

STONEX X300

User Manual

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STONEX® Srl | Via Cimabue 39 | 20851 - Lissone (MB) | Italy
Phone +390392783008 ; +390392785575 | Fax +390392789576 |

www.stonexpositioning.com



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Company Info

STONEX S.R.L.
Via Cimabue, 39 - 20851 Lissone (MB) Italy
Phone: +390392783008
Fax: +390392789576
Email: info@stonex.it
Website: www.stonexpositioning.com

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Release Notice

This is the February 2016 release of the STONEX® X300 User Guide.
The following limited warranties give you specific legal rights. You may have others, which vary from state/jurisdiction to state/jurisdiction.

Standard Limited Warranty

General Warranty for Instruments

The terms and conditions of this Limited Warranty constitute the complete and exclusive warranty agreement between The Customer or Dealer and STONEX® for the Product and it supersedes any prior agreement or representation made in any STONEX® sales document or advice that may be provided to Customer by any STONEX® representative in connection with Customer's purchase of the Product. No change to the conditions of this Limited Warranty is valid unless it is made in written form and signed by an authorized STONEX® supervisor.

STONEX® warrants that its Products based on Laser Scanning technology:

- (1) are free from defects in materials or workmanship for generally 1 year except for accessories or specific parts for which different limited warranty period shall apply.
- (2) have been tested/calibrated in proper working status prior to shipment.

The warranty period starts from date of first sale of the instruments. At its sole discretion, under the warranty period, STONEX® will repair the product or send parts for replacement at its expense. STONEX® agree to repair or replace the defected instrument within thirty (30) days, only if STONEX® recognizes that the defects of the instrument are not caused by human factors or no obvious damage to its surface is visible. STONEX® warrants any new replaced parts or

products are warranted to be free from defects in materials and workmanship for thirty (30) days or for the remainder of the Limited Warranty Period of the Product in which they are installed, whichever is longer. Faulty Parts or Products replaced under this Limited Warranty shall become property of STONEX®.

All products that have to be repaired have to be returned to our technical representative office location via any delivery company the customer prefers.

NOTE: STONEX® is not accountable for the unlikely event that the Products get lost in transit. Any damage inflicted by the customer or by third party after the products have been delivered to the customer is excluded from the limited warranty as well any damage arising from an improper use, from any action or use not provided for in the enclosed user guides and/or manuals.

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.

Return policy Dead On Arrival instruments

All returned products have to 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 has to 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 to place 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.

Firmware/Software warranty

Stonex doesn't warrant that operation of Firmware/Software on any instruments will be uninterrupted or error-free, 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 instruments specification.

Over Warranty repair(s) policy

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

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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.

One (1) year on STONEX® Products:

Laser Scanner X300: 1 YEAR OF WARRANTY, excluding battery supply accessories (6 months).

Repair/Service procedure for Dealers

1. S/N of the instrument and a detailed description of the defect (sometimes pictures or video) will be required to indicate the cause and problem.
2. If dealer wants to repair an instrument under warranty period on their site:
 - 2.1 If dealers don't have the part in stock they have to send an official order to STONEX® and pay for it and then so STONEX® will send the new part to them so they can repair the instrument.
 - 2.2 When the repair is over, the dealer has to fill the "Spare Part Refund" module and send it to the dedicated mail address.
 - 2.3 Must wait for STONEX®'s authorization SPR.
 - 2.4 When dealer receives the SPR authorization number they can send back to STONEX® appointed office the broken part with attached the SPR module.
 - 2.5 When STONEX® receives the broken part, STONEX® shall verify it and if everything

is ok the cost of the part shall be refund (refund will be done only after check of the failure part and final approval of STONEX®).

3. If the instrument needs to be sent back to STONEX® for repair/replacement, dealers/customers have to send to STONEX® a “Returned Merchandise Authorization (RMA)” before they send back the fault instrument. STONEX® shall, at its sole discretion, decide on the place of performance for work under warranty.

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.

Chapter 1: Introduction

1.1 General

STONEX® is the manufacturer of the 3D Laser Scanning System STONEX X300. Laser scanning is an automatic process during which real objects are surveyed and sampled almost completely to determine their location, size, orientation and form. The STONEX X300 rapidly determines high-resolution measurement results within very short time and within a field of view of max. 360° horizontal and 90° vertical (-25° to +65°).

1.2 Bundled components

Bundled components

- STONEX X300 Laser Scanner
- 2x Battery
- Battery charger
- Tribrach
- Transport case

1.3 Description of the system



Figure 1: X300 Front-Right side

1. Transport handle
2. GPS mount (standard 5/8" fitting)
3. Laser window
4. Camera window (Camera UP and Camera DOWN)

Figure 2: X300 Rear side



5. Power button
6. Led control bar
7. USB port
8. Smart port: Ethernet and external power supply
9. GPS port
10. Battery handle
11. Battery pack

1.4 Operational specifications

X300 supports four scan modes at different resolution (point grid). Scan time varies according to the scan mode.

Resolution	H. res. (360°)	V. res. (90°)	Total points	H. step (°)	V. step (°)	Time x 360° *	Columns/sec.
Fine	16000	4000	64000000	1.350	1.350	53m 20s	5
Standard ¹	8000	2000	16000000	2.700	1.350	26m 40s	5
Fast	4000	1000	4000000	5.400	5.400	3m 20s	20
Preview	2000	500	1000000	10.800	10.800	50s	40

Table 1: Scanner resolution (*: referred to scan time only, excluding warmup, initialization, positioning, photo capture)

Grid step (cm) Distance (m)	H. step 10	V. step 10	H. step 30	V. step 30	H. step 50	V. step 50	H. step 100	V. step 100	H. step 200	V. step 200
Fine ²	0.3927		1.1781		1.9635		3.9270		7.8540	
Standard ³	0.7854	0.3927	2.3562	1.1781	3.9270	1.9635	7.8540	3.9270	15.7080	7.8540
Fast	21.5708		4.7124		7.8540		15.7080		31.4159	
Preview	3.1416		9.4248		15.7080		31.4159		62.8319	

Table 2: Distance reference

¹ The compression rate to generate the 2D view is 2000 points per column.

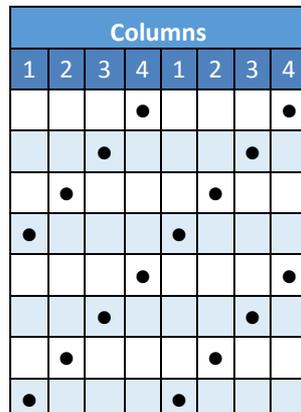
² Fine and Standard scan modes share the same vertical spacing (distance between lines).

The spatial difference between the two modes lies in the speed of the scanner rotation (step angle) and consequently in the number of points per scan line.

³ When using Standard scan mode, the acquired points are not resulting in a square grid.

The scan pattern is made by four columns of 1000 points each, as described in the following scheme.

The scanner rotation is the cause of the horizontal distribution of the points. As consequence, the vertical step is out of phase and the grid is not square.



1.5 Precautions for Safety

◆ Don't collimate the sun directly

Don't collimate the sun directly for protecting instrument.

◆ Avoiding the vibrations on the instrument

When transporting, keep the instrument in the case and try your best to lighten vibrations.

◆ Carrying the instrument

When carrying, the instrument handle must be hold tight.

◆ Check the battery power

Before using the instrument, you should check the battery power whether it is enough.

◆ Battery Maintenance

If the instrument is not in using for a long time, the battery should be taken out from the instrument and stored in separate place. Meantime, the battery should be charged every month.

◆ Taking out the battery

It is not suggested to take out the battery when the instrument is on. Otherwise, stored data may be lost. So it is better to replace the battery after powering off the instrument.

◆ Setting up the instrument on the tripod

When using it, please ensure the connection between tripod and instrument is firm.

◆ Assembling the tribrach on the instrument

The setting of tribrach would influence the accuracy. The tribrach should be check frequently, the screw which connects the tribrach must be locked tightly and the central fixing screw should be tight.

◆ 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.

◆ 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.

◆ The 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.

◆ Stored data responsibility

STONEX® should not be held liable for the lost data because of wrong operation.

1.6 Transport and shipping

◆ Transport in the field

When transporting the equipment in the field, always make sure that you

- either carry the product in its original transport container,
- or carry the tripod with its legs splayed across your shoulder, keeping the attached product upright.

◆ Transport in a road vehicle

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

◆ Shipping

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

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. Before transportation or shipping, contact your local passenger or freight transport company.

◆ Field adjustment

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

1.7 Storage

◆ Product

Respect the temperature limits when storing the equipment, particularly in summer if the equipment is inside a vehicle. Refer to technical datasheet for information about temperature limits.

◆ Field adjustment

After long periods of storage, inspect the field adjustment parameters given in this user manual before using the product.

◆ LiPoly batteries

- Remove batteries from the product and the charger before storing.
- After storage recharge batteries before using.
- Protect batteries from damp and wetness. Wet or damp batteries must be dried before storage or use.
- A storage temperature range of -20°C to +30°C/-4°F to 86°F in a dry environment is recommended to minimize self-discharging of the batteries.

1.8 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: these may attack the polymer components.

Keep plugs clean and dry. Blow away any dirt lodged in the plugs of the connecting cables.

1.9 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.

	WARNING:	Ignoring this indication and making an operation error could possibly result in death or serious injury to the operator.
	CAUTION:	Ignoring this indication and making an operation error could possibly result in personal injury or property damage.



WARNING

- Do not perform disassembly or rebuilding. Fire, electric shock or burn could result. Only STONEX® authorized distributors can disassemble or rebuilt.
- Do not collimate the sun directly.
- Do not cover the charger. Fire could be result.
- Do not use defection power cable, socket or plug. Fire, electronic shock could result.
- Do not use wet battery or charger. Fire, electronic shock could result.
- Do not close the instrument to burning gas or liquid, and do not use the instrument in coal mine. Blast could be result.
- Do not put the battery in the fire or high temperature condition. Explosion, damage could result.
- Do not use the battery which is not specified by STONEX®. Fire, electric shock or burn could result.
- Do not use the power cable which is not specified by STONEX®. Fire could result.
- Do not short circuit of the battery. Fire could result.

- 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

- Do not touch the instrument with wet hand. Electric shock could result.
- Do not stand or seat on the carrying case, and do not turn over the carrying case arbitrarily, the instrument could be damaged.
- Be careful of the tripod tiptoe when setup or move it.
- Do not drop the instrument or the carrying case.
- Do not touch liquid leaking from the instrument or battery. Harmful chemicals could cause burn or blisters.
- Please assemble the tribrach carefully: if the tribrach is not stable, series damage could result.
- Do not drop the instrument or tripod. Series damage could result. Before use it, check the central screw is tight.
- GPS and Smart port connectors on the rear panel of the scanner are up to IP65 standard when the protective caps are well mounted, or used with cables specified by STONEX® (GPS, Ethernet and power supply connections).
The USB port is up to IP65 standard also without the rubber cap but it is mandatory to keep the connector free from dust and water before using it. It is recommended to keep the rubber cap on during the scan and to use the USB port in safe environment, in order to avoid harming the device.

1.10 Safety Standards for Laser

STONEX X300 series adopt the class of Laser Product according to IEC Standard Publication 60825-1 Amd. 2:2001. According this standard, EDM device is classified as Class 1M Laser Product.

When activate the laser pointer (red laser), class of the laser is 2.

Follow the safety instructions on the labels to ensure safe use.

CAUTION: CLASS 1M LASER RADIATION WHEN OPEN
AVOID DIRECT EYE EXPOSURE.

CAUTION: CLASS 2 LASER RADIATION WHEN OPEN
DO NOT STARE INTO THE BEAM



WARNING

- Never point the laser beam at other's eyes. It could cause serious injury.
- Never look directly into the laser beam source. It could cause permanent eye damage.
- Never stare at the laser beam. It could cause permanent eye damage.
- Never look at the laser beam through a telescope or other optical devices. It could cause permanent eye damage.

1.11 Battery Specifications

1.11.1 Components Information

Product: Lithium battery

Product Type: Lithium Polymer Battery

Energy: less than 100 W/h each cell

Nominal Voltage: 3.7 Volt

Product composition	Content (%)
Rare earths	>40
Li ₂ CO ₃ (No metal Lithium at all)	>10
Mn	>2.0
Ca	>0.1
Graphite	>2.0
Na	>0.1
C	>3.0
Fe	>3.0
PE	>3.0
Cu	>8.0
Al	>5.0
K	>1.0
F	>3.0
Sr	>1.0

Table 3: Battery specifications

1.11.2 Hazard identification

Main Hazard: flammable under high temperature

Effect of over exposure: irritation of skin, eyes and respiratory tract.

Symptoms of (over) exposure: coughing, headache, dizziness, unconsciousness.

Skin: as result of adsorbption throught the intact skin, the substance may cause dry skin redness.

Eyes: pain, redness.

Ingestion: sore throat, stomach-ache, headache, dizziness, dullness.

1.11.3 Fire fighting measures

Suitable: dry chemical, powder, CO₂ foam, sand, water (only large amount).

Hazardous thermal decomposition and combustion products: put on adequate protective equipment. Do not breath vapour.

Protective equipment: wear full protective clothing and self-contained breathing apparatus.

1.11.4 Accidental release measures

Personal precautions: put on adequate protective equipment. Do not breath vapour.

Environmental precautions: keep away from drains, surface water, ground-water and soil.

Clean procedures: collect as much as possible using clean container for disposal.

Disposal according local regulations.

1.11.5 Temperature range

Mode	Continuous	Occasional
In storage	+30°C max	-30/+80°C
During discharge	-30/+80°C	-30/+80°C
During charge	0/+75°C	0/+75°C

Table 4. Battery temperature range

1.11.6 Stability and reactivity

Conditions to avoid: heat above +80°C or incinerate, deform, mutilate, crush, pierce, disassemble.

Short circuit. Prolonged exposure to humid conditions.

Materials to avoid: N/A

Hazardous decomposition products: corrosive/irritant Hydrogen fluoride (HF) is produced in case of reaction of lithium hexafluorophosphate (LiPF₆) with water. Combustible vapors and formation of Hydrogen fluoride (HF) and phosphorous oxides during fire.

1.11.7 Toxicological information

STONEX® Lithium-Ion rechargeable batteries do not contain toxic materials.

1.11.8 Ecological information

When properly used or disposed, STONEX® Lithium-Ion rechargeable batteries can be recycled and do not present environmental hazard during their life time.

1.11.9 Disposal considerations

Dispose in accordance with applicable regulations, which vary from country to country.

Lithium-Ion batteries should have their terminals insulated and be preferably wrapped in individual plastic bags prior to disposal.

Incineration: incineration should never be performed by battery users but eventually by trained professionals in authorized facilities with proper gas and fumes treatment.

Recycling: send to authorized recycling facilities.

1.11.10 Handling and Storage

Use the battery properly according to the product specification, do not disassemble or short circuit the battery.

Store away from sources of heat or ignition: over high temperature will make the cell inflate melt the separator, causing short circuit.

The storage area should be cool, dry, well ventilated, out of direct sunlight, away from metal or sharp edge, such as keys pins or wires.

1.12 About User

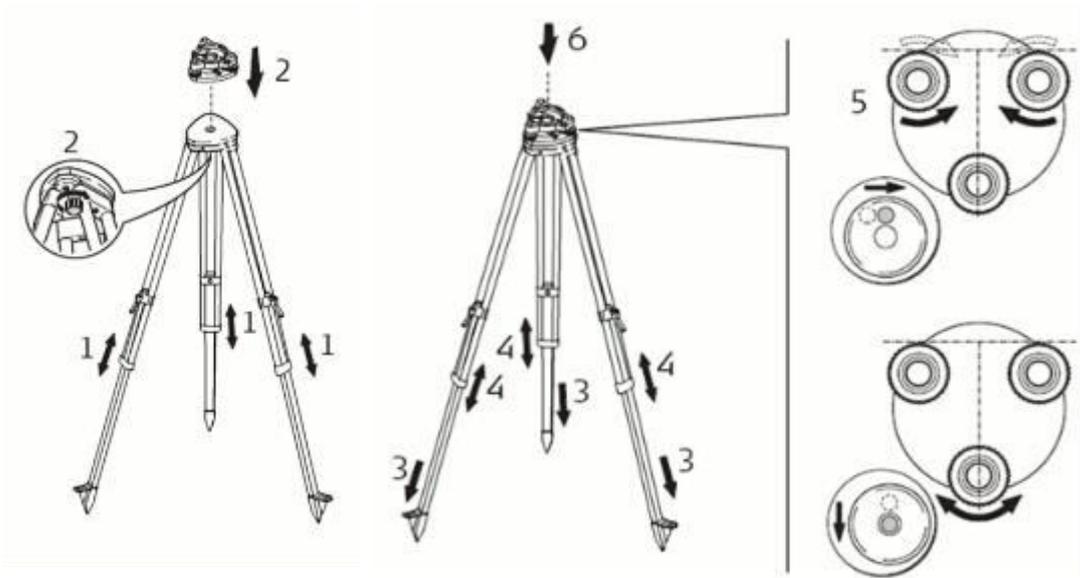
1. This product is for professional use only!
The user is required to be a qualified surveyor or have a good knowledge of surveying, in order to understand the user manual and safety instructions, before operating, inspecting or adjusting.
2. Wear required protectors (safety shoes, helmet, etc.) when operating.

1.13 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.

Chapter 2: Setting up the STONEX X300

2.1 Setting up



1. Extend the tripod legs to the same length to allow for a comfortable working posture. Tighten the screws at the bottom of the legs.
Fold the handles down to detain the length of the legs.
2. Place the tribrach on the tripod and secure it with the central fixing screw.
3. Drive the tripod's legs firmly into the ground.
4. Set up the tripod so that its plate is as horizontal as possible.
5. Level the tribrach using the circular level.
Turn two of the leveling screws simultaneously in opposite directions.
The index finger of your right hand indicates the direction in which the bubble should move. Now use the third leveling screw to center the bubble.
6. Place the instrument on the tribrach and secure it with the tribrach's locking knob.
7. Make sure that the instrument is leveled by checking the built-in bubble level.

2.2 Insert/remove the battery

There are different power supplies available for the STONEX X300:

1. X300 battery pack (for wireless operation, included in the bundle)
2. X300 external power unit (thanks to the optional X300 Smartcable)

Figure 3 represents the X300 battery pack: for proper mounting, the connectors must be facing up and the handle must be on the outer side.

Figure 4 represents the X300 battery housing, placed in the rear side of the scanner.



Figure 3: X300 battery pack



Figure 4: X300 battery housing

2.2.1 Plug the X300 Battery

To plug the battery pack, follow the instructions described in Figure 5 and Figure 6.



Figure 5: Plug the battery pack



Figure 6: Plug the battery pack

1. Insert the lower edge of the battery into the housing, placing it on the pushing supports.
2. Use the handle to press down the battery until stroke end.
3. Tilt the battery in vertical position.
4. Release the battery upward until it is firmly seated.

2.2.2 Remove the X300 Battery

To remove the battery, follow the instructions described in *Figure 7* and *Figure 8*.

1. Use the handle to press down the battery until stroke end.
2. Tilt the battery outward until the upper edge is out of the housing.
3. Lift out the battery from the pushing supports.



Figure 7: Unplug the battery pack



Figure 8: Unplug the battery pack

2.3 Charge the battery

The X300 battery can be charged directly using the appropriate battery charger, included in the bundle (*Figure 10*).



Figure 9: Battery power plug



Figure 10: Battery charger

2.3.1 Features

Model: Li-ion battery charger
Input: AC 100 ~ 240 V 50/60 Hz
Output: 12.6 V / 3 A

2.3.2 Battery Charge

1. Connect the AC cable to the power pack as described in *Figure 11*.
2. Plug the power connector to the battery as described in *Figure 12*.
3. Connect the external power unit to the power source.



Figure 11: Power pack



Figure 12: Plug the power connector

During the charge, the status light on the power pack will inform you about the charge progress (*Figure 13*).

The charging time for a completely discharged battery is about 3 hours.



Figure 13: Charge status light

Red solid light: the charge is in progress. Do not disconnect the battery.

Green solid light: the charge is complete. Disconenct the battery from the power source.

Chapter 3: Operating the STONEX X300

3.1 Power on the scanner

The following workflow describes the operations performed during the power on process. To power on the X300 simply press the power button on the top of the instrument. There's no need to press and hold the button: just push and release it.

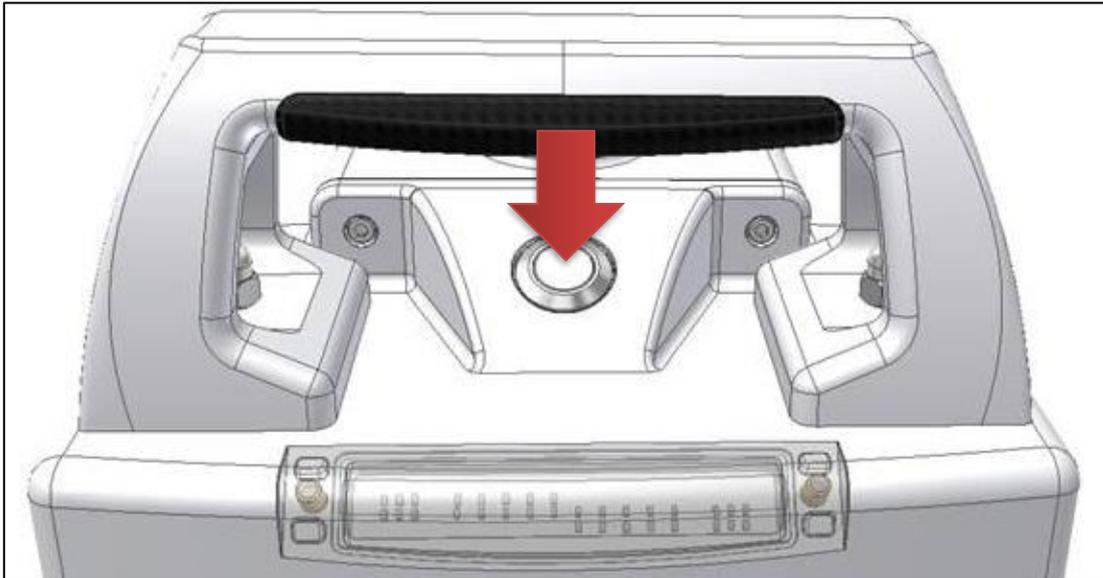


Figure 14: power button

- After a moment, all LEDs will turn on for a moment and a single beep is played. Now the instrument is on.
- The LEDs start to blink: this means that the X300 is doing the initialization procedures.
- Two short beeps are emitted to signal that the system controller has done its work and the microcontroller has started.
- After a while, the Green and Yellow LEDs stay on. The microcontroller is initializing all the devices.
- If the devices initialization is ok:
 - Yellow LED turns off and Green LED stays on
 - Three short beeps are emitted
- If the device initialization is not ok:
 - Yellow and Green LEDs turn off, Red LED blinks
 - One long beep is emitted
 - After a while, the microcontroller tries to initialize again

If the system is not able to initialize correctly, it continues to retry until the system is powered off.

3.2 Power off the scanner

There are two ways to power off the X300 laser scanner.

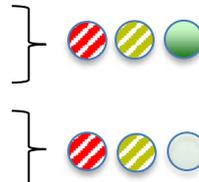
3.2.1 Standard power off

3.2.1.1 Up to firmware version 0.4.100

1. Push and hold the power button
2. After a while a beep will be emitted, continue to press the button
3. A second beep will be emitted, continue to press the button
4. After a while, a series of beeps will be emitted. If you release the button during this phase, a Standard shutdown will occur:
 - A short beep is emitted
 - A long beep is emitted
 - The system is powered off

3.2.1.2 Firmware version later than 0.4.100

1. Push and hold the power button
2. After a while a beep will be emitted, continue to press the button
3. A second beep will be emitted, continue to press the button
4. After a while, a series of beeps will be emitted. If you release the button during this phase, a Standard shutdown will occur:
 - A short beep is emitted
 - A long beep is emitted
 - **STATUS LEDs:**
 - GREEN** → solid on
 - YELLOW** and **RED** → blinking
 - **GPS LEDs:**
 - GREEN** → off
 - YELLOW** and **RED** → blinking
 - The progress bar displays a count-down (from right to left)
 - The system is powered off



3.2.2 Forced power off

If the system does not shut down using the Standard power off procedure, you can try to force the shut down:

1. Follow the steps for the Standard power off (par. 3.2.1.1) but do not release the button after the step 4.
2. Another beep will be emitted
3. Immediately after the beep, an endless series of very short beeps will be emitted. Release the button now: the system will be forcibly powered off.

WARNING! – Under normal circumstances, always use the Standard power off procedure. All data will be lost if the scanner is forced to power off during scanning or saving process.

3.3 Led indicators

There are 14 LED indicators placed on the top of the instrument.

- Three LEDs on the left margin are dedicated to the X300 status. They are in different colors. Starting from the left: **Red**, **Yellow**, **Green**
- Ten **Blue** LEDs in the middle are used to display the progress of long operations (such as scan and saving)
- Three LEDs on the right margin are dedicated to display the GPS status, if connected. Starting from the left: **Green**, **Yellow**, **Red**

Each LED can assume three different states:

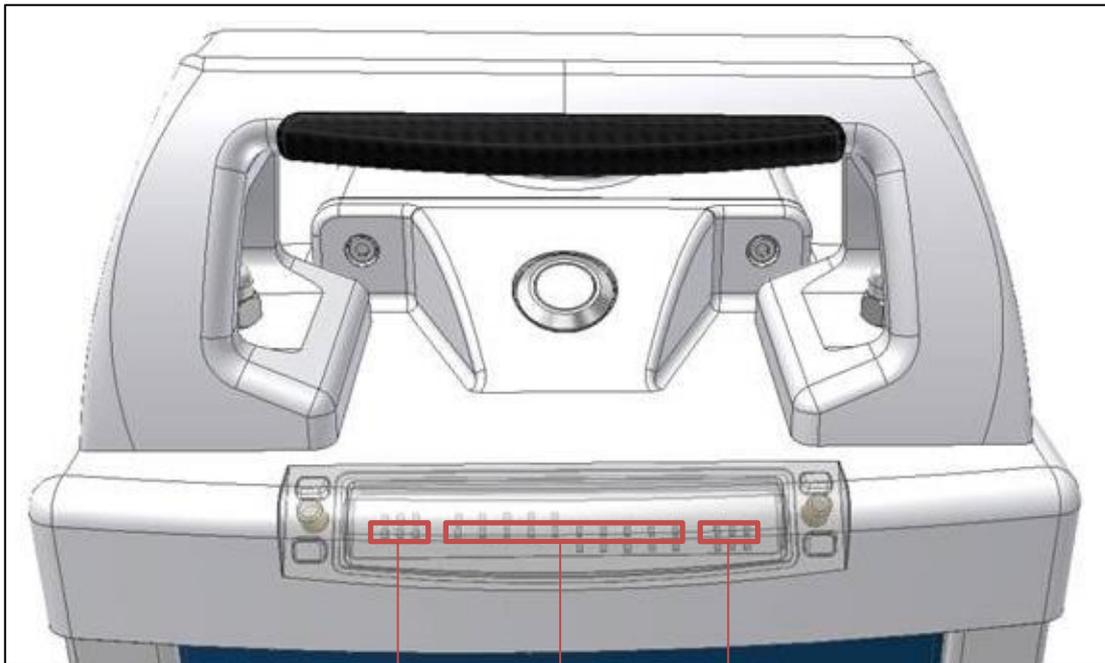


Figure 25: Led indicators

Status

Progress

GPS

- Off
- ◐ Blinking
- Solid light

3.3.1 Status LEDs

LEDs status	Description
	X300 is powered off
	The system is initializing. This state appears few seconds after power on
	The system is ready and waiting for user input
	System error. Use the controller to check the failure on Status section.
	Scan initialization
	X300 is busy working on something (performing a scan, for example)
	X300 is storing data
	Scan successfully completed
	A new system controller firmware is uploading
	An indeterminate state. Something gone wrong
	Low battery. Please change the battery before continuing to work
	Internal temperature is above warning threshold

Table 5: Status LEDs

-  Off
-  Blinking
-  Solid light

3.3.2 GPS LEDs

Starting from firmware v. 0.5.48, external GNSS receivers can be connected to the X300 using the GPS port of the scanner (see par. 1.3).

When a supported and configured receiver is connected to the X300 with **X300 GPS kit**⁴ accessory, the scanner is able to track the position of the receiver.

The GPS coordinates are automatically stored in the scanner raw data and will be used by Stonex Reconstructor software to geolocalize the scanner position.

The default coordinate reference system is: **WGS84/UTM**.

The following table describes the status of the GPS LEDs.

LEDs status	Description
	X300 is powered off or no GPS data available
	The system is initializing This state appears few seconds after power on
	Some GPS related error. Use the GPS controller to check the failure
	GPS data incoming but do not contains valid point information
	GPS data incoming. Point quality is Autonomous
	GPS data incoming. Point quality is Float
	GPS data incoming. Point quality is DGPS
	GPS data incoming. Point quality is RTK

Table 6: GPS LEDs

-  Off
-  Blinking
-  Solid light

⁴ Click [here](#) for further information about the “X300 GPS kit” or visit the Stonex website: www.stonexpositioning.com

3.3.2.1 Stonex GPS kit

Stonex GPS kit is designed and tested to comply with the Stonex GNSS receivers' family. The supported Stonex GNSS receivers are listed hereunder:

- S9 III
- S9 III N
- S9 III Plus
- S9 III N Plus
- S8
- S8 N
- S8 Plus
- S8 N Plus
- S10
- S10 N



Stonex GNSS receivers has to be configured as follow:

- Enable the output of NMEA GGA (\$GPGGA) sentence at 1Hz data rate through the integrated 7-pin Lemo serial port.
Refer to the receiver user guide and documentation to learn more about configuration and settings.
- Enable the RTK (Real Time Kinematic) corrections via Ntrip service or UHF radio.
Refer to the receiver user guide and documentation to learn more about configuration and settings.

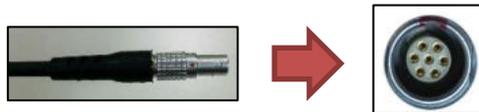
NOTE – It is mandatory to set the GNSS receiver in differential mode, so as to receive RTK corrections via Ntrip service or UHF radio.

The coordinates are stored only when the GPS receiver gets a fix quality equal to “RTK”.

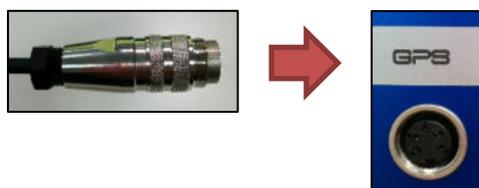
Connect the GPS kit as follow:

1. Mount the configured GNSS receiver on the leveled X300 laser scanner using the two section pole with universal standard 5/8” fitting, then connect it using the GPS kit serial cable:

- The cable end with the 7-pin connector goes to the GNSS receiver (bottom plate);



- The cable end with the 5-pin circular connector goes to the GPS port of the X300 laser scanner (see par. 1.3);



2. Turn on the GNSS receiver and wait until the end of the initialization time.
Check the front panel to identify the status of the receiver, the working mode and the GSM, UHF or external datalink mode.
Refer to the receiver user guide and documentation to learn more about configuration and settings.
3. Turn on the X300 laser scanner, wait for the initialization and check the satellites and the status by looking at the GPS led section on the right margin of the X300 LED bar (see par. 3.3 and par. 3.3.2).
4. Set up X300 Laser Scanner and operate it as described in the present user guide (see par. 3.4).

3.3.2.2 Compatibility with third-party GNSS receivers

This section covers the technical specifications to establish a connection between third-party GNSS receivers and Stonex X300 Laser Scanner.

STONEX® should not be held liable for the proper operation of the equipment or possible damages that may occur when connecting the X300 laser scanner with GNSS receivers other than Stonex.

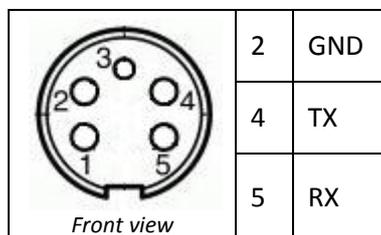
Technical requisites:

- The GNSS receiver must be configured to output NMEA GGA (\$GPGGA) sentence at 1Hz data rate through a physical serial port.
- The GNSS receiver must be able to receive and apply RTK (Real Time Kinematic) corrections via Ntrip service or UHF radio.
- Perform the connection between the configured GNSS receiver and the X300 laser scanner GPS port (see par. 1.3) using a compatible serial cable (not provided by STONEX®).

The pinout configuration of the X300 GPS port is described in the following diagram:

Amphenol Circular Connector C 091 D Female

No. of contacts: 5



NOTE – It is mandatory to set the GNSS receiver in differential mode, so as to receive RTK corrections via Ntrip service or UHF radio.

The coordinates are stored only when the GPS receiver gets a fix quality equal to “RTK”.

3.3.3 Battery level alert

The battery level is continuously monitored.

The critical threshold is below 20% and the alarm is visible on the **RED** Status LED: 

- **At 20%** : LED is on, with 1 second off every 8 seconds
- **At 15%** : LED is on, with 1 second off every 2 seconds
- **At 10%** : LED is solid on

A buzzer is also present:

- **At 15%** : one short beep every 16 seconds
- **At 10%** : one short beep every 4 seconds
- **At 5%** : prolonged beep every 4 seconds

3.3.4 Internal temperature alert

Temperature is continuously monitored.

The alarm is visible on the **YELLOW** Status LED: 

- **Temp < -15° or > +75°**: LED is on, with 1 second off every 8 seconds
- **Temp < -20° or > +80°**: LED is on, with 1 second off every 2 seconds
- **Temp < -25° or > +85°**: LED is solid on

A buzzer is also present. In case of double alarm (critical temperature and low battery) the priority is given to temperature:

- **Temp < -20° or > +80°**: short beep every 16 seconds
- **Temp < -25° or > +85°**: short beep every 4 seconds
- **Temp < -30° or > +90°**: prolonged beep every 4 seconds

3.3.5 GPS offsets

The following diagram shows the position of the origin point of the measures and the relative offsets to the GPS mount.

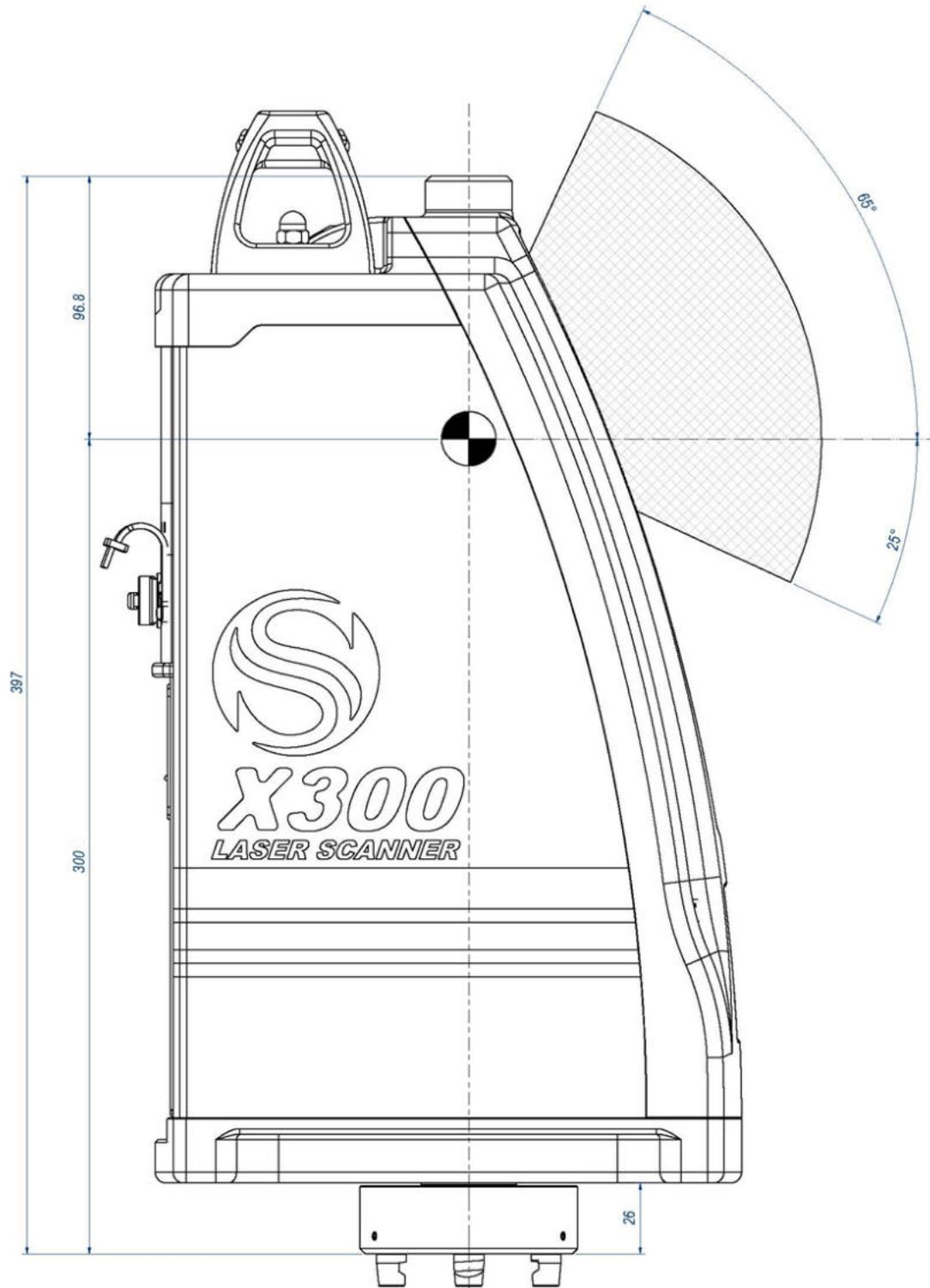


Figure 16: GPS offsets

3.3.6 X300 Framework offsets (optional accessory)

X300 Framework is compatible only with X300 laser scanners of the “PS4” serie.
Control the scanner S/N to check the serie number.

Example: X300**PS4**XXXXX

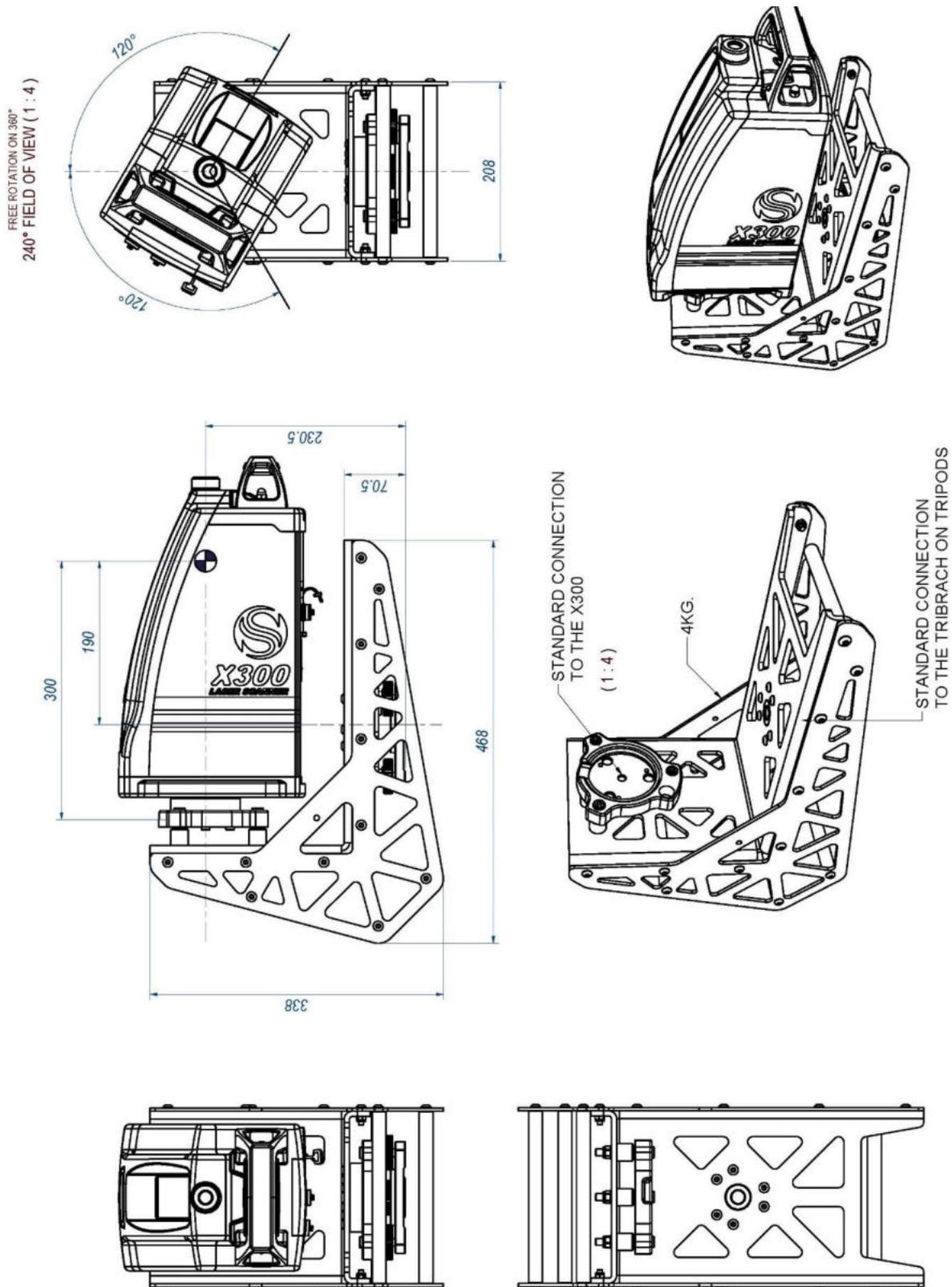


Figure 17: X300 Framework offsets

3.4 Use of the onboard software

To operate the Stonex X300 Laser Scanner, all you need is a control device equipped with a Wi-Fi hardware and a web browser, whether it is a pc, a tablet or a smartphone. You do not even need to install any drivers or softwares, since the web interface server is built into the scanner.

3.4.1 Tested OS and web browsers

The X300 web interface is based on HTML 5 markup language and it is compatible with most of the latest browsers on the market.

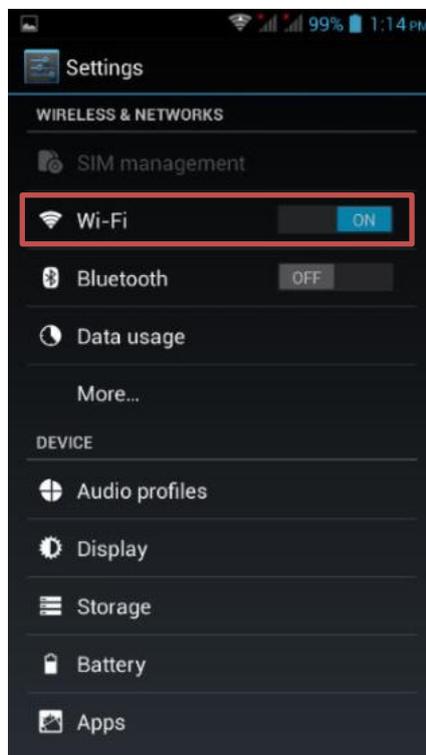
The table 6 reports the operating systems and web browsers that have been successfully tested with X300 web interface. Please, avoid to use Explorer web browser.

Tested OS	Tested browser
Windows XP/7/ 8/8.1/10	Chrome, Firefox, Opera
OS X	Safari, Chrome, Firefox
Android v.4.1.2 and later	Chrome (mandatory browser)
iOS	Safari

Table 7: Tested OS and browsers

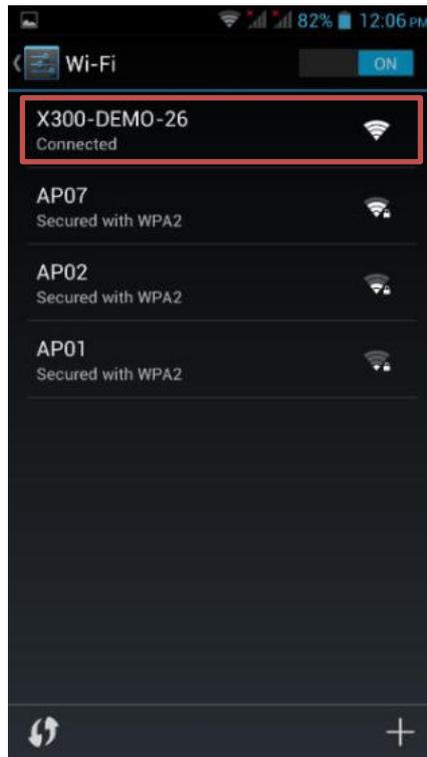
3.4.2 Connect to X300

1. Enable the Wi-Fi on your handset/smartphone/tablet/computer

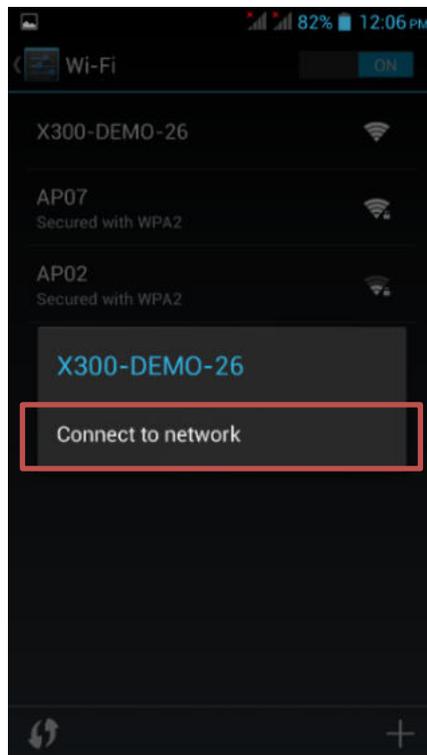


2. Search for the X300 wireless network using the OS connection manager: the X300 is

identified by its serial number (e.g: X300-DEMO-26)

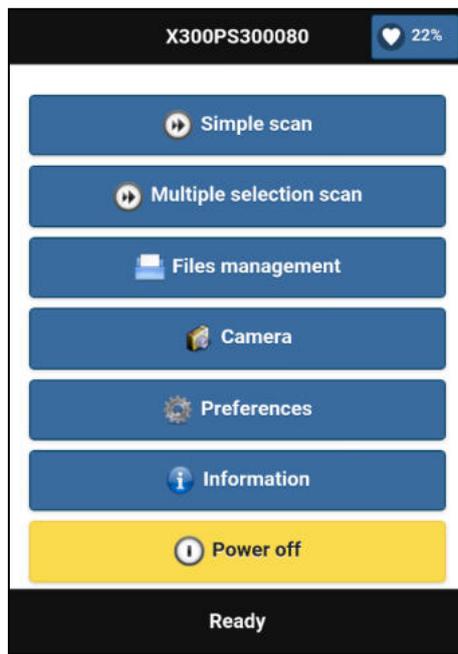


3. Connect to the X300 network.
It is an open connection, no passkey is required.



4. Open the web browser: the X300 main page will appear.

If not, refresh the page or enter the following IP address: **192.168.1.11**



5. The access to the main page is protected by User ID and Password.

Default settings:

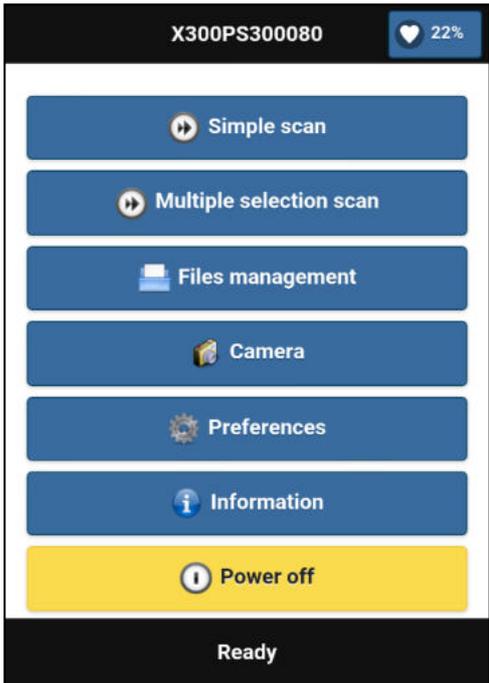
- **User ID:** x300 or X300 (no case sensitive)
- **Password:** 1234

Users can later chose whether to change user ID and password or remove the protection. (see par. 3.5.8.2).

3.5 Web interface

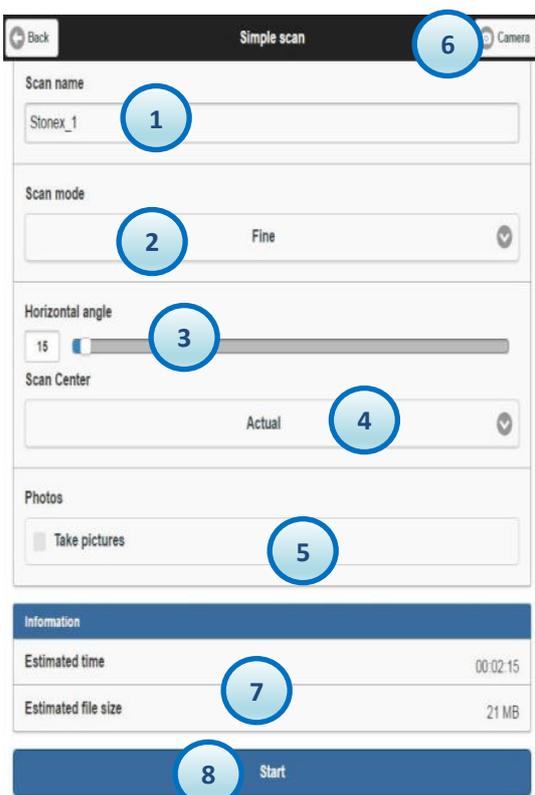
3.5.1 Home page

The *Homepage* is the main menu of the X300 web interface. From here users can access to all the X300 functions and settings.

Homepage	Functions
	<p>Simple scan Enter the single scan procedure</p> <p>Multiple scan Enter the multiple scan procedure</p> <p>Files management Browse and manage stored data</p> <p>Camera Enter the camera settings menu and preview thumbnail</p> <p>Preferences Enter X300 preferences:</p> <ul style="list-style-type: none">▪ Language: change interface language▪ Security: allows to enable/disable the network protection▪ Calibration settings▪ Home position management▪ Enable/disable the red tracking line▪ Upgrade X300 firmware <p>Information Device and software details</p> <p>Power off Close all the running processes and turn off the scanner.</p> <p>Battery percentage It's shown in all screens</p>

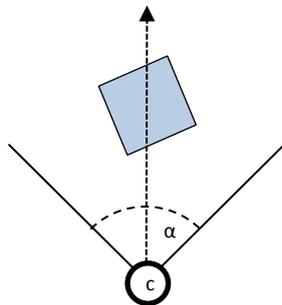
3.5.2 Simple scan

The Simple scan menu provides access to the scan control panel. Here it is possible to define scanning parameters and options.

Simple Scan	Functions
 <p>The screenshot shows the 'Simple scan' control panel. It includes a 'Scan name' field (1) with 'Stonex_1' entered, a 'Scan mode' dropdown (2) set to 'Fine', a 'Horizontal angle' slider (3) set to 15 degrees, a 'Scan Center' dropdown (4) set to 'Actual', a 'Take pictures' checkbox (5) which is disabled, an 'Information' section (7) showing 'Estimated time' as 00:02:15 and 'Estimated file size' as 21 MB, and a 'Start' button (8) at the bottom.</p>	<ol style="list-style-type: none">1. Scan name Enter the name of the new scan that you want to start.2. Scan mode Select the scan resolution from the drop-down list (par. 1.4).3. Horizontal angle Set the angle for the horizontal rotation of the scanner (unit: °deg).4. Starting Position of Scan Set the starting position of Laser X300 (Index or Actual Position)5. Photos Enable/Disable the photos capture using the X300 internal cameras. When the control is enabled, the X300 automatically takes the pictures after scanning. The two synchronized onboard cameras allow to cover the vertical angle of the scan. The number of the pictures varies according to the the width of the horizontal angle.6. Camera Enter the Camera menu (see par. 3.5.7).7. Information It displays scan estimated time and file size information depending on the settings (photos included).8. Start Press the Start button to start scanning, according to the given settings.

Tip!

The center (c) of the scan area is placed along the bisector of the horizontal angle (α):



Turn the laser window toward the center of the scene and set the scan angle in order to embrace the whole scene or just a portion. Alternatively you can set a new index.

Renaming the new scan, if the scan file already exist in the Files management archive or the file name is invalid, the scan name will be colored in red and a message with a suggested name will appear in a yellow box.

Click on it to accept the suggestion.

If advised name is not accepted and the invalid or existing one is not modified, clicking on Start button, a system message will appear, asking for continuing with rename procedure:

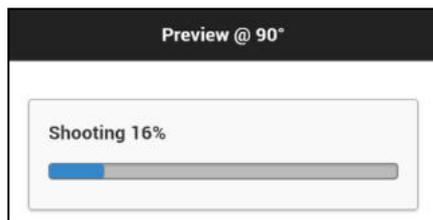
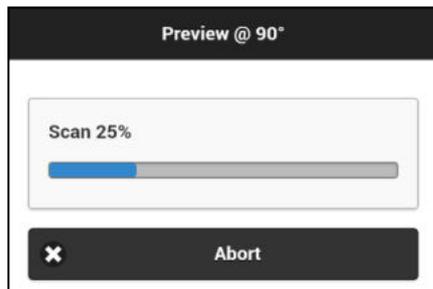
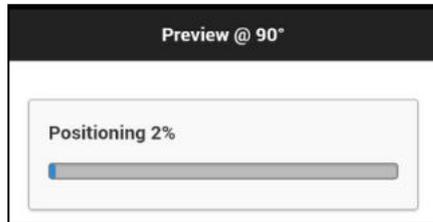
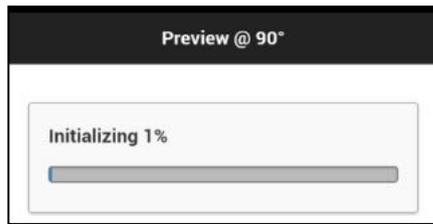
- Yes: the scan will be renamed as suggested.
- No: it return to the Simple Scan page and the user must rename the current new scan.

NOTE

Some digits, such as space or special characters, are forbidden in order to avoid system issues.

Accepted characters are:

- 0...9
- a...z
- A...Z
- *_ [underscore]*



The **scan process** go through six sequential steps.

1. Initializing

The scanner warms up and registers the scan center position.

2. Positioning

The scanner turns until reaching the start position.

3. Scan

Scanning in progress. Use either the software progress bar on the control device or the LEDs status bar on the X300 to check the progress. When the scan is finished, the X300 will return to the origin position.

4. Shooting (optional)

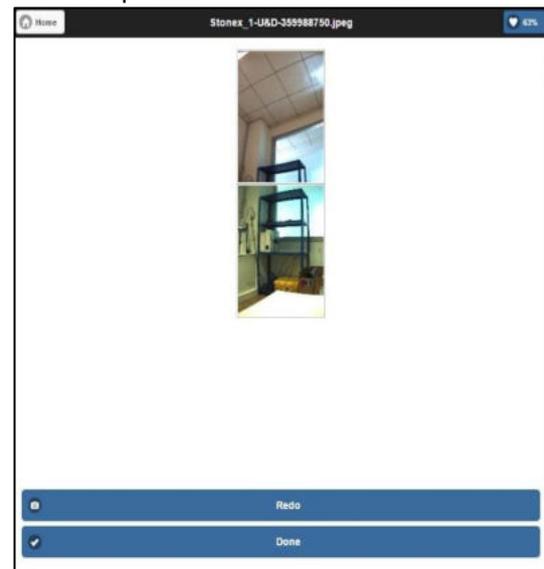
If the camera option is enabled, the photos are automatically acquired after scanning.

5. Finalizing/Saving

Data are stored in the internal solid memory. Press **Done** button to return to the Simple scan menu.

6. Checking and if necessary redo photos

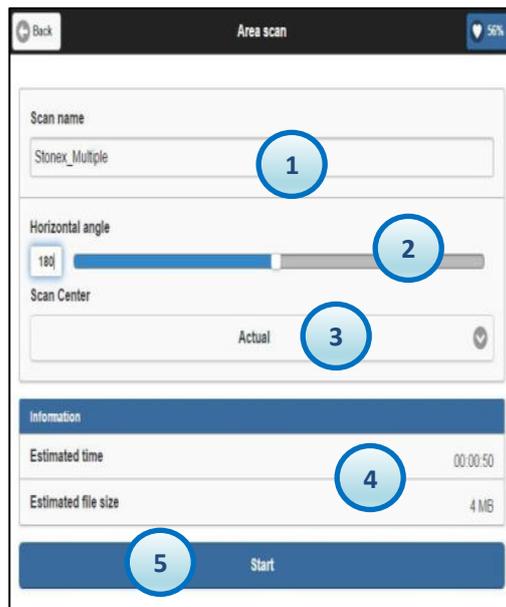
User can check each couple of photos and shot again couple that he wants to redo. Previous photos will be overwritten.



3.5.3 Multiple scan

Multiple-scan function is available from v. 08.00 of the X300 firmware (October 2015). The Multiple-scan menu allows to perform sequential sub-scans of specific areas by manually selecting rectangular frames on a main preview grid, used as reference. Each sub-scan will be saved as independent file and can be carried out using dedicated settings. Furthermore, the scans of a sub-set are mutually registered by default.

Multiple Scan Functions



NOTE

Some digits, such as space or special characters, are forbidden in order to avoid system issues.

Accepted characters are:

- 0...9
- a...z
- A...Z
- *_ [underscore]*

1. Scan name

Enter the name of the preview scan to used as reference for the sub-scans.

2. Horizontal angle

Set the angle for the horizontal rotation of the scanner (unit: °deg).

3. Starting Position of Scan

Set the starting position of Laser X300 (Index or Actual Position)

4. Information

It displays scan estimated time and file size information depending on the settings (photos included).

5. Start

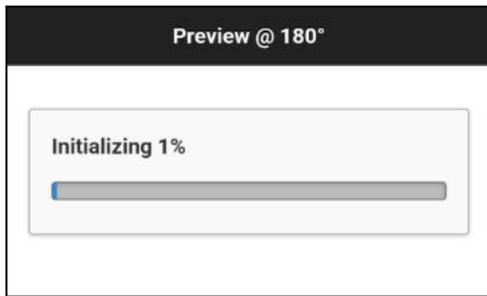
Press the **Start** button to start scanning, according to the given settings.

Renaming the new scan, if the scan file already exist in the Files management archive or the file name is invalid, the scan name will be colored in red and a message with a suggested name will appear in a yellow box.

Click on it to accept the suggestion.

If advised name is not accepted and the invalid or existing one is not modified, clicking on Start button, a system message will appear, asking for continuing with rename procedure:

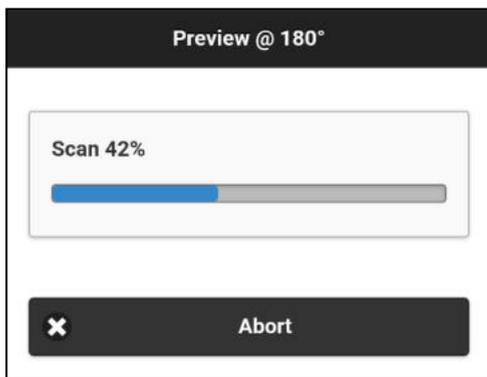
- Yes: the scan will be renamed as suggested.
- No: it return to the Simple Scan page and the user must rename the current new scan.



The **scan process** go through four or five sequential steps.

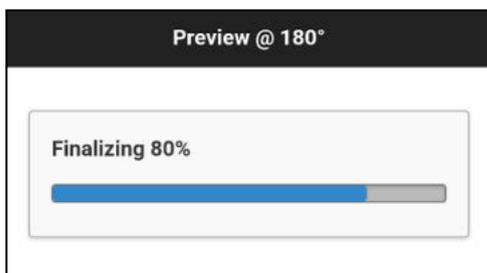
1. Initializing

The scanner warms up and registers the scan center position.



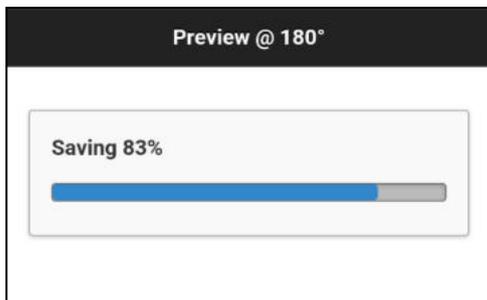
2. Positioning

The scanner turns until reaching the start position.



3. Scan

Scanning in progress. Use either the software progress bar on the control device or the LEDs status bar on the X300 to check the progress. When the scan is finished, the X300 will return to the origin position.



4. Finalizing/Saving

Data are stored in the internal solid memory.



NOTE

Repeat steps **from 5 to 7** to add other sub-scan frames



5. Sub-scan selection

Now it is possible to use the preview scan as it was a canvas: use the fingers (touchscreen) or the mouse (pc) to pinch the red dots on the corner of the scan-frame (green rectangle) and drag them along X and Y direction until the area of interest is inside the scan-frame.

If the area of interest is not visible on the screen, just slide the image to the right-left using the fingers (touchscreen) or the mouse (pc). The green scan-frame will move accordingly remaining always visible on top.

Press the  button on the sliding bar on the left to confirm the selection.

The preview will be displayed in the sub-scans panel below.

Repeat the steps described in this section to select other scan frames.

Each scan-frame is serially numbered, use the LEFT () and RIGHT () buttons to scroll through the selection.

Press the **Delete** button to erase the selected scan-frame.

6. Scan mode

Select the scan resolution from the drop-down list (par. 1.4).

The resolution will be applied to the selected scan-frame.

7. Photos

Enable/Disable the photos capture using the X300 internal cameras.

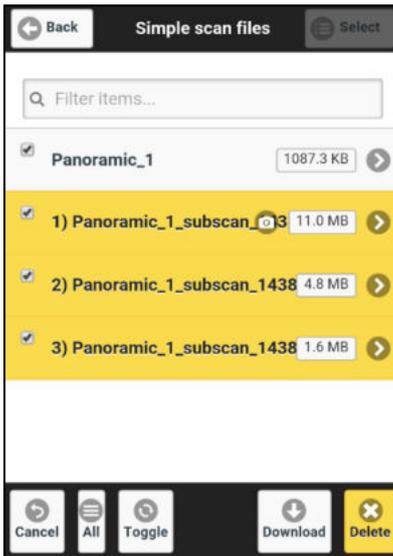
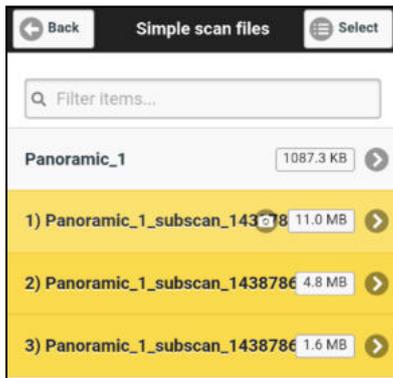
When the control is enabled, the X300 automatically takes the pictures after scanning. The two synchronized onboard cameras allow to cover the vertical angle of the scan.

The number of the pictures varies according to the the width of the horizontal angle.

8. Start

Press the **Start** button to start scanning, according to the given settings.

The process will consider each scan-frame in sequence.



At the end of each scan the X300 will return to the homing position and then move to the next scan-frame, according to the following cycle:

Scan 1/n → Home → Scan 2/n → Home → Scan 3/n → Home → → Scan n/n → Home → END SCAN

9. Checking and if necessary redo photos

User can check each couple of photos and shot again couple that he wants to redo. Previous photos will be overwritten.

10. Managing scans

The scans are available in the **Files Management** menu (par. 3.5.6), the sub-scans are numbered and grouped under the reference scan.

In the example on the left:

REFERENCE SCAN:

- Panoramic 1

SUB-SCANS:

- Panoramic_1_subscan_1438786438
- Panoramic_1_subscan_1438786504
- Panoramic_1_subscan_1438786577

To download the whole scanset (reference + sub-scans) at once, tap the **Select** button in the toolbar (top right) and then chose the reference scan: the sub-scans will be automatically selected.

To import multiple-scan point clouds in Stonex Reconstructor software, see par. 4.3.4

3.5.4 Single point measure

The single point function allows to pick up points inside the scan window and calculate the distance of the selected point from the scanner center.

The measured points can also be saved and downloaded in ASCII txt format.

It is also possible to measure the distance between two selected points within the same point cloud (par. 3.5.5).

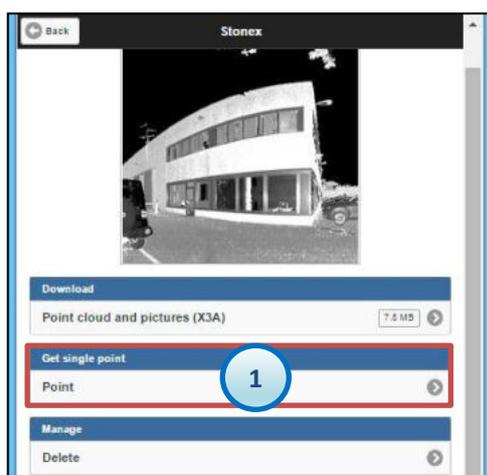
The single point measure is available for all the X300 scan modes, with the following constraints:

Scan resolution	Max H. angle
Preview	360°
Fast	90°
Standard	10°
Fine	5°

Table 7: Constraints to single point measure

If the dimension of the horizontal angle is larger than the values reported in the table above, the single point calculation cannot be carried out and a warning message is displayed.

Single point distance Functions



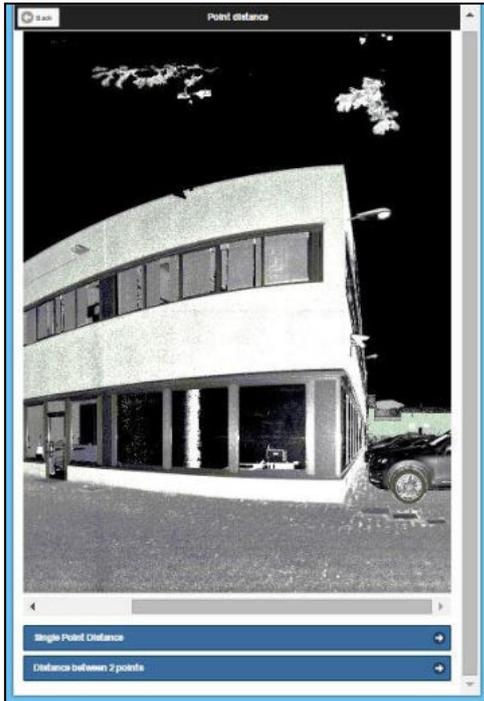
The single point measure function is available in the **Files Management** menu (par. 3.5.6) for every scan file stored in the X300 internal memory.

1. Get single point menu

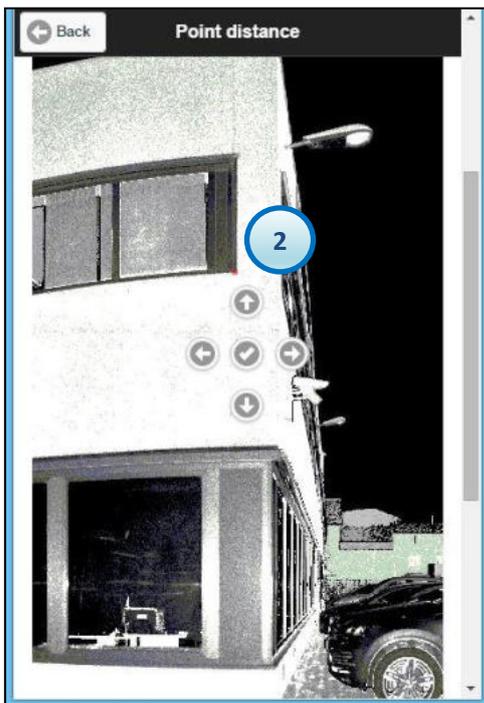
Press the **Point** button to enter the Single point measure menu.



Wait that the high quality preview of the scan is loaded and displayed.



When the high-quality preview is displayed, it is possible to slide the image from right to left and vice versa using the cursor (pc) or fingers (touchscreen)

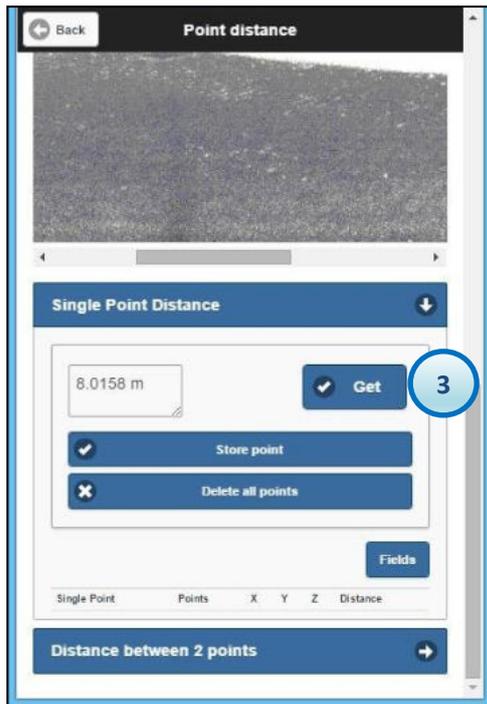


2. Select the point to measure

Select the point on the preview using the finger (touchscreen) or the mouse (pc).

The point will be marked with a **red spot** (visible in the bottom-right corner of the window).

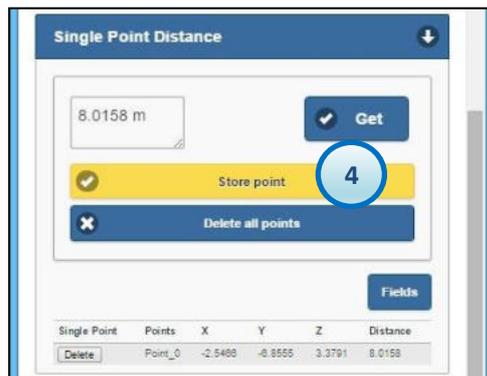
An arrow pad is visible on top of the image, allowing to increase the accuracy of the selection. Use the arrow to move the red spot along X and Y direction until the position is correct, then confirm the point using the **Confirm icon** 



3. Get the point distance

Tap on the **Single Point Distance** to scroll-down the menu and press the **Get** button to calculate the measure.

The distance measure (in meter units) is displayed in the box on the left.

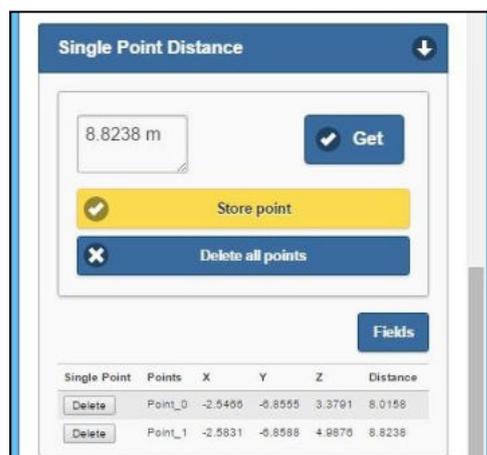


4. Save the measure

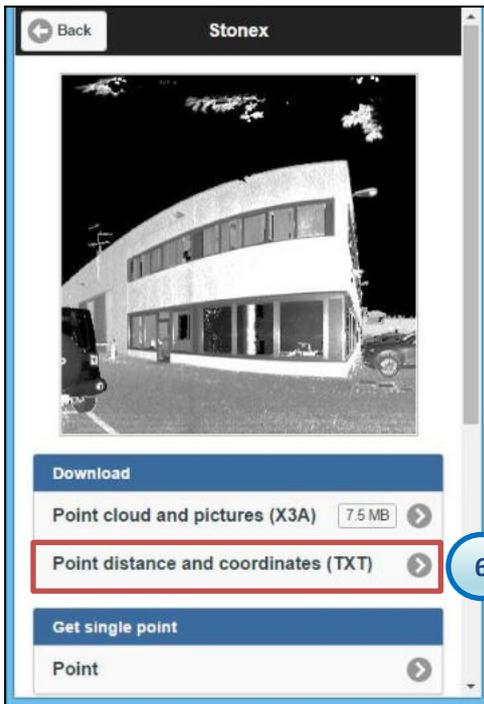
Tap the **Store point** button to save the point and add it to the point list.

The measure is stored in the X300 internal memory and it is linked to the point cloud, so that the points are reloaded and displayed each time that the scan file is opened in the **File Management** menu.

Repeat the steps **from 1 to 4** to measure other points and add them to the point list.



Press the **Delete all points** button to permanently erase all the points from the point list and from the X300 internal memory.



5. Download the points file

It is possible to download the points file in ASCII .txt format from the **File Management** menu (par. 3.5.6).

Open the scan file to which the points file is linked and press the **Point distance and coordinates (TXT)** button.

```
Stonex.txt
1 Point x y z distance
2 Point_0 -2.5466 -6.8555 3.3791 8.0158
3 Point_1 -2.5831 -6.8588 4.9876 8.8238
4
```

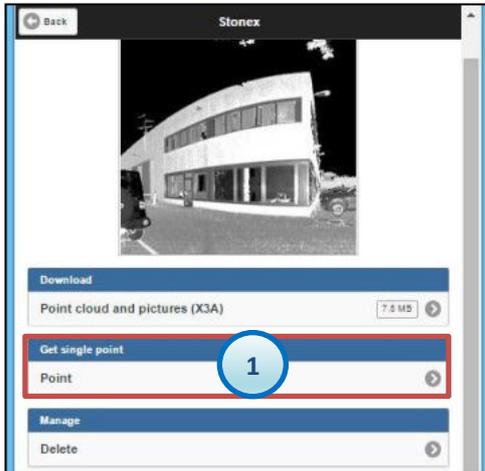
The X, Y, Z coordinates are referred to the local reference system of the scanner.

The distance is calculated between the scanner (scan origin) and the target point.

3.5.5 Measure the distance between 2 points

The procedure to measure the distance between two points of the same point cloud is partially shared with the Single point measure (par. 3.5.4).

Distance between 2 points	Functions
---------------------------	-----------



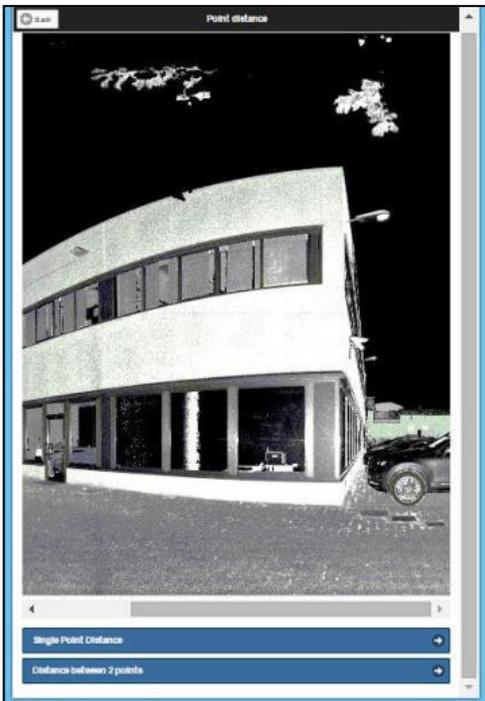
The single point measure function is available in the **Files Management** menu (par. 3.5.6) for every scan file stored in the X300 internal memory.

1. Get single point menu

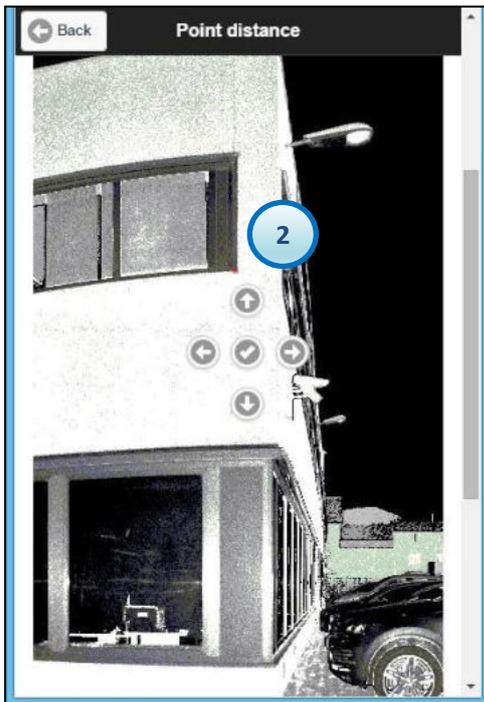
Press the **Point** button to enter the Single point measure menu.



Wait that the high quality preview of the scan is loaded and displayed.



When the high-quality preview is displayed, it is possible to slide the image from right to left and vice versa using the cursor (pc) or fingers (touchscreen)

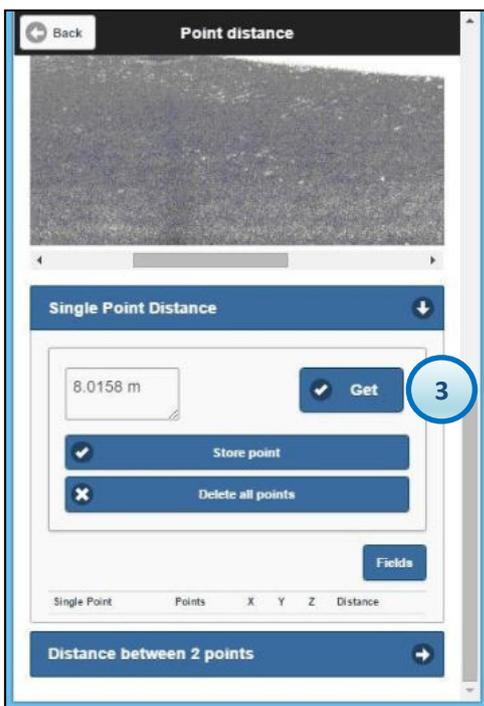


2. Select the point to measure

Select the point on the preview using the finger (touchscreen) or the mouse (pc).

The point will be marked with a **red spot** (visible in the bottom-right corner of the window).

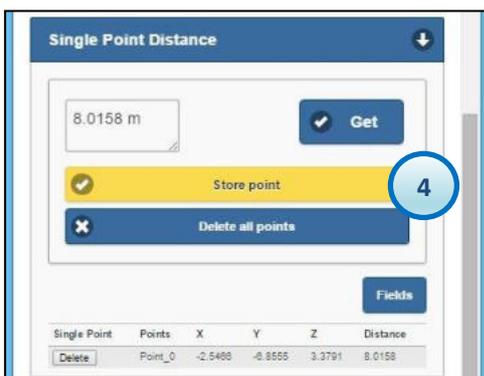
An arrow pad is visible on top of the image, allowing to increase the accuracy of the selection. Use the arrow to move the red spot along X and Y direction until the position is correct, then confirm the point using the **Confirm icon** 



3. Get the point distance

Tap on the **Single Point Distance** to scroll-down the menu and press the **Get** button to calculate the measure.

The distance measure (in meter units) is displayed in the box on the left.

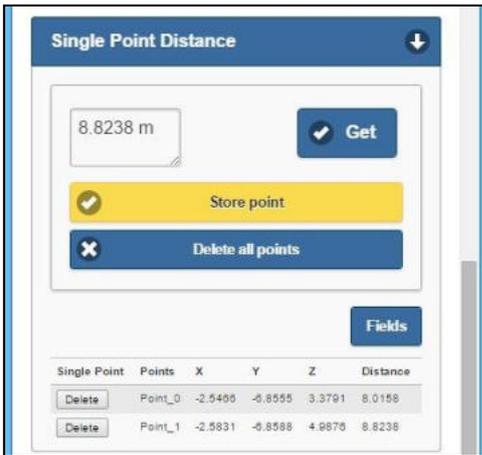


4. Save the measure

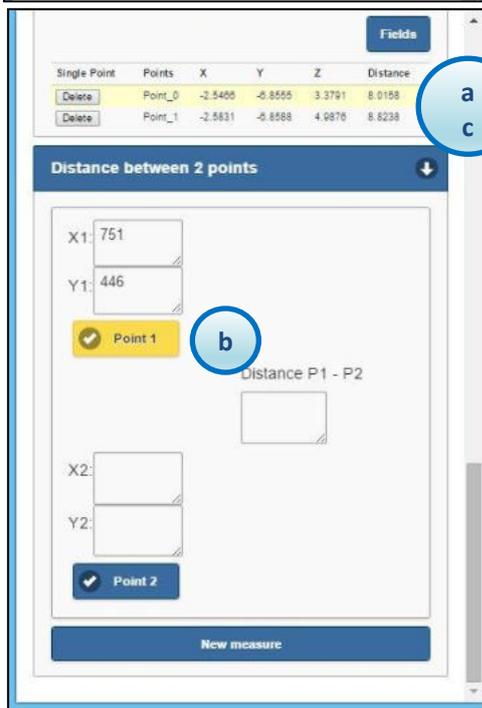
Tap the **Store point** button to save the point and add it to the point list.

The measure is stored in the X300 internal memory and it is linked to the point cloud, so that the points are reloaded and displayed each time that the scan file is opened in the **File Management** menu.

Repeat the steps **from 1 to 4** to measure other points and add them to the point list.

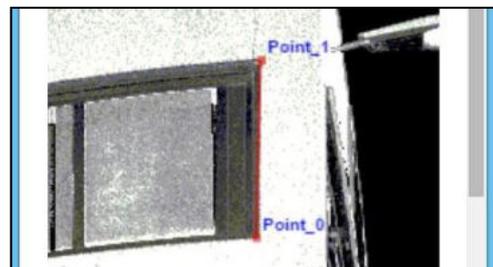
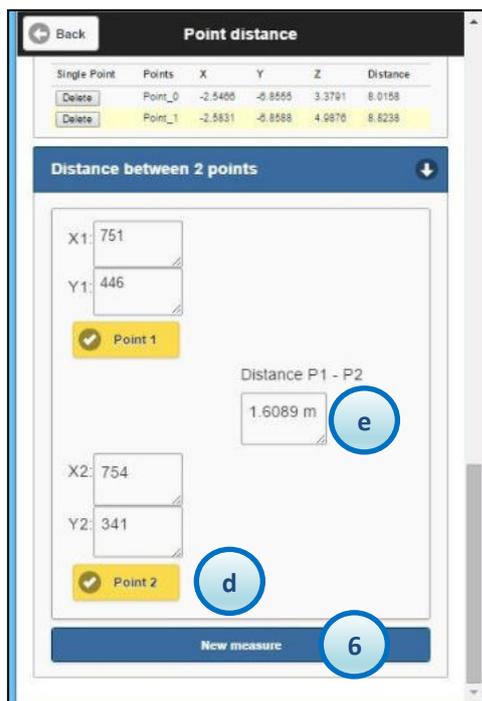


Press the **Delete all points** button to permanently erase all the points from the point list and from the X300 internal memory.



5. Select point 1 and point 2 from the point list

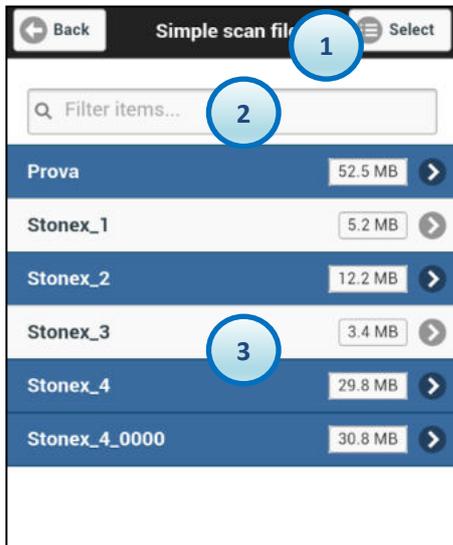
- Select the **first** point from the point list by tapping on it. The image coordinates are displayed in the boxes below.
- Tap on the **Point 1** button to confirm the element (the button will turn to yellow color)
- Select the **second** point from the point list by tapping on it. The image coordinates are displayed in the boxes below.
- Tap on the **Point 2** button to confirm the element (the button will turn to yellow color)
- The Distance value (in meter units) is displayed in the **Distance P1 – P2** box. The P1-P2 distance is displayed in the preview image.



- Tap the **New Measure** button to clear all the fields and start a new measure

3.5.6 Files management

Files management	Functions
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From this menu it is possible to browse the files stored in the internal memory, manage them and find out scan information.

Giving a quick look at the page, you can receive direct information:

- Blu boxed scan files are the ones done with photos capture. Grey boxed scan files are the ones done without taking pictures.
- At the right side there is the estimated size of each scan file in .x3a format.

Available are:

- **Select options and tools**
- **Searching filter bar**
- **Scan details profile**

1. Select button

When you click on **Select** button, little squares will appear near scan file names. This function permits to show and activate other management tools:

a. All

All the scan files will be selected.

b. Toggle

Scan files that were selected will be unchecked and the ones that were unselected will be checked.

c. Download

Download directly from here all the selected files in a single scan archive (.x3a) via Wi-Fi.

NOTE

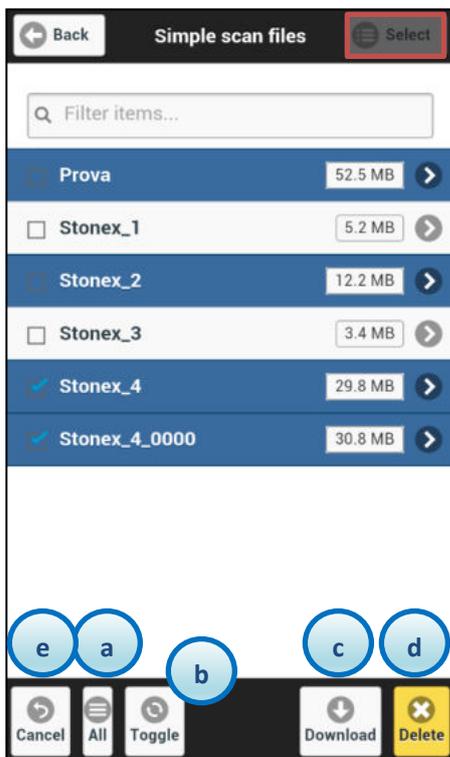
Refer to par. 4.1 for further details about scan file formats.

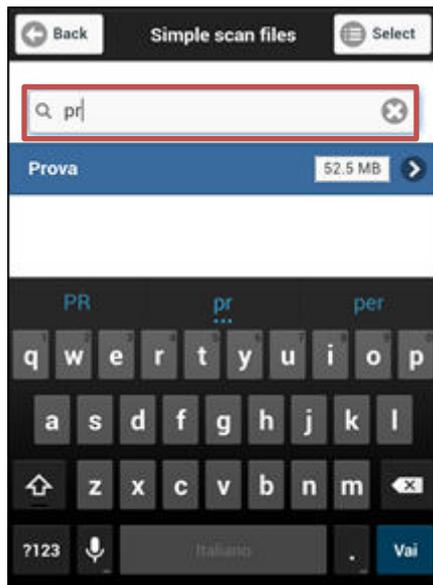
d. Delete

Delete all selected files.

5. Cancel

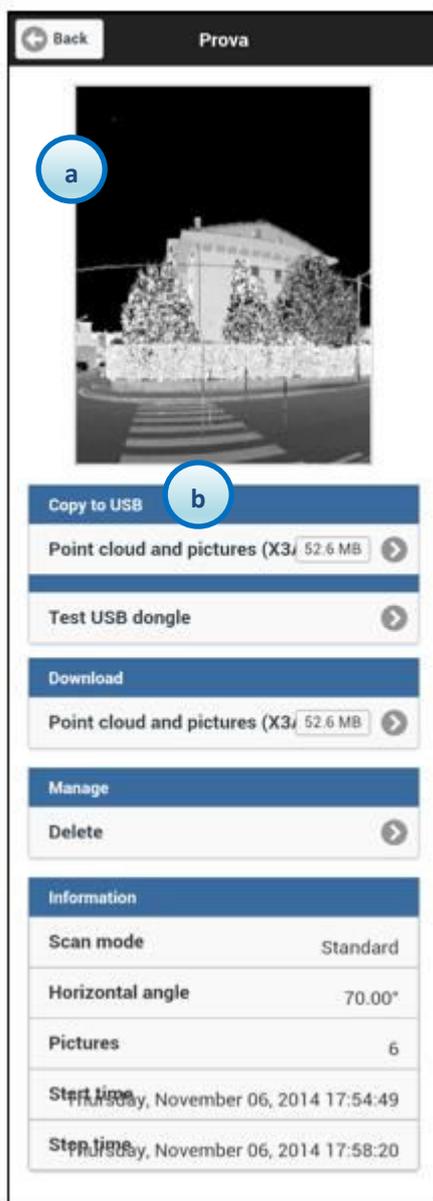
Quit from **Select** tool.





2. Searching filter bar

In the Searching filter bar, write the name or part of it to find out all the files corresponding to the filter.



3. Scan profile

When you click on a specific scan file box, you will be led to its dedicated information page.

In the profile you can find:

a. Preview thumbnail

It shows a preview thumbnail of the point cloud scanned by the X300 (without pictures matching).

b. Copy to USB

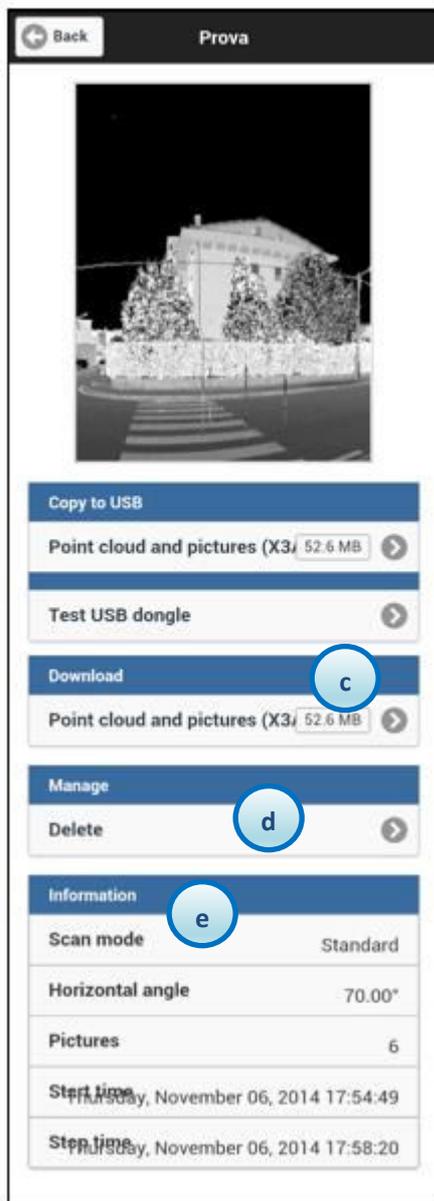
USB download becomes available when a USB memory drive is connected to the X300 USB port.

Click on **Point cloud and pictures (X3A)** to download the scan file into the USB driver. On the right there is the estimated file size.

Firmware versions later than 0.5.48 enable an integrity test function on the USB memory drive: **Test USB dongle** (see par. 3.5.9.6)

NOTE

Plug the USB memory drive in the X300 USB port only after powering on the scanner and remove it after turning off the scanner.



c. Download

Download of the selected file through Wi-Fi or Ethernet cable (optional).

On the right there is the estimated file size.

d. Manage - Delete

Erase the selected file from X300 internal memory.

NOTE

Deleted files are permanently removed from the X300 solid memory.

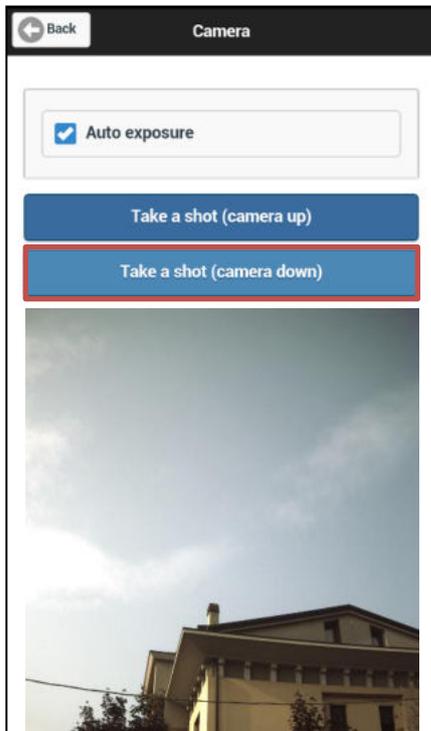
e. Information

This panel shows the details of the scan file.

- **Scan mode:** (preview, fast, standard fine);
- **Horizontal angle:** the horizontal rotation made by the unit during the scan;
- **Pictures:** the number of pictures, taken with the internal cameras, associated to the scan file;
- **Start Time/Stop time:** time stamp of the scan.

3.5.7 Camera

Camera	Functions
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From this menu it is possible to check the light exposure of the digital cameras and take a shot to check it on camera up and down separately.

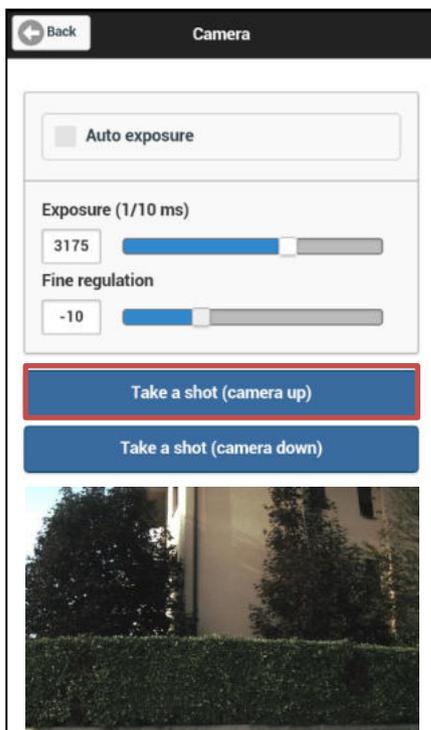
Auto exposure

Flag this checkbox to activate the light auto-exposure for each picture of the scan session.

Press the **Take a shot** button to acquire a picture preview from the selected camera:

Camera up: the upper camera, facing forward.

Camera down: the lower camera, facing upward.



Manual exposure

Enter manually the exposure value or slide the cursor to change it.

Press the **Take a shot** button to acquire the picture from the selected camera:

Camera up: the upper camera, facing forward.

Camera down: the lower camera, facing upward.

NOTE

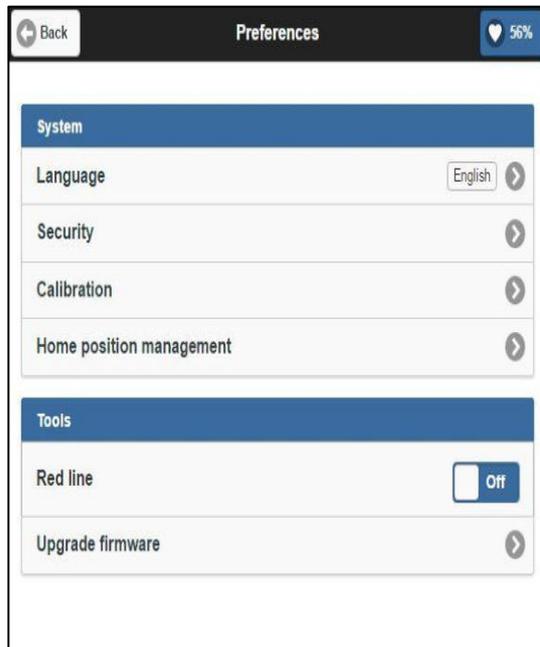
The preview pictures are not stored in the internal memory.

Tip!

In conditions of high ambient brightness, adjust the first slider to the minimum (25 ms) and move the second slider from left to right until you find the right balance.

3.5.8 Preferences

Preferences	Functions
-------------	-----------



From this menu it is possible to manage the system and tools preferences.

System

- **Language:** change the software language (see par. 3.5.8.1)
- **Security:** modify the protection settings of the Wi-Fi/Lan cable connection (see par. 3.5.8.2)
- **Calibration:** enter the digital compensator menu (see par. 3.5.8.3)
- **Home position management:** set the index position of the maser scanner (factory or user index)

Tools

- **Red line:** enable/disable the visible laser tracking light (not for measures)
- **Upgrade firmware:** enter the menu for the upgrade of the X300 internal firmware (see par. 3.5.8.4)

3.5.8.1 Language

Language	Functions
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From this menu it is possible to change the default language of the X300 onboard software.

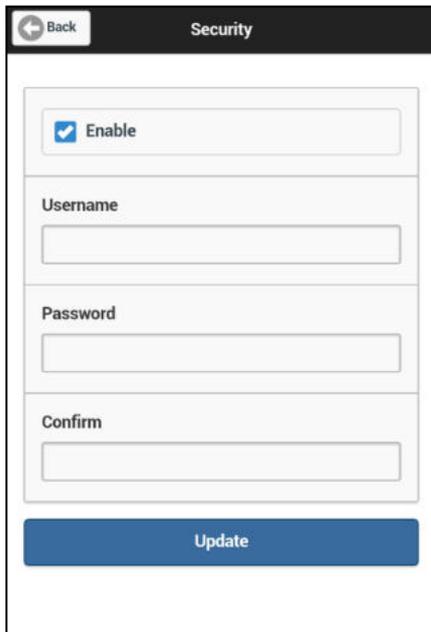
Tap on a language to apply the change.

NOTE

Stonex will periodically release additional language packs, independently or upon request, at the discretion of Stonex.

3.5.8.2 Security

Security	Functions
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In this menu it is possible to enable/disable the network authentication.

When the network authentication is enabled, username and password are requested by the web browser, in order to prevent unauthorized access to the X300 web interface.

Username and password are user-defined settings, so Stonex has no way of knowing or recovering the authentication settings defined by the users.

- **Username:** enter or change the username for the network authentication (factory setting: x300 or X300)
- **Password/Confirm:** enter or change the password for the network authentication (factory setting: 1234).

Press **Update** button to apply the changes.

3.5.8.3 Compensator

Calibration/Compensator	Functions
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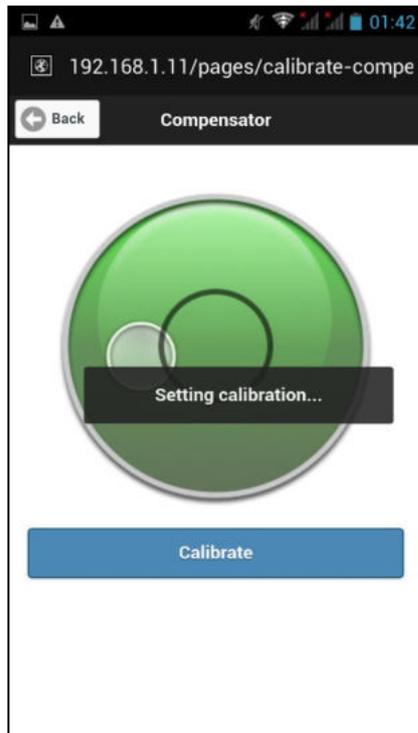


In this menu it is possible to check if the X300 Laser Scanner is leveled and if the internal compensator of the X300 is correctly set.

It's important to verify if the compensator is properly calibrated or not. In fact, the Z axis of the dataset is calculated using the data of the internal compensator.

The calibration of the compensator is part of the X300 production procedure but sudden movements, transportation on the field and slight impacts could deteriorate the compensator accuracy.

It is therefore good practice to periodically check and adjust the calibration of the electronic compensator:



PROCEDURE:

1. Level the instrument using the tribrack (par. 2.1).
2. Press the **Calibrate** button to start the auto-calibration routine.
3. Do not move the scanner until the auto-calibration routine is over (about 3 minutes).
4. Check the bubble in the compensator screen. The bubble should now be inside the internal smaller circle (when the scanner is leveled).

NOTE

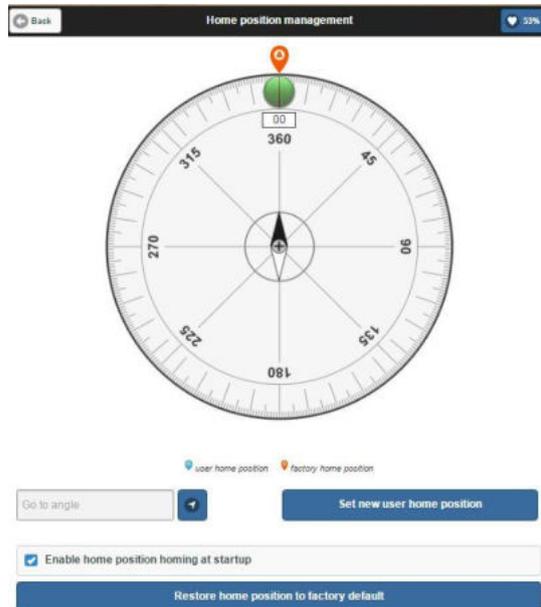
The compensator operative range is $\pm 20^\circ$. Wider tilt angles cannot be measured and adjusted.

As consequence, the scan position in Stonex Reconstructor will result incongruous with respect to the main XYZ axis orientation.

Beside this, no deformation is applied to the scan data.

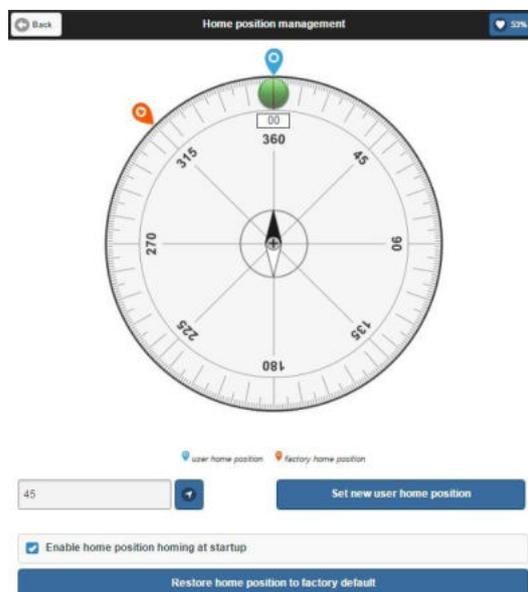
3.5.8.4 Home position management

Home position management	Functions
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In this menu it is possible to set the X300 Laser Scanner home position choosing if:

1. Maintain the factory home position
2. Move to a specific angle (it isn't possible to set a negative value) and set it as "new user home position"
3. Enable (or not) home position homing at startup
4. Restore home position to factory default (if user as changed it)



Move to a specific angle:

1. Insert a value into "Go to angle" or rotate manually the Laser Scanner
2. Set it as new home position: User Home Position will be the "Blue" symbol and Factory Home Position will be the "Red" one.

When you choose for example to do a simple scan you can set as starting position "Actual" if you move manually the Laser Scanner or "Index" position that refers to the last set home position.

When you turn off your Laser Scanner and you startup it, Laser will move on last memorized Home Position: User if you have set it or Factory if you haven't changed it.

Enable home position homing at startup

You can choose if enable or not index at startup on machine that, if you disable this function, will not move to search index at startup.

Restore hom position to factory default

Restore the factory home position

3.5.8.5 Upgrade firmware

Stonex releases periodically new firmware versions for the X300 Laser Scanner. The need to update the firmware may have several reasons: release of new functions, bug fixing and improvements of existing software features. Firmware update can be carried out either by Stonex authorized dealers and end users.

If you need further instructions or have questions about the procedure, please contact the Stonex LaserTeam support at: Laser.Team@stonex.it

CHANGELOG

Up to firmware version 0.5.99 the file extension is *bin*. This file format has been discontinued after the release of the version 0.6.0.

From firmware versions later than 0.6.0 the new file extension is *x3u*. Once installed, the *x3u* firmwares cannot be downgraded to previous *bin* firmwares.

Upgrade firmware

Functions



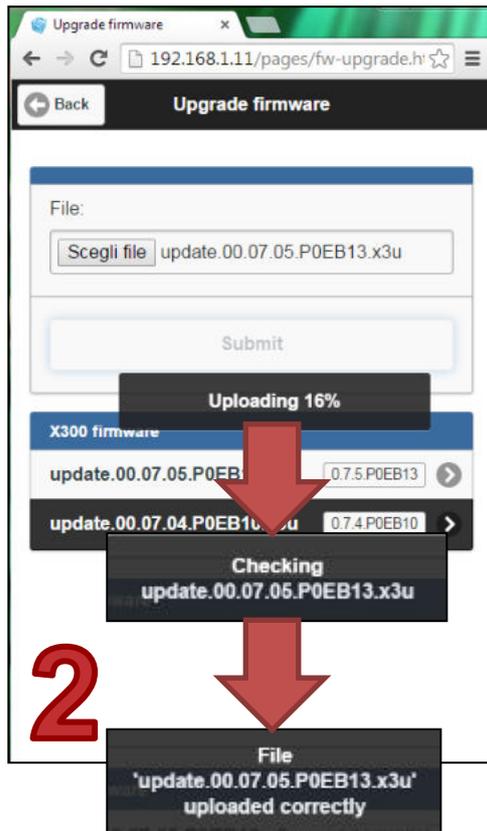
Follow carefully the steps to upgrade the X300 firmware:

Step 1

Browse your computer or server to locate the firmware file (*.bin or *.x3u) provided by Stonex or Stonex authorized dealers.

Press the **Submit** button to upload the firmware file onto the X300 flash memory.

Step 2

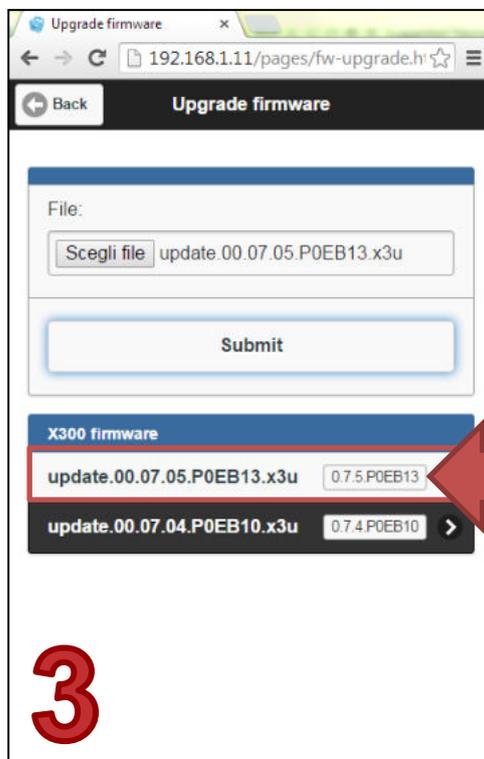


Wait until the end of the upload procedure: the system will upload the firmware, check the upload procedure and inform about its correctness.

It takes less than a minute to complete the process.

NOTE

Do not turn off the scanner or remove the battery during the upload process.



Step 3

The firmware is saved into the internal memory. Tap on it to apply the change and upload the system (red arrow).

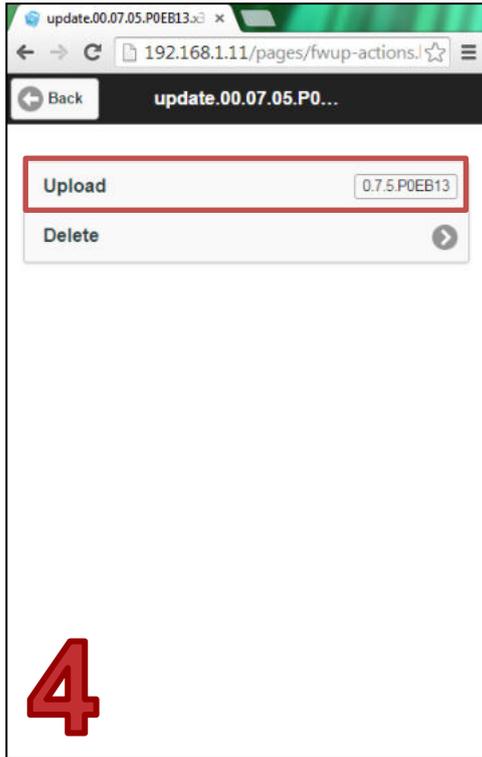
The background color of the row containing the firmware is defined by the following criteria:

- **GRAY:** the firmware is more recent than the currently installed one.
- **BLACK:** the firmware has the same version of the currently installed one.
- **YELLOW:** the firmware is less recent than the currently installed one.

NOTE

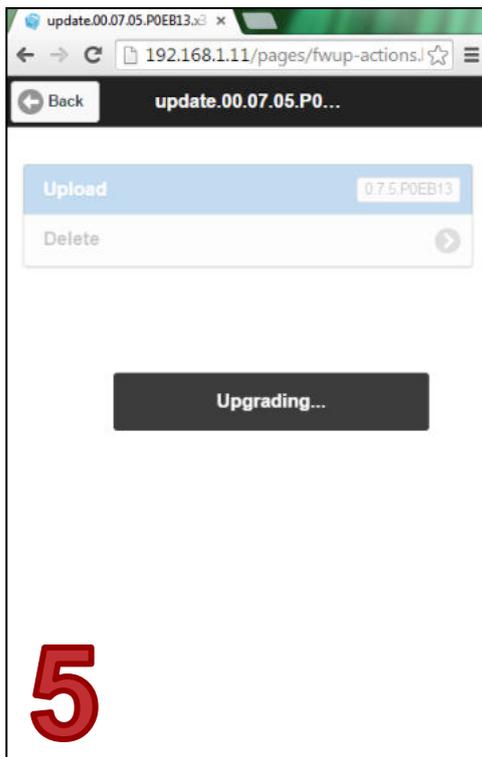
It is possible to upload several firmwares on the same scanner, the files will be visible in the X300 firmware list, but firmwares are upgradable only one-by-one.

Step 4



Tap **Upload** button to apply the selected firmware.

Tap **Delete** button to erase the file from the internal memory.



Step 5

Wait until the end of the upgrade procedure. It takes less than a minute to complete the process.

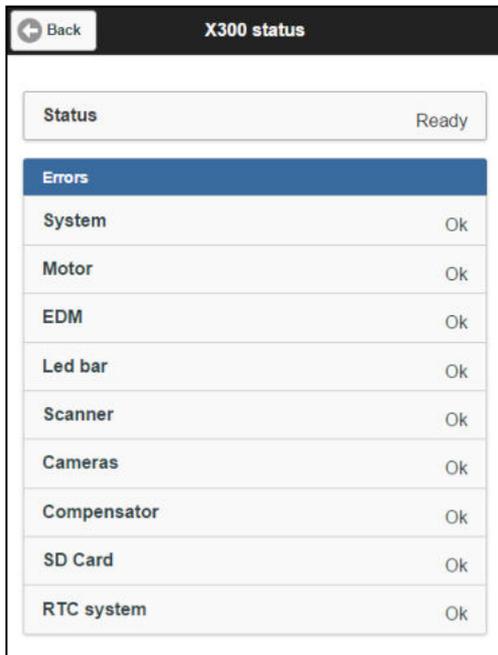
When the procedure is complete, the X300 will **automatically restart** and the firmware will **be automatically deleted** from the internal memory of the instrument.

NOTE

Do not turn off the scanner or remove the battery during the upgrade process.

3.5.9.1 X300 Status

X300 Status	Functions
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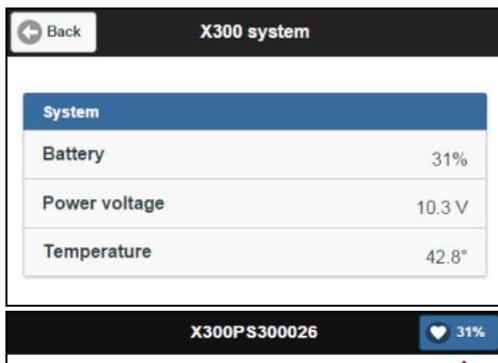
This page checks and displays whether the hardware components inside the scanner are correctly powered and running.

The components that are working properly are marked with the initials "OK".

If the Status is other than "Ready", please contact Stonex Laser Team support at Laser.Team@stonex.it, providing the .X3K file (see par. 3.5.9.5)

3.5.9.2 System

System	Functions
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Allows to check:

- **Battery level**
- **Power voltage**
- **Internal temperature**

The battery level is also visible in the battery notification icon located in the upper-right corner of the main page (red arrow). It's shown in all screens.

3.5.9.3 Internal memory

Internal memory	Functions
-----------------	-----------

X300 storage	
Internal memory	
Storage size	29.7 GB
Free space	29.5 GB
Storage for scan	
Fine	58
Standard	232
Fast	915
Preview	3358
With pictures	
Fine	47
Standard	120
Fast	197
Preview	234

This menu allows to check the available free memory and the statistics of the data for each scan mode with or without pictures capture.

3.5.9.4 Features

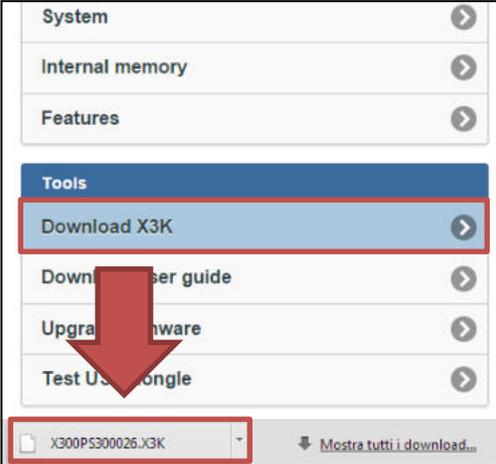
Features	Functions
----------	-----------

X300 features	
Device	
Serial #	X300PS300026
Unique ID	XCCCK2K7AB5M6FMDCTC2
Features	
Scan	Enabled
Max. range	Maximum
Camera res.	High
Max. scan mode	Fine
Compensator	Enabled
GPS	Enabled

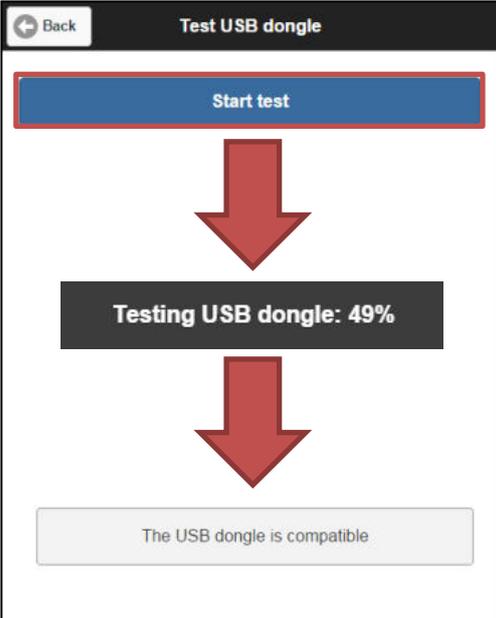
From this menu users are allowed to easily verify which functionalities of the instrument are enabled or locked, according to the purchase agreement.

In Device section, you can see the serial number and the X300 ID, which identify uniquely the single instrument.

3.5.9.5 Download X3K

Download X3K	Functions
	<p>The X3K file is a technical file (unique for each X300 unit) used as log-system file, useful to check the configuration of the scanner in case of malfunction.</p> <p>If required by Stonex Support, download and send it via mail to: Laser.Team@stonex.it</p> <p>To download it, click on “Download X3K” and the X3K file will be directly downloaded on the controller.</p>

3.5.9.6 Test USB dongle

Test USB dongle	Functions
	<p>This function performs a write/read testing on the connected USB memory drive in order to verify the compatibility of the support (existing data will not be deleted).</p> <p>NOTE Requisite: at least 140 Mb of free space available on the support.</p>

3.5.9.7 Automatic shutdown

From firmware version 08.07 was introduced an emergency procedure which provides for the automatic shutdown of the machine.

Laser Scanner, reached 25% of battery power, signals with a popup that reached 18% of the battery charge will proceed to the Laser Scanner X300 turning off.

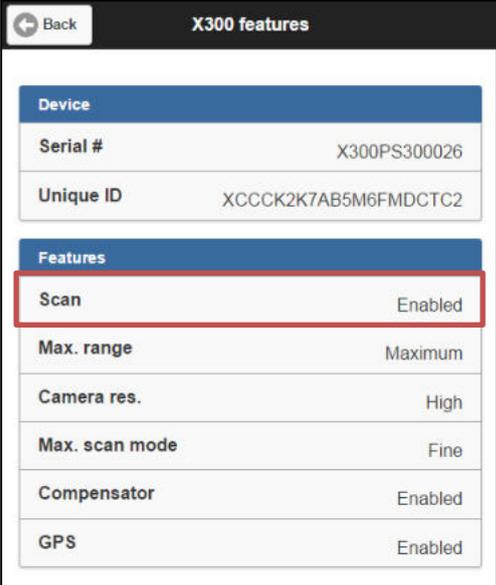
The machine at that time will stop any activity that is doing (not saving any data of partial scans) and shut down.

3.6 X300 L - Pay per Use

From a practical standpoint, “Pay per Use” means that some features of the X300 Laser Scanner have been locked or limited by factory defaults.

This is the case of the **X300 L**, a laser scanner similar to the regular X300 but with a shorter range and subject to working time limitation⁵.

To check which functionalities are enabled and which are locked/limited, enter **Information/Features** menu (see par. 3.5.9.4).



The screenshot shows a mobile application interface titled "X300 features". It has a "Back" button in the top left. The interface is divided into two sections: "Device" and "Features".

Device	
Serial #	X300PS300026
Unique ID	XCCCK2K7AB5M6FMDCTC2

Features	
Scan	Enabled
Max. range	Maximum
Camera res.	High
Max. scan mode	Fine
Compensator	Enabled
GPS	Enabled

If the **Scan** feature is **Disabled**, that means that the “Pay per Use” period is expired.

As consequence, the X300 unit cannot be used for scanning any longer, even though the stored data are still accessible and can be managed normally through Wi-Fi, Smart cable and USB memory drive.

To verify the expiry time of your instrument, enter **Information/Features** menu (see par. 3.5.9.4) and refer to **Scan** information.

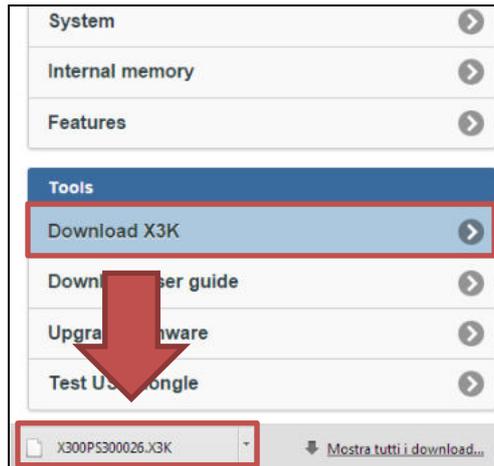
⁵ Contact the nearest authorized Stonex sales representative for information about the “Pay per Use” program. Click [here](#) for technical information about X300 L Laser Scanner or visit Stonex website: www.stonexpositioning.com

3.6.1 Upload the “Pay per Use” firmware

To enable the scanning function, a special firmware file has to be upload on the X300 L unit. The “Pay per Use” firmware is provided by Stonex, according to the “Pay per Use” contract.

To activate the “Pay per Use” license follow the steps:

1. Enter the **Information** menu and press the **Download X3K** button (see par.3.5.9.5)
A license file (.X3K format) is downloaded from the scanner to the controller.



2. Send it to Laser.Team@stonex.it
Object of the mail: **X300 L – Pay per Use subscription**
3. Stonex will perform authorization checks and send you back the activation firmware for the period of time stipulated in the “Pay per Use” contract.
The received firmware file has “.X3H” extension.
4. Upload the firmware onto the X300 unit.
The firmware upload procedure is described at par. 3.5.8.4 of the present User Guide.

Chapter 4: Manage data with Stonex Reconstructor software

The X300 Laser Scanner can export data in *x3a* file format.

The Stonex Reconstructor software can import *x3s* and *jpeg* file formats.

All file formats referring to X300 Laser Scanner are described hereunder.

4.1 X300 files format

1. ASCII comma separated values (**DISCARDED** from firmware ver. 0.5.74)

This is an interchange format that can be adapted to many software platforms, different from Stonex Reconstructor.

The data format is X,Y,Z or X,Y,Z,R ("," as decimal separator), where "R" is the raw reflectance value acquired by the scanner ($0 \leq R \leq 1$).

The ASCII format cannot be processed with the camera blending algorithm and cannot be merged with the pictures taken with the X300 integrated cameras.

From 0.7.00 firmware version, this format is available only converting the *x3a* format with X300 Manager tool (see par. 4.3.2), because the download from the X300 Laser Scanner used to take too much time.

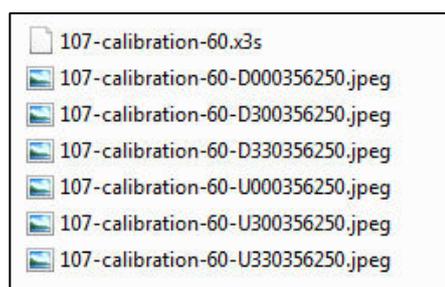
2. Stonex cloud file (*x3s*) (**DISCARDED** from firmware ver. 0.5.74)

This is the binary format ready for Stonex Reconstructor.

It can be equipped with camera pictures that can be used to create the "color" layer when imported in Stonex Reconstructor.

If a scan project is equipped with camera pictures, the final dataset is made by:

- *namefile.x3s*: one file containing the scan;
- *namefile-value.jpeg*: several files containing the pictures related to the scan.



The number of the pictures varies according to the width of the horizontal scan angle.

From 0.7.00 firmware version, this format is available only converting the *x3a* format with X300 Manager tool (see par. 4.3.2).

3. X300 RAW file (*x3r*) (**DISCARDED from firmware ver. 0.5.74**)

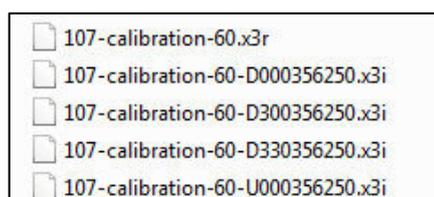
This is the raw source format used to create the scan files in real time and store them inside the X300 memory.

Compared to the previous two, this is a more compact and lightweight format.

It can be equipped with camera pictures that can be used to create the “color” layer when imported in Stonex Reconstructor.

If a scan project is equipped with camera pictures, the final dataset is made by:

- *namefile.x3r*: one file containing the raw scan data.
- *namefile-value.x3i*: raw files containing the pictures related to the scan.



The number of the raw pictures varies according to the width of the horizontal scan angle.

4. X300 RAW Archive file (*x3a*) (**adopted from firmware ver. 0.4.80**):

This is the new file format which wraps the scan data into a single compact file.

The files packed inside *x3a* are:

- *namefile.x3r*: raw scan data file (see above point);
- *namefile-value.x3i*: raw files containing the pictures related to the scan (if any);
- *namefile.x3m*: it is created if the dataset contains multiple-scans (see par. 3.5.3 and par. 4.3.4);
- *U_X300S/N.cal*: calibration file of camera Up;
- *D_X300S/N.cal*: calibration file of camera Down;

The X300 archive format *x3a* is available for the download with both Wi-Fi/LAN and USB driver.

NOTE – *x3a* archive, *x3r* and *x3i* format files must be converted before importing them in Stonex Reconstructor. See par. 4.3.2 for further details.

4.2 File size

The following table reports the raw data size at different scan resolutions (100% valid points).

	H. res. (360°) n. points	V. res. (90°) n. points	Total points	x3r raw file (Mb)
Fine	16000	4000	64000000	< 500 Mb
Standard ⁶	8000	2000	16002000	< 130 Mb
Fast	4000	1000	4000000	< 35 Mb
Preview	2000	500	1000000	< 10 Mb

Table 8: File size

⁶ The compression rate to generate the 2D view is 2000 points per column.

4.3 Import data in Stonex Reconstructor

Stonex Reconstructor software can import raw scan data in Stonex cloud file (x3s) and other formats. See par. 4.1 for X300 file format description.

x3s files can be directly imported into Stonex Reconstructor, while x3r, x3i and x3a files must be converted before importing.

4.3.1 General import and export formats (v.3.2)

Data type	Import Formats	Export Formats	Export Rec. proprietary formats
Unstructured Point Cloud	Kubit point cloud (.ptc) LAS format (.las) PLY point cloud (.ply) Text format (.txt) e57 unstructured point cloud PTS point cloud (.pts)	Kubit point cloud (.ptc) LAS format (.las) PLY point cloud (.ply) Text format (.txt) e57 unstructured point cloud PTS point cloud (.pts)	(.rup)
Structured Point Cloud	Comma separated values (.csv) DEM ascii header+matrix (.asc) Radscan text file (.txt) Text format (.txt) Stonex Reconstructor format (.x3s)	e57 structured and unstructured point cloud Generic binary raster (*.*) Text format (.txt) Kubit point cloud (.ptc) LAS format (.las) Leica Scanstation scan (.ptx) PLY point cloud (.ply) PTS point cloud (.pts)	(.rup) (.rgp) (.rrf)
Triangle Meshes	DXF (.dxf) IFC (.ifc) STL mesh (.stl) WRML (.wrl / .wrml)	3DS (.3ds) DXF (.dxf) PLY mesh (.ply) WRML (.wrl) STL mesh (.stl) Text format (.txt)	(.rtm) (.vg3)
Polylines	DXF polyline (.dxf) List of points (.txt)	DXF polyline (.dxf)	(.rpl)
Trajectories	DXF trajectory (.dxf) Trajectory from point list (.txt)		(.rtr)
Movies		AVI (video codec installed on the pc)	
Complete projects			(.recprj) (.r2s) (.siprj)

Table 9: Import/export formats

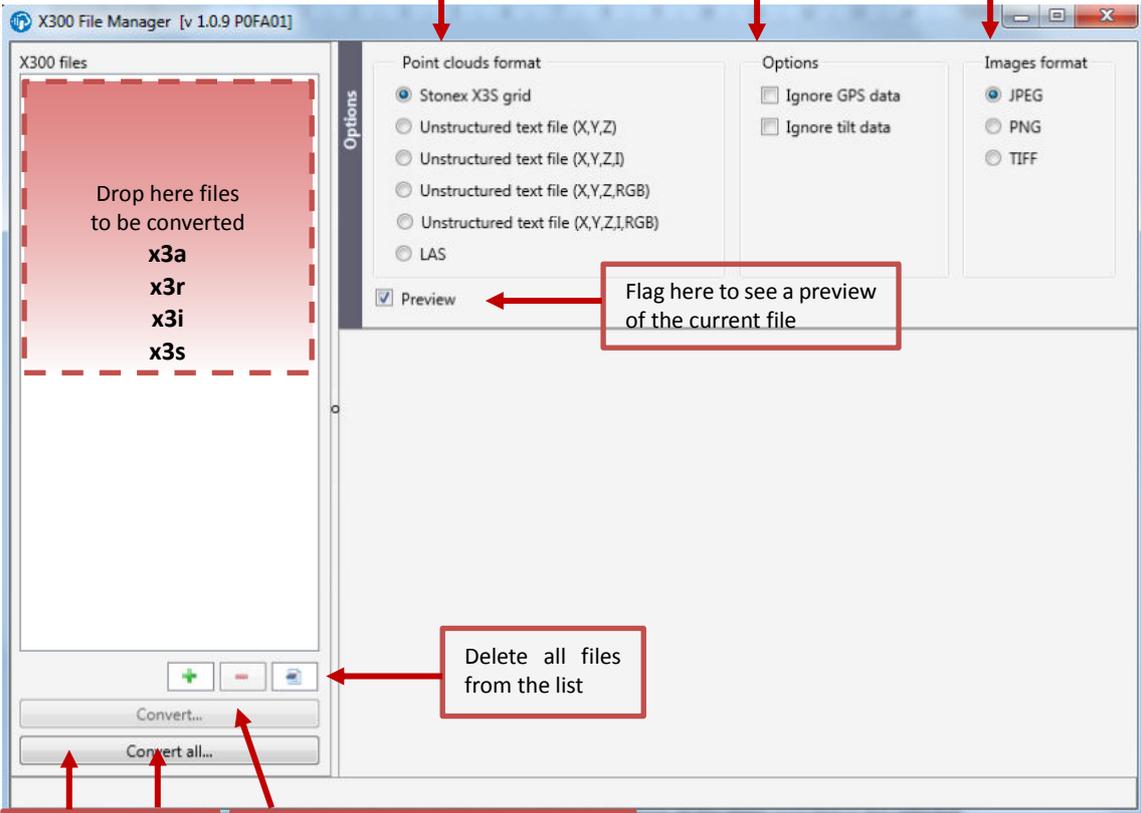
4.3.2 X300 Manager: convert x3r, x3i and x3a files

X300 raw files archive (x3a) can be easily converted to Stonex Reconstructor format (and others) using the free “X300 Manager” tool.

Select in which format you want to convert the point cloud file.
Stonex Reconstructor imports x3s format. You can export even LAS format (if manager is licensed).

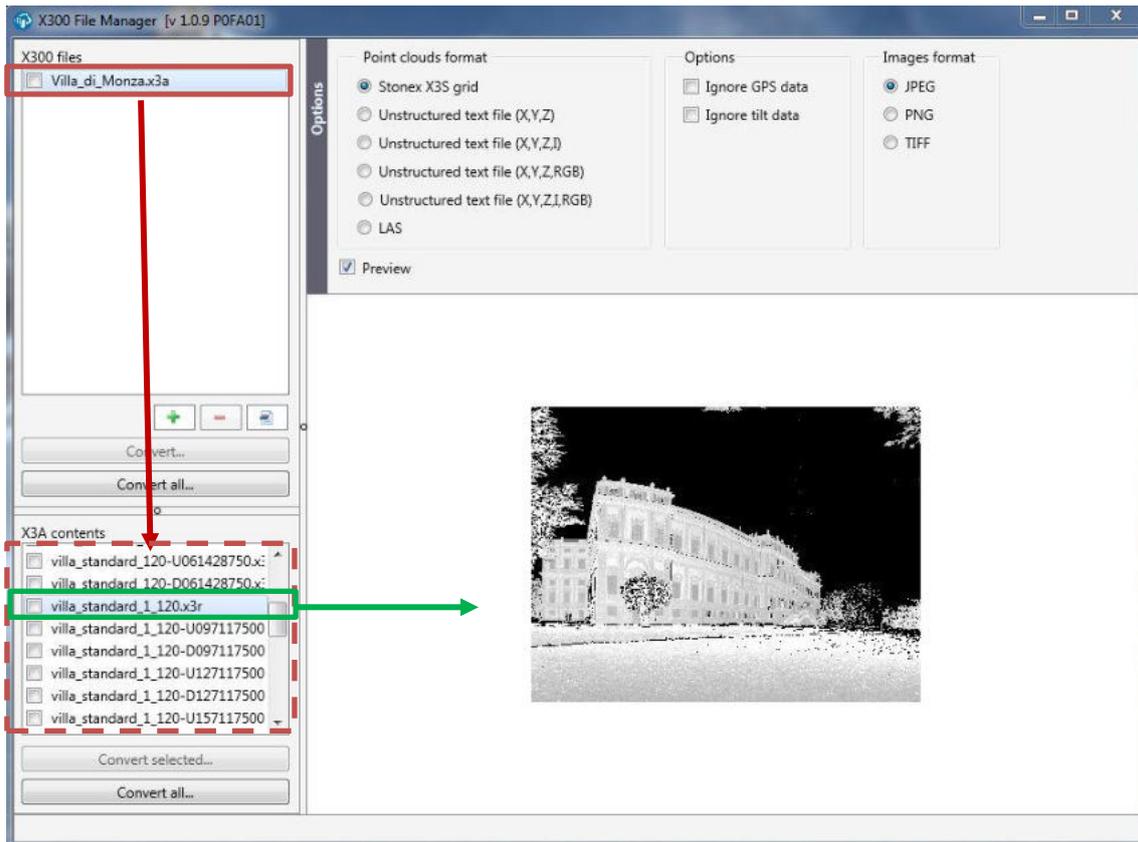
You can decide to ignore GPS and/or tilt data saved during scanning.

Select in which format you want to convert the pictures captured by X300. **Stonex Reconstructor imports jpeg format.**



The screenshot shows the X300 File Manager interface. On the left, a dashed red box contains the text: "Drop here files to be converted x3a x3r x3i x3s". Below this are buttons for "+", "-", and a folder icon, with a callout box stating: "+ : browse to add a file to convert - : delete all flagged file from the list". Below these are "Convert..." and "Convert all..." buttons, with a callout box: "Click to convert one or more files". The main area has three panels: "Point clouds format" with radio buttons for Stonex X3S grid, Unstructured text file (X,Y,Z), Unstructured text file (X,Y,Z,I), Unstructured text file (X,Y,Z,RGB), Unstructured text file (X,Y,Z,I,RGB), and LAS; a checked "Preview" checkbox with a callout: "Flag here to see a preview of the current file"; "Options" with checkboxes for "Ignore GPS data" and "Ignore tilt data"; and "Images format" with radio buttons for JPEG, PNG, and TIFF. A callout box at the bottom right says: "Delete all files from the list" pointing to the "-" button.

If you select a file in the list, another box will appear, where all the items included in the selected file will be displayed. If you select an item of the detailed list and you flag the preview option, it shows a preview thumbnail (this option is available for scans, pictures and calibration files).



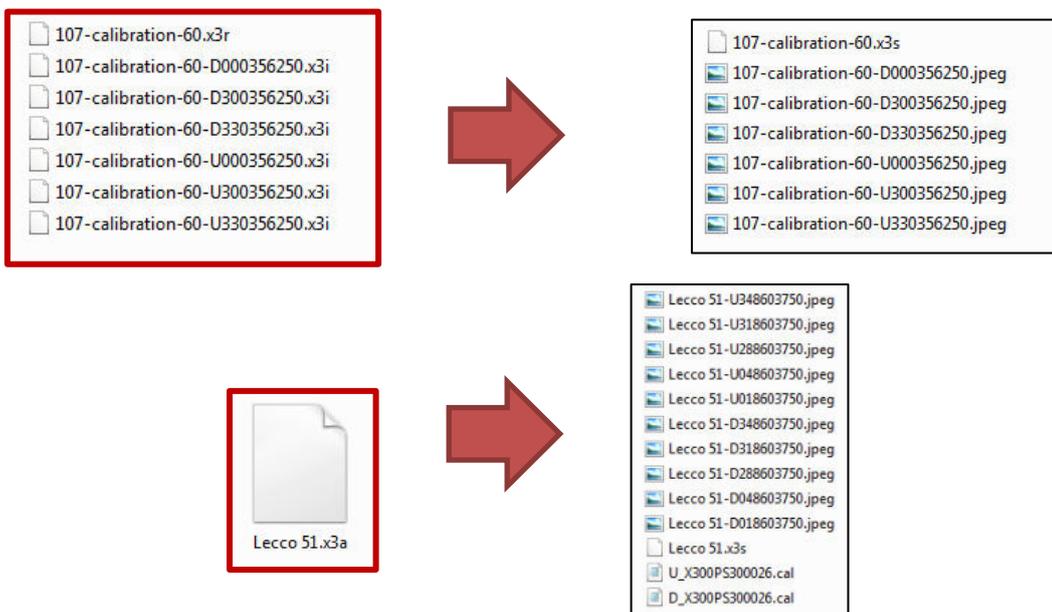
Convert and **Convert all** buttons have the same functions for both the two levels:

- **Convert:** flag the scan file/s you want to convert and click on **Convert**.
- **Convert all:** all the files in the list will be converted, independently from the flags.

If you want to convert a single or more selected files of an archive *x3a*, you can flag them in the *lower window* and click on **Convert** button just under it.

When you click on **Convert** or **Convert all** button, a window with the folders tree will appear. Select the folder in which you want to save the converted files.

The raw data folder is selected by default.



4.3.3 Import and color the X300 point clouds

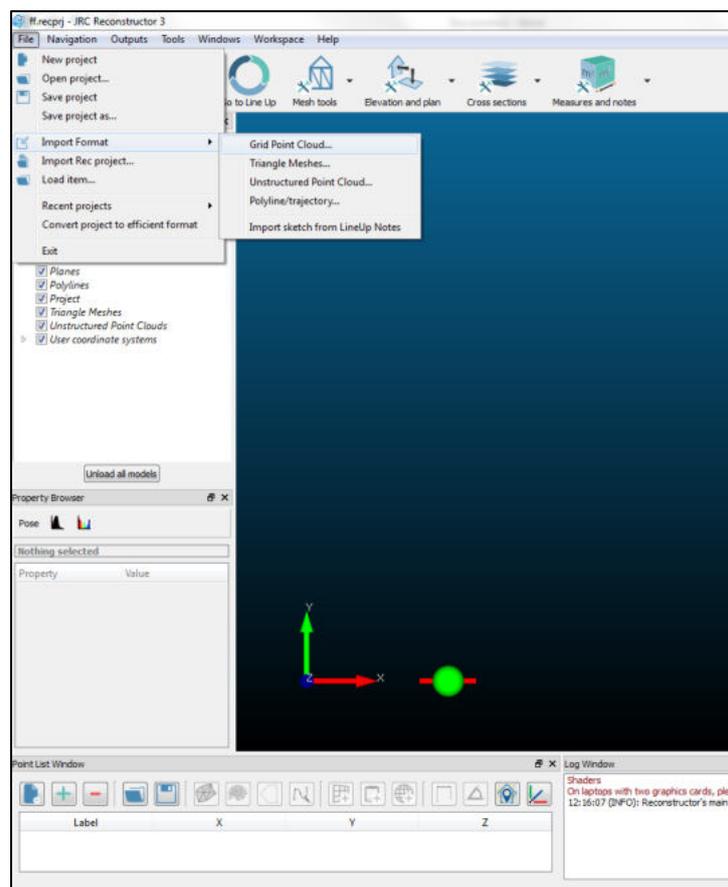
Open Stonex Reconstructor from the Windows Program menu.

Select **New Project** to create empty workspace or **Open project** to continue an existing Reconstructor project. The import workflow is identical in both cases.



From the **File** menu, select **Import Format** and then **Grid point Cloud**.

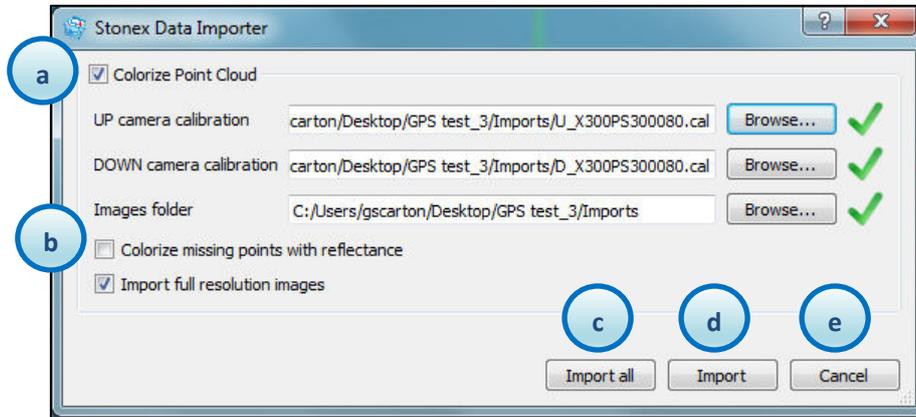
Browse the hard disk and select the **x3s** files to import.



NOTE

The program automatically creates a subfolder named “Imports” inside the project folder. The user can choose whether to use this subfolder to store the raw data or not (it is not mandatory).

When you select the **X3S** file, the LINE UP Wizard will guide you through the import steps. A dialog will guide you also through the point clouds colouring (color blending).



a. Colorize Point Cloud

Activating this checkbox, the coloring of the point clouds with pictures will be enabled. The calibration files (*cal*) as well as the pictures are automatically loaded (if stored in the same folder of the *x3s* files).

b. Colorize missing point with reflectance

(enabled): points not covered by images are displayed with the original reflectance values.

(disabled): points not covered by images are converted to “black points” (points without reflectance value) that can be filtered out and deleted using the automatic filtering functions.

c. Import All

Press **Import all** to import all the selected scan in sequence.

d. Import

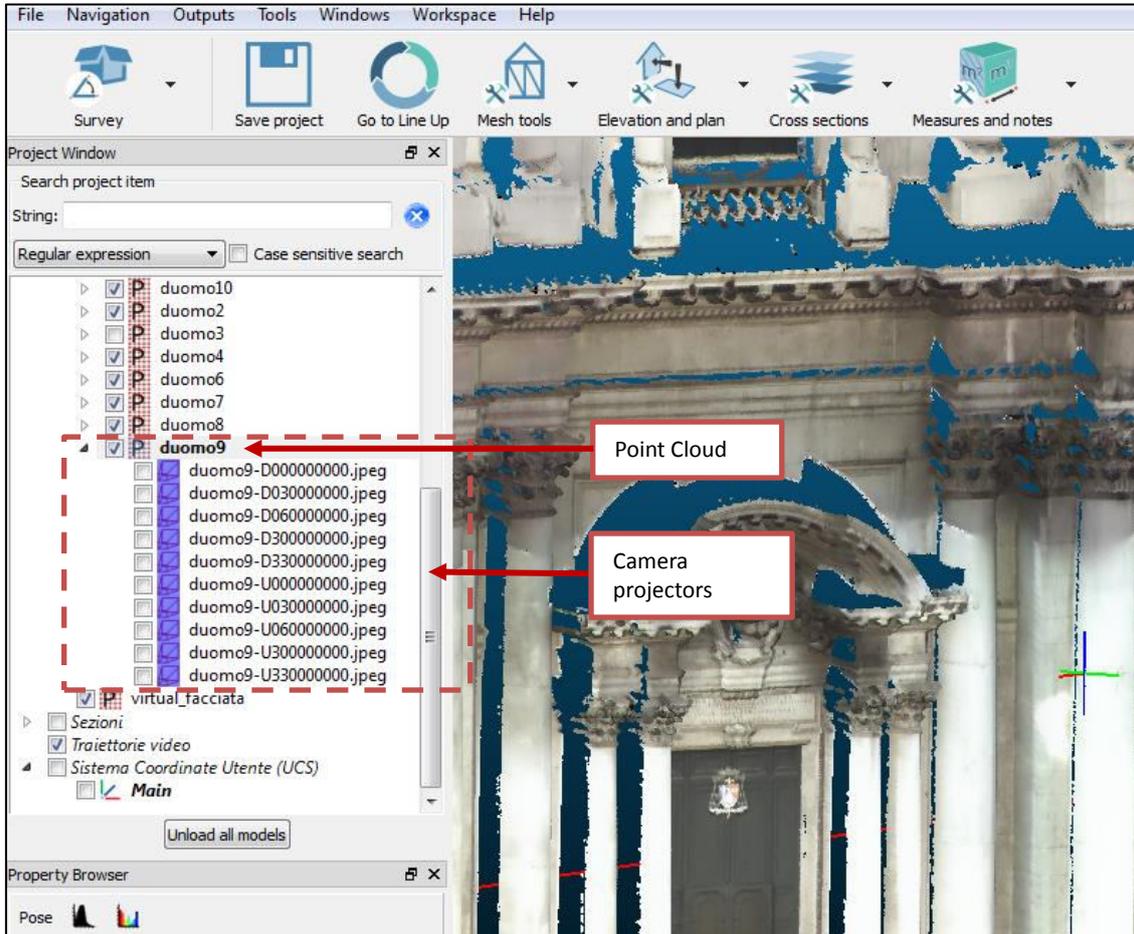
Press the **Import** button to import each scan separately.

e. Cancel

Press the **Cancel** button to abort the import process.

The program automatically creates the *camera projectors* related to the pictures and the *Grid Point Clouds* related to the scan data.

The colored model is loaded into the workspace.
The cameras are grouped under the scan.



4.3.4 Import the X300 multiple-scan point clouds

Multiple-scan automatic grouping is available from the v. 3.2 of Stonex Reconstructor. When a multiple-scan dataset is imported, Stonex Reconstructor automatically places the elements in a group with “children move together” registration property.

As consequence, all the scans inside the group are bound together and treated as a single object during the registration against other point clouds, making the procedure faster and less error-prone.

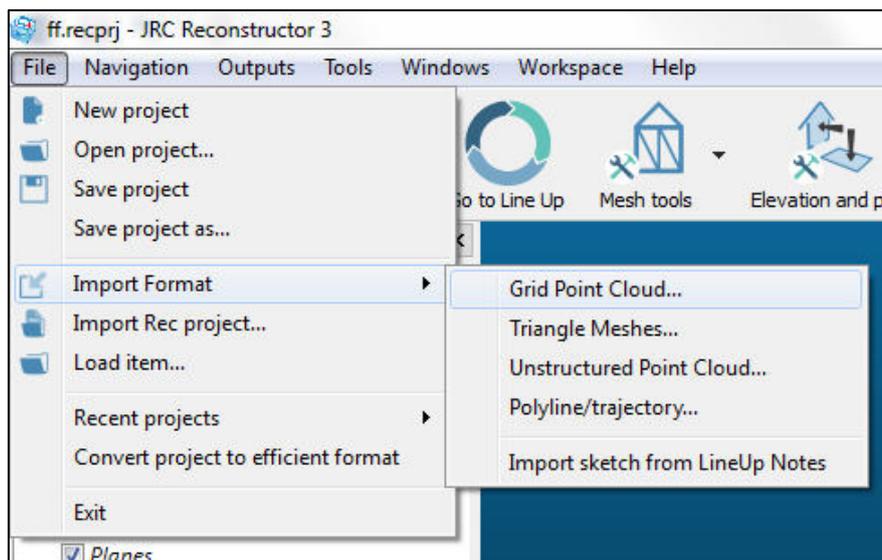
Previous versions of Stonex Reconstructor can import multiple-scan data as single scans. The group and the registration property can be manually set by users at the end of the import session.

Open Stonex Reconstructor from the Windows Program menu.

Select **New Project** to create empty workspace or **Open project** to continue an existing Reconstructor project. The import workflow is identical in both cases.



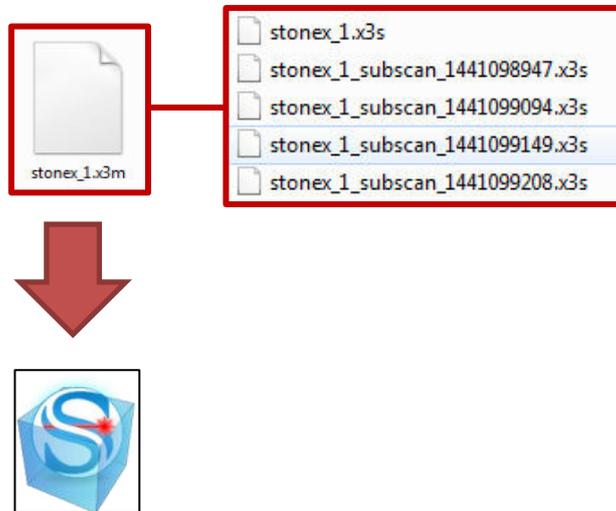
From the **File** menu, select **Import Format** and then **Stonex multiple scans (*.x3m)**.



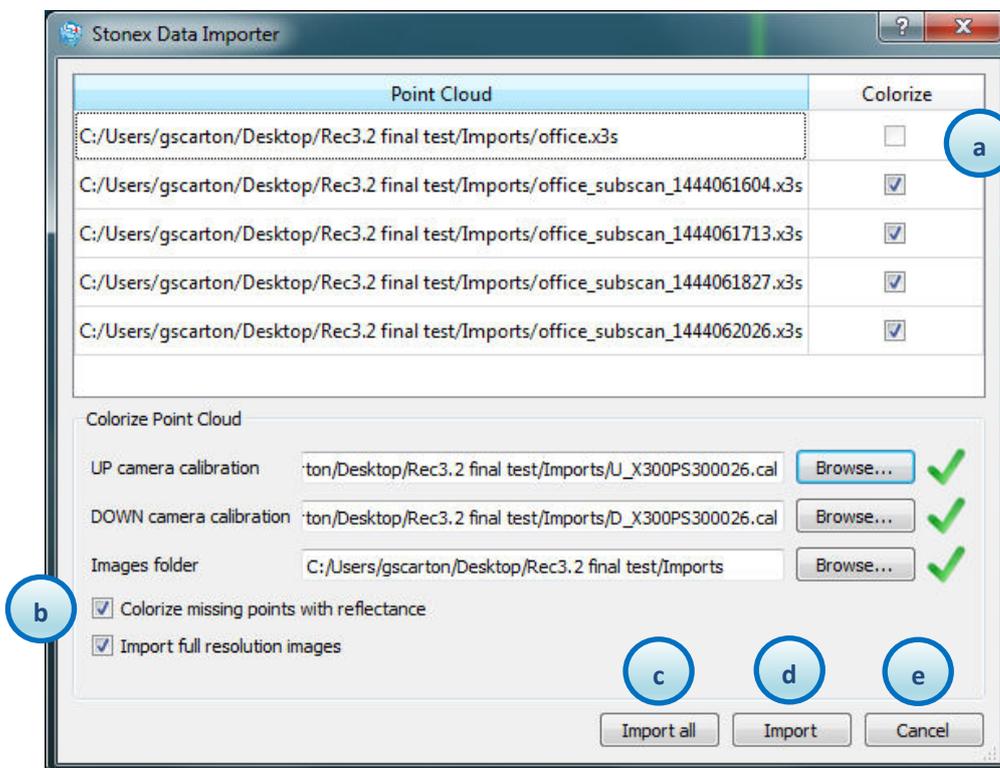
Browse the hard disk and select the **X3M** files to import.

The X3M files does not contain any point cloud data, it is a link to the multiple-scan dataset and must be placed in the same folder of the X300 raw data (x3s).

X3M files allows to import and group the multiple-scan dataset in the Stonex Reconstructor project window.



When you select the **X3M** file, the LINE UP Wizard will guide you through the import steps. A dialog will guide you also through the point clouds colouring (color blending).



a. Colorize Point Cloud

Activating this checkbox, the coloring of the point clouds with pictures will be enabled. The calibration files (*cal*) as well as the pictures are automatically loaded (if stored in the same folder of the x3s files).

b. Colorize missing point with reflectance

(enabled): points not covered by images are displayed with the original reflectance values.

(disabled): points not covered by images are converted to “black points” (points without reflectance value) that can be filtered out and deleted using the automatic filtering functions.

c. Import All

Press **Import all** to import all the selected scan in sequence.

d. Import

Press the **Import** button to import each scan separately.

e. Cancel

Press the **Cancel** button to abort the import process.

The program automatically creates a group with the same name of the reference scan and apply the “Children move together” registration property.

