Orbis™ Premium
Mobile Scanner and Datalogger
User Manual

FARO

November 2024

Legal Notices

Release Notice

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Introduction

The Orbis™ Premium Mobile Scanner and Datalogger (referred to in this document as "Orbis") is a hand-held scanner that provides a fast and easy way to capture 3D point cloud data by walking through the area of interest. Follow the instructions in this manual to create 3D point clouds in less time than with traditional methods.

Principle of Operation

The Orbis Premium consists of a 2D time-of-flight laser range scanner rigidly coupled to an inertial measurement unit (IMU) mounted on a motor drive. The motion of the scanning head on the motor drive provides the third dimension required to generate 3D information. A novel 3D Simultaneous Localization and Mapping algorithm (FARO's 3D SLAM) combines the 2D laser scan data with the IMU data to generate accurate 3D point clouds.

The Orbis Premium captures raw laser range measurement and inertial data. This data must be processed using FARO's 3D SLAM algorithm to convert the raw data into a 3D point cloud. The data is processed using the FARO Connect processing application, or FARO Sphere XG.

Stream and Sphere XG

FARO Stream

Stream is a mobile app that connects FARO hardware with FARO Sphere XG cloud-based applications and services. By uniting hardware with cloud software, Stream makes on-site capture workflows more efficient and brings captured data directly into the FARO ecosystem, all while providing live feedback of the captured scan.

Stream provides the best on-site efficiency for data capture with the Orbis Premium scanner for scan operations in architecture, engineering, construction and facility management, geospatial & mining and public safety analytics. Users can be confident in the successful and complete scan data they collect in real-time, confident that no additional site visits will be required because of missing data and confident in radically expedited project finalization times as Stream and Sphere XG are already doing some of the work automatically while a Orbis Premium operator is returning from the field.

NOTE: To use Orbis Premium with Stream, you need an additional Sphere XG license or a an existing subscription for Business or Enterprise Pack in Sphere XG. A valid Sphere XG license enables the Orbis Premium scanner to be used in the free Stream app . You can also use the Orbis Premium scanner and Stream for 30 days with a trial license. Contact your FARO sales representative for more information.

FARO Sphere XG

FARO Sphere XG is a cloud-based digital reality platform that provides its users a centralized, collaborative experience across the organization’s reality capture and 3D modeling applications. When paired with the Stream mobile app, Sphere XG enables faster processing and project management from anywhere in the world.

Sphere XG systematizes every activity while remaining intuitive to navigate, allowing users the ability to better organize their 3D scans and 360° photos alongside 3D models and manage that data across diverse teams around the world.

With Sphere XG, 3D point clouds and 360° photo documentation can be viewed and shared all in one place, aligned to a floorplan and viewable over time. Ideal for 4D construction progress management where the ability to compare elements over time is critical, project managers and virtual design and construction (VDC) managers can better democratize data and eliminate the need to use two platforms for their reality capture needs. Now you can import your georeferenced 3D models into Sphere XG and have it aligned effortlessly with your point clouds to track projects and identify potential issues, clashes, or deviations efficiently in one platform. The result is de-siloed data, greater ease of use, and the enhanced ability to share unified, accurate and up-to-date 4D progress documentation in a centralized location.

Safety Precautions

General Safety

Always follow basic safety precautions when operating the Orbis™ Premium Mobile Scanner and Datalogger to reduce the risk of personal injury and to prevent damage to the equipment. Do not operate the equipment with suspected defects or obvious mechanical damage. Refer all servicing of the equipment to qualified service personnel. Only use the components and accessories supplied with your system or other accessories recommended by FARO Technologies Inc. Before operating the system for the first time, read this manual in full.

The equipment contains sensitive electrical and mechanical parts and thus requires appropriate handling. Do not bend or pull the cables forcibly. Never push objects of any kind into the connectors or sockets. Keep the equipment out of the reach of children. Under no circumstances should any modifications be made to the Orbis™ Premium Mobile Scanner and Datalogger without prior written permission from FARO.

General Information

Notes and Signs

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

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

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

NOTICE: A NOTICE denotes a hazard. It calls attention to an operating procedure or practice 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 NOTICE until the indicated conditions are fully understood and met.

NOTE: A NOTE is additional information that aids you in the use or understanding of the equipment or subject. 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.

Intended Use

Use the product under the operating conditions and limitations described in this User Manual.

Improper Use

Improper use means using the product other than described in this document, or under operating conditions that differ from those described herein.

Improper use of the product can impair the protection provided by the product, and product damage or serious personal injury can occur.

Operators

In the interests of safety, use the Orbis Premium Mobile Scanner and Orbis Datalogger only after having read and understood this manual, and carefully considered all potential hazards involved.

We recommend that you participate in training offered by FARO.

General Safety Information

CAUTION!

- Do not open the housing. Opening the housing can result in serious personal injury due to dangerously high voltages, or damage to the product, which will affect the product's warranty.
- Do not use parts not supplied or recommended by FARO.
- Only replacement parts authorized by FARO may be used, following instructions provided by FARO.

- Do not expose the Orbis™ Premium Mobile Scanner and Datalogger and its accessories to **extreme temperatures**. The ambient temperature must not be lower or higher than given in the specifications. Do not use the scanner near heat sources, such as radiators, heat registers, or other heat-producing products (including amplifiers).
- Do not **immerse** the scanner and its accessories in **water**. Liquid inside the product enclosure can lead to damage, fire, or electric shocks.
- Properly dispose of the product and batteries in accordance with local and national regulations. For more information, see *Disposal* on page 45.
- Do not use the scanner and its accessories in an **explosive environment**. Do not operate the instrument in the presence of flammable gases or fumes. Operation of any electrical instrument in such an environment constitutes a safety hazard.
- Do not use the scanner in the vicinity of strong **magnetic or electrical fields**.
- Before operating the scanner and its accessories in **hazardous areas**, contact the local safety authorities and safety experts.
- Ensure that the device is protected from rain or spray water. Use the scanner in a non-condensing environment.
- Take care that the Orbis Premium Mobile Scanner does not tip over. Always handle the scan head with care.

CAUTION! When the product is transferred from a cold to a significantly warmer environment, water may condense on some elements inside the scanner. To avoid this, place the scanner in an airtight plastic bag before transfer. This allows condensation to form on the bag rather than inside the scanner. If you cannot pack the scanner in an airtight manner, wait until observable **condensation water** evaporates from the scanner before switching on the Orbis™ Premium Mobile Scanner and Datalogger.

Nameplate symbols


Indicates conformity with health, safety, and environmental protection standards for products sold within the European Economic Area.


Indicates that the product should not be discarded as unsorted waste but must be sent to separate collection facilities for recovery and recycling.


Indicates that FARO has provided important information in the user manual regarding intended use and safety. Read this information before using the device.


Indicates that the electromagnetic radiation from the device is below the limits specified by the

Federal Communications Commission. FARO has followed the requirements of the Supplier's Declaration of Conformity authorization procedures.

Indicates conformity with the applicable standards for products sold within Great Britain.

Orbis Premium Mobile Scanner Laser Safety

- The Mobile Scanner is classified as a **CLASS 1 LASER PRODUCT** in accordance with IEC 60825-1:2014 (ed. 3).
- Complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.

  Conforme à 21 CFR 1040.10 et 1040.11 sauf pour la conformité à IEC 60825-1 Ed. 3. comme décrit dans la notice laser n°. 56, daté du 8 mai 2019.
- The Mobile Scanner is safe under reasonably foreseeable conditions of operation. The maximum permissible exposure (MPE) cannot be exceeded. It is harmless to the eyes if it is used and maintained in accordance with the instructions in this User Manual.

Electrical Safety

WARNING! Do not open the housing. Dangerously high voltages are present inside the enclosure. Only qualified service personnel should open the housing. Never push objects of any kind into this product through openings, as they may touch dangerous voltage points or cause short circuits. This could result in a fire, electric shock, or damage to the product.

NOTICE: This device is not intended for use in residential environments, and it cannot ensure a suitable degree of protection of radio reception in such environments.

- This product should be operated only from a battery supplied or recommended by FARO. Ensure that the specifications of the AC converter are met. If you do not know the power-line voltage in your area, consult your local power company.
- To avoid electrical shock, use the power-supply unit in dry indoor environments only.

Battery Safety

DO NOT attempt to dismantle the battery.

DO NOT short-circuit the battery.

DO NOT dispose of in normal household waste.

The battery is splashproof but not waterproof. Do not immerse in water.

Use only the charger supplied with the battery. The battery should be charged fully before use.

If storing the battery, store it in a charged state. Recharge after every 6 months.

Excess heat will degrade the battery rapidly. Always store the battery in a cool, dry place. DO NOT leave for long periods in the sun or in a hot vehicle.

It is recommended to recharge the battery within 12 hours if fully discharged.

Mechanical Safety

WARNING! Rotating parts The scanning unit rotates while scanning and for a short period after the scan. Do not touch the rotating unit with your hands, fingers, hair, clothing or any objects at the risk of personal injury and damage to the scanner.

CAUTION! Do Not Open the Housing Opening the housing can cause serious personal injury and damage to the product.

NOTICE: Replacement Parts Use only replacement parts authorized by FARO according to the instructions obtained from FARO. Do not use parts not supplied or recommended by FARO.

NOTICE: Take care that the mobile scanner does not tip over while attaching or detaching cables, phone mount or hand grip.

NOTICE: Check cable connectors for correct alignment (red dots) and push latches before removing the connector.

NOTICE: Lift the Mobile Scanner only by the handle. Do not hold or lift the scan head. Doing so could damage the alignment and reduce the accuracy of the scanner.

Transport

The following precautions must be taken when transporting the scanner equipment:

- The scanner must be transported in a transport case.
- The scanner must be turned off during transportation or shipping.
- Remove the battery from the scanner before shipping.
- When carrying the scanner, be careful not to drop it. Strong impact can seriously damage the scanner, and render it incapable of proper operation.
- Carry the scanner separately from its equipment or, for optimal protection, use the original transport case.
- When shipping and transporting the scanner by rail, sea, air, or road, use its original transport case and a suitable outer cardboard box for optimal protection against shock and vibration.
- The FARO batteries are lithium-ion batteries and are thus classified as dangerous goods. When transporting or shipping the FARO batteries, ensure that you observe all applicable local and international rules and regulations. For further information, contact your local carrier before transportation or shipping.
- For lithium-ion batteries with less than 100 Wh energy content, an exemption is provided that allows you to carry such a battery without further paperwork. The maximum battery energy a single person can carry is 200 Wh.

Ensure that the total energy content of all batteries that any individual person carries is less than 200 Wh, and that no single battery has more than 100 Wh energy content. Review currently applicable national and international regulations for the transport of Li-On batteries, and also verify with your airline or freight company in advance.

The battery has been tested and passed section 38.3 of the UN Manual of Tests and Criteria (UN Transportation Testing) as required by the IATA Dangerous Goods Regulations (2016), Section 2.3.5.9. The battery is below the 100 Wh limit for transportation on passenger planes. For the purposes of air transportation, the battery is classed as “Packed with equipment” (ICAO/IATA Packing Instruction 966, Section II) – Cells or batteries contained in a package with associated electronic equipment. Special rules may apply to the transportation of spare batteries. It is recommended that you check with your local air transportation safety authority and/or the proposed air carrier for specific requirements on lithium battery transportation.

Never ship a damaged battery by air transportation.

Storage

Prior to storing the scanner for prolonged periods:

1. Remove the battery.
2. Pack the scanner and the battery in its shipping case to protect it from environmental hazards, dust, and dirt.

3. Store all components in an environment where:
    - The humidity level is low
    - The temperature is relatively stable
    - The components are not be subjected to extreme temperatures, environmental conditions, or heavy vibrations

Servicing

Servicing and repair must only be done by qualified service personnel authorized by FARO. Remove the battery before returning for serviceing. Request servicing, then deliver it to qualified service personnel under the following conditions, if:

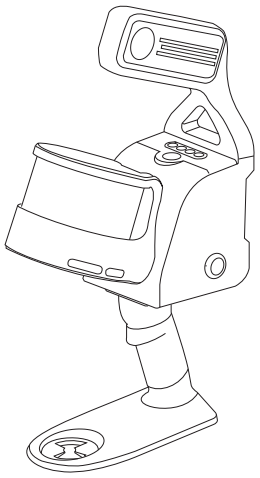
- the power-supply cord or plug is damaged.
- the product has been exposed to rain, water, or other liquids.
- the product has been dropped or damaged in any way.
- objects have fallen onto the product.
- the product does not operate normally when following the operating instructions.
- the product exhibits a distinct change in performance.
- the required service and calibration date is reached.

Included Parts

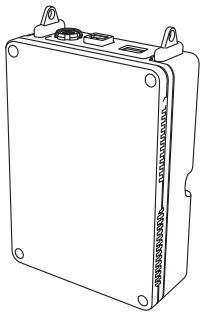
In addition to the parts shown below that are included with the Orbis™ Premium Mobile Scanner and Datalogger, you also need an up-to-date Android or iPhone. A protective case for the phone is strongly recommended.

Orbis Premium Mobile Scanner

(Replacement handle P/N ACCS-MNT-0031)

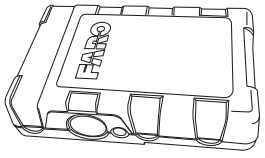


Orbis Datalogger



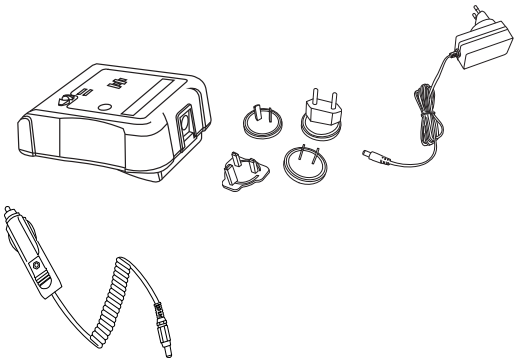
Orbis Datalogger Battery

(P/N: ACCS-PWR-0030)

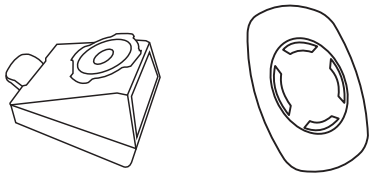


Battery Charging Kit

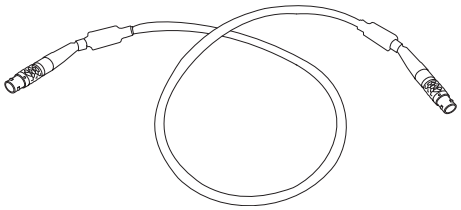
(P/N ACCS-PWR-0031)



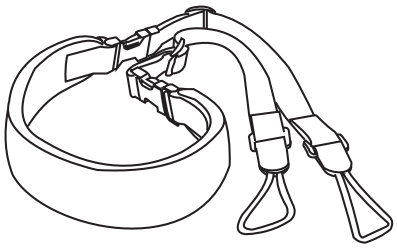
Phone Mount
(P/N ACCS-MNT-0032)



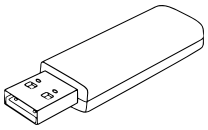
Orbis Premium-Cable
(P/N ACCS-CBL-0013000)



Orbis Datalogger Shoulder Strap

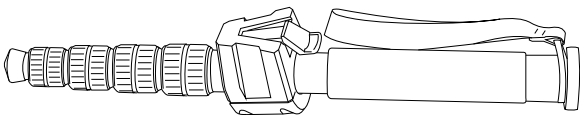


USB Flash Drive

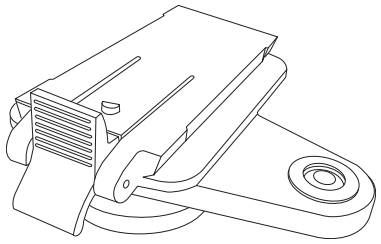


Monopod (P/N: ACCS-TRPD-0030)

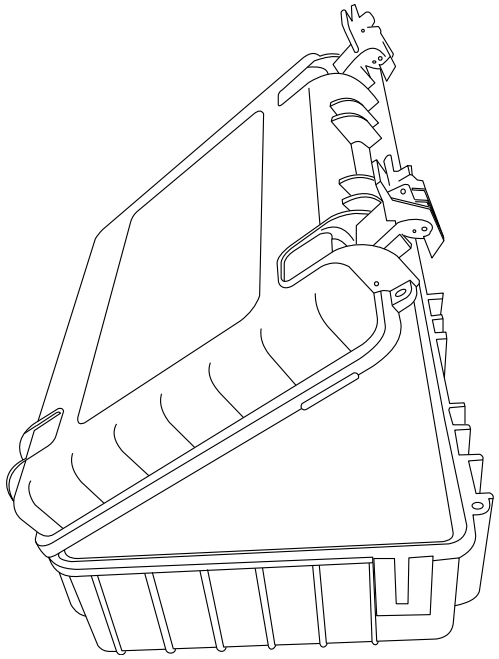
Monopod Datalogger Adaptor Assy (P/N: ACCS-MNT-0018-000)



Mobile Scanner adapter for the monopod
(P/N ACCS-MNT-0030)



Transportation case
(P/N ACCS-CASE-0028)



Parts of the Orbis Premium Mobile Scanner and Orbis Datalogger

① Camera Power Button [1]

② Camera

③ LED Array

④ Function Button

⑤ GPIO socket

⑥ Scan Head

⑦ Handle

⑧ Reference Point

[1] The camera power button is not used in normal scanner operation.

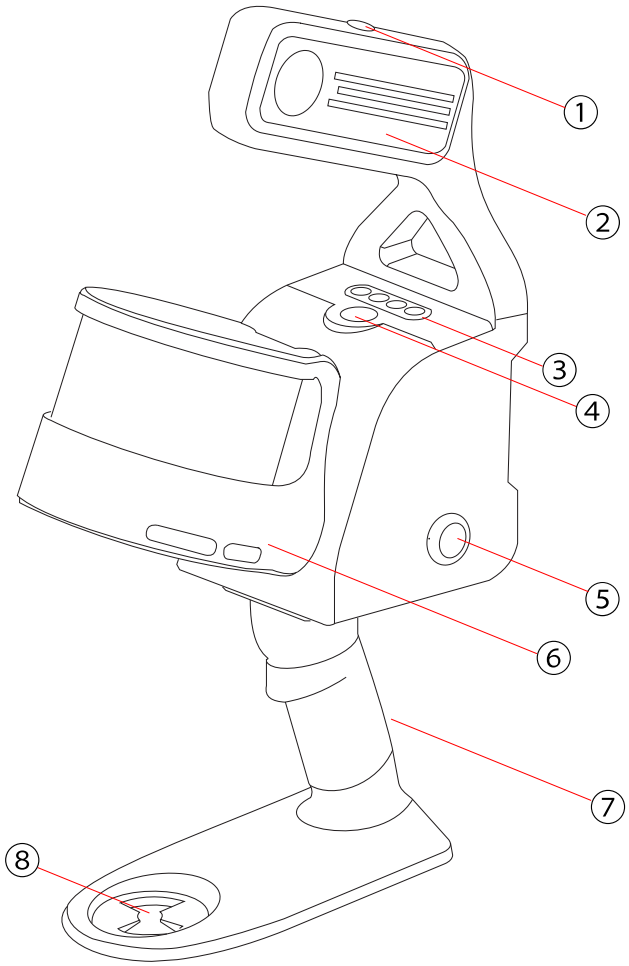


Figure 1-1 Parts of the Orbis Premium Mobile Scanner

NOTICE: Do not hold or lift the scan head. Doing so could damage the alignment and reduce the accuracy of the scanner. Lift the Mobile Scanner only by the handle.

① Battery

② Power Button

③ GPIO Socket

④ Status LED

⑤ Ethernet Socket (RJ-45 connector)

⑥ Data LED

⑦ USB Socket (Data transfer only)

⑧ Battery Display Switch

⑨ Battery Display

⑩ Battery Release

⑪ Function Button

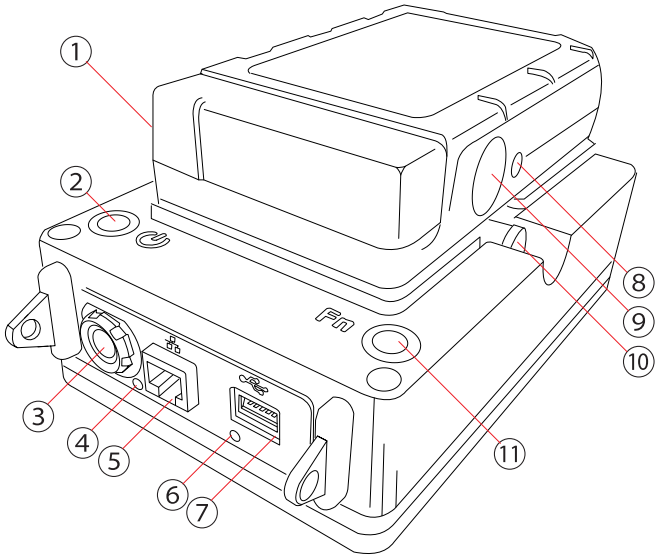


Figure 1-2 Parts of the Orbis Datalogger

Connecting the Hardware

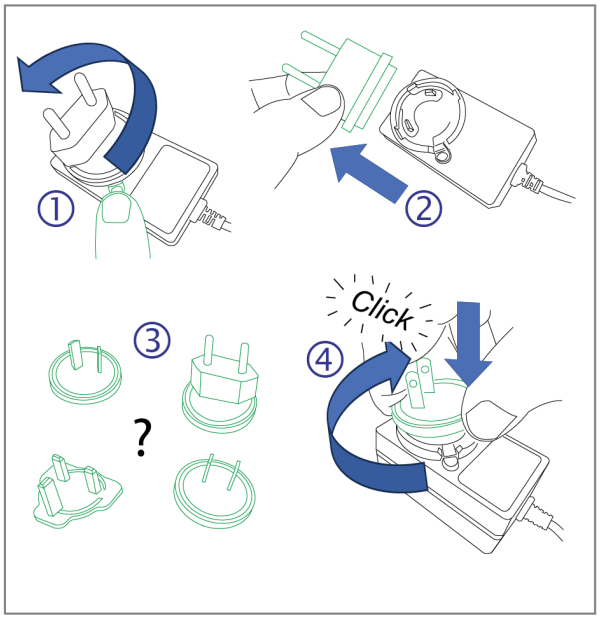
1. **Ensure that the plug is set up for your power sockets.**
   You only need to do this step once.

   ① Push the button as shown in the diagram and twist the pins slightly counter-clockwise.

   ② Remove the pins.

   ③ Select the pins that match the socket of your power mains.

   ④ Press the correct pins into the power supply as shown and twist slightly clockwise until it clicks into place.



2. **Charge the battery.**

   ① Plug the power supply into a wall socket.

   ② Plug the cable into the charging cradle.

   ③ Align the charger with the battery.

   ④ Slide the charger onto the battery as shown.

   ⑤ Charge for two hours, or until the LED on the charger turns green.

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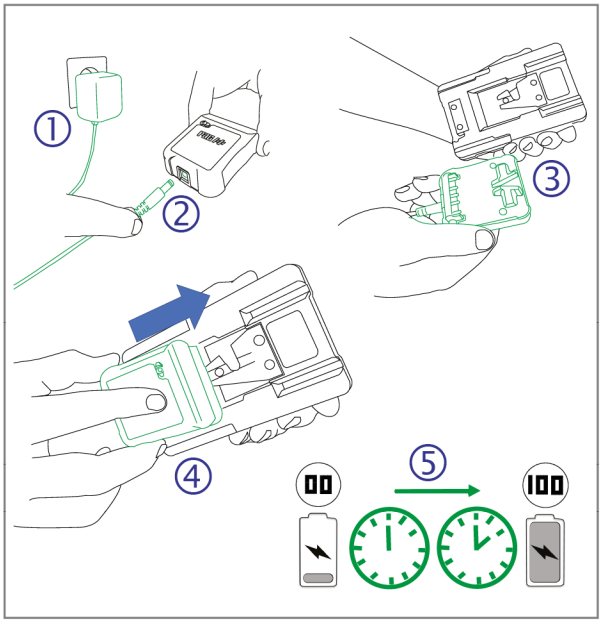


3. **Attach the Datalogger shoulder strap.** You only need to do this step once.

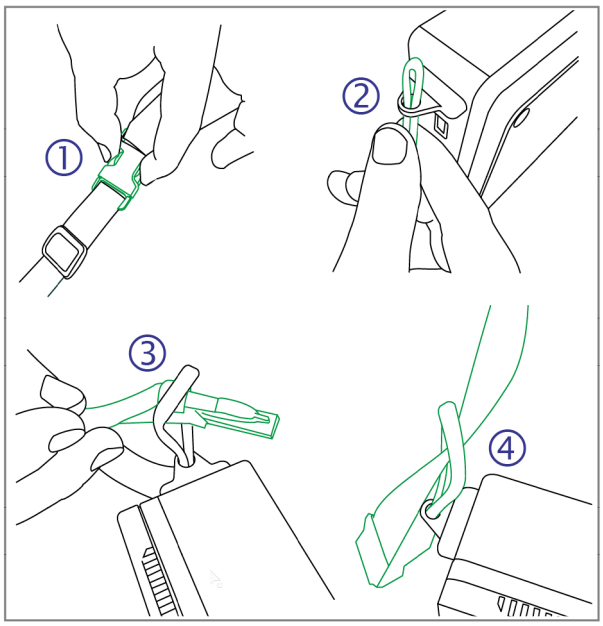
   ① Separate the buckle.

   ② Push the nylon loop through the hole in the bracket on the Datalogger.

   ③ Thread the buckle thorough the loop.

   ④ Pull the strap tight.

   Repeat for both straps, then reconnect the buckles.



NOTICE: Take care that the scanner does not tip over when doing the following steps.

4. **Attach the phone mount.**

   ① Position the phone mount on the Mobile Scanner as shown.

   ② Push the phone mount up until it clicks into place.

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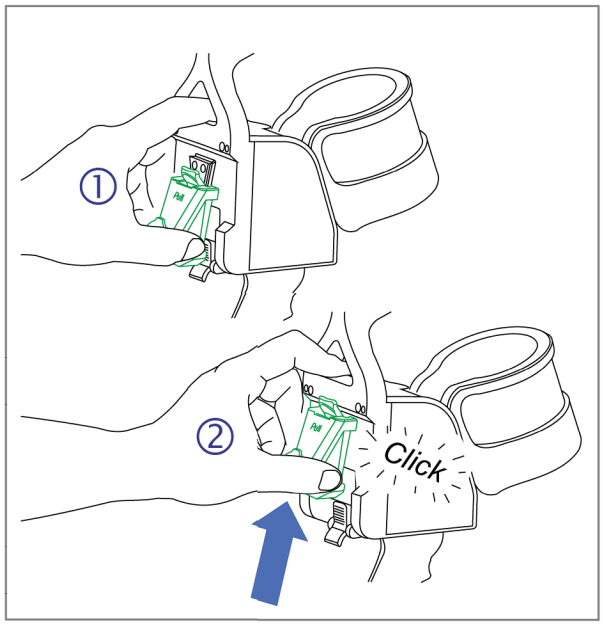
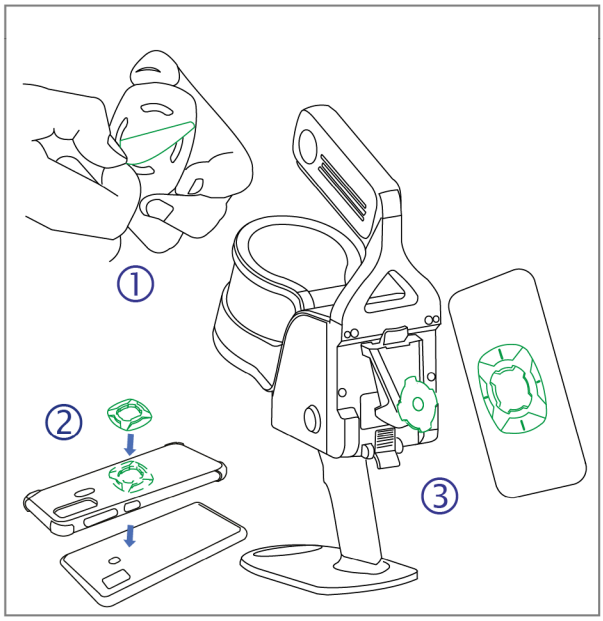


NOTICE: In the next step, it is important to ensure that the adhesive of the Quadlock firmly attaches it to your phone. Because the adhesive often does not stick well to glass, FARO recommends that you attach the Quadlock to a plastic protective case that is made to fit your particular phone model. You may also consider buying a Quadlock case for your phone, with the Quadlock already built into the case.

5. **Attach the Quadlock to your phone.**

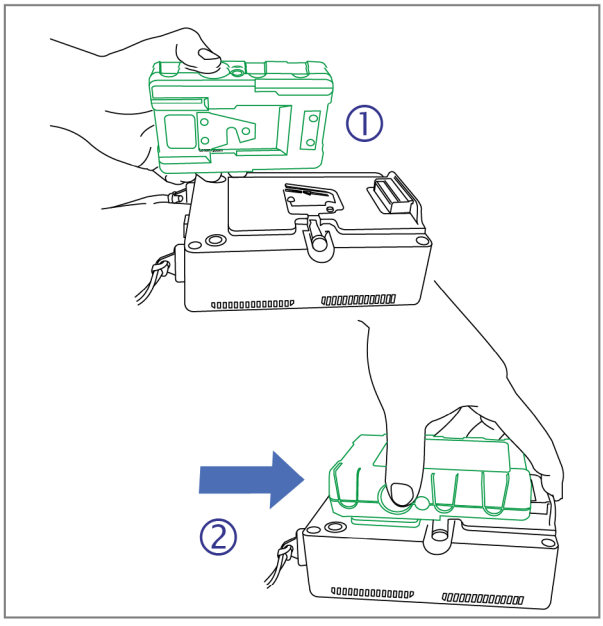


① Remove the adhesive backing from the Quadlock.

② Press the Quadlock onto your phone. Take care to avoid the camera lenses. You may want to put the Quadlock onto a phone case, rather than directly on the phone.

③ Connect the phone to the Mobile Scanner using the Quadlock.

6. **Attach the battery to the Orbis Datalogger.**



① Position the charged battery over the Orbis Datalogger as shown.

② Slide the battery into place.

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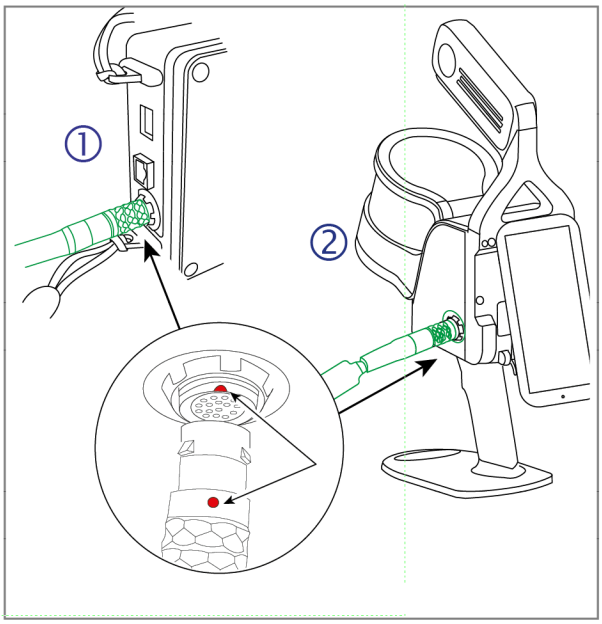
7. **Attach the Orbis Premium cable.**



① Attach the cable to the Orbis Datalogger. Take care to align the red dots as shown—do not use force.

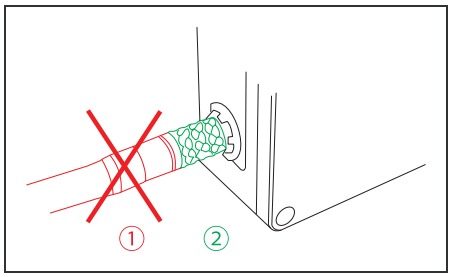
② Attach the cable to the Mobile Scanner. Take care to align the cable as shown—do not use force.

Your Orbis Premium scanner is now ready for use.

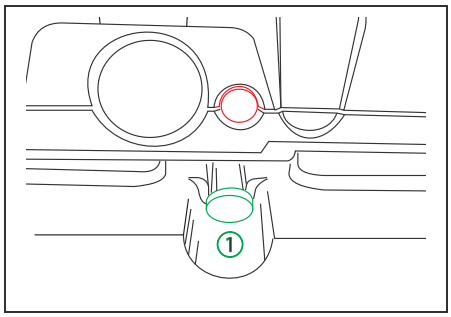
Disassembly Notes

When removing the cable from the Orbis Datalogger and the Orbis Premium Mobile Scanner, grasp the knurled sleeve ② and pull straight back.

(Do not pull on the cable. ①)



To remove the battery from the Orbis Datalogger, press the release button ② and pull the battery to disengage it.

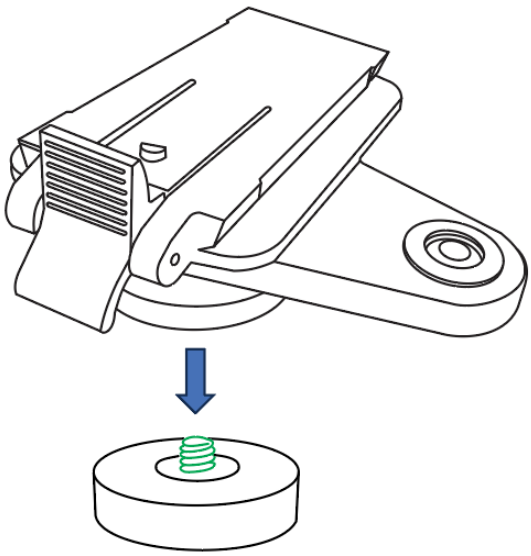


Attach the Mobile Scanner to the Monopod

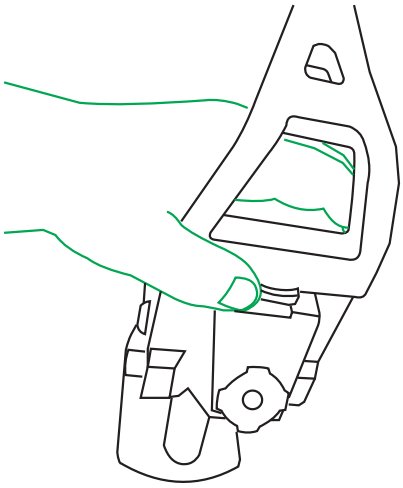
Use the instructions below attach the Mobile Scanner to monopod.

NOTICE: Perform the instructions below with care. Do not tip over, drop or knock the scanner while removing the handle.

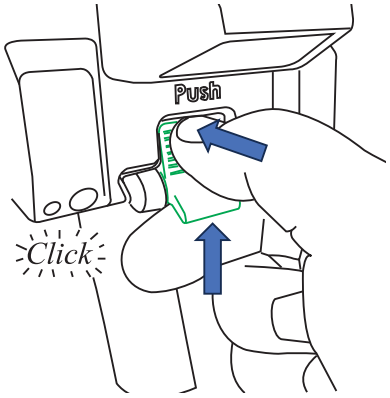
1. Attach the adapter to the monopod with the screw at the top of the monopod:



2. Hold the top of the Mobile Scanner with one hand as shown.



3. With your other hand, push on the upper tab while pulling up on the lower tab until you feel and hear a click.



4. Carefully slide the handle back to remove it from the body of the scanner. You may need to initially use your thumb to push the body forward to start the handle sliding.

5. Carefully slide the monopod adapter (with the monopod attached) into the slot from which you just removed the handle. Press firmly until you feel and hear a click.

Mount the Orbis Datalogger on the Monopod

The monopod is provided with a mounting bracket that allows you to mount the Orbis Datalogger onto the monopod. You may find it easier to work with the monopod when the Datalogger is attached, because it helps to balance the Mobile Scanner.

To mount the Datalogger on the monopod:

1. Remove the shoulder strap from the Datalogger to ensure that it does not become caught on anything while moving with the monopod.
2. Attach battery to the Datalogger.
3. Attach Datalogger to the monopod by sliding the v-mount into the mounting bracket until it clicks. See Figure 1-3
4. Attach the cables to the Datalogger.
5. Attach cables to Mobile Scanner.

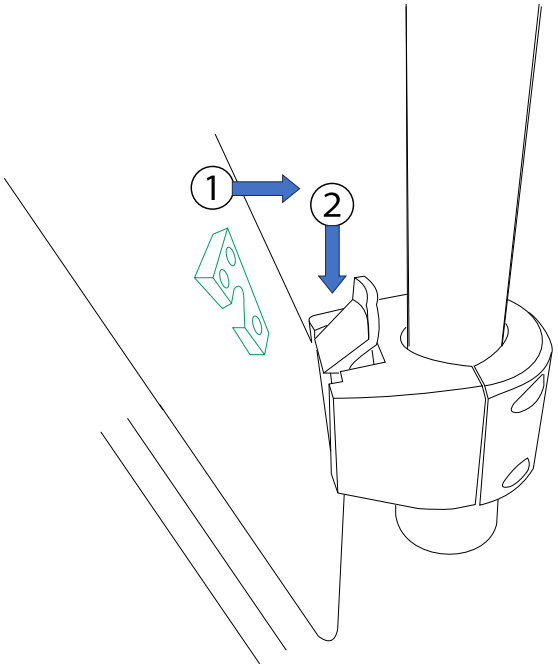


Figure 1-3 Insert v-mount into the Orbis Datalogger mounting bracket.

To remove the Datalogger, press the latch in the direction of the monopod and pull the Datalogger v-mount out of the mounting bracket.

Scanning

This section describes how to connect the Orbis Premium to your phone, how to collect raw scan data, and how to download the raw scan data from the Orbis Datalogger.

Set the WiFi Regulatory Domain

Different countries have varying rules for WiFi configuration. Your Orbis Premium's regulatory domain might be locked to a specific region or set to a global default, depending on where it was sold. If it is set to a global default, you may want to change it to the country where you are using the device. This could also improve WiFi speed, as the default setting restricts the frequency to 2.4 GHz, while most countries allow the faster 5 GHz.

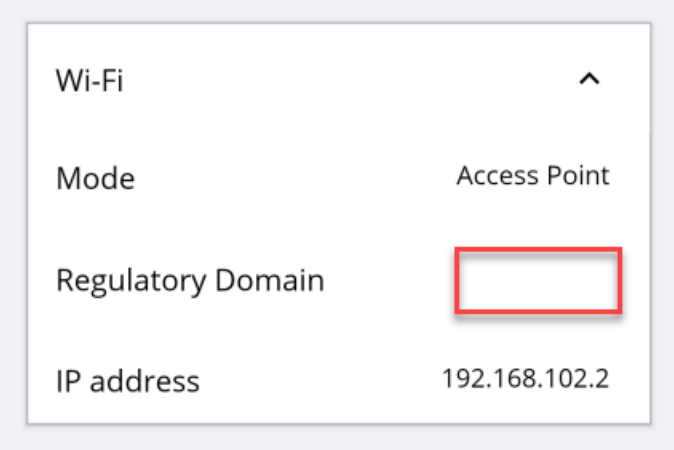
Set the WiFi Regulatory Domain:

NOTE: The instructions below will not work for scanners that have the regulatory domain permanently set.

1. Connect the Mobile Scanner and the Datalogger and switch on the power.
2. Connect to Stream.
3. Tap available devices. The icon may look different, depending on the connection status:

4. Ensure that you are connected to the device, then tap the more icon ⋮.
5. Tap the settings icon ⚙.

6. Tap the area marked by the rectangle, below. This may be blank as in the graphic, or may have the name of a country, if the domain was previously set.



7. Select your country from the list that appears, then tap **OK**.

The settings will be applied the next time the Orbis Premium starts.

Create a Scan using Stream

The process of collecting data using the Orbis Premium scanning system is highly automated. However, care must be taken to ensure that the collected data can be successfully processed into a 3D point cloud using FARO's unique 3D SLAM algorithm. It is strongly recommended that you create a survey plan, considering the recommendations in *Best Practices for Scanning* on page 34 before starting scan.

When you are ready to start collecting data, follow the steps below.

NOTICE: If the Orbis Premium loses power while scanning, all data from that scan will be lost. Pay attention to the charge level of the battery during scanning. Finish your scan and replace the battery if the charge level gets low.

Phase 1: Prepare the hardware

1. Connect the equipment as shown in this User Manual.
2. Set the Mobile Scanner on a flat, stationary surface, and ensure the scan head is free to rotate.
3. Turn on the Orbis Datalogger by pressing the power button.
4. Wait until the LED array on Mobile Scanner shines green. The scanner is now in **standby mode.**

Phase 2: Connect your phone to Orbis Premium

1. On your phone, connect to the Orbis_ORDxxxxx wireless network. The default password is: 0123456789. Note that you will not have Internet access via the Orbis Premium network.
2. Start the FARO Stream app on your phone.

   Stream will automatically search network for a FARO scanning device. This may take a few seconds. When Stream connects to your Orbis Premium scanner, you will see the following icon at the top of the app . If the scanner doesn't connect automatically, switch to **Device List** to see additional information.

NOTE: Some phones may not connect to the scanner when the phone is connected to a mobile network. If the scanner is not found, switch off the mobile network connection while using Stream.

Phase 3: Create a project

1. Tap the **Projects** icon to create a project.
2. Give your project a name, or accept the default provided for you. You can also assign an image to the project to make it easier to identify it in the lists of projects.
3. Tap **Create**. The new project will be created and the app will show the projects list.
4. Tap the project you created.
5. Tap the structure icon .
6. Tap the more icon , at the right of the project name.
7. Tap the sheet icon, the **Create New Sheet** window appears.
8. Give your sheet a name, or accept the default, then tap create.
9. Tap the view icon to jump to the scanning view.

Phase 4: Begin scanning

1. Tap Play to begin scanning

   The Stream app will count down and the scanner LEDs will blink orange during initialization.

NOTICE: The scanner must remain static during initialization. Ensure that the scanner is placed on a stable, flat surface and that it cannot flip over. Do not touch or otherwise disturb the scanner. If the scan head is disturbed during initialization, the system will revert to standby mode (running red LEDs). If this happens, initiate the scan again.

2. When the scan head starts rotating, pick up the scanner and conduct the scan. During scanning, carry the Orbis Datalogger using the supplied shoulder strap, or mounted on the monopod. Follow the scanning guidelines explained in *Best Practices for Scanning* on page 34.

Phase 4: End scan; begin finalization

1. Tap the stop button in Stream to stop scanning. Wait while the scan data is converted to the required output format.

When the finalization phase is complete, the scanner returns to **standby mode.**

From standby, either initiate a new scan (phase 42, above), download the data from the latest scans, or shut down as described below.

Shutdown

To switch off power to the Mobile Scanner and the Datalogger, long-press the power button until two beeps are emitted. The system will power down.

NOTICE: Do not remove the battery from the Datalogger until the Data LED is off.

LED Blink Codes

Scanner State	Orbis Datalogger LEDs		Scan Head LED Array
	Status	Data	
Orbis Dataloggerbooting up	orange blinking	-	-
Orbis Datalogger connecting to scan head	orange	-	orange, in sequence
Standby mode	green	-	green
Initiating new scan	orange	-	orange
Initialization mode	orange blinking	-	orange blinking
Scanning mode	blue	-	blue, in sequence
Trigger reference point	green flash blue green flash	-	blinking

Scanner State	Orbis Datalogger LEDs		Scan Head LED Array
	Status	Data	
Trigger Flash scan	green flash blue green flash	-	
End scan - finalization	orange pulse	orange blinking	orange
USB transfer	green	-	-

Flash Scans

In addition to the normal Orbis Premium scanning mode, Orbis Premium can create Flash scans. These scans have a density and precision comparable to terrestrial laser scanning. There are generally two ways to use Flash scans:

- Scan with Orbis Premium as usual, but create Flash scans in areas where accuracy is especially important, such as HVAC rooms. (See Figure 1-4, below.)
- Use Flash to cover the entire area when accuracy is important everywhere. In this case, the mobile scan is used only for pre-registration of the Flash scans. (See Figure 1-5, below.)

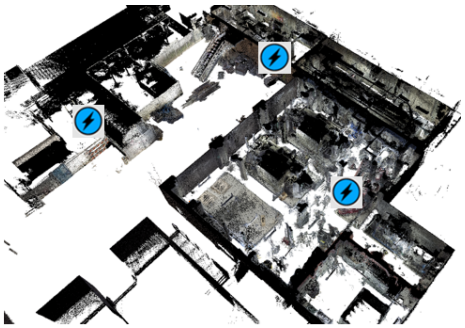


Figure 1-4 Targeted Flash scans for areas where more accuracy is important

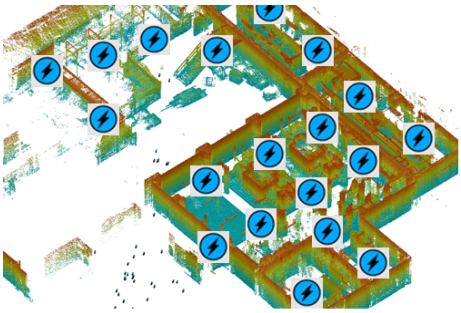


Figure 1-5 Complete Flash scan coverage, when accuracy is important throughout the scanned area.

To make a Flash scan:

1. Remove the Orbis Premium handle and replace it with the monopod. (See, *Attach the Mobile Scanner to the Monopod* on page 19.)
2. Begin to scan.
3. When you get to the place where you want to make a Flash scan, place the monopod on the ground and hold the scanner as motionless as possible.
4. Tap the button.

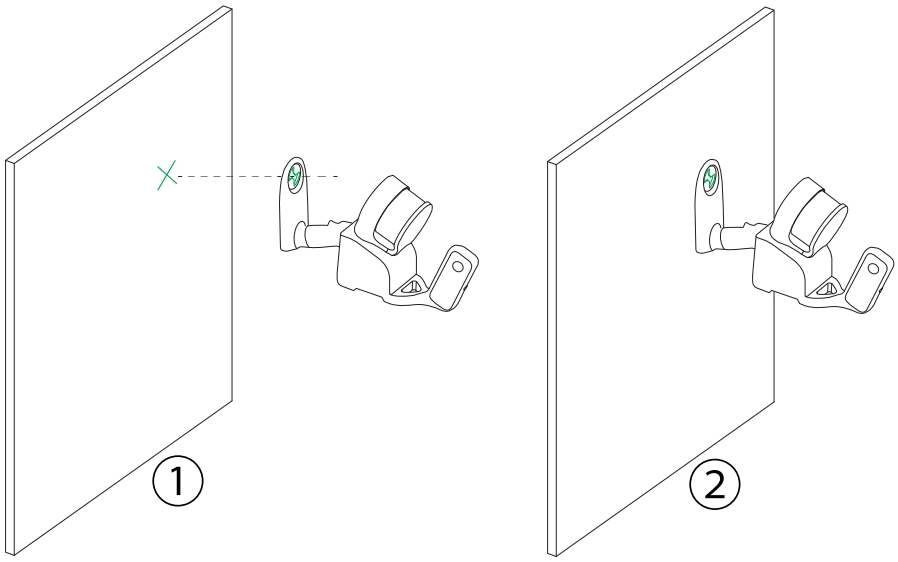
5. Tap the **Create Flash Scan** button.
6. Continue to hold the scanner as motionless as possible and wait while the app counts down the scan.
7. When the app notifies you that the scan is complete, continue with mobile scanning. Repeat each time you want to make a Flash scan.

Reference Points

Known control points that surveyors have placed on real-world objects can be captured and automatically matched to the associated coordinates in the scan during the processing. These points are called reference points. If you mark three or four of the same reference points in two different scans, FARO Connect software can use the points to automatically register the two scans.

To enter a reference point:

1. Begin to scan.
2. When you get to the real-world marker that you want to enter into the scan as a reference point:
   a. Tap the button.
   b. Tap the **Create Reference Point** button.
   c. Align the scanner with the mark ① , then place the scanner so that the hole in the foot is resting on the marker ② . If the marker is on a wall, you would position the scanner like this.



3. Tap the blue button ( ). The reference point is captured immediately. If you decide not to create a reference point, tap .

After the reference point is captured, you can scan as usual.

Static 360° Photos

The Orbis Premium Mobile Scanner regularly makes pictures while scanning. These pictures are used to color the scan points, and can also be viewed as 360° images in Sphere XG. But there may be instances when you want a image of especially high quality, for example to document an HVAC room, or to capture text or patterns. In this case, you can trigger a **Static 360° Photo**. This is a picture taken when you are not moving, and which is marked as a Static 360° Photo so that you can find it easily when when working with the scan data.

To make a Static 360° Photo:

1. Begin to scan.
2. When you get to place where you want to create a Static 360° Photo:
   a. Tap the button.
   b. Tap the **Create Static 360° Photo** button .
   c. Hold the scanner as still as possible. The less the scanner moves, the better the quality of the Static 360° Photo will be.
   d. Tap the blue button ( ). Static 360° Photo is captured immediately. If you decide not to create a reference point, tap .

After the Static 360° Photo is captured, you can scan as usual.

Create a Scan Without Stream

It is recommended to use the Stream app to control the Orbis Premium Mobile Scanner. Stream provides you with visual feedback as you scan, informational messages, easy transfer of data and other helpful features. It is possible, however, to scan without using Stream using the instructions below.

Phase 1: Prepare the hardware

1. Connect the equipment as shown in *Connecting the Hardware* on page 15.
2. Set the Mobile Scanner on a flat, stationary surface, and ensure the scan head is free to rotate.
3. Turn on the Orbis Datalogger by pressing the power button.
4. Wait until the LED array on Mobile Scanner shines green. The scanner is now in **standby mode.**

Phase 2: Initiate a new scan

Without lifting the scanner, long press the function button on the Orbis Datalogger until you hear two beeps.

The scanner enters **initialization mode**, indicated by orange blinking LEDs. Initialization takes 15 seconds.

NOTICE: The scanner must remain static during initialization. Do not touch or otherwise disturb the scanner. If the scan head is disturbed during initialization, the system will revert to standby mode. If this happens, initiate the scan again.

Phase 3: Begin scanning

When the scan head LED array begins running blue and the scan head starts rotating, pick up the scanner and conduct the scan. During scanning, the Orbis Datalogger can either be carried in your spare hand or carried on your side using the supplied shoulder strap.

While scanning you can mark a reference point, or make a Flash scan:

To mark a reference point, position the scanner on the marker, then press and hold the button on the scanner until the LED array flashes green and you hear a beep. Immediately release the button and then walk away (at least 5 m (15 ft). If you remain near the marker, the scanner will not record a reference point, but instead will try to make a Flash scan. Note that the scanner will flash green after about 15 seconds. For more information, see *Reference Points* on page 27

To make a Flash Scan, press and hold the button on the scanner until the LED array flashes green and you hear a beep. Immediately release the button. The LED will change back to blue, but with a different pattern. Hold the scanner motionless for about 15 seconds until the scanner LED flashes green again and returns to blue. You can now scan normally. For more information, see *Flash Scans* on page 26

Phase 4: End scan; begin finalization

1. Long-press the function button on the Orbis Datalogger until you hear two beeps. The data LED will light orange while the scan data is converted to the required output format.

2. When the finalization phase is complete, the scanner returns to **standby mode.** (The status LED and the scan head LED array are green.)

3. From standby, either initiate a new scan (phase 2, above), download the data from the latest scans, or shut down as described below

Shutdown

To shut down the Orbis-Premium, long-press the power button until two beeps are emitted. The status and data LEDs on the Orbis Datalogger will alternate red until the system powers down.

NOTICE: Do not turn the Orbis Datalogger off until the data LED is off.

Using your Scan Data

Download to USB Flash Drive

To download the raw scan data, power on the Orbis Datalogger if not already powered on. Connect the supplied USB memory USB socket to the Orbis Datalogger front panel. The data LED light will blink orange while the data is transferring to the flash drive. The USB flash drive must not be removed when the Data LED is blinking orange. After a few seconds (depending on the size of the data file to be transferred) the data LED will turn off. All data that has not previously been transferred will be transferred and the USB flash drive can be removed.

NOTICE: Do not remove the USB flash drive while the orange Data LED is lit. This can result data loss.

The following flash drive file formats are supported: exFAT, FAT32, and NTFS.

Downloading data is an automatic process whereby only data that has not previously been downloaded will be transferred.

Transfer your data to Sphere XG

1. Ensure that your phone is connected to the Orbis Premium Wi-Fi.
2. From the Project view in Stream, tap the three-dot menu of the project you want to transfer.
3. Tap the cloud icon, then confirm that you want to transfer the project. The project data will be transferred to the phone and is visible in the Stream app. This can take quite some time, depending on the size of the project.
4. After the project is transferred, switch your phone's Wi-Fi connection to a network with an Internet connection
5. From the Project view in Stream, tap the three-dot menu of the project you want to transfer to Sphere XG.
6. Tap the cloud icon. You will be prompted to log into your Sphere XG account.
7. Log in and select the correct workspace.

File Naming

Files are automatically named in accordance with the start date and time of the dataset recording (with respect to the time/date set on the Orbis Datalogger clock) in the form YYYY-MM-DD_hh-mm-ss.zip

An example file name for a dataset recorded at 13:41 on 31st October 2022 is:

222-10-31_13-41-26.zip

The ZIP file contains two files:

YYYY-MM-DD_hh-mm-ss.geoslam - file containing the raw scan data

YYYY-MM-DD_hh-mm-ss.params - file containing key parameters used for data collection

LED Status Summary

Status LED on the Orbis Datalogger		LED array on scan head		Description
	orange blinking	-	-	Orbis Datalogger booting
	orange		orange	Connecting to scan head
	green		green	Scanner is in standby mode
	orange		orange	Scanner about to enter initiation mode
	orange blinking		orange blinking	The scanner is in initiation mode
	blue		blue	The scanner is in scanning mode

Table 1-1 Orbis Datalogger Status LED status summary

Data LED on Orbis Datalogger		LED array on scan head		Description
	orange		orange	Scan data is being formatted. **NOTICE:** Do not turn off the Orbis Datalogger while scan data is being formatted.
	green		green	Data is transferring to USB flash drive. **NOTICE:** Do not remove the USB flash drive while data is being transferred.
-	-		green	The USB flash drive can be removed.

Table 1-2 Orbis Datalogger Data LED status summary

Status LED on Orbis Datalogger		LED array on scan head		Description
	single red flash		single red flash	Laser sensor not detected
	double red flash		double red flash	IMU sensor not detected
	triple red flash		triple red flash	Laser and IMU sensors not detected
	orange		orange	Orbis Datalogger turned off during finalization Shut down paused until finalization is complete

Table 1-3 LED Error Status Summary

Stream Settings

Use the Setting page to change various defaults in the Stream app.

Tap ☰, ⚙**Settings** and adjust the settings for your situation.

Display Settings
Switch dark Mode on or off. Using dark mode may prolong the life of the battery in the device where you are running the Stream app.

Language Settings
Select the language you would like the interface to display.

Data View Settings
Select the scan labels you want to display (All, Shortened, or Latest).

Automatic Firmware Download
Select how you want to download new firmware when it becomes available (Always, only when connected to Wi-Fi, or Never).

Analytics Settings
Decide whether to help FARO improve Stream by sending us anonymous usage data. We encourage you to enable this option. This will help us to improve our app features and scanner settings. No project data or scans are transferred to FARO.

Best Practices for Scanning

This section provides guidelines for how the Orbis™ Premium Mobile Scanner and Datalogger should be used to achieve the best possible results. Prior to conducting a survey, you should plan the proposed survey path to identify potential problem areas, e.g., feature-poor environments, doorway transitions and stairwells. In these areas, you should plan how to conduct the survey taking into account the recommendations in this section. The plan should also make provision for “closing loops” wherever possible. Adhere to these guidelines to achieve the best results.

The Environment

The FARO 3D SLAM algorithm used to process the raw laser scan data into a 3D point cloud relies on there being features in the scanned environment that are repeatedly scanned as the operator passes through the scanned environment. For a feature to be significant the ratio of its size to its range must be approximately 1:10, e.g., at 5 m range for a feature to be significant it must be >0.5 m in size. In ‘Feature poor’ environments, include open spaces and smooth walled passageways. In smooth-walled hallways, there may not be sufficient features in the direction of travel for FARO’s 3D SLAM algorithm to determine forward motion. In feature-poor environments we recommend the following steps are taken:

- If possible, augment the environment with additional features. e.g., boxes in a corridor or a parked vehicle in an open field.
- Ensure that whatever limited features are available are scanned repeatedly as you move through the environment by pointing the Mobile Scanner in the direction of the feature. By doing so more measurement points are made of the feature increasing the likelihood that it will be used by FARO’s 3D SLAM algorithm. This is particularly important when the feature is at long range (>10 m). e.g., when scanning a smooth walled passageway where the only feature in the direction of travel is the end wall or door.
- Avoid scanning moving objects (e.g., passing pedestrians or vehicles) as FARO’s 3D SLAM algorithm may lock on to these objects as static features.

Loop-Closing

FARO’s 3D SLAM algorithm processes the raw scan data into a point cloud using a method analogous to the Traverse technique used in survey practice. With this technique, a previously known position of the scanner is used to determine the current position. This method can magnify small measuring errors, causing the calculated position to “drift”. It is good survey practice to “close the loop” by re-scanning a known position so that the compounded error can be spread around the loop.

As a minimum, you must start and end the survey in the same position to ensure at least one loop closure. It is recommended to close the loop as often as possible to minimize error and improve the accuracy of the resulting point cloud.

In general, it is better to do circular loops instead of just retracing one's steps. This applies to horizontal as well as vertical loops, so enter and exit through different doors, and move between floors via different stairwells.

It is important to scan the closed loop regions carefully to ensure the key features are scanned from a similar perspective. It may be necessary to turn around if you return to a region from a different direction. This is particularly important in feature-poor environments.

Transitioning Between Environments

Extra care must be taken when transitioning between environments, for example passing through a doorway or turning through a tight bend to avoid introducing errors. When transitioning between environments the local view may change abruptly and FARO's 3D SLAM algorithm may have difficulty placing the new environment relative to the previous environment. This may result in rooms on either side of a doorway being slightly misaligned.

Transition through doorways slowly and ensure that there is a period when the scanner can view features on both sides of the doorway (i.e., into both rooms).

Try to open all doors before starting the survey. Avoid scanning doors as they are being opened. If necessary, face away from the door and open from behind then pass through the doorway backwards.

Transition around tight bends slowly and ensure that there is a period when the scanner can view features on both sides of the bend.

Take care when transitioning from an enclosed feature-rich environment to an open feature-poor environment, for example exiting a building. It may be necessary to turn and face the exit and the exterior of the building if no other features are within range.

Avoid scanning any moving objects (e.g., walking pedestrians) as you pass through a transition.

Walking Speed

It is recommended that data is captured at walking speed to ensure good coverage and high-resolution data. If the forward movement is too fast there may not be enough repeat scans of features for FARO's 3D SLAM algorithm to be able to process the raw laser data into a point cloud.

Minimum and Maximum Range

Data within a small range value is not processed (by default) to eliminate data from the scanner operator being included in the final point cloud. Avoid close proximity to walls and ceilings.

The maximum range of the scanner is 120 m. This range will only be achieved in optimal conditions (indoors with good target reflectivity). The typical maximum range will be 60-80 m in most conditions. It is recommended that the range is kept to less than 50 m where possible to ensure good point density and to assist the FARO's 3D SLAM algorithm.

Duration of Scanning

For very large surveys the project should be broken down into more than one scan mission. This is to avoid very large file sizes as well as reduce any drift that might be created in the data. It is recommended that each survey be limited to a maximum of 30 minutes. At slow walking pace, it is possible to cover 1000-3000 m of survey distance.

Survey Areas with Restricted or Difficult Access

The scanning head can remain stationary for short periods of time whilst the operator negotiates difficult access points (e.g., tight squeezes in cave systems). The scanning head can also be held in the hand and moved up and down to mimic the normal oscillating motion for short periods of time to assist transition through survey areas with restricted or difficult access.

Moving Objects in the Environment

In most cases the FARO 3D SLAM algorithm can handle moving objects in the environment. To estimate the sensor trajectory, the algorithm assumes a large proportion of the environment is static. However, in some feature-poor environments where 3D structure is lacking in some dimensions, moving objects can have a greater impact on the solution. In particular, moving objects should be avoided in long tunnel-like environments (e.g., corridors), relatively open spaces and when transitioning through doorways.

It is best practice not to have other people closely accompany the operator during the scan acquisition as they will be scanned throughout the map leaving streaks of data and potentially corrupting the solution in feature-poor environments. If people are required to follow the operator, they should ideally maintain a distance of 20 m or more from the operator.

Creating Point Clouds Using FARO Connect

It is necessary to process the raw data collected by the Orbis Premium using FARO's 3D SLAM algorithm to generate a homogenous 3D point cloud of the environment that has been mapped. This is done using FARO Connect software or FARO's Sphere XG. For more information, refer to the Connect Viewer User Manual, also available at the FARO Knowledge Base.

Maintenance

- Store the Orbis Premium Mobile Scanner, Orbis Datalogger, and accessories in the transport case when not in use.
- Protect the devices from shaking, shocks, vibration, and large variations in temperature.
- Check the cables for damage to outside insulation, connectors, and pins.
- Check the housing of the hand unit for damage.
- Avoid knocking or dropping the device.
- Examine the external interfaces to ensure that they are not damaged.
- If the Orbis Premium Mobile Scanner or Orbis Datalogger become dirty or dusty, clean with a soft dry cloth. If necessary, dampen the cloth with isopropyl alcohol.
- Always unplug all cables and remove the battery before cleaning with alcohol.

Upgrade Firmware

Occasionally, FARO provides firmware upgrades for the Orbis Premium Mobile Scanner to add support for new features, improve performance, and fix problems. To be notified about firmware updates and to install them use the following procedure:

1. In the *Stream Settings* on page 33 set **Automatic Firmware Download** to always or only when connected to Wi-Fi. You only need to do this once. Note that firmware files are large and you may be charged for the data download by your mobile Internet provider, depending on your data plan.
2. When new firmware is available, Stream will notify you. You may need to switch to a WLAN network with Internet connectivity, depending on your settings.
3. When the download is complete, switch back to the Orbis Premium WLAN. Stream will search for your Orbis Premium scanner.

4. When Stream connects to the Orbis Datalogger, you will see a message informing you that firmware is available.

NOTICE: Before upgrading firmware, ensure that the Orbis Datalogger battery and your phone are both fully charged to ensure that the devices do not lose power during the upgrade. Loosing power during an upgrade could damage your device.

5. Tap **Install** to begin the installation process.

NOTICE: Do not switch off the power to the Orbis Datalogger or your phone during installation. Doing so could damage your device.

6. During installation, the Orbis Premium WLAN network will go offline. When it reappears, the upgrade is complete.
7. Restart the Orbis Datalogger. Check your network settings and reconnect when it is available.

NOTE: You can check your firmware version in Stream by checking under **Available Devices**.

Recharging the Battery

Plug the charger into the AC mains – the LED light will glow green.

Plug the charger lead firmly into the battery. The LED light will change to red to indicate charging. When the LED light changes back to green, the battery is fully charged.

Disconnect the charger from the battery and from the AC mains.

CAUTION! Do not leave the charger connected to the battery for long periods after the battery is charged.

Battery Capacity and Run-time Display

A single button press of the display button on the side of the battery shows a percentage figure of available capacity, to a resolution of 1%.

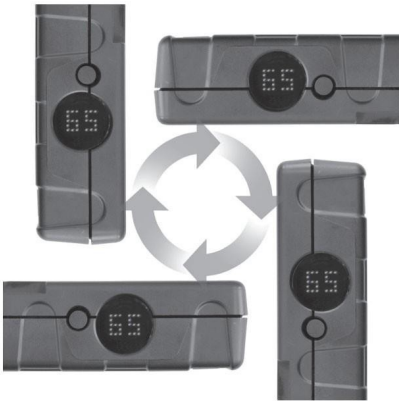
The accuracy of the display is maintained by tracking battery performance and adjusting calibration values to compensate for the aging of the cells.

When the battery is completely discharged the display will indicate as below.

When the battery is completely charged the display will indicate 100%.

When connected to the Orbis Premium that is powered on, two presses of the battery's display button will show a predicted run-time against the load, expressed in hours and minutes.

The capacity display senses the orientation of the battery and adjusts to ensure legibility.



Technical Specification

General

Maximum range	120 m
Field of view	360º x 290º
Scan rate	640,000 points per second
Mobile scanning precision	5 mm (1 sigma)
Mobile scan image resolution	18 M points
Mobile scanning imaging rate	1 image per second
Stationary Flash scanning precision	2 mm (1 sigma)
Stationary Flash scanning duration	15 sec. including color
Stationary Flash scanning resolution	72 M points (13mm @ 10 m)
Laser safety classification	Class 1 eye-safe per IEC 60825-1:2014
Laser wavelength	905 nm
Wireless communication	Standard IEEE 802.11 ax/ac/a/b/g/n
Environment	Indoor and temporarily outdoor use, pollution degree 2
Humidity	Non-condensing
IP Rating	Orbis Premium Mobile Scanner: 54 Orbis Datalogger: Not rated
Altitude	< 2000 m (6561 ft)
Operating temperature	0º C to +40º C (32º F to 104º F)
Power supply	Orbis Premium Mobile Scanner: 14.8 VDC ~ 2.4 A Orbis Datalogger:12 VDC ~ 1.5 A
Ports for Orbis cable on the Orbis Premium Mobile Scanner and the Orbis Datalogger	12 V, 1.5A
Weight	Orbis Premium Mobile Scanner: 2.10 kg (4.63 lbs) Orbis Datalogger : 0.95 kg (2.09 lbs)

Dimensions	Scanning head 216 x 108 x 266 mm (153 mm excluding the handle) Carrying case 500 x 625 x 250 mm (19.69 x 24.61 x 9.84 in)
Battery life	Approximately 3 hours of continuous use

Battery

Output voltage	14.8 V nominal
Capacity	6.1 Ah (+/-5%) 90 Wh
Charge voltage	16.8 V
Weight	0.55 kg (1.21 lbs)
Charging temperature	0° C to 40° C
Life cycle	More than 300 cycles
Protection	Over current, over voltage, under voltage, thermal
Transportation	UN 38.3 transportation test certified

Appendix 1: Further Help and Information

In the event of a problem that cannot be resolved using the information supplied, contact FARO. You can also gain assistance through the FARO Knowledge Base.

For further assistance, contact FARO Technical Support by telephone or email. Our Customer Support personnel will discuss your situation, determine the cause of the problem and provide the appropriate technical assistance.

To contact FARO, see *Technical Support* on page 43 for phone numbers and email addresses.

Technical Support

FARO Technologies, Inc. is committed to providing the best technical support to our customers. Our Service Policy is detailed under Industrial Service Policy in this the user manual. If you have any difficulties using one of our products, follow these steps before contacting our Technical Support Team:

- Be sure to read the relevant sections of the documentation.
- Visit the FARO Customer Care area on the Web at www.faro.com to search our technical support database. 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 can give us, the easier the issue is to solve.
- If you still cannot resolve your issue, have your device's serial number available before calling.
- Emails or faxes sent outside regular working hours are usually answered before 12:00 noon the next working day. If our staff are on other calls, leave a voice mail. Calls are always returned within 24 hours on business days. Remember to leave a detailed description of your difficulty along with your device's serial number. Do not forget to include your name, fax number, and telephone number with extension, so we can promptly reach you.

North America	Support Hours (Monday through Friday) 8:00 a.m. to 7:00 p.m. Eastern Standard Time (EST) Email: support@faro.com Phone: +1 800 736 2771, +1 407 333 3182 (Worldwide) Mexico: 866-874-1154 Fax: +1 407-562-5294
Europe	Support Hours (Monday through Friday)

	8:00 a.m. to 5:00 p.m. Central European Standard Time (CET)
	Email: support.emea@faro.com
	Phone: +800 3276 7378, +49 7150 9797 400 (Worldwide)
	Fax: +800 3276 1737, +49 7150 9797 9400 (Worldwide)
	Support Hours (Monday through Friday)
	8:30 a.m. to 5:30 p.m. Singapore Standard Time (SST)
Asia	Email: supportap@faro.com
	Phone: +1 800 511 1360, +65 6511 1350 (Worldwide)
	Fax: +65 6543 0111
	Support Hours (Monday through Friday)
	9:00 a.m. to 5:00 p.m. Japan Standard Time (JST)
Japan	Email: supportjapan@faro.com
	Phone: +81 561 63 1411 (Worldwide)
	Fax: +81 561 63 1412
	Support Hours (Monday through Friday)
	8:30 a.m. to 5:30 p.m. China Standard Time (CST)
China	Email: supportchina@faro.com
	Phone: +400.677.6826
	Fax: +86 21 6494 8670
	Support Hours (Monday through Friday)
	9:30 a.m. to 5:30 p.m. India Standard Time (IST)
India	Email: supportindia@faro.com
	Phone: 1800.1028456
	Fax: +91 11.4646.5660

Disposal

At the end of its life cycle, this product must not be disposed with normal waste, but instead must be returned to a recycling facility for electric and electronic devices.

Contact your local government or local waste disposal operators to ensure you comply with local laws.

Software License Agreement

This Software License Agreement is part of the Operating Manual for the product and software system for which you have purchased from FARO (collectively, the "Licenser"). With 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 *Purchase Conditions* on page 46 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).

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* on page 50 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* on page 47 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 majuere, 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 *Purchase Conditions* on page 46.

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 Orbis™ Premium Mobile Scanner and Datalogger and reported to FARO within the Maintenance/Warranty Period. If the Orbis™ Premium Mobile Scanner and Datalogger 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 Orbis™ Premium Mobile Scanner and Datalogger will be repaired or adjusted to the extent found by FARO to be necessary or at the option of FARO, replaced with a new Orbis™ Premium Mobile Scanner and Datalogger 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 Orbis™ Premium Mobile Scanner and Datalogger. Within a reasonable time of receipt of such notice, FARO shall have the System and Orbis™ Premium Mobile Scanner and Datalogger diagnosed by its service personnel, and maintenance/warranty service will be provided at no cost to the Purchaser if the System and Orbis™ Premium Mobile Scanner and Datalogger 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 Orbis™ Premium Mobile Scanner and Datalogger 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 Orbis™ Premium Mobile Scanner and Datalogger, 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 Orbis™ Premium Mobile Scanner and Datalogger's ("Temporary Replacements") while corresponding parts of the Purchaser's system or Orbis™ Premium Mobile Scanner and Datalogger are undergoing repair at

FARO's factory. Shipping charges for these "Temporary Replacement" parts or Orbis™ Premium Mobile Scanner and Datalogger'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 Orbis™ Premium Mobile Scanner and Datalogger 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 Orbis™ Premium Mobile Scanner and Datalogger 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 Orbis™ Premium Mobile Scanner and Datalogger, 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 Orbis™ Premium Mobile Scanner and Datalogger, 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 Orbis™ Premium Mobile Scanner and Datalogger, 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 of 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

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 Orbis™ Premium Mobile Scanner and Datalogger, the Software, operating manuals and any other product or merchandise sold pursuant to the Order. If the Purchaser is buying only a Orbis™ Premium Mobile Scanner and Datalogger, 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 Orbis™ Premium Mobile Scanner and Datalogger, the Software, the Computer, and optional parts and accessories associated with the Orbis™ Premium Mobile Scanner and Datalogger.

8.06 "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.

8.07 "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.

Industrial Service Policy

This Service Plan (hereafter, the "Plan") is part of the Operating Manual for the FARO manufactured product purchased from FARO (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. 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 permit.

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 can not 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 Scanner and all of the associated optional parts, and 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 (maintenance upgrades) for the life of the Purchaser's current version. All enhancement and functionality upgrades must be purchased.

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.

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

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

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

2.05 "System" means a combination of the Hardware, the Software, the Computer, and optional parts associated with the Orbis™ Premium Mobile Scanner and Datalogger.

2.06 "Hardware" means the scanner and all of the associated optional parts, and the Computer if provided by FARO.

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

Service Plans

Information about FARO 's service plan options can be found on the FARO Knowledge Base https://knowledge.faro.com/Essentials/General/Service_Plans_for_FARO_Hardware.

Industrial Products Service Policy

A one-year maintenance/warranty comes with the purchase of new FARO manufactured hardware products.

The most regular of the FARO Standard Maintenance Terms and Conditions can be found in the FARO Knowledge base.

FARO Software

All FARO Software users will receive maintenance releases until the end of life for the version at no charge electronically or at a minimal fee for the computer media package. All enhancement and functionality upgrades will be available for purchase upon release.

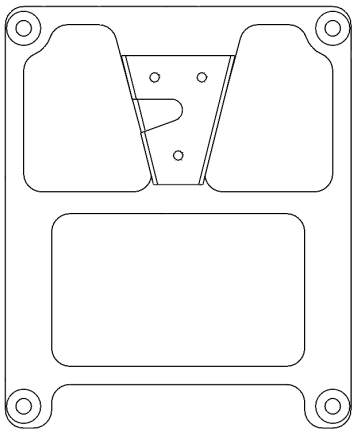
Hardware & Software Training

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.

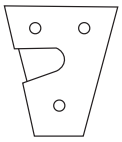
Appendix 2: Accessories

V-Mount Kit

The V-mount kit is a set of two V-mounts, one for the Orbis Premium Mobile Scanner and one for the Orbis Datalogger. The kit makes it possible for you to use your Orbis Premium Mobile Scanner equipment with the GEOSlam ZEB Locate Backpack, and the GEOSlam ZEB Horizon Car Mount. To order the V-mount, contact your FARO sales representative and request part number 810-000178-000.



V-Mount for the Orbis Premium Mobile Scanner



V-mount for the Orbis Datalogger

To attach the V-mount to the Orbis Premium Mobile Scanner

1. Remove the handle from the mobile scanner. (Consider that the handle can only be replaced after the bracket is removed.)

2. Attach the black bracket to the back of the Orbis Premium Mobile Scanner using the 4 screws provided with the kit and a Torx 20 bit. Ensure that the screws are snug, but do not over-tighten.

NOTE: The Orbis Premium Mobile Scanner will not fit in the case when the V-mount is attached. Remove the V-mount from the Orbis Premium Mobile Scanner before replacing it in the case.

To attach the V-mount to the Orbis Datalogger

1. Remove the stock V-mount from the back of the Orbis Datalogger with a screwdriver.
2. Attach the orange V-mount using the 3 screws provided with the kit and a Torx 10 bit. Ensure that the screws are snug, but do not over-tighten.

NOTE: The kit V-mount cannot be used with the monopod mounting bracket.

CAUTION! To avoid damage to your or and injuries due to falling parts, always check to ensure that the V-mount screws are tight before using the V-mount to attach your Orbis Premium equipment to other accessories,

Appendix 3: Certifications

European Union

CE Declaration of Conformity

Hereby, FARO Technologies, Inc. declares that the radio equipment type Orbis Datalogger. is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following Internet address:

https://www.faro.com/en/Support-Overview/Technical-Documentation/Certificates

FARO Technologies Inc. is represented in Europe by FARO Europe GmbH, Korntal-Münchingen, Germany.

Non-EU Countries

USA

The following statement relates to the Orbis Premium Mobile Scanner and Orbis Datalogger.

Federal Communication Commission Interference Statement:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

RF exposure statements

The product complies with the FCC portable RF exposure limit set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The further RF exposure reduction can be achieved if the product can be kept as far as possible from the user body or set the device to lower output power if such function is available.

FCC ID: YQMGS610390

Supplier's Declaration of Conformity
47 CFR § 2.1077 Compliance Information

Unique Identifier:

Brand: FARO
Model: Orbis Datalogger

Responsible Party – U.S. Contact Information

FARO Technologies, Inc.
125 Technology Park
Lake Mary, FL
32746

Internet contact: https://www.faro.com/en/About-Us/Contact-Us

FCC Compliance Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

DocuSigned by:
Allen Muhich
A342EC0ADD7D4...

Name: Allen Muhich
Job Title: Chief Financial Officer
Company Name: FARO Technologies, Inc.

Canada

The following statement relates to the Orbis Premium Orbis Datalogger.

Industry Canada statement:

This device complies with Industry Canada license-exempt RSSs. Operation is subject to the following two conditions:

1) This device may not cause interference, and

2) This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

1) l'appareil ne doit pas produire de brouillage;

2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, meme si le brouillage est susceptible d'en compromettre le fonctionnement.

Caution:

1) The device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;

Avertissement:

1) Le dispositif fonctionnant dans la bande 5150-5250 MHz est réservé uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;

Radio Frequency (RF) Exposure Information

The radiated output power of the Wireless Device is below the Industry Canada (IC) radio frequency exposure limits. The Wireless Device should be used in such a manner such that the potential for human contact during normal operation is minimized.

This device has been evaluated for and shown compliant with the IC Specific Absorption Rate ("SAR") limits when operated in portable exposure conditions.

Informations concernant l'exposition aux fréquences radio (RF)

La puissance de sortie émise par cet appareil sans fil est inférieure à la limite d'exposition aux fréquences radio d'Industrie Canada (IC). Utilisez l'appareil sans fil de façon à minimiser les contacts humains lors d'un fonctionnement normal.

Cet appareil a été évalué et démontré conforme aux limites de DAS (Débit d'absorption spécifique) d'IC lorsqu'il est utilisé dans des conditions d'exposition à des appareils portables.

IC ID: 9265A-GS610390

Japan

Radio Equipment Certification Under the Radio Act of Japan

当該機器には電波法に基づく技術基準適合証明等を受けた特定無線設備を装着している

020-230403

W52 and W53 is for indoor use only

Air Transport Certificate

PAG Ltd.
565 Kingston Road
London SW20 8SA
United Kingdom

Air Transport Certificate for PAG Li-Ion Batteries

PAG Ltd. London, England

hereby declares that the PAG L90 Slim Lithium-Ion battery has been tested and certified by Intertek Group PLC to comply with the UN Manual of Tests & Criteria, Part III, subsection 38.3 as required by the IATA Dangerous Goods Regulations (2016), Section 2.3.5.9.

PAG L90 Slim Battery Test Report Number: 102471069

In addition to UN testing, this Li-Ion battery has an individual Watt-hour rating below 100Wh. This rating is in compliance with the IATA DGR (2016) which states:

> *(a) each installed or spare battery must not exceed:*
> *2. for lithium ion batteries, a watt-hour rating of not more than 100Wh.*

Signed for and on behalf of PAG Ltd.

Alan Lavender
Chief Executive
Date: 01.04.16.

Glossary

C

collection
A list of projects that belong together and which is used for the joint assignment of project permissions

F

FARO Sphere XG
A cloud-based information platform provided by FARO that provides a centralized, collaborative experience across the company's reality capture applications and customer support tools through a secure, single point sign-on process.

FARO Stream
A FARO phone app from which you can control a Focus Premium laser scanner or ORBIS Mobile Scanner, perform various processing steps, collect complementary data, and upload captures directly into FARO Sphere.

features (handheld scanners)
2D Objects (e.g., planes) and textures that are recorded by a handheld scanner and which can be identified by the scanner software. Features are used during the tracking process.

G

GPIO
General Purpose Input Output. A digital signal that has no predefined purpose, but which can be defined by the designer of the circuit.

P

point cloud
A set of data points captured by innumerous hardware that represents an object in 3D form, from which dimensions can be extracted.

processing
A series of software manipulations to the scan data in a project that improve the quality of the scan.

R

registration
The process of aligning multiple scans in a parent coordinate system using reference positions common between scans. References are common points between scans that are used to create a "best-fit" alignment.

S

scan (Focus)
: A file or collection of files recorded by the scanner, containing millions of data points that include position, reflectance, and color for single scan points. A scan consists of scan points that were recorded from a single scanner location. Its points are organized in a row/column order.

scan (general)
A file or collection of files recorded by scanner containing different kinds of data of the scanned object or environment.

T

target
A physical object in the area to be scanned that can be detected by the software and used to register the scans. A target can be a naturally occurring plane such as a wall or desk, or an artificial marker.

tracking
The process of following features from frame to frame. Tracking makes it possible to reconstruct the movement of a hand-held scanner in space, thus putting the points of the individual frames into a common 3D context.

W

workspace
A collection of projects and applications that can be assigned to users and groups. Different users and groups can have different permissions in the workspace.

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