

STONEX®X40<sup>GO</sup> *SLAM Laser Scanner* **User Guide** 



www.stonex.it

GOapp v2.6.6

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# Changelog

GOapp					
	Added Geotag function for X120GO.				
	Support to X40GO.				
Version 2.8.8	Added languages (Ukraine, Japanese).				
	Changes of acquisition interface.				
	Improved preview stability for X120GO.				

# 1. Legal Notice

### 1.1 Copyrights and trademarks

STONEX®, the STONEX® logo, and X40<sup>GO</sup> are trademarks of STONEX® S.r.l. STONEX® GOapp, STONEX® GOpost are trademarks of STONEX® S.r.l. All other trademarks are the property of their respective owners.

# 2. Standard Limited Warranty

# 2.1 Shipping policy

The Customer or the Dealer is required to pay for the charges for shipping of fault parts or instruments to STONEX® representative office and STONEX® (will provide) the shipping for return. Dealers needs to follow STONEX® repair/service procedure to achieve a better and prompt service result.

## 2.2 Return policy Dead on Arrival instruments

All returned products must be shipped to STONEX® representative office.

The original Purchaser has a period of seven (7) days, starting from date (data) of purchasing to signal the existence of a defect in the instrument for a full refund (less shipping and handling), provided the merchandise is in new, resalable condition and returned in the original, undamaged packaging. Customer must pay for both the return and the original freight fees, regardless of the original freight paid by the Company. All warranty books, instruction manuals, parts and accessories must be included as well as the original box in which the item was shipped. We recommend placing the original carton inside another box, to avoid any additional damage to the carton itself. In some cases, returns of special items will require a re-stock fee. Acceptance of returned merchandise is final only after inspection by STONEX®.

Above terms and (policy shall apply as for hardware.) Dealers needs to follow STONEX® repair/service procedure to achieve a better and prompt service result.

### 2.3 Firmware/Software warranty

STONEX<sup>®</sup> doesn't warrant that operation of Firmware/Software on any instruments will be uninterrupted or errorfree, or that functions contained in Firmware/Software will operate to meet your requirements.

STONEX® will forward the Software/Firmware Fix to the dealer or customer. Firmware/software Fix means an error correction or other update created to fix a previous firmware version that substantially doesn't conform to the instrument's specification.

# 2.4 Over Warranty repair(s) policy

Customer shall pay the standard repair fees for any service (whether part replacement or repairs) and performed by STONEX<sup>®</sup> under request and explicit authorization of the customer itself. In this case the customer is charged for return shipment's fees as well.

### 2.5 Disclaimer and Limitation of Remedy

All other express and implied warranties for this product, including the implied warranties of merchantability and fitness for a particular purpose and/or noninfringement of any third party's rights, are hereby disclaimed.

STONEX® expressly disclaims all warranties not stated in this limited warranty. Any implied warranties that may be imposed by law are limited in duration to the term of this limited warranty. Some jurisdictions do not allow the exclusion of implied warranties or limitations on how long an implied warranty lasts, so the above exclusions or limitations may not apply to customer. Customer must read and follow all set-up and usage instructions in the applicable user guides and/or manuals enclosed. If customer fails to do so, this product may not function properly and may be damaged. Customer may lose data or sustain personal injuries. STONEX®, its affiliates and suppliers do not warrant that operation of this product will be uninterrupted or error free as do all electronics at times. If this product fails to work as warranted above, customer's sole and exclusive remedy shall be repair or replacement. In no event will STONEX®, its affiliates or suppliers be liable to customer or any third party for any damage in excess of the purchase price of the product. This limitation applies to damages of any kind whatsoever including (1) damage to, or loss or corruption of, customer's records, programs, data or removable storage media, or (2) any direct or indirect damages, lost profits, lost savings or other special, incidental, exemplary or consequential damages, whether for breach of warranty, contract, tort or otherwise, or whether arising out of the use of or inability to use the product and/or the enclosed user guides and/or manuals, even if STONEX®, or an authorized STONEX® representative, authorized service provider or reseller has been advised of the possibility of such damages or of any claim by any other party. Some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages for some products, so the exclusions or limitations may not apply to customer. This limited warranty gives customer specific legal rights, and customer may also have other rights which vary from country/state/jurisdiction to country/state/jurisdiction.

### 2.6 Environmental recycling

The cardboard box, the plastic in the package and the various parts of this product have to be recycled and disposed of in accordance with the current legislation of your Country.

#### FOR COUNTRIES IN THE EUROPEAN UNION (EU)

The disposal of electric and electronic device as solid urban waste is strictly prohibited: they must be collected separately.

Contact Local Authorities to obtain practical information about correct handling of the waste, location, and times of waste collection centers. When you buy a new device of ours, you can give back to our dealer a used similar device. The dumping of these devices at unequipped or unauthorized places may have hazardous effects on health and environment.

The crossed dustbin symbol means that the device must be taken to authorized collection centers and must be handled separately from solid urban waste.



#### FOR COUNTRIES OUTSIDE EUROPEAN UNION (EU)

The treatment, recycling, collection, and disposal of electric and electronic devices may vary in accordance with the laws in force in the Country in question.

# 3. Introduction

## 3.1 General

Thank you for purchasing STONEX® X40<sup>GO</sup> 3D Laser Scanner.

This manual includes important safety directions and instructions for setting up and using the product. Please read this manual carefully before using, so that our products can serve you better.

When you begin to use the product, we assume that you are a competent user who has read through and understood the contents of this manual and is fully aware of the necessary dangers, warnings, and cautions.

In the event of any discrepancy between the information contained in this manual and the actual, the actual information shall prevail, and the Company reserves the right to make further revisions or changes to this manual without notice.

X40<sup>GO</sup> is a compact system providing high-precision point clouds based on SLAM technology. LiDAR orientation is designed to maximize coverage in a range of 70 meters and a 12-megapixel camera provides color information to the 3D model. A simple and cost-effective solution, ideal for interior surveys and floor plan generation. Mapping results are generated immediately inside the scanner after the scanning.

# 3.2 Description of the system



- 1. Lidar Head.
- 2. Color camera.
- 3. Type-c USB port for charging and data download.
- 4. Battery indicator status



- 5. Release button.
- 6. System indicator led.
- 7. Status indicator led.
- 8. Power button.
- 9. Magnetic ring for tablet and smartphone.



# 3.3 Precaution for safety

- 1. Avoid vibrations: when transporting, keep the instrument in the case and try your best to lighten vibrations.
- 2. Instrument carrying: when carrying, the instrument handle must be hold tight.
- 3. Check the battery power: before using the instrument, you should check the battery power whether it is enough.
- 4. High temperature condition: don't put the instrument in high temperature condition for a long time, it is bad for the instrument performance, and it can damage the hardware components.
- 5. Temperature changing sharply: the sharp temperature changing on the instrument will shorten the distance measurement range. For example, after taking the instrument out from a warm car to a cold condition, wait for some time: it can be used when it adapts the surrounding condition.
- 6. Noise from the instrument: when the instrument is working it is normal if you hear noises from instrument motors. They will not affect the instrument work.
- 7. Stored data responsibility: STONEX® should not be held liable for the lost data because of wrong operation.

# 3.4 Transport and shipping

### TRANSPORT IN THE FIELD

- 1. When transporting the equipment in the field, always make sure that you:
  - a. either carry the product in its original transport container,
  - b. or carry the tripod with its legs splayed across your shoulder, keeping the attached product upright.

### TRANSPORT IN A ROAD VEHICLE

- 2. Never carry the product loose in a road vehicle, as it can be affected by shock and vibration.
- 3. Always carry the product in its transport container and secure it.

### SHIPPING

**4.** When transporting the product by rail, air, or sea, always use the complete original STONEX® packaging, transport container and cardboard box or its equivalent to protect the instrument against shock and vibration.

#### SHIPPING AND TRANSPORT OF BATTERIES

- **5.** When transporting or shipping batteries, the person in charge of the product must ensure that the applicable national and international rules and regulations are observed.
- 6. Before transportation or shipping, contact your local passenger or freight transport company.

### FIELD ADJUSTAMENT

**7.** After transport, inspect the field adjustment parameters given in this user manual before using the product.

### 3.5 Storage

- 1. Keep away from magnetic fields.
- 2. Protect against falling.
- 3. Prevent crushing.
- 4. Keep away from humid environments.

If the device is not used for a long time, please store it in a safe, dry and ventilated place that avoids direct sunlight, the storage environment requires a relative humidity of less than 40%, and a temperature between -20°C and +60°C to avoid excessive humidity in the environment that causes the device to produce condensation. The recommended storage temperature is  $+5^{\circ}C \sim +28^{\circ}C$ .

# 3.6 Cleaning and drying

- Never touch the cover glass with your fingers.
- Use only a clean, soft, lint-free cloth for cleaning.
- If necessary, moisten the cloth with water or pure alcohol. Do not use other liquids.
- Keep plugs clean and dry. Blow away any dirt lodged in the plugs of the connecting cables.

# 3.7 Definition of indication

For the safe of your product and prevention of injury to operators and other persons as well as prevention of property damage, items which should be observed are indicated by an exclamation point within a triangle used with WARNING and CAUTION statements in this manual.

The definitions of the indications are listed below.

Be sure you understand them before reading the manual's main text.





- **1.** Do not perform disassembly or rebuilding. Fire, electric shock, or burn could result. Only STONEX® authorized distributors can disassemble or rebuilt.
- 2. Do not cover the charger. Fire could result.
- 3. Do not use defection power cable, socket, or plug. Fire, electronic shock could result.
- 4. Do not use wet battery or charger. Fire, electronic shock could result.
- **5.** Do not close the instrument to burning gas or liquid, and do not use the instrument in coal mine. Blast could result.
- 6. Do not put the battery in the fire or high temperature condition. Explosion, damage could result.
- 7. Do not use the power cable which is not specified by STONEX®. Fire could result.
- **8.** When this product encounters disturbance of severe Electrostatic Discharge, perhaps it will have some degradation of performance like switching on/off automatically and so on.



### CAUTION

- 1. Do not touch the instrument with wet hand. Electric shock could result.
- **2.** Do not stand or seat on the carrying case, and do not turn over the carrying case arbitrarily, the instrument could be damaged.
- **3.** Do not drop the instrument or the carrying case.
- **4.** Do not touch liquid leaking from the instrument or battery. Harmful chemicals could cause burn or blisters.
- 5. Do not drop the instrument. Serious damage could result.
- 6. Please be careful when removing the scanner from the equipment case and take care to protect he laser head.
- 7. Do not touch the protective cover of the laser emitting area with your hands.
- 8. Please try to keep the scanner moving smoothly during data collection and avoid violent shaking.

# 3.8 Safety standards for lasers

STONEX® X40<sup>GO</sup> series adopt the class of Laser Product according to IEC Standard Publication 60825-1:2014. According to this standard, the device is classified as Class 1 Laser Product.

# 3.9 Device power supply

X40<sup>GO</sup> scanner handle integrate 3000mAh replaceable lithium battery, safer and more reliable. Working voltage 10.8V, each battery single continuous working time of about 100 min (separate power supply X40<sup>GO</sup>). The battery in normal maintenance under normal use conditions, charge and discharge cycle times  $\geq$  500 times.

### **Charging advice**

- 1. Do not use non-standard power adapter to charge the battery.
- 2. If the temperature of the battery is high after the operation, it is necessary to wait until the battery is reduced to room temperature before charging the battery, and the ambient temperature of battery charging is required to be within the range of 5°C to 40°C.
- 3. Please charge in the isolated area, away from flammable materials. To avoid the danger of electric shock, please do not open the charger without authorization.
- 4. To avoid the danger of electric shock, please do not open the charger without authorization.

#### **Operation advice**

- 1. Battery use temperature is required to be controlled at -10°C ~+50°C, if the battery temperature is too low, it will affect the lithium-ion activity and discharge efficiency.
- 2. Please make sure the device connection port is dry and free of water before connecting and installing.
- 3. Please keep the Smart Battery Grip out of direct sunlight.
- 4. Using the battery in a low temperature environment (-10°C∼15°C) will reduce the battery capacity and discharge voltage, it is recommended to preheat the battery to 15°C or above before use, and it is better to preheat it to 20°C or above.
- 5. Do not remove the battery directly from a powered device.
- 6. Low battery temperature triggers low temperature charging protection and prevents charging.

- 7. Do not continue to use a battery that has been deformed by a fall or impact.
- 8. If the battery accidentally falls into water, immediately remove the battery, and place it in a safe, open area, away from the battery until it is completely dry. Air-dried batteries should not be reused and should be disposed of properly according to the disposal instructions in this document.
- 9. If the battery fire occurs, please use water, water mist, sand, fire blanket, dry powder,
- 10. carbon dioxide fire extinguisher to extinguish the fire immediately, the fire is very easy to explode. Please choose the fire extinguishing method according to the above recommended order according to the actual situation.
- 11. It is strictly prohibited to use batteries that are not officially provided by Stonex. If you need to replace the battery, please purchase it from Stonex or Stonex dealers. Stonex is not responsible for battery accidents or equipment failures caused using batteries other than those provided by Stonex.
- 12. Battery storage temperature and humidity requirements are -20°C ~45°C, 45%~90%RH.
- 13. It is strictly prohibited to use or charge batteries that are bulging, leaking or damaged. Do not use the battery when it emits a strange odor, becomes hot (the temperature of the battery itself exceeds 60°C), deformed, discolored or any other abnormal phenomenon. If the battery is abnormal, please contact Stonex after-sales service or other agents for further treatment.
- 14. Use the battery in an environment where the temperature is between -10°C and 50°C. Excessive temperatures (above +50°C) may cause the battery to catch fire or even explode. Too low a temperature (below -10°C) will seriously damage the battery.
- 15. It is prohibited to disassemble or puncture the battery with sharp objects in any way. Otherwise, battery leakage will cause fire or even explosion.
- 16. Do not mechanically strike, crush, or throw the battery. Do not place heavy objects on the battery or charger.
- 17. If the battery is dropped or struck by an external force, stop using the battery.
- 18. Do not heat the battery. Do not place the battery in a microwave oven or pressure cooker.
- 19. Do not place battery contacts on a conductive surface (such as a metal tabletop, glasses, watch, jewelry, or other metal objects).
- 20. Do not short-circuit the positive and negative terminals of the battery with wires or other metal objects.
- 21. If the battery connector is dirty, wipe it with a clean, dry cloth. Failure to do so will result in poor battery contact, which may cause energy loss or charging malfunction.

#### **Transportation**

Batteries should be placed in a safe box during transportation to avoid contact with liquids or bumping against hard objects, and never immerse them in water or get them wet. When the battery is exposed to water, it may decompose and cause spontaneous combustion or even an explosion.

#### Maintenance

After each operation, the battery should be recharged in time, please do not store the low battery for a long time, if not used for a long time, please charge the battery to more than 50% and then store it and carry out charging and discharging maintenance every 3 months.

#### **Battery storage**

- 1. Please store the battery out of the reach of children and pets.
- 2. Batteries should be stored in an explosion-proof box in a cool and dry place, prohibited from prolonged exposure to high temperatures and avoid direct sunlight.

- 3. Do not place the battery near a heat source (furnace or heater, and so on), and do not leave the battery in a car on a hot weather day. Do not store the battery in an environment that exceeds 60°C. The ideal storage temperature is 22°C 28°C.
- 4. May not be stored in multiple occurrences of alternating high and low temperature environments.
- 5. May not be stored in a fully charged transportation box when the battery temperature exceeds 45°C.
- 6. Prolonged low battery storage will result in over-discharge of the battery, which may even cause the battery to be scrapped in severe cases.
- 7. Do not place sharp objects with or puncture the batteries.
- 8. Prevent the battery from being dropped and knocked.
- 9. Store the battery in a dry environment.
- 10. Do not store the battery for long periods of time after it has been completely discharged to avoid overdischarging the battery and causing damage that will make it impossible to restore it to service.

#### Battery disposal

- 1. Do not disassemble, impact, extrude the battery or put it into fire. Please do not put the battery in a high temperature environment.
- 2. If the battery is bulging, broken or leaking, please do not use it again and dispose of it in time.
- 3. Be sure to discharge the batteries completely before disposing of them in the designated battery recycling bin. Batteries are hazardous chemicals and should not be disposed of in the regular trash. For details, follow your local battery recycling and disposal laws and regulations.
- 4. If the battery cannot be completely discharged, please do not dispose of the battery directly in the battery recycling bin and contact a professional battery recycling company for further processing.

Model	SP30
Charging interface	Type-C3 port
Input voltage	5-20 V
Output voltage	10.8 V
Battery capacity	3000 mAh
Standard	GB31241-2014S
Duration	100 min
Weight	About 400 g
Dimension	Length×Width×Height
	85 mm×60 mm×144.5 mm

#### **Battery specifications**

### 3.10 About User

- **1.** The X40<sup>GO</sup> Scanner must be used by trained operators only. When operating the X40<sup>GO</sup>, please always follow basic safety precautions to prevent injury or damage to equipment.
- **2.** The user is required to be a qualified surveyor or have a good knowledge of surveying, in order to understand the user manual and safety instructions, before operating, inspecting, or adjusting.
- 3. Do not operate the equipment if it shows obvious defects or damage. Please follow STONEX® service

procedure to repair the equipment.

- 4. Please use only the components and accessories provided by the manufacturer.
- 5. Before operating the X40<sup>GO</sup> for the first time, please read this manual completely.
- **6.** The equipment contains electrical components and mechanical parts, so proper operation is required. Do not pull or bend the data transmission line forcibly.
- **7.** Do not push any other objects into the data transmission line interface, place the device out of the reach of children, and do not modify or disassemble the X40<sup>GO</sup> scanner under any circumstance without the prior written permission of STONEX®. Otherwise, the warranty would not be applied.

## 3.11 Exceptions from Responsibility

- **1.** The user of this products is expected to follow all operating instructions and make periodic checks of the product's performance.
- **2.** The manufacturer assumes no responsibility for results of a faulty or intentional usage or misuse including any direct, indirect, consequential damage and loss of profits.
- **3.** The manufacturer assumes no responsibility for consequential damage and loss of profits by any disaster, such as earthquakes, storms, floods etc.
- **4.** The manufacturer assumes no responsibility for any damage and loss of profits, due to a change of data, loss of data, an interruption of business etc., caused by using the product or an unusable product.
- **5.** The manufacturer assumes no responsibility for any damage and loss of profits, caused by usage except for explained in the user manual.
- **6.** The manufacturer assumes no responsibility for damage caused by wrong transport or action, due to connecting with other products.

# 4. Setting up the STONEX®X40<sup>GO</sup>

4.1 Device assembly

#### **Mounting base**







When installing the handle, first align the slide rail under the handle with the slot above the handle and then push it in.

After installing it in place, you can hear the "click" sound. Check that the release button at the back of the handle is fully rebound, and the joints between the body and the handle have been aligned and are solid and free of looseness.

#### **Detach handle**



### 4.2 Led status

#### **System information**

The system will provide visual and audio inputs to the user, in order to understand the status of the system.



	Led color	Indicator Status
	Firmware upgrade	White light, on
System Indicator	System not ready	Red light, flashing
	System ready	Blue light, on
	MCU Firmware upgrade	White light, flashing fast
Chatrice landlinestern	Device initialization	Red light, on
Status Indicator	Device ready	Green light, on
	Data collection in progress	Green light, flashing

	Sound	Sound description
	One beep	Power ON
	One beep	Shutdown
Durran	One beep every 10 seconds	Low battery
Buzzer	One beep every second	Ultra-low battery
	One beep	GCP information collection
	One beep	Start data collection



The battery status indicator will show the percentage of the remaining battery. It will also give information about the charging and discharging conditions.

Battery LED Indicator Status List							
Status		LED1	LED2	LED3	LED4		
	Undervoltage	Flash(5Hz)	Slow Flash(1Hz)	Out	Out		
	Discharge Low Temperature	Flash(5Hz)	Out	Slow Flash(1Hz)	Out		
Discharge Protection	Discharge Over Temperature	Flash(5Hz)	Out	Out	Slow Flash(1Hz)		
Status	Discharge Overcurrent	Flash(5Hz)	Slow Flash(1Hz)	Slow Flash(1Hz)	Out		
	Discharge Short Circuit	Flash(5Hz)	Slow Flash(1Hz)	Slow Flash(1Hz)	Slow Flash(1Hz)		
	Overvoltage	Slow Flash(1Hz)	Out	Out	Flash(5Hz)		
Charge Protection	Charging Low Temperature	Out	Slow Flash(1Hz)	Out	Flash(5Hz)		
Status	Charging Over Temperature	Out	Out	Slow Flash(1Hz)	Flash(5Hz)		
	Charging Overcurrent	Slow Flash(1Hz)	Slow Flash(1Hz)	Out	Flash(5Hz)		
	0%~12%	Slow Flash(1Hz)	Out	Out	Out		
	13%~24%	Always On	Out	Out	Out		

	25%~37%	Always On	Slow	Out	Out
			Flash(1Hz)		
	38%~49%	Always On	Always On	Out	Out
Power	50%~62%	Always On	Always On	Slow	Out
Indicator				Flash(1Hz)	
	63%~74%	Always On	Always On	Always On	Out
	75%~87%	Always On	Always On	Always On	Slow
					Flash(1Hz)
	88%~100%	Always On	Always On	Always On	Always On

	Status	LED1	LED2	LED3	LED4	
	0%~24%	LED1->LED4 Streaming LED Display				
	25%~49%	Always On	LED2->LED4 Streaming LED Display			
Charging	50%~74%	Always On	Always On	LED3->LED4	Streaming	
Indicator				LED Display		
	>=75%	Always On	Always On	Always On	Slow	
					Flash(1Hz)	
	Full	Always On	Always On	Always On	Always On	

**Description**: The LED will light up for 6 seconds when you press the key to check the power level, the first 3 seconds will show the power level, the last 3 seconds will show the power level if the battery is normal, otherwise it will show the protection status.

# 4.3 Charging method

The X40GO battery can be charged by connecting the charger to the battery via a Type-C cable.

Mode 1: The charger is connected to the Type-C port on the X40GO grip for charging.

**Mode 2**: When the grip is mounted to the X40GO body, the charger is connected to the Type-C port on the body for charging.



# 4.4 Data storage

X40GO uses build-in SSD memory with a capacity of 512 GB and can be connected to a PC via a data cable for data interaction.

The SSD interface can be accessed when the scanner is turned off.



**NOTE**: The USB post is used both for charging the battery and for download data.

# 5. Operating the STONEX®X40<sup>GO</sup>

# 5.1 How to use X40<sup>GO</sup> without application

The X40<sup>GO</sup> scanner can be used without other devices. For proper use follow the rules below:

- Turn on the scanner by pressing the power button for a couple of seconds.
- Place the scanner in a stable spot for initialisation. Press the power button once, followed by an audible warning. The green LED will start flashing indicating that the instrument is acquiring data correctly.
- Wait one minute for the instrument to initialise. Make sure that there are no people or objects moving in front nearby. After the first minute, the head will start to turn, and a second beep will indicate the start of data acquisition. Pick up the scanner and start scanning.
- If you wish to acquire a control point, place the scanner over a target or recognisable point and stand over this point for a few seconds and press the button on the side of the handle (not the power button) to save the position of the control point.
- To end the scan, press the power button once. The green LED will stop flashing indicating the end of data acquisition.

# 5.2 How to use X40<sup>GO</sup> with application: GOapp installation

GO*app* is mobile APP for X40<sup>GO</sup> for Android (8.0 version or above) and iOS, which allows to perform operations such as project management, real-time point cloud display, image preview, firmware upgrade, etc.

- 1. Download on PC from here (android .apk): GOapp for Android
- 2. You can download it also from the app store of your device.

# 5.3 Device binding

The first time you open the GO*app*, you will have the following page, where the *Add Now* button allows to bind a new device.



X40<sup>GO</sup> should relate to Bluetooth of the tablet on which is installed GOapp. Turn first the hot spot and the Bluetooth of the tablet.



Open the APP homepage, press and hold the power button of X40<sup>GO</sup> scanner for 3 seconds, wait for about a minute. Select the symbol of Bluetooth in the app and choose the device by the serial number.

09:36 🗷 📕 🔹 🕴 🕅 🕯
<
WLAN <b>X</b> NFC
Please select a device
X40G02408101
O
• • •

Enter the hot spot name and the password of the tablet and click confirm.

This way the connection between the tablet and the scanner will be set. Remember to turn on the hot spot before opening the application in order to have the automatic connection between the two devices after the first time.



X40<sup>GO</sup> scanner equipment will automatically appear on the homepage.



#### **User settings**

By clicking the user icon, the user settings page will open. In this page is possible to change the language, by clicking *Language* (English, Italian, Chinese available now), and is possible to check the installed applications version by clicking *About GOapp*. The *Export Log* should be used only if requested by stonex support team.



# 5.4 Equipment work

Connect the X40<sup>GO</sup> scanner through mobile phone Wi-Fi, click on the online device with the green dot logo in the upper right corner of the APP page.



After successful connection, the equipment will be initialized. Click on *Start work* to start the scan.



You can also click on the camera icon **O** to take a picture.



#### **Device Status-Connection failed**

If the device connection fails, please recheck the device connection status and troubleshoot one by one:

- 1. Check whether the Bluetooth or the hotspot are turned on.
- 2. Check X40<sup>GO</sup> LED status.
- 3. Exit the work interface, return to the home page, and check whether there is a green cursor in the upper right corner of the connected device icon.
- 4. Try to completely close the GO*app*, clear the background of GO*app*, re-enter GO*app* and try to connect to the X40<sup>GO</sup> device again.

If the connection fails when you re-enter the equipment interface after the above operation, please contact your local dealer for more assistance.

#### Device status-out of communication range

When GO*app* is disconnected from X40<sup>GO</sup>, the device status will prompt "Not in communication range". It is necessary to check whether the mobile phone is connected to the device X40<sup>GO</sup>, or the distance between the mobile phone and the device is too far.

#### **Device status - Device activation failed**

If a device activation failed message appears, you need to connect the controller (phone/tablet) to an internet connection and open the application. Then the application will be able to perform time synchronization.

#### **Parameter initializing**

After clicking *Start work*, leave the scanner still to allow the laser scanner parameters to initialise for approximately one minute. Ensure that there are no moving objects in front of the scanner at this stage.



#### Working page

After connecting X40<sup>GO</sup> through GO*app*, the APP enters the standby page, and the system will automatically enter the working page and start to display the laser scanning data in real time by pressing the power button on the instrument. The interface includes:

equipment information (1), settings (2), working time, temperature, battery percentage and storage (3), switching 2D or 3D display function (4), add a GCP (5), add feature (6), point list (7).



Click the End work button to stop the acquisition.

#### Working-real-time 3D scanning display

When the APP is in the standby interface, press the power key of X40<sup>GO</sup> device briefly to start the operation, and the page will automatically jump to the 3D scanning display interface.

#### Working-View status information

In the process of X40<sup>GO</sup> operation, click the "Equipment Information" button at the upper right corner of the working interface to view the current basic status information, motor status information and error status information.



#### Add GCP

Once you have moved on to a control point, for example indicated by a target, you must centre the centre of the target via the cross in the base of the instrument.

At this point, clicking on the *Add GCP* icon will save the point as a GCP. In addition to the message of successful acquisition, the new ground control point will be visible along the motion track by the presence of a yellow square, one for each point acquired.

#### Add feature: geotag

Click on add feature to take an image and save it as a geotag. You can give a name to the picture you save. After clicking confirm, the picture is saved. The camera that takes the picture is the top camera, so point the desired object with that camera.



#### **Point list**

The point list button opens a list showing the order of saved points (gcp, geotags) and allows their names to be changed.

	Point	List				
wh	Index	Name	E	fit	I	
R	1	estintore	/	ĩ	I	
d Fe	2	cartelli1	1	ii.		
Ξ	3	manometro	1	î	I	
are .	4	cartelli2	1	ii.		
	5		1	Î		
50	Confirm					
3	)				ŧ	

### 5.5 Settings

Click the "Settings" button in the upper right corner of the working interface to enter the setting interface. Click *Regular Settings* to enter the setting interface, where you can set the device name, camera parameters, Wi-fi settings, can format the internal memory and can change the point cloud visualization in real-time.

09:42 🖪 📕 🕴 👋 🐿	@ ∎
Settings	
P Device NameX40G02408101	>
ӧ Camera Params	>
🛜 WI-FI Settings	>
🦉 Format SSD	
🧧 Point Cloud Display	>
• •	

#### Modify device name

Click on the Device name, enter the content to be modified in the pop-up "Modify Device Name" dialog box, and click "Confirm" to modify the device name.

#### **Camera parameters**

You can switch on/off the cameras, and you can change the frequency to avoid flickering in the images. Switch between 50 Hz and 60 Hz, depending on the type of lights are present in the environment. Usually LED lights can create wrong shadows, so take an image before the data acquisition and change the frequency if you notice anomalies.



#### **Format SSD**

Click here if you want to format the SSD of the scanner.



#### **Point Cloud Display**

You can choose if visual a global preview of the point cloud in the app. Global preview may slow down the performances of your tablet.



#### **Delete equipment**

If you want to remove the device, click on Delete dialog box, and click "Confirm" to delete the device. The Delete Device function allows you to delete devices that do not need to appear on the front page.

### 5.6 Firmware

Firmware update will optimize the performance of firmware or device drivers, as well as the performance of processors or other device hardware. Firmware upgrade can also fix the problems found in the old version. On the home screen, the arrow icon indicates the presence of a new firmware download. If white, there are no updates.



#### Automatic firmware upgrade reminder

Every time you open the application to log in, the application will automatically detect the latest firmware version and the local current firmware version. If the latest firmware file is not downloaded locally, you will be reminded to download the latest firmware in the pop-up window on the home page, so that you can directly update the firmware after connecting the device. In addition, the arrow icon will turn red, signalling the presence of firmware to be updated.



Click on the red arrow to check the firmware version to be downloaded.



To make sure you have the latest Firmware version, open the application, before connecting to the scanner's wifi. Otherwise, the following message will appear.



#### Latest firmware download

After the firmware of the homepage pop-up window is upgraded, click OK, which will jump to the firmware download window. Click Download to start downloading. Currently, don't operate your mobile phone, wait for the download to complete, and then click OK to exit the firmware upgrade window.

#### Firmware upgrade process

When the pop-up window on the home page prompts to download firmware, the firmware package will be downloaded locally.

- 1. When opening the app, log in to the account, click "Download the latest firmware" in the pop-up window to upgrade the firmware, and close the download page after the download is completed.
- 2. Turn on the X40<sup>GO</sup> device, connect the device Wi-Fi, click "Home" to enter the device details, click the "Settings" button in the upper right corner of the page, and click "Firmware Upgrade".
- 3. Click "Firmware Upgrade" in the firmware upgrade interface, and then click "Update". Please wait patiently for the firmware upgrade package to be transmitted to the X40<sup>GO</sup> device. Do not operate the mobile phone or X40<sup>GO</sup> device at this time.
- 4. After the transmission is completed, click OK. At this time, please wait for 35s before manually restarting the equipment. After restarting the equipment, check the LED status, and control when LED status return to normal. At this time, the firmware update is successful, and the equipment can be used normally.

In case the latest firmware package is not downloaded on the home page.

- 1. Turn on the X40<sup>GO</sup> device, connect the device Wi-Fi, and click the "Home" to enter the device details, and click the "Settings" button in the upper right corner of the page.
- 2. When checking the firmware upgrade, you need to disconnect the Wi-Fi connection of X40<sup>GO</sup> device (if the device has not acquired the latest firmware version, you will be prompted to disconnect the Wi-Fi of the device and re-enter the firmware upgrade page), keep your mobile phone connected to the Internet, and click "Firmware Upgrade".
- 3. After the download is completed, reconnect the Wi-Fi of X40<sup>GO</sup> device, exit the firmware upgrade page, and click the device on the home page again to enter the device standby page.
- 4. Click "Settings" in the upper right corner of the standby page, enter the firmware upgrade page, click "Firmware Upgrade" and then click "Update". Please wait patiently for the firmware upgrade package to be transmitted to X40<sup>GO</sup> equipment. Please do not operate your mobile phone or X40<sup>GO</sup> equipment at this time.
- 5. After the transmission is completed, click OK. At this time, please wait for 35s before manually restarting the equipment. After restarting the equipment, check the LED status, and control when LED status return to normal. At this time, the firmware update is successful, and the equipment can be used normally.

# 6. Data collection

#### **Device Power On**

Long press the scanner power button for 3 seconds. Wait until:

- System indicator [Blue light is always on].
- Status indicator [Green light is always on].

At this point, the device starts successfully and is in standby mode and keep the scanner on a flat and stable surface.

#### **Start collection**

The scanner needs to be calibrated before starting data collection and should be placed at a distance of greater than 40 centimeters from the object to be measured and not too far away. The calibration phase should take at least 60 seconds before motion acquisition begins. The scanner should not be held in the hand while calibrating but must be placed on a fixed surface such as a secure floor or tabletop.

To start the acquisition, short press the start button on the scanner, the status indicator will start to fast flashing green, at this time the device is being calibrated. Wait for 60 seconds (cell phone APP will show a countdown to read the seconds). After 60 seconds, the status indicator will start flashing slowly green and canl start data acquisition.

#### **GCP** collection

When you need to collect control points, please first align the cross center of the device base to the control point, then press the control point collection button, and after hearing a beep, the control point is collected successfully. If you are using the app you can click on Add GCP to save it and enter a name to the point.





#### **Stop collection**

Short press the scanner ON/OFF button to end data acquisition or the button on the app.

#### **Device shutdown**

Press and hold the scanner ON/OFF button to turn off the device and wait until the system indicatorand status indicator are all off.

#### Data download

After data collection, turn off the scanner, connect the X40<sup>GO</sup> to the PC with the data cable, find the folder named "SN\_XXXXX" and copy it on your PC. The system will automatically generate this folder every time the data collection is completed, and the order of data collection can be recognized according to the number at the end of the folder.

# 6.1 Data collections instructions

### **Indoor Environment**

If it is an indoor environment, multi-path locations should be selected as far as possible as the starting and ending points of data collection. After the site survey, plan the closed route of the survey area.



#### **Outdoor Environment**

If it's an outdoor environment, besides finding multi-path locations and planning closed routes, it is also necessary to ensure that the measured object is within the effective measurement range of the scanner (because of the different reflectivity of ground objects, the distance is also different).



Notice: A multipath location refers to a location that can be reached from multiple directions.

#### **Closed routes**

- 1 The slender closed route is similar to **U-Shaped**, can barely meet the accuracy requirements. If conditions permit, users are advised not to choose this route.
- 2 The trajectory is similar to O-shaped, there is no redundant closed-loop, and the accuracy of data calculation is good, which is one of the most basic requirements for route selection.
- **3** Multi O-route: the whole track is similar to O-shaped, with many closed circles, and the data solution accuracy is the best. It is composed of many closed O-shaped routes, which greatly improves the data solution accuracy and is the best route planning.



#### Typical surroundings data collection considerations

X40<sup>GO</sup> scanner can acquire point cloud data in the range of 360×59, and the point density decreases with the increase of measurement distance. In the process of data acquisition, the device should be stable and avoid violent shaking, and non-measurement objects such as pedestrians and vehicles should be prevented from blocking the front of the device for a long time, to ensure the integrity of data acquisition.

#### Precaution when passing through the door

When the hand-held scanner passes through the indoor door, it is recommended to pass slowly sideways to ensure that the scanner is relatively stable, and the door is open as much as possible. If the door is closed, when approaching the door, you need to turn the scanner back to the door and open the door with the other hand. During the process of passing through the door, you should fully consider the scanning field of vision and scan the scenes outside the door as much as possible in the room. When closing the door, try to avoid the scanner scanning the moving door as much as possible, to prevent data calculation errors.



#### **Attention when turning corners**

When the hand-held scanner passes through the corner, it is recommended to avoid too fast corners, and the way of the corner should be considered in route planning. Get as many point cloud data at the same position before and after the corner as possible to improve the accuracy of data calculation.



#### Precautions for large-scale data acquisition

When the scanner is used to collect large-scale data, the whole survey area should be divided to facilitate the data calculation efficiency, improve the calculation accuracy and facilitate the survey area management. Divide the larger survey area into several small survey areas. It is suggested that the planned data collection time of each survey area should be 25-30 minutes, and the overlapping range of survey areas should be at least 30%.

#### **Suggestions for scanning long corridors (Tunnels)**

Generally, the data obtained in areas with rich features and textures will have good calculation results. To ensure the calculation accuracy, it is necessary to manually set a feature point with a diameter of about 1 meter every 10 meters or place some objects with complex structures such as chairs and stools in this area. Improve the accuracy of the solution. In addition, during data acquisition, attention should be paid to the incident angle of the laser, and data acquisition should be done in the middle of the corridor or tunnel as far as possible, and meaningless in-situ rotation should not be carried out, to avoid the sudden decrease of the incident angle caused by object occlusion and errors in data calculation.



# 6.2 Data Processing

Post-processing of the X40GO data is done via the GOpost software. This is used if you want to reprocess the data and if you want to colour the cloud.For more information on this, please refer to the GOpost manual.

# 6.3 Software license activation request

After opening GOpost, click in the upper right corner on the button Software licensing.

In a new window the license screen will open.

Contact your local dealer in order to request the license activation. You will need to provide the UUID and the serial number of the instrument.

As soon as you receive the .fmpkt file, import it into GOpost via the license management page.			
⊘ License	-		$\times$
SLAM Serial ID			
Device UUID		Сору	
Authorization Status None			
Date of Expiry None			
Import Authorization File			
Now the license is active			

Now the license is active.

# 7. External panoramic camera



The instrument can process video obtained through the Insta360 X4 camera. This will allow coloring the cloud with spherical images (if one prefers to use this camera over the internal ones) and will allow obtaining 360-degree spherical images that can be measured using GOpost software.

The panoramic camera holder should be mounted on the back of the scanner, aligning it with the hole in the back. Once mounted, you can mount the camera on top of the holder by securing it with the appropriate screw **Important**: The camera should be mounted with the video screen in the same direction as the USB ports.

Once mounted, the camera should be controlled via the insta 360 application that can be downloaded from the camera website.

Set the camera's video recording as:

- Resolution: 5.7K
- Frame: 30 fps

At this point you can start operating the panoramic camera.

Turn on the scanner, and then turn on the camera. At this point connect the tablet to the scanner. The camera can also be used without the supporting application.

Start the video capture, and then start the scanner to scan.

After the initialization minute, before starting with the scan, make movements from right to left by rotating the scanner and the camera (3 times). This is for the post-processing calibration of the camera.

When the scan is finished, stop the scanner and then stop the camera.

At this point download the camera data to the computer.

Refer to Chapter 4 of the GOpost manual for processing.

# 8. Technical data

# 8.1 Bundle components

Ν	PART NAME	QUANTITY
1	Scanner	1
2	Handle battery	1
3	Scanner base bracket for GCP	1
4	Battery chargers EU/US	1
5	USB License key for GOpost	1

# 9. Appendix

# 9.1 X40<sup>GO</sup> technical features

LIDAR	
Max Range	70 m @ 80%, 40 m @ 10%
Min Range	0.1 m
Scanning Point Frequency	200.000 pts/s
Field Of View	Horizontal 360° Vertical -7~52°
Laser class	1
Wavelength	905 nm
RGB CAMERA	

Pixel	12 Mpx
Cameras FOV	210° (Diagonal)
Focal length	1.26 mm
Resolution	2704 x 2288 pixel
Sensor size	1 / 2.3 inch
Pixel size	1.55 μm

SYSTEM	
Relative accuracy	6 mm <sup>1</sup>
Control point support	Ground and wall
Operative mode	Realtime visualization with GOapp, SLAM mode
Data storage	512 GB SSD
Communication	Wi-fi, USB type-C
Post-processing	GOpost software <sup>2</sup>
ELECTRICAL SPECIFICATION	
Power consumption	18 W
System supply voltage	20 V

Operating time	1.7 h (single battery)
Battery input voltage	5-20 V
Battery output voltage	10.8 V
Battery capacity	3000 mAh
PHYSICAL SPECIFICATION	
Weight	650 g (Without battery) 1160 g (With battery)
Size	283.8 mm x 173.8 mm x 170 mm
Operating temperature	
	-20°C to +50°C (-4°F to 122°F)
Operating humidity	-20°C to +50°C (-4°F to 122°F) <95%

<sup>1</sup> environment dependent

<sup>2</sup>Any CPU, any NVIDIA GPU



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