# Leica BLK3D

- when it has to be **right**

Leica Geosystems

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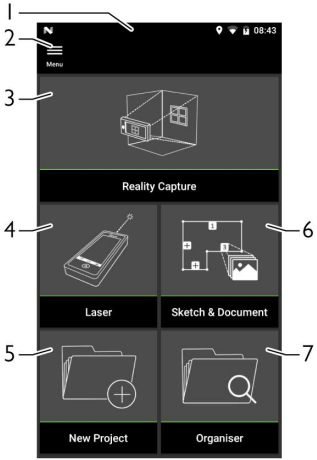
## Components

The Leica BLK3D is a remote measurement tool with a class 2 laser. It enables to measure distances within a picture at any time. See chapter Technical data for scope of use.

1. Measure
2. Touch screen
3. Back
4. Home
5. Measure
6. Recents
7. Camera
8. USB port protection lid
9. USB port
10. ON/OFF

## Home screen




1. Status bar
2. Side menu
3. Reality Capture
4. Laser
5. Sketch & Document
6. New Project
7. Organiser

## Distance measurement (ISO 163331-1):

| | |
|---|---|
| Accuracy with favourable conditions: * | ± 1.0 mm / 0.04 in *** |
| Accuracy with unfavourable conditions: ** | ± 2.0 mm / 0.08 in *** |
| Range with favourable conditions: * | 250 m / 820 ft |
| Range with unfavourable conditions: **** | 120 m / 394 ft |
| Smallest unit displayed: | 0.1 mm / 1/32 in |
| X-Range Power Technology™: | yes |
| Ø laser point at distances: | 6 /30 / 60 mm (10 / 50 / 100 m) |

## Tilt measurement:

| | |
|---|---|
| Measuring tolerance to laser beam: ***** | ± 0.2° |
| Measuring tolerance to housing: ***** | ± 0.2° |
| Range: | 360° |

* applies for 100 % target reflectivity (white painted wall), low background illumination, 25 ºC

** applies for 10 to 100 % target reflectivity, high background illumination, - 10 ºC to + 50 ºC

*** Tolerances apply from 0.05 m to 10 m with a confidence level of 95%. The maximum tolerance may deteriorate to 0.1 mm/m between 10 m to 30 m, to 0.20 mm/m between 30 m to 100 m and to 0.30 mm/m for distances above 100 m

**** applies for 100 % target reflectivity, background illumination of approximately 30'000 lux

***** after user calibration. Additional angle related deviation of +/- 0.01° per degree up to +/-45° in each quadrant.

## P2P measurement with DST 360 (optional):

| | |
|---|---|
| Working range vertical sensor: | -64° to > 90° |
| Accuracy vertical sensor up to: | +/- 0.1° |
| Working range horizontal sensor: | 360° |
| Accuracy horizontal sensor up to: | +/- 0.1° |
| Tolerance P2P function at distances<br>(combination of sensors and distance measuring) approx.: | +/- 2 mm / 2 m<br>+/- 5 mm / 5 m<br>+/- 10 mm /10 m |
| Levelling range: | +/- 5° |

## General:

| | |
|---|---|
| Dimensions (H x W x D): | 180.6 x 77.6 x 27.1 mm (7.11 x 3.06 x 1.07 in) |
| Weight (with rechargeable battery): | 480 g / 17 oz |
| Temperature range: | Storage: -25 to 60 °C / -13 to 140 °F<br>Operation: -10 to 50 °C / 14 to 122 °F<br>Charging: 0 to 40 °C / 32 to 104 °F |
| Tripod adapter: | supports 1/4-20 UNC screw adapters |

## Technology:

| | |
|---|---|
| Operating system: | Android 7 (Nougat) |
| Processor (with integrated GPU): | Snapdragon 820 QuadCore (2.2 GHz) |
| RAM Memory: | 4 GB |
| Real-time processor: | STM32F446 |
| Screen: | 5.0" IPS, HD 720x1280 LCD capacitive multi-touch screen, chemically strengthened, brightness: 450 cd/m2 |
| Stereo camera: | Pixels: 2 x 10 MP (15.8 cm diagonal base line)<br>Field of view: 80°<br>Focal length: 4.0 mm (22 mm in 35 mm equiv. in 1:1)<br>Aperture: F3.0 |
| DISTO™ camera: | Pixels: 2 MP<br>Field of view: 14° |
| I/O: | USB Type-C 1.0 for data transfer and charging (water-resistant), integrated speaker and microphone |
| Keyboard: | Three physical buttons (Power, DIST, Camera), four touch buttons (Back, Home, Recents, DIST) |
| Additional sensors: | Compass, 3D accelerometer and 3D gyroscope |
| Laser class: | 2 |
| Laser type: | 635 nm, < 1 mW |

## Storage:

| | |
|---|---|
| Internal storage: | 64 GB |
| Single shots: | 14000 pictures |
| Multi shots: | 5000 pictures |

## Communication:

| | |
|---|---|
| Bluetooth® Smart: | Bluetooth v4.1 and v2.1<br>Radiated power: 1.78 mW (BLE)<br>Radiated power: 10.00 mW (BT classic)<br>Frequency: 2402-2480 MHz |
| WLAN: | Standard: 802.11 b/g/n<br>Radiated power: 6.31 mW<br>Frequency: 2412-2462 MHz |
| GPS: | A-GPS and GLONASS |

## Power Management:

| | |
|---|---|
| Battery: | Rechargeable battery pack Li-Ion (3.80 V, 3880 mAh, 14.7 Wh) (included) |
| Power Management: | AC adaptor (input: 100-240 V AC) (included)<br>External charger (input: 100-240 V AC) (optional) |
| Charge time: | < 3.5 h (with AC adaptor)<br>< 5 h (with optional external charger) |
| Operating time: | Typical capture*: 4 h / 220 multi-shot captures<br>Continuous capture*: 2.5 h / 1000 single-shot captures<br>Laser measurements: 6.5 h / 9500 laser measurements<br>Auto power off: 3 h |

* Wi-Fi, Bluetooth® off, flash off, screen luminosity 50 %

## Introduction

The safety instructions (see Safety Instructions) and the user manual should be read through carefully before the product is used for the first time.

The person responsible for the product must ensure that all users understand these directions and adhere to them.

The symbols used have the following meanings:

### WARNING

Indicates a potentially hazardous situation or an unintended use which, if not avoided, will result in death or serious injury.

### CAUTION

Indicates a potentially hazardous situation or an unintended use which, if not avoided, may result in minor injury and/or appreciable material, financial and environmental damage.

Important paragraphs which must be adhered to in practice as they enable the product to be used in a technically correct and efficient manner.

## Charging Li-Ion battery

Charge batteries when battery icon in status bar is flashing and before using it for the first time. While charging, the device may heat up. This is normal and should not affect the device's lifespan or performance. If the battery gets hotter than 40°C / 104°F, the charger stops. At a recommended storage temperature of -20°C to +30°C (-4°F to +86°F), batteries containing a 50% to 100% charge can be stored up to 1 year. After this storage period the batteries must be recharged. To save energy, unplug the charger when not in use.

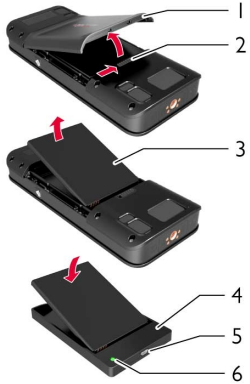
### CAUTION

Connecting the charger improperly may cause serious damage to the device. Any damage caused by misuse is not covered by the warranty. Use only Leica-approved chargers, batteries, and cables. Unapproved chargers or cables can cause the battery to explode or damage the device.

## Charge Li-Ion battery by USB port on the device

Use the provided USB-C cable to charge the BLK3D. Open the lid (1) and plug the cable into the port of the device (2). Plug the end of the USB-C cable into one of the provided adaptors. Select the appropriate one for your country. The device can also be charged connecting the USB-C cable to the computer, but this takes more time. If the device is connected to the computer via USB cable, you can download and upload data. During charging, the device cannot be used for measuring or acquiring images.

## Charge Li-Ion battery by USB charger (optional)




Remove battery cover (1) by opening the slider (2) from left to right. Remove battery (3) and place it into charger (4). Insert the USB cable into the port (5). Plug the charger into an electrical socket. Charging is completed when indicator light (6) turns green.

## Switching ON/OFF

### Switching ON

Press ON/OFF button (1) to switch device ON.

### Switching OFF

Press ON/OFF button (1) for at least 2 seconds to switch device OFF.

## Update

Connect the BLK3D to the internet via WiFi to get the latest updates.

## Using the touch screen

It is recommended to use fingers on the touchscreen. Do not allow the touch screen to come into contact with other electrical devices. Electrostatic discharges can cause the touch screen to malfunction. Do not allow the touch screen to get in contact with water. The touch screen may malfunction in humid conditions or when exposed to water. To avoid damaging the touch screen, do not tap it with anything sharp or do not apply excessive pressure to it with your fingertips.

### Tap

Tap on the display to open an application or to make a selection.

### Drag

Touch and hold object and drag it to the target position.

### Double tap

Double tap on image to zoom it. Double tap again to return.

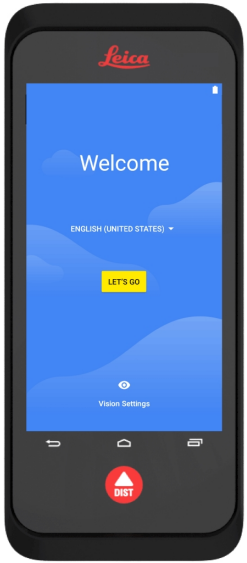
### Spread and pinch

Spread two fingers apart on image to zoom. Pinch to zoom out.

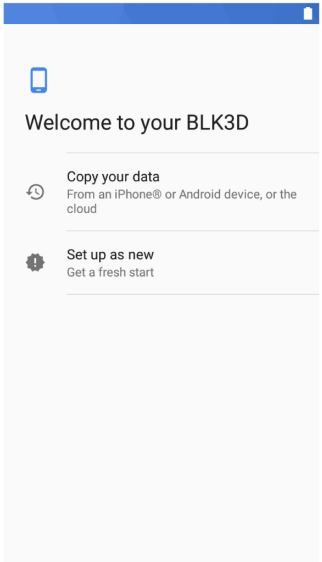
### Swipe

Swipe from left to right on the screen to scroll side Menu. Swipe downwards to scroll through options.

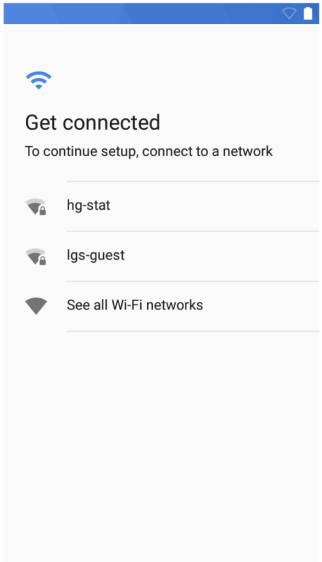
## Activation



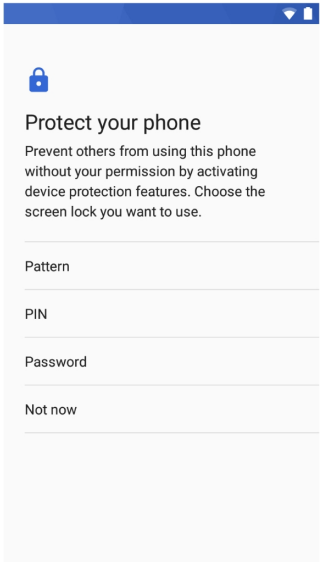

Select language for operating system.




Copy your data from another device or set up as new.

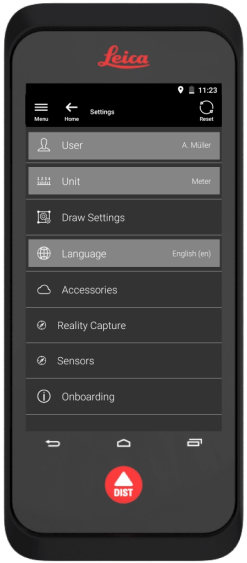



Connect to a WiFi network.

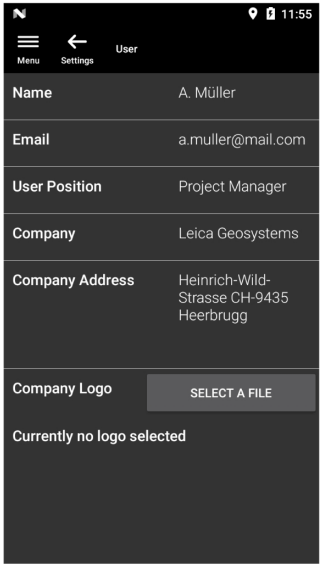



Protect your device with a PIN or a pass-word (optional).

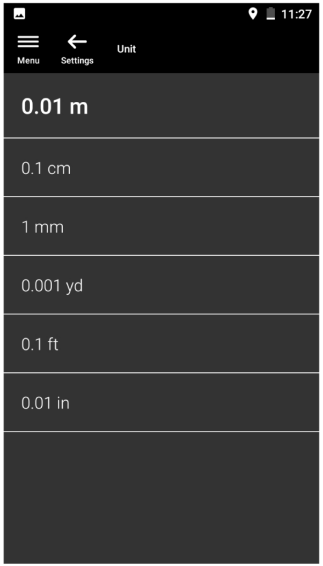
## Settings



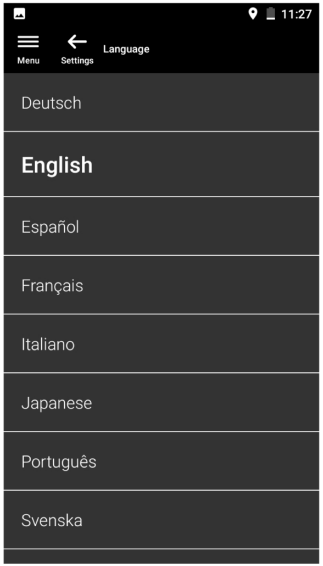

Select “Settings” menu.




Enter user data.




Select measurement unit.




Select language.

## 1. Take photo

1 Select "Reality Capture" function.

2 Choose between different settings:

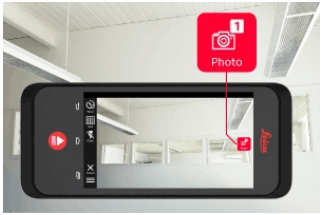
**Timer:** set a time delay for the photo acquisition.

**Grid:** show grid lines on display for better orientation.

**Flash:** set the flash ON/OFF.

**Cancel:** cancel last operation and go back to home screen.

**Menu:** show menu for main navigation.




3 Take a photo of the objects you want to measure.

4 To increase measurement accuracy take an additional photo from a slightly other perspective.

5 Review photos. Press "Remove" to delete unwanted photos and "Keep" to exit Review mode.

6 Go to Measure mode (see 2. Measure distances in photo).

**New:** Cancel and create new "Reality Capture" scene.

## 2. Measure distances in photo

1 Select "Distance". Place fingers on the edges of the object you want to measure. Spread fingers apart to enlarge the object.

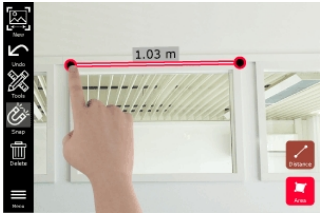
2 Tap a point on photo to start measuring process.

**Snap:** Automatic snap to edges in photo (activated by default).

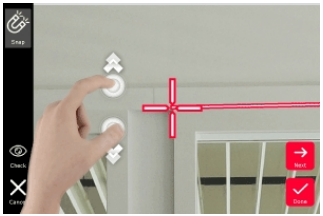
**Delete:** delete selected measuring point/line.

**Undo:** erase last operation.

3 Tap the second point. The measured distance is automatically shown above the line.



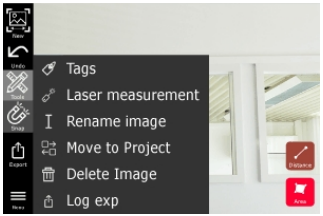

4 Tap on any measured point again to activate Precise mode.



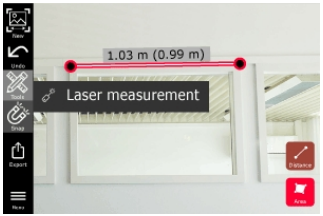
5 Drag and spread to precisely center the point you want to measure in the hair cross.

**Done:** confirm measuring point position.

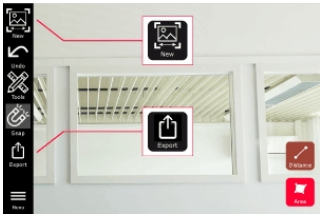
**Next:** jump the next measuring point for precise point selection.




6 Select Tools to add Tags, Rename or Delete scene, Move scene to a project (see Organiser), measure distances with Laser (see Laser).




7 Select a line and measure the distance with Laser. Laser measurement is shown in brackets (see Laser).



8 Choose different options:

**New:** exits Measure mode to take a new photo.

**Export:** export the scene in JPG or PDF format.

## 3. Measure areas in photo

1 Select "Area". Place fingers on the edges of the object you want to measure. Spread fingers apart to enlarge the object.

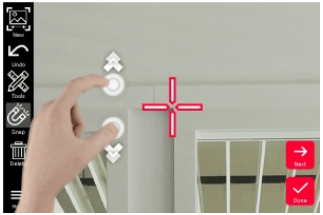
2 Tap a point on photo to start measuring process.

**Snap:** Automatic snap to edges in photo (activated by default).

**Delete:** delete selected measuring point/line.

**Undo:** erase last operation.

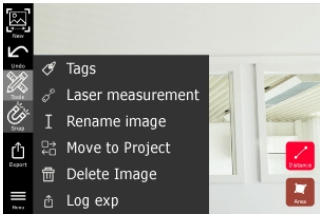
3 Tap on next measuring points to complete the area. Tap on any measured point again to activate Precise mode. Define more points to complete the area. Tap on any point to activate Precise mode.



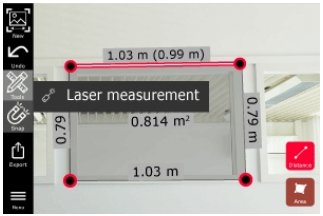
4 Drag and spread to precisely center the point you want to measure in the hair cross.

**Done:** confirm measuring point position.

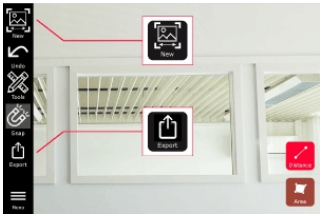
**Next:** jump the next measuring point for precise point selection.




5 Select Tools to add Tags, Rename or Delete scene, Move scene to a project (see Organiser), measure distances with Laser (see Laser).




6 Select a line and measure the distance with Laser. Laser measurement is shown in brackets (see Laser).

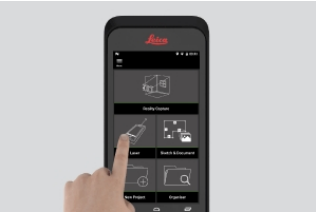


7 Choose different options:

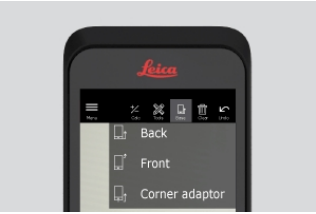
**New:** exits Measure mode to take a new photo.

**Export:** export the scene in JPG or PDF format.

## Distance

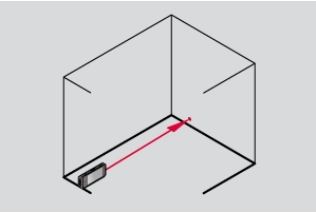


1 Select "Laser" function.



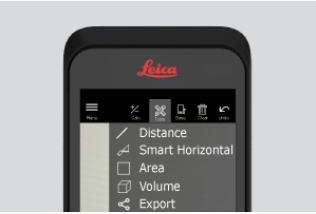

2 Adjust measuring reference:

**Back:** Distance is measured from the bottom of the device (default setting).
**Front:** Distance is measured from the top of the device.
**Corner adaptor:** Distance is measured from the corner adapter (optional).



3 Select "Distance" from "Tools". Aim laser at the target.

4 Press "Measure" button (see Overview). Measured distance is shown at the bottom of the screen.

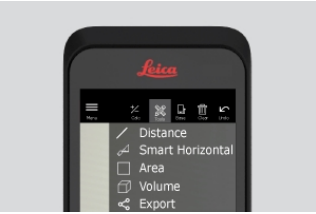



5 Select "Tools" to choose between different measurements (Distance, Smart Horizontal, Area and Volume) and export measurement into a PDF report.

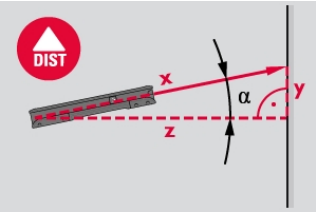
6 Select "Calc" and choose between "Add" and "Subtract". Take another Distance measurement to Add/Subtract to/from the previous one.

7 Swipe right to left to delete a single measurement, or select "Clear" to cancel the measurement list.

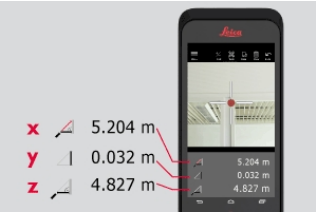
## Smart Horizontal




1 Select "Smart Horizontal" from "Tools". Adjust measure reference if needed.

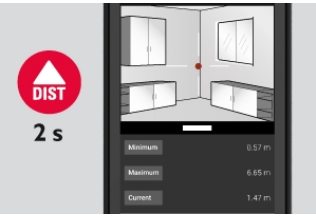



2 Aim active laser at target. Measure with "Measure" button.

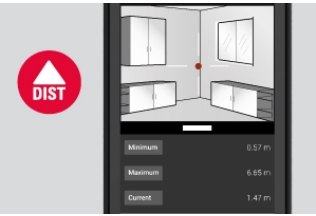



3 Vertical and horizontal distances are calculated.

## Tracking

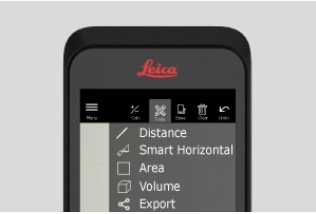



1 Press or "Measure" button for 2 seconds to activate tracking mode.

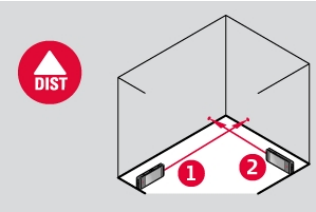



2 Press or "Measure" button again to finish the measurement.

## Area



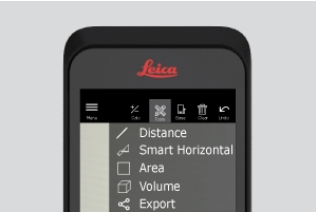

1 Select "Area" from "Tools". Adjust measure reference if needed.



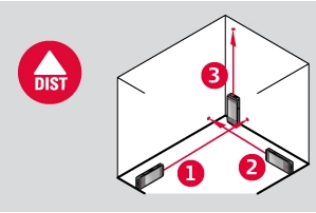

2 Measure two distances (length and width) with "Measure" button.

3 Circumference and Area are automatically calculated.

## Volume



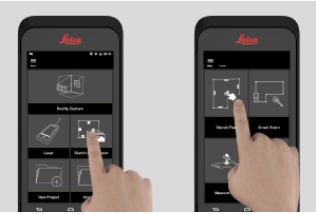

1 Select "Value" from "Tools". Adjust measure reference if needed.



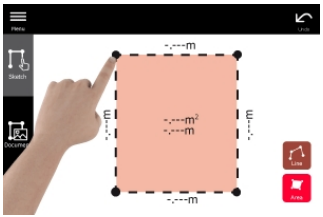

2 Measure three distances (length, width and height) with "Measure" button.

3 Area, Wall Area, Circumference and Volume are automatically calculated.

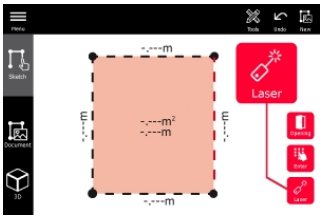
## Sketch Plan (Advanced)



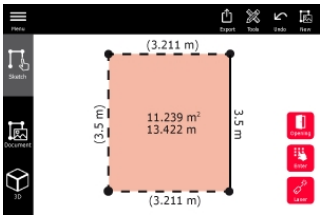
1 Select "Sketch Plan" function from "Sketch & Document" menu.



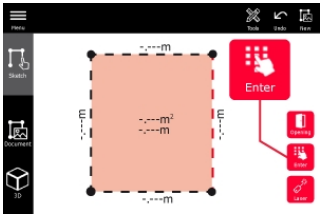
2 Select "Line" or "Area" and draw by dragging or tapping.



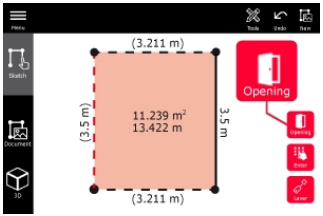

3 Select a line and press "Laser" to measure the length.



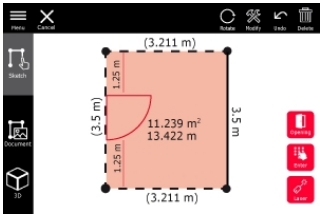

4 The sketch is automatically scaled. Calculated values are in brackets.



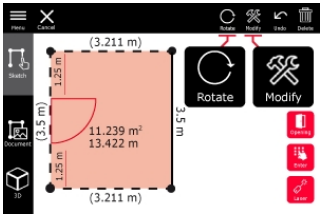

5 Alternatively select a line and press “Enter” to add length.



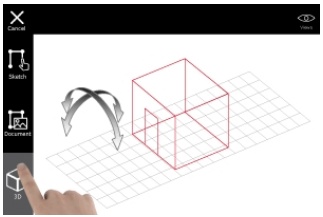

6 Select a line and press "Opening" to add doors or windows.



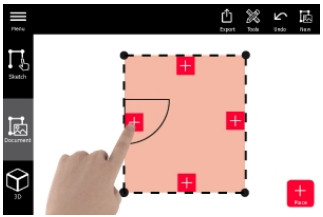

7 Drag the opening to move it or select the distance from the wall and measure it.



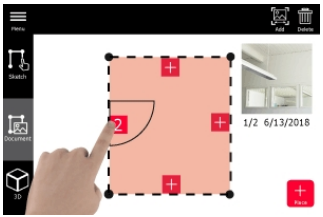

8 Select opening and press "Modify" to change type and enter width and height.



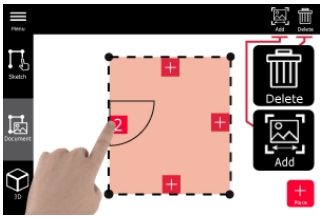
9 Switch to "3D" mode. A room height can be entered.



10 Switch to "Document" and select an empty placeholder to add Reality Capture scenes.

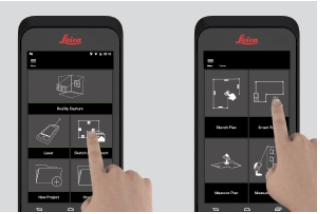



11 Select a placeholder to review the scenes. Press the scene preview to open it.

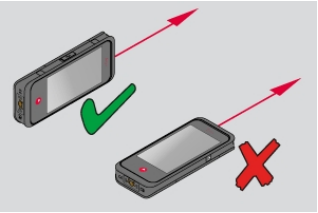



12 Select a placeholder to "Delete" or "Add" Reality Capture scenes.

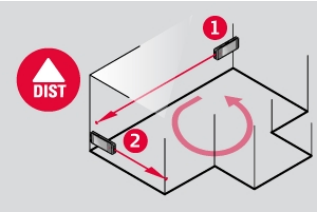
## Smart Room (Advanced)



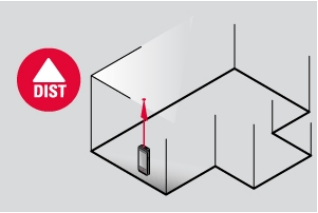
1 Select "Smart Room" function from "Sketch & Document" menu.



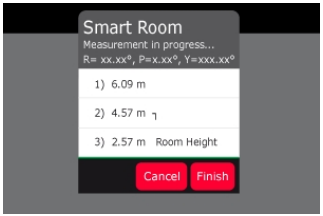
2 Keep screen oriented away from the wall while measuring.



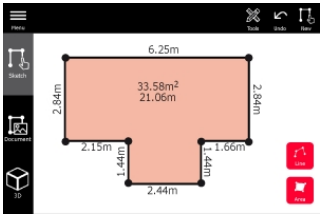

3 Measure room clockwise/anti-clockwise. Reverse measurements can be taken.




4 Room Height can be measured anytime.



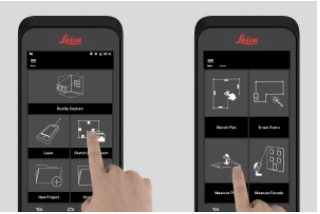

5 All measured values are displayed. After the last measurement press "Finish".



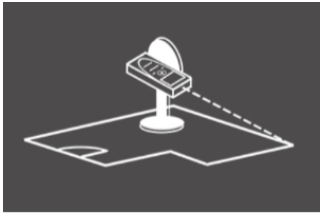

6 The floorplan can be modified in "Sketch" mode (see Sketch Plan).

## Measure Plan (Advanced)

1 Connect BLK3D to Leica DST 360 adapter.

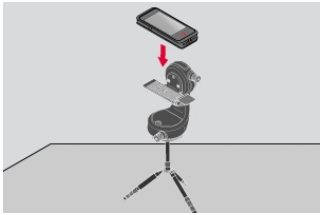


2 Select “Measure Plan” function from “Sketch & Document” menu.

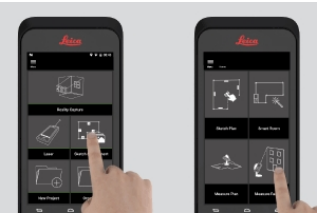


3 Measure lines, areas or points. Follow on-screen instructions.

## Measure Facade (Advanced)

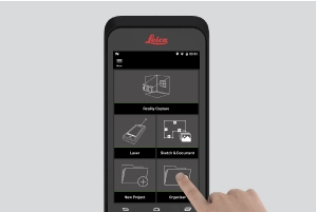


1 Connect BLK3D to Leica DST 360 adapter.



2 Select “Measure Facade” function from “Sketch & Document” menu.

3 Measure lines, areas or points on a facade. Follow on-screen instructions.

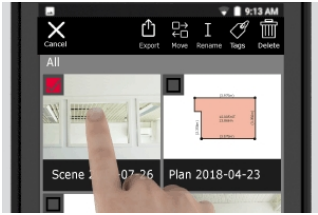


1 Select "Organiser" function.

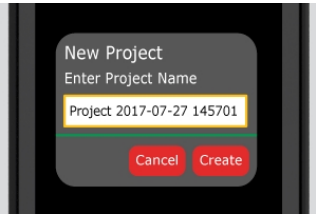
2 All the sketches and scenes are stored in four categories:

1. All
2. Projects
3. Scenes
4. Plans

3 Open the category "All". All the plans, Reality Capture scenes and projects are stored.



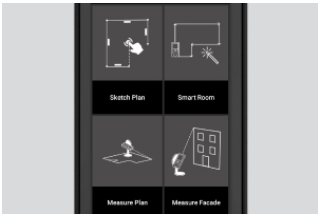

4 Use the "Select" button to select an item. Different actions are available: Export, Move to Project, Rename, Tag and Delete.




5 Open the category "Projects". Press the "Project" button to create a new Project folder. Plans and scenes can be moved in project folders.

6 Open the category "Scenes". All the Reality Capture scenes are stored. Press "RC" button to add a new scene.

7 Open the category "Plans". All the plans, including plans with scenes attached, are stored.




8 Press "S&D" button to add a new plan.

- Clean the device with a damp, soft cloth.
- Never immerse the device in water.
- Never use aggressive cleaning agents or solvents.

## International Limited Warranty

The Leica BLK3D comes with a two year warranty from Leica Geosystems AG. To receive an additional year warranty, the product must be registered on our website at http://myworld.leica-geosystems.com within eight weeks of the purchase date.

If the product is not registered, our two year warranty applies.

More detailed information about the International Limited Warranty can be found on the internet at: www.leica-geosystems.com/internationalwarranty.

The person responsible for the instrument must ensure that all users understand these directions and adhere to them. The product is permitted to use for skilled persons only.

## Symbols used

The symbols used have the following meanings:

**WARNING**

Indicates a potentially hazardous situation or an unintended use which, if not avoided, will result in death or serious injury.

**CAUTION**

Indicates a potentially hazardous situation or an unintended use which, if not avoided, may result in minor injury and/or appreciable material, financial and environmental damage.

Important paragraphs which must be adhered to in practice as they enable the product to be used in a technically correct and efficient manner.

## Permitted use

- Capture interactive images
- Measure in interactive images
- Measure distances
- Tilt measurement
- Point to point measurement
- Data transfer with Bluetooth®/WLAN
- 2D/3D CAD export

## Prohibited use

- Using the device for the first time without reading instructions
- Using the device outside the stated limits of use (see section Limits of use)
- Deactivating safety systems and removing explanatory and hazard labels
- Opening of the equipment by using tools (screwdrivers, etc.)
- Using not approved accessories from other manufacturers
- Deliberate dazzling of third parties; also in the dark
- Using the device in surveying sites with inadequate safeguards
- Deliberate or irresponsible behaviour on scaffolding, when using ladders, when measuring near machines which are running or near parts of machines or installations which are unprotected
- Aiming directly in the sun

## Hazards in use

**WARNING**

Watch out for erroneous measurements if the instrument is defective or if it has been dropped or has been misused or modified. Carry out periodic test measurements. Particularly after the instrument has been subject to abnormal use, and before, during and after important measurements.

**CAUTION**

Never attempt to repair the product yourself. In case of damage, contact a local dealer.

**WARNING**

Changes or modifications not expressly approved could void the user´s authority to operate the equipment.

**CAUTION**

Only use chargers recommended by the manufacturer to charge the batteries.

## Limits of use

Refer to section Technical data. The device is designed for use in areas permanently habitable by humans. Do not use the product in explosion hazardous areas or in aggressive environments.

## Areas of responsibility

### Responsibilities of the manufacturer of the original equipment:

Leica Geosystems AG
Heinrich-Wild-Strasse
CH-9435 Heerbrugg
Internet: www.leica-geosystems.com

The company above is responsible for supplying the product, including the User Manual in a completely safe condition.

The company above is not responsible for third party accessories.

### Responsibilities of the person in charge of the instrument:

- To understand the safety instructions on the product and the instructions in the User Manual.
- To be familiar with local safety regulations relating to accident prevention.
- Always prevent access to the product by unauthorised personnel.

## Disposal

**CAUTION**

Flat batteries must not be disposed of with household waste. Care for the environment and take them to the collection points provided in accordance with national or local regulations.

The product must not be disposed with household waste. Dispose of the product appropriately in accordance with the national regulations in force in your country. Adhere to the national and country specific regulations.

Product specific treatment and waste management can be downloaded from our homepage.

## Electromagnetic Compatibility (EMC)

**WARNING**

The device conforms to the most stringent requirements of the relevant standards and regulations. However, the possibility of causing interference in other devices cannot be totally excluded.

## FCC statement (applicable in U.S.)

This equipment has been tested and found to comply with the limits for a Class B digital instrument, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

This device complies with part 15 of the FCC rules. Operation is subjected to the following two conditions:

- This device may not cause harmful interference, and
- this device must accept any interference received, including interference that may cause undesired operation.

### FCC Radiation Exposure Statement

The radiated rf output power of the instrument is below the FCC radio frequency exposure limits for portable devices according to KDB 447498.

## ISED Statement (applicable in Canada)

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

- This device may not cause harmful interference, and
- this device must accept any interference, including interference that may cause undesired operation of the device.

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

- l'appareil ne doit pas produire de brouillage;
- l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

### Radio Frequency (RF) Exposure Compliance Statement

The radiated rf output power of the instrument is below the Health Canada's Safety Code 6 exclusion limit for portable devices (radiated element separation distance between the radiating element and user and/or bystander is below 20 cm).

## Japanese Radio Law and Japanese Telecommunications Business Law Compliance

This device is granted pursuant to the Japanese Radio Law (電波法) and the Japanese Telecommunications Business Law (電気通信事業法).

## Regulatory

Regulatory information, certification, and compliance marks are available on BLK3D. Go to Android Settings > About phone > Regulatory labels.

## Use of the product with Bluetooth®

⚠ WARNING

Electromagnetic radiation can cause disturbances in other equipment, in installations (e.g. medical ones such as pacemakers or hearing aids) and in aircraft. It can also affect humans and animals.

### Precautions:

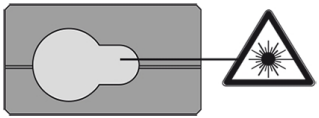
Although this product conforms to the most stringent standards and regulations, the possibility of harm to people and animals cannot be totally excluded.

- Do not use the product near petrol stations, chemical plants, in areas with a potentially explosive atmosphere and where blasting takes place.
- Do not use the product near medical equipment.
- Do not use the product in airplanes.
- Do not use the product near your body for extended periods.

## Laser classification

The device produces visible laser beams, which are emitted from the instrument: It is a Class 2 laser product in accordance with:

- IEC60825-1 : 2014 „Radiation safety of laser products“



### Laser Class 2 products:

Do not stare into the laser beam or direct it towards other people unnecessarily. Eye protection is normally afforded by aversion responses including the blink reflex.

### ⚠ WARNING

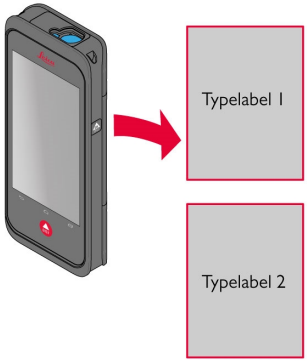
Looking directly into the beam with optical aids (e.g. binoculars, telescopes) can be hazardous.

### ⚠ CAUTION

Looking into the laser beam may be hazardous to the eyes. Don't dazzle other individuals. Pay particular attention to the direction of the laser beam when remotely operating the product via an app or software. A measurement could be triggered at any time.

| |
|---|
| Wavelength |
| 655 nm |
| Maximum radiant output power for classification |
| 0.95 mW |
| Pulse duration |
| 400 ps |
| Pulse repetition frequency |
| 320 MHz |
| Beam divergence |
| 0.16 x 0.6 mrad |

## Labelling




Subject to change (drawings, descriptions and technical data) without prior notice.