Artec Point

User Manual

Version 1.0

Artec 3D



Introduction

Purchase

Congratulations on the purchase of an Artec Point scanner!

This manual contains important safety directions as well as instructions for setting up the product and operating it. Refer to **1 Safety directions** for further information. Read carefully through the User Manual before you switch on the product.

The content of this document is subject to change without prior notice. Ensure that the product is used in accordance with the latest version of this document.

Product identification

The model and serial number of your product are indicated on the type label. Always refer to this information when contacting Artec 3D Support Team or Authorized Reseller.

Trademarks

Windows® is a registered trademark of Microsoft Corporation in the United States and other countries. All other trademarks are the property of their respective owners.

Artec 3D is a registered trademark of ARTEC EUROPE S.à r.l.in the European Union, the USA and other countries.

Customer support

If you have any question regarding the use of Artec Point, refer to the Artec 3D Support Team or fill out the question form available here.

Overview of products

Handheld 3D scanners typically include a light source (such as laser or white light), a structured light projector, two or more industrial cameras, a computing unit for 3D digital image processing, and accessories like calibration plates and marker points for calibrating the device. Industrial cameras obtain 3D data of objects based on machine vision principles and use marker point information for automatic data stitching to achieve basic 3D scanning and measurement functions.

The handheld 3D scanner is easy to carry, easy to use, and is highly practical. The handheld 3D scanner, produced by ARTEC EUROPE S.à r.l., uses multiple line lasers to obtain the 3D point cloud data of an object’s surface. The operator holds the scanner and adjusts the distance and angle between the scanner and the object in real time, allowing it to automatically obtain the 3D surface information of the object. The scanner can be easily carried to an industrial site or production floor, according to the size and shape of the object, and, within the workspace, can be used for effective and accurate scanning.

Working principle

Artec Point scanner is an instrument that uses the principle of binocular vision to obtain a spatial three-dimensional point cloud. It works by matching the marker points of the current frame with a library of marker points to obtain the spatial position of the scanner and the object. and emits a laser on the surface of the scanned object, and two industrial cameras, calibrated by the manufacturer, capture the reflected laser and calculate the shape data of the object.

Artec Point uses a blue laser for scanning. The two cameras of the scanner are positioned at specific angles, and their fields of view intersect to form a common field of view. During the scanning process, more than four marker points must be present in this common field of view. The common focal distance of the scanner is called the reference distance, and the common focal range is called the depth of field. The reference distance and depth of field of the scanner are related to the instrument, with the specific values based on the actual test data of the equipment. Generally, the reference distance and depth of field values are related to the laser band and resolution.

Regulatory information

The European Union

This product is in compliance with applicable EU regulations and **CE mark** is properly affixed on the scanner.

Applicable EU Directives as outlined in the CE declaration of conformity.

EMC Directive 2014/30/EU

Low Voltage Directive 2014/35/EU

RoHS Directive 2011/65/EU

Disposal of Electrical and Electronic Equipment in Private Households

In the European Union, Norway, Iceland and Liechtenstein: This symbol on the product, or in the manual and in the warranty, and/or on its packaging indicates that this product shall not be treated as household waste. Instead it should be taken to an applicable collection point for the recycling of electrical and electronic equipment.

The U.S.

FCC Rules and Regulations

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 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.

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

UK representative ARTEC 3D (UK) LTD, 71-75 Shelton Street, Covent Garden, London, WC2H 9JQ, United Kingdom

1 Safety directions

1.1 General introduction

The following directions enable the person responsible for the product, and the person who actually uses the equipment, to anticipate and avoid operational hazards.

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

Warning messages

Warning messages are an essential part of the safety concept of the scanner. They appear wherever hazards or hazardous situations can occur.

- Make the user alert about direct and indirect hazards concerning the use of the product.
- Contain general rules of behavior.

For the user’s safety, all safety instructions and safety messages need to be strictly observed and followed. Therefore, the manual must always be available to all persons performing any tasks described here.

DANGER, **WARNING**, **CAUTION** and **NOTICE** are standardized signal words for identifying levels of hazards and risks related to personal injury and property damage. For your safety, it is important to read and fully understand the following table with the different signal words and their definitions. Supplementary safety information symbols may be placed within a warning message as well as supplementary text.

Warning symbol	Description
⚠ **DANGER**	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
⚠ **WARNING**	Indicates a potentially hazardous situation or an unintended use which, if not avoided, could result in death or serious injury.
⚠ **CAUTION**	Indicates a potentially hazardous situation or an unintended use which, if not avoided, may result in minor or moderate injury.
NOTICE	Indicates a potentially hazardous situation or an unintended use which, if not avoided, may result in 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.
	Indicates a potential hazard to the user's eyes due to laser light exposure, which, if not avoided, may result in eye injury or vision impairment.

1.2 Definition of use

Intended use	• Measuring horizontal and vertical angles • Measuring distances • Scanning objects • Scanning targets • Capturing and recording images • Recording measurements • Computing with software
Reasonably foreseeable misuse	• Use of the product without instructions • Use outside of the intended use and limits • Disabling of safety systems • Removal of hazard notices • Opening the product using tools, for example a screwdriver, unless this is permitted for certain functions • Modification or conversion of the product • Use after misappropriation • Use of products with recognizable damage or defects • Use with accessories from other manufacturers without the prior explicit approval of Artec 3D • Inadequate safeguards at the working site • Deliberate blinding of third parties

1.3 Limits of use

Warning symbol	Description
Environment	Suitable for use in an atmosphere appropriate for permanent human habitation. Not suitable for use in aggressive or explosive environments. **Precaution:** Do not change the temperature suddenly during product use, as this may cause condensation and lead to equipment failure.
⚠ **WARNING**	Working in hazardous areas or close to electrical installations or similar situations is a life risk.
⚠ **CAUTION**	Local safety authorities and safety experts must be contacted by the person responsible for the product before working in such conditions.

1.4 Responsibilities

Artec 3D (manufacturer) is responsible for supplying the product, including the User Manual, other manuals listed in the Introduction, and original accessories, in a safe condition.

The person responsible for the product has the following duties:

- To understand the safety instructions on the product and the instructions in the User Manual
- To ensure that the product is used in accordance with the instructions
- To be familiar with local regulations relating to safety and accident prevention
- To stop operating the system and inform Artec 3D immediately if the product and the application become unsafe
- To ensure that the national laws, regulations and conditions for the operation of the products are respected.

1.5 Hazards of use

Warning symbol	Description
⚠ **WARNING**	Distraction or loss of attention. During dynamic applications there is a danger of accidents occurring if the user does not pay attention to the environmental conditions around. **Precaution:** The person responsible for the product must make all users fully aware of the existing dangers.
NOTICE	Dropping, misusing, modifying, storing the product for long periods or transporting the product. Watch out for erroneous measurement results. **Precaution:** Periodically carry out test measurements, particularly after the product has been subjected to abnormal use and before and after important measurements.
⚠ **WARNING**	Short circuit of battery terminals. If battery terminals are short circuited e.g. by coming in contact with jewelry, keys, metallized paper or other metals, the battery can overheat and cause injury or fire, for example by storing or transporting in pockets. **Precaution:** Make sure that the battery terminals do not come into contact with metallic/conductive objects.

1.5 Hazards of use

Warning symbol	Description
⚠ **WARNING**	If the product is improperly disposed of, the following can happen: • If polymer parts are burnt, poisonous gasses are produced which may impair health. • By disposing of the product irresponsibly you may enable unauthorized persons to use it in contravention of the regulations, exposing themselves and third parties to the risk of severe injury and rendering the environment liable to contamination. **Precaution:** The product must not be disposed of with household waste. Dispose of the product appropriately in accordance with the national regulations in force in your country. Always prevent access to the product by unauthorized personnel. Product-specific treatment and waste management information can be received from Artec 3D or Authorized reseller.
⚠ **WARNING**	Risk of injuries to users and equipment destruction due to lack of repair knowledge. **Precaution:** Only authorized Artec 3D Service Centers are entitled to repair these products.
⚠ **WARNING**	Unauthorized disassembling of the product Either of the following actions may cause you to receive an electric shock or may be the reason for fire: • Touching live components • Using the product after incorrect attempts were made to carry out repairs **Precaution:** • Do not disassemble the product. • Only authorized Artec 3D Service Centers are entitled to repair this product.
⚠ **WARNING**	The limits of use for the scanner are restricted as follows: • To be operated indoors only. Using the device outdoors is at your own risk and is not covered by the warranty. • Ambient temperature: -10 °C–40 °C • Relative humidity: up to 10-90% RH • Avoid direct sunlight in the scanning area • Clean and dust-free environment

1.5 Hazards of use

Warning symbol	Description
⚠ **WARNING**	Dirt, water, or oil stains may affect the use of the product and cause measurement deviations. • If dirt is on the surface of the product's glass, blow it off with clean air. If the dirt is stubborn, wipe it off with a soft cloth dampened with alcohol. • If dirt is on the surface of the object, blow it off with clean air or wipe it off with a clean, soft cloth. • If the measuring object vibrates, it may cause a deviation in the measured value. After turning on the power, wait about 5-10 minutes before use. Since the circuit does not stabilize immediately after the power is turned on, the measured value may be inaccurate.
⚠ **WARNING**	Do not wipe the product with a damp cloth, volatile oil, thinner, etc. Otherwise, the product may become discolored or deformed. If the product is dirty, use a cotton cloth with diluted neutral detergent, wring it out, wipe the product, and then dry it with a soft cloth. Avoid storing the product in places prone to • High humidity or dust • Corrosive or flammable gas • Direct sunlight
⚠ **WARNING**	Electric shock due to missing ground connection. If the unit is not connected to ground, death or serious injury can occur. **Precaution:** The power cable and power outlet must be grounded.
⚠ **WARNING**	Electric shock due to use under wet and severe conditions. If the unit becomes wet, it may cause electric shock. **Precaution:** • If the product becomes humid, it must not be used. • Use the product only in dry environments, for example in buildings or vehicles. • Protect the product against humidity. To use this product properly and safely, please avoid places prone to the following, as otherwise it may cause malfunction: • high humidity or dust • corrosive or flammable gas • splashes of water, oil, chemicals static electricity
⚠ **WARNING**	Failure or fire due to incorrect power supply voltage. Choose the correct power supply voltage. Otherwise, a malfunction may cause failure or fire.

1.6 Laser classification

1.6.1 General





The following chapters provide instructions and training information about laser safety according to international standard IEC 60825-1 (2014-05) and technical report IEC TR 60825-14 (2004-02). The information enables the person responsible for the product and the person who actually uses the equipment, to anticipate and avoid operational hazards.

According to IEC TR 60825-14 (2004-02), products classified as laser class 1, class 2 and class 3R do not require:

- laser safety officer involvement
- protective clothes and eyewear
- special warning signs in the laser working area

if used and operated as defined in this User Manual due to the low eye hazard level.

National laws and local regulations could impose more stringent instructions for the safe use of lasers than IEC 60825-1 (2014-05) and IEC TR 60825-14 (2004-02).

1.6.2 Laser safety precautions

The laser wavelengths of Artec Point are as follows:

Type	Artec Point
Blue wavelength	450nm

This product is classified as a Class 2M Laser Product according to IEC 60825-1.

It 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.

Caution: Use of controls, adjustments, or procedures other than those specified herein may result in hazardous radiation exposure.

Warning symbol	Description
⚠ DANGER	If you do not control and adjust according to the procedures specified here, you may injure the human body (eyes, skin, etc.). Therefore, please be sure to observe the following items.
	About Class 2M laser products: • Do not stare at the laser or its reflected light. • Do not intentionally point the laser at people, especially their eyes. • Pay attention to the reflected light path of the laser. The laser can be both specular and diffuse. If there is a danger of reflected light, please cover it with a baffle. • Do not use a concentrator, magnifying glass, or microscope to observe the laser output within 100 mm. • This product does not have a mechanism to turn off the laser irradiation when disassembled. Please do not disassemble it.

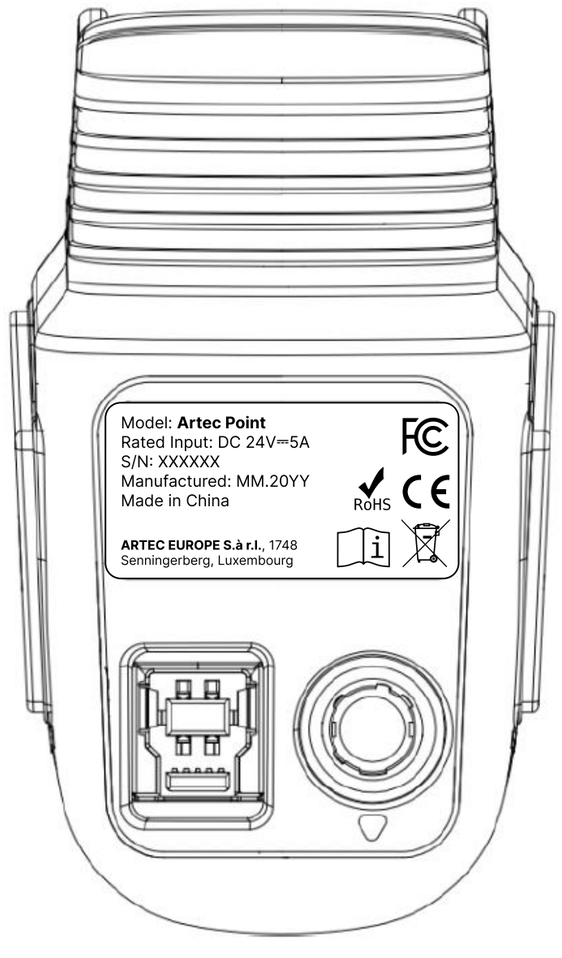
1.6.2 Laser safety precautions

Identifier Label

An ID label is affixed on the product as below.



Label placement



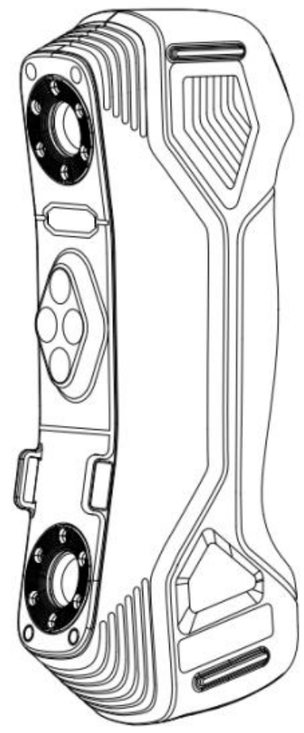
2 Scanner setup

2.1 Scanner configuration

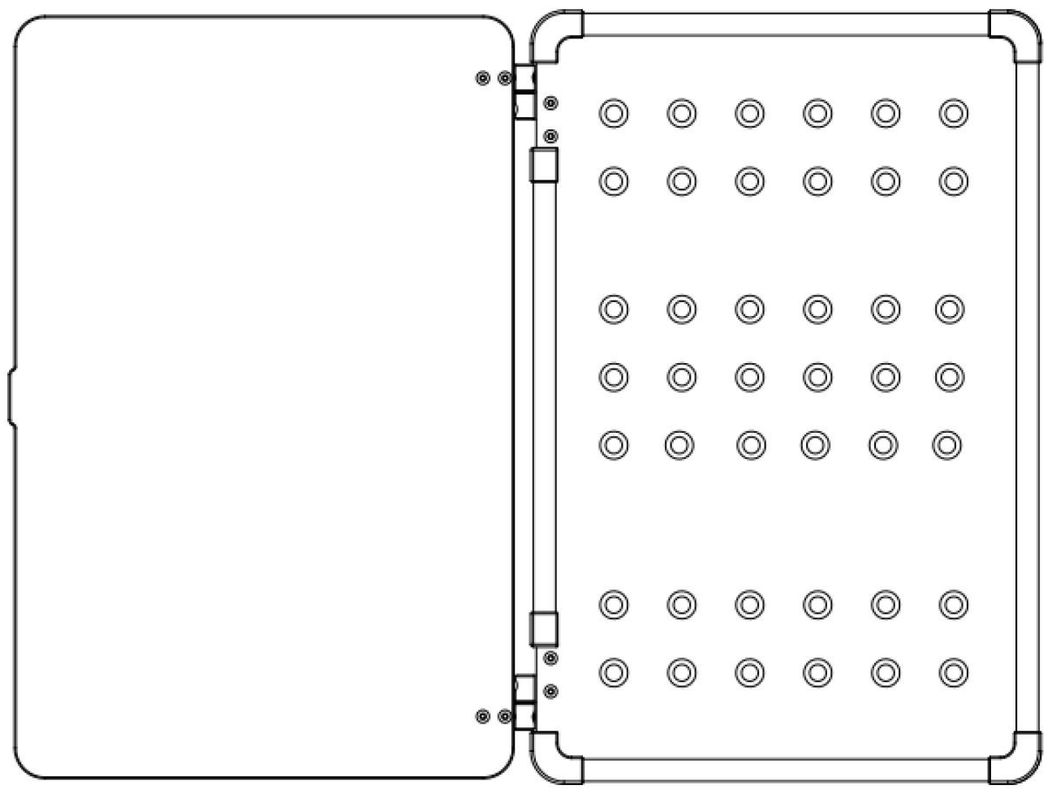
Please remove the scanner from the outer packaging and verify that the following standard configuration items are present in the container.

Standard Delivery Package includes the following components:

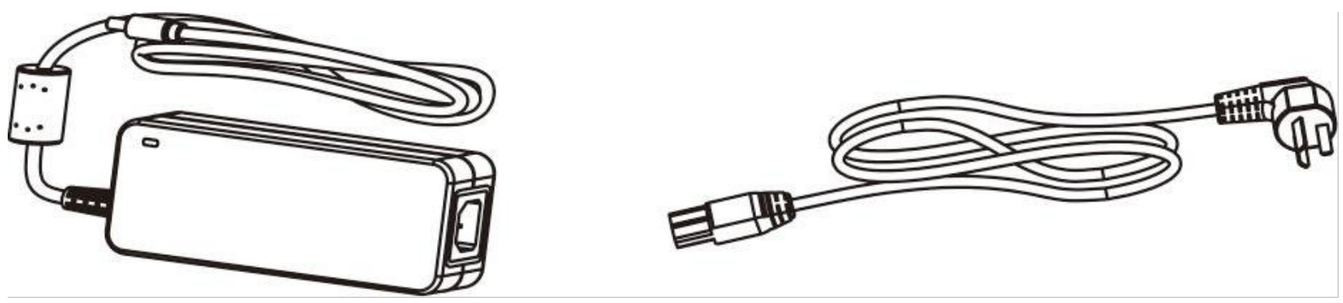
1. Artec Point handheld laser 3D scanner



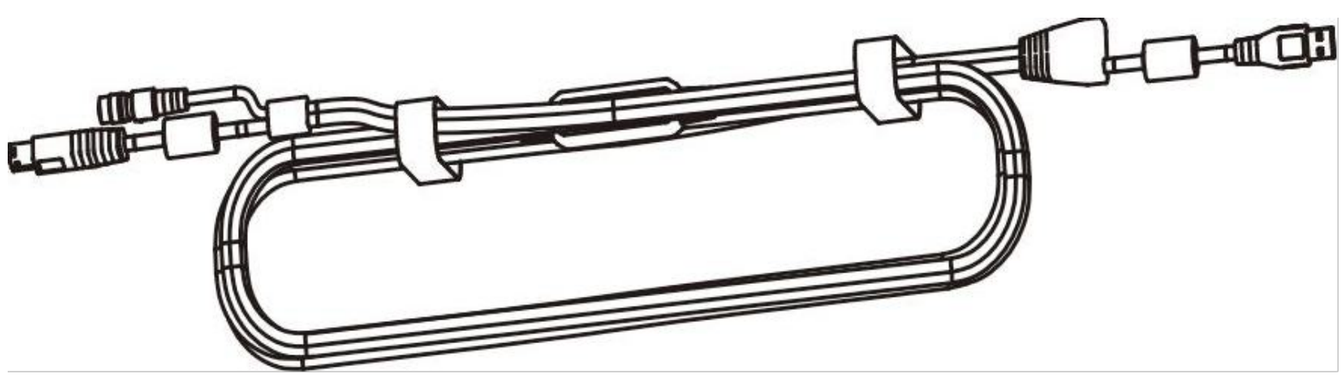
2. Master plate (Calibration board): referred to as the calibration board, it is mainly used to calibrate the camera parameters. To ensure good data quality, the calibration board is used to calibrate the camera before the scanner is used or when there is a temperature change or poor quality of scanned data. The shape of the calibration board is shown in Figure 2.



3. Power adapter: connects to the device through a USB cable to provide external power.



4. USB Cable: DC interface with power adapter to power the scanner. Type A interface connects to the PC and transfers the scanned data to the PC. Type B interface connects to the scanner.



5. Power data cable: 4 meters in length

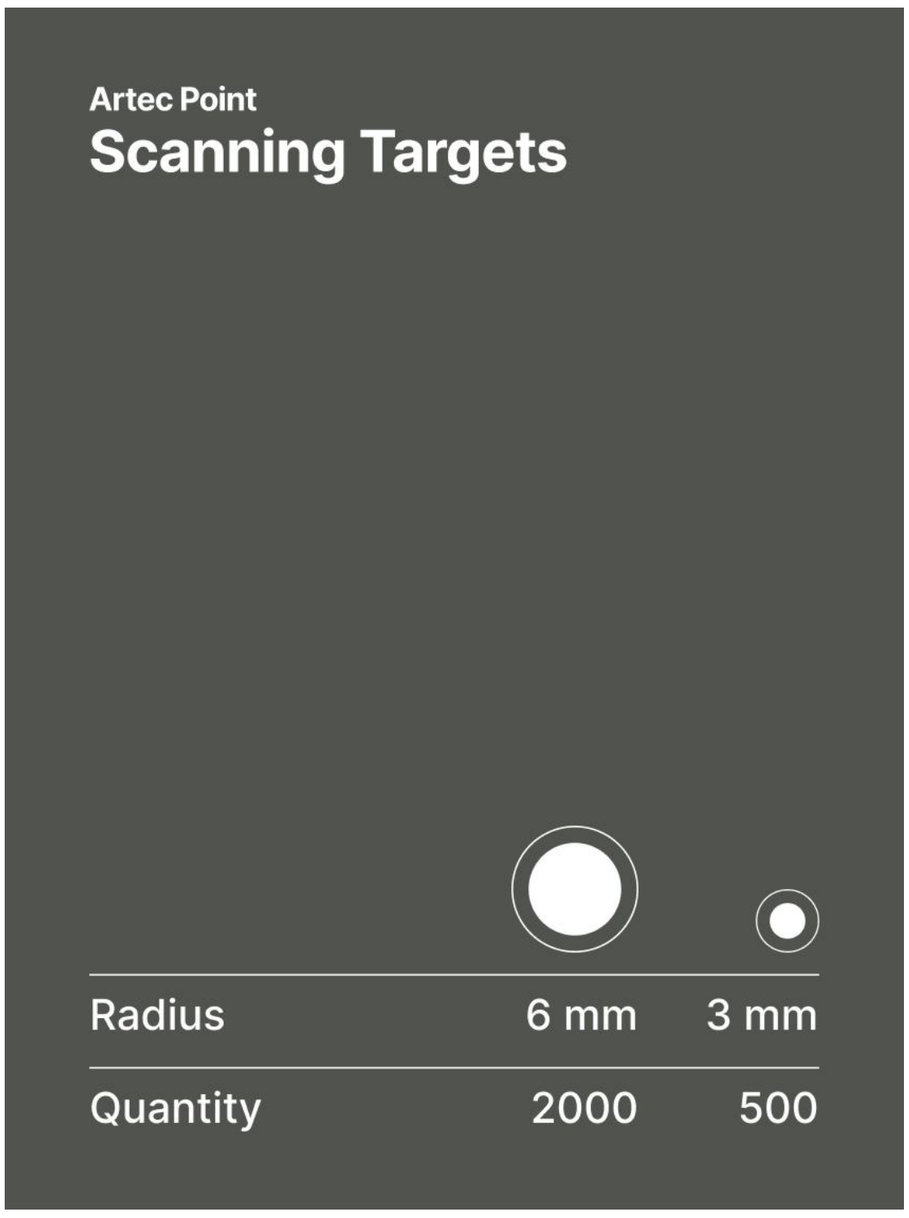
6. Carry case

7. C-Type to USB3.0

8. 2x Set of Higher Reflective Targets -φ6 mm 2000 PCS

9. 2x Set of Higher Reflective Targets -φ3 mm 500 PCS

   Note: φ6mm targets are used in blue light fast scanning mode and φ3mm targets are used in blue light fine scanning mode



10. Dongle



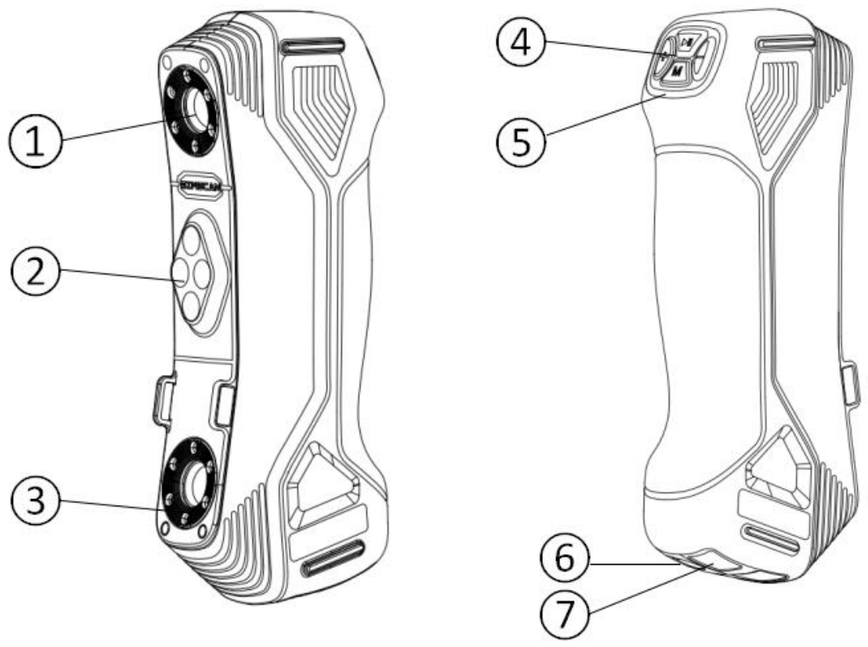
11. ISO certificate 17025

12. Transport packaging (Carton box, styrofoam)

NOTICE

For standard orders, the type and quantity of accessories are fixed. For non-standard orders, the specific type and quantity of optional accessories are subject to customer orders.

2.2 Scanner components



1 Camera A 2 Laser emitter 3 Camera B 4 Function button

5 Indicator light 6 USB cable power port 7 USB cable Type B port

The names and functions of some structural components are detailed in the table below.

Name	Function
4 Function button	▶II 1. Single press: Start/Pause scanning. 2. Double press: Switch the laser modes. Laser modes: • Grid: The fastest mode with the largest field of view, suitable for general-purpose scanning. • Parallel Lines: Provides high resolution with a smaller field of view and lower speed. • Single Line: Designed for scanning deep holes.
	M 1. Short press from the main screen: Enter Calibration mode. 2. Long press in Targets, Geometry, and Calibration modes: Return to the main screen of the Scan panel in Artec Studio.
	+ 1. Short press from the main screen: Enter Geometry mode. 2. Single press in Targets/Geometry mode: Zoom in. 3. Double press in Targets/Geometry mode: Zoom in twice. 4. Long press in Targets/Geometry mode: Lock the scene.
	– 1. Short press from the main screen: Refine Geometry. 2. Single press in Targets mode: Zoom in. 3. Double press in Targets mode: Zoom out twice. 4. Long press in Targets/Geometry mode: Unlock the scene.

2.2 Scanner components

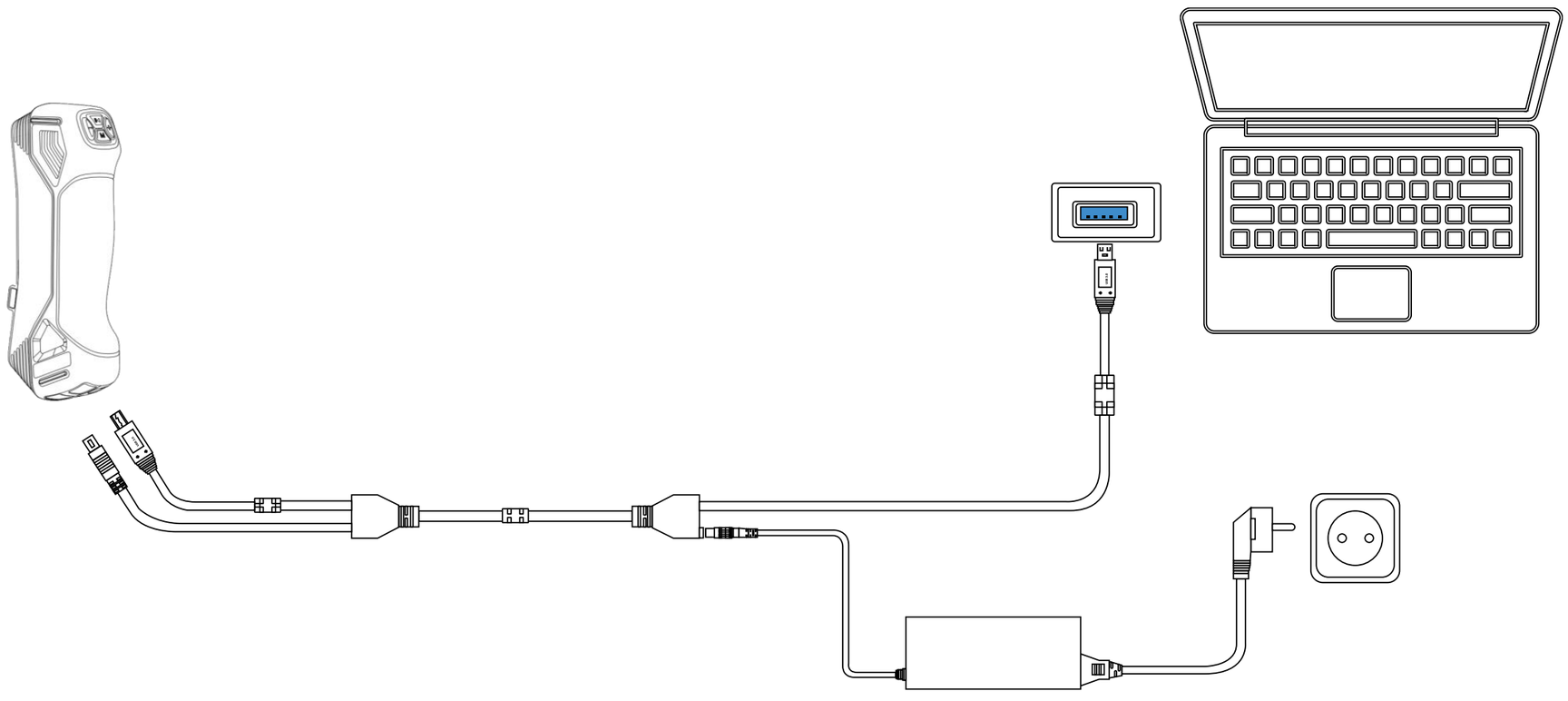
Name	Function
5 Indicator light	Red: The scanner is disconnected from Artec Studio. Blue: The scanner is connected to Artec Studio. Green: The scanner is scanning at the optimal distance. Light changes: The distance is either too large or too small for scanning. For more details on Artec Studio, please refer to **3 Software.**
6 USB cable power port	Power connector for accessing USB cable.
7 USB cable Type B port	USB cable Type B Port for accessing USB cable Type B connector.

2.3 Device connection

The device connection involves a two-step process, including connecting the power supply to the scanner and then connecting the scanner to the computer. The connection cable consists of the power adapter cable and the USB cable. The power adapter provides power to the scanner, and the USB cable has four ports, which are connected to the computer, power adapter, and scanner.

To connect Artec Point:

1. Insert the dongle into the computer's USB port.
2. Connect the USB Type A port of the cable to the USB 3.0 port on the computer.
3. Connect the power port and Type B port of the USB cable to their corresponding interfaces on the device (when connecting, ensure that the direction of the arrow at the cable interface matches to prevent damage).
4. Plug the power adapter into the DC port of the USB cable.
5. Finally, after confirming that the above steps are correctly done, plug the power adapter into the power socket.



3 Software

3.1 General information

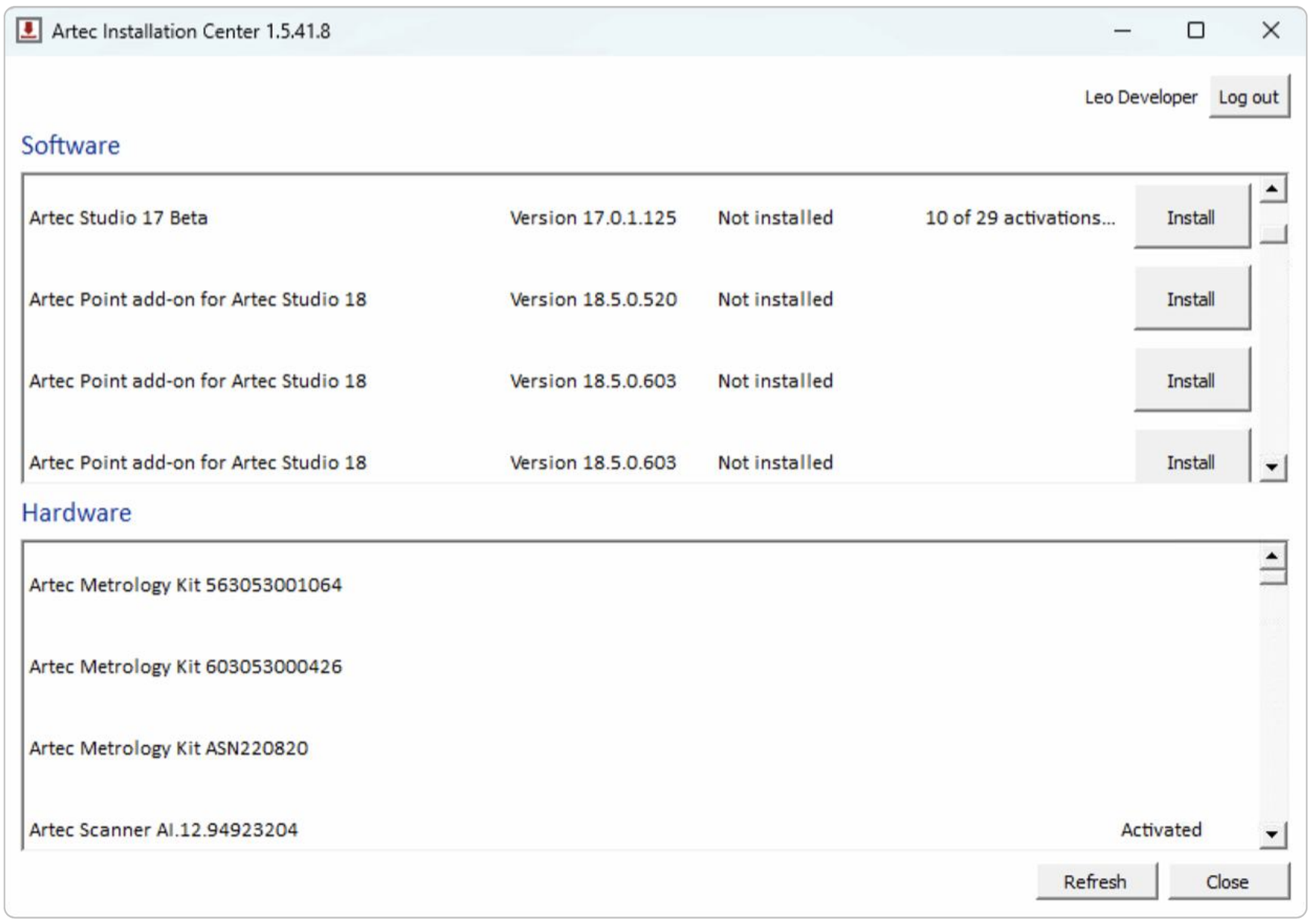
Scanning data from Artec Point can be processed and saved using the Artec Studio 18 software, which needs to be purchased separately and does not come with the scanner.

Artec Point requires Artec Studio 18 (and later) software which allows it to scan and process scanned data. Artec Studio 18 (and later) should be purchased separately, to obtain software, contact Artec 3D Sales Team or Authorized Reseller. Note that an Internet connection must be available to download and license the software.

You must install the Artec Point Addon plugin before connecting the scanner to your computer.

3.2 Installation

1. Open my.artec3d and download Artec Installation Center.
2. Install Artec Installation Center on your computer and launch it.
3. Click Install near the Artec Studio label as the Artec Studio manual describes.
4. Click Install near the Artec Point Addon label. See the Figure x
5. Finish installation



3.3 Check the software running environment

1. Ensure the computer power is set to a high-performance state:
- Right-click on the battery icon in the system tray and select the High Performance option from the power plan options.
2. Verify that the graphics card driver is up to date.
3. Confirm the graphics card is set to a high-performance state:
- Right-click on a blank area of the desktop and open the NVIDIA Control Panel.
- Ensure that the preferred graphics processor is set to "High-performance NVIDIA processor."

3.4 Scanning with Artec Point

3.4.1 Open Artec Studio scan panel

1. Launch Artec Studio.

2. Open Scan panel.

3. Click the **Scan with Artec Point** button and wait for Artec Point to initialize.

An initialization process will shortly begin, indicating that the scanner is being prepared.

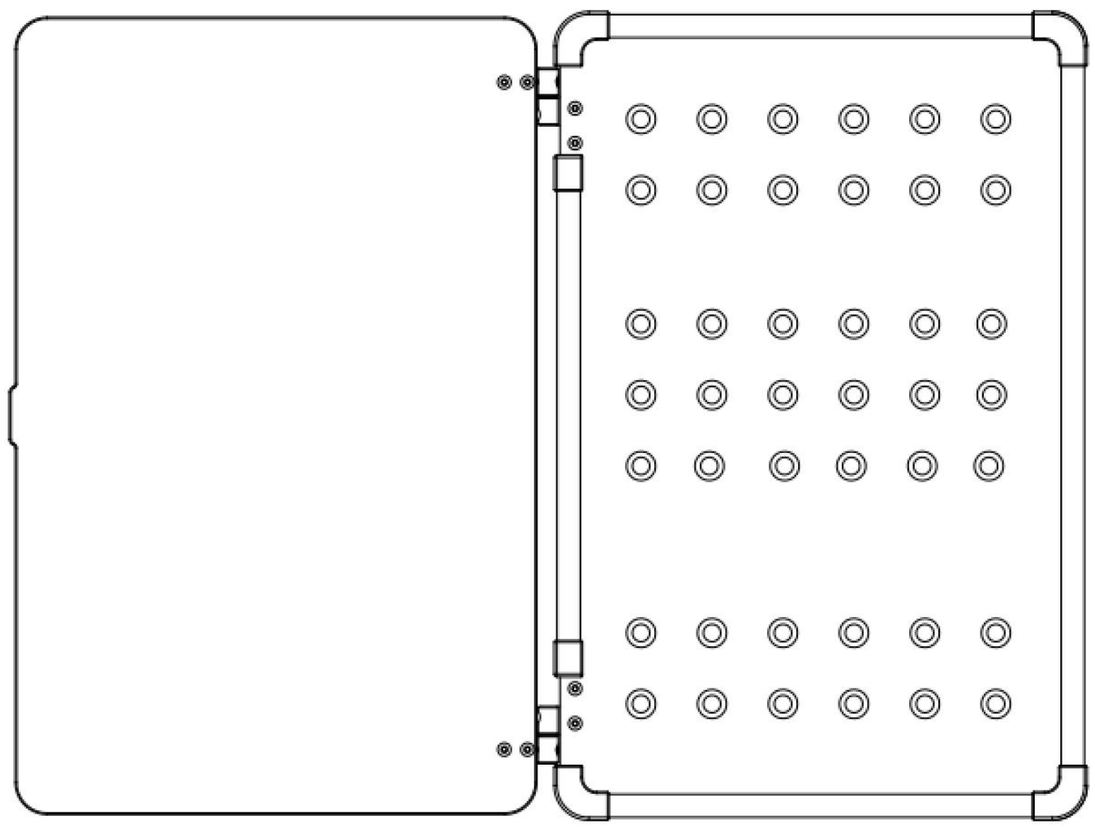


3.4.2 Calibrate scanner

To gain the best results, we recommend calibrating Artec Point before each scanning session.

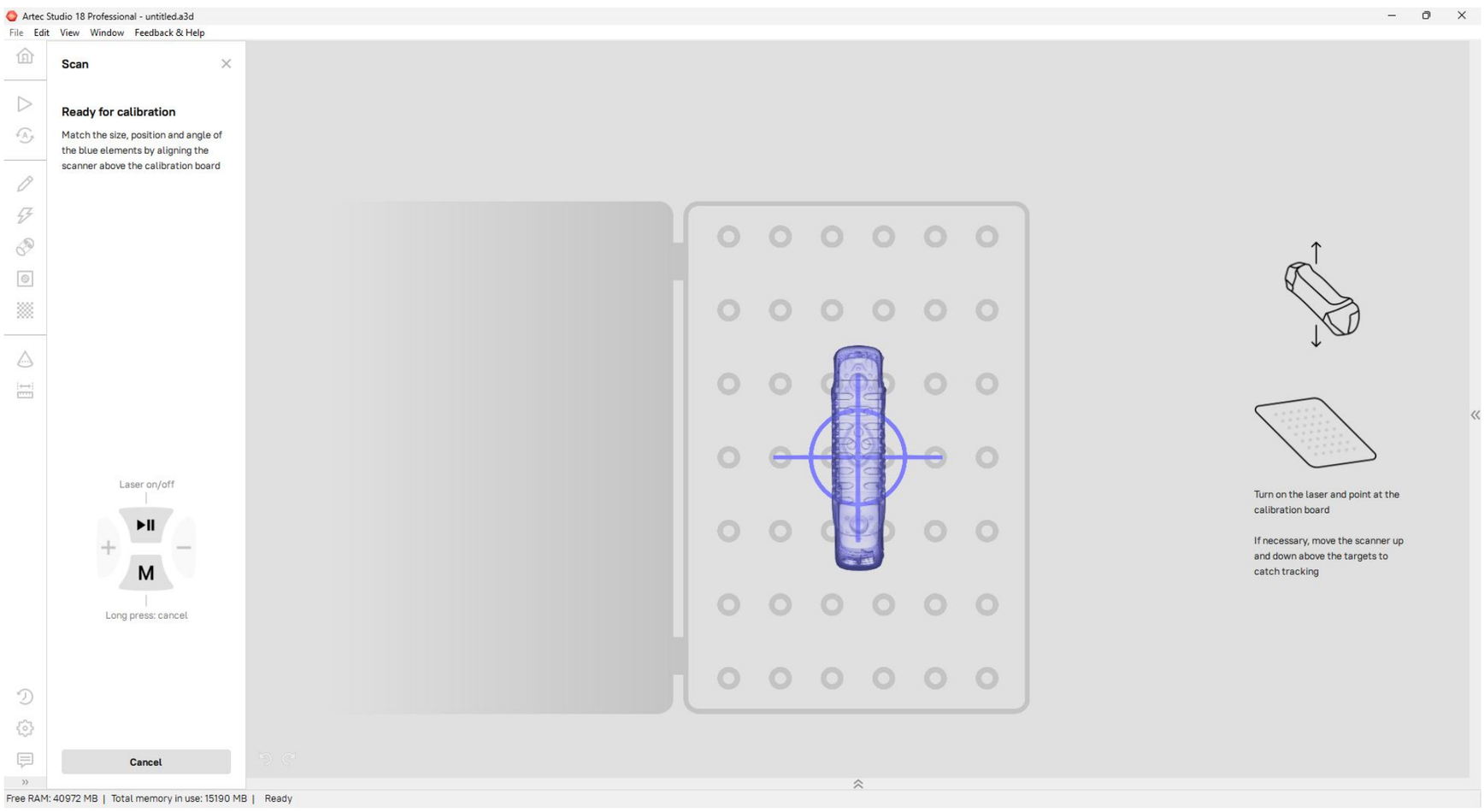
To calibrate Artec Point:

1. Ensure that Artec Studio is open and the scanner is connected and initialized.
2. Put the calibration board on the flat surface.



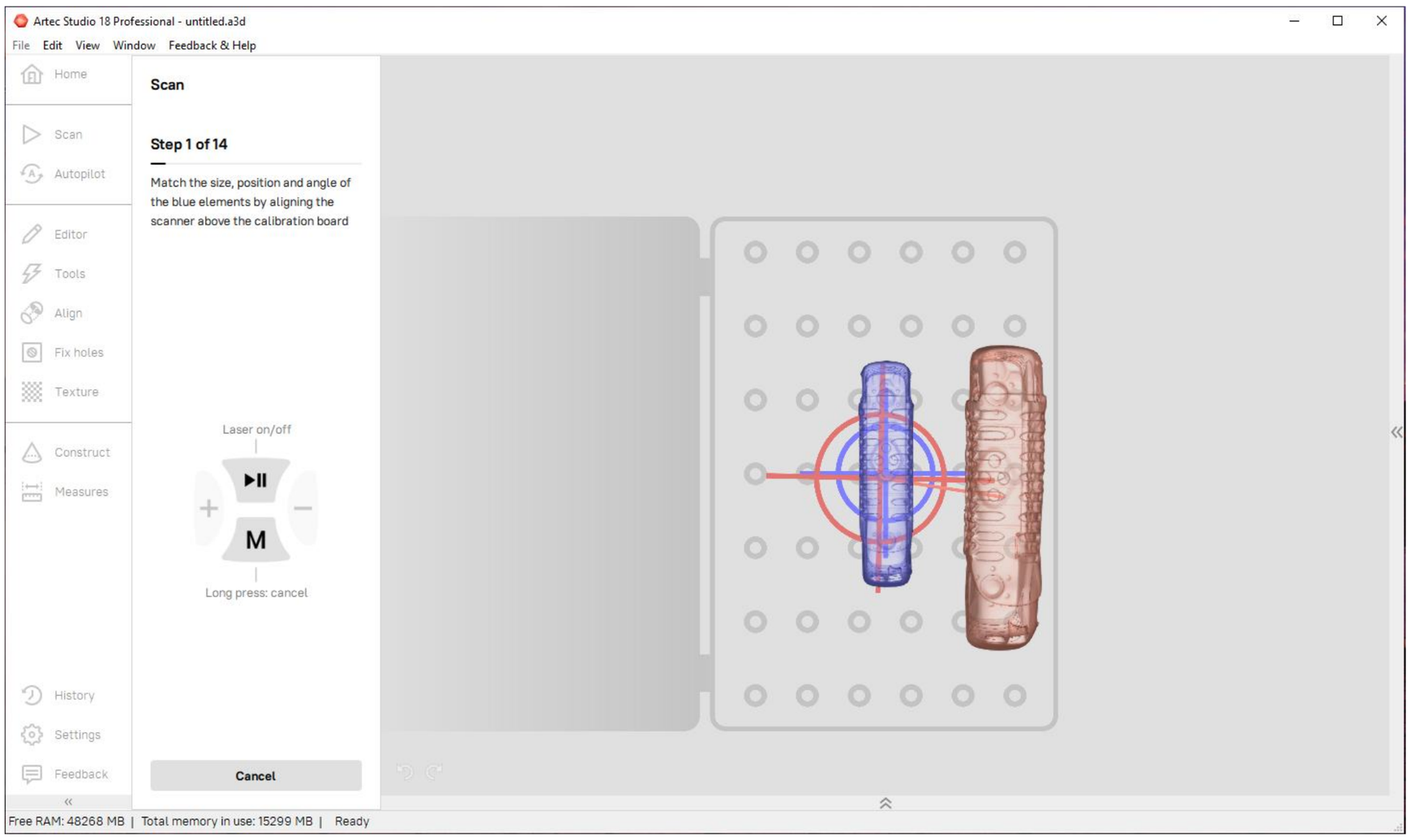
3. Click the **Start** button.

   Once calibration is started, you will see the calibration board in the 3D scene.



3.4.2 Calibrate scanner

4. Follow the instructions for scanning the calibration board.



Once calibration is completed, Artec Point is ready for further scanning.

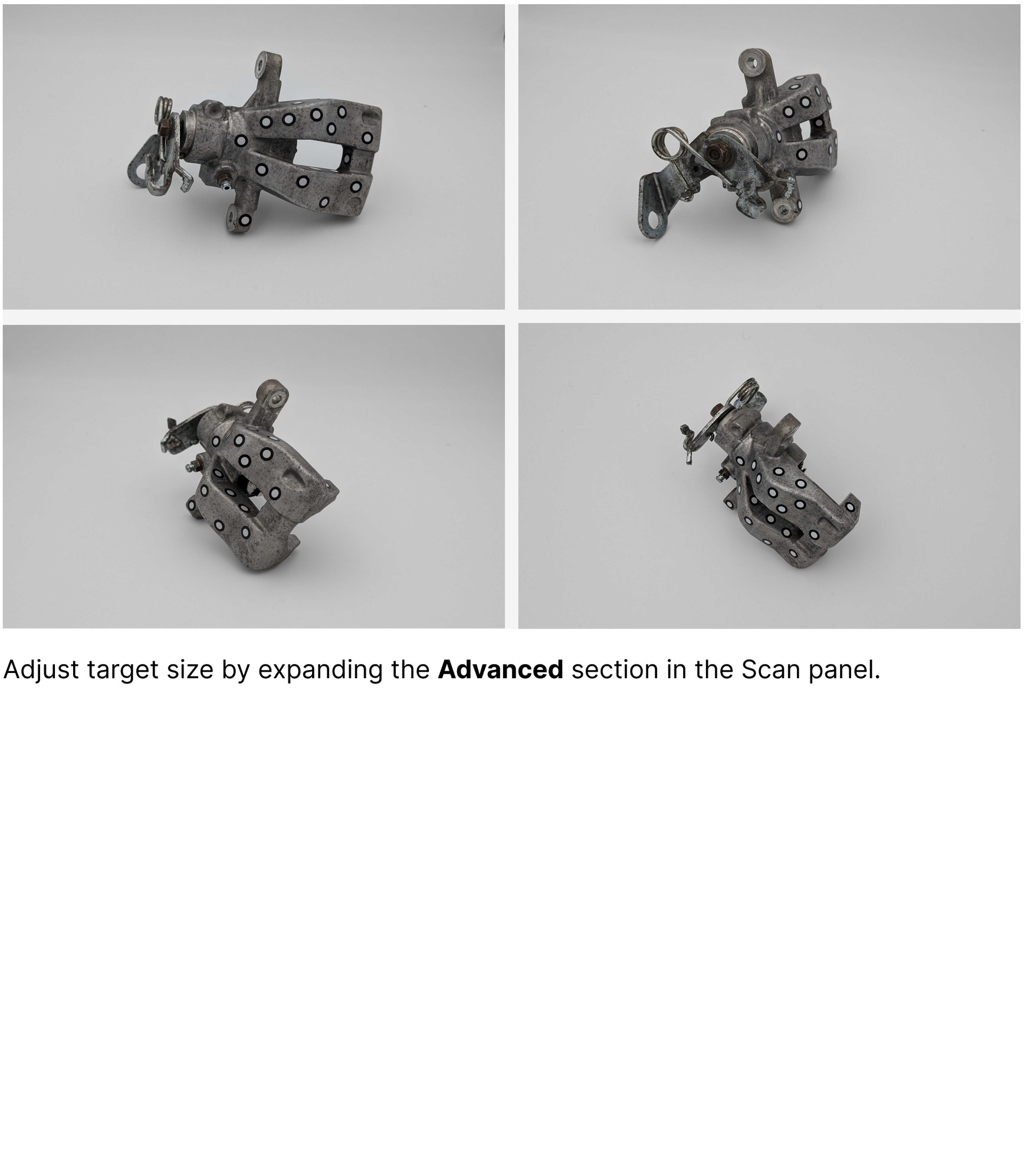
3.4.3 Prepare object

The targets are generally made of special highly reflective materials, allowing the scanner to accurately identify their center coordinates for positioning the measured workpiece. To enhance stitching accuracy and efficiency, it is recommended to complete scanning in Targets mode before scanning laser points.

1. Attach reflective targets to or near the work piece.

   Note: Avoid placing targets on prominent features to prevent loss of key feature data.

   Also, avoid placement on regular shapes to prevent misidentification.



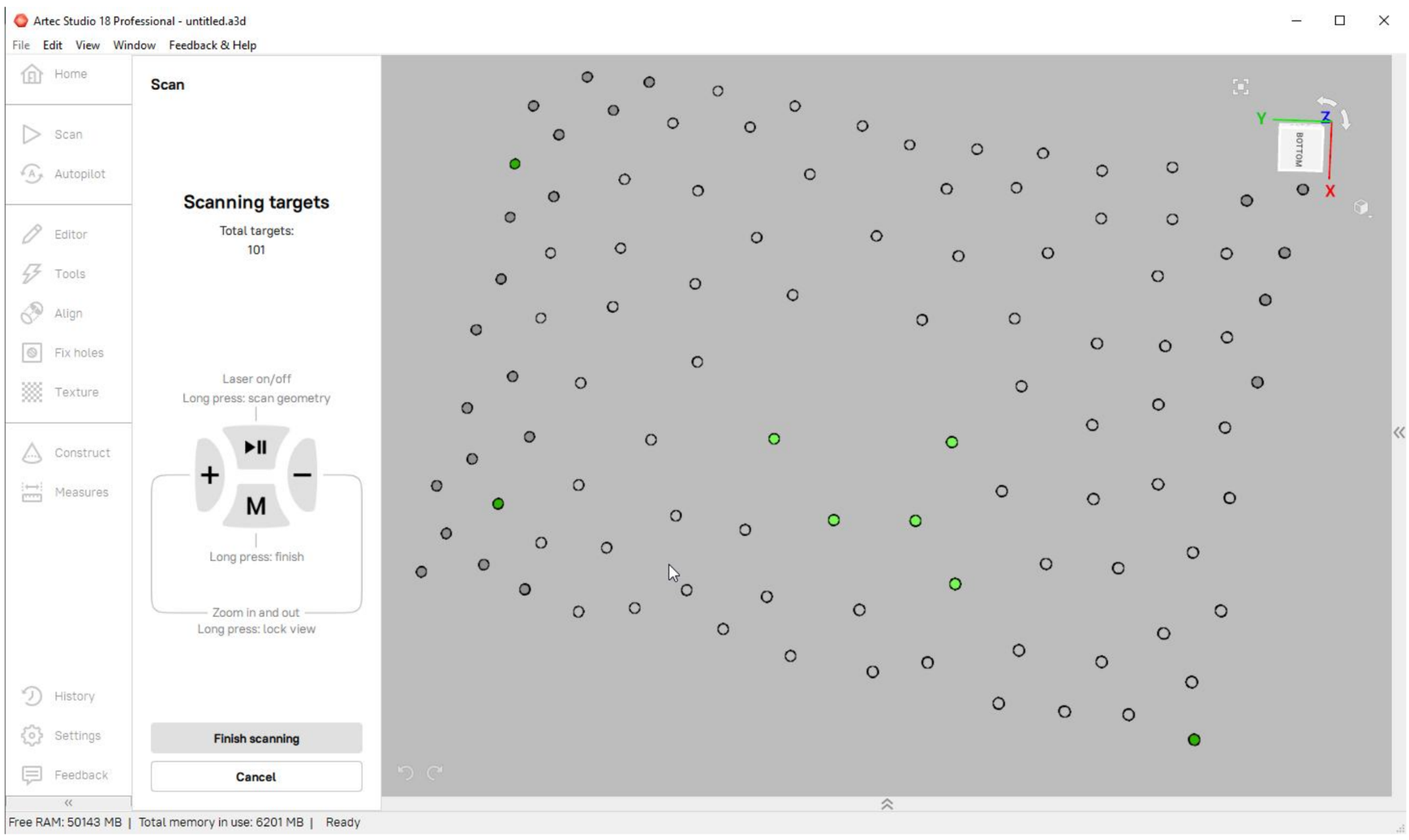
2. Adjust target size by expanding the **Advanced** section in the Scan panel.

3.4.4 Scan targets



1. Click the **Play** button to the right of the **Scan targets** section to begin scanning in Targets mode.

   When Artec Studio displays the **Ready to scan** label, you are ready to proceed with scanning in Targets mode.





2. Press the **Play** button on the scanner to turn on its laser.

3. Position the scanner near the work piece and ensure targets begin to appear one by one in the 3D scene.



4. Press the **Play** button on the scanner again when scanning is complete.



5. Finally, click the **Finish scanning** button in Artec Studio. Artec Studio will automatically optimize the scanned targets.

NOTICE

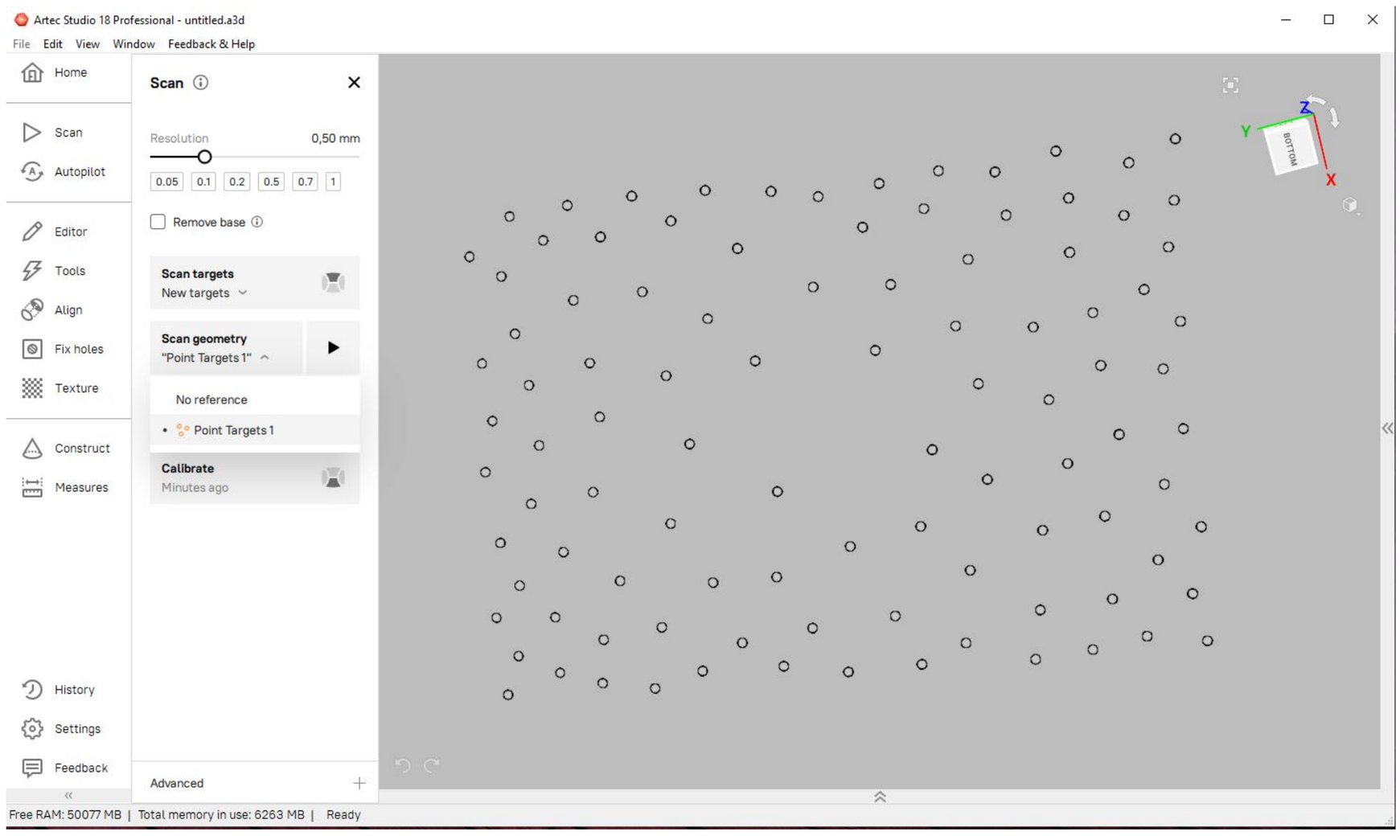
If the target cloud applied to the object has not been fully scanned (e.g. only the targets on the top of the object have been scanned, and the object needs to be flipped to scan the remaining targets on the bottom), select the existing target cloud in the Scan targets mode and scan the missing targets.

3.4.5 Scan object

Now that the targets have been scanned, you can proceed to scanning the object itself.

Scan geometry
Without targets ⌄ Ctrl+G

1. Select the targets object that scanning will be based on by clicking on the **Scan geometry** button.

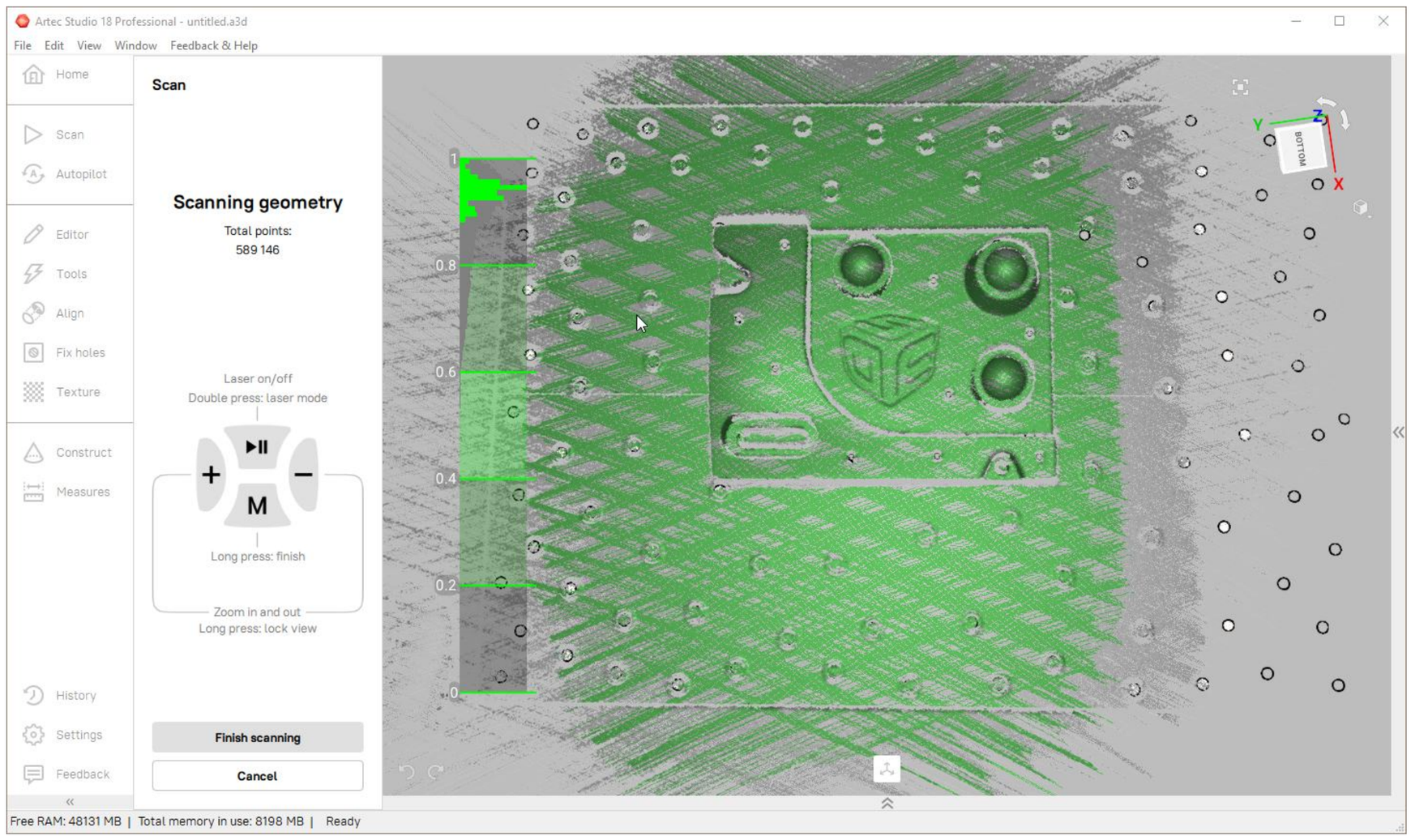


2. Click the **Play** button to the right of the **Scan geometry** section to initiate scanning in Geometry mode.



3. Press the **Play** button on the scanner to turn on its laser.

4. Position and move the scanner near the work piece and ensure the distance between the scanner and the object allows the triangle icon on the histogram near the Scan panel to stay close to the green area.



3.4.5 Scan object



Finish scanning

5. Press the **Play** button on the scanner again when scanning is complete.

6. Finally, click the **Finish scanning** button in Artec Studio. Artec Studio will automatically perform initial scans processing and optimization.

NOTICE

If you feel that the entire object has not been fully scanned, you can scan it again. Each new scanning session will create a new point cloud.

3.4.6 Scan settings

Basic settings

Name	Function
Resolution	The resolution of the scanned object. Please note that specific areas of the object can be scanned at different resolutions using the Refine Scan feature. For more information, refer to **3.4.7 Refine scan**.
Remove base	Select this option to isolate and remove the base that is scanned as part of the object. This feature allows for the base to be identified and deleted while keeping the object intact.

Advanced settings

Name	Function
Targets	Select the sizes of the targets: 3 mm, 6 mm, or 12 mm.
Target excision	Removes points around targets in the point cloud to create smoother edges; the higher the value (0 to 3 mm), the larger the hole but the cleaner the edges.
Base cut-off threshold	Automatically detects the base using targets and allows adjustment of the cut-off position upwards from this point, typically within 1–2 mm; the value range varies from 0 to 25 mm.
Laser exposure	Controls the laser illumination time; decrease it for highly reflective objects. The default value is 1 ms for regular objects, 0.5 ms for larger ones. For capturing finer details, set it lower. The value range is from 0.1 to 10 ms.

3.4.7 Refine scan

Once object scanning is complete, you can use the Refine scan feature to select the desired area and rescan it at a higher resolution. This can be particularly useful when most of the object is uniform, but contains small details that need to be captured in higher detail. It is not recommended to scan the entire object at a high resolution.

To refine a specified area:

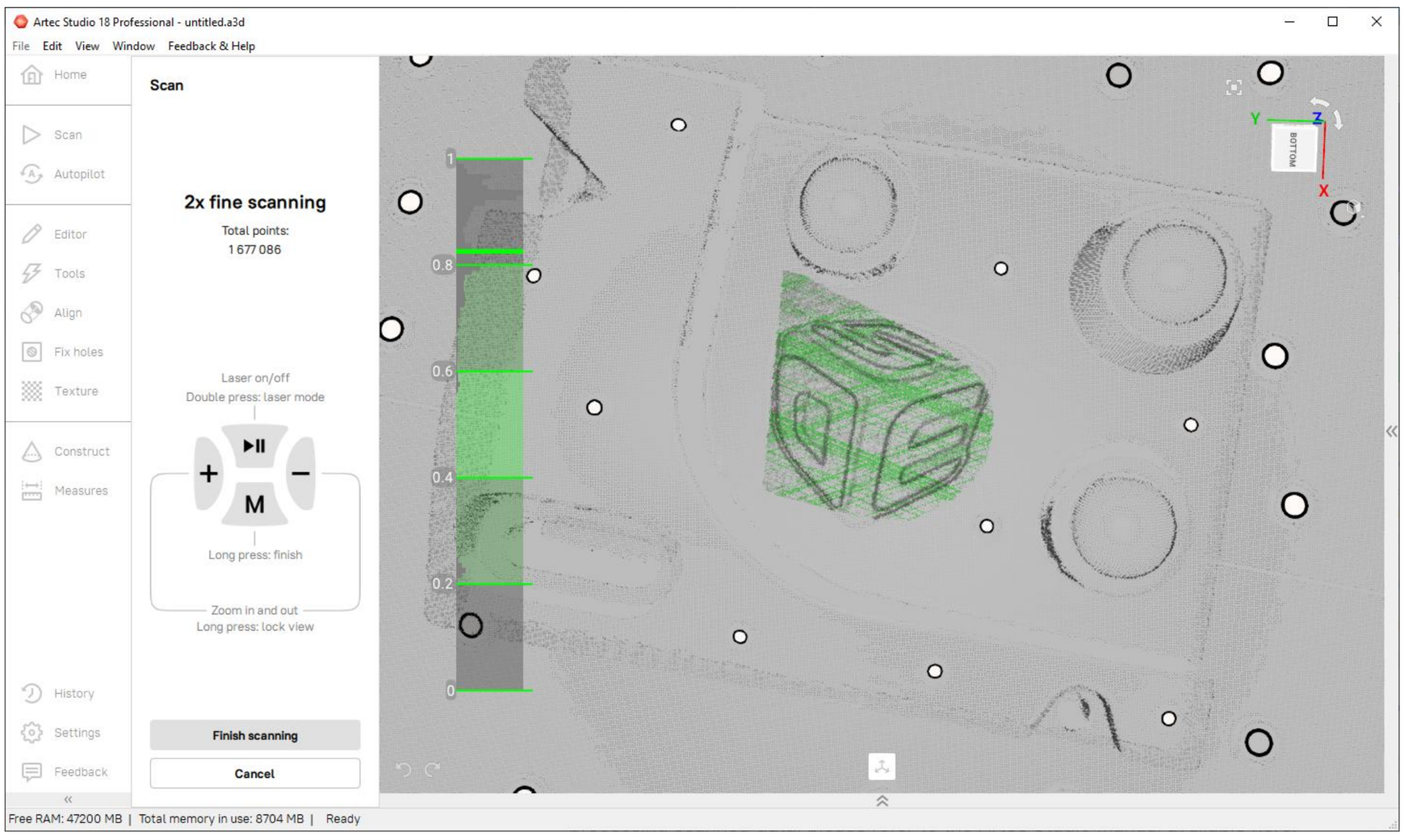
Refine scan Ctrl+R
2x (0.05 mm)

1. Click the **Refine scans** button under the **Advanced** section in the Scan panel.

2. Select the fine scan magnification (×2, ×4, ×8). A higher level provides more refined data.

3. Use the Lasso selection to choose the designated area. The selected area will be highlighted in green.

4. Rescan the selected area.



3.4.8 Further processing

For further information regarding the settings of Artec Point scanning and post-processing scanned data, please refer to the Artec Studio manual available here.

3.5 Software license agreement/warranty

3.5.1 International limited warranty

This product is subject to the terms and conditions set out in the International Limited Warranty which you can review here or collect from your Artec 3D distributor.

3.5.2 Software license agreement

Scanning data from Artec Point can be processed and saved using the Artec Studio 18 software and later, which needs to be purchased separately and does not come with the scanner. This software is protected by copyright and other laws, and its usage is defined and regulated by the Artec Europe End User License Agreement (EULA), which covers various aspects such as, but not limited to, License Grant and Restrictions, Export Restrictions, Disclaimer of Warranties, and other information. Please ensure that at any time you fully comply with the terms and conditions of the Artec Europe End User License Agreement (EULA), which is provided along with all products. For the full text of the Artec Europe End User License Agreement (EULA), please reach out to the Artec 3D Support Team. You must not install or use the software unless you have read and accepted the terms and conditions of the Artec Europe End User License Agreement (EULA). The installation or use of the software or any part thereof, is deemed to be an acceptance of all the terms and conditions stated in the License Agreement. For any inquiries regarding the acquisition of Artec Software, please contact our Sales team.

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