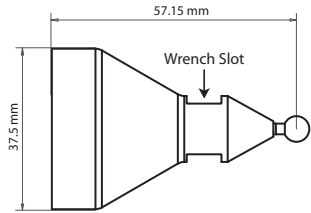
Body: Stainless Steel
Stem: Tungsten Carbide
Ball: Zirconia
Thread: 1 ¼" 20 UN

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)
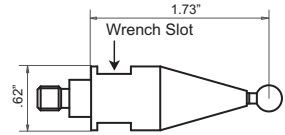
1.73"
Wrench Slot
.62"

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 Part # 21460 or the Platinum/Fusion/FARO Gage to Metric Adapter Part # 2712 to connect to the FaroArm. *See "Quantum Extension Adapter i-Probe Part # 21460" on page 17 and "Platinum/Fusion/FARO Gage to Metric Adapter Part # 2712" on page 20.*

- 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)

44mm
Wrench Slot
15.8 mm

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

6mm Ball Probe

- 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)

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Metric Ball Probes - M4

The following probes require the Quantum Universal Adapter i-Probe Part # 20780 to connect to the FaroArm. *See "Quantum Universal Adapter i-Probe Part # 20780" on page 19.*

The ball diameters of these probes are not certified.

> **NOTE**: These probes are not available for use with the FaroArm Edge/Platinum/Fusion and 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

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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.
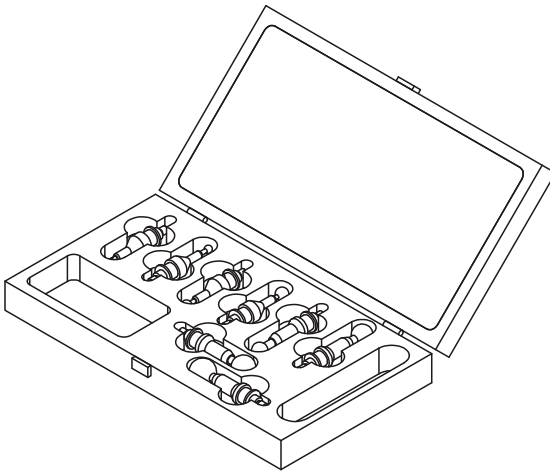
1/64" Radius Carbide Probe Part # PROBE0045

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

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accurate measurement. See the following drawing for an example of good and bad ball probe contact.

Good Ball Probe Contact   Bad Ball Probe Contact

1" REFERENCE SPHERE

1" REFERENCE SPHERE

Probe not touching the reference sphere

1/64" Radius Carbide Probe
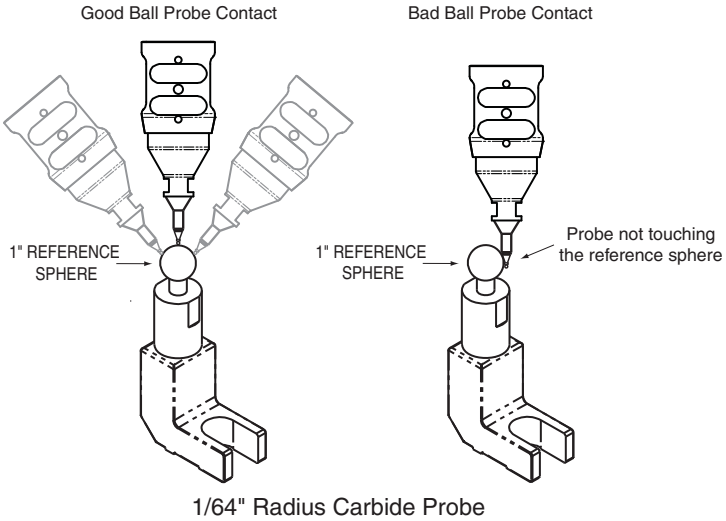
¼" Curved Ball Probe
Part # PROBE0025

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.

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

3.94"

Wrench Slot

.62"

Body: Stainless Steel
Stem: Tungsten Carbide
Ball: Zirconia
Thread: M6x1
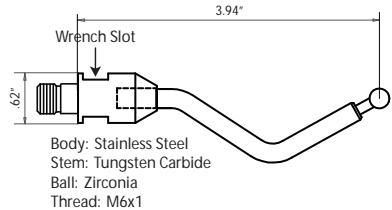
1/4" Curved Ball Probe

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¼" Extended Ball Probe Part # PROBE0021

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

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

Body: Stainless Steel
Stem: Tungsten Carbide
Ball: Zirconia
Thread: M6x1
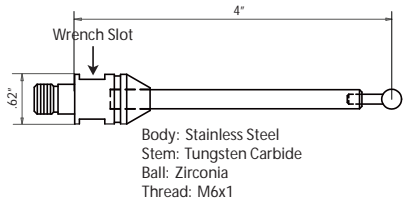
1/4" Extended Ball Probe

90° Angle Ball Probe Part # PROBE0060

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

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

Body: Stainless Steel
Stem: Tungsten Carbide
Ball: Ruby
Thread: M6x1

3mm Ruby Ball - 90°
Angle Probe

Delrin (Nonmarring) Ball Probes

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.

Flat Spot on
Delrin Probe

Probe
Equator

> **HINT**: You can determine *flat* spots on a ball probe by high compensation results. The two Delrin ball probes are listed below.

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

- ¼" Delrin (nonmarring) Ball Probe - Part # PROBE0032

- ⅛" Delrin (nonmarring) Ball Probe - Part # PROBE0030

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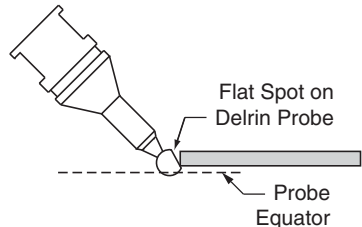
Chapter 3: Point Probes

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 series FaroArm. It requires the Quantum Universal Adapter i-Probe Part # 20780 to connect to the FaroArm. *See "Quantum Universal Adapter i-Probe Part # 20780" on page 19.*

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

Platinum and Fusion Series, and FARO Gage
Part # PROBE0071

The following probe is only for the Platinum or Fusion series FaroArm, or the FARO Gage. Installing other probes on the Platinum or Fusion series FaroArm, or the FARO Gage requires an adapter. *See "Platinum/Fusion/FARO Gage to Metric Adapter Part # 2712" on page 20.*

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

- Carbide Point Probe - Part # PROBE0071
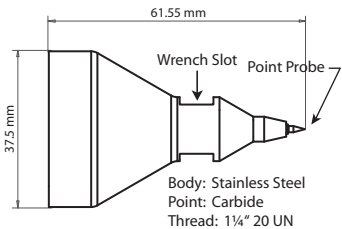
Carbide Point Probe

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.

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

57.9 mm
Wrench Slot
Point Probe
15.8 mm
Body: Stainless Steel
Point: Carbide
Thread: M6x1

Carbide Point 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.

> **NOTE**: FARO Technologies, Inc. does not guarantee the accuracy of the FaroArm with the use of this probe.
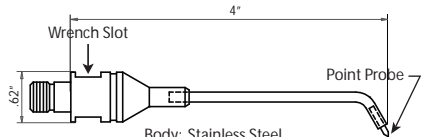
4"
Wrench Slot
Point Probe
.62"
Body: Stainless Steel
Point: Carbide
Thread: M6x1

4" Extended, 60 degree
Carbide Point Probe

4" Long Carbide Point Probe
Part # PROBE0046

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

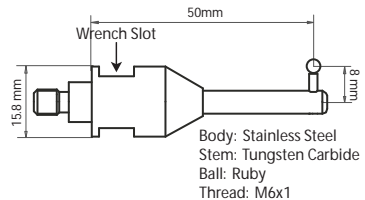> **NOTE**: FARO Technologies, Inc. does not guarantee the accuracy of the FaroArm with the use of this probe.
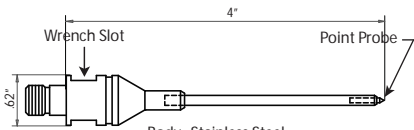
4"
Wrench Slot
Point Probe
.62"
Body: Stainless Steel
Point: Carbide
Thread: M6x1

4" Long Carbide Point Probe

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5" Long Carbide Point Probe
Part # PROBE0042

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

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

Body: Stainless Steel
Point: Carbide
Thread: M6x1
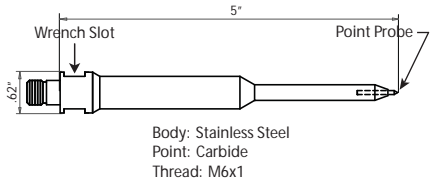
5" Long Carbide Point Probe

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.

Body: Stainless Steel
Point: Delrin
Thread: M6x1

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)
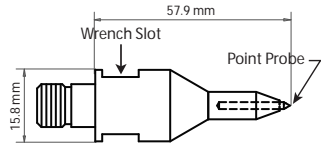- ⅛" Point Probe - Part # PROBE0030 (M6 x 1 threads)
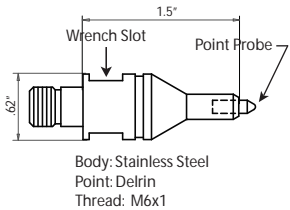
Chapter 4: Probe Accessories

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

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 Part # PROBE0073 and 21604. *See "Probe Extension Kit Part # PROBE0073 and 21604" on page 20.*

Installation

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

1. Remove any probe from the FaroArm.

2. Remove the thread guard. Unthread the guard by turning it counter-clockwise.
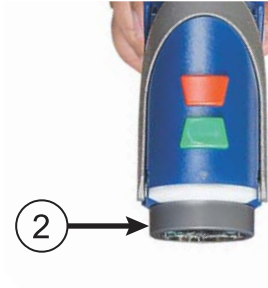
3. Open the probe locking lever.

4. Slide the probe onto the end of the FaroArm. Rotate the probe until the marks on the probe and the handle match.

5. 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.

6. Close the probe locking lever.

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

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

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 8.*

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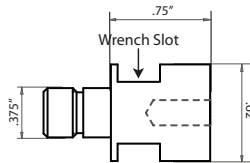
Body: Stainless Steel
Thread in: 3/8 - 24
Thread out: M6x1

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).

.75"
Wrench Slot
.24"
.62"
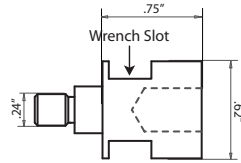
Body: Stainless Steel
Thread in: M6x1
Thread out: 3/8 - 24

Metric to English Adapter

Platinum/Fusion/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 FARO Gage.

1.55"
Wrench Slot
1.5"
.73"
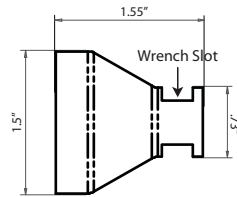
Body: Stainless Steel
Thread in: 1 ¼" 20 UN
Thread out: M6x1

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, Part # PROBE0073 for FaroArm Edge/Platinum/Fusion and 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.
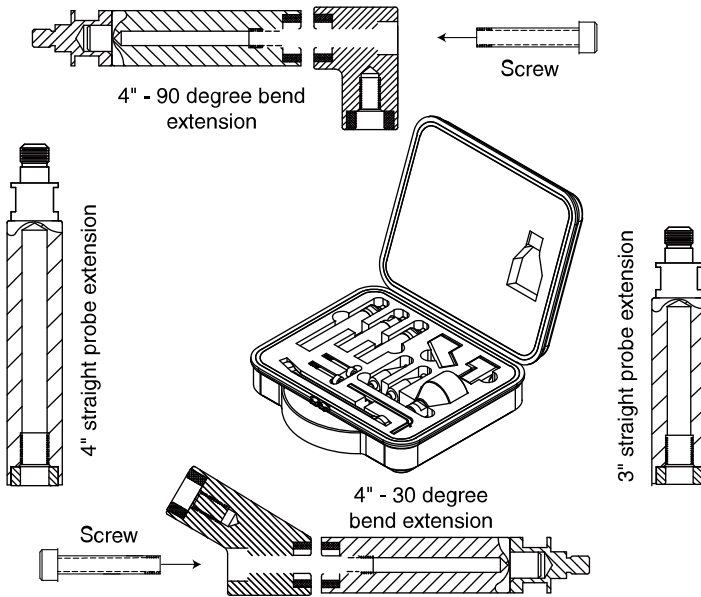
For more information on installing the adapter onto your FaroArm, see
"Quantum Extension Adapter i-Probe Part # 21460" on page 17.

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 checkbox 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.

Body: Stainless Steel
Thread: M6x1
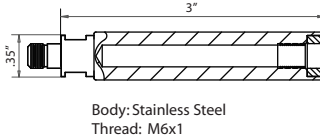
3" Straight Probe Extension

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.

Body: Stainless Steel
Thread: M6x1
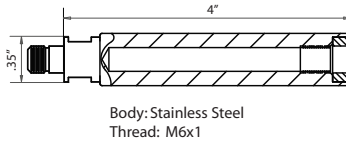
4" Straight Probe Extension

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.

Body: Stainless Steel
Thread: M6x1

12" Straight Probe Extension

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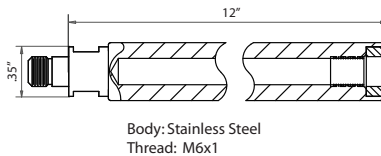
NOTE: FARO Technologies, Inc. does not guarantee the accuracy of the FaroArm with the use of this extension.

M4 Probe Extensions

The following probe extensions have standard M4 threads and require the Quantum Universal Adapter i-Probe Part # 20780 to connect to the FaroArm. *See "Quantum Universal Adapter i-Probe Part # 20780" on page 19.*

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 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.

.89"
Wrench Slot

90°

.62"
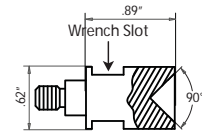
Body: Stainless Steel
Thread: M6x1

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.

Cone Probe

Tooling Ball

Position #4

Position #1

Position #2

Position #3
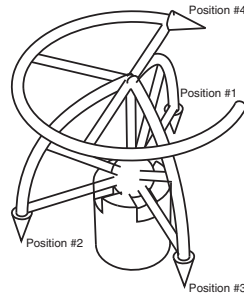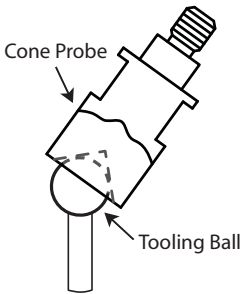
Swiveling Edge Probe
Part # PROBE0044

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.

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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.
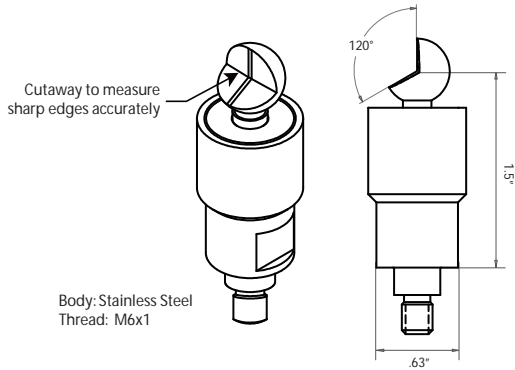
Swiveling Edge Probe

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.
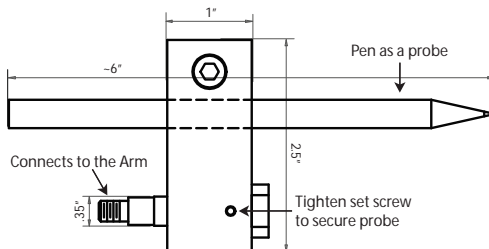
Penholder Probe

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> **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.
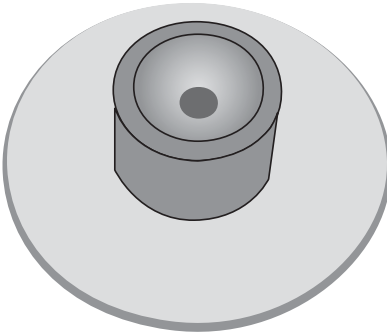
Magnetized Probe
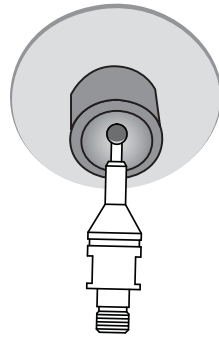
Magnetized Probe
with 1/4" Ball Probe

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.

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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.
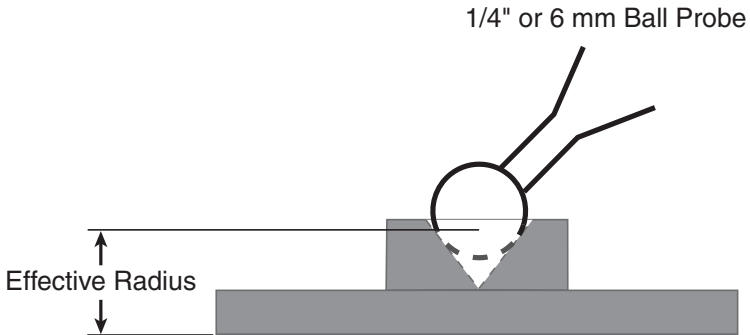
1/4" or 6 mm Ball Probe

Effective Radius

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.
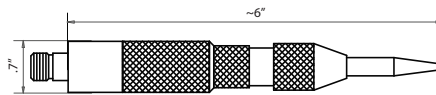
Body: Stainless Steel
Thread: M6x1

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. 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.

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TP20 Probe
Part # PROBE0072

Platinum/Fusion Series and FARO Gage TP20 Probe Kit

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
Part # 11769

Quantum Series TP20 Probe Kit

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 Series

The TP20 Probe Part # 20735 connects the TP20 probe to the Quantum series FaroArm.

Chapter 4: Probe Accessories

Edge Series

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

Installation

Quantum and Edge Series

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 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 63.*

1 - FaroArm with standard probe removed
2 - Renishaw TP20 Probe Body
3 - Renishaw TP20 Probe Module

Remove the set screw using a flathead screwdriver.
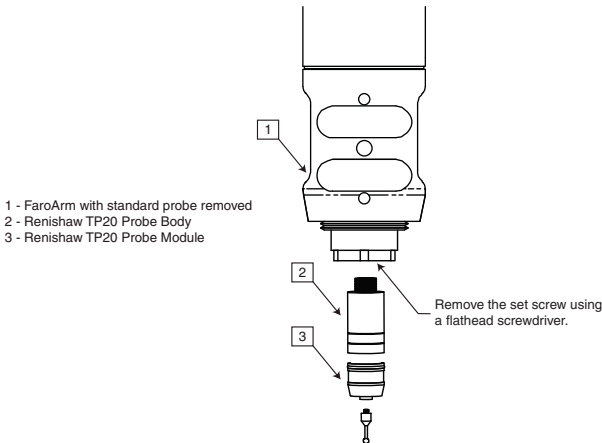
Figure 4-1 TP20 probe Installation - Platinum and Fusion series

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 Measure or Caliper 3D:

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.

To enable the Options/Aux. Port in Caliper for Windows:

1. Select the **Settings** menu and choose **Configuration and Options**.

2. From the **Accessories** menu, place a check mark in the Aux Switch box.

3. Select the probe type.

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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 (RTTP) 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 Platinum and Fusion series, or FARO Gage 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 *http://www.renishaw.com/ client/product/UKEnglish/PGP-44.shtml*

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.
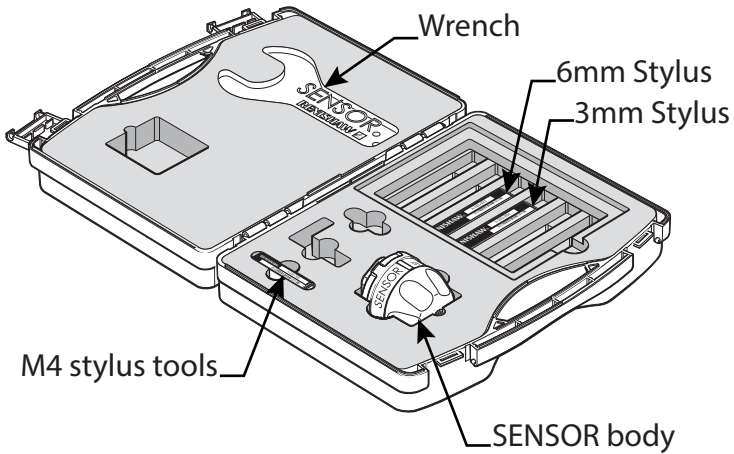
Additional Items:
- Cleaning kit
- User Manual CD

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

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Chapter 5: Stands and Mounts

There are four optional rolling stands and a tripod that help you setup the FaroArm to measure your part.

Heavy-Duty Rolling Stands

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.
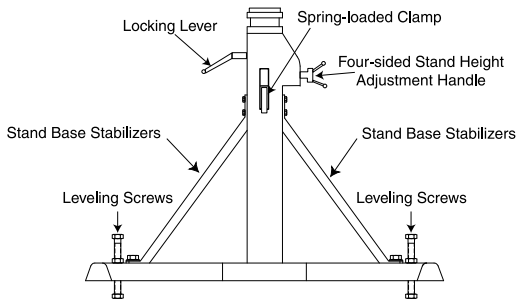
Heavy-Duty Rolling Stand

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

- Rolling Stand (20" to 25") - Part # IG-18
- Rolling Stand (28" to 42") - Part # IG-10
- Rolling Stand (36" to 54") - Part # IG-24
- Rolling Stand (43" to 67") - Part # IG-9

Adjusting the Stand

To raise the stand's main tube:

1. Move the locking lever to the UP position. 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, push the locking lever down. This prevents the tube from moving.
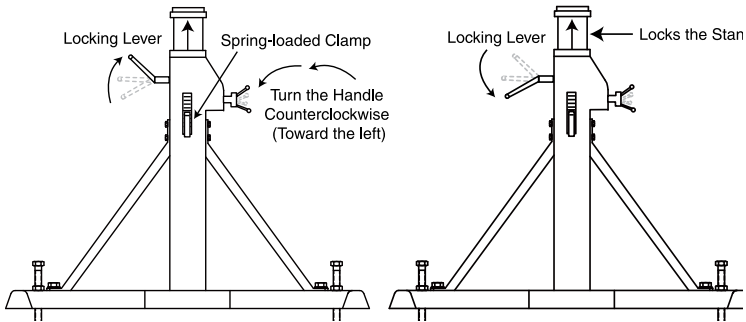
To lower the stand's main tube:

1. Move the locking lever to the UP position.

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. Move the locking lever back to the UP position to lock the tube in position.

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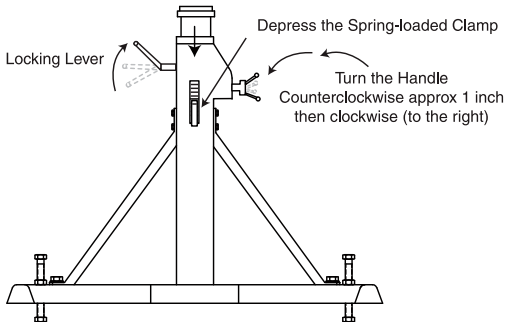
Adjusting the Stand's Base for Transport

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.

Grasp stabilizer and lift.   Grasp stabilizer and lift.
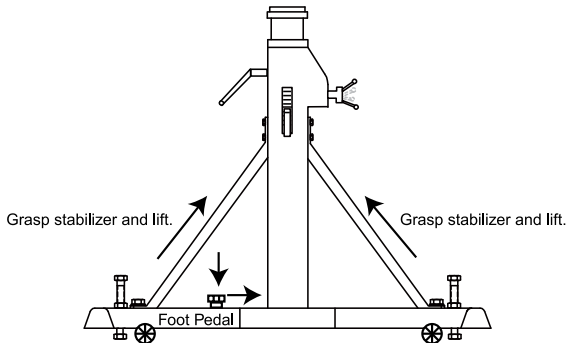
Foot Pedal

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.

Foot Pedal

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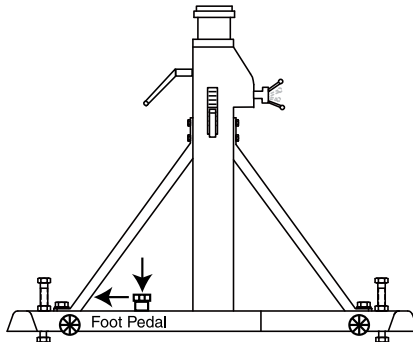
Adjusting the Stand for Stability

To stabilize the stand on an uneven space:

1. Adjust the three leveling screws with your hand. Use your wrench to lock the nuts located at the base of the stand. This keeps the stand from rocking back and forth on an uneven surface.
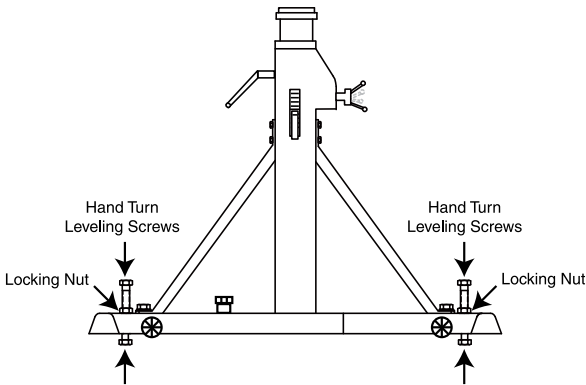
Folding Tripod
(Part # 15532)

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

To use the Folding Tripod:

1. Remove the Folding Tripod from its case.

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2. Spread out the legs, placing the Pads flat on the floor. Fully extend the tripod legs.

3. Tighten the center knob to provide further support to the legs.

4. Loosen the handle on each of the three legs.

5. Each leg has etched lines to help adjust the height of the tripod

    NOTE: Tighten all three handles to ensure that the tripod remains stable.

6. Thread the mandrel mount onto the tripod.

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.

Mount the FaroArm to the top of the tube extension

Tube Extension screws
onto the main tripod tube

Grab and turn
to tighten

Main Tube

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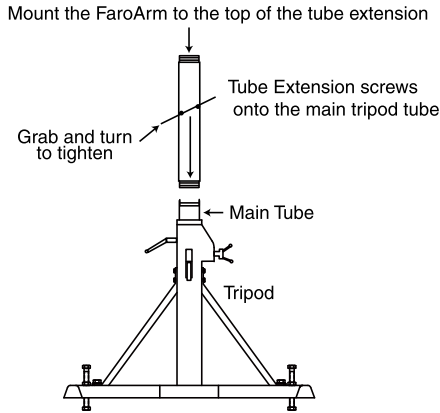
> **NOTE**: Two holes are drilled into the tube extensions for tightening the extension to the main tube. Using a metal rod or a similar object, insert the rod into the holes and twist to tighten the tube extension.

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 Magnetic Mount is used for all FaroArm modules. It is a large, magnetic base used to mount the FaroArm to surface plates, tools, and other ferrous surfaces. It comes with the 3½" ring on top and the tool to turn the magnet on and off.

Magnetic Mount

Tool that turns the magnet
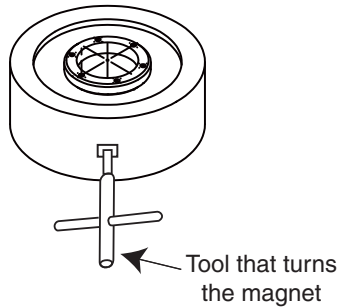
Figure 5-1

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.

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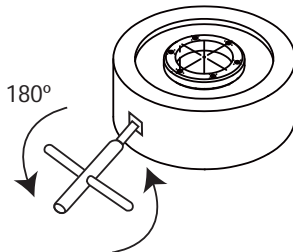
Turn the tool 180 degrees to the left
to turn off the magnet

Figure 5-2

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

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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%)
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 Phone, Fax or E-Mail with any questions for a reduction factor for a particular material that you need to use as a base. *See "Technical Support" on page 63.*

3½" Mounting Ring
Part # IG-27

The 3½" Mounting Ring is typically used for the Bronze/Sterling/Platinum/Fusion/Quantum series FaroArm, and the FARO Gage. 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 the FaroArm.

ø.218 C'BORE
ø.344 X .22 DP.
6 EQUAL PLACES
ON A 2.970 B.C.

10-32 UNF x.75 DEEP

3.500-8 UN-2A

6 Equal Spaces
on 2.970 B.C.

THREADED RING   RING MOUNTING
                       HOLE PATTERN
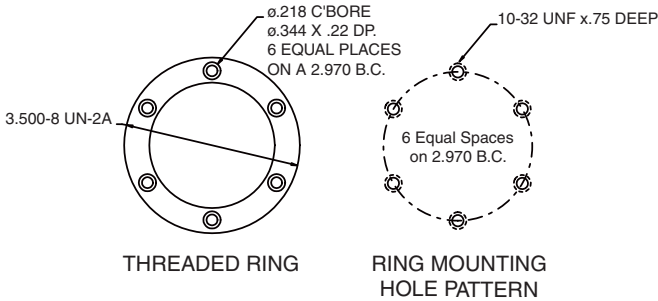
Vacuum Mount
Part # 13402-001, Imperial
Part # 13402-002, Metric

The Vacuum Mount is used with the Bronze/Sterling/Platinum/Fusion/Quantum series FaroArm to mount it to a granite surface.

> **NOTE**: A smaller model, part # 13403-001 (Imperial) part # 13403-002 (Metric) is available for the 4ft. model FaroArms and the FARO Gage.

> **CAUTION**: Always disconnect the FaroArm/FARO Gage from the Vacuum Mount before moving. Moving the FaroArm/FARO Gage and Vacuum Mount together may cause damage to the FaroArm/FARO Gage.

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.

Chapter 5: Stands and Mounts

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.

1. Vacuum Pump
2. Pressure Relief Valve
3. Flexible Tubing
4. 3½" Mounting Ring
5. Vacuum Mount
6. Pressure Gauge
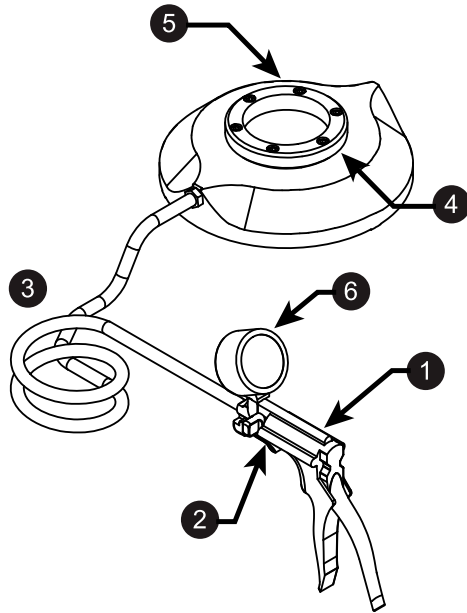
To use the Vacuum Mount:

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 FaroArms 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.

1. Charging connection
2. Upper plate
3. Ventilation
4. Vacuum manometer
5. On/off switch
6. Surface
7. Base
8. Charging level LEDs
9. 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).

47

- 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.

Attach to the bottom of the
tripod leveling screws.

Rubber Tripod Feet
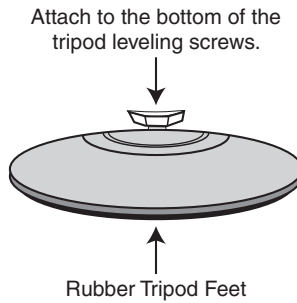
Chapter 6: Miscellaneous

This chapter covers the miscellaneous accessories available for the FaroArm® and FARO® Gage.

All-In-One Workcart
Part # ACCS0164

The All-In-One Workcart is a convenient workcenter for the FaroArmor FARO Gage operator. The workcart includes a printer and provides convenient storage spaces for your computer, monitor, 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.

> **WARNING**: 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.

Top View   Side View
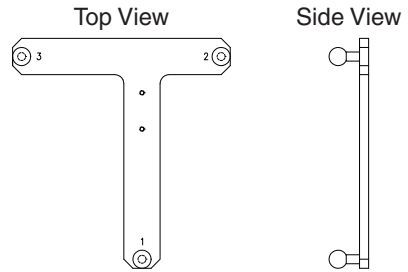
Leapfrog Magnetic Spheres

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.

Top View
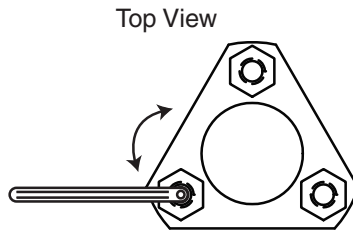
Turn allen wrench
to adjust height of feet

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

Side View of the Magnetic Sphere
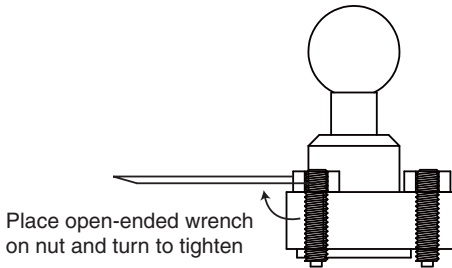
Side View of the
Cone Tip Sphere

Place open-ended wrench
on nut and turn to tighten
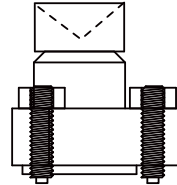
Listed below are the part numbers of the single sphere, single cone tip, the sphere kit, and magnetic cone tip kit.

- 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.

Load Point Line

45°
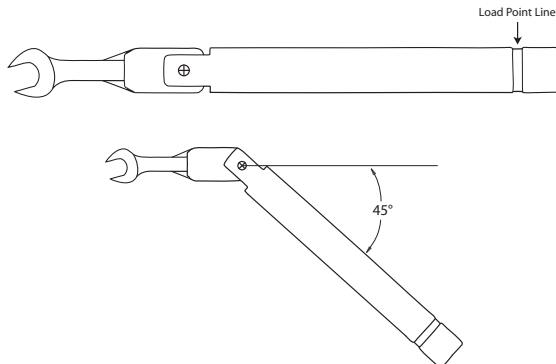
NOTE: Torque is preset to 50in/lb. Use only to tighten probes.

Applying Torque

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 cup 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.

Protective Cap

Slide hook to the right

Loosen or remove thumbscrews holding protective cap in place

Cone

.250-20 UNC x .75 DEEP

1.750

PROBING KIT ASSMEBLY MOUNTING HOLE PATTERN
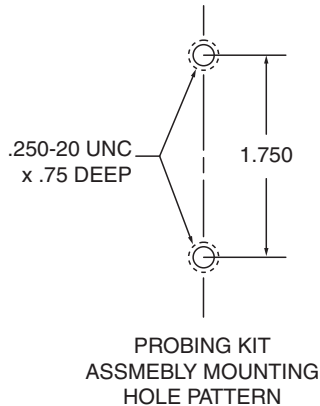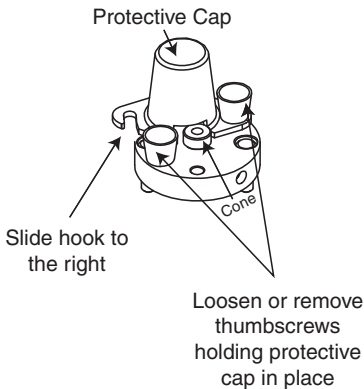
FaroArm and FARO Gage Probe Compensation Cone
Part # 12722 and 10308

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.
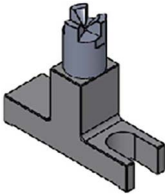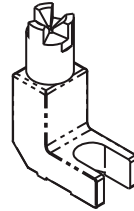
Part # 12722   Part # 10308

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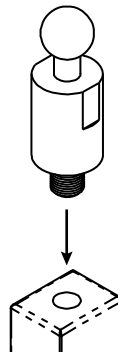
IMPORTANT: Use a 12 mm wrench to tighten the cone or sphere to prevent movement during probe compensation.

FaroArm Quantum Battery Pack and Charging Base

FaroArm Quantum Battery Pack
Part # 14705

Smart Battery for the FaroArm Quantum.

Charging the Battery Pack

Install the battery pack and connect the FaroArm and FARO Gage 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 and FARO Gage. 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 63.*

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

FaroArm Quantum Battery Pack Charging Base
Part # 20654 and # 20623

The FaroArm Quantum Battery Charging Base is an external charging base for FaroArm 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 FaroArm Quantum battery in this charging base.

FaroArm 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.

FaroArm 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.

FaroArm 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/FARO Gage Battery Pack Kit Part # ACCS0146

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

The Platinum/Fusion/Quantum/FARO Gage 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 63.*

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

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 63.*

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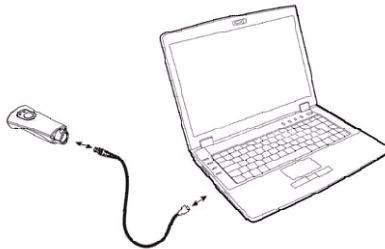
3.   Plug the USB connector into a USB port on your computer.

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.

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

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

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

Japan:
0120.922.927, +81 561 63 1411 (Worldwide)

China:
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)

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65 65430111

Japan:
+81 561 63 1412

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+86 021 61917600

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+91-11-46465660

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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*.

Appendix A: Software License Agreement

This Software License Agreement is part of the Operating Manual for the product and software System which you have purchased from FARO TECHNOLOGIES, INC. (collectively, the "Licenser") By your use of the software you are agreeing to the terms and conditions of this Software License Agreement. Throughout this Software License Agreement, the term "Licensee" means the owner of the System.

I.   The Licenser hereby grants the Licensee the non-exclusive right to use the computer software described in this Operating Manual (the "software"). The Licensee shall have no right to sell, assign, sub-license, rent or lease the software to any third party without the Licenser's prior written consent.

II.   The Licenser further grants the Licensee the right to make a backup copy of the software media. The Licensee agrees that it will not decompile, disassemble, reverse engineer, copy, transfer, or otherwise use the software except as permitted by this section. The Licensee further agrees not to copy any written materials accompanying the software.

III.   The Licensee is licensed to use the Software only in the manner described in the Operating Manual. Use of the Software in a manner other than that described in the Operating Manual or use of the software in conjunction with any non-Licenser product which decompiles or recompiles the software or in any other way modifies the structure, sequence or function of the software code, is not an authorized use, and further, such use voids the Licenser's set forth below.

IV.   The only warranty with respect to the software and the accompanying written materials is the warranty, if any, set forth in the Quotation/Purchase Order and *Appendix B: Purchase Conditions* pursuant to which the software was purchased from the Licenser.

V.   THIS WARRANTY IS IN LIEU OF OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE SOFTWARE AND WRITTEN MATERIALS. IN NO EVENT WILL THE LICENSER BE LIABLE FOR DAMAGES, INCLUDING ANY LOST PROFITS OR OTHER INCIDENTAL OR

CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE SOFTWARE, NOTWITHSTANDING THAT THE LICENSER HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, THE LICENSER WILL NOT BE LIABLE FOR ANY SUCH CLAIM BY ANY OTHER PARTY.

VI.   In the event of any breach by the Licensee of this Agreement, the license granted hereby shall immediately terminate and the Licensee shall return the software media and all written materials, together with any copy of such media or materials, and the Licensee shall keep no copies of such items.

VII.   The interpretation of this Agreement shall be governed by the following provisions:

A. This Agreement shall be construed pursuant to and governed by the substantive laws of the State of Florida (and any provision of Florida law shall not apply if the law of a state or jurisdiction other than Florida would otherwise apply).

B.   If any provision of this Agreement is determined by a court of competent jurisdiction to be void and non-enforceable, such determination shall not affect any other provision of this Agreement, and the remaining provisions of this Agreement shall remain in full force and effect. If any provision or term of this Agreement is susceptible to two or more constructions or interpretations, one or more of which would render the provision or term void or non-enforceable, the parties agree that a construction or interpretation which renders the term of provision valid shall be favored.

C. This Agreement constitutes the entire Agreement, and supersedes all prior agreements and understandings, oral and written, among the parties to this Agreement with respect to the subject matter hereof.

VIII.   If a party engages the services of an attorney or any other third party or in any way initiates legal action to enforce its rights under this Agreement, the prevailing party shall be entitled to recover all reasonable costs and expenses (including reasonable attorney's fees before trial and in appellate proceedings).

Appendix B: Purchase Conditions

All Purchase Orders (hereafter, the "Order") for FARO-provided products and services (hereafter, the "Product") are subject to the following terms and conditions, which are agreed to by the Purchaser. All capitalized terms are defined in Section 8.00 Definitions hereafter.

1.00   Payment of Purchase Price

1.01   Purchaser hereby promises to pay to the order of FARO all deferred portions of the Purchase Price, together with interest on late purchase price payments payable at 1.5% per month (18% per annum).

1.02   The Purchaser grants to FARO a security interest in the products sold pursuant to the Order, which may be perfected by UCC-1 Financing Statements to be recorded in the applicable County of the Purchaser's business location and filed with the Secretary of State's Office, which security interest will remain in effect until payment in full of the purchase price together with interest on late purchase price payments payable thereon had been received by FARO.

1.03   If the Purchaser fails to make full payment of the purchase price within the period set out in the Order, FARO shall at its option have the following remedies, which shall be cumulative and not alternative:

a)   the right to cancel the Order and enter the Purchaser's premises to re-take possession of the Product, in which event the Purchaser agrees that any down-payment or deposit shall be forfeited to FARO, as liquidated damages and not as a penalty, and all costs incurred by FARO in connection with the removal and subsequent transportation of the Product shall be payable by the Purchaser upon written demand;

b)   the right to enter the Purchaser's premises and remove any Software, components of the Product or other items necessary in order to render the Product inoperative;

c)   the right to withhold all services which would otherwise be required to be provided by FARO pursuant to the Warranties set out in Section 4.00 Warranties and Limitation of Liability hereof;

d)   terminate any existing software license agreement and

e)   pursue any other available remedy, including suing to collect any remaining balance of the purchase price (i.e., accelerate the

payment of the purchase price causing the entire balance to immediately become due and payable in full).

f)   Customer will be charged a 20% restocking fee for refusal to accept equipment as delivered. Equipment must be returned unopened within 10 business days of receipt at customer facility.

1.04   If Purchaser fails to make payment(s) in accordance with the terms of this Order, the Purchaser's Products may be rendered inoperable until such payment terms are met.

No waiver by FARO of its rights under these conditions shall be deemed to constitute a waiver of subsequent breaches or defaults by the Purchaser. In the event more than one Product is being purchased pursuant to the Order, unless otherwise set forth herein, each payment received by FARO from Purchaser shall be applied pro rata against the cost of each product rather than being applied to the purchase price of any product.

2.00   Delivery and Transportation

2.01   Delivery dates are estimates and not guarantees, and are based upon conditions at the time such estimate is given.

2.02   FARO shall not be liable for any loss or damage, whether direct, indirect or consequential, resulting from late delivery of the Product. The Purchaser's sole remedy, if the Product is not delivered within 90 days of the estimated delivery date, shall be to cancel the Order and to recover from FARO without interest or penalty, the amount of the down-payment or deposit and any other part of the purchase price which has been paid by the Purchaser. Notwithstanding the foregoing, such right of cancellation shall not extend to situations where late delivery is occasioned by causes beyond FARO's control, including, without limitation, compliance with any rules, regulations, orders or instructions of any federal, state, county, municipal or other government or any department or agency thereof, force majeure, acts or omissions of the Purchaser, acts of civil or military authorities, embargoes, war or insurrection, labor interruption through strike or walkout, transportation delays and other inability resulting from causes beyond FARO's control to obtain necessary labor, manufacturing facilities or materials from its usual sources. Any delays resulting from such causes shall extend estimated delivery dates by the length of such delay.

2.03   Responsibility for all costs and risks in any way connected with the storage, transportation and installation of the Product shall be

borne entirely by the Purchaser. If any disagreement arises as to whether or not damage to the Product was in fact caused in storage, transit or on installation, the opinion of FARO's technical advisors, acting reasonably, shall be conclusive.

3.00   Installation and Operator Training

3.01   The Purchaser shall be responsible for installation of the Product, including, without limitation, the preparation of its premises, the uncrating of the Product and setting up of the Product for operation. Purchaser may elect to order contract services from FARO to perform this service should they elect to do so.

4.00   Warranties and Limitation of Liability

4.01   FARO warrants that (subject to Section 4.06), the Product shall be free from defects in workmanship or material affecting the fitness of the Product for its usual purpose under normal conditions of use, service and maintenance. A complete statement of FARO's maintenance/ warranty service is set forth in *Appendix C: FARO Products Service Policy*.

4.02   FARO warrants that the Software shall operate according to specifications and the System shall operate and perform in the manner contemplated in connection with the usual purpose for which it is designed.

4.03   The maintenance/warranty set out in paragraphs 4.01 shall expire at the end of the twelve (12) month period commencing on the date of shipment from the FARO factory (the "Maintenance/Warranty Period").

4.04   Subject to the limitations contained in Section 4.06, the Warranties shall apply to any defects found by the Purchaser in the operation of the FaroArm and reported to FARO within the Maintenance/Warranty Period. If the FaroArm or the Software is found by FARO, acting reasonably, to be defective, and if the defect is acknowledged by FARO to be the result of FARO's faulty material or workmanship, the FaroArm will be repaired or adjusted to the extent found by FARO to be necessary or at the option of FARO, replaced with a new FaroArm or parts thereof at no cost to the Purchaser.

4.05   Claims under the Warranties shall be made by delivering written notice to FARO of the defect in the System, the FaroArm. Within a reasonable time of receipt of such notice, FARO shall have the System and FaroArm diagnosed by its service personnel, and

maintenance/warranty service will be provided at no cost to the Purchaser if the System and FaroArm is found by FARO to be defective within the meaning of this Section.

(If, in the reasonable opinion of FARO after diagnosis of the system and the FaroArm are not defective, the Purchaser shall pay the cost of service, which shall be the amount that FARO would otherwise charge for an evaluation under a non-warranty service evaluation.

4.06   The Warranties do not apply to:

a)   Any defects in any component of a System where, if in the reasonable opinion of FARO, the FaroArm, Software or System has been improperly stored, installed, operated, or maintained, or if Purchaser has permitted unauthorized modifications, additions, adjustments and/or repair to any hard drive structure or content, or any other part of the System, or which might affect the System, or defects caused or repairs required as a result of causes external to FARO workmanship or the materials used by FARO. As used herein, "unauthorized" means that which has not been approved and permitted by FARO.

b)   The Warranties shall not cover replacement of expendable items, including, but not limited to, fuses, diskettes, printer paper, printer ink, printing heads, disk cleaning materials, or similar items.

c)   The Warranties shall not cover minor preventive and corrective maintenance, including, but not limited to, replacement of fuses, disk drive head cleaning, fan filter cleaning and system clock battery replacement.

d)   Any equipment or its components which was sold or transferred to any party other than the original Purchaser without the expressed written consent of FARO.

4.07   Factory Repairs

a)   IF SYSTEM IS UNDER MAINTENANCE/WARRANTY: The Purchaser agrees to ship the Product to FARO in the original packing containers. FARO will return the repaired or replacement Product. FARO will incur the expense of the needed part and all return shipping charges to the Purchaser. FARO may authorize the manufacturer of a component of the Product to perform the service.

b)   IF SYSTEM IS UNDER PREMIUM SERVICE PLAN: When practical and subject to availability, FARO will make available to

the Purchaser substitute component parts or FaroArm's ("Temporary Replacements") while corresponding parts of the Purchaser's system or FaroArm are undergoing repair at FARO's factory. Shipping charges for these "Temporary Replacement" parts or FaroArm's will be the responsibility of FARO.

c)　IF SYSTEM IS NOT UNDER MAINTANENCE/ WARRANTY: The Purchaser is responsible for the cost of the replacement part or software, and all shipping charges. All charges shall be estimated and prepaid prior to commencement of repairs.

d)　Replacement parts used for repair may be new, refurbished, or contain refurbished materials.

4.08　Nothing herein contained shall be construed as obligating FARO to make service, parts, or repairs for any product available after the expiration of the Maintenance/Warranty Period.

4.09　Limitation of Liability

FARO shall not be responsible under any circumstances for special, incidental or consequential damages, including, but not limited to, injury to or death of any operator or other person, damage or loss resulting from inability to use the System, increased operating costs, loss of production, loss of anticipated profits, damage to property, or other special, incidental or consequential damages of any nature arising from any cause whatsoever whether based in contract, tort (including negligence), or any other theory of law. FARO's only liability hereunder, arising from any cause whatsoever, whether based in contract, tort (including negligence) or any other theory of law, consists of the obligation to repair or replace defective components in the System or FaroArm subject to the limitations set out above in this section.

This disclaimer of liability for consequential damage extends to any such special, incidental or consequential damages which may be suffered by third parties, either caused directly or indirectly resulting from test results or data produced by the system or any component thereof and the Purchaser agrees to indemnify and save FARO harmless from any such claims made by third parties.

4.10　The foregoing shall be FARO's sole and exclusive liability and the Purchaser's sole and exclusive remedy with respect to the system.

THE SOLE RESPONSIBILITY OF FARO UNDER THE WARRANTIES IS STATED HEREIN AND FARO SHALL NOT BE

LIABLE FOR CONSEQUENTIAL, INDIRECT, OR INCIDENTAL DAMAGES, WHETHER THE CLAIM IS FOR BREACH OF WARRANTY, NEGLIGENCE, OR OTHERWISE.

OTHER THAN THE EXPRESS WARRANTIES HEREIN STATED, FARO DISCLAIMS ALL WARRANTIES INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS.

4.11   FARO does not authorize any person (whether natural or corporate) to assume for FARO any liability in connection with or with respect to the Products. No agent or employee of FARO has any authority to make any representation or promise on behalf of FARO, except as expressly set forth herein, or to modify the terms or limitations of the Warranties. Verbal statements are not binding upon FARO.

4.12   The Maintenance/Warranties extend only to the Purchaser and are transferable, only under the following conditions:

- The FaroArm is currently under maintenance/warranty.

- New owner is, or becomes, a certified user.

- A FARO maintenance/warranty transfer form is completed, and submitted to Customer Service.

All claims under the Warranties must originate with the Purchaser, or any subsequent owner, and the Purchaser will indemnify and save FARO harmless from any claims for breach of warranty asserted against FARO by any third party.

4.13   Oral representations of FARO or its sales representatives, officers, employees or agents cannot be relied upon as correctly stating the representations of FARO in connection with the system. Refer to this purchase order, any exhibits hereto and any written materials supplied by FARO for correct representations.

4.14   PURCHASER ACKNOWLEDGES THAT IT HAS PURCHASED THE SYSTEM BASED UPON ITS OWN KNOWLEDGE OF THE USES TO WHICH THE SYSTEM WILL BE PUT. FARO SPECIFICALLY DISCLAIMS ANY WARRANTY OR LIABILITY RELATED TO THE FITNESS OF THE SYSTEM FOR ANY PARTICULAR PURPOSE OR ARISING FROM THE INABILITY OF THE PURCHASER TO USE THE SYSTEM FOR ANY PARTICULAR PURPOSE.

5.00   Design Changes

5.01　　The FaroArm, the Software and the System are subject to changes in design, manufacture and programming between the date of order and the actual delivery date. FARO reserves the right to implement such changes without the Purchaser's consent, however, nothing contained herein shall be construed as obligating FARO to include such changes in the FaroArm, Software or System provided to the Purchaser.

6.00　　Non-Disclosure

6.01　　All Software including, without limitation, the Operating System Program and any FARO special user programs, provided to the Purchaser as part of the system, either at the time of or subsequent to the delivery of the FaroArm, is the intellectual property of FARO. The Purchaser shall not reproduce or duplicate, disassemble, decompile, reverse engineer, sell, transfer or assign, in any manner the Software or permit access to or use thereof by any third party. The Purchaser shall forthwith execute any further assurances in the form of non-disclosure or licensing agreements which may reasonably be required by FARO in connection with the software.

7.00　　Entire Agreement / Governing Law / Miscellaneous / Guarantee

7.01　　These Purchase conditions constitute the entire agreement between FARO and the Purchaser in respect to the Product. There are no representations or warranties by FARO, express or implied, except for those herein contained and these conditions supersede and replace any prior agreements between FARO and the Purchaser.

7.02　　No representative of FARO has any authority to modify, alter, delete or add to any of the terms or conditions hereof. Any such modifications shall be absolutely void unless made by instrument in writing properly executed by an actual authorized employee or agent of FARO.

7.03　　The terms and conditions hereof shall be binding upon FARO and the Purchaser, and shall be construed in accordance with the laws of the State of Florida, United States of America.

7.04　　FARO shall be entitled to recover all its reasonable fees and costs including, but not limited to, its reasonable attorney's fees incurred by FARO in connection with any dispute or litigation arising thereunder or in connection herewith, including appeals and bankruptcy or creditor reorganization proceeds.

7.05   These conditions shall not be construed more strictly against one party than another as a result of one party having drafted said instrument.

8.00   Definitions

8.01   "FARO" means FARO Technologies, Inc.

8.02   "Purchaser" means the party buying the Product and who is legally obligated hereunder.

8.03   "Software" means all computer programs, disk drive directory organization and content, including the computer media containing such computer programs and disk drive directory organization and content, sold pursuant to the Order.

8.04   "Product" means the FaroArm, the Software, operating manuals and any other product or merchandise sold pursuant to the Order. If the Purchaser is buying only a FaroArm, or the Software, Product will mean the product being purchased by the Purchaser pursuant to the Order.

8.05   "System" means a combination of the FaroArm, the Software, the Computer, and optional parts and accessories associated with the FaroArm.

8.06   "Certified user" means any person who has completed and passed the written exam issued by FARO. The exam is available upon request.

8.07   "Purchase Order" means the original document issued from the Purchaser to FARO, listing all parts and/or services to be purchased and the agreed purchase price.

8.08   "Maintenance/Warranty Transfer Form" means a document to be completed for the transfer of the FARO Maintenance/Warranty. This document is available from FARO upon request.

Appendix C: FARO Products Service Policy

A one-year maintenance/warranty comes with the purchase of new FARO-manufactured hardware products. Supplemental Service Plans are also available at additional cost. See *Appendix D: FARO Service Policy* for further details.

FARO Hardware under Maintenance/ Warranty

The following is a summary of what services can be obtained under the original warranty or Supplemental Service Plan.

1. Factory repairs on FARO-manufactured hardware products at any FARO Service Center.

2. Factory repairs are targeted for completion within 7 (FaroArms, Laser Line Probe and Freestyle), 14 (Laser Trackers and Laser Scanners), or 10 (3D Imagers) working days of FARO's receipt of the defective item. The customer is responsible for returning the hardware to a FARO Service Center in the original packing container or custom case.

3. FARO will return the hardware via 2-day service within the continental United States. Outside the continental United States, FARO will return the hardware to the customs broker via 2-day service. Expedited service can be arranged at the customer's expense.

4. Upon expiration of the original warranty, a Supplemental Service Plan may be purchased and renewed on an annual basis for any FARO-manufactured hardware products, as long as material and resources are available.

5. All Supplemental Service Plans will be due for renewal one year and one day from the day the FARO-manufactured hardware is shipped from FARO.

6. Please contact FARO Customer Service to transfer the warranty. The original warranty and Supplemental Service Plans are transferable to subsequent owners under the following conditions:

- The FaroArm is currently under the original warranty and Supplemental Service Plan.
- The new owner is, or becomes, a certified user.
- FARO Customer Service is informed of and approves the transfer.

Upon approval by FARO Customer Service, the new owner will receive a FARO Transfer of Original Warranty or Service Plan agreement form executed by FARO.

7. Replacement parts used for repair may be new, refurbished, or contain refurbished materials.

FARO Hardware NOT under Maintenance/ Warranty

Factory assessments and repairs on FARO-manufactured products will follow the following procedure:

1. The customer obtains a service number from FARO's Customer Service Department.

2. The customer ships the product to a FARO Service Center with the service number on the label along with payment or a corporate purchase order for system testing and evaluation, which includes compensation and calibration.

3. The payment will be applied toward the total service cost beyond the initial payment. The estimated repair cost will be given to the customer prior to the repair. The total cost must be paid prior to beginning the service.

4. The customer is responsible for all shipping charges to and from FARO, including import and export fees for international customers.

5. FARO will continue to repair FARO-manufactured hardware products as long as material and resources are available.

6. Replacement parts used for repair may be new, refurbished, or contain refurbished materials.

FARO Software

FARO's warranty may differ depending on the Software you are utilizing. Please consult your software warranty or contact FARO customer service to determine the warranty conditions for your particular software.

Hardware & Software Training

FARO's training program is designed to instruct trainees in the operation of FARO's hardware and software, which the customer has purchased. The training classes are set up for each trainee to obtain valuable hands-on application exposure. This will help the trainees in their everyday use of the hardware and software. FARO also feels that once the trainee completes the training, finding solutions to problems or applying applications will be simpler. Details are as follows:

1. The training class will prepare attendees to successfully attain an operator's certification (see *Certification Requirements* section below for more details).

2. The fee schedules for advanced additional training courses can be obtained from Customer Service, or the Sales department.

Certification Requirements

An operator's inherent ability to understand 3D concepts may be in their background training. However, the precision with which the operator performs 3D measurements with the FaroArm is critical in establishing the accuracy and repeatability of the results of subsequent measurements.

In order to establish the proficiency of operators, FARO has instituted an Operator Certification program, wherein each operator's knowledge and understanding of the FaroArm is evaluated. The successful operator is awarded a certificate which identifies him/her as an accredited operator of the product. The requirements are as follows:

1. Attend a FARO-conducted basic training course, either at a FARO Facility or on-site at your facility.

2. Certification will be awarded once the class has been completed, and then the certified user will be registered for hardware and software support.

To certify an operator, please contact your local FARO office.

Repair Fee Schedule

(Out of Warranty/Maintenance Owners Only!)

System Testing and Evaluation Fee - Contact your local FARO Service Center for pricing.

A fee is charged for any system testing and evaluation. This includes system diagnosis, compensation and calibration, and applies to all FARO-manufactured hardware. However, this fee does not include disassembly/repair costs if required. An estimated cost for disassembly/repair will be given to the customer prior to the repair. The disassembly/repair charges must be paid in full prior to the actual disassembly/repair. However, if no repairs are needed the fee will be applied to the cost of system testing and evaluation. All evaluations contain a calibration. Recertification will be performed on an "as needed" basis.

Contact your local FARO Service Center for the current system testing and evaluation fee pricing.

FARO®

Transfer of Original Warranty or Service Plan Agreement

_____
(SELLER'S CORPORATE, BUSINESS UNIT, OR INDIVIDUAL NAME AS APPLICABLE),
hereby waives all rights under the warranty service policy for:

Hardware Device Serial Number_____

Additional Hardware Device Serial Number_____

Computer Service Tag Number_____

purchased originally on _____(DATE).

_____
(BUYER'S CORPORATE, BUSINESS UNIT, OR INDIVIDUAL NAME AS APPLICABLE),
hereby assumes all rights and obligations of the Hardware Warranty/Maintenance from

_____ (DATE OF TRANSFER).

This transfer is only valid under the following conditions:

1. The FaroArm is currently under warranty/maintenance.
2. New owner is, or becomes, a certified user.
3. This maintenance/warranty transfer form is completed and submitted to FARO Customer Service.

AGREED

_____   _____
(PRINT SELLER'S CORPORATE, BUSINESS   (PRINT BUYER'S CORPORATE, BUSINESS
  UNIT, OR INDIVIDUAL NAME AS   UNIT, OR INDIVIDUAL NAME AS
           APPLICABLE)   APPLICABLE)

X_____   X_____

_____   _____
(PRINT NAME OF SIGNATORY)   (PRINT NAME OF SIGNATORY)

FARO Technologies, Inc.

Approved by   X _____

_____
(PRINT NAME OF SIGNATORY)

Buyer's Contact Information:

Company_____

Address_____

Address_____

City_____ State_____ Zip_____

Phone Number_____ E-mail_____

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Appendix D: FARO Service Policy

This Service Plan (hereinafter, the "Plan") is part of the Operating Manual for the FARO manufactured product purchased from FARO TECHNOLOGIES, INC. (hereafter, "FARO"). The Plan and all of the optional additions, are subject to the conditions in Appendices A, B, & C, and are subject to change at any time. This appendix refers to FARO's service plans as written in the sales advertising literature, and is meant to provide additional details that the literature does not provide.

1.00   The purchase of the Plan shall occur with the purchase of the FARO products.

1.01   The Plan shall apply to systems exclusively created or authored by FARO.

1.02   The Plan shall include FARO product hardware only, and cannot be extended or transferred through the sale of any part of the system to a third party unless the entire system has been sold or transferred.

1.03   The Plan shall not cover Hardware or Software which has been subjected to misuse or intentional damage. FARO reserves the right to determine the condition of all returned Hardware and/or Software.

1.04   FARO shall determine the service method and contractor to service/repair all hardware which is not directly manufactured by FARO. All outside contractor terms and conditions are available from FARO and are incorporated herein by reference.

1.05   FARO shall not be responsible for any non-FARO authored software which inhibits the operation of the system. Furthermore the Plan will not cover the re-installation of any software.

1.06   The Hardware and Software are subject to changes in design, manufacture, and programming. All updates are as follows:

    a)   Hardware - The FaroArm and all of the associated optional parts, including the Computer, are not subject to updates.

    b)   Software - All computer programs, authored by FARO, which are used in conjunction with the FARO provided Hardware, will be updated in accordance with a particular update plan specific to the software.

c) 3rd Party software - All computer programs not authored by FARO will not be updated under the Plan. The purchaser is responsible for the acquisition of all 3rd party software updates and warranty service or claims.

1.07   In the event that FARO replaces any product or replacement product, FARO retains all right, title, and interest in and to all products or portions of products that were replaced by FARO.

2.00   Definitions

2.01   "FARO" means FARO Technologies, Inc. including all subsidiaries, affiliates, divisions and related companies.

2.02   "Purchaser" means the party buying the Product and who is legally obligated hereunder.

2.03   "Product" means the FARO-manufactured FaroArm, the Software, operating manuals and any other product or merchandise sold pursuant to the Order. If the Purchaser is buying only the FARO-manufactured FaroArm, or the Software, Product will mean the product being purchased by the Purchaser pursuant to the Order.

2.04   "System" means a combination of the FARO-manufactured FaroArm, optional parts associated therewith, the Software, and the Computer.

2.05   "Hardware" means the FARO-manufactured product and all associated optional parts, and the Computer if provided by FARO.

2.06   "Software" means all computer programs, authored by FARO, which are used in conjunction with the FARO provided Hardware.

The following is a layman's definition of the coverage.

Standard Service Plans

All shipping times below are to destinations within the continental United States. Outside the continental U.S., FARO will ship equipment directly to the customs broker.

- Standard Service Plans are contracted at time of purchase or at any time while a unit is covered by a FARO hardware service plan (as described in more detail later).
- The Standard Service Plan covers the Product.

- Shipping costs, including insurance from the Purchaser to FARO are the responsibility of the Purchaser. FARO will be responsible for all return shipping costs including insurance.
  - FARO will return the hardware via 2 day service within the continental United States.
  - Outside the continental United States, FARO will return the hardware to the customs broker via 2 day service.
  - Expedited service can be arranged at the customer's expense.
- All reasonable efforts will be made to keep the service repair time within 7 (FaroArm), or 14 (Laser Tracker and Laser Scanner) working days. The equipment will be returned via 2-Day service; therefore, total service repair time will vary due to return shipping location.
- As the Product may be used with software packages not authored by FARO, this service plan is limited to covering only FARO produced or authored products. For items not produced or authored by FARO, the customer is responsible for securing their own separate warranty or service plan coverage.

Hardware Coverage

Product minus Computer

Covered

- All parts and labor for the Product falling under normal use as described in Appendix B.
- Annual compensation and calibration of the Product as necessary.

Not Covered

- Misuse
- Intentional Damage
- Wear and tear of probes, SMRs, target tooling and adapters, ball bars, auxiliary hardware products such as cables, wrenches, hex keys, screwdrivers, etc.

Computer

Covered

- FARO contracts with 3rd party service providers for this service for up to 3 years. The terms and conditions of FARO's contract with the provider apply herein and are incorporated herein by reference.
- Typically, these services include repair of the computer, memory cards, and video monitors.

Not Covered

- All exclusions contained in the 3rd party service provider's policy which is incorporated herein by reference.
- Software operating system installation.
- User intentional or unintentional removal of key software property or files.

Software Coverage

Covered

- FARO's warranty may differ depending on the Software you are utilizing. Please consult your software warranty or contact FARO customer service to determine the warranty conditions for your particular software.

Not Covered

- End users are responsible for the procurement and installation of 3rd party authored or software updates as required to use with FARO authored software products, unless FARO resold these packages to the end user as an authorized reseller. Examples of 3rd party authored software are: DOS, Windows, AutoCAD, AutoSurf, SurfCAM and others.

Extended Warranty with Loaner

The Extended Warranty with Loaner Plans additionally provide loaner equipment when service (and in some cases calibration) is required. All equipment shipping costs are paid for by FARO (both ways). FARO will make its best efforts to ship all loaner equipment within 24 hours of the receipt of the purchaser's request. Once the need for a service has been verified by FARO, FARO will make its best effort to ship all loaner computers within 72 hours of the receipt of the purchaser's request.

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