Artec Leo
USER GUIDE

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This manual will show you how to get started with Artec Leo, prepare objects and scan them. Use the left panel to get an overview of the entire manual, or consult the genindex page to find references for various topics. Also review the *terms* we use throughout.

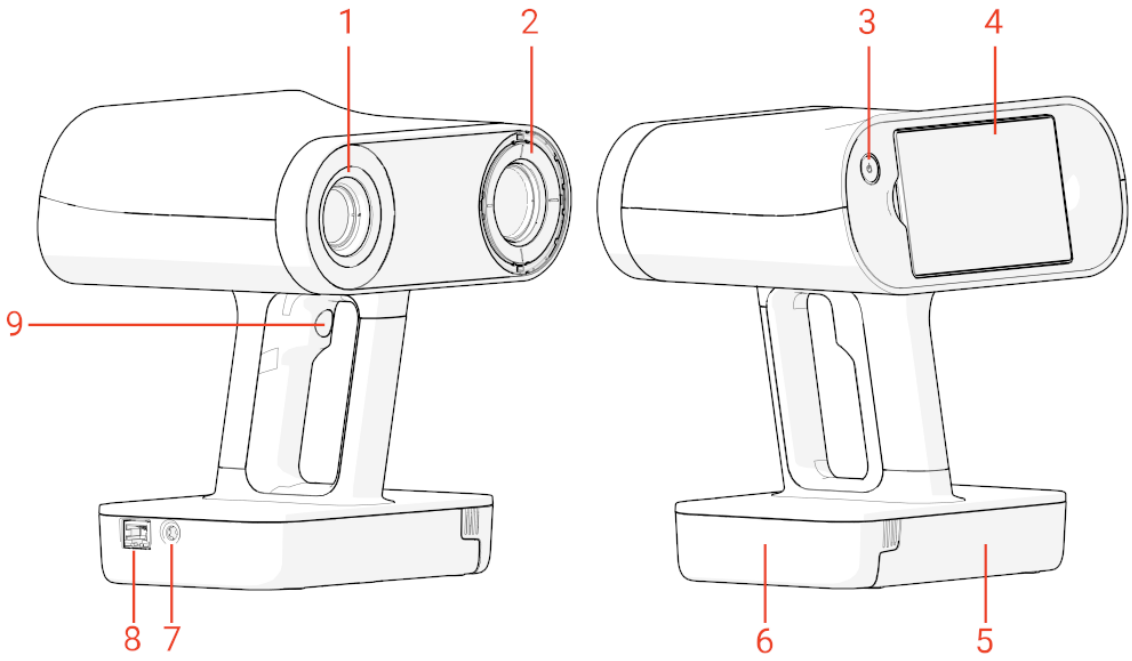
Quick Start Guide

In addition to this manual, you can find practical tips in the Quick Start Guide for Leo that comes with the scanner.

Meet Leo

Artec Leo is a completely self-inclusive scanner with a built-in computing unit, display and battery. Designed for a next-generation user experience, it allows user to:

- Scan various objects with ease
- See the model in real time



1. Camera with flash-bulb ring
2. Projector
3. Power button
4. Tiltable display
5. Battery housing
6. Battery compartment lid
7. Power port
8. Ethernet port
9. Start/Stop button on the handle

Specifications are available at Artec website.

Status Icons

	Wireless network signal level
	No Internet
	Wired connection is being used
	Battery charge level
	Battery is charging
	Internal storage capacity
	*Screen casting* is enabled
	*Support access* is enabled
	Scanner temperature is high

Glossary

Below are the terms used throughout this manual.

See also:

genindex

Addition An iteration of continuous scanning resulted in recording 3D data to the existing scan (see *Project Structure*).

Base Surface which supports an object that is being scanned. The most common supporting surfaces are the floor and table.

DC cable Cable that connects the scanner with the power adapter. DC stands for direct current.

Preview Scanner state in which it reconstructs and displays surfaces on the screen, but doesn't record them.

CHAPTER

ONE

FIRST STEPS WITH LEO

Setting up Artec Leo is easy and includes the following steps:

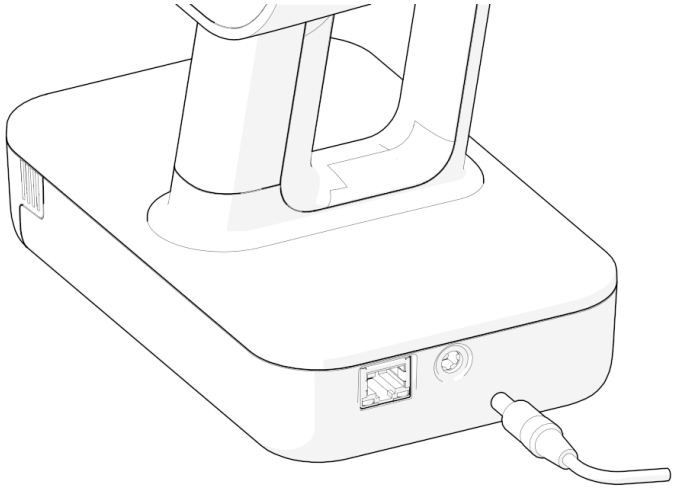
1.1 Turn On

1. Take Leo out of the case and place it vertically on a flat rigid surface.
2. Press the power button button near the screen (see *Meet Leo*, 3).
3. If the scanner hasn't booted up, try plugging it to the power adapter.

Note: When you turn on the Leo scanner later after its activation, you may be prompted to enter a password. This happens if *storage encryption* has been previously enabled.

1.1.1 Plug In Power Adapter

1. Get familiar with the *safety recommendations*.
2. Plug the Leo DC-cable into the round port on scanner base.



Caution: Never use DC cables and adapters designed for other Artec scanners (Eva, Spider, etc.)

3. Connect the power cord to the power adapter.
4. Plug the power cord into the power outlet.

1.2 Read License Agreement

Once the scanner is turned on, it will show the greeting screen with the license agreement. Read it carefully and, if you agree to the terms, *Accept* it.

1.3 Connect to the Internet

The initial Leo activation requires an Internet connection; afterwards, you can use the scanner offline.

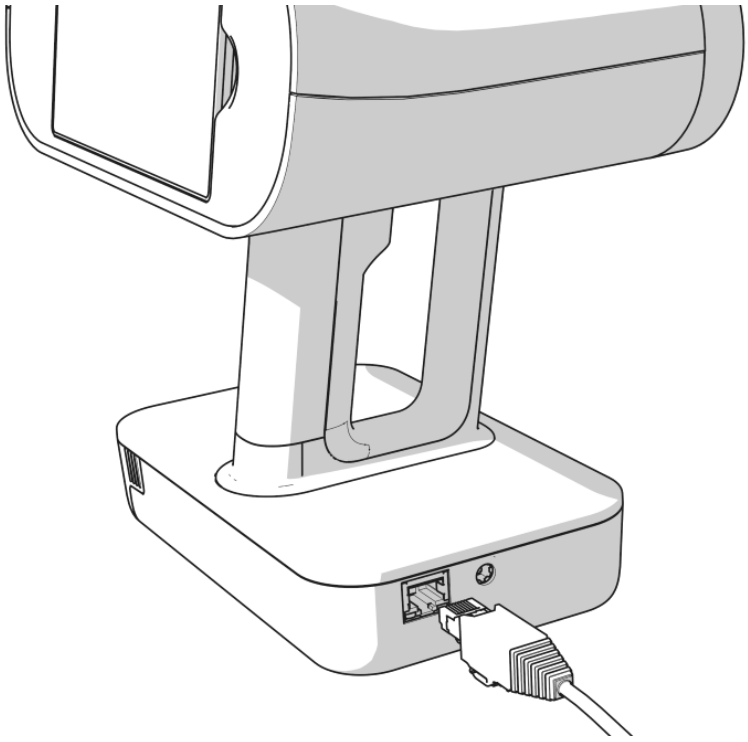
1.3.1 Wi-Fi

To connect to a Wi-Fi network,

1. Wait for the required network to appear in the list.
2. Tap the network that you intend to join.
3. Enter the password (key) for this network and tap *Connect*. Once you are connected to a Wi-Fi network, icon  will appear in the top status bar.

1.3.2 Wired Connection

To create a wired connection, plug the Ethernet cable into the scanner as the figure depicts. If the network is configured as DHCP, the connection will be established automatically and icon  will appear in the top status bar.



1.4 Activate Leo

To activate your Leo, you need a valid account at *my.artec3d*. Use the account your Artec reseller registered for you, or create a new account using either a mobile device or a computer.

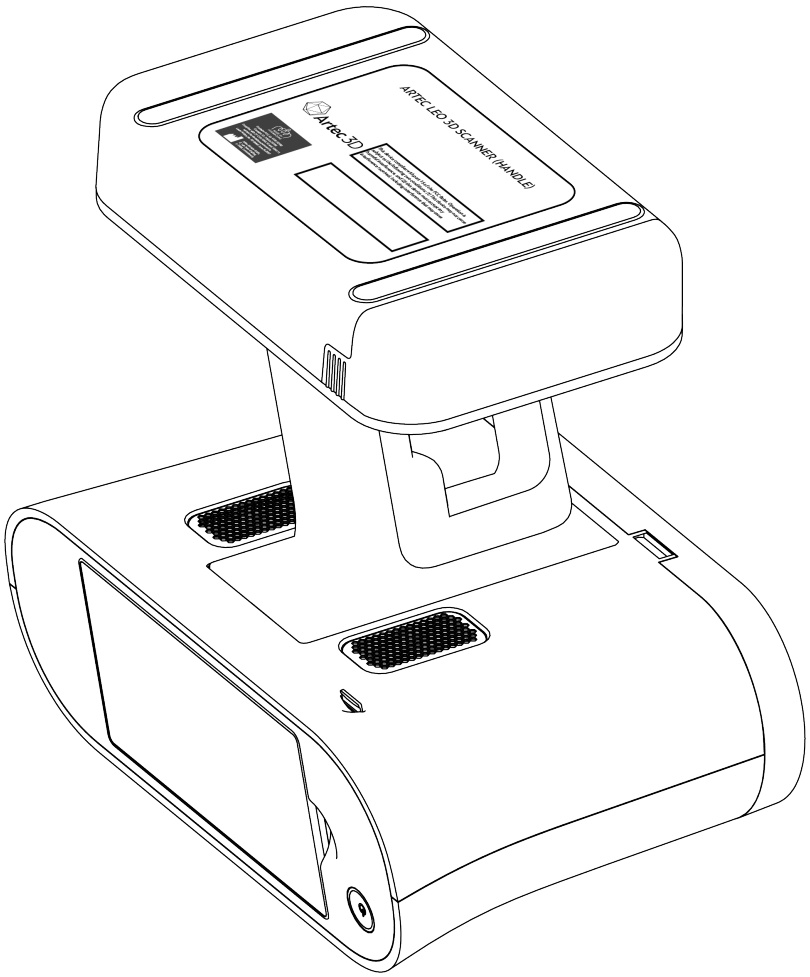
1. In the *Network* screen, tap *Next*.
2. Enter your email for *my.artec3d*.

3. Tap *Next*.
4. Enter your password and tap *Next*.
5. In the new dialog that appears, enter a *name for your Leo*.
6. Tap *Done*.

Your Leo is now ready for operation.

1.5 Apply Serial Number Sticker

The envelope that comes with Leo scanner contains the serial number sticker. Place it on the underside of your Leo battery housing.



1.6 Before You Start

Before using the scanner, remove the protective film from the front panel. Scanning with the film attached may affect data quality.

1.7 Select Artec Studio Version

Some new features of Leo may be incompatible with older versions of Artec Studio. To prevent situations where Leo project is not supported by the currently installed version of Artec Studio, Leo will show the modal for selecting the Artec Studio version on the first launch.

You can switch to a different version of Artec Studio later in the *Settings* → *Scanner* → *Advanced* under *Artec Studio version* section.

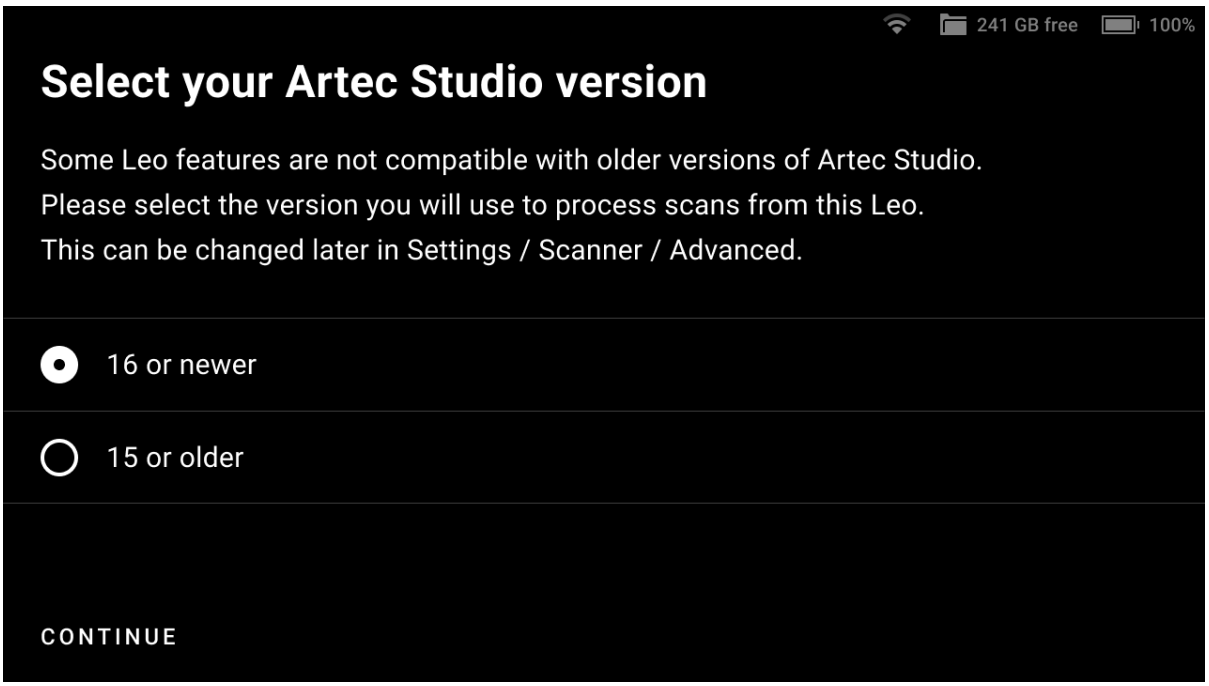


Figure 1: Select Artec Studio version on your first launch.

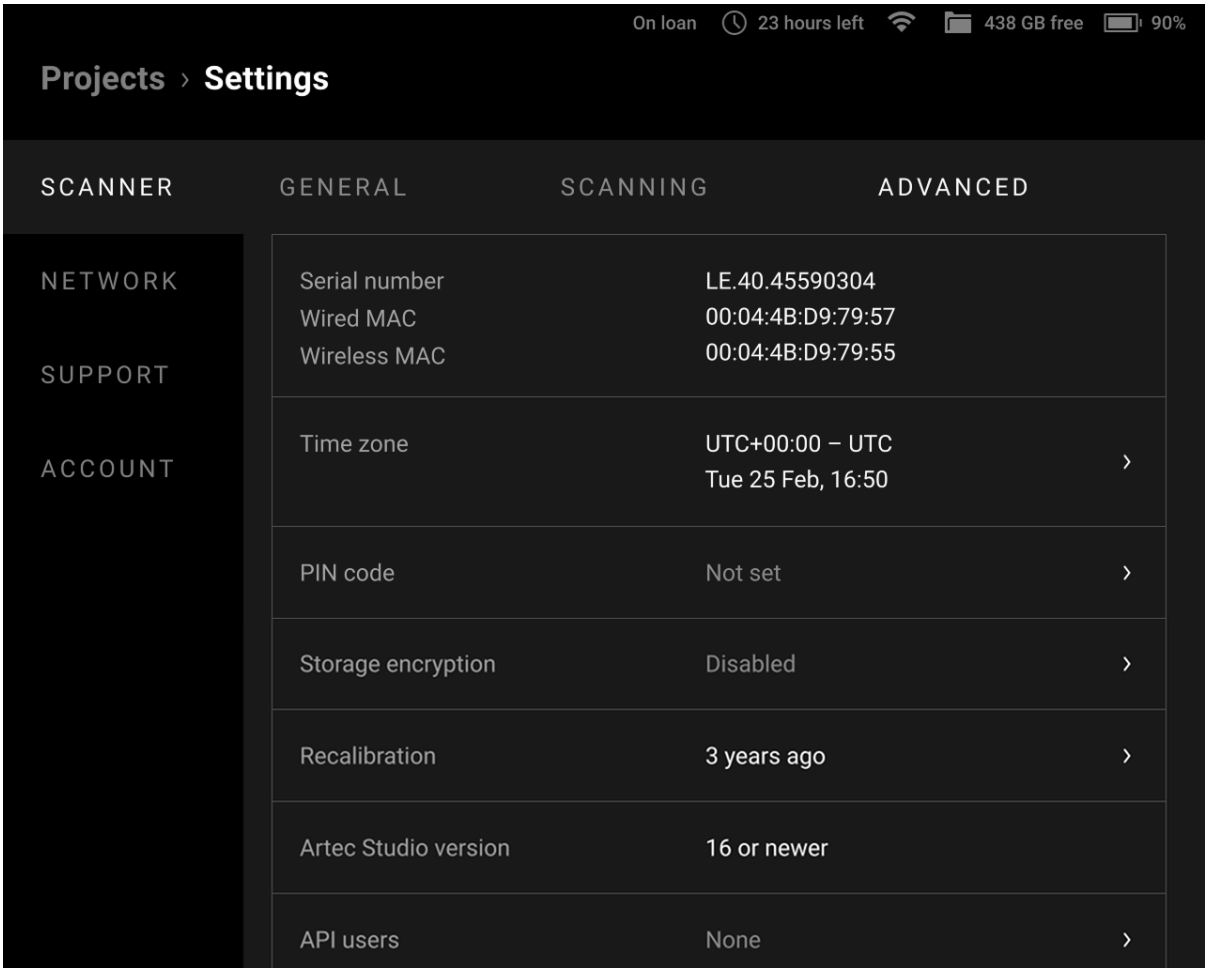


Figure 2: Change the Artec Studio version in the Advanced Settings.

CHAPTER

TWO

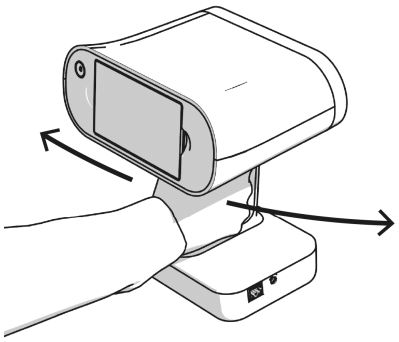
SCAN

2.1 Prepare

Since Artec Leo is a self-inclusive device featuring computing and graphics processing units, you don't need to connect it to a PC running Artec Studio while scanning. A built-in *tiltable display* allows you to focus on scanning and eliminates the need to have a laptop in your hands.

You may want to use Artec Studio later to *process* the scanned data.

Caution: Always grip the scanner by its handle; use your other hand for extra support when necessary.



2.1.1 About Color Overlays

Leo colors the scene that it scans. This coloring, or overlay can be made on the basis of:

- *Scan sufficiency*
- *Distance to the object*.

2.1.2 About Tiltable Display

When scanning particular objects or regions, you may need to tilt or rise your Leo scanner. In this case, the display content may disappear from your sight. What comes in handy is the ability to tilt the display to observe the scanning scene:

1. Put your fingers into the finger recesses near the display.
2. Drag both ends of the display to tilt it down.

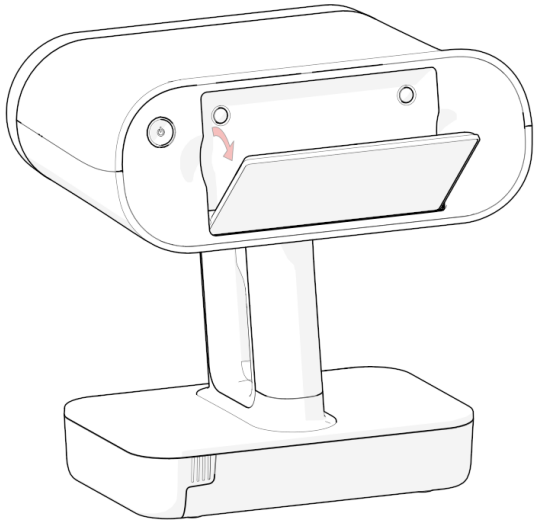


Figure 3: Tilting the scanner display.

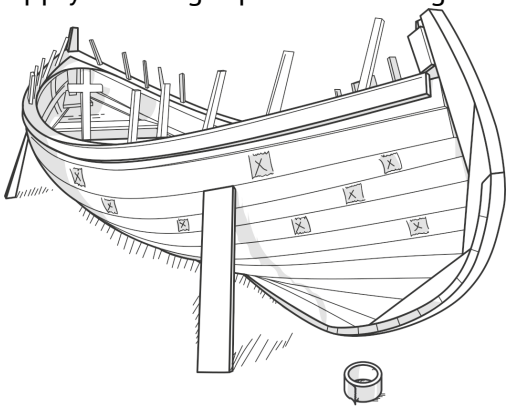
To broaden your user experience with displaying 3D content, you may as well *employ an external mobile device*.

2.1.3 Prepare Object and Surroundings

Before scanning, ensure that the objects meet the following requirements:

- They must be stationary.
- They should have geometry and/or texture features.
- They should have no black, transparent or reflective surfaces.
- They should be uniformly lit.
- There is enough space around the object for you to scan it.

If the object doesn't meet all the requirements, it can still be scanned. You may need to prepare its surface (see the table below).

Transparent, shiny, reflective	Dust with anti-glare spray 
Thin, fine or repetitive features	Apply masking tape to the background and/or draw X's on it 
Black glossy	Dust with anti-glare spray
Black matte	Increase *Texture brightness*

Note: In the HD mode, you can capture dark or shiny surfaces in high resolution, in their original shape and with no extra steps. See *HD Mode & HD Reconstruction* for details.

2.1.4 About Targets

Typically, a target is a round sticker that has a black ring with a white circle in the center. The targets are placed on the object being scanned to ease identification of the various regions. Using the target-assisted scanning allows you to scan larger areas in one session, improve the accuracy of captured surfaces and boost productivity by reducing postprocessing time. You do not need to align the scanned surfaces after scanning, so you can immediately proceed to fusion (see Artec Studio Manual for details). The only downside of this method is the necessity of preparation.

To enable the target-assisted scanning with Leo, you need to perform the following steps:

1. Prepare a special target file in the `OBC` format that contain the coordinates of the targets. Such a file can be obtained, for example, by means of the *Scan Reference* kit (see Scanning with photogrammetry for details). Note that starting from the 1.8 version Leo is able to work with sparse target data.

2. Upload the target file to Leo and make it a default one (see *Enable Target-Assisted Scanning* for details).

After that, you can proceed to the *Target-Assisted Scanning*.

2.2 Scan

To start a new scan,

1. Tap *New project* or press the start/stop button . Artec Leo will start preview, i.e. building surfaces without recording them.
2. Adjust either *parameter* as necessary.
3. Direct the scanner at the object.
4. Practice your movements and assess the quality of the surface being reconstructed on the screen.
5. Once you're ready, tap or press the start/stop button .
6. Scan the object from all possible sides.
7. Tap or press the start/stop button .
8. Rotate or turn the object upside down to scan the missing regions (go to step 3).
9. Tap in the upper-left corner if you are done with the scan.

Once you have recorded a scan, it is added to the project (see *Project Structure*).

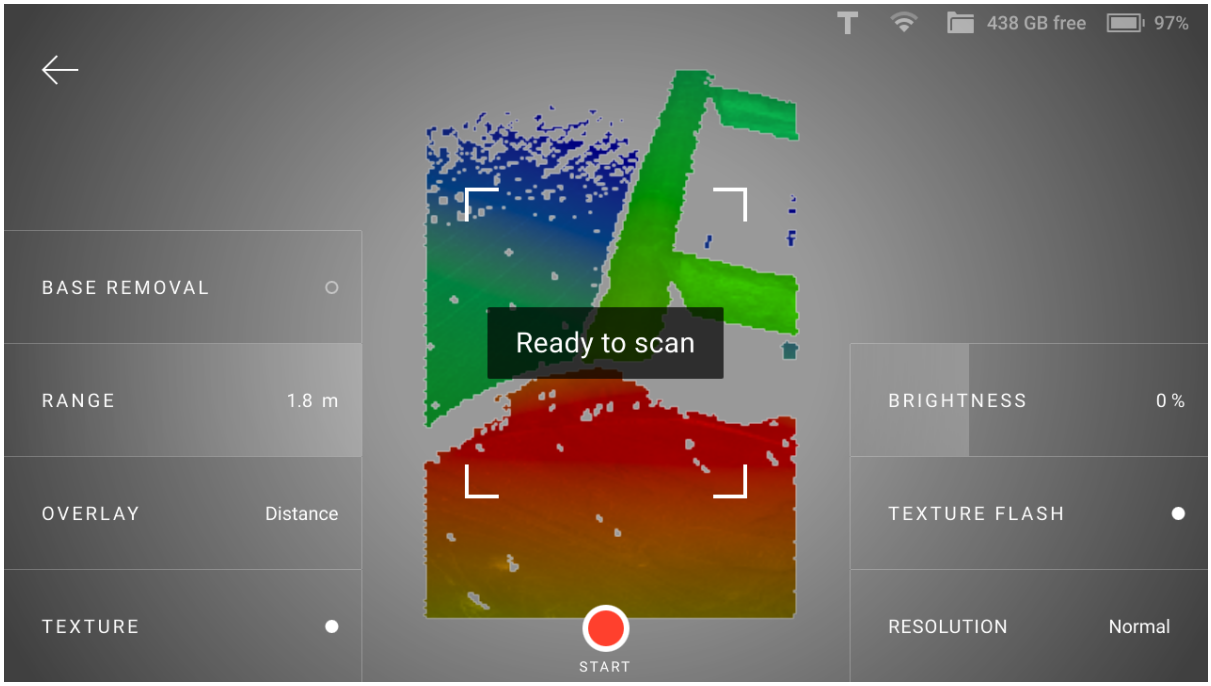


Figure 4: Scan screen.

2.2.1 Losing and Resuming Tracking

As you move the scanner, it captures a series of frames. Leo uses features in overlapping areas of these frames to automatically align them. This process is called tracking. If Leo becomes unable to continue building an object surface, it enters the tracking lost mode. It may happen, if:

- You move the scanner very fast.
- Scanner's field of view contains insufficient surface area.

Leo in the lost tracking mode displays message: *Point at scanned area*.

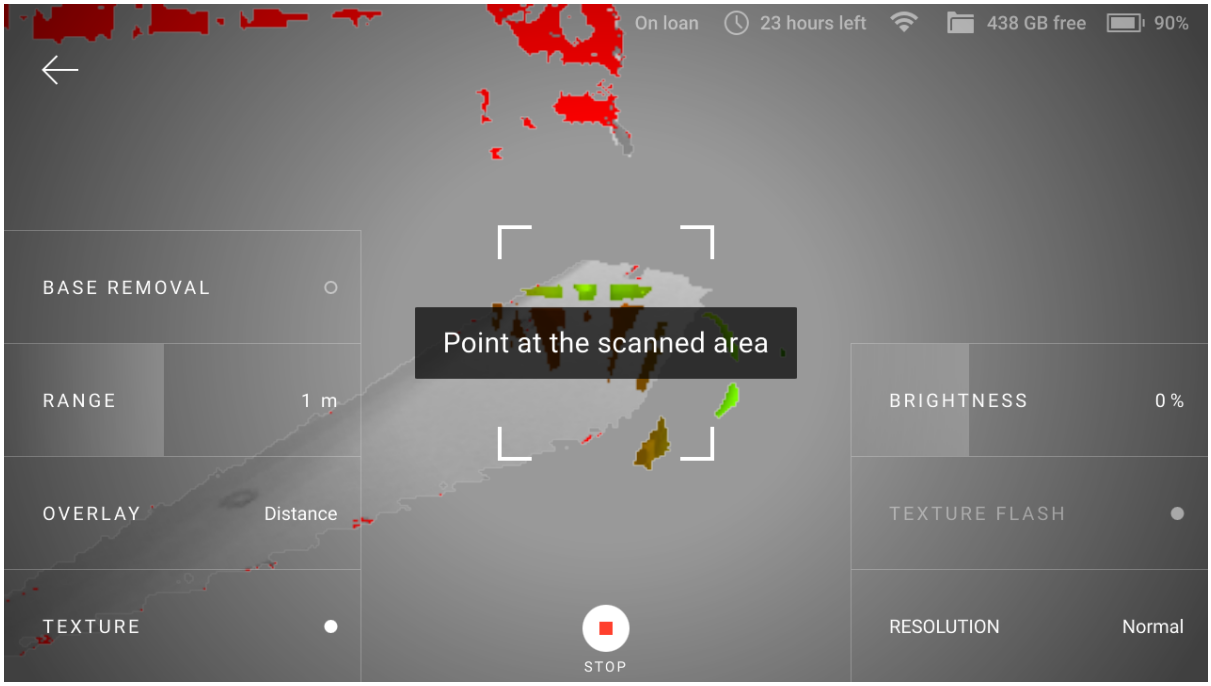


Figure 5: Tracking lost.

2.2.1.1 Resume Scanning

To resume scanning,

1. Direct the scanner at a region you've already captured, maintaining the original scanner orientation toward this region.
2. If Leo recognizes the region, it will display the *Ready to scan* message and correctly orient the scene on the screen.
3. Press the start/stop button to continue recording. Leo will continue recording data in a new *addition*.

Alternatively, you can enable Leo to automatically continue scanning after tracking is lost and restored. To enable this:

1. Go to *Settings* → *Scanner* → *Scanning*

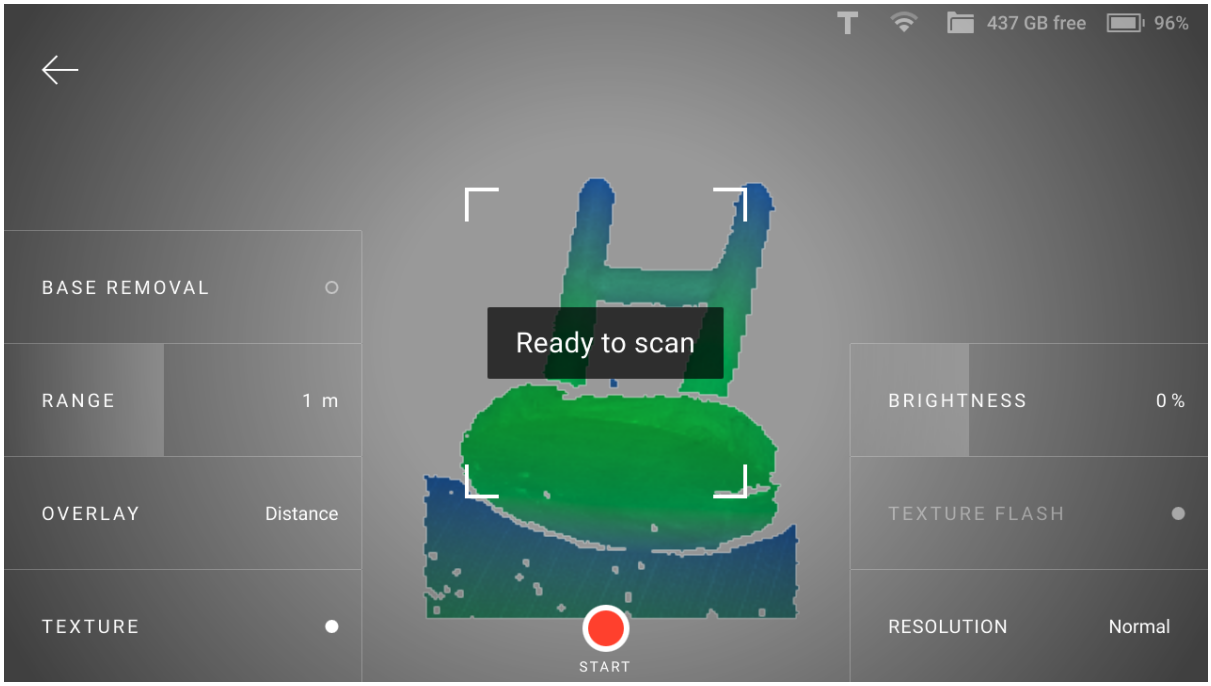


Figure 6: Leo has recognized the region and is ready to continue scanning.

2. Turn on the *Start scanning when tracking found* toggle.

This setting allows the scanner to automatically continue recording data, after you bring the scanner back to a recognizable region (i.e., after tracking is restored). You don't have to to press for confirmation.

2.2.2 Pause and Resume Scan

While scanning, you may need to pause capturing for various reasons. Press the start/stop button to this end.

There are two ways to resume your scan:

- *Addition*
- *New Scan in Project*

2.2.2.1 Addition

If you want to continue scanning the same scene, create a new *addition* to a scan. A successfully created addition will be aligned with the previously captured 3D data.

To continue scanning in the same scan, follow the procedure covered in *Resume Scanning*.

2.2.2.2 New Scan in Project

If you intend to add a new scan that relates to the project, but either of **the cases below** is applicable, consider adding a new scan:

- Scanning scene has changed.
- You flipped the object.

To add a new scan,

1. Open the required project.
2. Tap *Add scan*.
3. Point the scanner at the object and press the start/stop button  .

2.3 HD Mode & HD Reconstruction

HD mode scanning is an AI-powered scanning technology for ultra-sharp, clean, and detail-rich scans.

Key advantages of the HD mode:

- scanning with a high resolution of up to 0.2 mm
- broad range of objects that can be scanned flawlessly and in high detail: from smaller, intricate parts like valve handles, to larger areas with fine details like car engines
- little to no noise in raw data for cleaner post-processed data and saved time for your final 3D model
- capability to capture dark or shiny surfaces in high resolution, in their original shape and with no extra steps

Up until version 1.7, Artec Leo enabled you to capture HD data, which had to be reconstructed in Artec Studio to give you the complete surface geometry. Starting from version 1.8, you will be able to preview the reconstructed model (HD scans) in Artec Leo itself, without the need to export it to Artec Studio. Keep in mind that the preview of the reconstructed model has no impact on the data which you send to Artec Studio.

The HD reconstruction in Artec Leo is off by default. When you start your project, you will see the *Resolution* button at the lower-right corner. Tap on *Resolution* before scanning, and select an appropriate HD resolution to capture HD frames and enable HD reconstruction.

The three HD resolution modes available are:

1. SD - no HD frames recorded.
2. Normal - every 8th frame recorded, will be HD.
3. High - every 4th frame recorded, will be HD.
4. Ultra - every 2nd frame recorded, will be HD.

The higher the resolution, the larger the project will be and more time will be required for its reconstruction. The speed of scanning might also vary depending on the resolution.

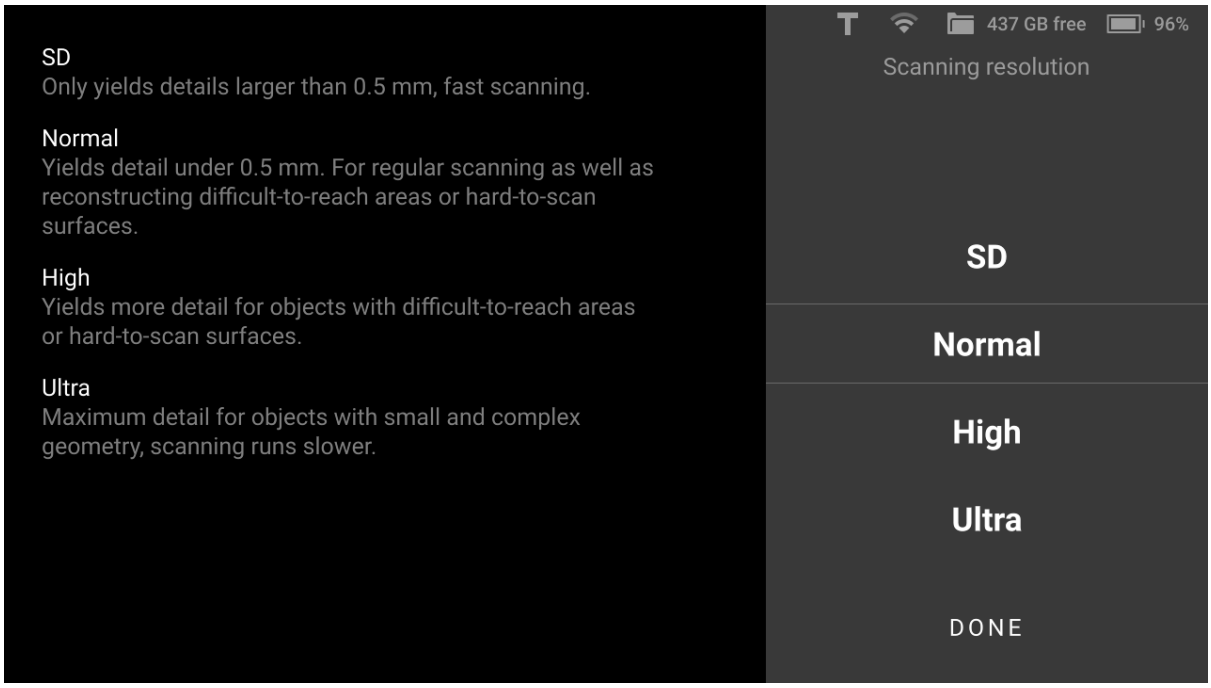


Figure 7: Scanning resolution options.

Then you perform the scanning as usual. Once you stop scanning and even exit the current project, HD reconstruction will continue to run in the background until you start another scan in a new project.

Note: It is advised not to rotate or change the position of the object during reconstruction. If you do so by mistake, the reconstruction will pause and resume again.

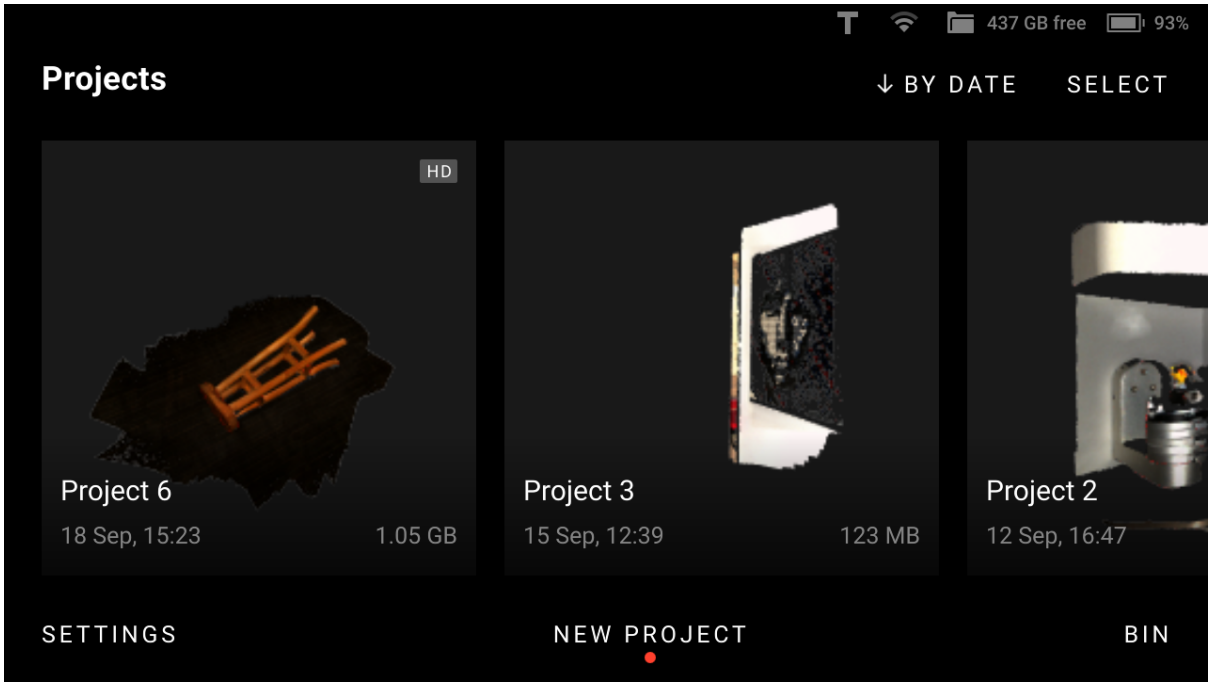


Figure 8: Project with HD data.

2.4 Configure Scanning

You can set for scanning either of the following parameters.

- *Texture*
- *Texture Flash*
- *Base Removal*
- *Exclude Background*
- *Texture Brightness*
- *Scanning Range*
- *Quality Overlay*
- *Distance Overlay*

2.4.1 Texture

If you want to see texture while scanning,

1. Press the start/stop button  to start *Preview*.
2. Ensure that *Texture* mode is activated.

Note: During scan, Leo displays texture blended with *quality overlay*. To observe pure texture, stop scanning.

2.4.2 Texture Flash

To enable texture flash and get a bright, softly-lightened image,

1. Press the start/stop button  to start *Preview*.
2. Ensure that *Texture flash* is on.

   Turn it off if you cannot use it due to circumstances. Note that turning the flash off must be compensated for by sufficient ambient lighting or increasing the value of *Exposure*. Keep in mind that high exposure will result in slower performance.

When *Texture flash* option is turned on, the *Exposure* setting will not be displayed. Instead, you can adjust the *Brightness* of the output image.

2.4.3 Base Removal

Once imported in Artec Studio, scans from Leo can be cleared from base, i.e. flat surface that supports object being scanned. The following recommendations might help you decide whether you need this option.

Objects to scan	Options
Distinct vertical object	*Base removal* is on
Entire scene, floor, table	*Base removal* is off
Object sticking out of a wall	*Base removal* is on and *Horizontal base removal only* off

To enable base removal,

1. Press the start/stop button|redbut| to start *Preview* mode.
2. Ensure that Base removal is turned on.
3. Direct the scanner at the flat surface which you intend to leave out.
4. Press the start/stop button  to start scanning.

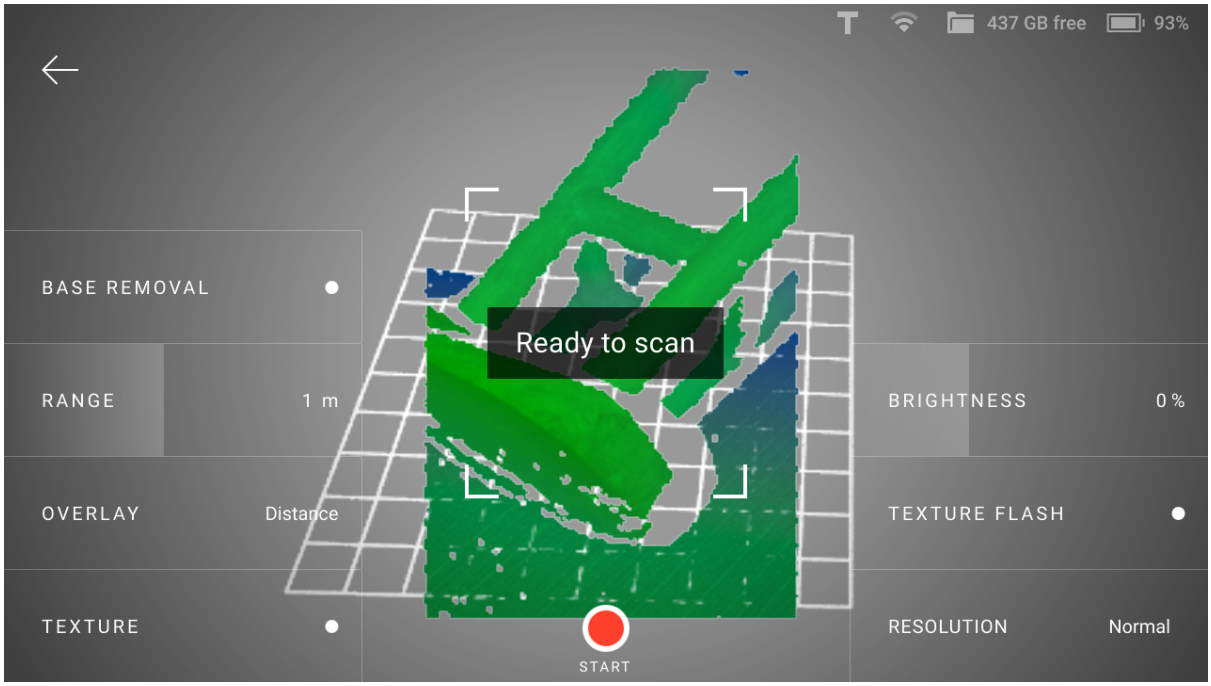


Figure 9: Detected base.

Before you *import project*, ensure that the *Launch base removal for Leo scans* checkbox is selected in Artec Studio settings.

2.4.4 Exclude Background

This feature enables you to remove any unwanted background in the entire 3D space surrounding the object during scanning. Naturally, the surroundings also includes the base, and therefore this feature removes the base as well. Note that, the *Base Removal* option disappears from Leo screen when this feature is enabled.

To exclude background in your scans:

1. Turn on the *Exclude background for new scans* in Settings.
2. Press start/stop button to start *Preview* mode.
3. Ensure that Exclude Background is turned on.
4. Direct the scanner at the object you intend to scan. The red areas on the window are excluded as unwanted background.
5. Press start/stop button to start scanning.

You can adjust the *Sensitivity* parameter depending on how much of the surrounding environment you want to leave out. The *Show 'exclude background' sensitivity* setting displays the *Sensitivity* slider on your scan window in the Preview mode, which can be adjusted before scanning. However, if this option is disabled, you will be able to adjust the sensitivity after scanning is completed. To adjust sensitivity after scanning, click on the *Exclude Background* button that appears after scanning is completed.

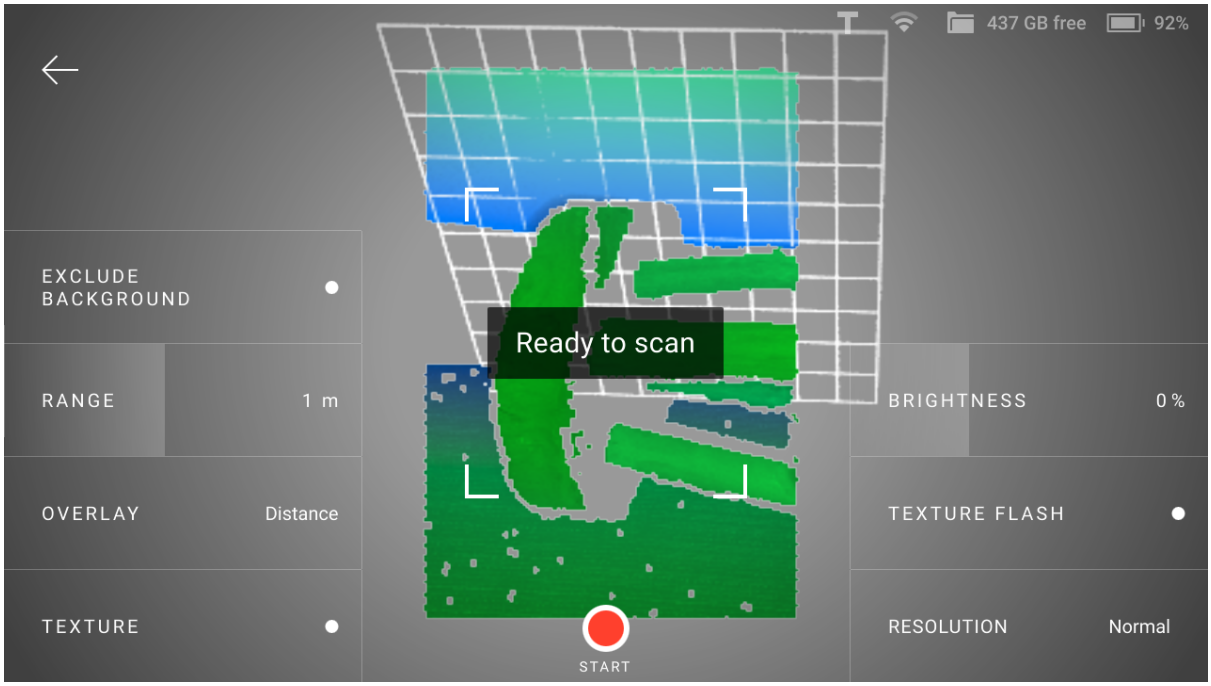


Figure 10: Option to exclude background.

Before you import project, ensure that the Exclude background for Leo scans checkbox is selected in Artec Studio settings.

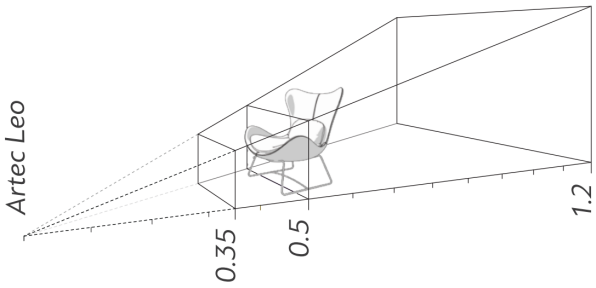
2.4.5 Texture Brightness

You can adjust texture brightness for scans.

1. Tap *New project* or *Add scan*. Leo starts *Preview*.
2. Direct the scanner at the surface with rich texture which you can use to assess texture quality.
3. Move the *Texture brightness* slider left and right to set an optimal value (as a percentage).

2.4.6 Scanning Range

Leo's default scanning range is from 0.35 to 1.2 meters. Optimal distance for most objects is about 0.5 meters (1.5 ft) which corresponds to the middle of this range. Surfaces recorded at the far distances might be of bad quality. You may want Leo to cull these distant surfaces, i.e. shrink its field of view by adjusting position of the farthest plane:

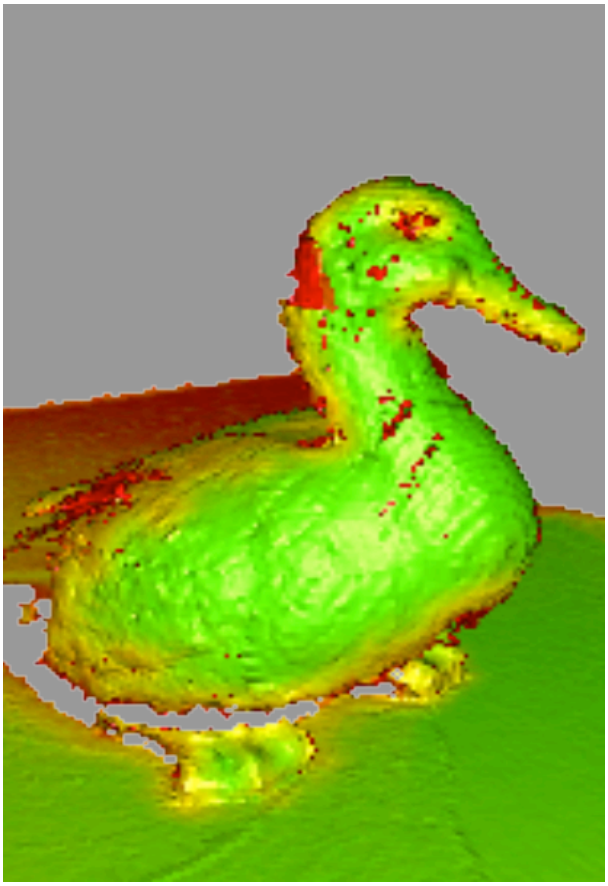


1. Press start/stop button to enter *Preview* mode.
2. Move the *Range* slider left and right to set an optimal value.

Texture frames of the object (or parts of the object) scanned from a distance of more than 1.2 meters are not recorded in Leo. These missing texture frames then appear as black empty spaces when the scan is opened in Artec Studio.

2.4.7 Quality Overlay

Once you start scanning (after a preview), the scene will color indicating the scan sufficiency.



Red	Insufficiently scanned area[1], distant object, fast movements
Orange	Satisfactory scanned area
Green	Well-scanned area

See also:

Texture

2.4.8 Distance Overlay

Distance overlay helps identify an optimal scanning distance. It colors surfaces using different colors depending on how close the scanner is to the object (see the table below).

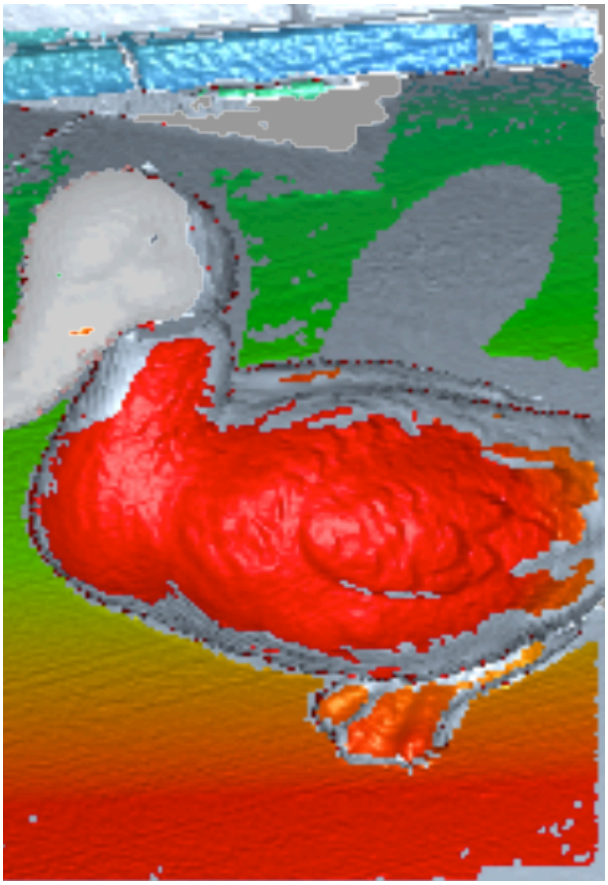


Figure 11: Distance overlay.

Transparent	Out of the sight
Red	0.35 m
Orange	0.4 m
Green	0.45–0.85 m
Blue	1–1.2 m
Deep blue	Above 1.2 m

See also:

Scanning Range.

2.5 Target-Assisted Scanning

To perform scanning with targets, a target file with information about the targets to use must first be uploaded into Leo and selected as the default one (see *Enable Target-Assisted Scanning* for details).

Then follow these steps:

1. Until Leo does not see the targets from the selected target file in its field of view, its screen will be like the one presented in Figure 12.

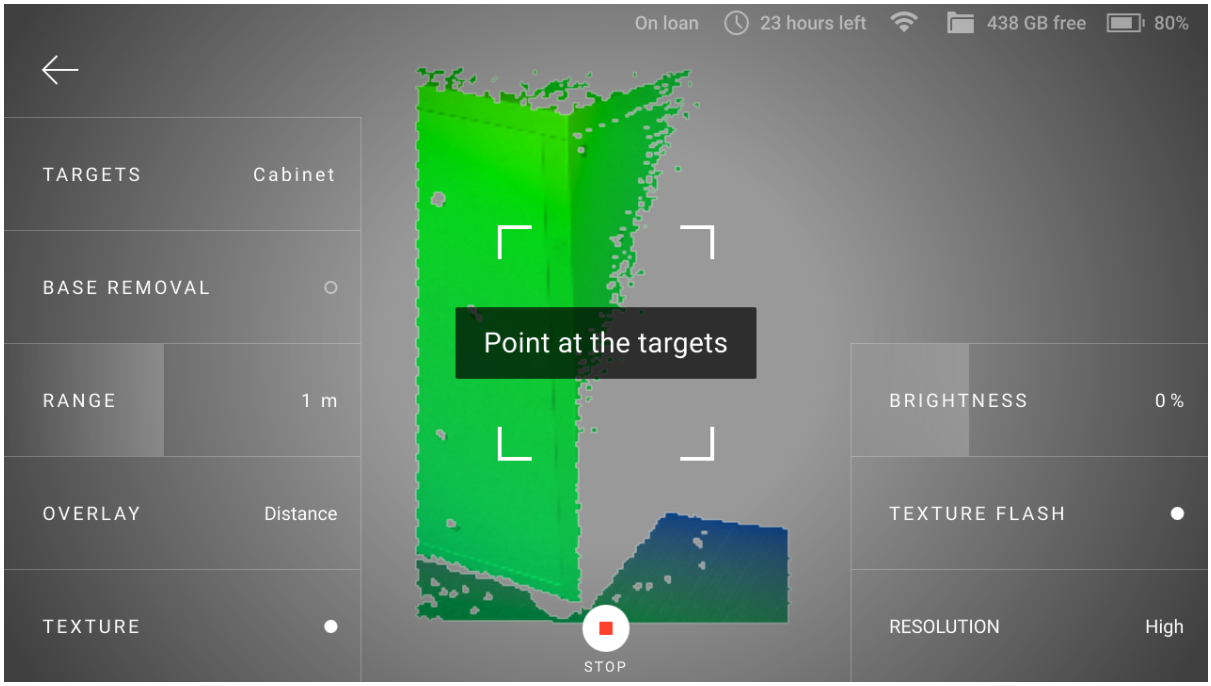


Figure 12: Target-assisted scanning mode is set but Leo does not see targets in its field of view.

   Point the scanner at the object with the targets. When Leo recognizes the targets, you will see them on the preview screen.

2. Before you start scanning, you can select another target file. To do this, tap *Targets* at the lower-right corner and then select the desired target file from the list. Select *None* to not use targets when scanning.

   Note: Once the scanning has started, you will no longer be able to change the target file: the *Targets* button will be locked.

3. Tap or press start/stop button and start scanning.

   During the scanning process, the target marks should be visible on the screen, as they were on the preview screen (Figure 13). If Leo does not see the targets in its field of view, then the tracking will be lost, the recording will be interrupted and the warning *Point at the scanned area* will be displayed.

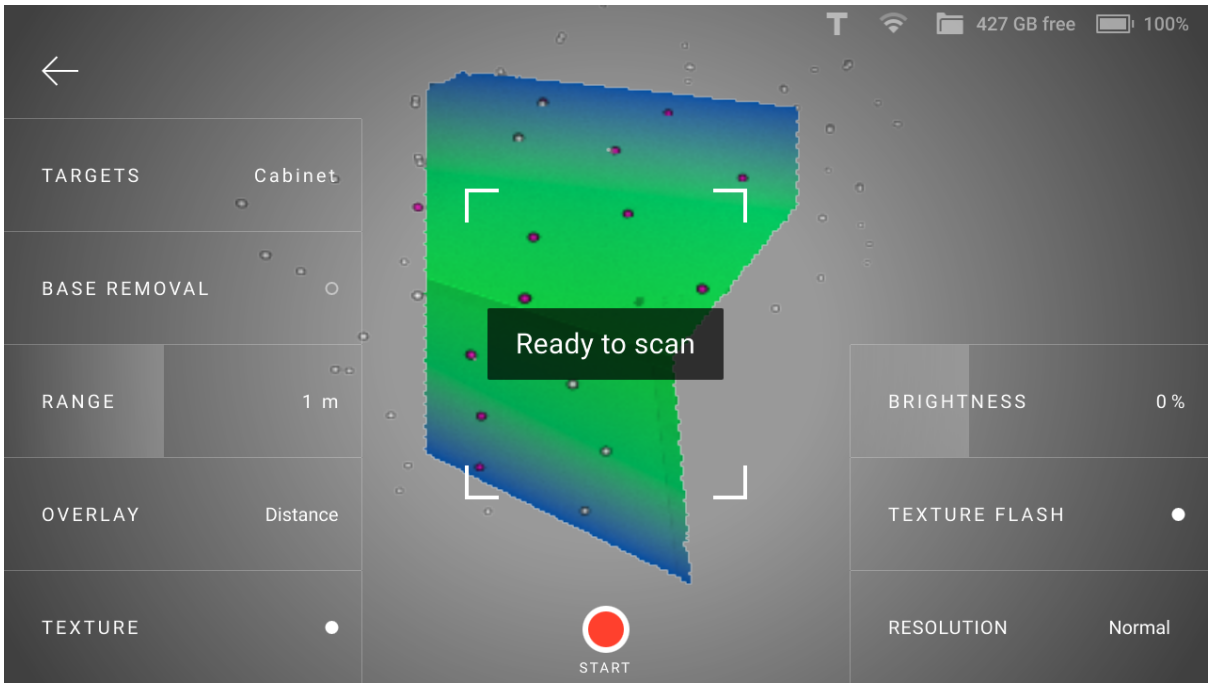


Figure 13: Leo has recognized the targets and is ready to scan.

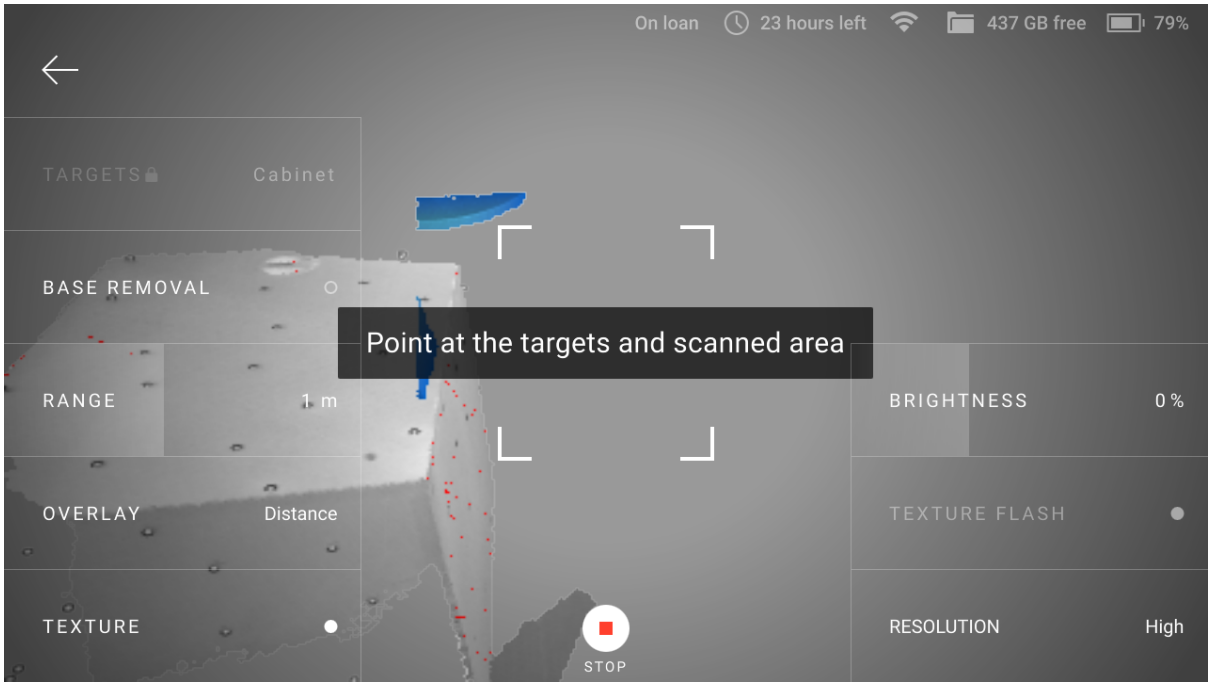


Figure 14: Leo has lost tracking when scanning with targets.

4. If the tracking is lost, you can do one of the following:
    - Point the scanner at the targets again. When Leo recognizes the targets, its screen will be like the one presented in the figure below and you can continue scanning.

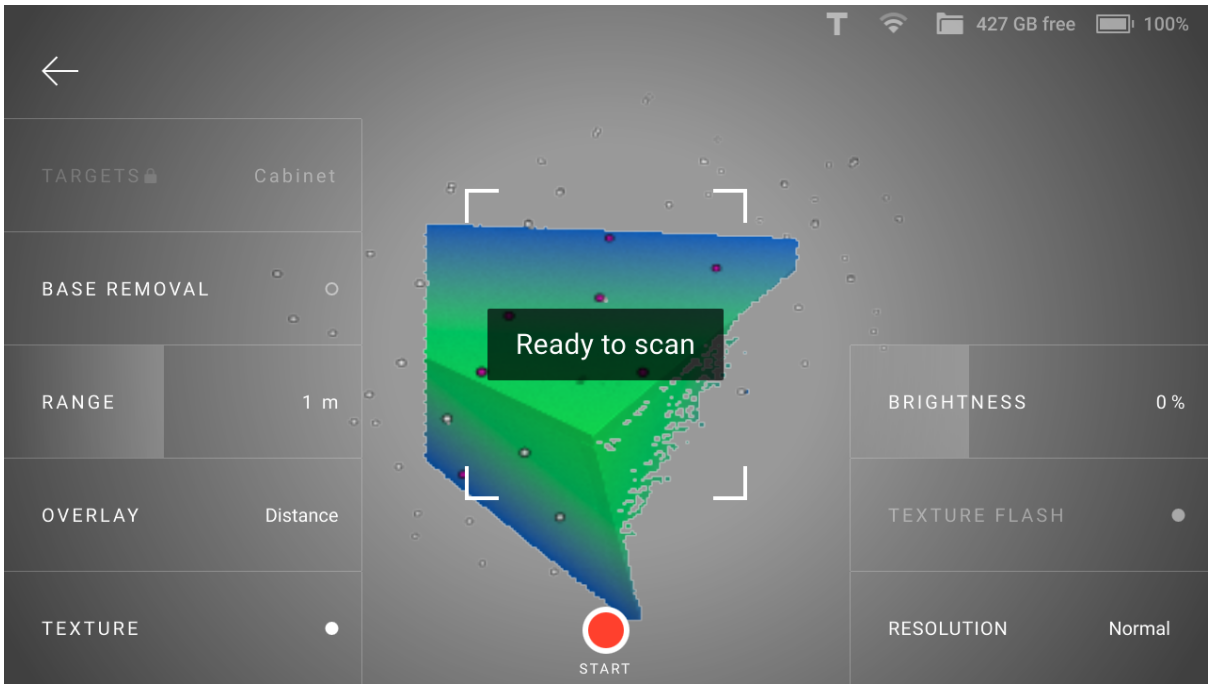


Figure 15: Leo has recognized the targets and is ready to continue scanning.

- Tap or press start/stop button to stop scanning.

CHAPTER

THREE

PROJECTS AND SCANS

Once Leo has booted up, the *Project* screen appears. Scanner allows you to view projects and scans on its display (*Open Project*), continue scanning to the existing scan and add new scans to the project.

By default, the most recent project is available on the left of the screen. To invert the order, tap the *Date* link in the top right corner.

3.1 Project Structure

Any Leo project includes at least one scan. If the scan was paused or interrupted and then resumed, an *addition* appears in the *History* section of the Scanning screen. You can undo each addition sequentially by navigating the *History* backwards.

3.2 Open Project

To open a project,

1. Access the *Projects* screen.
2. Scroll the list horizontally while consulting the preview images.
3. Then tap the required project. Leo will display the project structure where you can either add a new scan or continue recording to the existing one.

3.3 Copy Project

To copy a project on your local computer,

1. Make sure that you computer is connected to the same network as Leo.
2. Access the *Projects* → *Settings* → *Cast screen to browser*.
3. Toggle *Enable screen casting* and *Allow control* switches.
4. Open any browser on your local computer and enter the Leo's IP + '/app/projects'.

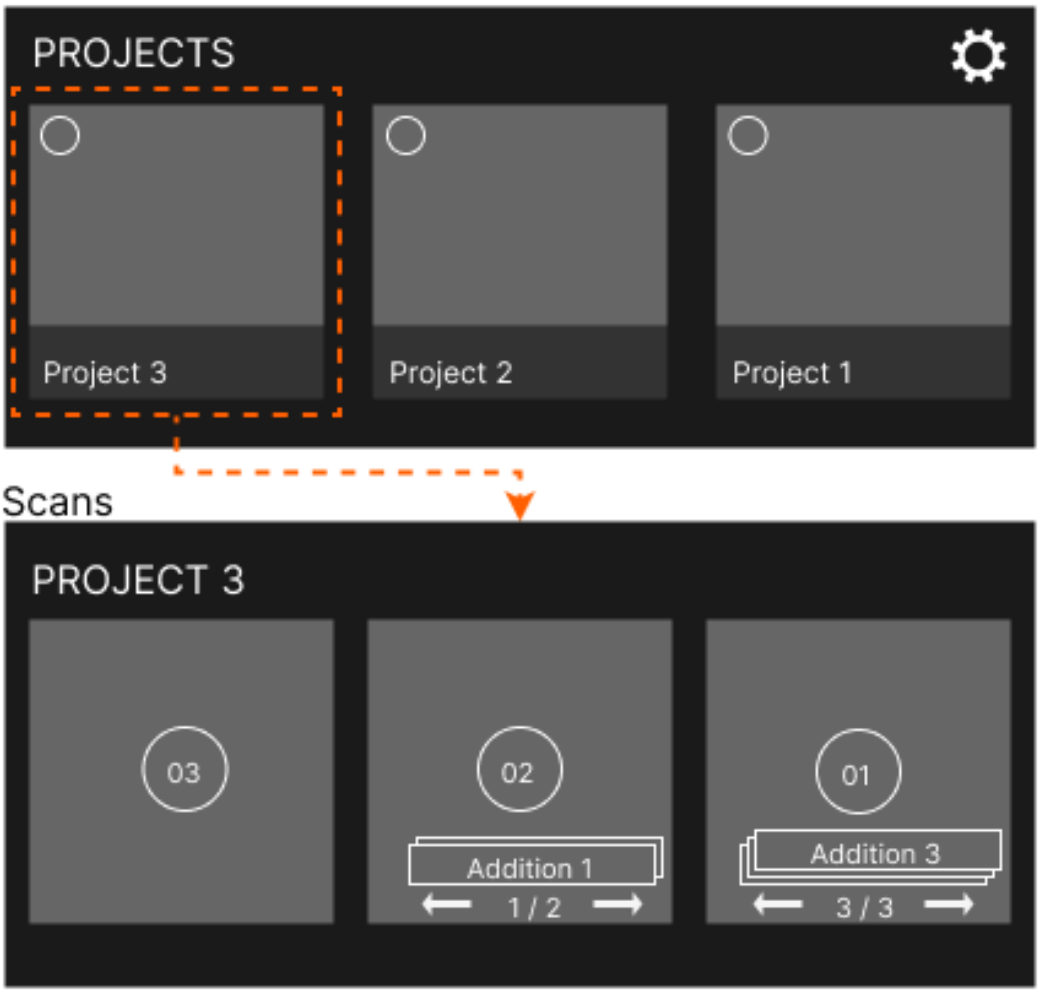


Figure 16: Understanding project structure.

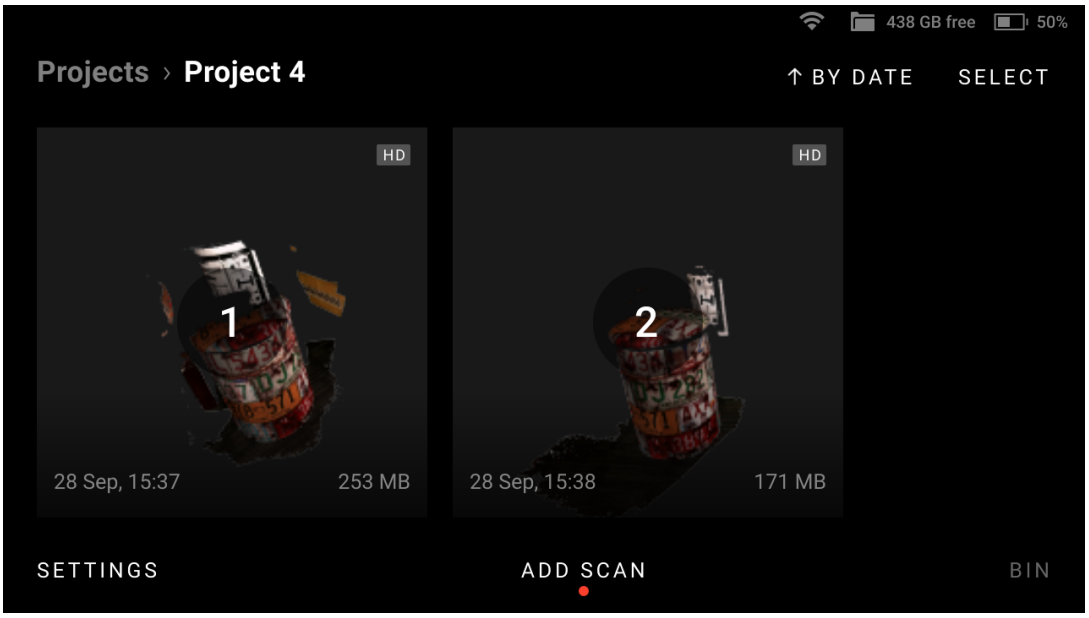


Figure 17: Scans in a project.

5. Select the project(s) you would like to get and click *Download* button.

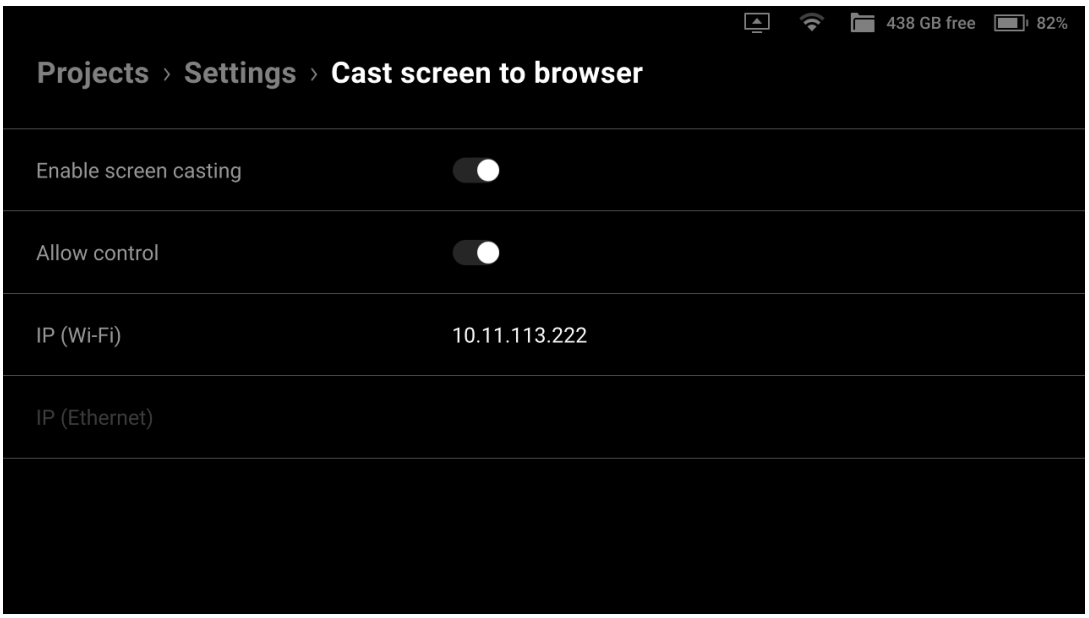


Figure 18: Scans in a project.

3.3.1 Encrypt Projects to Export

To ensure security of HD scan data, Leo enables you to encrypt your projects before exporting them to your local computer through the browser. To do so, turn on the *Encrypt projects (AS16+)* feature in Settings. After selecting projects, when you tap *Download*, Leo converts those projects into a new .leo format before downloading them.

Note: The encrypted projects in .leo format are only compatible with Artec Studio version 16 and above.

3.3.2 View 3D Data

Use the following gestures to navigate 3D content on Artec Leo.

Rotate	Move one finger across the screen around the scene.
Pan	Move two fingers across the screen.
Zoom	Use two fingers: spread them apart to zoom in and move them toward each other to zoom out.

To bring back and scale the possibly moved away 3D content, use the *Fit to view* button.

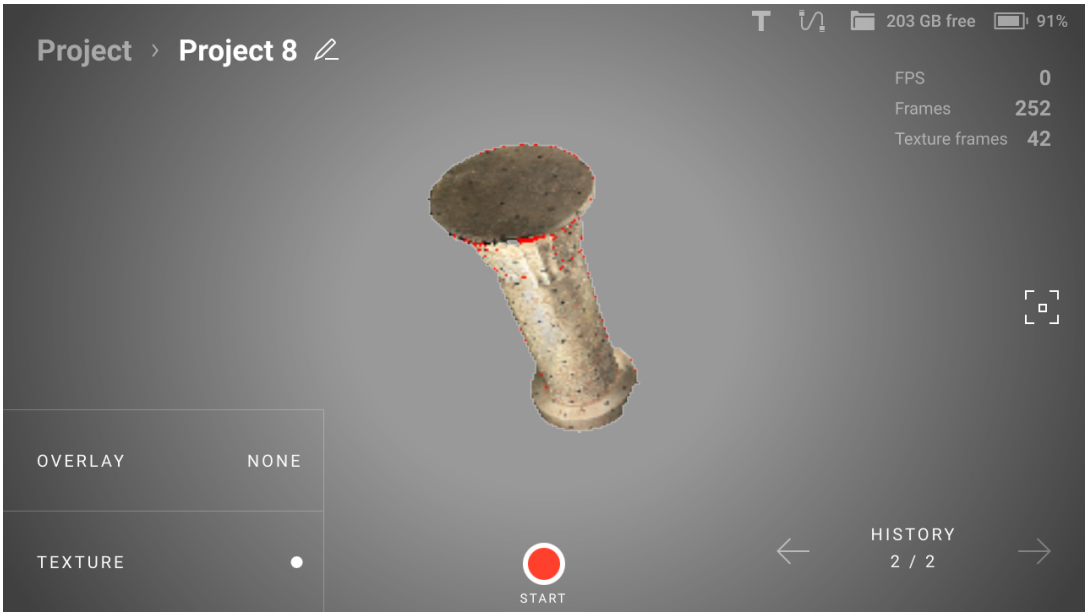


Figure 19: Viewing a project.

3.4 Upload Project to Artec Cloud

Using Artec Leo, you can now upload your projects directly to Artec Cloud without needing SD cards or cables. Artec Cloud is an easy-to-use collaborative platform that makes your 3D scan data available to you anytime and anywhere.

To upload one or several projects to Artec Cloud:

1. Access the *Projects* screen.
2. Tap the *Select* button.
3. Select the items that you want to upload.
4. Tap *Upload to Cloud*. Artec Leo will automatically upload the items to your Artec Cloud account.

Note: Please ensure that your Cloud account has enough storage space before uploading large projects. Also, make sure Leo is connected to the internet until the upload is completed.

Attention: The 'Upload to Cloud' functionality is available to Artec Cloud users with a Trial, Collaboration, or Processing license only. Check the Artec 3D website for more information about Artec Cloud licenses.

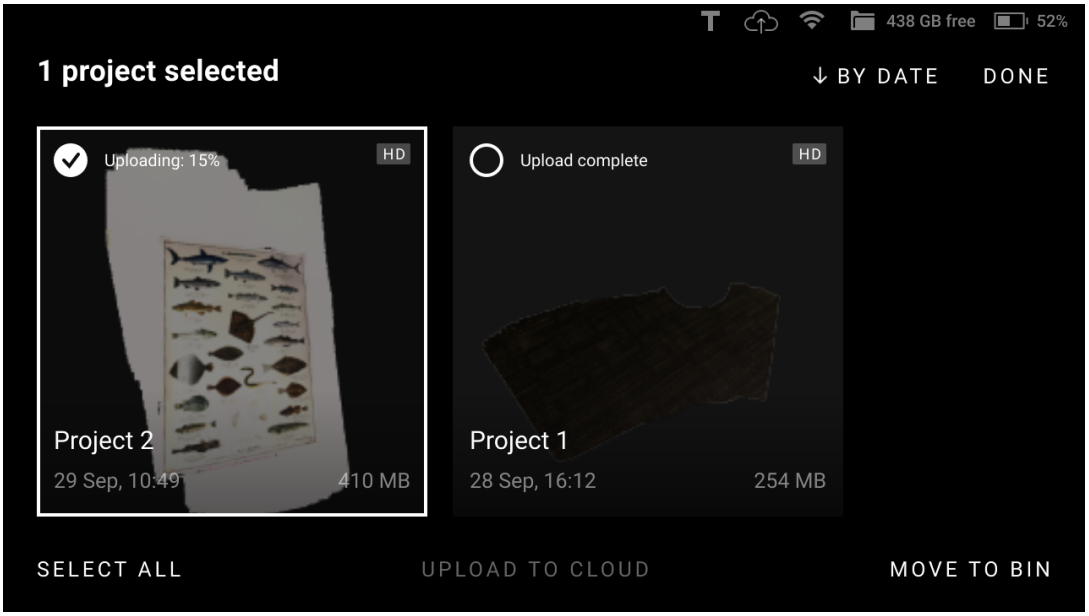


Figure 20: Uploading to Cloud.

3.5 Rename Project

To rename a project, open the project and open any scan inside the project. On the scan-viewing window, simply tap on the Project name, or click on the Edit icon at the end of the name field, and change the name.

3.6 Remove Project or Scan

To delete one or several projects,

1. Access the *Projects* screen.
2. Tap the *Select* button.
3. Select the items that you want to remove.
4. Tap *Move to bin*. Artec Leo will move the items to the *Bin*.

3.6.1 Remove Scan

To delete scans from the project, before step No. 2 in the *procedure*, open the required project.

3.7 Access Deleted Projects and Scans

To access the deleted scans and projects:

1. Open the *Projects* screen.
2. Tap the *Bin* button. Leo will open the Trash bin showing all deleted scans.

Note: Any deleted project will split into scans once it appears in the Trash bin.

Leo lists all the deleted scans by time created. Scans are named using the `Project 2/1` pattern meaning that it is the `Scan 1` from the `Project 2`.

To select scans in the *Trash bin*, tap them. To select all items at once, use the *Select all* button.

To restore scans	To delete scans
Tap *Restore*. The scans will then appear in their respective projects.	Tap *Delete*. The scans will be permanently deleted from Leo.

3.8 Trusted Accounts

Only specific users can open projects from Leo in Artec Studio:

- Scanner owner
- Users from the *Trusted accounts* list.

To grant the specific user an access to your Leo projects, follow the steps:

1. Open *my.artec3d*.
2. Access the *Scanners* section.
3. Scroll to the *Trusted account* title.
4. Click the *add* link.
5. Enter the email address of this *my.artec3d* user.
6. Access *Projects* on Leo.
7. Tap *Settings*
8. Then select *Scanner* → *General* → *System*.
9. Tap *Renew* in the *Scanner configuration* field.

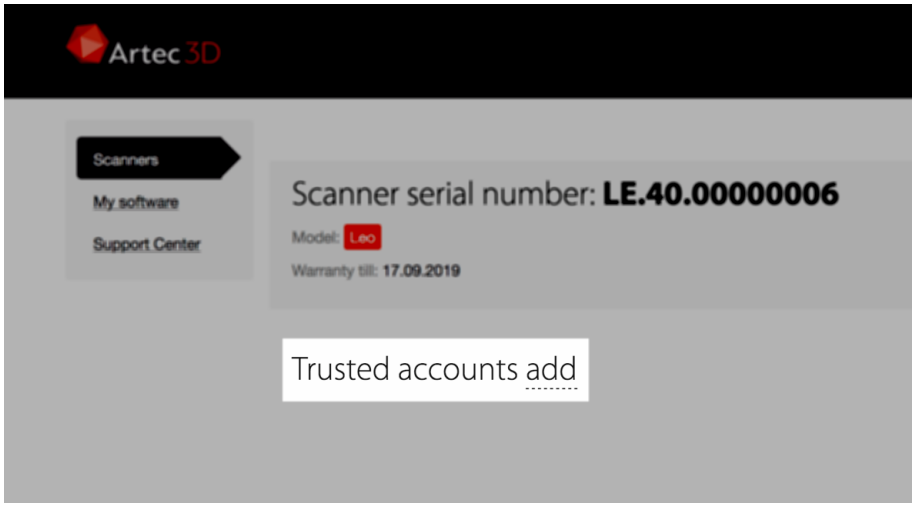


Figure 21: Trusted accounts for Leo.

Attention: If you plan to share a project with someone from the *Trusted accounts* list by *copying a project through a network, first ensure that you have :ref:`renewed the scanner configuration*.

3.9 Open Project in Artec Studio

Leo produces raw scans that you can process in Artec Studio no older than version 13. It is possible to import projects from Artec Leo over a network (*Direct Import in Artec Studio*).

Important: The account you use in Artec Installation Center must be either the same as on Leo scanner or one of the *Trusted accounts* list at *my.artec3d*.

Important: If you scanned with the *Remove base* enabled, ensure that the *Launch base removal for Leo scans* checkbox is selected in Artec Studio settings.

3.9.1 Direct Import in Artec Studio

To successfully import a project from Leo,

1. Ensure that your computer and Leo are connected to the same network.
2. Ensure that Leo doesn't displays any 3D data.
    - If the device is scanning, cease the session.
    - If any project is open, close it.

3. Open Artec Studio.
4. Select *File* → *Import* → *Leo project (connect to scanner)*.
5. Choose the scanner from the list and click *Connect*.
6. Select the required project from the project list and click *Import*.

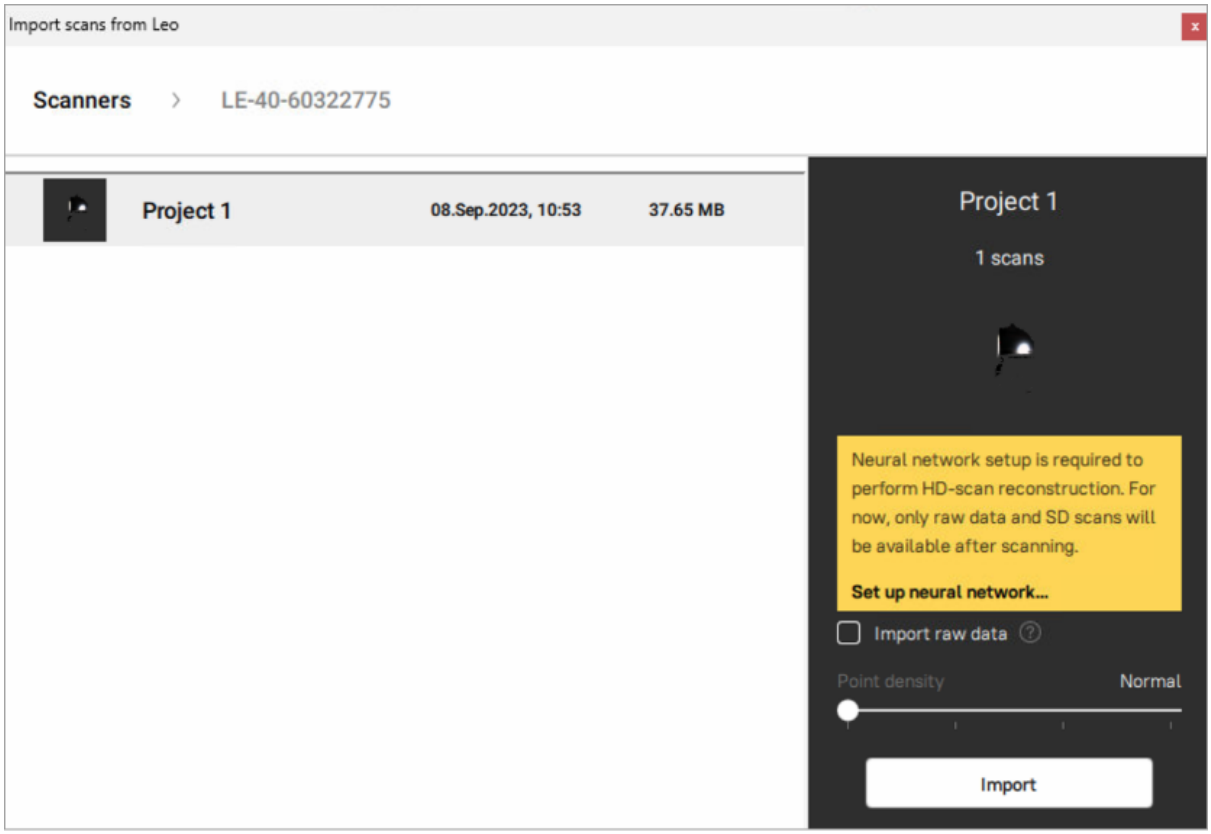


Figure 22: Importing project to Artec Studio.

Once the application imports files, scans will appear in the *Workspace* panel. The imported project and scans will be automatically grouped — the group with the project name will be divided into subgroups of scans (see here about grouping in *Workspace* panel).

3.10 Process Project in Artec Studio

Once you import the project, process it as Artec Studio Manual suggests.

Important: Double check that the *Current scanner type* is set as *Artec Leo* in Artec Studio settings (Scan → Algorithm settings).

3.10.1 Autopilot

One of the convenient ways to process the scanned data from Leo is through using Autopilot. As soon as you import a Leo scan in Artec Studio, select *Autopilot* in the left toolbar.

CHAPTER

FOUR

SETTINGS

Settings allows you to get information on various aspects of Leo operation and adjust it to suit your preferences. To access settings from the *Projects* screen, tap *Settings*.

This chapter covers the following scanner settings and some related topics:

4.1 Scanner

4.1.1 General

The *General* tab (shown in the figure) contains the following fields:

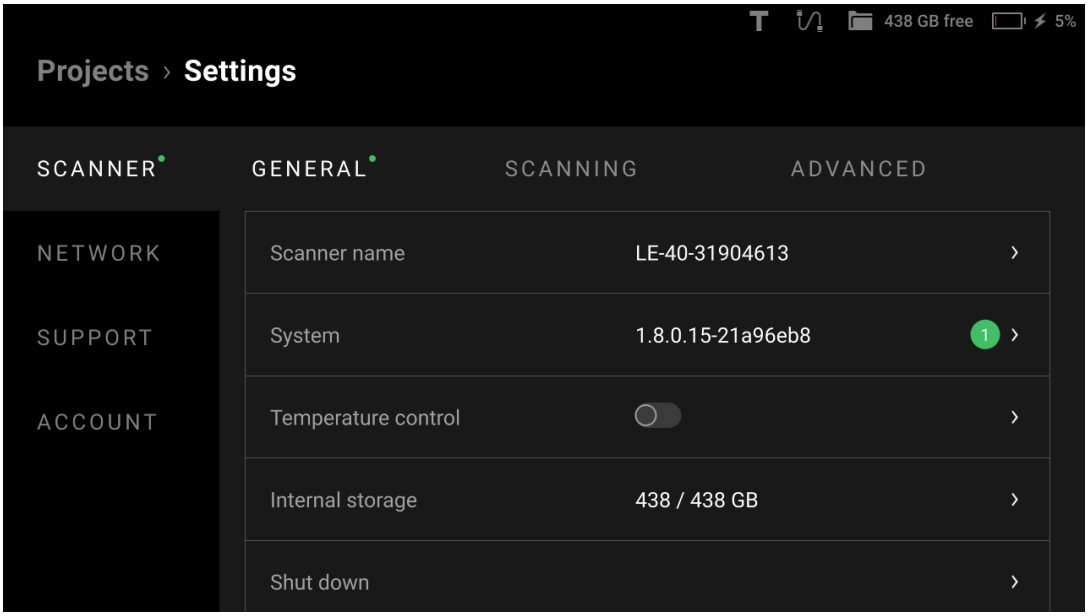


Figure 23: General ⊠ Scanner ⊠ Settings.

Parameter	Description
Scanner name	Also a network hostname. Tap the field to change it. What characters to avoid?
System	Tap the field to see the versions of the scanner software and firmware and check for updates (details in the *section below*).
Temperature control	Enable it for Leo to turn on the temperature indicator that indicates when Leo's temperature is optimal for best scan results (details in the *section below*).
Internal storage	Shows how much internal storage space is available (in GB) on Leo. To clear the storage, tap *Format*.
Shut down	Safely turns off the scanner.

When proceeding to clearing the internal storage (via the *Format* button), you can also configure its encryption (see figure below). The general procedure is the same as described in *Storage Encryption*.

4.1.1.1 Temperature Control

The temperature of a device plays a significant role in its performance, and Leo is no different. Leo produces exceptionally precise results when it is within a specific temperature range. At a given point, to produce best scans, enable the :*Temperature control* feature in Settings. This will display a temperature indicator on Leo's screen. The temperature indicator shows you whether Leo is in its optimal temperature range, and also displays the time left for it to reach that state. Even after Leo reboots, the timer won't reset.

An intitial warm-up time of 25 mins after turning on Leo, and an ambient temperature of 25°C is recommended.

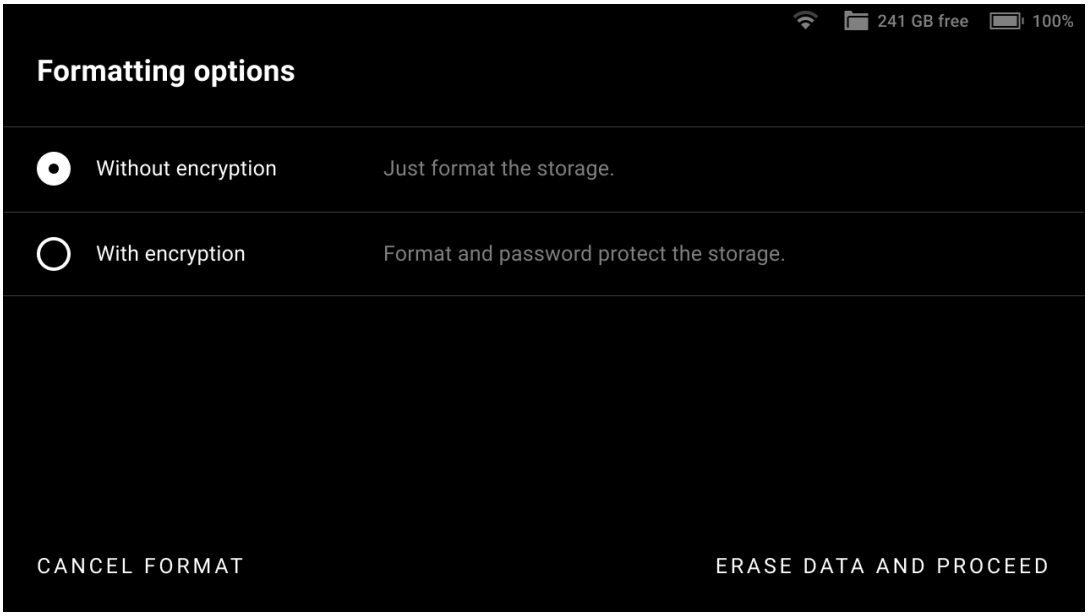


Figure 24: Options of storage formatting and encrypting.

Note that, the initial warm-up time may vary according to the environmental temperature (say, in case of extremely cold environments). Once Leo reaches optimal temperature, it's recommended to keep it ON, in order to prevent temperature drop. For example, when changing Leo's battery, it's better to keep it plugged in, to avoid losing heat.

Attention: Leo's battery drains three times faster with this feature enabled. It is advisable to keep extra batteries in hand, when scanning large objects.

4.1.1.2 Update Leo Software

To ensure that your scanner is running the latest version of software, select *Scanner* → *General* → *System* and then tap the *Check for updates* button. If Leo is connected to the Internet and there are no available updates (you have the latest software), you will be notified that *Leo is up to date* (see the figure below).

If the update is available, then click the *Update* button and wait for the update to download.

Attention: Artec Leo supports *resumable* updates. It allows you to resume an update after a network failure or any interruption.

To resume update, simply click on *Resume* after the issue has been resolved. Leo will continue updating from where it stopped.

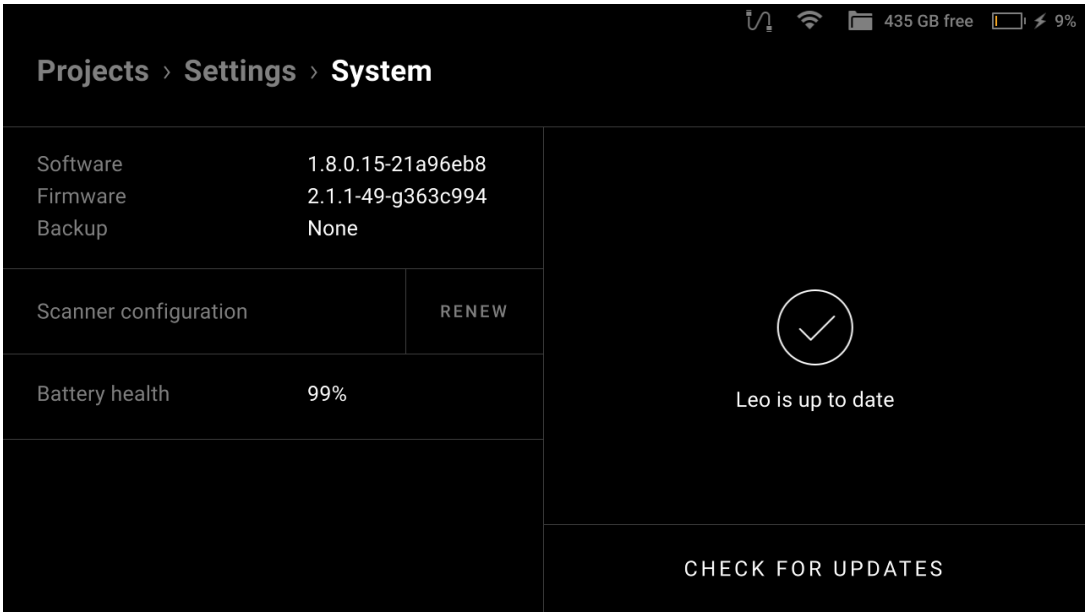


Figure 25: System ⊠ General ⊠ Scanner ⊠ Settings.

4.1.1.3 Why Renew Configuration?

To access projects from Leo, you don't necessarily need to use the same account both for the scanner and Artec Studio. A Leo owner may add any *my.artec3d* account as *trusted* from their profile at *my.artec3d*.

To download the latest scanner settings and license information, tap *Renew* in the *Scanner configuration* field.

4.1.2 Scanning Settings

The *Scanning* tab looks as shown in the figure below.

The section allows you to make fine tuning of the parameters shown in the table below.

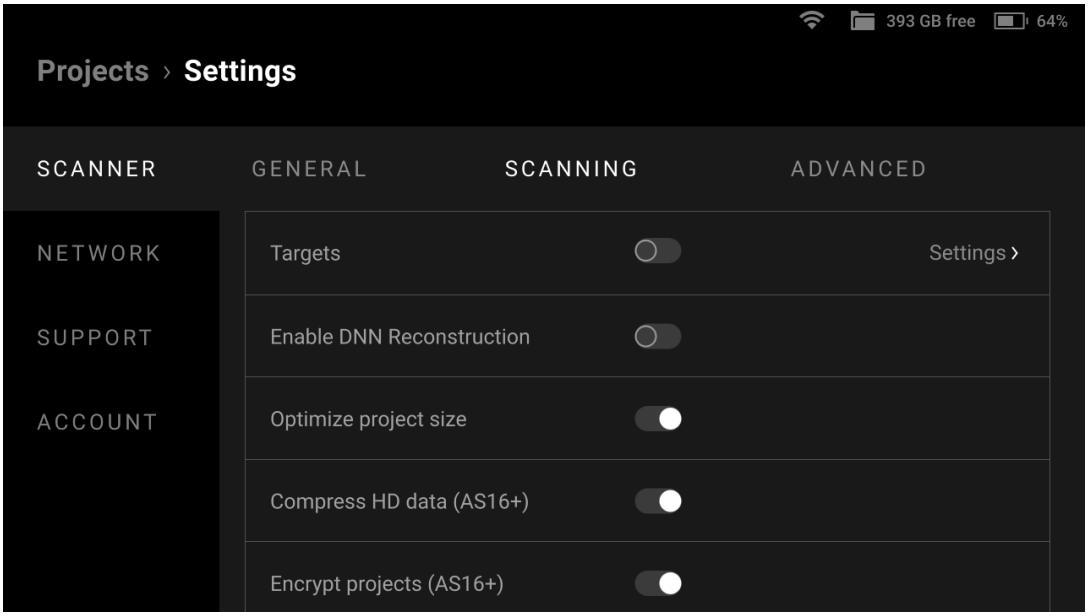


Figure 26: Scanning ☒ Scanner ☒ Settings.

Parameter	Description
Targets	Turn it on to enable the target-assisted scanning with Leo. See *Enable Target-Assisted Scanning* to find out how to configure this mode.
Optimize project size	Reduce the project size by only storing sufficiently novel captured frames or at least 3 frames per second.
Compress HD data (AS16+)	Enable this setting to compress the size of your HD scan data. This can save storage space and speed up data transfers. Compressed HD data is only compatible with Artec Studio versions 16 and above.
Encrypt Projects (AS16+)	Turn it on for Leo to encrypt HD projects before exporting them to your local computer through the browser. The projects are exported in a new .leo format *Encrypt Projects to Export*.
Record without registration	Turn it on to increase scanning speed (fps) and avoid tracking loss by delaying registration (Leo will be capturing all frames).
Save primary texture	The setting determines whether to record texture for key frames. **Note:** To entirely disable recording texture, turn off both *Save primary texture* and *Save supplementary texture*.
Save supplementary texture	Instruct Leo to record additional texture frames. You can manually specify the texture-frame rate in frames per second (fps).
Maximum scanning speed	Select the scale value to change Leo scanning speed (in frames per second) if you find it not appropriate for your needs. For example, if you're just starting to use Leo, it's a good idea to choose a slower scanning speed, so that Leo will record fewer identical frames. You will avoid data redundancy and save your Leo's storage space.
Start scanning when tracking found	Turn it on to start scanning and recording data immediately once lost tracking is found (see *Resume Scanning*).
Horizontal base removal only	Turn it on to instruct the scanner to detect and mark for removal of only horizontal supporting surfaces in your scans (see *Base Removal*).
Base offset	By selecting the scale value (in millimeters), you can adjust the offset from the supporting surface to compensate for scanner error when determining this surface.
Auto shutdown	Use it to set time of automatic shutdown when scanner is idle.
Auto lock	Turn it on to automatically lock the scanner when not in use, after a set amount of time. It also locks Leo's display on external devices or browsers. Leo can be unlocked by tapping on its display or with a *PIN Code*.
Language	Choose the desired language for Leo's UI, and change anytime.
Show frame counters	Turn it on to display the number of captured frames and textures as well as scanning speed (in frames per second) in the course of scanning.
Exclude background for new scans	Turn it on to instruct the scanner to detect and exclude the surroundings of the object in your scans.
Show 'exclude background' sensitivity	Turn it on to display the sensitivity slider on the scan window before scanning. This setting is available only when the

4.1.2.1 Enable Target-Assisted Scanning

To enable the target-assisted scanning, follow these steps:

1. Select *Settings* → *Scanner* → *Scanning*.
2. In the *Targets* line, tap *Settings*.
3. On the next screen, specify the inner and outer diameters of the targets and then tap *Target files on Leo*.

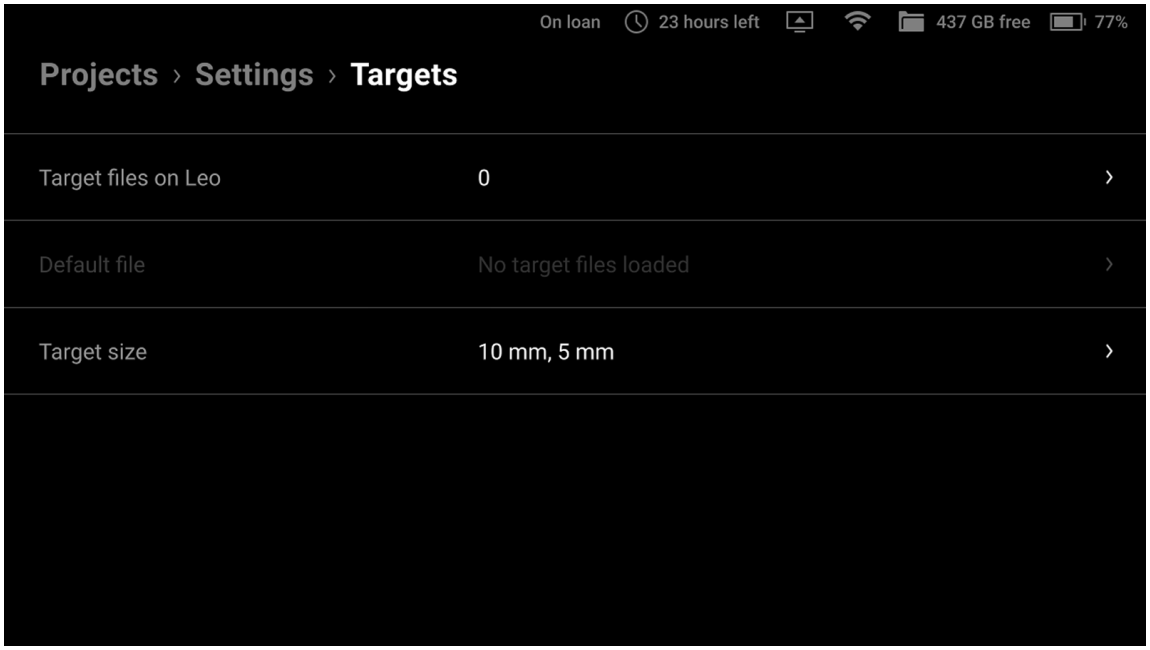


Figure 27: Settings of Target-Assisted Scanning mode.

   You will see a screen with an option for uploading a target file directly Leo using your browser and an Internet connection.

4. Click *Load via Internet* option. The following screen appears.

5. Open a browser on the computer where the desired target file (or files) is stored and enter the IP address shown on Leo's screen into the address bar. Leo's response will appear in the browser.

6. In the line with the paperclip icon, specify the path to the target file in the `OBC` format along with its name. In the comment field, you can provide a short custom name that will be used for the uploaded target file on all Leo's screens.
7. Tap *Upload* and wait until the processing is finished.
8. Once the uploading is complete, choose the default target file for the next scanning session and tap *Select*. The resulting screen will look like in figure below.

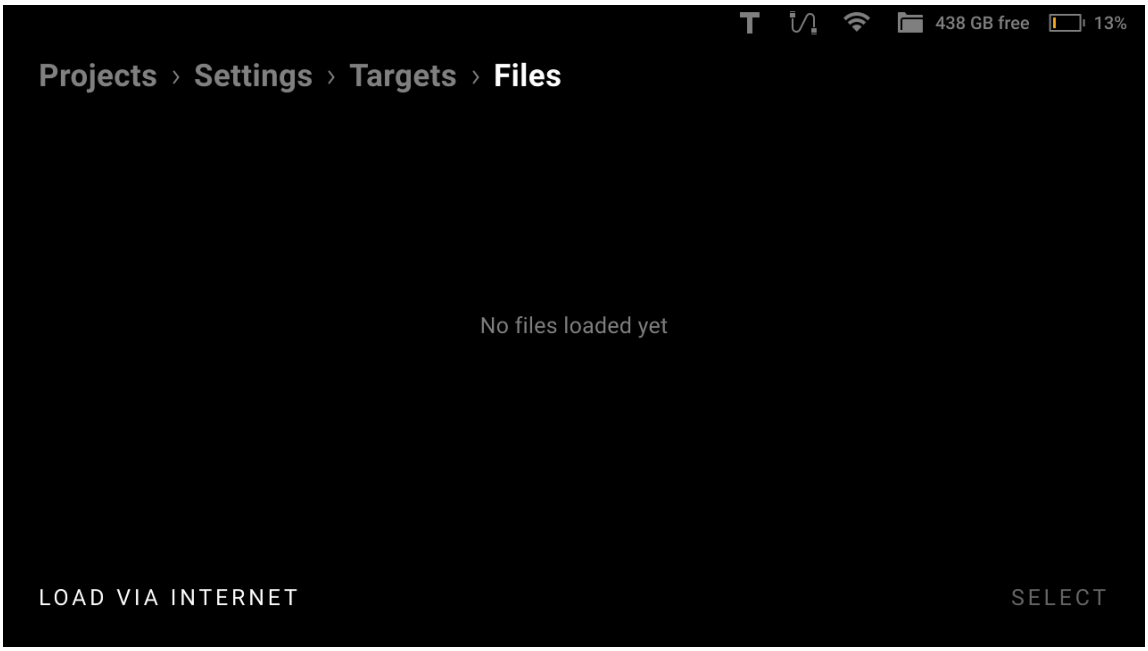


Figure 28: Options of targets uploading.

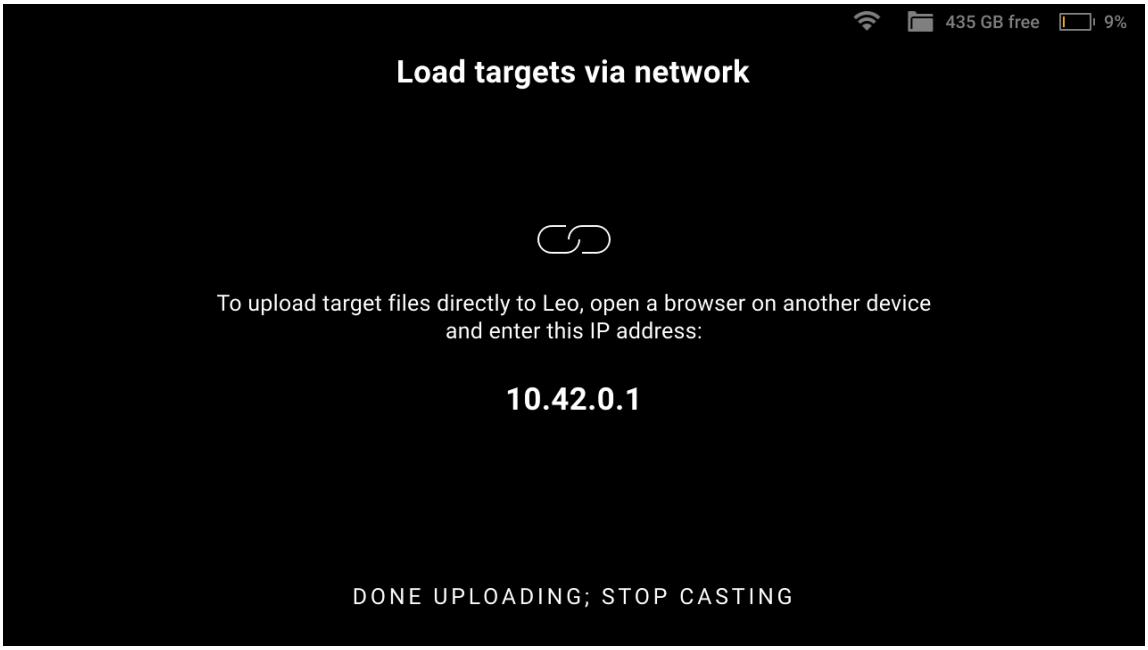


Figure 29: Instruction on connecting to Leo for targets uploading.

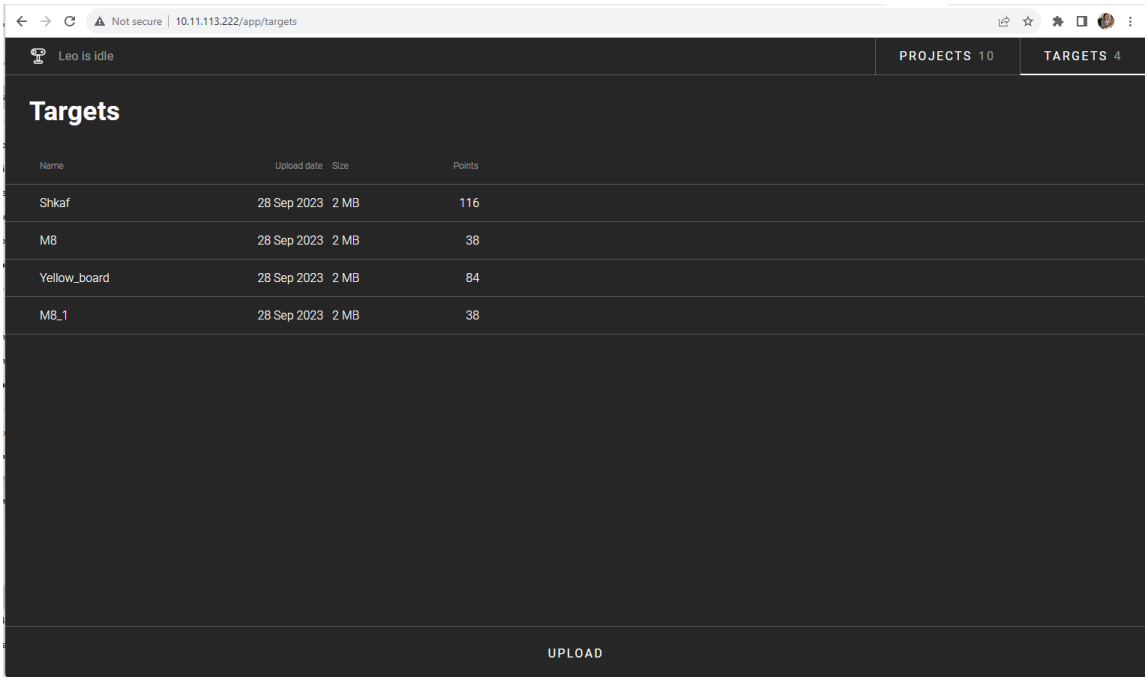


Figure 30: Leo's response in your browser.

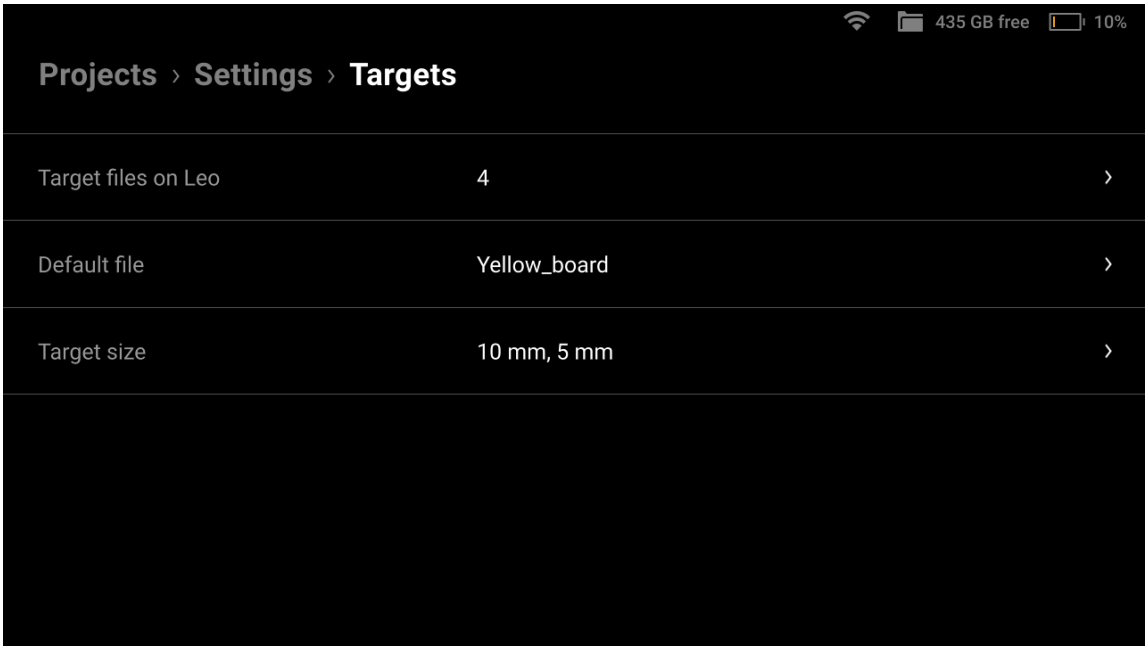


Figure 31: Uploading of target files is complete and the default target file is selected.

4.1.3 Advanced Settings

The *Advanced* tab shows miscellaneous parameters:

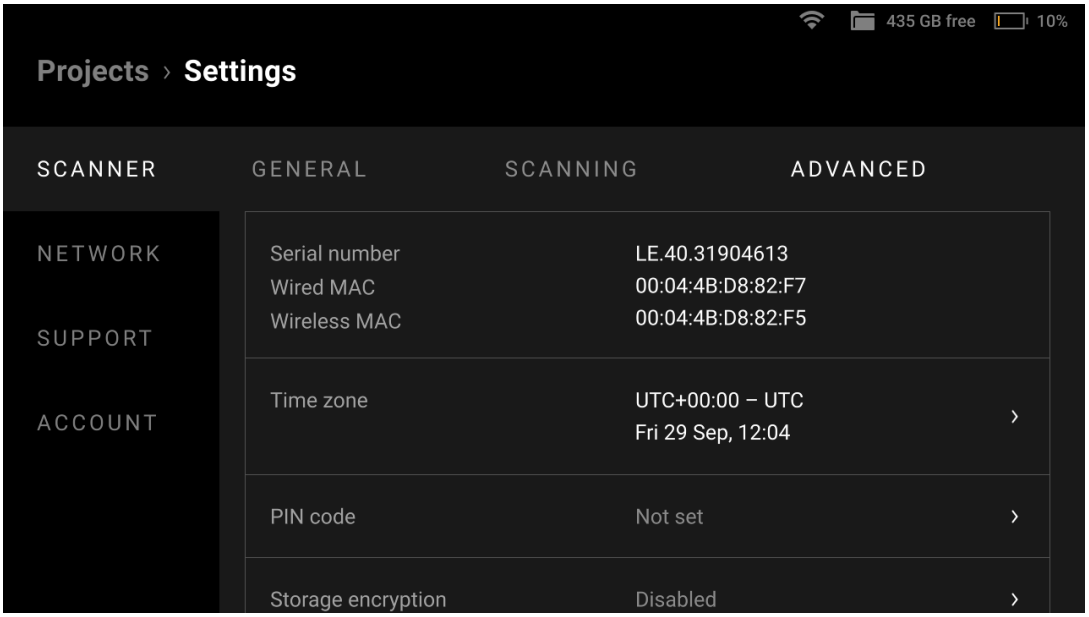


Figure 32: Advanced ⊠ Scanner ⊠ Settings.

Parameter	Description
Serial number	Shows the serial number of the scanner
Wired MAC	Displays the MAC address of the Ethernet adapter
Wireless MAC	Shows the MAC address of the Wi-Fi adapter
Time zone	Displays the current date and time and allows you to select the required time zone.
PIN code	Allows you to set a 4-digit PIN code to unlock Leo. This enhances the *Auto-Lock* feature by providing better security. More information here *PIN Code* .
Storage encryption	Shows the status of storage encryption (see *Storage Encryption*)
Recalibration	Shows the date of the last calibration
Artec Studio version	Indicates support for Artec Studio versions 15 or later or 16 or later. Projects scanned with the *16 or later* option will not be accessible in Artec Studio 15. Switch between the options by tapping them.
API users	Displays the number of users in the allowed list with API access (see *API Users*)

4.1.3.1 Storage Encryption

Storage encryption is a way to restrict access to Leo's storage by using a password. Once the storage is encrypted, no one will be able to use the Leo scanner without knowing the password.

Warning: If the password for the Leo's storage is lost or forgotten, it cannot be restored. In this case, to reset your password or disable the storage encryption, you will need to format the storage and erase all your data.

You can change the password for the Leo's storage at any time without affecting your data. However, this would require entering the current password (see *Changing encryption password*).

Note: By default, the storage encryption is disabled.

The status of storage encryption can be one of the following:

Encryption status	Description
Disabled	The storage encryption is disabled.
Enabled	The storage encryption is enabled, the device is password protected.

Attention: Both enabling and disabling the storage encryption require formatting the Leo's storage, which means the loss of all stored data.

To enable the storage encryption, follow these steps:

1. Select *Settings* → *Scanner* → *Advanced* → *Storage Encryption*.
2. Tap *Restart and encrypt storage* in the lower-right corner.
3. Create and enter a password for accessing the storage and then confirm it on the next screen.
4. On the screen that appears, enter "Erase all" to confirm the erasure of all stored data and then tap *Start encryption*.

After this, the process of storage encrypting will start. During encrypting the progress bar will be displayed as well as the estimate of the remaining time.

To disable the storage encryption, follow these steps:

1. Select *Settings* → *Scanner* → *Advanced* → *Storage Encryption*.
2. Tap *Disable Encryption* in the lower-right corner.

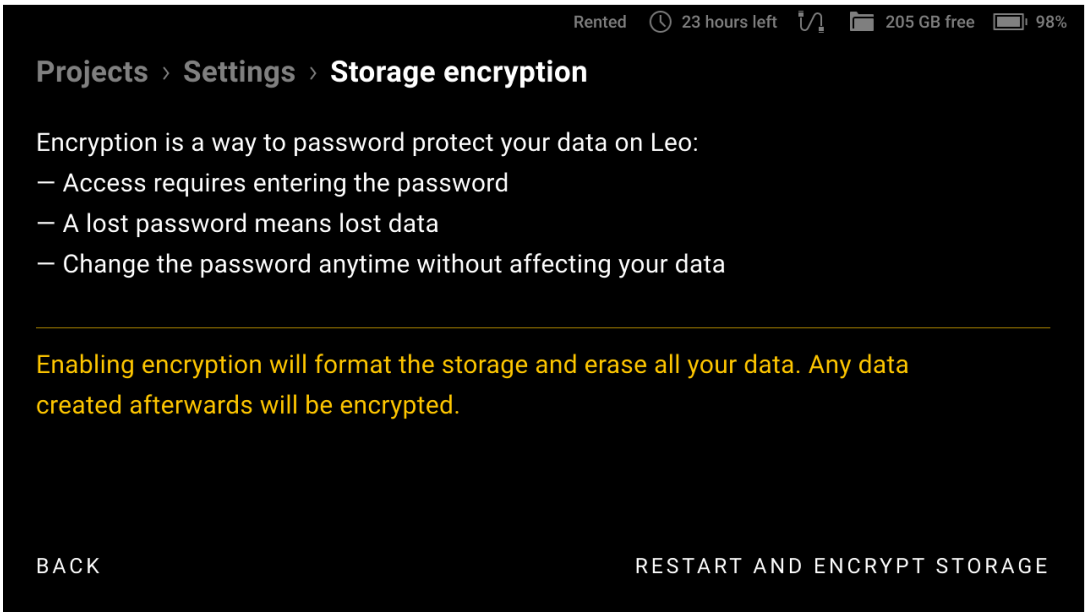


Figure 33: Enabling encryption.

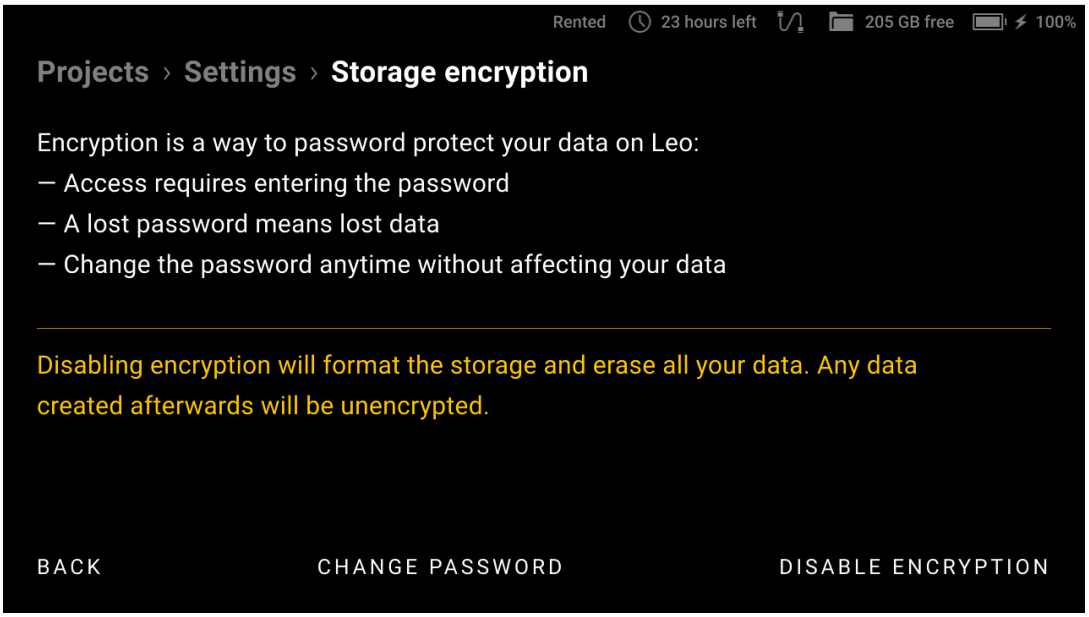


Figure 34: Disabling encryption.

After this, the process of disabling the storage encryption will start.

To change the password for the storage, follow these steps:

1. Select *Settings* → *Scanner* → *Advanced* → *Storage Encryption*.
2. Tap *Change password* at the bottom of the screen.
3. Enter the current encryption password.
4. On the next screens, enter a new encryption password and then confirm it.

The storage encryption password will be changed without affecting your stored data.

> **Attention:** This password will be required every time you turn on your Leo, so be sure to remember or write it down.

4.1.3.2 PIN Code

You can enhance the security of your device and data by setting a 4-digit unlock PIN Code. Every time Leo screen gets locked, you need to enter this PIN Code to unlock it. To enable unlock with a PIN Code, follow these steps:

1. Select *Settings* → *Scanner* → *Advanced* → *PIN Code*.
2. Turn on the *Unlock LEO with PIN Code* toggle.
3. On the next screen, set up your 4-digit numerical PIN Code and confirm.

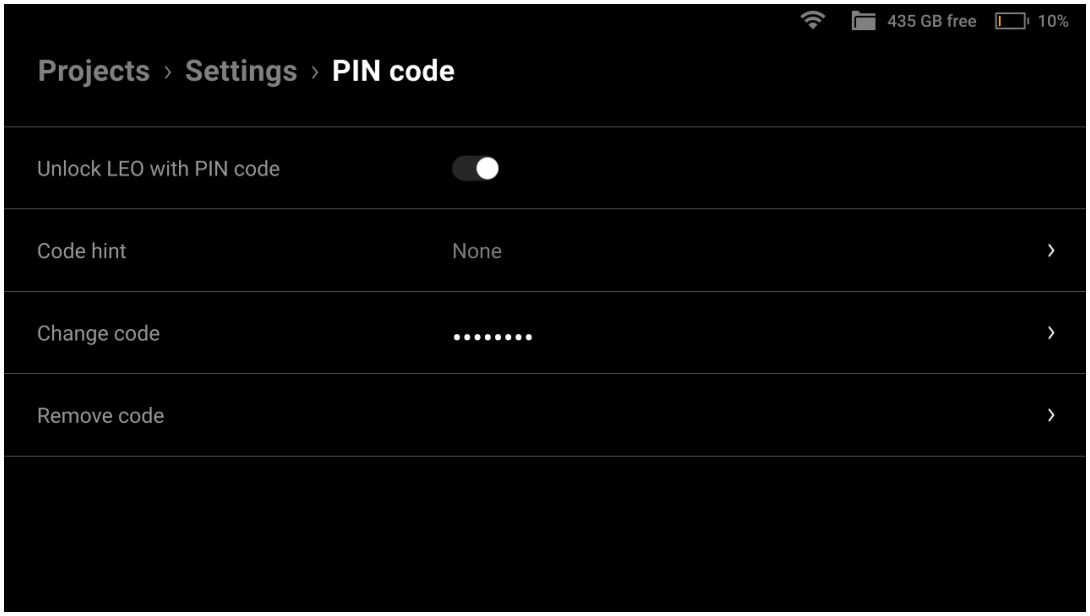


Figure 35: Unlock with PIN Code.

If you need help to remember your PIN Code, you can also set up a *:Code hint*.

To change your current PIN Code, tap on *Change code*, enter a new PIN Code and confirm it.

To remove your current PIN Code, tap on *Remove code* and confirm it.

> **Attention:** If you enter the wrong PIN Code three times in a row, our system will automatically invalidate your PIN Code. You will then have to reset your PIN Code using your MyArtec credentials. See *Reset PIN Code* about recovering your PIN Code.

4.1.3.3 API Users

Manage access to the SDK, which provides over a hundred methods, including starting/stopping scanning, adjusting settings, and downloading scanned project data to a computer.

To add a user:

- Tap the setting name to open the management screen.
- Tap the *Add user* button,
- Enter the user's name in the *API user name* field.
- Scan the QR code on the user page to complete the setup.

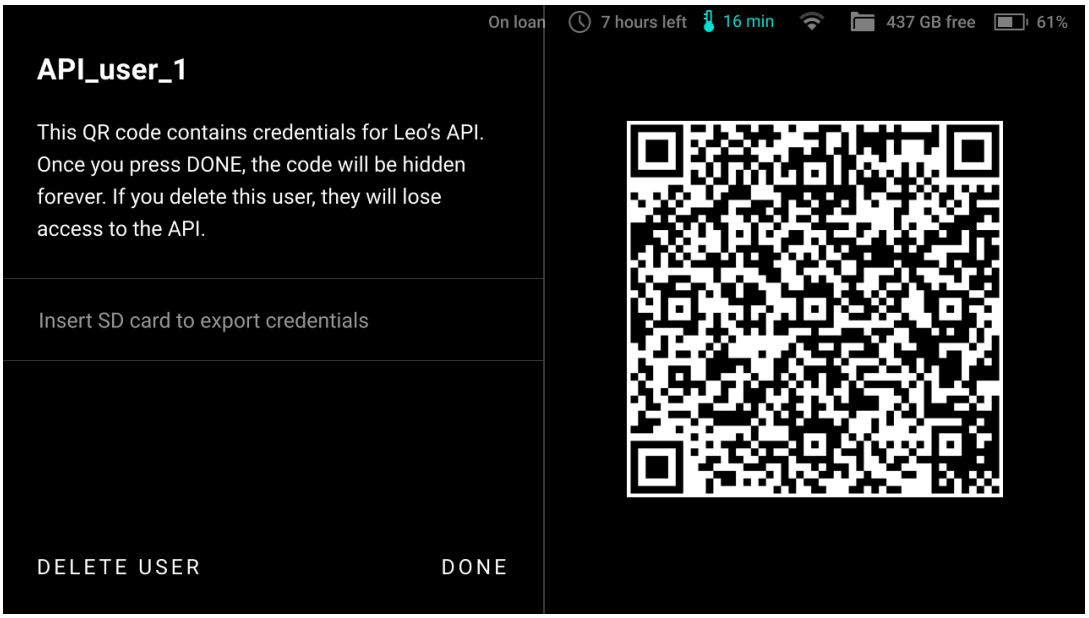


Figure 36: Scan the QR code to add a new user.

Now, the list of users with API access is displayed and can be edited or updated at any time.

4.2 Network

To transfer project files, Leo must be connected to the local network. For initial activation and regular *updates*, an Internet connection is required.

You can use both wired (Ethernet) and wireless (Wi-Fi) connection to set up Leo's communication with other devices. Leo can connect to an existing network or create one itself.

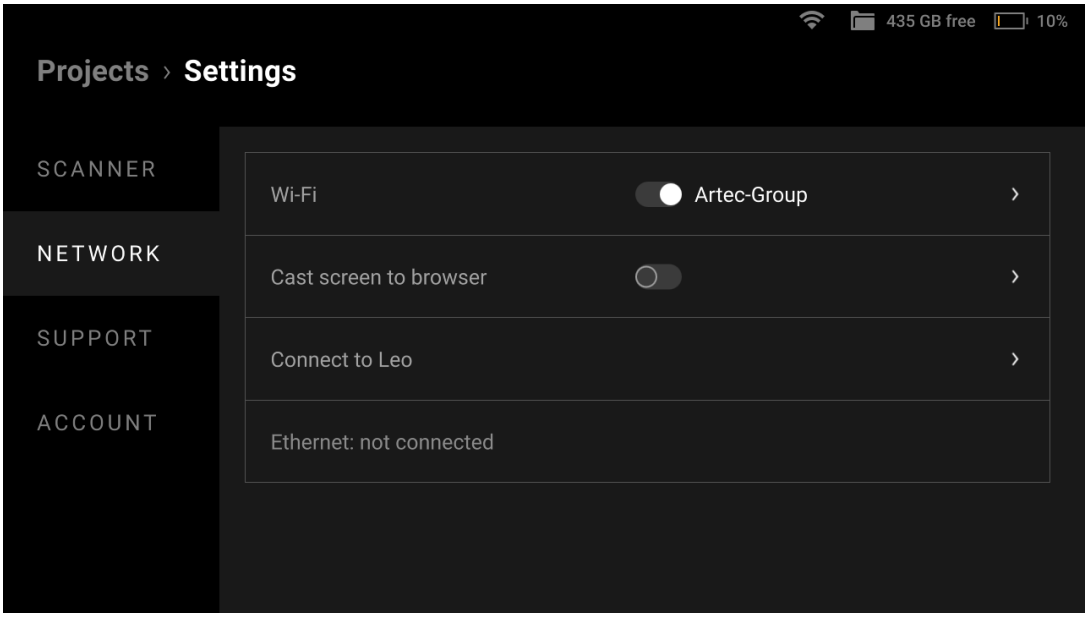


Figure 37: Network ⊠ Settings.

4.2.1 Network Connections

To connect to an existing wired network, you need to

- Connect the scanner via an Ethernet cable to a network device that provides the network operation (e.g. a switch).
- Check that the scanner has obtained an IP address via DHCP.

Note: DHCP (Dynamic Host Configuration Protocol) is a protocol that provides automatic central management for the distribution of IP addresses within a network. A DHCP server must be configured to automatically assign an IP address to a device in a network. For more information about DHCP server operation, contact your network administrator.

To connect to an existing wireless network, you need to

- Turn on *Wi-Fi* to enable wireless connection.
- Select the required Wi-Fi network from those found by your scanner.
- Enter the password (key) for this network and tap *Connect*.

After successfully connecting to the network, the connection icon  will appear in the status bar.

To set up your own wired network with Leo, you need to

- Connect the scanner via an Ethernet cable to a computer with Artec Studio software.
- Select *Settings* → *Network* → *Connect to Leo*.
- Turn on the *Wired (DHCP server)* toggle for the computer to automatically obtain an IP address from Leo via DHCP.
- Configure the computer to automatically obtain an IP address via DHCP in the network adapter properties.

After these steps, you can interact with the scanner using Artec Studio software.

Warning: Be careful when using Leo as a DHCP server. If you connect to a network in this mode with another DHCP server, it may result in an unwanted network configuration.

To set up your own wireless network with Leo, you need to

- Select *Settings* → *Network* → *Connect to Leo*.
- Specify *Hotspot name* and *Hotspot password* for your future connection.
- Turn on the *Wireless (Hotspot)* toggle.
- Connect your computer with Artec Studio software via Wi-Fi to the newly created hotspot.

After these steps, the computer and scanner will be on the same network and ready to communicate.

Note: Connecting to existing networks (both wired and wireless) will allow you to access the Internet (if configured) to update the software, communicate with my.artec3d.com and download projects. Networks created by Leo (as a DHCP server or hotspot) allow only file transfer.

4.2.2 Cast Screen to Browser

The *Networks* section also contains screencasting controls. They are described in detail *here*.

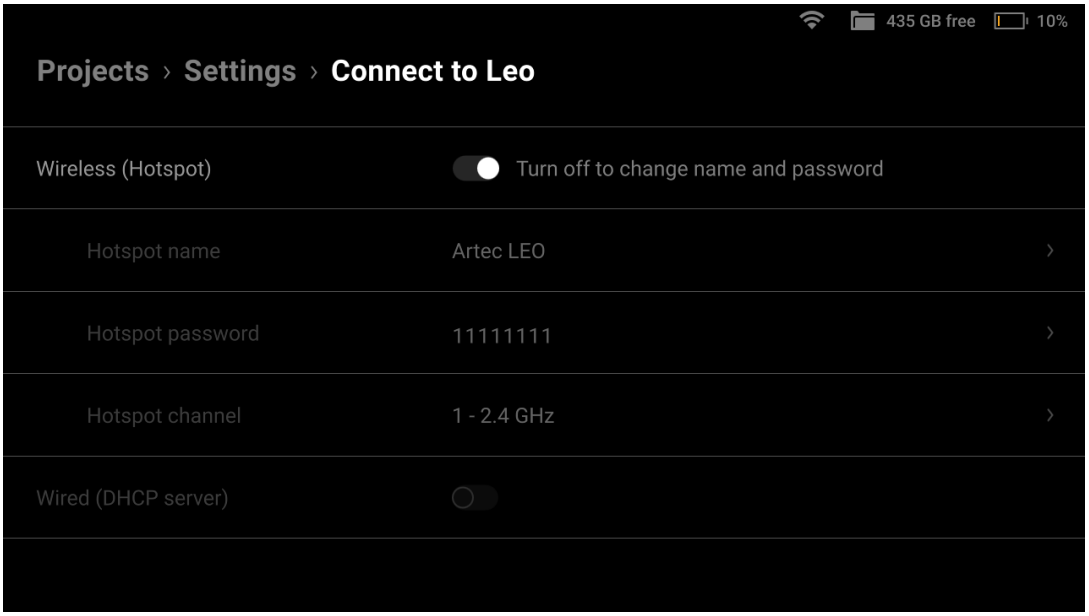


Figure 38: *Connect to Leo* settings.

4.3 Support

This section allows you to generate and send reports to the support.

For more information, see the *Get Support* chapter.

4.4 Account

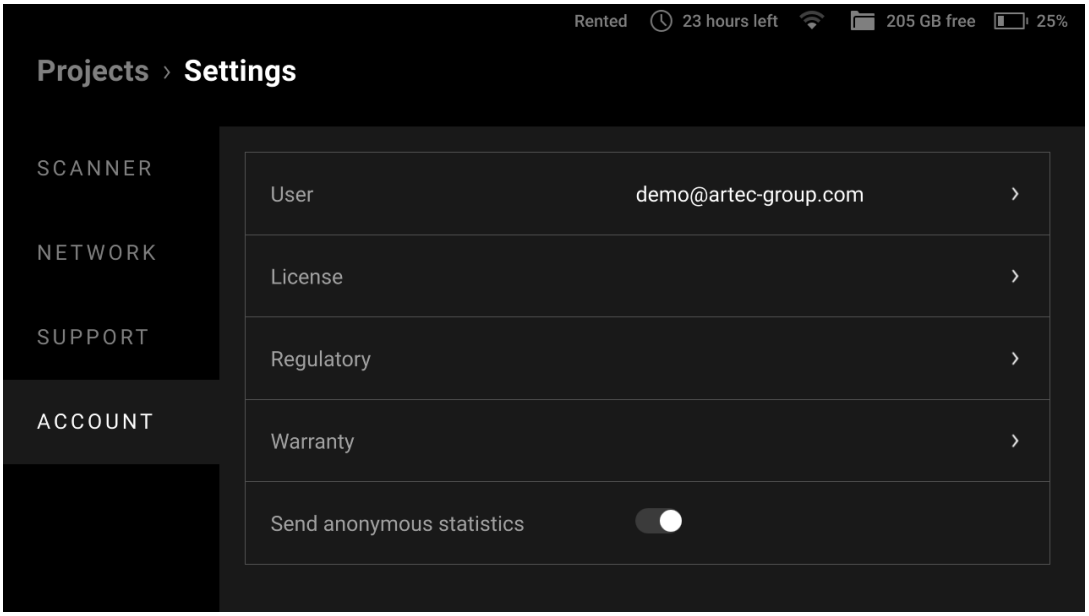


Figure 39: Account ☒ Settings.

The *Account* tab contains the following parameters:

Parameter	Description
User	Select to view and edit *user information*.
License	Select the section to see the license agreement for the Artec Leo embedded software.
Regulatory	Select the section to see the regulatory compliance statements.
Warranty	Select the section to see the information about the legal warranty and liability of the parties.
Send anonymous statistics	Turn on the toggle to allow Leo to send anonymous statistics to Artec 3D to improve the quality of the product.

4.4.1 User

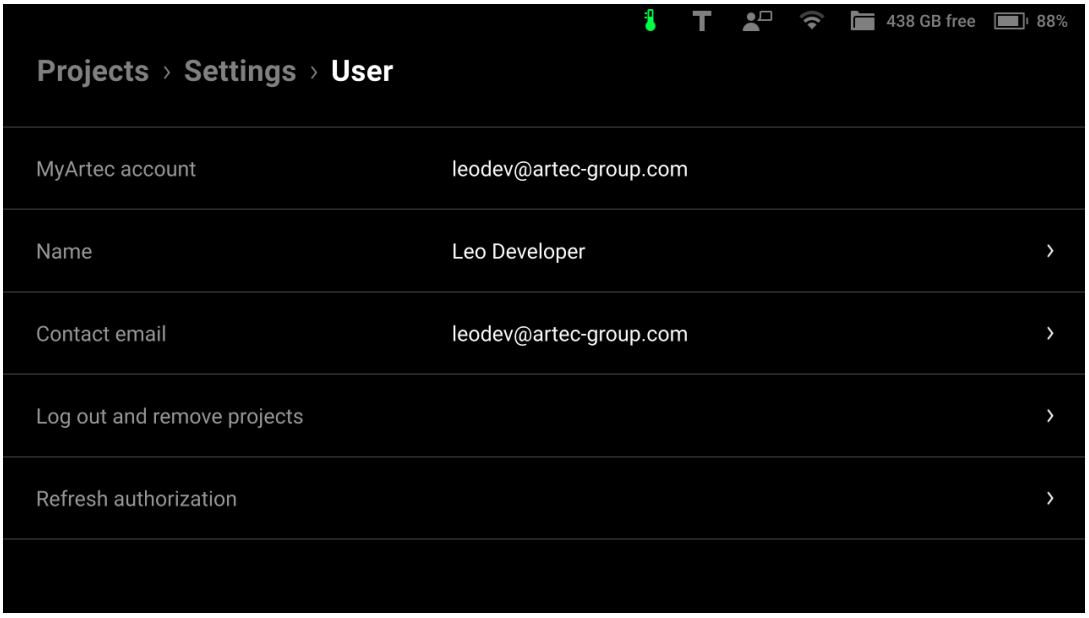


Figure 40: User ☒ Account ☒ Settings.

The *User* tab lists the following fields:

Parameter	Description
MyArtec account	Determine the *my.artec3d* account that you are using for your Leo scanner.
Name	Name for a person who uses Leo.
Contact email	Select to specify an email different from that used in *my.artec3d* account. The support team will use it as a reply-to address for the support reports sent from Leo.
Log out and remove projects	Use it to log out from this account and log in with another one. Note that logging out will delete all projects.
Refresh authorization	Allows you to update your My Artec password on Leo without logging out. If you change your My Artec password, Leo will require the new password to continue syncing with My Artec servers. Clicking this button prompts you to enter the updated password for the currently logged-in account. This feature prevents loss of access to projects in case the password was changed on My Artec.

4.5 Turn Off

Note: A single press of the power button on the scanner housing works as a *Back* button, i.e. it returns a user to the previous screen or state.

To turn off Leo scanner, follow the steps:

1. Press the power button as many times as needed for the *Project* screen to appear. Then press- the power button once again.	1. Select *Settings* → *Scanner* → *General* → *Shut down*.
2. Tap *Shut down* in the dialog that has appeared.	

Important: A long press of the power button starts a hard reset. Use a hard reset sparingly, only if it is absolutely necessary, since it may lead to incorrect termination of the system processes.

CHAPTER

FIVE

CALIBRATION

Calibration is the process of checking and adjusting a scanner's measurements by comparing them with the standard (etalon) values. All Artec Leo scanners are delivered pre-calibrated and issued with a calibration certificate (2022 onwards).

However, in some cases, owing to careless handling or transportation (jolts, accidental drops or some other reason), Leo may fail to produce best results. To resolve these issues, you can recalibrate your Leo.

5.1 Leo Recalibration

To recalibrate your Leo, you need a *Calibration Board*.

Step 1: Calibration board setup

1. Open the case containing the *Leo Calibration board* and place it on a flat surface, preferably the floor.
2. Detach the lid from the case, but do not take the *Calibration board* out of the casing.
3. Avoid touching the board as it can damage the markings and tamper with the calibration results.

Important: It is advised to handle the *Calibration board* with utmost care. Perform calibration while keeping the board inside its casing always.

Step 2: Preparation

1. Turn on Leo, and if calibrating for the first time, make sure it is connected to Wifi.

Note: Subsequent recalibrations can be performed even without internet, as Leo caches the board file.

---

1. Go to Settings → Scanner → Advanced, and select the *Recalibration* option. The following screen displays the recommended environmental conditions for recalibration.

2. Make sure the ambient temperature is around 20-23 degrees Celsius, and there is no direct sunlight in the room. Click on *Start*.
3. Scan the QR-code on the *Calibration board*, and wait.
4. The next screen is the warm-up screen that indicates the time required to warm Leo up to its optimal temperature range (~30 minutes). Keep Leo ON, and wait while Leo warms up.

Note: To obtain precise results, it is essential to warm up Leo to its optimal working temperature before recalibration. DO NOT skip this step.

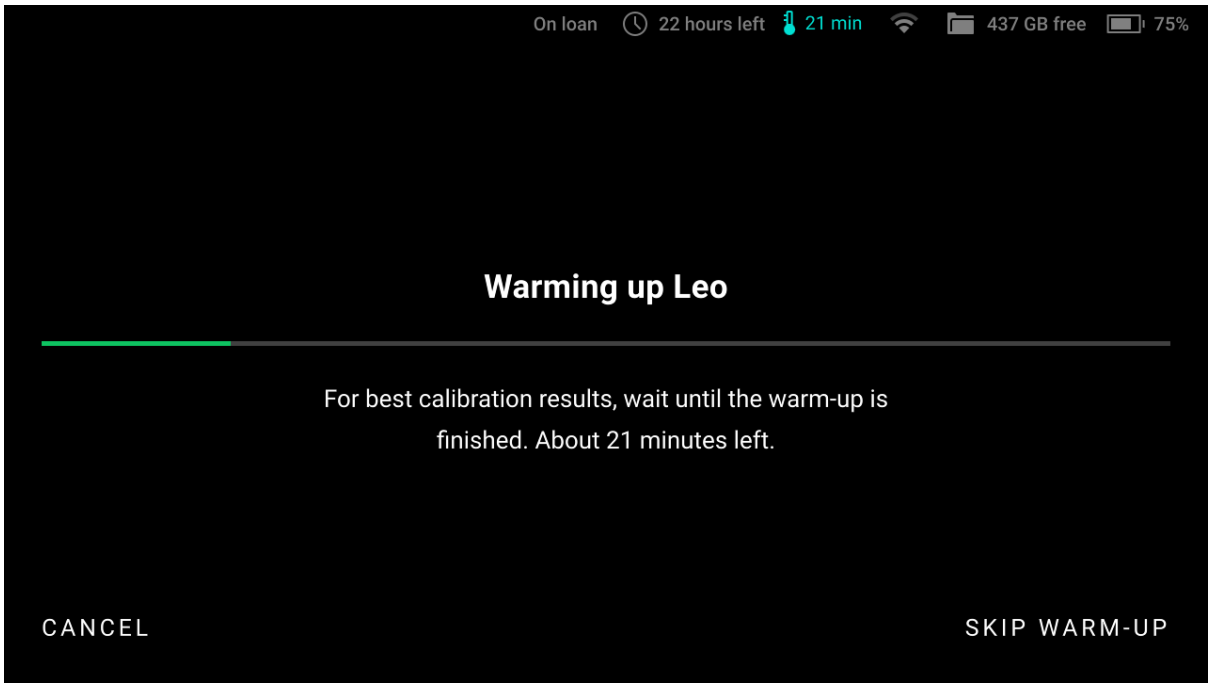


Figure 41: Leo warms up to its optimal working temperature.

Step 3: Calibration

1. After Leo warms up to its optimal temperature, the scanning screen opens up.
2. If there is no *Calibration board* in the field of view, Leo displays the screen as shown in Figure 42. In this case, simply point Leo to the *Calibration board* to open the scanning screen.
3. Hold Leo within the distance range of 66.5 cm - 106.5 cm from the calibration board, throughout the scanning procedure.
4. Point Leo to the *Calibration board* and start scanning (See Figure 43). There are multiple trajectories you should cover with your scanner, to perform recalibration.
4. The green dot in represents the center of the *Calibration board*, and the green circle represents the *Calibration board*, i.e. your field of view (See Figure 44).
5. The arcs represent the respective trajectories you will have to follow during scanning.

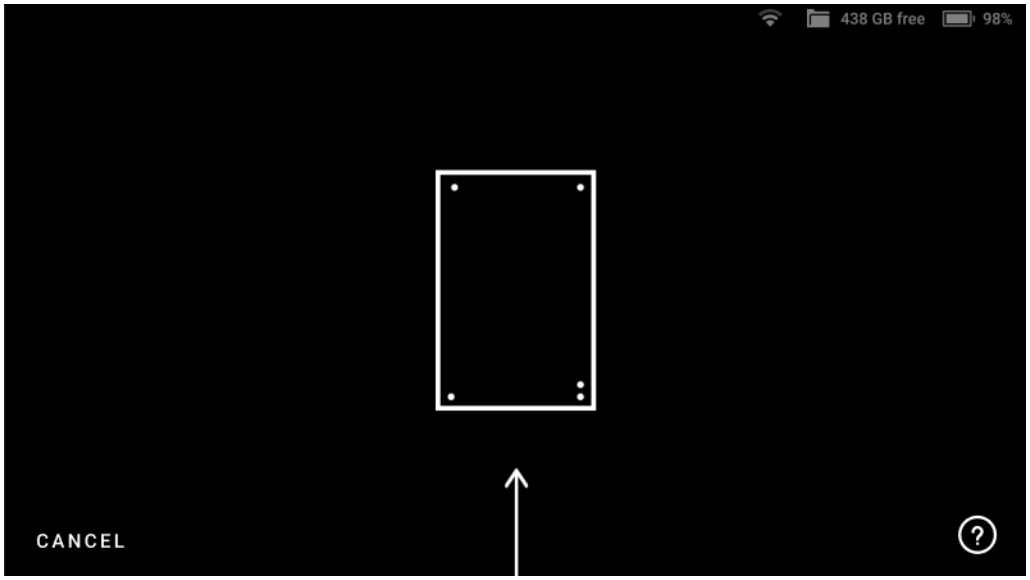


Figure 42: Leo's screen when there is no *Calibration board* in its field of view.

6. To capture data, first align the green dot with the intersection of the arcs.

Important: Make sure the green dot stays inside the green circle (field of view) during scanning. A red dot indicates that the scanner is out of the field of view.

---

7. Now slowly move the green dot to the first circle on the arc, and glide Leo following the trajectory, from one circle to another such that the green dot overlaps each circle.
8. As you move along the arc trajectory, the circles will turn green, indicating that the data has been captured. Scan until all the circles turn green.
9. Similarly, scan the board following all the subsequently displayed arc trajectories on Leo.
10. Lastly, you need to hold Leo over the *Calibration board*, and move it perpendicularly forward and backward, along the z-axis (See Figure 46).
11. Scan in this manner, until all the white circles turn green.
12. Maintain the recommended distance between the 'calibration board' and scanner at all times. If the scanner is too far from the board, Leo will display an error on the scanning screen Figure 46.

Step 4: Result

1. After capturing data from all three positions, Leo will proceeds to calculation and processes the calibration.
2. Leo will display the recalibration result. Click on *Done*, and you have successfully recalibrated your Leo.
3. If for some reason, the recalibration was unsuccessful, repeat the process from the

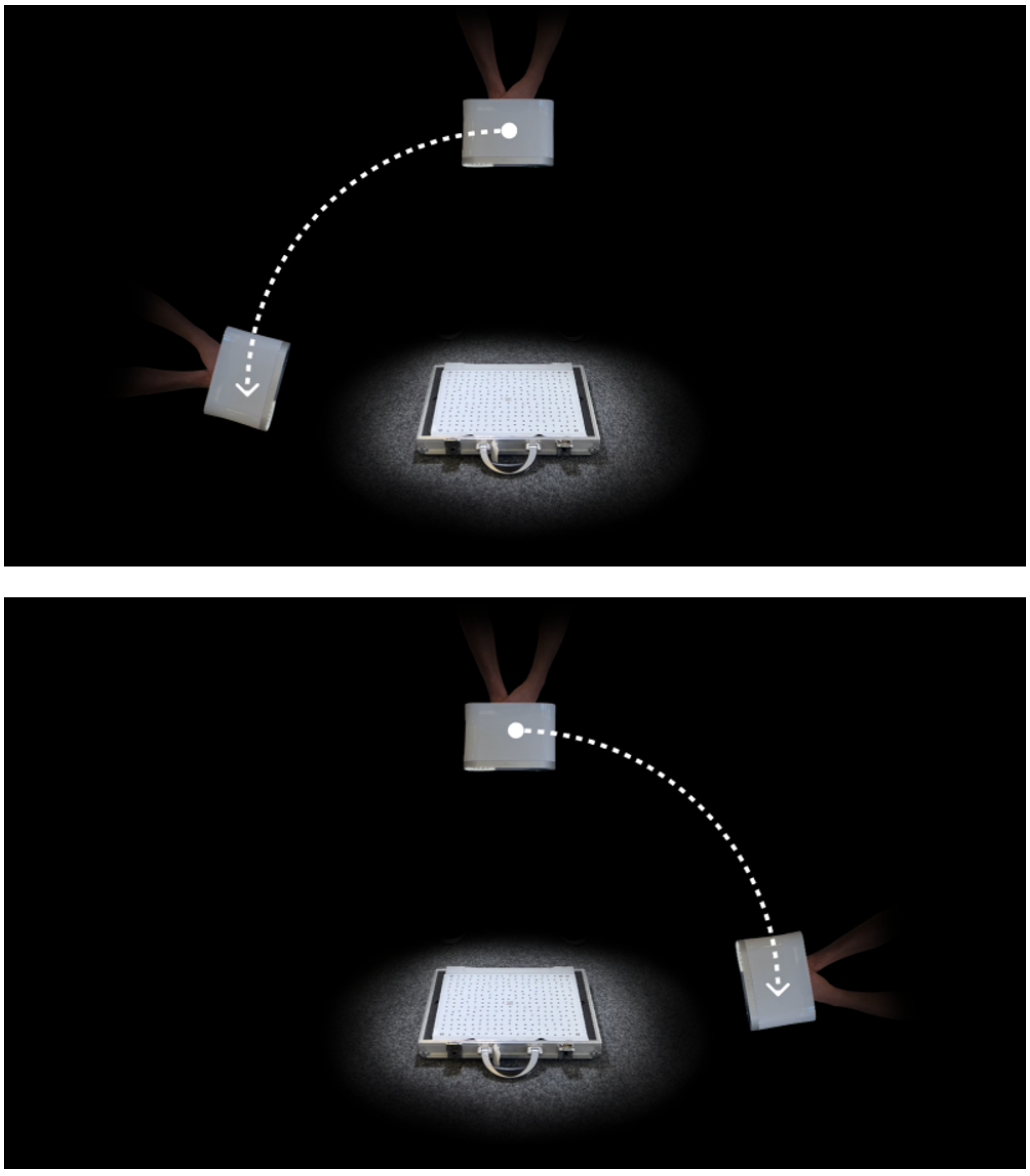


Figure 43: Trajectories of scanning for recalibration.

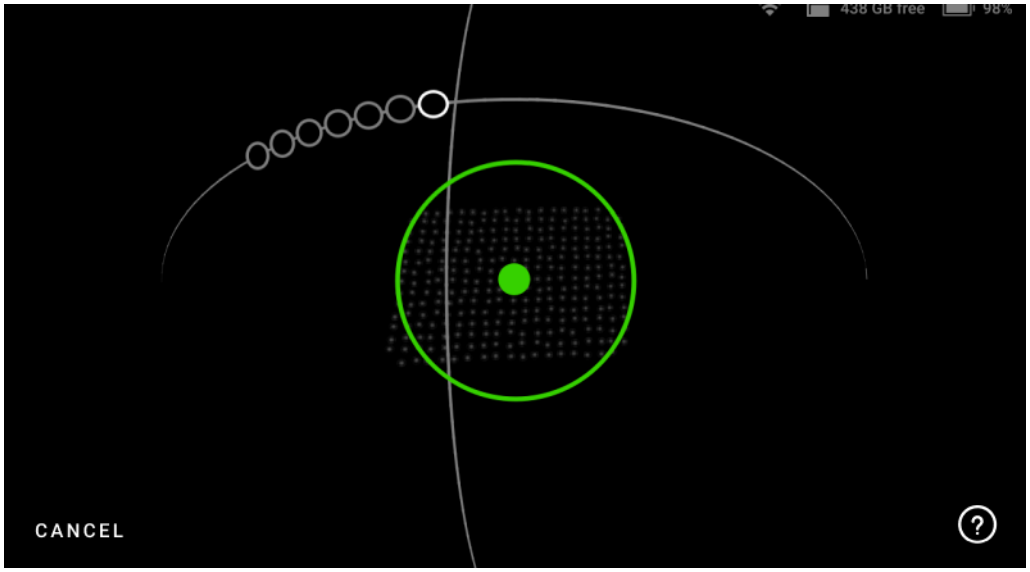


Figure 44: Green dot represents center of the Calibration board.

beginning or *ask for support*.

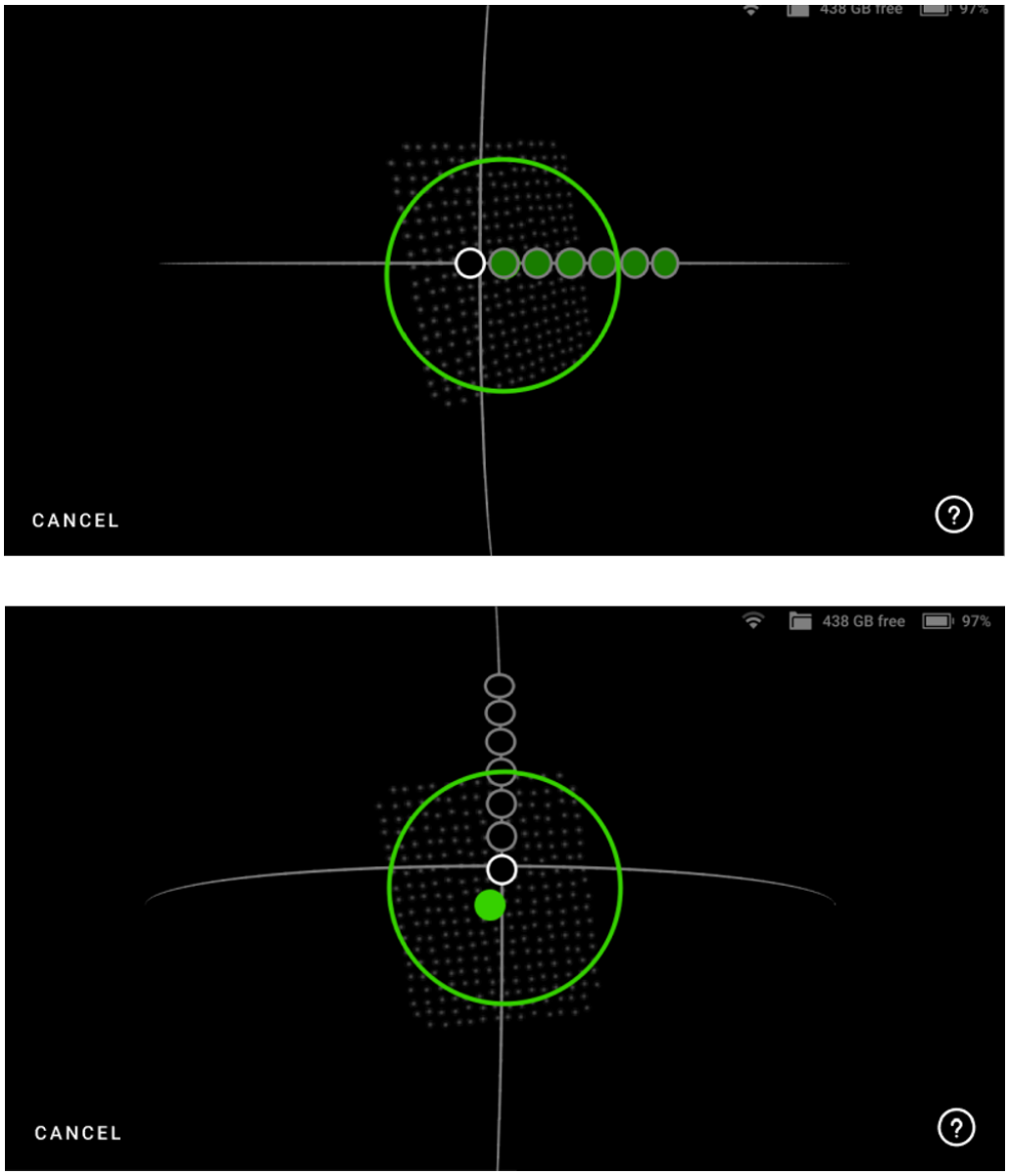


Figure 45: Move the scanner along the trajectory until all circles are green.

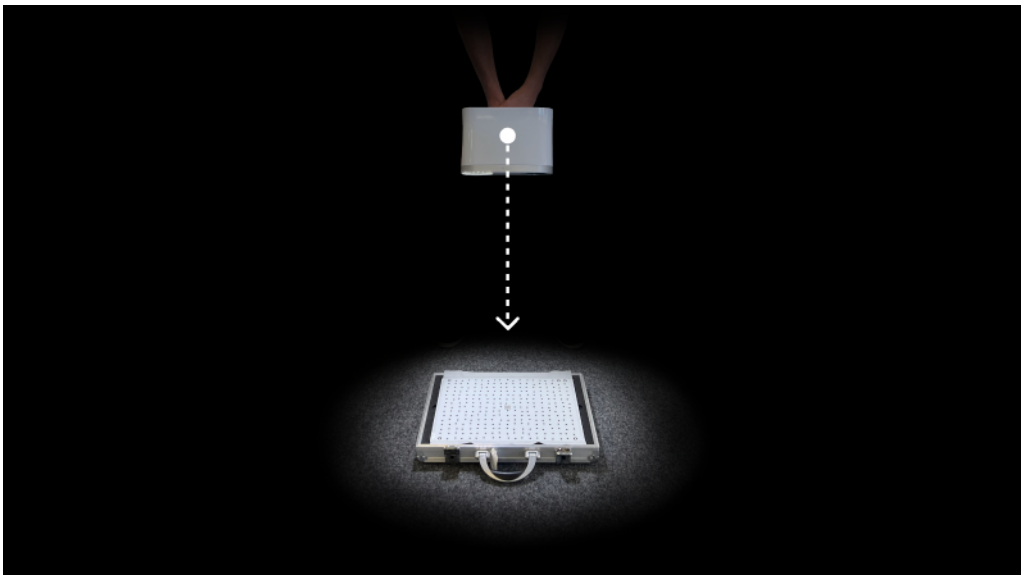


Figure 46: Forward and backward scanning of the board.

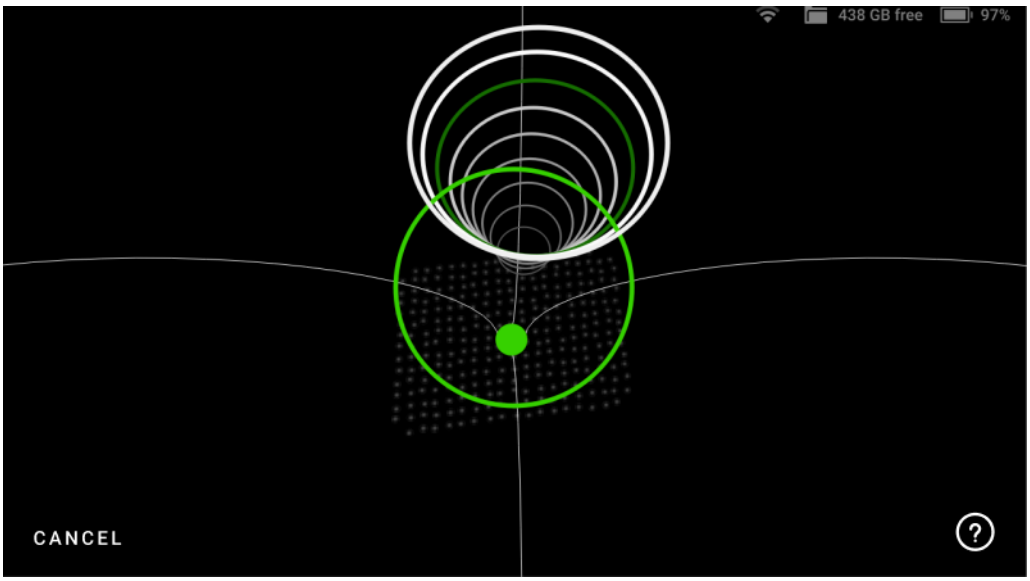


Figure 47: Move the scanner along the trajectory until all circles are green.

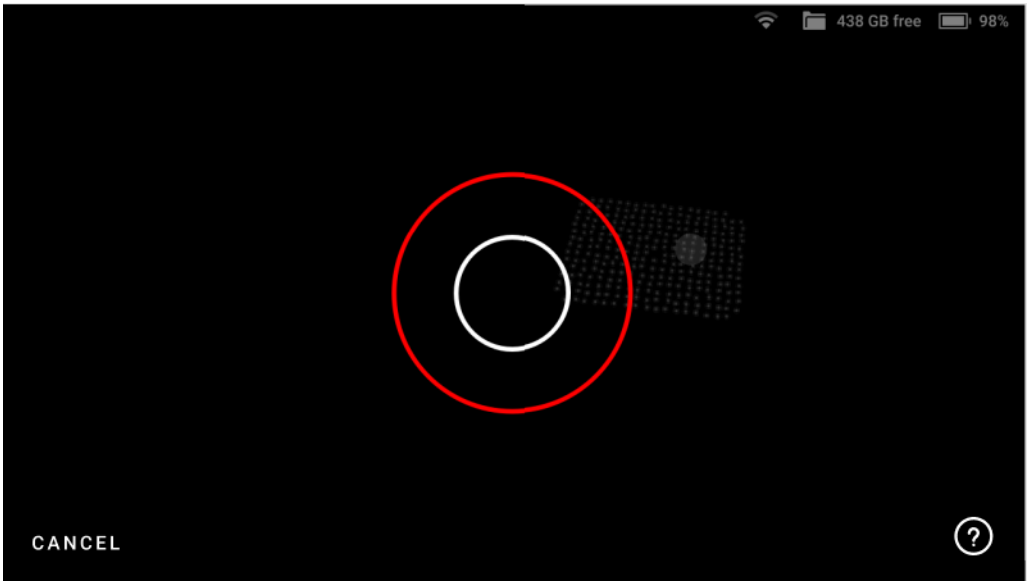


Figure 48: Red circle indicates a distance error.

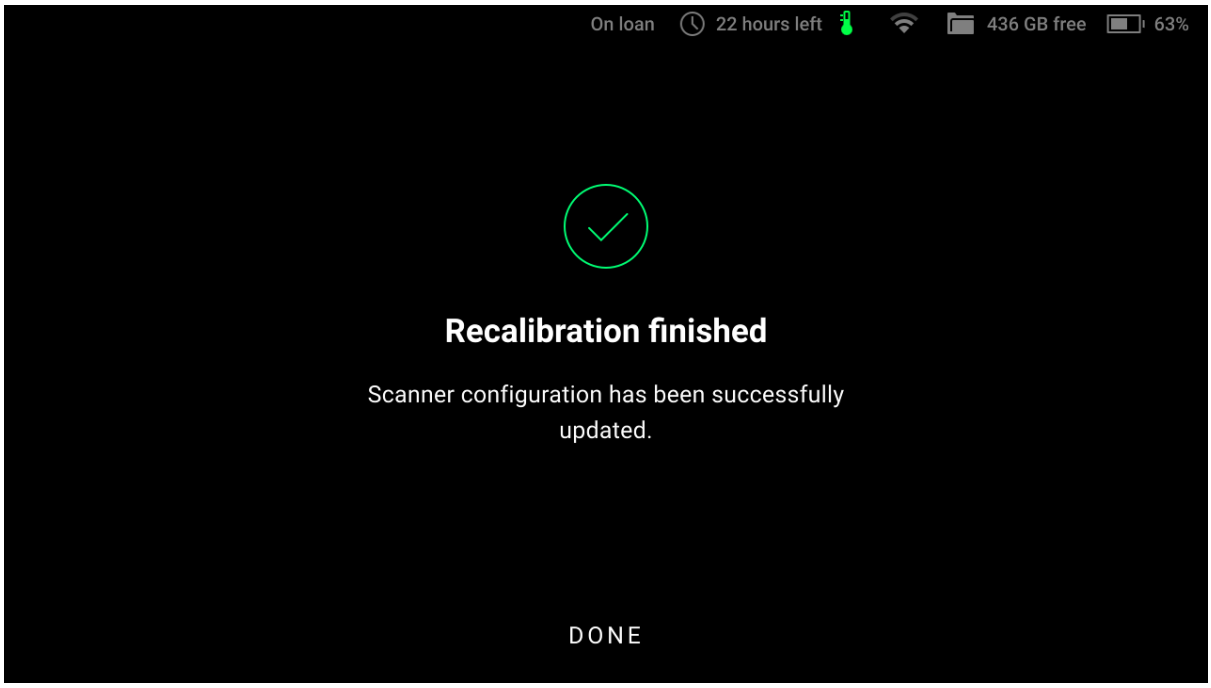


Figure 49: Leo screen displays the calibration result.

CHAPTER

SIX

OTHER DEVICES AND ACCESSORIES

6.1 External Display

Artec Leo allows to cast its screen to a browser. It means that you can have an additional display to observe a 3D scene. Another device needs to be connected to the same network as Leo scanner.

Note: Only screens with 3D content can be casted. To enable casting, you need to start scanning or open a project.

To cast your Leo screen, follow the steps:

1. In the *Projects* screen, tap *Settings*.
2. Select the *Network* section.
3. Turn on the *Cast screen to browser* toggle.
4. Locate the scanner's IP address that appears near the toggle.
5. Open a web browser on another device.
6. Type in the Leo's IP address and confirm your entry.
7. On Leo, *start scanning* or *open a project*.

6.1.1 Allow Control

Turn on *Allow Control* to control Leo through your browser. Artec Leo enables you to access and manage projects, upload targets and perform many other Leo operations on your browser.

To manage Projects, click on the *Projects* tab on the upper right corner of your browser window. You will see all Leo projects displayed on your browser window.

- You can add a *New Project* and rename a project by clicking on the respective control buttons.

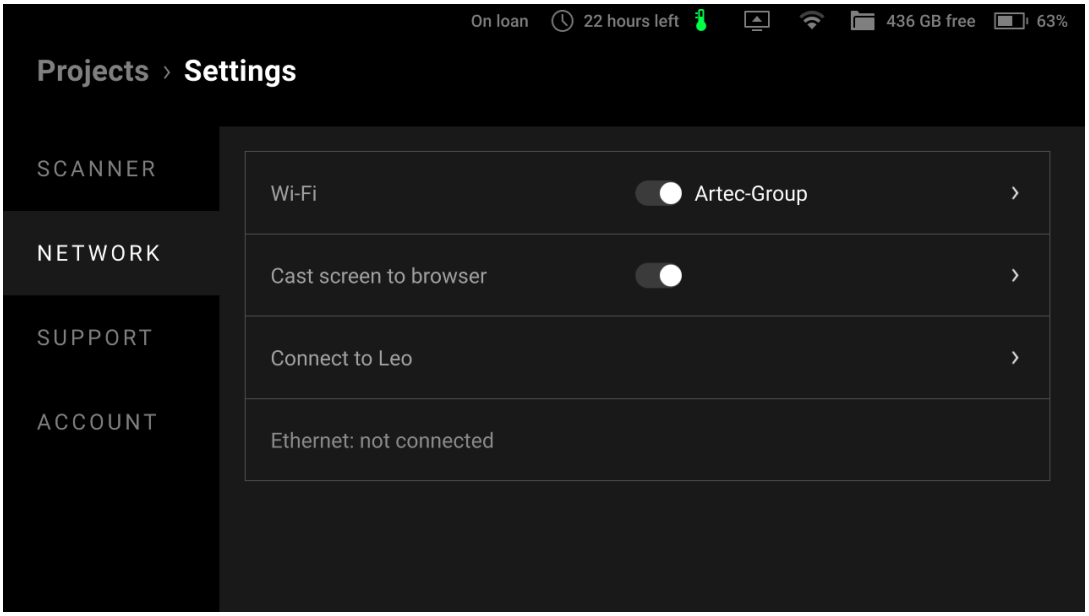


Figure 50: Screen casting settings.

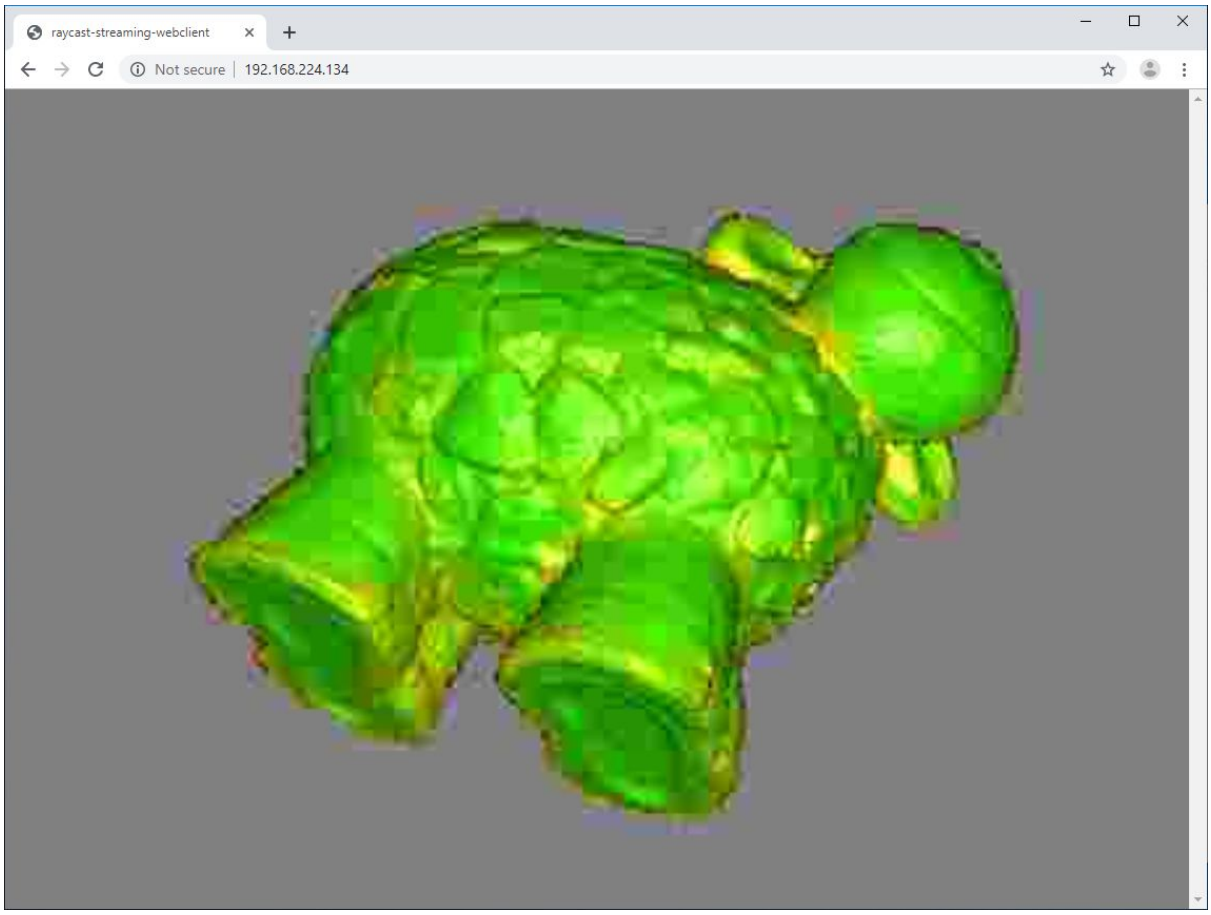


Figure 51: Browser window set to cast Leo screen.

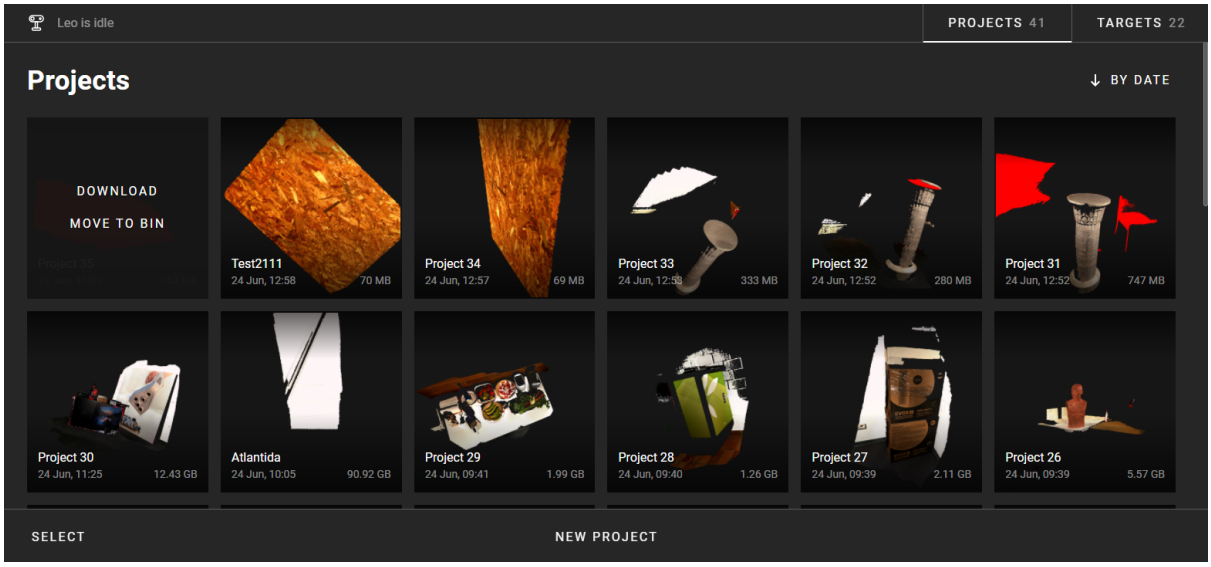


Figure 52: Browser window enabled to control Leo.

- You can start and add a new scan inside an existing project *New scan*. The browser window will display the buttons to control the scan process: *Start*, *Stop* and *Close*.
- Hovering the cursor on each project will display the *Download* and *Move to bin* buttons.

To manage *targets*, click on the *Targets* tab on the upper right corner of your browser window. You will see all your target files and details there.

- To *upload* a new target file, tap on *Upload*. Alternatively, you can drag and drop your target file from your computer.

6.2 Battery

6.2.1 Charge Battery

To charge your Leo battery, *plug the power adapter* into your scanner. You can also *take out the battery* from the scanner and charge it using the special charger.

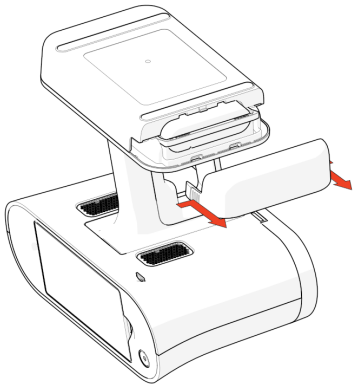
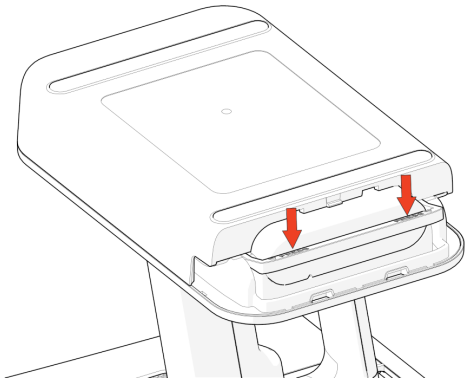
See also:

Battery Usage

6.2.2 Replace Battery

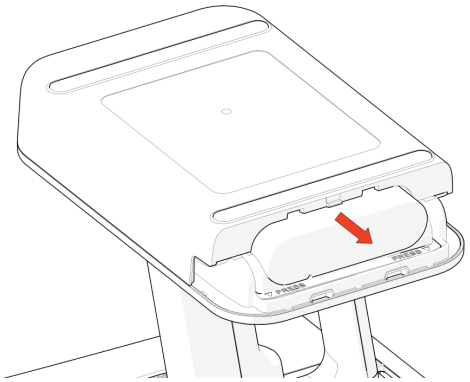
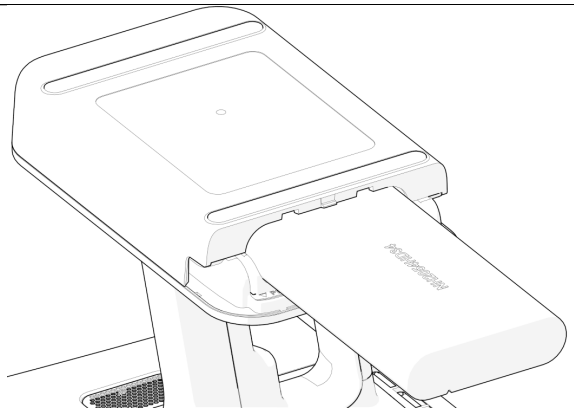
Caution: *Shut down* your Leo before replacing its battery.

To remove the battery from Leo, follow the steps:

1. Turn Leo upside down.	
2. Open the battery compartment by pressing the both latches of the lid.	
3. Push the bracket in the direction of the depicted arrow.	

continues on next page

Table 1 – continued from previous page

4. While still holding the bracket in the lowest position, pull the battery towards you.	
5. Again push the bracket down.	
6. While still holding the bracket in the lowest position, insert a newly charged battery into the compartment.	
7. Close the battery lid.	

6.3 Calibration Board

All Artec Leo scanners are delivered pre-calibrated and issued with a calibration certificate (2022 onwards). It is however, possible to recalibrate Leo. See *Calibration* for detailed information.

The Leo *Calibration board* is especially designed for recalibrating Leo, and enables you to calibrate Leo in just a few steps.

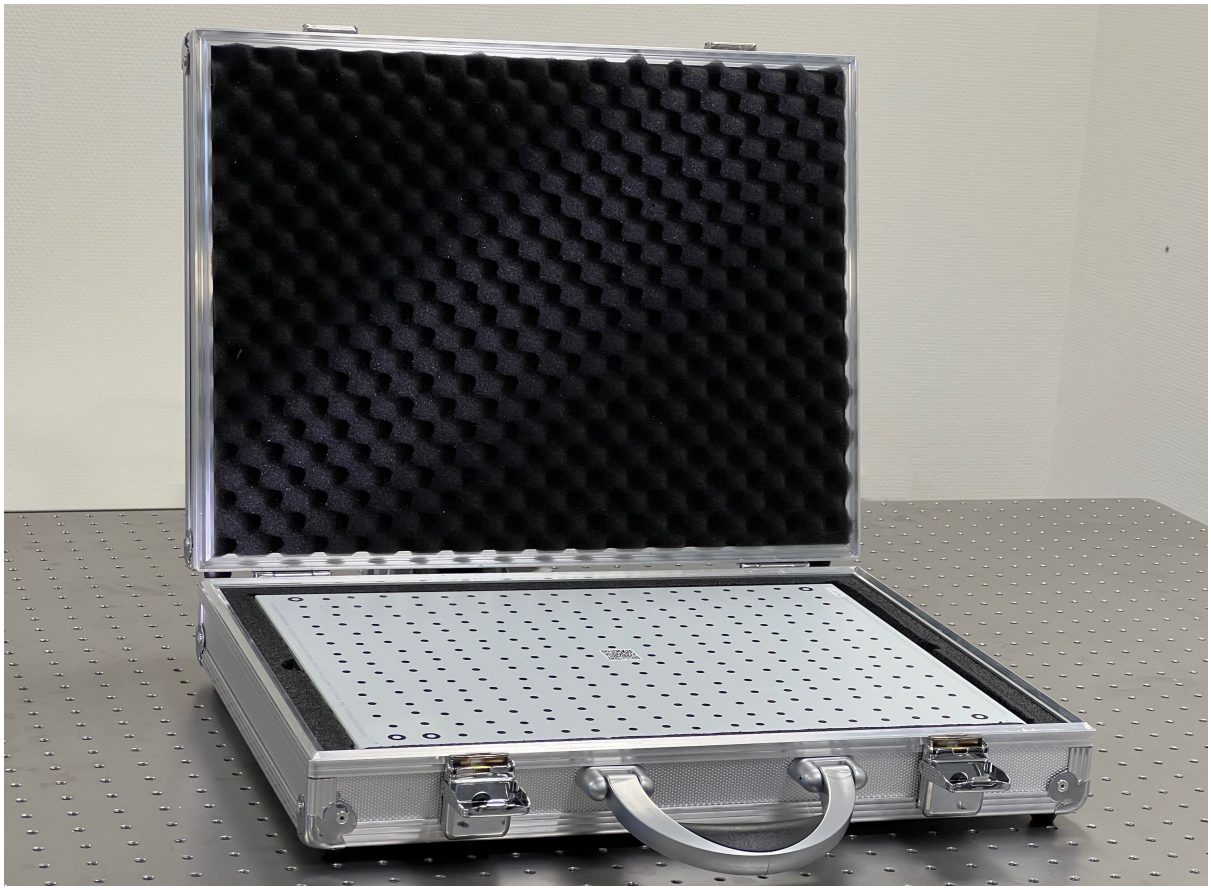


Figure 53: Leo's Calibration board.

CHAPTER

SEVEN

SAFETY AND HANDLING INFORMATION

7.1 Safety Information

It is important to read all the safety information before starting to use your new Leo scanner. If you don't follow these instructions, damage, injury, or malfunction may happen.

Become familiar with the following safety messaging conventions used throughout this manual.

Warning: Warns you about actions that could result in personal injury.

Caution: Cautions you about actions that may result in malfunctions or physical damage to Artec Leo scanner.

Attention: General important information.

7.1.1 Laser Exposure

Artec Leo scanner is a device that is safe both for an operator and a subject of scanning under conditions of its intended use. In accordance with EN 60825-1:2014, the Artec Leo 3D Scanner is to be classified as a Laser Class 1 product when used as intended.

Complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.

It is thereby confirmed that Leo is compliant with all the standard safety requirements and is safe for end users. Class 1 laser product means that the device is safe regardless of the distance to the laser aperture.

Warning: Avoid looking into the scanner lens from the distance lower than 35 centimeters.

Leo has an additional protection system that halts the laser light if the distance between the device and the object becomes lower than 10 centimeters.

Warning: Never attempt to *disassemble* the scanner. The laser source inside the device can cause eye injury if the device is operated in a disassembled or modified state. Only authorized ARTEC EUROPE S.à r.l. personnel can perform service operations.

7.1.2 Wireless Network Usage

Scanner uses radio signals to connect to Wi-Fi networks. You must observe regulations that forbid the use of electronic device in some facilities. Turn off Wi-Fi in the scanner settings to this end.

7.1.3 Electrical Safety

To avoid electrical shock, use Leo in dry environment (see *Operating Temperature and Humidity* for details).

Warning: Never open scanner housing or insert foreign object into its openings.

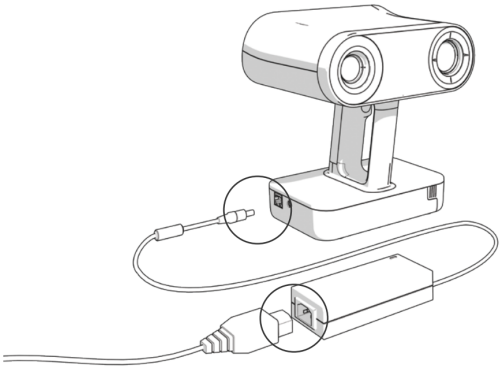
7.1.3.1 Power Supply and Cables

- Use only power adapters and cables intended for Leo scanner and supplied by ARTEC EUROPE S.à r.l..

  Caution: Using the DC cables and power adapters intended for Artec Eva or other scanners may lead to malfunction of Leo scanner.

- Before you plug the power cord into a power outlet, check the connection in the locations:
  - Between Leo and the DC cable

– Between the power supply and the power cord



- Protect the cables from being trodden on or being squashed.
- Protect the openings from foreign objects or dripping liquids.
- Place power supply unit on a stable surface. A drop or fall could cause damage.
- Always check all the cables for damages.

7.1.3.2 Battery Usage

Use only batteries, cables and charging devices intended for Leo and supplied by ARTEC EUROPE S.à r.l..

Warning: Do not immerse a battery into fire and do not puncture it.

Avoid discharging scanner battery completely. Watch the battery charge level: the  icon at the top of the screen shows it.

Caution: Never store Leo with a discharged battery. If the scanner is to go unused for long periods, charge the battery at least once every three months.

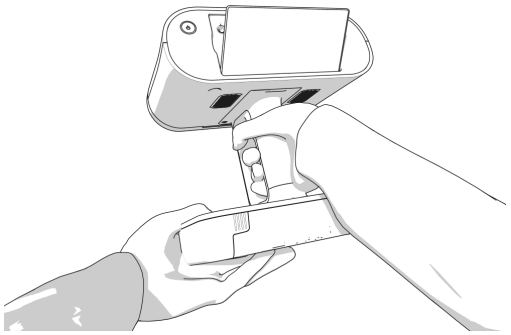
Avoid prolonged battery depletion. Charge the battery regularly, even if the scanner is not in use. If left uncharged for an extended period, the battery may become completely depleted and will no longer hold a charge.

Caution: Never leave the battery uncharged for long periods. Charge it at least once every three months to maintain its capacity. Battery replacement is not available.

7.2 Handling Information

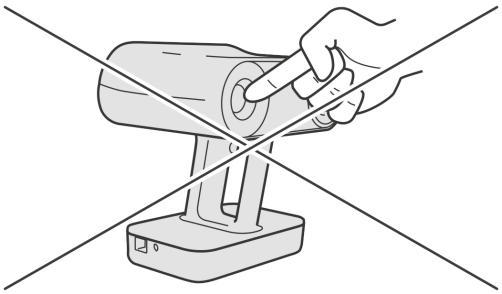
Artec Leo is an instrument that contains sophisticated optical and computing systems. Handle it with care, avoid jolting and inflicting any impact or pressure on the device.

Caution: Always grip the scanner by its handle; use your other hand for extra support when necessary. Gripping only the scanner head or battery housing may lead to device malfunction.



7.2.1 Optical Parts

We strongly advise that you refrain from touching the optical parts of the scanner. Use a blower to remove dust from the lens. If a grease spot adheres to the lens or other optical parts, wipe it with a lens cloth.



Caution: Do not use cleaners that contain organic solvents to clean the lens.

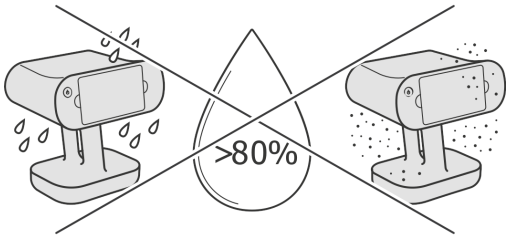
7.2.2 Operating Temperature and Humidity

Artec Leo is designed to function in ambient temperatures between +15°C and +35°C (59°F and 95°F) and humidity of up to 80%. Avoid exposure to condensation.

When you are using the scanner, it is normal for it to get warm. Artec Leo may, however, fail to function if the device can't regulate its internal temperature. Wait for a few minutes before trying to scan again.

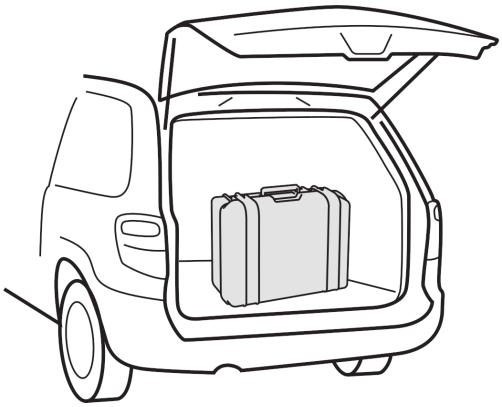
7.2.3 Exposure to Liquid and Dust

Avoid direct exposure to any liquid or dust as it could lead to deterioration in the device's performance. If your scanner has been exposed to liquid, turn it off and unplug power cable. To dry the device, use soft cloth.



7.3 Transportation and Storage

When transporting your Leo, do so only using the hard case. The Artec Leo case has been specially engineered and thoroughly impact tested by ARTEC EUROPE S.à r.l. in order to protect the device from any external damage during shipping or transportation.

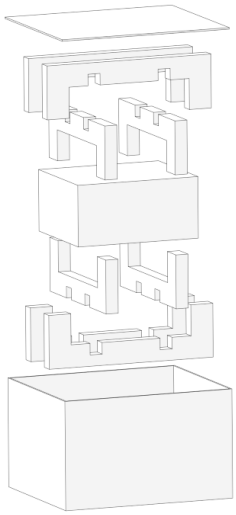


Leo case has foam sections designed to store scanner's original and optional accessories. Don't store any extraneous items in this case. Don't alter the case or remove any foam sections.

When not using your scanner, please keep it safely stored in the hard case.

Caution: Never turn on the scanner while it is stored in the hard case. It may cause overheating.

For cargo shipping, we suggest using the original wooden box your scanner arrived in. Before putting the hard case in the box, ensure all foam sections are correctly installed. Safely store this box for future use; don't discard it.



7.3.1 Batteries

When transporting spare batteries for Leo, ensure that you observe regulations of your air or transport carrier.

7.4 Disassembling and Repair

Do not try to open the scanner, remove any of its parts or tamper with it any other way. This may lead to malfunction of the device or even cause harm to human health (see *Laser Exposure*). The only allowed operation for a user is the battery replacement in the battery compartment.

All the maintenance and repair procedures are only carried out by the manufacturer.

7.5 Legal Warranty and Hidden Defects

1. Artec shall be held liable for any lack of conformity and hidden defects which exist upon 3D scanner LEO (the “Product”) delivery, even unknown to Artec.
2. The legal warranty allows the Client to report to Artec any defaults of conformity of the Product resulting from the packaging or the Product’s installation if such installation formed part of the Contract or took place under Artec’s responsibility. In case of lack of conformity, the Client has the choice between (i) requesting to remedy the lack of conformity, unless this is impossible or disproportionate, by the repair or replacement of the Product, or (ii) returning the Product and being reimbursed, or keeping the Product and having part of the price reimbursed. The Client cannot request the return of the Product or the reimbursement of part of the price if Artec replaces or repairs the Product. In order to invoke the legal warranty, the Client must, by any means, inform Artec of the default in conformity within two years from the time of delivery of the Product.
3. This legal warranty is without prejudice to the Client’s right to prevail of any other action permitted by law, such as the warranty for hidden defects.

7.6 Manufacturer’s Address

```
ARTEC EUROPE S.á r.l.
4 Rue Lou Hemmer, L-1748
Senningerberg, Luxembourg
```

7.7 Factory’s Address

```
ARTEC EUROPE S.á r.l.
11 Breedewues, L-1259
Senningerberg, Luxembourg
```

7.8 Compliance

Leo is compliant with the regulations stated in this section.

7.8.1 European Union

CE

ARTEC EUROPE S.à r.l. declares that Artec Leo meets the provision of the following Directives:

- 2014/53/EU The Radio Equipment Directive (RED)
- 2014/35/EU The Low Voltage Directive (LVD)
- 2014/30/EU The Electromagnetic Compatibility Directive (EMC)
- 2011/65/EU The Restriction of Hazardous Substances Directive (RoHS)
- 2012/19/EU The Waste Electrical and Electronic Equipment (WEEE)

and complies with the following standards:

- EN 55032:2015 (CISRP 32)
- EN 60825-1:2014
- EN 60950-1:2006+A2:2013
- EN 61000-4-3:2006+A2:2010
- EN 62368-1:2014
- EN 301 489-1 V1.9.2
- EN 301 489-17 V2.2.1

7.8.2 United States

7.8.2.1 Federal Communication Commission (FCC)

FC

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

This equipment has been tested and found to comply with the limits for a Class B digital device, 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 receiver.

- Connect the equipment to 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.

Important: Changes or modifications to this device not authorized by ARTEC EUROPE S.à r.l. could void the electromagnetic compatibility (EMC) and wireless compliance and negate your authority to operate the product.

Caution: Use the interface cables sold or provided by Artec for this device. Using other interface cable may exceed the limits of Class B Part 15 of the FCC rules.

7.8.2.2 FCC RF Radiation Exposure Statement

1. This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
2. Artec LEO is a Portable device for body worn operation, this device has been tested and meets FCC RF exposure guidelines. When used with an accessory that contains metal may not ensure compliance with FCC RF exposure guidelines.
3. To get access to the Regulatory information that includes E-labels, go to Settings → Account → Regulatory.

7.8.2.3 Food and Drug Administration (FDA)

Complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.

7.8.3 Canada

Contains IC: 7361A-P2180.

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions: 1. This device may not cause interference, and 2. This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : 1. l'appareil ne doit pas produire de brouillage, et 2. l'utilisateur de l'appareil doit accepter tout brouillage radioelectrique subi, meme si le brouillage est susceptible d'en compromettre le fonctionnement.

7.8.3.1 Exposure to Radio Frequency Radiation

Caution: To comply with the Canadian RF exposure compliance requirements, this device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

Caution: Pour se conformer aux exigences de conformité RF canadienne l'exposition, cet appareil et son antenne ne doivent pas être co-localisés ou fonctionnant en conjonction avec une autre antenne ou transmetteur.

7.8.3.2 Portable Device Caution

Caution: For portable operation, this device has been tested and meets RF exposure guidelines when used with an accessory that contains no metal. Use of other accessories may not ensure compliance with RF exposure guidelines.

Caution: Pour portable utilisation, cet appareil a été testé et respecte les directives sur l'exposition aux RF lorsqu'il est utilisé avec un accessoire sans métal. L'utilisation d'autres accessoires peut ne pas garantir la conformité aux directives d'exposition aux RF.

7.8.4 Environmental Disclosures

California Prop 65 Warning — California law requires this warning to be provided to California customers.

Prop 65 Warning: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

7.9 Disposal Information

The symbol above means that Artec Leo and/or its battery meets the European Directive 2002/96/EC on Waste Electrical and Electronic Equipment. This symbol indicates that when product reaches the end of its life, it should be taken to a collection point designated by local authorities. The separate collection and recycling of your scanner and/or

its battery at the time of disposal will help preserve natural resources and ensure it is recycled in a way that protects human health and environment.

CHAPTER

EIGHT

GET SUPPORT

If you encounter some issues with Leo scanner, *ask for support*. If the issue is severe, the scanner may enter Recovery mode.

8.1 Send Report from Leo

To contact support, you can use Leo menu. Scanner has a form, where you can attach logs and provide detailed information. If you specified a different contact email in *Settings*, you'll receive an answer to this email address.

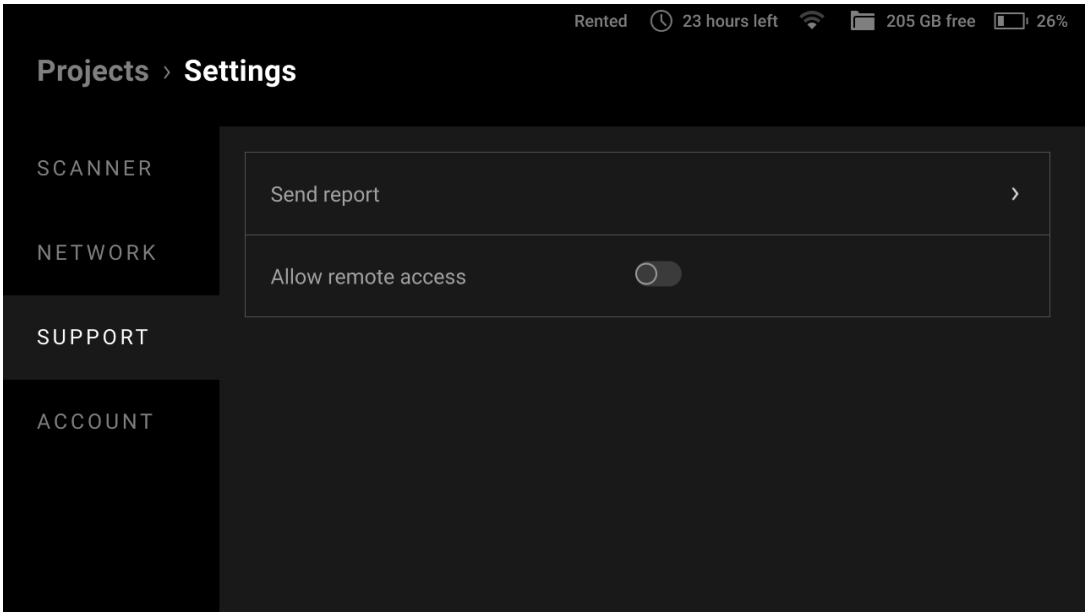


Figure 54: Support section in scanner settings.

To contact the support team from Leo, perform the following steps:

1. In the *Project* screen, tap *Settings*.
2. Ensure that your scanner is *connected* to the Internet.
3. Select the *Support* section.
4. Tap *Send report*.

5. Type detailed information related to the issue you experienced.
6. Tap *Next*.[1]

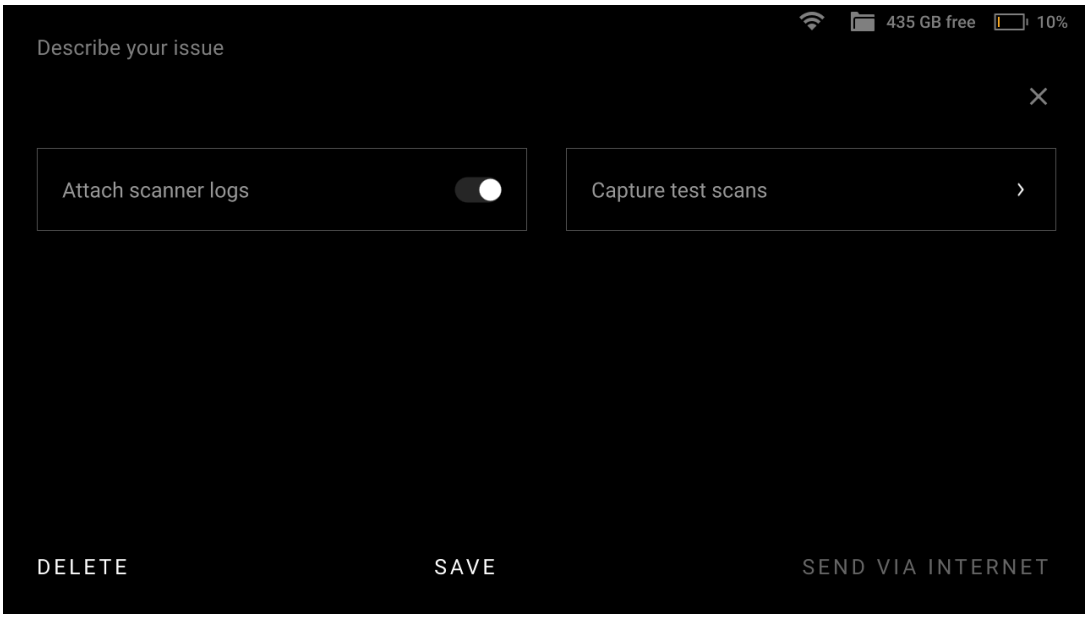


Figure 55: Sending report.

7. Turn on the *Attach scanner logs* toggle.

> **Important:** Leo won't send any stored scans from your projects.

8. Tap *Capture test scans*, if your issue relates to scanning.
   a. Warm up the scanner in *'Preview'* mode for at least 20 minutes beforehand.
   b. Tap *Capture test scans* and direct the scanner at a wall.
   c. During the capture process, **it is important to slowly move the scanner back and forth repeatedly** within the distance of 500 - 1000 mm from the wall.
   d. Tap *Start* to initiate the capture process.
9. Tap *Send*. Wait for the device to collect and send the required information to Artec.

8.2 Reset PIN Code

If you forget your unlock *PIN Code* or accidentally enter the wrong pin three times in a row, our system will automatically invalidate your *PIN Code*. This security procedure ensures that a stranger won't be able to access your data by simply 'guessing' your pin.

You can reset your *PIN Code* using either of the following ways.

Online Recovery : When Leo is connected to the internet

[1] You can store your entered text and continue editing the report later. Tap the *Save* button to this end.

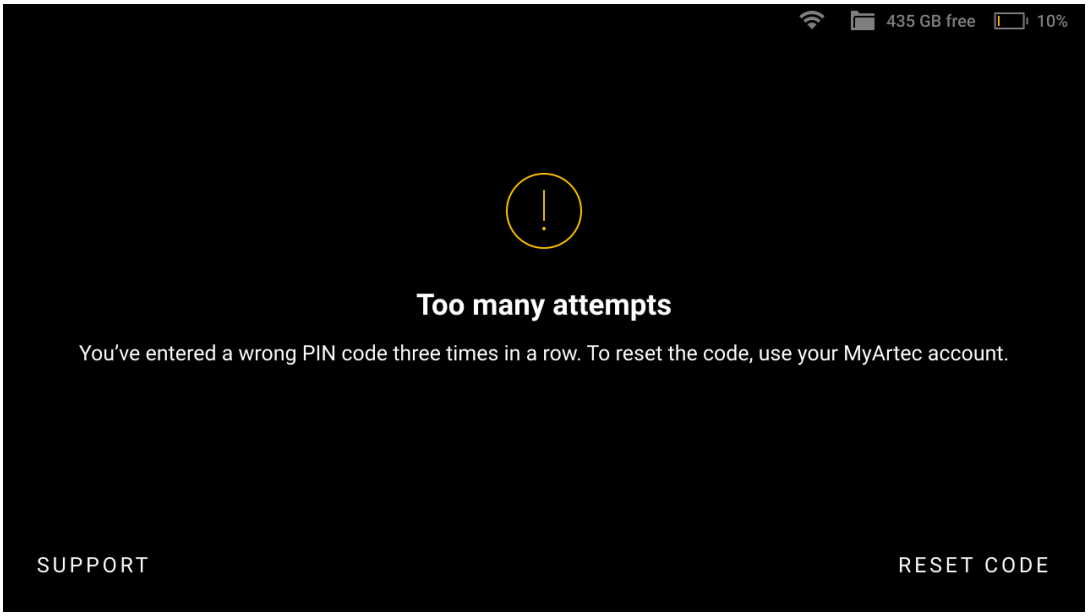


Figure 56: Reset your PIN Code.

1. On the error message screen, tap on *Reset code*.
2. You'll be prompted to enter your MyArtec account password. Enter your password.
3. Click on *Proceed*.
4. Reset your *PIN Code* and confirm it.

Offline Recovery : When Leo is NOT connected to the internet

You need a computer or phone with internet connection for the following steps.

1. Login to your MyArtec account online → Scanner section.
2. Select your device from your device list and click on the *Reset Leo PIN Code* link.
3. Now, on the Leo error message screen, tap on *:Reset code*. A reset code will be generated and displayed on your Leo screen.
4. Enter the reset code generated from Leo on your computer and click on *Get response code*. A response code will be generated and displayed on your computer screen.
5. Now, enter this response code on your Leo device.
6. Click on *Proceed*.
7. Reset your PIN Code and confirm it.

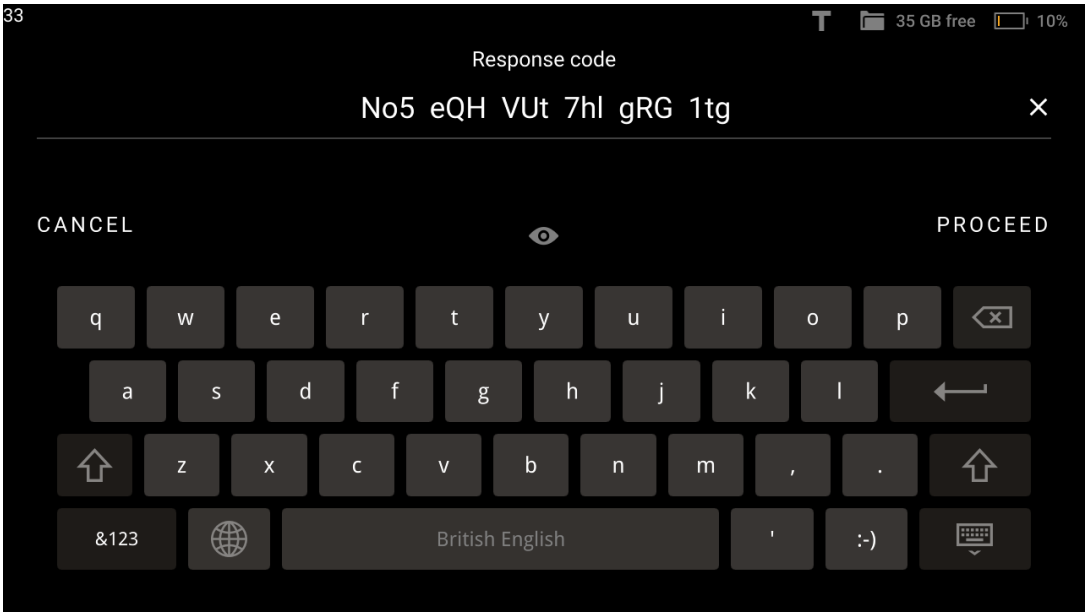


Figure 57: Response code on Leo screen.

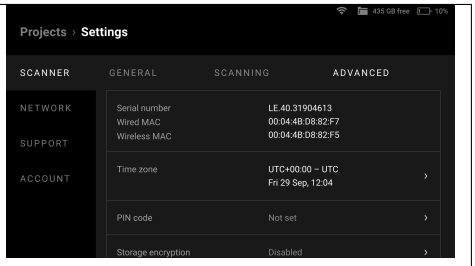
8.3 Enable Support Access

Some cases may require for the support team to have an access to your Leo. To enable this access, use the procedure below:

1. In the *Project* screen, tap *Settings*.
2. Select the *Support* section.
3. Tap *Allow remote access*. The icon will appear in the status bar.

8.4 Locate Serial Number

You can locate the serial number of your Leo using either of the following ways:

• In the *Project* screen, tap *Settings* → *Scanner* → *Advanced*	
• Access *my.artec3d* → *Scanners* section	
• Look at the bottom of the battery housing or *retrieve the serial number sticker* from the envelope	
• Detach the scanner handle using the hex key (2 mm) and locate the serial number in the attaching point.	

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