SHINING 3D

AutoScan-DS-EX Pro(C)

Instructions for Use

V1.0

MD CE

SHINING 3D

About the Instructions for Use

The Instructions for Use (hereinafter referred to as "the Instructions”) aims to present information about SHINING 3D's self-developed dental 3D scanner and its accompanying software DentalScan. The 3D scanner enables a complete workflow of order, scan and pre-design, which increases the productivity of the dental laboratory.

Safety Instructions

Signal	Meaning
	**Note:** This symbol is used to inform you of the additional information of the product.
	**Caution:** This symbol is used to inform you of incorrect operations that may damage the device or result in data loss. Any damages resulting from misuse are not covered by the warranty.
	**Warning:** This symbol is used to inform you of incorrect operations that may damage the device or result in data loss. Any damages resulting from misuse are not covered by the warranty.

Release Date	October, 2024
Release Version	V1.0.5

The Declaration of Intellectual Property and Disclaimer

Thank you for using the products of SHINING 3D TECH CO., LTD. (hereinafter referred to as the "SHINING 3D”). Before you use the products, please carefully read and understand this declaration. Once you use this product, it means that you fully accept this statement and promise to comply with the relevant regulations.

1. The contents of the Product Instruction and User Manual (hereinafter collectively referred to as the "Product Usage Documentation") are critical to your personal safety, legal rights, and liabilities. Before you use the products, Please ensure that you have carefully read the Product Usage Documentation, and use the product correctly in accordance with the requirements of the Product Usage Documentation. We also recommend that the products be operated by trained professional technicians.

2. Please inspect and/or maintain the product before use. If the product is damaged, deformed or in any other abnormal condition, stop using it immediately and contact the after-sales service personnel for maintenance. SHINING 3D will not be responsible for any problems caused by your failure to inspect or maintain the product in a timely manner.

3. SHINING 3D does not guarantee the applicability of the outcomes of your use of the products, and you are responsible for verifying the quality and functionality of the outcomes. You should check and verify thoroughly that any outcomes meet your requirements before using them, for which you bear full responsibility. If any damage arising from using the outcomes of any products, you shall bear the corresponding risk, and SHINING 3D shall not bear any responsibility.

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with the physical products, the later shall prevail. In addition to the mandatory provisions of laws and regulations, the contents of the Product Usage Documentation are subject to changes without further notice.

6. SHINING 3D shall not be held responsible for any damages and/or losses caused by human factors, environmental factors, improper storage and use, or any other factors other than due to the quality of the product. SHINING 3D also shall not be held responsible for any indirect anticipated profit loss, loss of reputation and other indirect economic losses. Except as otherwise expressly provided by laws and regulations, the total liability assumed by SHINING 3D (regardless of cause) shall not exceed the purchase price of the products you paid to SHINING 3D.

7. Disputes arising from this Declaration and the Product Usage Documentation thereof shall be governed by the laws of the People's Republic of China, excluding its conflict of law rules. In the event that certain provisions are in conflict with the applicable law, these provisions will be reinterpreted in full accordance with the law, while other valid provisions will remain in force.

8. All disputes between you and SHINING 3D that arise from, shall first be resolved amicably through negotiation. If a dispute cannot be resolved through friendly negotiation, any party may submit the dispute to the Court of Xiaoshan District, Hangzhou City, Zhejiang Province, People's Republic of China for litigation and settlement.

9. In the event of any questions about the contents of this Declaration and application of Product Usage Documentation, please contact us by the contact information provided in the User Manual. Thank you for your cooperation and support! We hope that our products can bring you a great experience of using.

Table of Contents

1. Read This First

The Instructions provides important procedures and information on how to operate the scanner and configure the DentalScan software correctly and safely. Before attempting to operate the product, read the Instructions and strictly observe all warnings and cautions. Pay extra attention to the information from Safety Information in chapter 2.

1.1. Basic Information

I. Product name and model

Product name: Desktop Dental 3D Scanner

Model: AutoScan-DS-EX Pro(C)

II. Name, residence, contact information and after-sales service of the manufacturer

Manufacturer name: Shining 3D Tech Co., Ltd.

Production Address： No.1398, Xiangbin Road, Wenyan, Xiaoshan, Hangzhou, Zhejiang, China

III. Contact Information

Manufacturer

Shining 3D Tech Co., Ltd.

No.1398, Xiangbin Road, Wenyan, Xiaoshan, Hangzhou, Zhejiang, China

www.shining3ddental.com

Customer Support

Email: dental_support@shining3d.com

Shining 3D's Representative

Lotus NL B.V.

Address: Koningin Julianaplein 10, 1e Verd, 2595AA, The Hague, Netherlands.

Telephone: +31644168999

Email: peter@lotusnl.com

IV. Product performance, main structural composition

Product performance

(1) Scanner appearance

The appearance should be: Smooth, no cracks, no stains, no obvious deformation. Flexible and reliable for operation.

(2) Scanner performance:

Scanning Noise	≤45dB
Scanning Speed	Upper/Lower 10s, Impression 25s.
Accuracy	≤10μm.

(3) Software features：

- Wizard type scanning operation process with backward function.
- Establish demand information including order information, dentistry type and tooth selection.
- Scan the tooth model according to the demand information and the included are sectioned model, unsectioned model, implant, full denture, removable partial denture, die tray, triple tray, post and core, pre-op and wax-up orders.
- Support adding scanning, alignment and data-editing.
- Design the scanned data and edit from different perspective to optimized effect.

- Pre-design functions include Coord Adjust, Mark Teeth, Bite Adjust, MarginLine, Undercut, Modified Model (optional), Screw Channel Sealing and AccuDesign (optional).
- For scanning operation and workflow, see chapter 6.6. "Scan".

Main structural composition

The Scanner consists of scanner body, power adapter, USB cable, fixture set, calibrator set, maintenance set and software. The carrier of the software is the USB flash drive, and its release version is 3.

Fixture set	Basic height adapter, Articulator height adapter, Articulator base, Arch tray, Full arch tray, Articulation transfer plate 1, Articulation transfer plate 2, Model Fixture, Impression Fixture, Die plate, All-in-one plate, Blu-Tack
Calibrator set	White balance plate, Calibrate plate
Maintenance set	Allen key, Lens cleansing cloth

Maintenance Notice:

It is recommended to only use the lens cleansing cloth provided in the package to cleanse the lens.

Use Allen key to replace the scanner head for maintenance. For more replacement steps, see Maintenance Manual.

Caution

- Only the Alley key and scanner head provided by Shining 3D are allowed to use during the maintenance process. Make sure to strictly follow the steps in the Maintenance Manual to replace the scanner head.
- It is recommended that users copy the software from the USB flash drive to the computer hard disk before installing the driver.
- Use Nvidia graphics cards to get the best scanning efficiency.

V. Product maintenance and care methods, special storage/transportation conditions, operating conditions.

(1) Do not connect the scanner to power if not used, keep it in dry environment.
(2) Work temperature: 10°C～30°C, relative humidity: 30%RH～80%RH
(3) Storage/transport temperature: -30°C～60°C, relative humidity: 10%RH～90%RH
(4) Air pressure： 70kPa～106kPa

Note

The temperature and humidity and atmospheric pressure conditions for storage/transportation are mentioned on the outer packaging.

VI. Production date and lifecycle.

The production date is shown on the product label. Lifecycle: 5 years.

1.2. Intended Use

The scanner is used to scan and capture the 3D characteristics of dental models including plaster models and impressions. It can work with the supplied software to export the 3D scan data for CAD/CAM. The scan data can be applied for the orthodontics, restoration, and implant.

Note

- The scanner satisfies CE related requirements.

Caution

- Do not use the scanner for purposes other than those intended and expressly stated above.
- The product is designed and intended for use by persons with professions of dentistry and dental laboratory technology.
- Do not misuse the scanner, and do not use or operate the software programs incorrectly.
- Only accessible to trained medical personnel for using the scanner and the supplied software application.
- Installation, use, and operation of the scanner are subject to the law in the jurisdictions in which it is used. Install, use, and operate the scanner only in such ways that do not conflict with applicable laws or regulations, which have the force of law. Use of the scanner for purposes other than those intended and expressly stated here, as well as incorrect use or operation, may relieve us or our agents from all or some responsibilities for resultant noncompliance, damage, or injury.
- The users of this scanner and software are responsible for image quality and diagnosis. They should ensure that the inspection data is being used for the analysis and diagnosis only. The images acquired by the scanner must be interpreted by a qualified medical professional. The software is unable to interpret these images or provide a medical diagnosis of the patient.

1.3. Contraindications

No known contraindications (or side effects).

1.4. Warnings

- Do not attempt to disassemble, repair, or modify the scanner and software.
- There are no user serviceable parts inside the scanner. Necessary modifications must be made only by the manufacturer or its designated agents.
- Do not allow foreign objects (including all types of liquids) to enter the scanner. Water, moisture, etc. may cause a short circuit in the electronic components and lead to malfunction.
- If the scanner is accidentally dropped to the ground, check to make sure the lens is not loose before using it.
- If the scanner is inadvertently dropped on the ground or impacted, it must be calibrated before use. If there are still accuracy problems or scanning abnormalities after calibration, please consult technical support.
- Do not cut, disassemble, or place heavy objects on the scanner, as it may cause damage to the device and prevent it from functioning properly.
- Do not cut, bend, modify, place heavy objects, or step on the cables. Otherwise, the external insulation may be damaged and result in short circuit or fire.
- Do not place any objects around the device while it is working to avoid interfering with the movement of the turntable
- To avoid electrical shock, use only supplied power adapter and connect it only to properly grounded wall outlets.
- The device should not be used adjacent to or stacked with other equipment. If adjacent or stacked use is necessary, the device should be observed to check normal operation in the configuration in which it will be used.

- Use only accessories and cables provided by the manufacturer. Other accessories or cables may increase product emissions or reduce immunity to interference.

1.5. Waste Electrical and Electronic Equipment

Disposal of Waste Electrical and Electronic Equipment and by users in private households in the European Union.

This symbol on the product or on the packaging indicates that this cannot be disposed of as household waste. You must dispose of your waste equipment by handling it over to the applicable take-back scheme for the recycling of electrical and electronic equipment and/or battery. For more information about recycling of this equipment, contact your city office, the shop where you purchased the equipment or your household waste disposal service. The recycling of materials will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and environment.

1.6. Disposal

All electrical and electronic devices must be disposed of separately from your other household waste in order to promote reuse, recycling and other forms of recovery, to prevent any potential adverse effects of hazardous substances on the environment and human health, and also to reduce the amount of waste in landfill. This includes accessories such as power adapters, power cables, etc. Do safely dispose of the device and its accessories in accordance with applicable laws and regulations.

For specific information on disposal of your device and the packaging, contact your local

distributor or service provider.

1.7. Warranty

The warranty is void if unauthorized personnel perform service or maintenance. To ensure correct product performance and to obtain warranty service, contact technical support.

2. Safety Information

2.1. Precautions

Failure to observe the instructions or disregard the warnings may result in damages to the product, personal injury, or even death of the user or the patient.

- Ensure that the connection is performed correctly. See 5.1 Connect the Scanner.
- Do not use the hardware and software for any application until you have read, understood, and known all the safety information, safety procedures, and emergency procedures contained in the chapter. Operating the hardware and software without a proper awareness of safe use could lead to fatal damage to the hardware or permanent data loss.
- The hardware and software should only be used in a medical facility under the supervision of trained personnel.
- Only authorized service labs should perform maintenance. It is expressly prohibited to open the scanner with tools.
- The hardware and software have been fully adjusted and tested prior to shipment from the factory. Unauthorized modifications will void your warranty.
- If the hardware or software is modified, appropriate inspection and testing must be conducted to ensure continued safe use.
- Before use, check the device for damage, loose parts, wear and tear, and other cosmetic problems. In case of such problems, please contact after-sales service.

- To ensure the performance and safety of the scanner, use only the original accessories provided with the scanner (or accessories specified by Shining 3D, consult technical support for details) and software.
- Use only the power adapter supplied within the package. Connecting the scanner to an unknown power adapter is very dangerous and may lead to fire or explosion.
- Reasonably arrange communication cables, power lines and other types of cables to prevent users or patients from tripping over the wires. Do not forcibly pull or bend cables of any kind.
- The scanner is not intended for use in environments with high concentrations of flammable liquids, gases, or atmospheric oxygen.
- There is a risk of explosion when the scanner is used around flammable anesthetics.
- The supplied medical grade power adapter should only be connected to a grounded power socket.
- Do not connect USB peripherals with an extended USB cable. Extended connection may cause unexpected usage fault.
- Always handle the scanner with care and avoid hitting or scratching the surfaces as it contains fragile components. Dropping the scanner on the floor may cause permanent damage.
- Never place any objects or load on the scanner.
- Do not dispose the scanner as unsorted municipal waste. The scanner must be collected separately and disposed of in accordance with the local laws and regulations. For proper disposal of this scanner, contact your local representative of Shining3D Corporation.

2.2. Labels and Symbols

The following symbols provide information on the product's labels and regulatory compliance.

Labels and symbols on the scanner/carry box.

Symbol	Explanation
	Indicates that the contents of the transport package are fragile and the package shall be handled with care.
	Indicates that the transport package shall be kept away from rain and in dry conditions.
	Indicates correct upright position of the transport package.
	Indicates that the marked item or its material is part of a recovery or recycling process.
	Indicates the medical device manufacturer.
	Device fulfills the requirements of the European Regulation 2017/745 given on the EU Declaration of Conformity.
	Indicates the item is a medical device.
	Signifies that the Instruction for Use/booklet must be read.
	Indicates the need for the user to consult the instructions for use.

Symbol	Explanation
UDI	Indicates the unique device identifier information.
	Indicates the entity importing the medical device into the locale.
EC REP	Indicates the authorized representative in the European Community/ European Union.
	Indicates the date on which a product was manufactured.
	Indicates that the medical device cannot be disposed of as household waste.

Note:

The symbols meet the requirements of ISO 15223-1 2021 "Medical devices - Symbols to be used with information to be supplied by the manufacturer Part1 General requirements".

2.3. Compliance

Anyone creating or changing a medical electrical system through a combination with other devices in accordance with standard IEC 60601-1:2005+AMD1:2012 Medical electrical equipment – Part 1: General requirements for basic safety and essential performance is responsible for ensuring that the requirements of these standards are met to the full extent to ensure the safety of patients, operators and the environment.

2.4. Electrical Safety

Only trained medical personnel should operate this scanner. The product complies with the following standards.

2.4.1 Electrical

- IEC 60601-1:2005+AMD1:2012 Medical electrical equipment – Part 1: General requirements for basic safety and essential performance
- IEC 60601-1-2:2014 Medical electrical equipment Part 1-2: General requirements for basic safety and essential performance-Collateral Standard: Electromagnetic disturbances– Requirements and tests
- IEC 60601-1-6:2010+AMD1:2013 Medical electrical equipment – Part 1-6: General requirements for basic safety and essential performance – Collateral standard: Usability
- IEC 60601-1-9:2007+AMD1:2013 Medical electrical equipment–Part 1-9: General requirements for basic safety and essential performance–Collateral Standard: Requirements for environmentally conscious design
- IEC 62366 2007+AMD1:2014 Medical devices–Part 1: Application of usability engineering to medical devices

2.4.2. Classification

- Type of protection against electric shock: Class I
- The degree of protection against electric shock: N/A
- Enclosure protection: IPX0
- Level of safety when used with flammable anesthetic gas mixed with air or flammable anesthetic gas mixed with oxygen or nitrous oxide: Non-AP/APG equipment.
- The mode of operation: Continuous operation
- Degree of protection against incoming liquids: Common device.

- Rated voltage of the device

  Power adapter: Input AC100~240V, 50/60Hz, Output: 24V2.5A

  The device: Input 60W (24V2.5A)
- Whether the device has a protective application against defibrillation discharge effects: No
- Whether the device has a signal output or input section: Yes
- Permanent installation device or non-permanent installation device: Non-permanent installation device

 **Warning**

- Use only the supplied medical grade power adapter.
- Shock hazards exist if the power adapter is damaged or is not properly grounded.
- To avoid risk of electrical shock hazards, always check the scanner and cable connections before use.
- To meet waterproof requirements, the sockets should not be placed on the ground.
- Do not use grounding type plugs for other purposes.
- Only authorized service labs can make internal replacements of the scanner and modify the software.
- Do not use the scanner if it is damaged. Contact technical support for replacement of the damaged equipment (see Contact information on chapter 1).
- Check the cable housing before use. Do not use the scanner if the housing is damaged or the cable is abraded.
- All devices connected to desktop dental 3D scanner shall comply with IEC 60601-1 and IEC 60950.

2.4.3. EMC Notice

 **Caution**

- The scanner meets the EMC requirements.
- Users should install and use the EMC information provided in the random file
- A portable or mobile RF communication device may affect the scanner's performance. Avoid strong ELECTROMAGNETIC interference when using a scanner, such as near a mobile phone or microwave oven.
- The guidance and manufacturer's statement are shown in the attached table.

 **Warning**

- This product should not be used close to or stacked with other devices. If needed, observe and check that it can operate properly in the intended configuration.
- Using cables or accessories other than those specified for use with the scanner might result in increased emissions or decreased immunity of the device.

Electromagnetic Emissions

Medical electrical equipment such as the scanner requires special precautions regarding electromagnetic compatibility and must be installed and put into service according to the following electromagnetic tables.

The scanner is intended for use in the electromagnetic environment specified below. The customer or user of the scanner should assure that it is used in such an environment.

Emission Measurement	**Conformity**
RF emissions CISPR 11	Group 1
RF emissions CISPR 11	Class B
Harmonic emissions IEC 61000-3-2	Class A

Voltage fluctuations/flicker according to IEC 61000-3-3	Applicable

Guidance and Manufacturer's Declaration – Electromagnetic Immunity		
Immunity Test	**IEC 60601-1-2 Test level**	**Compliance level**
Electrostatic discharge (ESD) IEC 61000-4-2	±8 kV contact ±2 kV, ±4kV, ±8 kV, ±15 kV air	±8 kV contact ±2 kV, ±4kV, ±8 kV, ±15 kV air
Electrical fast transient/burst IEC 61000-4-4	±2 kV for power supply lines	±2 kV for power supply lines
Surge IEC 61000-4-5	± 0.5 kV, ± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	± 0.5 kV, ± 1 kV line(s) to line(s) ± 2 kV line(s) to earth
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	0 % U_T; 0.5 cycle at 0°,45°,90°, 135°, 180°, 225°, 270°, 315° 0 % U_T ; 1 cycle 70 % U_T; 25/30 cycle 0% U_T; 250/300 cycle	0 % U_T; 0.5 cycle at 0°,45°,90°, 135°, 180°, 225°, 270°, 315° 0 % U_T ; 1 cycle 70 % U_T; 25/30 cycle 0% U_T; 250/300 cycle
Power frequency magnetic field IEC 61000-4-8	30 A/m 50Hz/60Hz	30 A/m 50Hz/60Hz
NOTE: U_T is the a.c. mains voltage prior to application of the test level.		

Guidance and Manufacturer's Statement - Electromagnetic emission		
Immunity test	**IEC 60601 test levels**	**Compliance level**
Radiated RF EM fields IEC 61000-4-3	3V/m 10V/m 80 MHz to 2.7 GHz 80% AM at 1 kHz	3V/m 10V/m 80 MHz to 2.7 GHz 80% AM at 1 kHz

Conducted disturbances induced by RF fields IEC 61000-4-6	3 V 0.15MHz to 80 MHz 6 V in ISM bands between 0.15MHz and 80 MHz 80% AM at 1 kHz	3 V 0.15MHz to 80 MHz 6 V in ISM and amateur radio bands between 0.15MHz and 80 MHz 80% AM at 1 kHz

Guidance and Manufacturer's Declaration - IMMUNITY to proximity fields from RF wireless communications equipment					
Immunity test	**IEC60601 test level**				**Compliance level**
	Test frequency	**Modulation**	**Maximum power**	**Immunity level**	
Radiated RF IEC 61000-4-3	385 MHz	**Pulse Modulation: 18Hz	1.8W	27 V/m	27 V/m
	450 MHz	*FM+ 5Hz deviation: 1kHz sine	2 W	28 V/m	28 V/m
	710 MHz 745 MHz 780 MHz	**Pulse Modulation: 217Hz	0.2 W	9 V/m	9 V/m
	810 MHz 870 MHz 930 MHz	**Pulse Modulation: 18Hz	2 W	28 V/m	28 V/m
	1720 MHz 1845 MHz 1970 MHz	**Pulse Modulation: 217Hz	2 W	28 V/m	28 V/m

	2450 MHz	**Pulse Modulation: 217Hz	2 W	28 V/m	28 V/m
	5240 MHz 5500 MHz 5785 MHz	**Pulse Modulation: 217Hz	0.2 W	9 V/m	9 V/m
Note* - As an alternative to FM modulation, 50 % pulse modulation at 18 Hz may be used because while it does not represent actual modulation, it would be worst case. Note** - The carrier shall be modulated using a 50 % duty cycle square wave signal.					

Guidance and Manufacturer's Declaration - IMMUNITY to proximity magnetic fields		
Test frequency	**Modulation**	**Immunity level (A/m)**
30 kHz	CW	8
134.2 kHz	Pulse Modulation 2.1 kHz	65
13.56 MHz	Pulse Modulation 50 kHz	7.5

The medical electrical equipment is suitable for the professional healthcare environment per 60601-1-2:2014+AMD1:2020. It is suitable for use in physician offices, clinics, hospitals, and other professional healthcare environments except near HF surgical equipment and the RF shielded room of an ME system for magnetic resonance imaging or other environments where the intensity of electromagnetic disturbances is high.

The clinical environments where the device can be used include physician offices, clinics, hospitals, and clinical point-of-care for diagnosis of patients except environments where the intensity of electromagnetic disturbances is high.

Caution

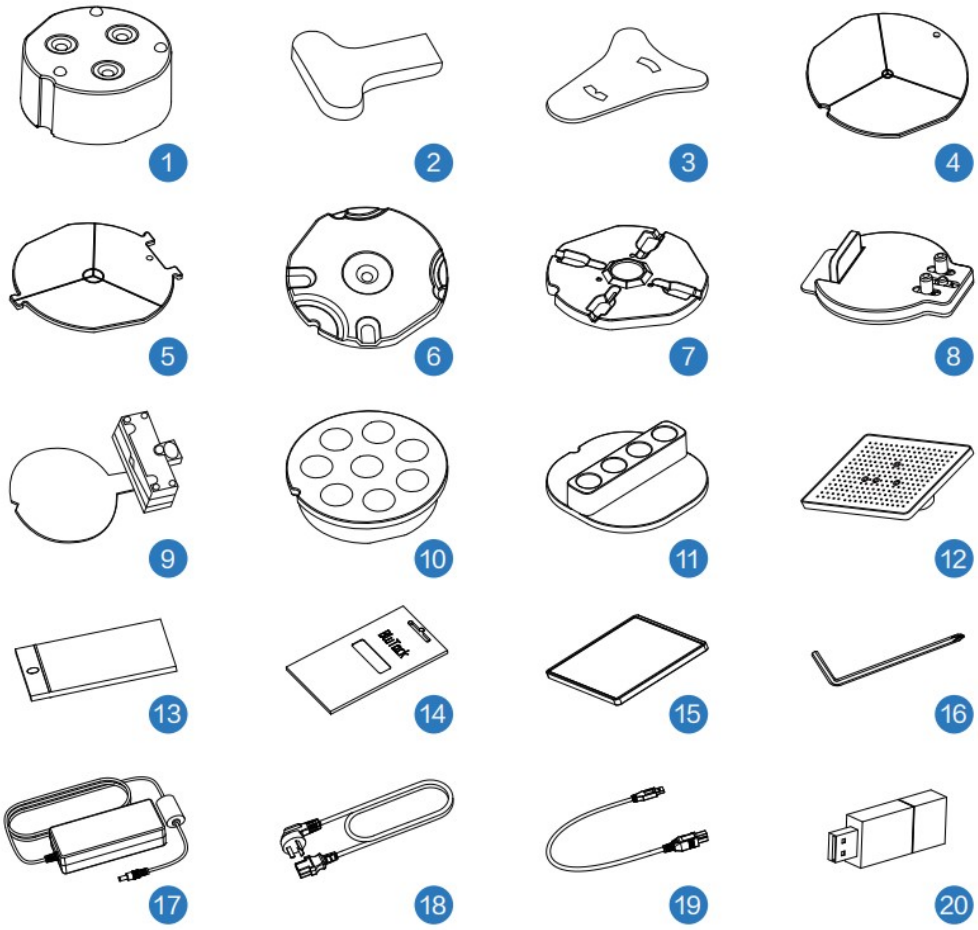
- Using cables or accessories other than those specified for use with the scanner might result in increased emissions or decreased immunity of the device.
- Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 inches) to any part of the scanner, including cables specified by the manufacturer. Otherwise, it could lead to degradation of the performance of this equipment.
- If immunity test level is higher than those specified in IEC60601-1-2, the minimum separation distance may be lowered. Lower minimum separation distances shall be calculated using the equation specified in IEC60601-1-2 Chapter 8.10.

3. Unpack the Package

Check the carry box for the following items. If any item is missing or damaged, contact the distributor or service provider immediately.

Note

The following figures in the parts list are for reference only, the actual product shall prevail if there is any inconsistency.



No.	Accessories	Quantity	Description
1	Basic height adapter	1	For calibration/die scanning/plaster model scanning/impression scanning, etc. Placed directly on the scanner's rotation table.
2	Articulator height adapter	1	For static articulator scanning.
3	Articulator base	1	For dynamic articulator scanning.
4	Arch tray	1	Fix the arch on the tray with Blu-Tack.
5	Full arch tray	1	Fix the full arch on the tray by rubber band.

No.	Accessories	Quantity	Description
6	Articulation transfer plate 1 (compatible with Artex and Kavo articulator bases)	1	For plaster model scanning which is taken from articulator.
7	Articulation transfer plate 2 (compatible with two other simple articulators in the market/Mega)	1	For plaster model scanning which is taken from articulator.
8	Model Fixture	2	For plaster model scanning.
9	Impression Fixture	1	For impression scanning.
10	Die plate	1	Fill holes with Blu-Tack, then insert dies for die scanning.
11	All-in-one plate	1	Fill holes and cover two sides with Blu-Tack for all-in-one (dies and quarter models) scanning.
12	Calibrate plate	1	For calibrating and correcting the scanner. Don't touch the surface of the plate to avoid damage.
13	Lens cleansing cloth	1	For cleansing the lens.
14	Blu-Tack	2	For fixing the dies in the holes.
15	White balance plate	1	For calibrating the white balance.
16	Allen key	1	For maintenance.
17	Power adapter	1	To supply 24V electric power.
18	Power cord	1	Connect the power adapter.
19	Data cable	1	Insert to USB 3.0 port.

No.	Accessories	Quantity	Description
20	Flash disk	1	For storing software and documents.

4. Scanner

4.1. Overview

The desktop dental 3D scanner is developed and manufactured by SHINING 3D. It is a professional solution for model data acquisition for orthodontics, restoration, and implant. It supports data transfer between clinical and technical offices, thus providing digital scale production. It is mainly used in the scenario of labs and dental clinic.

Intended use

The scanner is used to scan and capture the 3D characteristics of dental models including plaster models and impressions. It can work with the supplied software to export the 3D scan data for CAD/CAM. The scan data can be applied for the orthodontics, restoration, and implant.

Intended user

Only trained medical personnel with professions of dentistry and dental laboratory technology may use the scanner and the supplied software programs. The product can not be operated by the patients themselves.

Intended situations

Single coping, bridges, full anatomic crown, full anatomical bridge, inlay, onlay, inlay bridge, veneer, single wax-up, wax-up bridge, pressed crowns and bridge, post and core, telescopic crown, custom abutments, implant scanbody, removable partial denture, orthodontic cases, full denture, denture replication, provisional crown and bridge.

Note

The device is intended for use outside patient environment.

Workflow

1 Create an order: In the software, create an order with detailed information.

2 Scan model or impression: Scan the model based on the order created. In this method, 3D data of the model can be obtained more quickly than in traditional methods.

3 CAD design: The restoration design is based on the scanned data.

4 CAM processing: The restorations designed are converted into CNC machining data.

5 Manufacturing: The restoration data is sent to the milling machine or printer for printing.

6 Finish: Post-process the restoration.

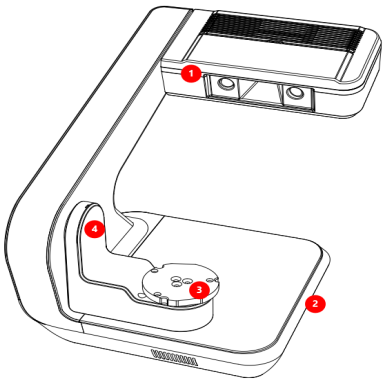
Scanner & Software

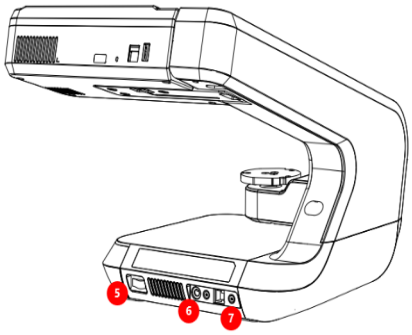
The scanner comes with supplied software.

Desktop dental 3D Scanner	The scanner is designed to acquire scan data from a variety of dental models and impressions in a convenient way.
DentalScan software	The accompanying software is designed to be user friendly, making it easy to acquire scan data.

4.2. Hardware Overview

4.2.1. Scanner Body





No.	Item	Description
1	Scanner head	Consists of two cameras and a light projector. Project structured light to reconstruct objects in the three dimensions through binocular disparity.
2	Power light	Indicates whether the scanner is powered on.
3	Rotary platform	Allows the scanned object to rotate during the scanning process.
4	Swinging platform	Allows the object to move in a swinging motion during the scanning process.
5	Power switch	Power on or off.
6	Power port	Provides power supply to the scanner.
7	USB3.0 port	Connects the scanner to the computer and transmits data.

Note

The horizontal load capacity of the rotary platform is 2.0 kg.

4.2.2. Main Cables

Item	Length(m)
USB3.0 cable	2
Power cable	1.5

4.3. Software Overview

4.3.1. Operating Environment

The computer should meet the minimum requirements to be able to run the scanner and applications. It is also recommended that the Windows system should be up to date to ensure that the USB 3.0 port works properly.

Note

- Please update your Windows system, graphics card and USB device drivers before installing the scanning software.
- To ensure smooth uploading or downloading of data, a network bandwidth of 25Mbps and above is recommended.
- The disk on which the package is installed must have more than 2GB of space remaining.
- The disk on which the order is stored needs to have more than 20GB of space remaining.

Caution

- Please run DentalScan on Windows System.
- Please use an NVIDIA graphics card to gain optimal scanning efficiency.

Configuration	Description
CPU	Intel® Core™ i7 or higher
RAM	≥16G
Graphic Card (GPU)	NVIDIA GTX1060(6G) or higher
Display resolution	1920 × 1080 or higher
System	Windows 10 / Windows 11 (64-bit)
Port	USB 3.0 Type-A or higher

4.3.2. Install the Software

1 Software package extraction.

- Insert the USB flash disk.
- Copy the software package from the USB flash disk.
- Save the software on your own PC.

2 Connect the scanner to PC and turn it on.

3 Double click setup file and install the software step by step with instructions.

4 Select the corresponding model **DS-EX Pro Series** and click **Next**.

5 Select the installation path and click **Install**.

6 Choose **launch activator exocad right now** if exocad has already been installed on your PC.

- Click **Select path**.
- Search the **DentalDB.exe** path and click **Blind** to close it.

7 Otherwise, cancel the selection **launch activator exocad right now** and click **Finish** directly.

5. Set the Scanner

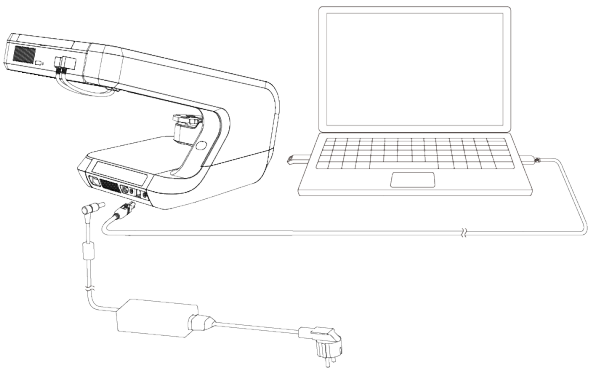
5.1. Connect the Scanner

Before running the software, please connect the scanner first. Please use the correct cable connection and connect the scanner to the computer by plugging it into the USB 3.0 port of the computer.

Caution

- Please do not run the program directly from the USB driver, the software must be copied from the USB driver to the computer's hard drive and the user must have read and write access to the folder to which the scanning software belongs.
- Use the power adaptor, cable, and power cord provided by SHINING 3D matching to the scanner.
- Don't plug the cable or the dongle into the neighboring USB ports on the computer.
- Don't plug wireless USB or wireless network adaptor into the computer while using the scanner.

Connect the scanner according to the following diagram.



After connecting the device, press the button on the back of the device to start it up.

Note

The icon in the bottom left corner of the login screen shows the current connection status.

Status	
Disconnected	
Connected	

● When the software prompts that the device is not connected or that the device is connected incorrectly:

1 Please first check that the power and data cables are connected correctly and ensure that the computer is switched on.
2 It is recommended to unplug the data and power cables and reconnect the lines, if the error message still appears.
3 It is recommended to close the software first, wait a few seconds and then restart the software.

Caution

After the device is successfully wired, enter the software interface and select the currently used device model.

5.2. Calibrate the Scanner

Read the following content before calibration.

Caution

- Please do not touch the front side of the calibration board and do ensure that there are no scratches or dirt on the calibration board.
- Please keep the calibration board away from corrosive liquid, metals, or sharp substances.
- Don’t place heavy objects on the calibration board.
- Don’t wipe the calibration board with any chemical liquid including alcohol.
- Please put the calibration board in the storage bag after finishing scanning.

5.2.1. Calibration Notice

The device needs calibration in the following scenarios:

- First-time connection.
- The scanner experienced violent shaking.
- A deterioration in the quality of the scanned data or frequent errors when stitching compared to the results of previous scans.
- Changes have occurred in the external environment during use. For example, the ambient temperature varies considerably.
- Calibrating the device every 15 days is recommended. The number below the calibration icon  on the upper right corner indicates the number of days since the last calibration.

Calibration may fail in the following scenarios:

- Calibration without the height adaptor.
- mismatched calibration files.
- Excessive ambient brightness. For example, calibrations in bright light.
- The front of the calibration board is badly damaged.

5.2.2. Operate Calibration

Calibration is the calibration of the equipment. Calibration ensures the accuracy of the equipment and improves the stitching effect after scanning.

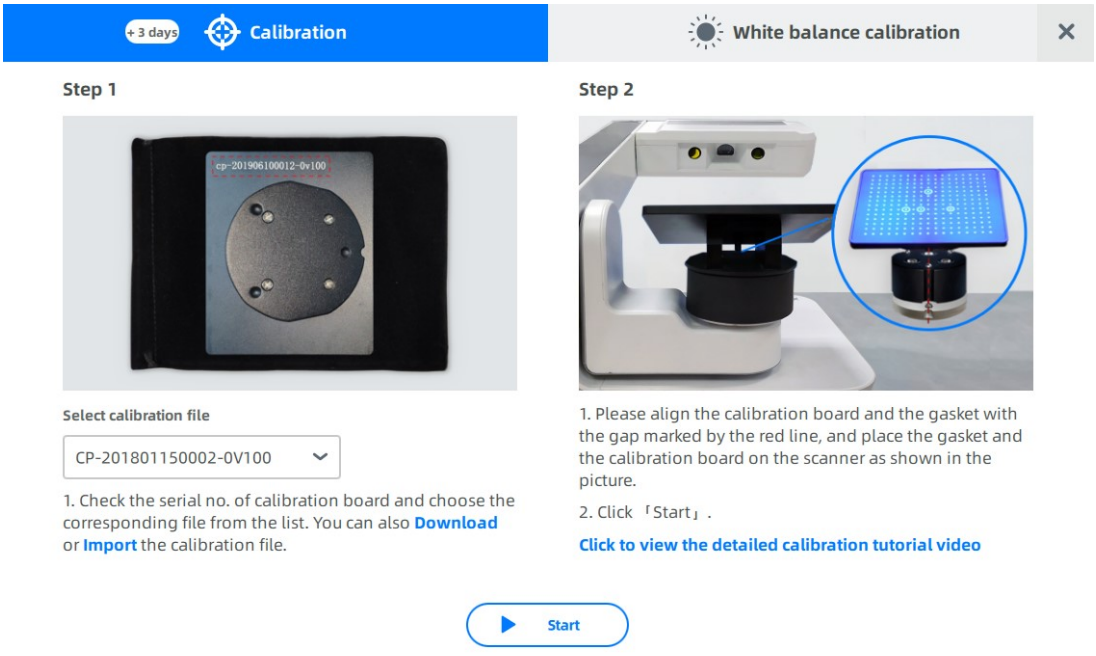
Caution

- Please download the corresponding calibration file according to the calibration board currently in use.
- Do not move the equipment during the calibration process.

Steps

1 Click on the upper right corner of the homepage to enter.

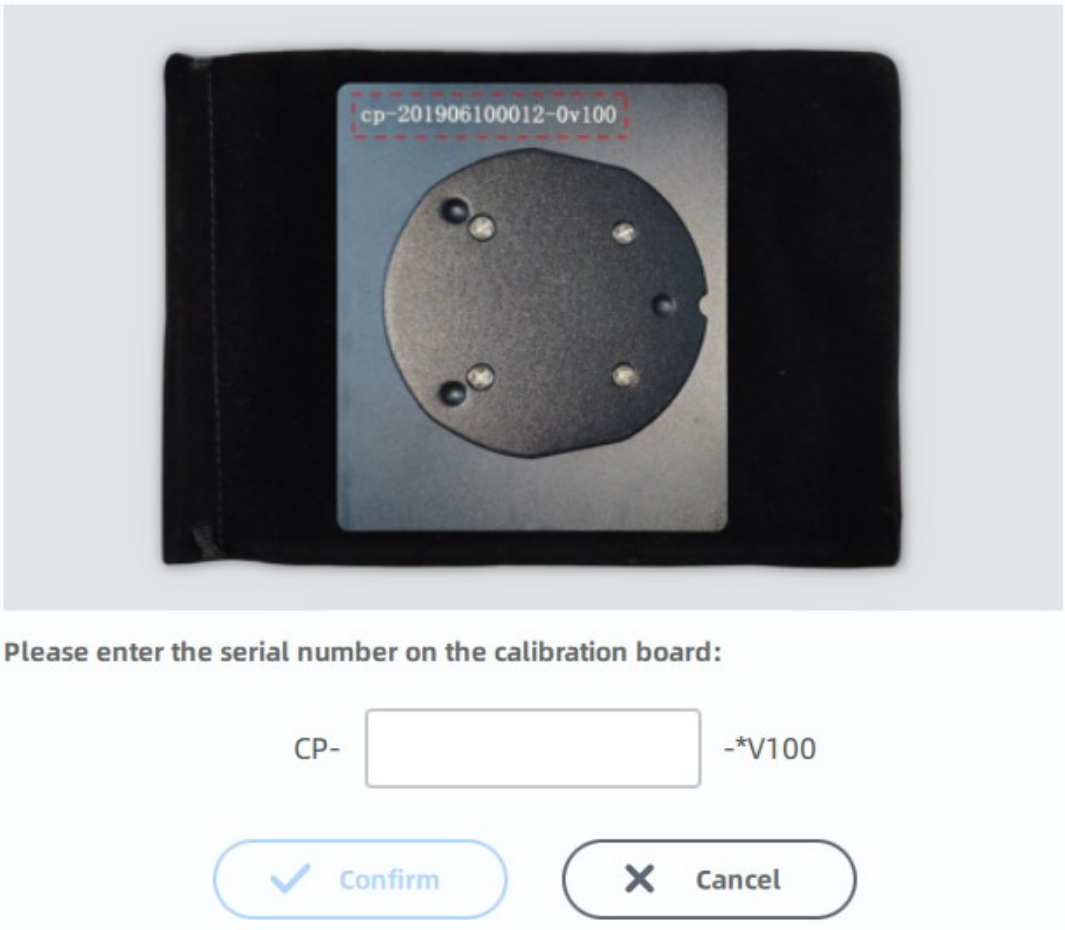
2 Click on **Calibration**.



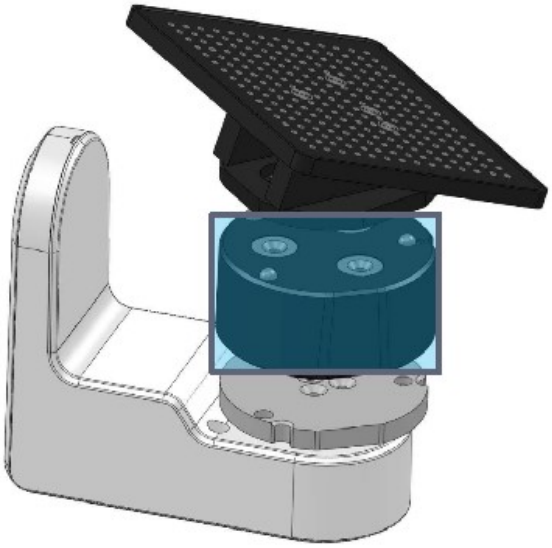
3 Check the serial number on the back of the calibration plate and click on **Select Calibration Board File** and check the drop-down list for an identical serial number.

● There is an identical serial number: click on the serial number and select the matching calibration board file.

● There isn't an identical serial number: click **Download**, enter the serial number printed on the back of the calibration board, and then click **Confirm** to download the matching calibration plate file. Or click on **import** and select the PLE file that matches the calibration board.



4 Place the basic height adaptor on the turntable, then place the calibration board on the basic height adaptor and ensure that the connection is secure.



5 Click on **Start** and the turntable will start to rotate. Data is collected from different angles and the whole calibration process is carried out automatically.

6 When the calibration is complete, the **Calibration successful** pop-up box appears. Click on ✕ to finish calibrating.

Note

Multiple calibrations can be performed to reduce the deviation.

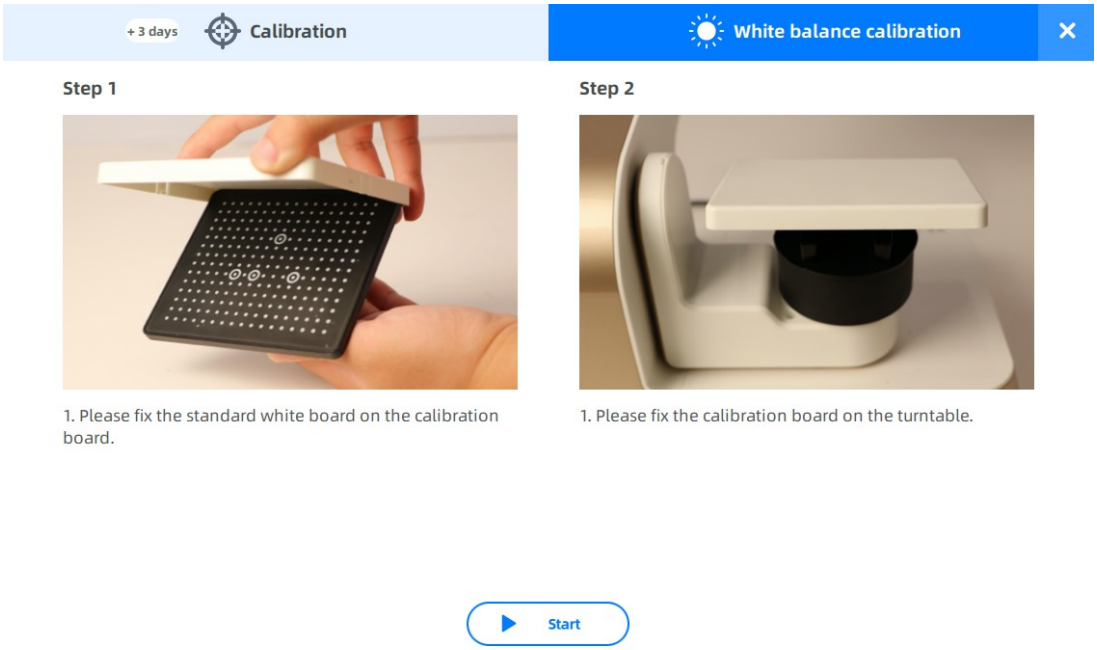
5.2.3. White Balance Calibration

Note

To ensure that the colors are reproduced accurately, perform the white balance correction every 3 months.

Steps

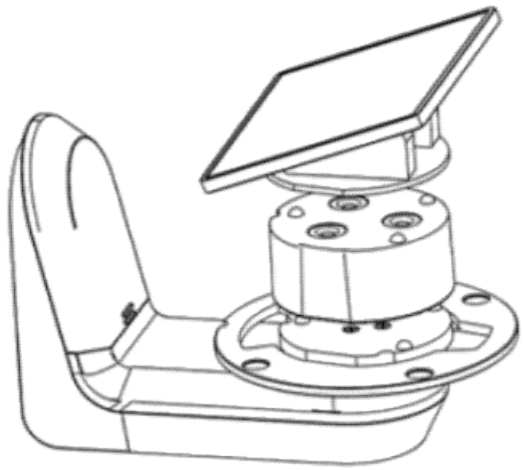
1 Click and select **White Balance**.



2 Secure the white cover to the calibration board.

3 Place the height adaptor on the turntable.

4 Place the assembled calibration board on the height adaptor.



5 Click **Start** so that the turntable starts to spin, and the white balance correction correction will processed automatically.

6 Click ✖ to confirm and exit.

6. Clinical Case Quick Guide

The chapter takes clinical case as example to show software related operations. For more software related operations, see User Manual.

6.1. Connect the Scanner

See 5.1 Connect the Scanner.

6.2. Activate the Scanner

Double-click DentalScan icon on the desktop to enter the login interface.

Register

Click **New User? Click here to register** to enter the registration interface if you do not have a SHINING Pass.

Steps

1 Click and select **Lab** or **Clinic / Hospital** from the list.

I am a lab technician: Register for technician and administrator accounts.

I am a hospital/clinic: Register hospital/clinic members and administrator accounts.

2 Enter the account information.

3 Click **Privacy Policy** and read the content carefully before agreeing.

4 Click **Sign Up** to confirm the registration information.

5 Click **Return** to return to the login page and log in.

Note

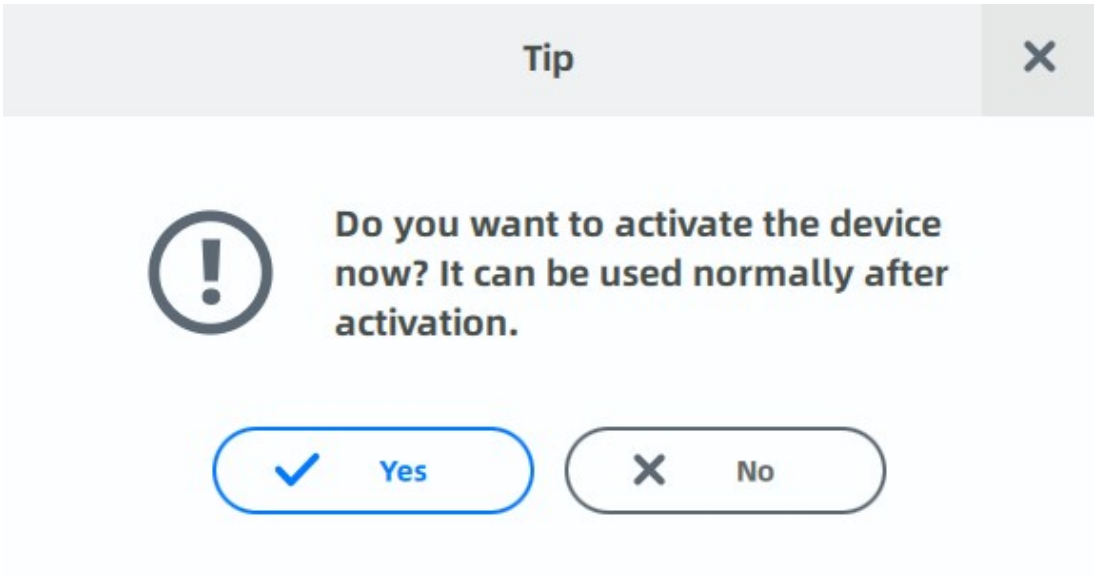
The notifications will be sent to the phone, or the email address being filled.

Login

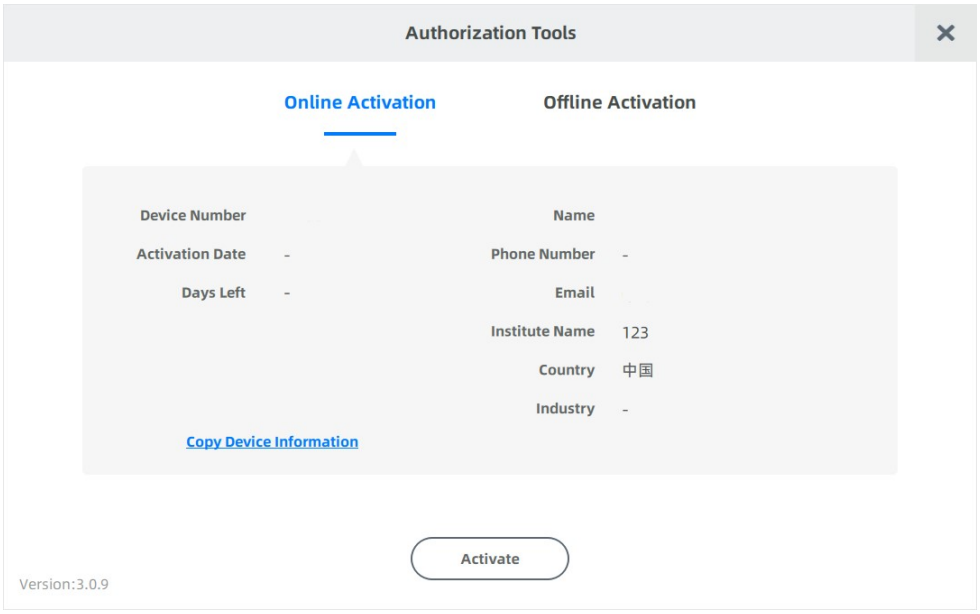
If you already have a SHINING Pass, you can log in by entering your account number and password on the login screen, or by entering your account number and verification code.

Online Activation

Activate the SHINING 3D pass for full permission. Click **Yes** to start activation.



Select **Online Activation**, the activation will be processed after clicking **Activate** if the computer with installed software has been networked.



Note

As DentalScan is set to download patches automatically, a reminder of **Please Update the Software** will pop up if the software is not of the latest version.
Click **Install** and follow the instructions to update the software to ensure it is fully functional.

6.3. Calibration

See chapter 5.2 Calibrate the Scanner. To ensure the quality of the scanned data, it is necessary to perform calibration periodically (every 15 days recommended).

6.4. Create New Order

Click to enter the setting new order page.

6.4.1. Order Information

1 Fill the blanks. Enter the information of the order and the patient.

2 Select the doctor and technician from the list. To add new options, click .

3 Select the patient type as restoration or orthodontics according to the reality.

4 Note that there exists a field for memos and other notes of the project.

Select case type **Restoration** or **Orthodontics**. Remarks such as tooth color requirements can be filled in.

● Restoration: The focus is on the treatment following chipped and missing teeth, such as inlays, full crowns and dentures, but also includes the use of artificial restorations such as occlusal plates and movable brackets. The user needs to select the specific tooth position to be treated and the type of treatment.
● Orthodontics: Orthodontics refers to the straightening of teeth. If you choose orthodontics, there is no need to choose the position of the teeth and the type of treatment.

6.4.2. Tooth Selection

1 Select **Patient Mode**.

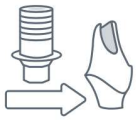
Note

Patient Mode is used to scan the patient's jaw model.

2 Use Operation Skills to Mark Teeth.

3 Add scanning steps and **Implant-Based**.

4 Set **Material** and **Teeth Color**.

Implant-Based		
	**Custom Abutment**	Add the step of scanning **ScanBody**.
	**Custom Abutment** (manual positioning)	Add the step of abutment scanning. After entering this step, abutment scanning is enabled by default.
	**Screw Retained**	Add the step of scanning **ScanBody** for dental implant.
	**Screw Retained** (manual positioning)	Add the step of abutment scanning.
	**ON Substructure Scan** (e.g, bar)	Add the step of scanning **ScanBody**.

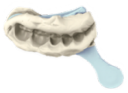
6.4.3. Type Selection

1 Select **Scan Type**.

Scan Type	Model	

Scan Type	Model	
	**Sectioned Model**	For scanning the upper/lower jaw in which dies are removable.
	**Unsectioned Model**	For scanning the whole upper/lower jaw in which dies are not removable.
	**Impression Model**	For scanning the impression.

2 Select **Occlusion Type**.

Pictures	Occlusion Type	Pictures	Occlusion Type	Pictures	Occlusion Type
	Two Stone Models in Occlusion		Triple Tray		Mushbite
	Two Stone Models in Artex CR		Two Stone Models in Articulator Bio-Art		Two Stone Models in Articulator P
	Two Stone Models in Articulator S (legacy)		Two Stone Models in Articulator S		Two Stone Models in Articulator Panadent

Pictures	Occlusion Type	Pictures	Occlusion Type	Pictures	Occlusion Type
					PCH
	Two Stone Models in Articulator Panadent PSH		Two Stone Models in Articulator Denar		Two Stone Models in Articulator AD2

3 Add digital **Scan Marker for Jaw Movement** for models having the occlusion relation or the scan marker for jaw movement.

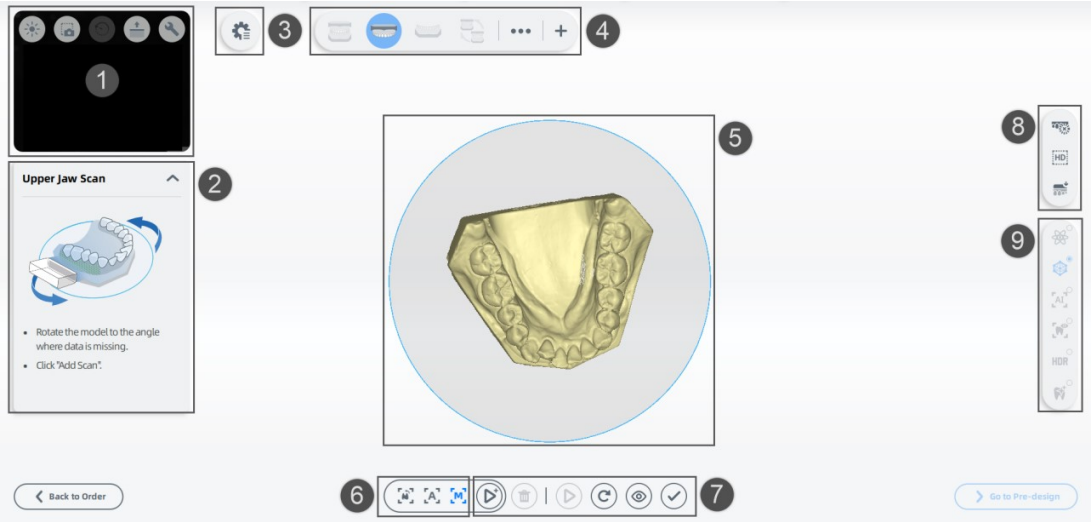
4 Click the button for further operations.

Button	Description
Scan	Start scanning.
Save	Save the current order for further scanning.
Explore	View the files related to current order.

- Baumann: A third-party fixture that can be used with the Artex CR type, Bio-Art, P, S (old style) and S occlusal frame bilateral plaster models for scanning, which is more cost effective.

6.5. Scan

6.5.1 Scan Interface



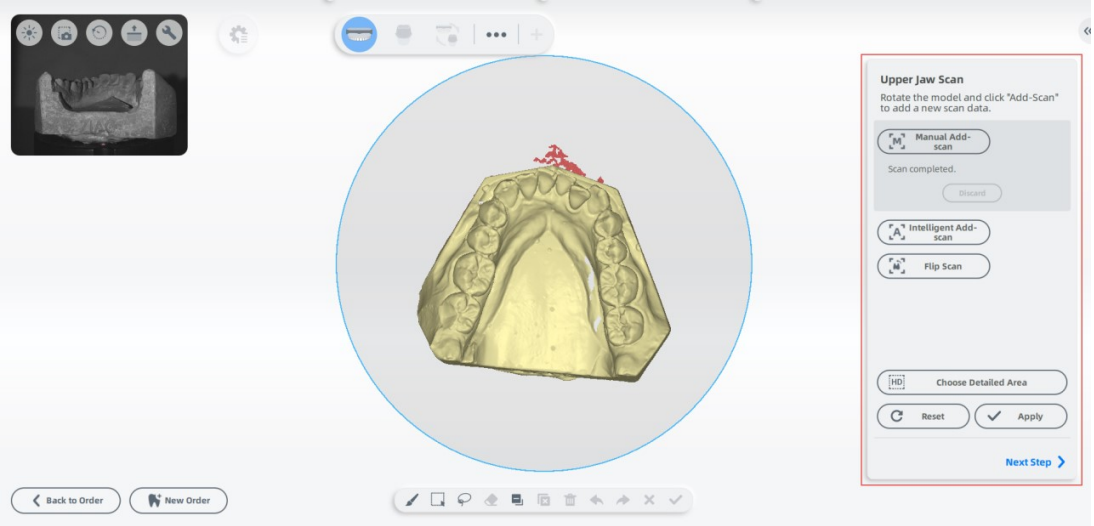
Number	Column	Introduction
1	**Camera Window**	Displays the real scanning scenarios and supports setting scanning Parameters.
2	**Guide**	Contains the current process, operating diagrams and detailed tips.
3	**Preset**	Supports setting the Scan workflow according to the specific situation.
4	**Progress Bar**	Displays the current position within the whole progress. To view the other processes, click •••. To add extra processes, click ✚.
5	**Preview**	Supports previewing the scanned data. To gain a comprehensive view to the model, please use Operation Skill for switching perspectives during the preview.
6	**Add Scan**	Supports Flip Scan, Intelligent Add-scan and Manual Add-

Number	Column	Introduction
		scan. Flip Scan : After flipping the model manually and fixing it with the fixture, rescan the model and align the scanned data. Intelligent Add-scan: the scanner will automatically collect data of selected areas. Manual Add-scan: Manually set the perspectives for re-scanning. : Click to start scanning. : Delete scanning data.
7	**Operation**	Supports functions of **Start Scan**, **Reset**, **Preview**, **Save** and Alignment.
8	**Edit & Import**	Supports functions of Edit and **Import**. **Cannot import models during All-in-one Scan/ Die Scan/ Triple Tray Scan Workflow.**
9	**Additional Function**	Provides various Additional Function for improving the quality to scanned data.

6.5.2 Navigation Mode

The navigation panel in the right corner of scanning process page. The panel information includes operation guide instructions, illustration and scan options.

Scan options for improving the scanning effect or changing the scanning mode during the current scanning phase. These parameters or function options provide different functions and parameter options for different scanning objects.



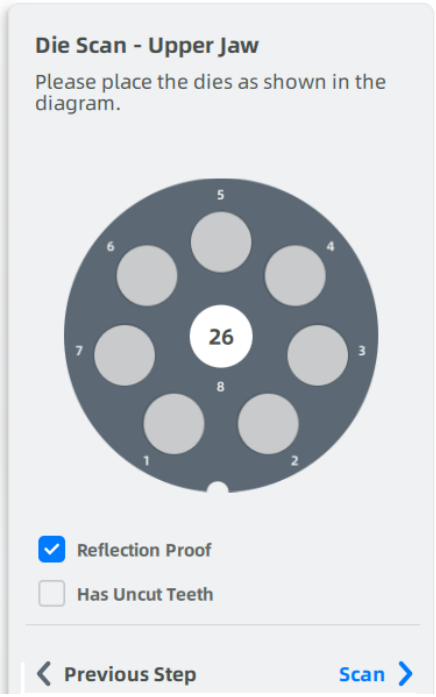
Open navigation mode page

In the scan settings page, check **Navigation Model** to display the navigation panel. See details in Scan settings。

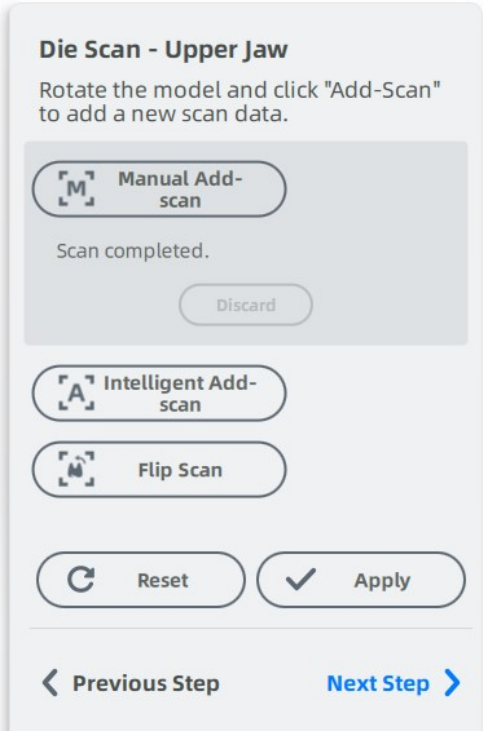
Navigation panel instructions

- Pre-scan options are different according to the process node. For example, full denture order, including fast scan mode; Die tray order, including unsectioned die and reduce high brightness.
- After scanning, options include manual add-scan, intelligent add-scan and flip scan.

Before scanning：



After scanning：

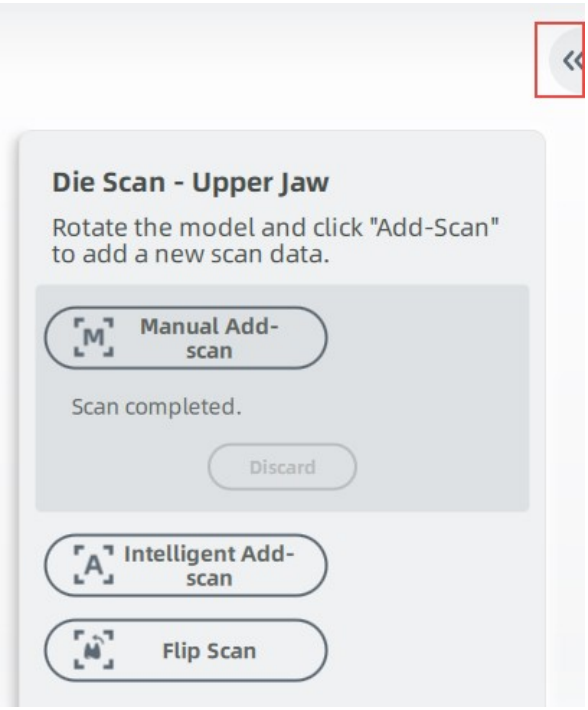


Note

When scan node is complete, the edit toolbar is displayed.

Panel keys description

Name	Description
Reset	Click **reset**, the scan data is cleared and backed back to the pre-scan operation page.
Apply	Click **application** to display the add scan operation.
Expand/ Hide Toolbar	Click « to expand the toolbar and display parameters options; Click again to hide the toolbar.



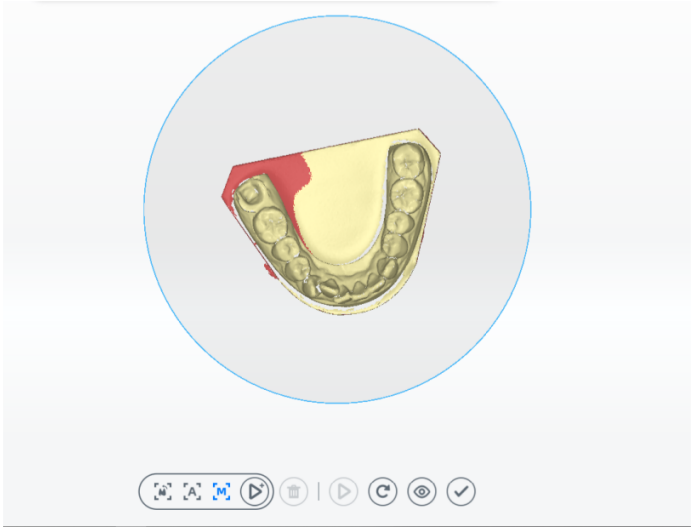
6.5.3 Parameters

Move the cursor into the camera window and set scanning parameters.

Icon	Introduction
	Click to see the brightness bar and auto-adjust button ◑ . Drag the slider or click ◑ to adjust the brightness, until several red spots appearing.
	Click to capture a screenshot and save it to the local folder.
	Click to see Z-axis adjustment bar and adjust the shooting height.
	Modify the scanning range by dragging the blue cutting line at the bottom of window. Only the range above the cutting line is to be scanned.
	Click to setup the scanner manually. **This function should only be conducted by professional technicians.**

6.5.4 Add Scan

If the scanned data is incomplete, or there are holes after scanning, select the corresponding scanning method to acquire the missing data.



Manual Add-scan

Rotate the model to scan on the desired angle.

Steps

1 Click .

2 Rotate the model to the scanning angle manually.

3 Click to scan.

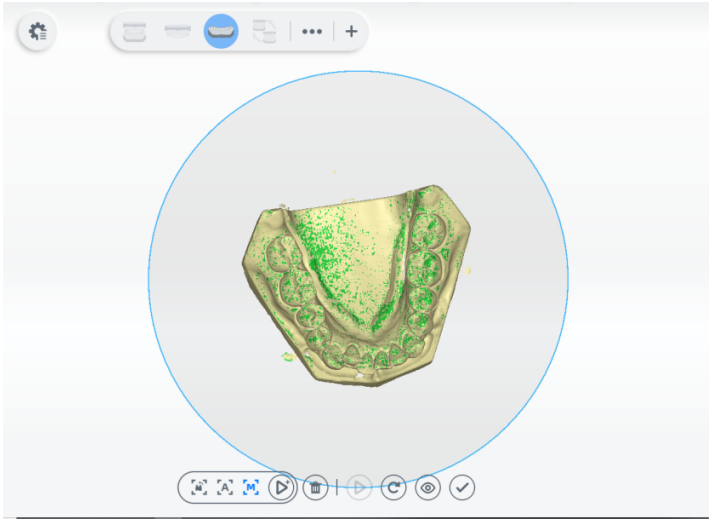
Note

The newly scanned data is highlighted in green.

4 After scanning, move or rotate the cutting plane to cut the model.

5 Click to edit the model.

6 Click to preview the scanned model.



Intelligent Add-scan

Scan the marked area automatically.

Steps

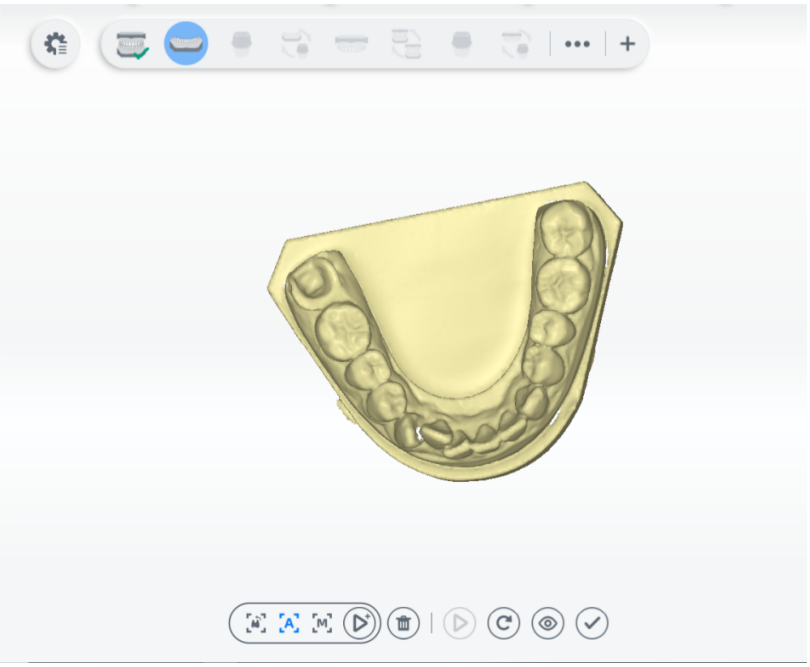
1 Click .

2 Press and hold the left mouse button (or click) on the model to mark the area to scan. The marked area is shown in red.

3 Click to scan.

4 Click to edit the model.

5 Click to preview the scanned model.



Flip Scan

Flip scan is mainly used for wax-up bottom scan and full dental scan to acquire interior data of the model.

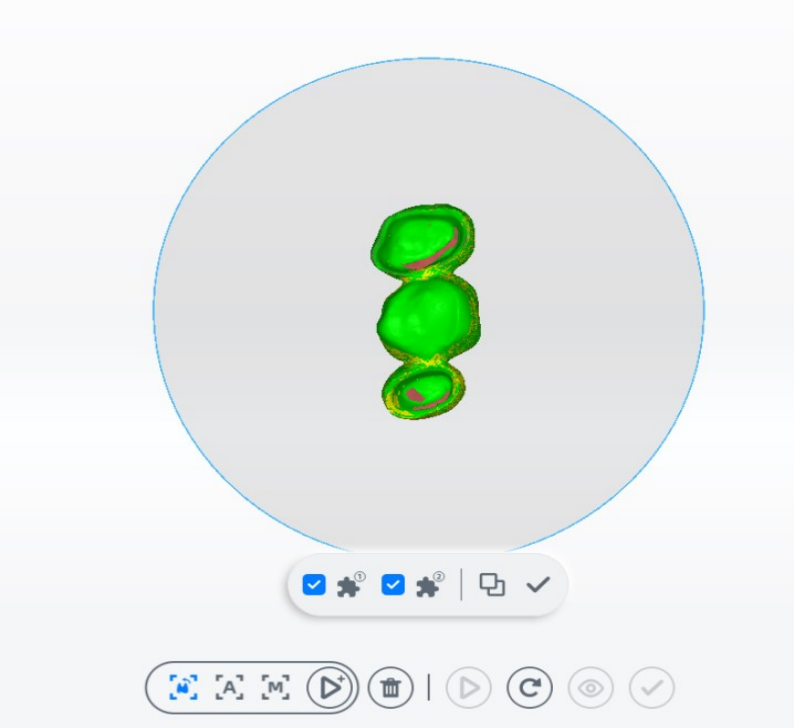
Steps

1 Follow the guidance on the interface to place the model.

2 Click .

3 Click to scan.

4 After scanning, check and to view the last scanned data (shown in yellow) and newly scanned data (shown in green).



5 Click ✔ to align automatically or click to align manually. For steps to align, see Alignment Operation.

Multiple Add-scan

If the number of scanbodies is less than the number to be scanned in the order, obtain the data of all scanbodies by using Multiple Add-scan.

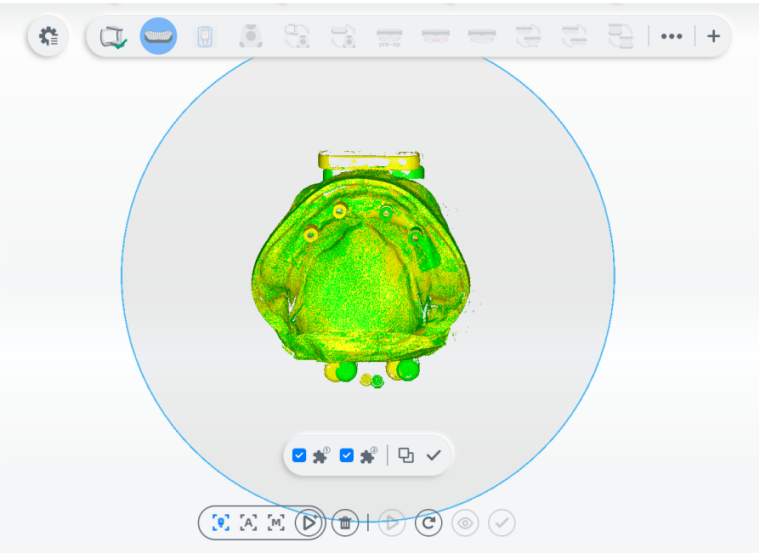
Steps

1 Click or press the space key to start scanning.

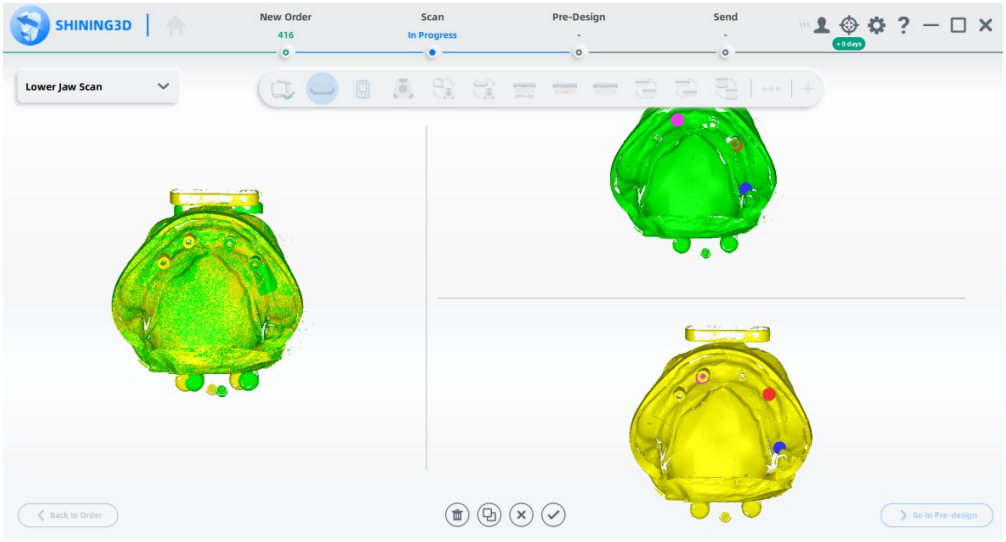
2 If there is no scanbody on other teeth, unscrew the scanbody and screw it on other teeth.

3 Click .

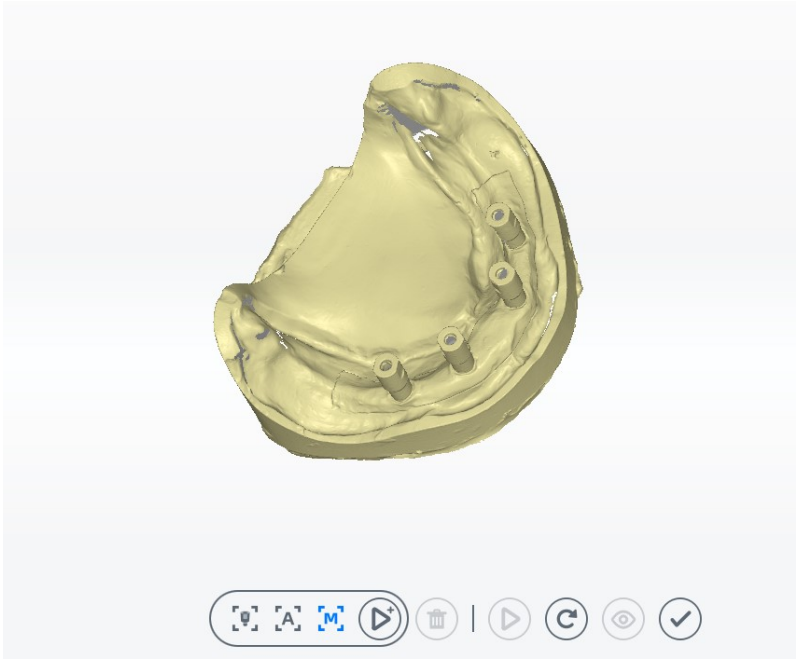
4 Click to scan.



5 Click  to align automatically. For steps to align, see Alignment Operation.



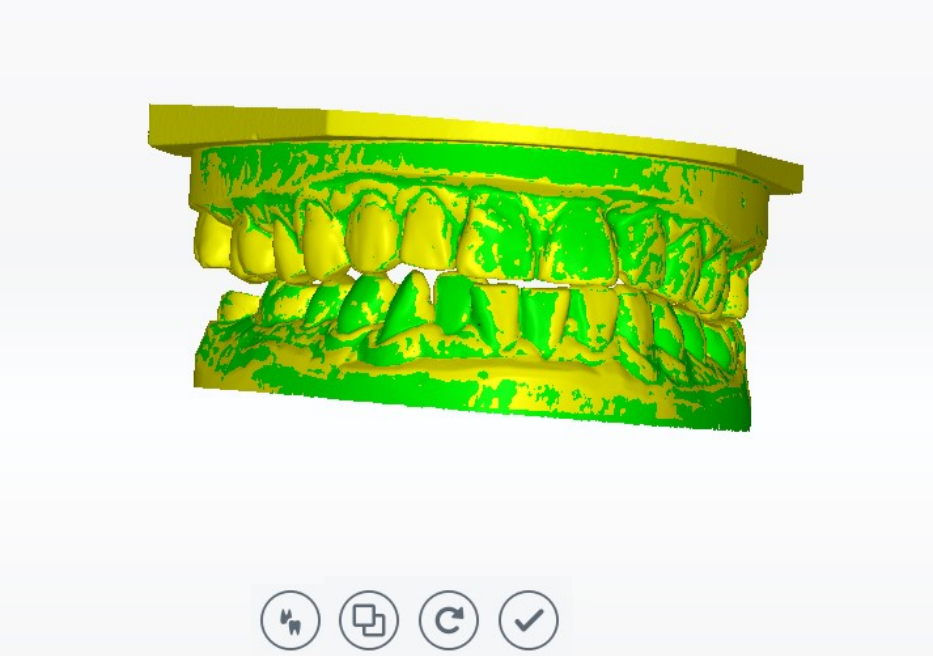
6 After scanning, click  , to preview the scanned model.



6.5.5 Alignment

Automatic Alignment

When entering the alignment interface, DentalScan is to process the alignment automatically.
Users can click ✔ for confirmation or adjust the alignment manually.



Manual Alignment

1 Click  for entering manual alignment interface.

2 Double-click To add points (max.3 choices) on the upper right alignment graph. Those points should be in the region of apparent features and should not be in one straight line.

3 Double-click to select points on the lower right alignment graph, the location must be the same as the previous ones.

4 To delete points, click , all the points added is to be cleared at once.

5 Click to process the alignment.

6 To exit the alignment interface and discard changes, click ✖; to apply all the changes and exit, click ✔.

Note

The effect graph is on the left side. Meanwhile the alignment graphs are separated at the upper right and lower right corners.

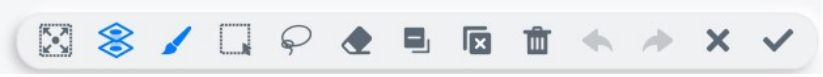
Function Tools

Icon	Name	Description
	Delete	Delete all points.
	Align	Start alignment.
	Return	Return to the first automatic alignment (post and core order).
	Cancel	Cancel alignment operations and exit.
	Apply	Apply alignment operations and exit.

6.5.6 Edit Function

Edit

Click to enter the editing interface, then use following tools to edit model.



Icon	Instruction
 **Connected Domain**	To mark all the redundant data or the noise red, select one part of it, then click **Connected Domain** to select all of connected ones.
 **Cut Through**	Add cutting through effect to **Rectangular / Lasso / Brush** for selecting external and internal data at once.
 **Brush**	1 Select the data by highlighting it red. 2 Move the brush. Click the left mouse button and hold to color the area waiting to be deleted into red. 3 Press Shift and slide the wheel to adjust the size of the brush.
 **Rectangular Selection**	1 Move the cursor into the area waiting to be deleted and select. 2 The data to be deleted will be displayed in red.
 **Lasso**	Select the data by highlighting it red.
 **Eraser**	Restore the selected data to original status.
 **Reverse**	Inverts the current selection of the data.

Choose Detailed Area Function

Click HD to enter the choosing detailed area interface, and then use following tools to refine the scanned data.

Note

- When **High Quality** is enabled, Detailed Area Function is available after scanning or rescanning.
- After selecting the detailed scanning area, only the selected area is accessible to the High Quality.

Icon	Instruction
Brush	Select the data by highlighting it green.
Spherical Selection	Select the data by highlighting it green.
Rectangular Selection	Select the data by highlighting it green.
Lasso	Select the data by highlighting it green.
Eraser	Restore the selected data to original status.
Select All	Select all the data by highlighting it green.

Icon	Instruction
 **Cancel Selection**	Cancel the current selection of the data.

Additional Function

Icon	Instruction
	Switch the upper jaw model and lower jaw model. All-in one models, and double-sided impressions are flipped automatically.
	Import the data of model. The newly imported data will cover the original one.
	Add scanning paths and process a multi-angle scan.
	Add details and process a high-quality scan.
	During scanning, the area near the preparation tooth is automatically identified and scanned. This function is only available when you select **AI Detection**.
	Texture scanning. Collect the real color data of the model. Only available when showing texture is enabled. Only available after completing White Balance calibration.
	Scan the abutment data.
	Improve the integrity to the scanned data. It helps to collect the data of articulators and gums.
	Improve the integrity to the non-separated die regions.

Icon	Instruction
	Recognize reflective objects such as rods.
	View the texture on the scanned data.
	Scan the adjustable articulator.
	Being applied when scanning double-sided impression.

6.6. Case Examples

Common cases include sectioned model, unsectioned model, implant-based (scanbody/abutment) cases, full denture, removable partial denture, die tray, tripe tray, post-and-core cases, and pre-op/wax-up cases. For details, see User Manual.

This chapter introduces the detailed scanning workflow for your reference. Included are sectioned model, and implant-based (scanbody) cases.

Note

Before scanning, you need to create a new order and select the specific teeth and types for different cases. For more, see chapter 5.5 "create the order".

6.6.1. Sectioned Model Case

A sectioned model is a plaster model from which the prepared tooth can be removed.

Total Jaw Scan

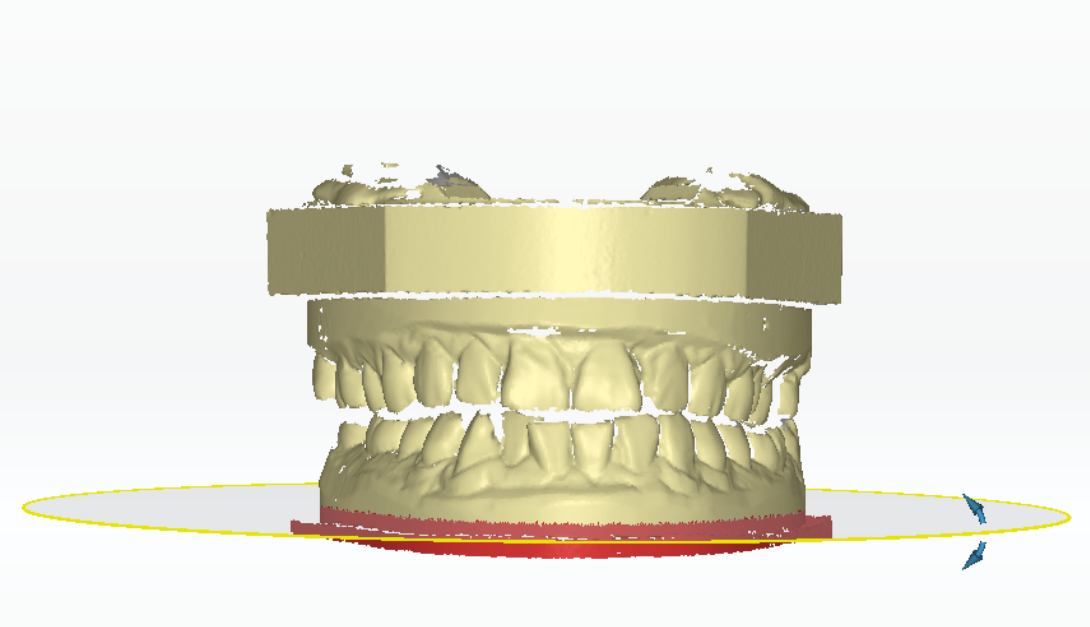
1 Place the height adaptor, the fixture, and the model.

2 Set the configuration in the camera window. For steps to set parameters, see Parameters.

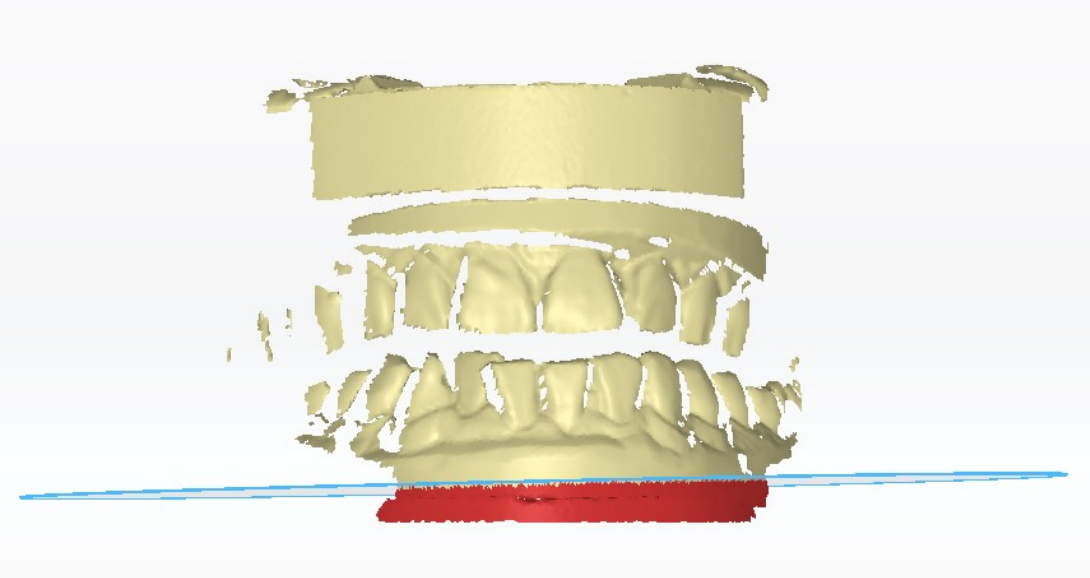
3 (Optional) Switch on additional functions. For more, see Function.

- : Add scanning paths and process a multi-angle scan. It is enabled by default when scanning the total jaw.

Turn on:

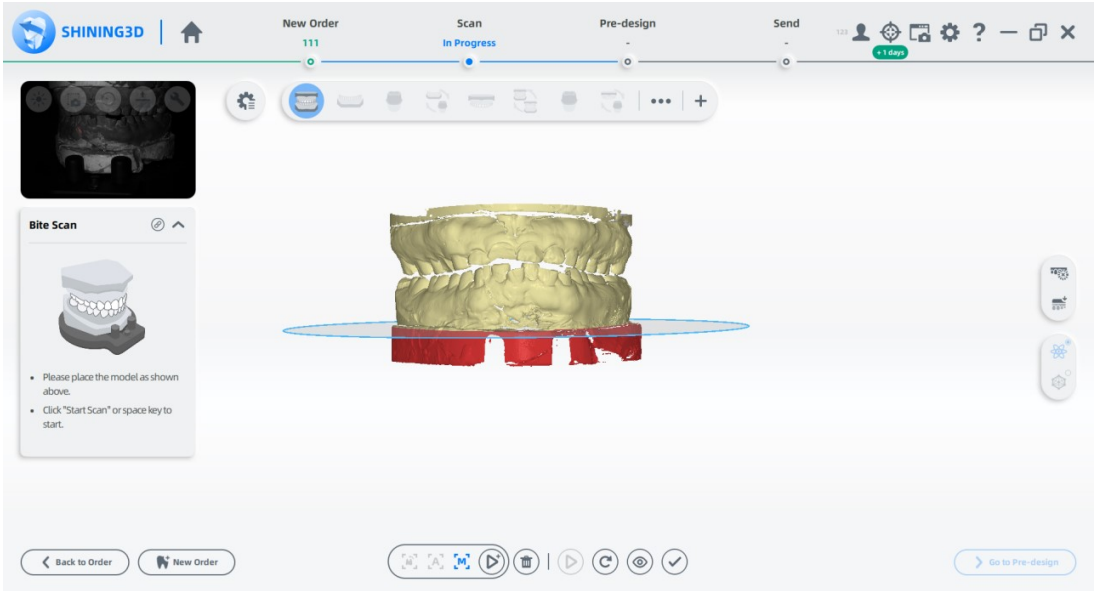


Turn off:



● : Add details and process a high-quality scan. For more, see Function.

4 Click or press the space key to start scanning.



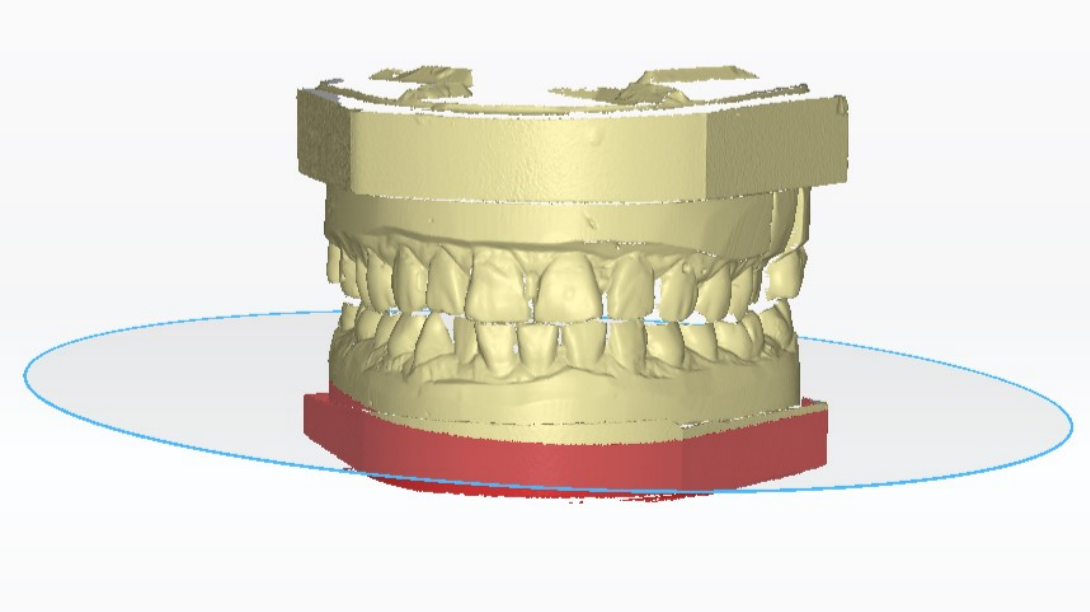
5 After scanning, move or rotate the cutting plane to cut the model.

● Move the cutting plane: Within the cutting plane, press and hold the left mouse button and move the cursor up and down to adjust the cutting height. The area to be

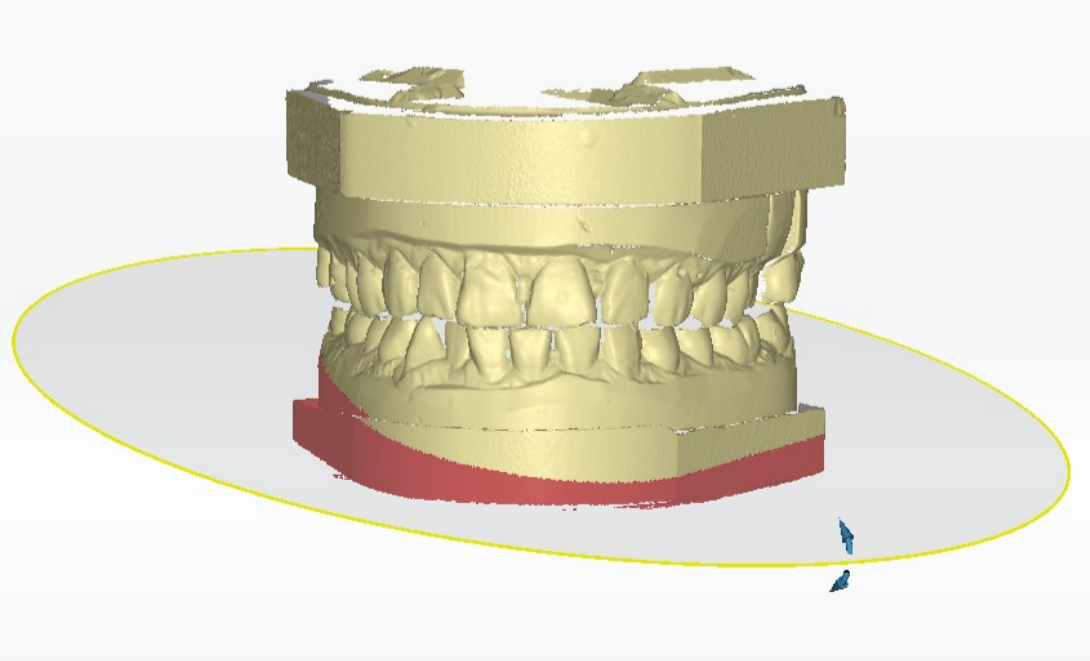
deleted is in red.

● Rotate the cutting plane: Move the cursor to the edge of the cutting plane until the edge of the cutting plane turns yellow and a blue arrow appears. At this time, press and hold the left mouse button and move the cursor to rotate the cutting plane. The area to be deleted is in red.

Move Cutting Plane:



Rotate Cutting Plane:



Icon	Description
	Edit the model. For more, see Function.
	Save the edit and return to the scanning interface.
	Preview the scanned model.
	Rescan.
	Finish the scanning step.

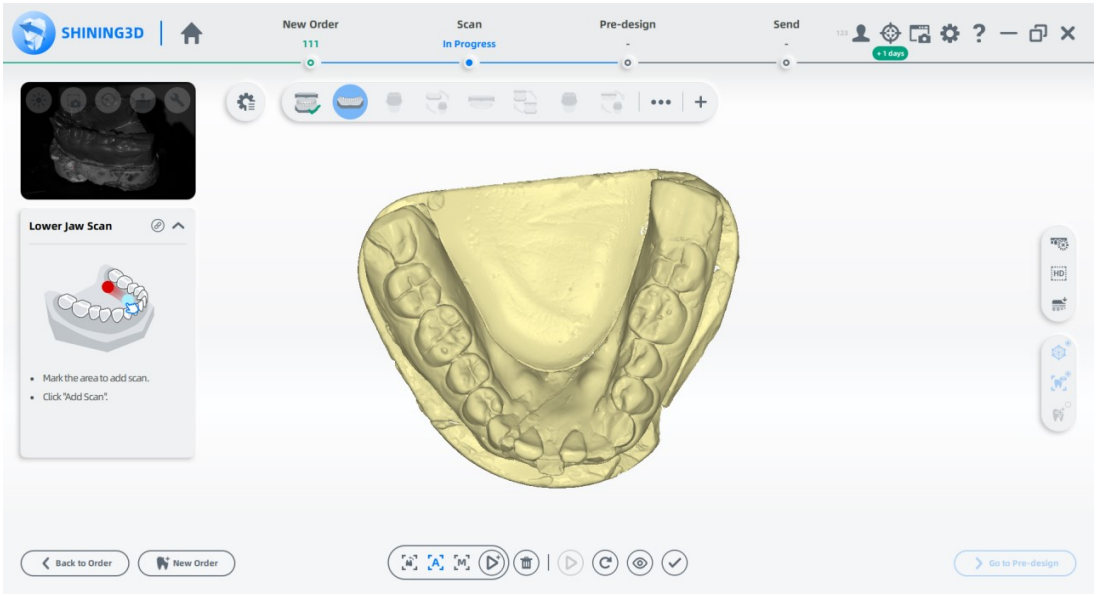
Lower Jaw Scan

1 Follow the guidance on the interface to place the model.

2 Click  or press the space key to start scanning.

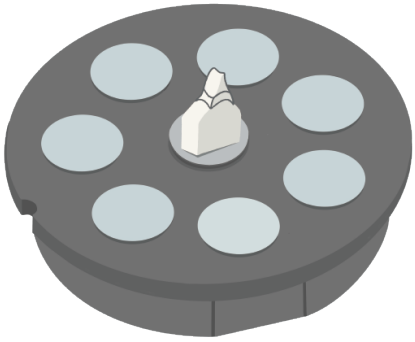
3 If the scanned data is incomplete, click  to add more data to the existing scan. For steps to add scan, see Add Scan.

4 After scanning, cut and edit the scanned data for a cleaner scan.



Die Scan - Lower Jaw

1 Place the model as shown.



2 Set the configuration in the camera window. For steps to set parameters, see Parameters.

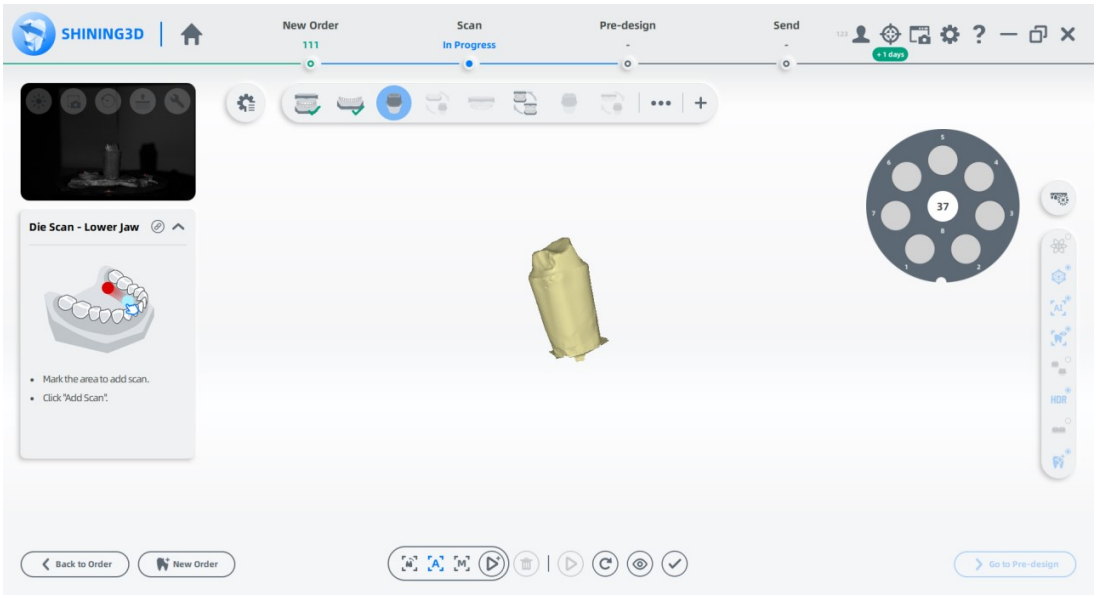
3 (Optional) Switch on additional functions. For more, see Function.

Note

- : Acquire the abutment data.
- : Improve the accuracy of data for scanning unsectioned tooth models.

4 Click or press the space key to start scanning.

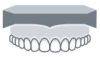
5 After scanning, cut and edit the scanned data for a cleaner scan.



Die Alignment - Lower Jaw

1 Check the automatic alignment and click  to finish.

2 (Optional) If the result is not optimal, click  and align the scanned data manually. For steps to align, see Alignment Operation.



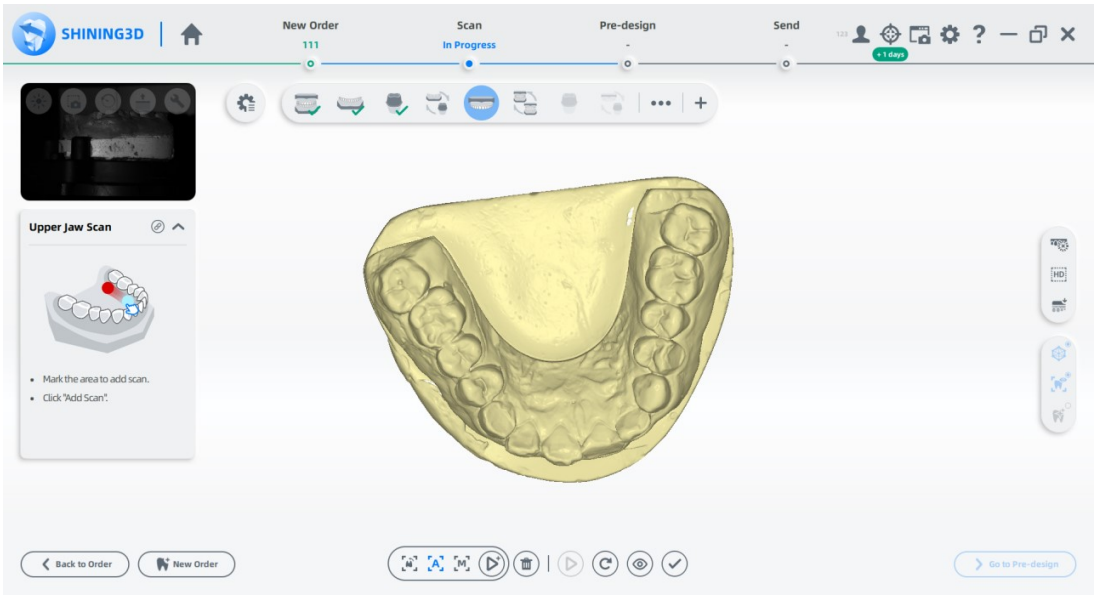
Upper Jaw Scan

1 Follow the guidance on the interface to place the model.

2 Click  or press the space key to start scanning.

3 If the scanned data is incomplete, click  to add more data to the existing scan. For details, see Add Scan.

4 After scanning, cut and edit the scanned data for a cleaner scan.



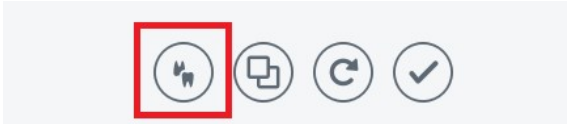
Occlusion Alignment

1 Check the automatic alignment and click to finish.

2 If the result is not optimal, click and align the scanned data manually. For steps to align, see Alignment Operation.

Note

According to the specific needs, you can enable or cancel the bite optimization (highlighted in red). Once enabled, it will automatically adjust and optimize occlusion data.



6.6.2. Implant-based (Scanbody) Case

Articulator Scan

1（Optional）Click , Click **Articulator** and check **Transfer**.

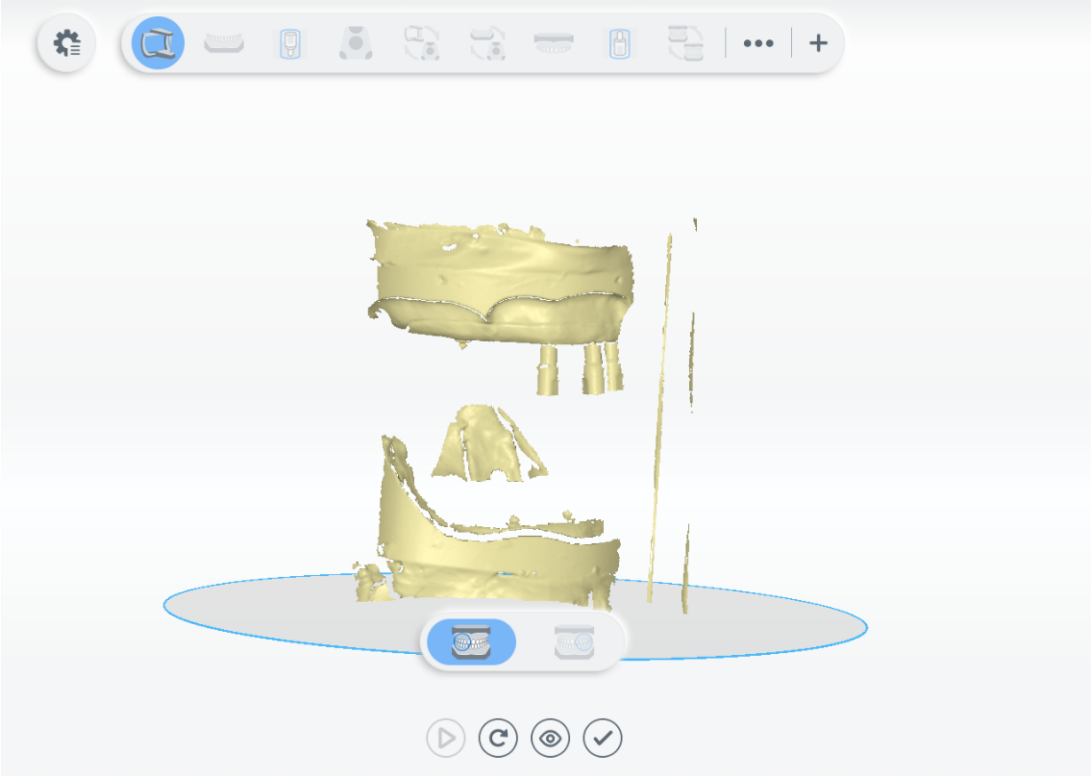
2 Click to turn on/off Articulator Dynamic Scan.

Fixture Installation under the Static Articulator Scan Mode	Fixture Installation under the Dynamic Articulator Scan Mode
	

3 Place articulator and model as shown in step 2 and set the configuration in the camera window. For steps to set the configuration, see Parameters.

4 Click or press the space key to start scanning.

5 The jaw frame model is turned 180° in the lateral direction.



Lower Jaw Scan

1 Follow the guidance on the interface to remove the articulator and place the fixture and the model.

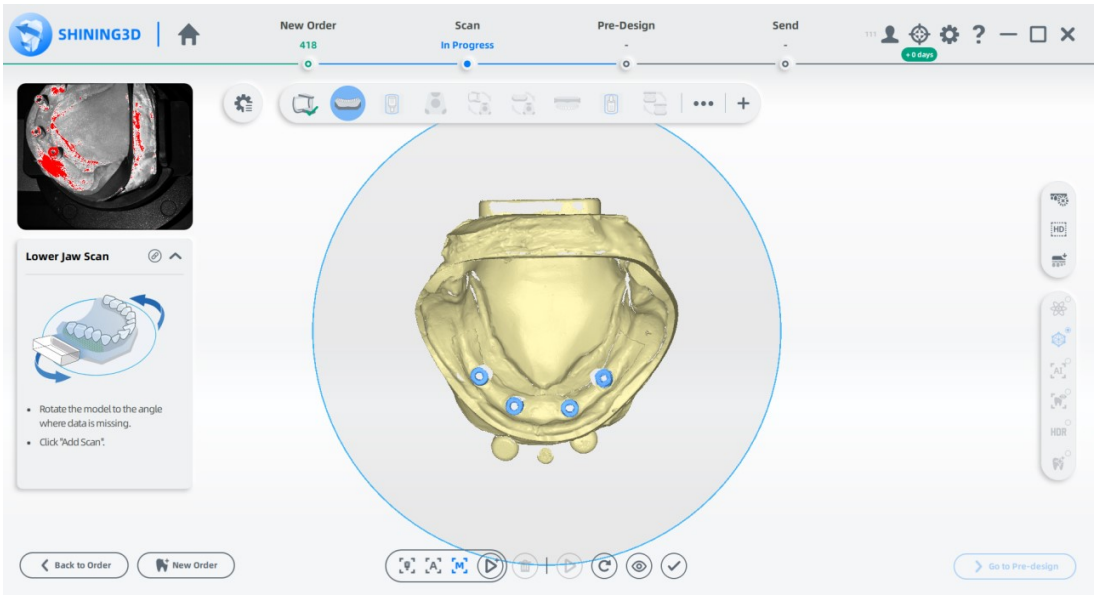
Note

If the scanbody is not recognized correctly, click HD to edit it. (Enable first).

2 Click or press the space key to start scanning.

3 If the scanned data is incomplete, click to add more data to the existing scan.

4 Click to edit the model. For more, see Function.



Lower Jaw Scanbody Extract

1 Select the tooth and double click on the corresponding scanbody.

2 Adjust the cylinder to cover the scanbody.

Note

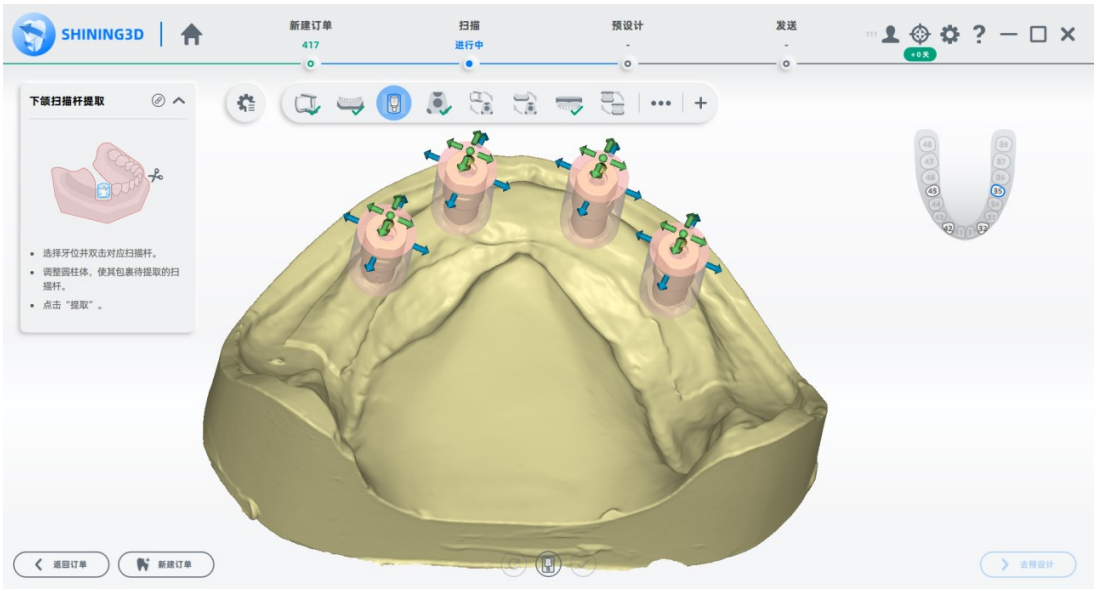
● Press and hold the left mouse button(LMB) on the cylinder to move it.

● Press and hold the left mouse button(LMB) to adjust the height of the cylinder by the yellow arrow.

● Press and hold the left mouse button(LMB) to adjust the scope of the cylinder by blue arrows.

● Press and hold the left mouse button(LMB) to rotate the cylinder by green arrows.

3 Click to extract the scanbody.



Lower Jaw Bottom Scan

1 Follow the guidance on the interface to place the fixture and the model.

2 Click or press the space key to start scanning.

3 If the scanned data is incomplete, click to add more data to the existing scan.

4 After scanning, move or rotate the cutting plane to cut the model.

5 Click to edit the model.

6 Click to save the edit and return to the scanning interface.

Upper Jaw Scan

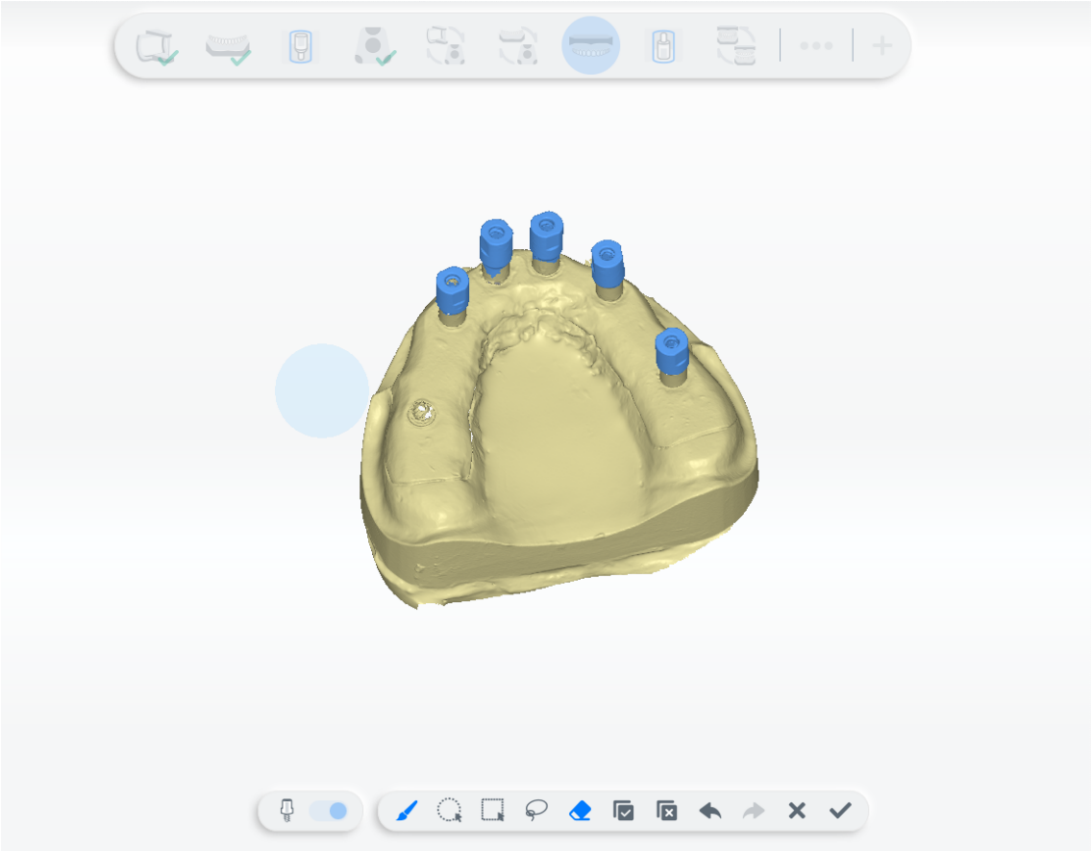
1 Follow the guidance on the interface to place the height adaptor, the fixture and the model.

2 (Optional) Turn on additional functions.

3 Click or press the space key to start scanning.

4 If the scanned data is incomplete, click to add more data to the existing scan.

5 After scanning, cut and edit the scanned data for a cleaner scan.



Upper Jaw Scanbody Extract

1 Select the tooth and double click on the corresponding scanbody.

2 Adjust the cylinder to cover the scanbody.

3 Click to extract the scanbody.

Occlusion Alignment

1 Check the automatic alignment and click to finish.

2 (Optional) If the result is not optimal, click and align the scanned data manually.

Transfer Plate Alignment

1 Check the automatic alignment and click to finish.

2 (Optional)If the result is not optimal, click and align the scanned data manually.

For steps to align, see Alignment Operation.

Lower Jaw Bottom Alignment

1 Check the automatic alignment and click to finish.

2 (Optional)If the result is not optimal, click and align the scanned data manually.

For steps to align, see Alignment Operation.

7. Pre-Design

7.1. Pre-Design

After finishing scanning, click **Go to Pre-Design** to design the scanned data.

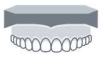
Pre-Design supplies functions of View Edit, Coord Adjust, Mark Teeth, Bite Adjust, Marginline Extract, Undercut Measure, Modified Model, Screw Channel Sealing, and export the data to AccuDesign.

7.2 View Edit

Observe the scan model and then optimize it.

Model List

Change the opacity and switch the viewing angle to edit the stereoscopic data.

Icon		
	**Upper Jaw**	Check the option to view the upper jaw data. Drag the slider to change the upper jaw opacity value.
	**Lower Jaw**	Check the option to view the lower jaw data. Drag the slider to change the lower jaw opacity value.

Icon		Icon	
	**Front View**		**Postback**
	**Top View**		**Bottom View**
	**Left View**		**Right View**

Edit

Click  to enter the editing interface.

Optimize the scanned model with the following tools.

Icon		Icon	
Brush	Select the data by painting it red.	**Undo**	Multi-clicking for undoing multi-operations.
Redo	Multi-clicking for redoing multi-operations.	**Cancel**	Discard the changes.
OK	Confirm the changes.		

Hole Mending

Vacancies with enclosed edge within the application range are to be filled with smooth data.

1 Click the icon to enter the hole mending interface.

2 Drag the slider to adjust the application range.

3 Click ✔ to confirm the operation and exit; click ✖ to discard the process and exit.

Texture

View the texture on the scanned model when texture scanning is enabled.

Smooth

Clean and improve the quality of data.

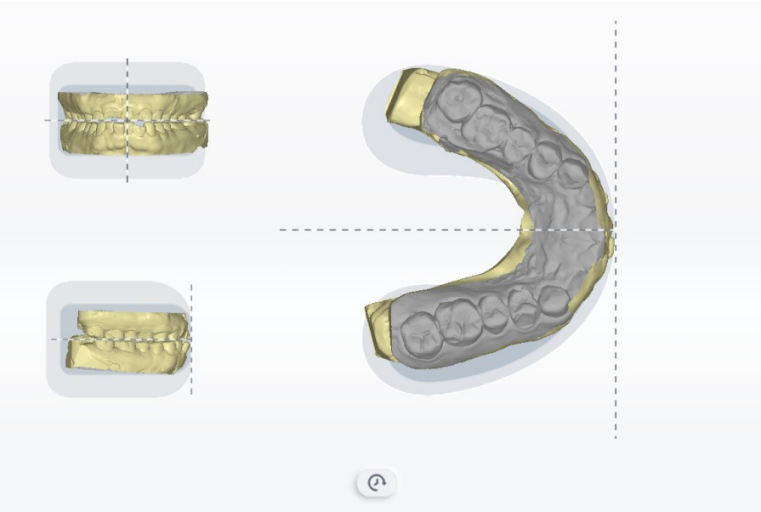
Auto-fill

Adjust the size of the model to be adaptive to the interface.

7.3 Coord Adjust

Adjust the position and the angle of model from three views, until the model being approximately horizontal and covering the central shadow area of the coordinate.

Click to enter the interface.



Click left/right mouse button and move the cursor to rotate the model.

Click left and right mouse button and move the cursor to move the model.

Click  , the system is to restore the model to the initial position.

7.4.  Mark Teeth

Exert following operation skills to select teeth from the left graph and set restoration types for them.

 **Note**

- DentalScan will automatically recognize teeth marks from the imported project.
- Single tooth mark cannot be deleted alone in this version.

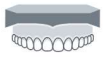
Action	Instruction
Left Button	Select one tooth.
Right Button	Delete the restoration type set to the tooth.
Space	Delete all the restoration types set to each tooth.
Ctrl + Left Button	Paste the selected restoration type to the tooth.
Shift + Left Button	Paste the selected restoration type to the teeth from previous selected one to the current one.

7.5.  Adjust Bite

Check if it is a normal occlusion and adjust it.

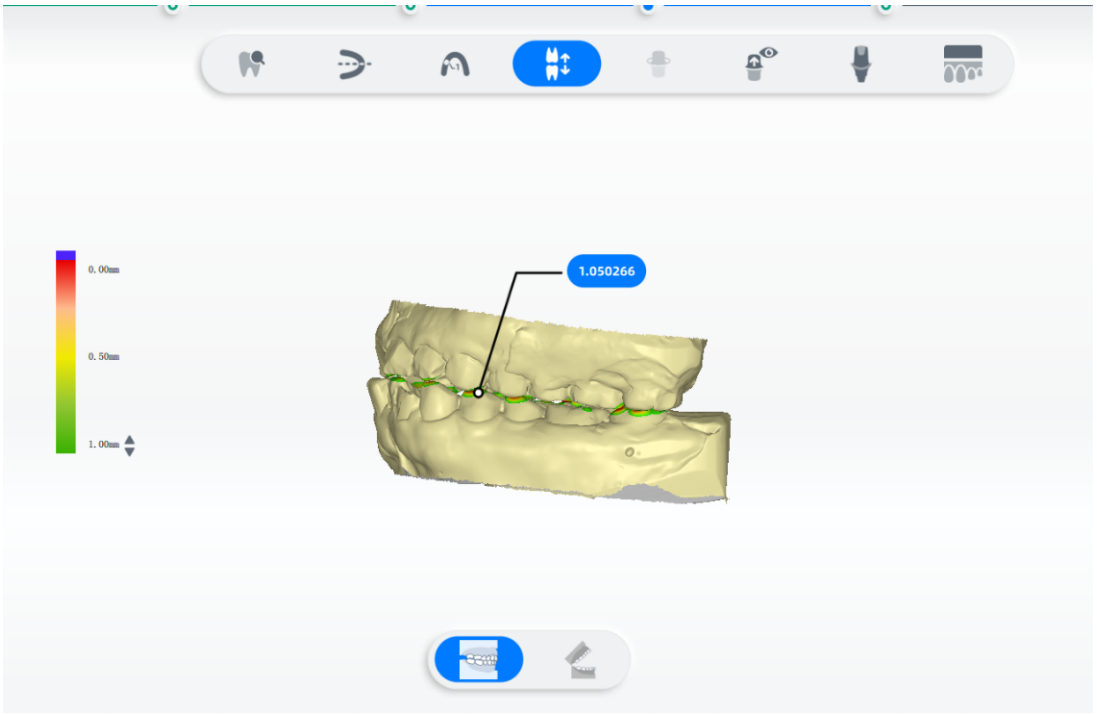
Color	
Green	The gap.

Color	
Red	The occlusion.
Blue	The collision.

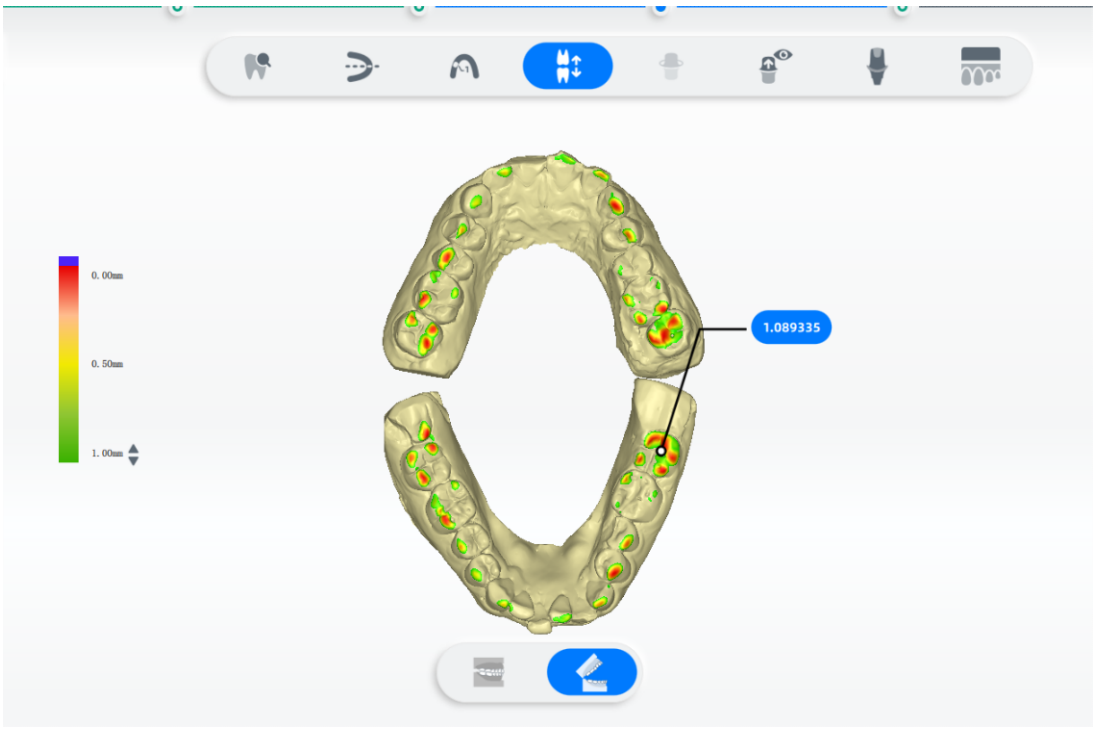
Icon		
		Exchange the upper jaw and the lower jaw.
		Open or clamp jaws for imitating the biting action.

Action	
Double Click	Check the specific occlusion value.
Click Up / Down Buttons on the Left Bar	Adjust the numerical range to occlusion.

Close:



Open:



7.6. MarginLine

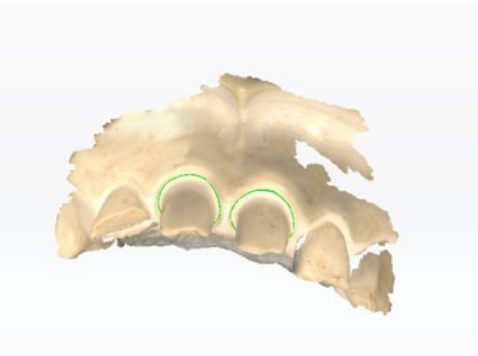
Drawing margin lines for generating extra teeth models.

To draw an optimum margin line, please exert Operation Skill to switch perspectives for observing the model during the process.

Note

- Please mark the teeth before extracting its margin line.
- DentalScan will recognize margin lines automatically when importing projects.

Auto Drawing



Click Ⓐ to extract marginline for teeth with apparent edge line automatically.

Manual Drawing

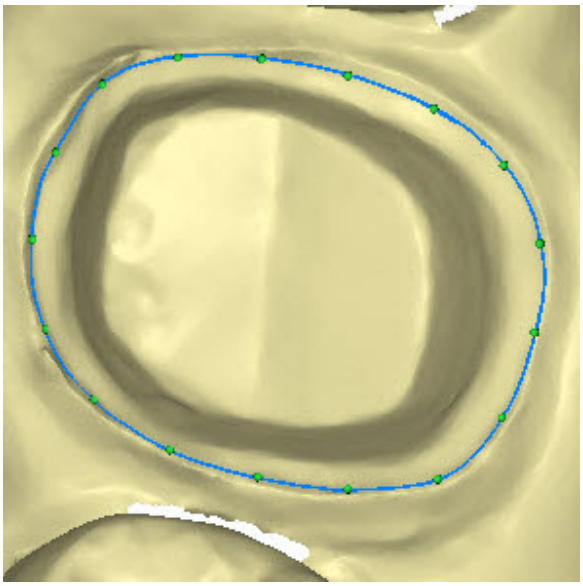
Click to select one tooth from the tooth list and pull it to the center, then use the following tools to extract the margin line.

	Cut the abutment and take the edge of the profile as the margin line.
	Drag the cursor to manually draw a margin line around the abutment with an inapparent edge.

	Click the edge of the abutment to add points, then double-click to draw a margin line going through all the added points. The added points are displayed in green. Click the points to move or delete when turning into red.
	Apply magnetic effect on the method. The line painted will automatically cling to the abutment's edge.

Manual Editing

Edit the margin line in detail.

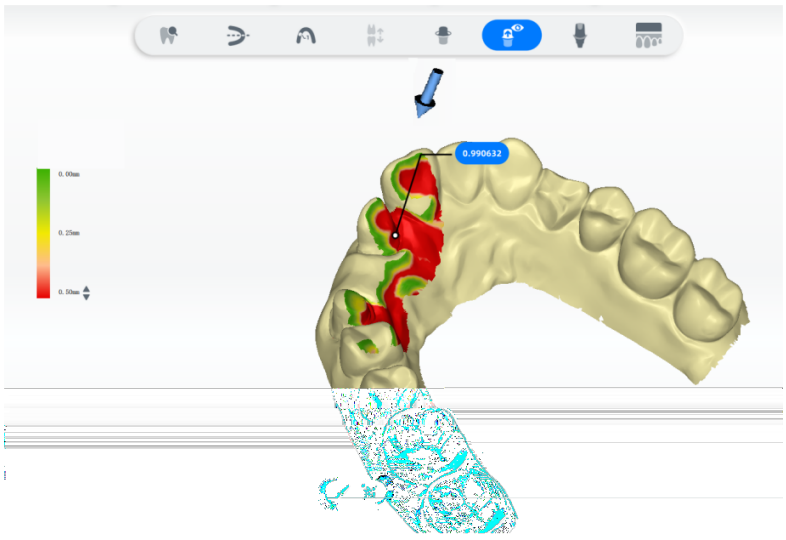


Icon	
	Replace a part of the line with the newly painted one.
	Adjust the line by dragging it or its point. Delete points by double-clicking.

 on the left of the tooth list indicates the line has been extracted.

7.7. Undercut

Measure the undercut on the dental crown.



Click one tooth and click to calculate.

To view the undercut value, move the cursor to the model.

Note

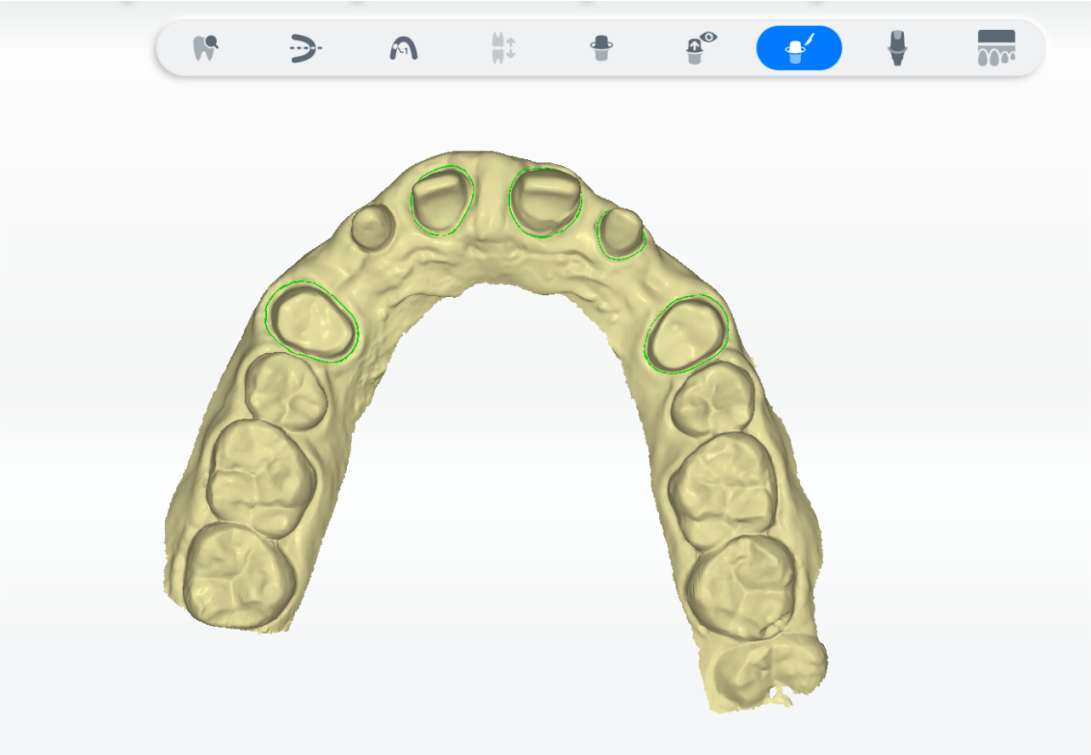
- Double-click left mouse button to re-calculate the undercut value on this perspective.
- To calculate the undercut value to a specific area, use to paint the area.
- Adjust the range of the undercut value through the bar on the left.

Function buttons

Icon	Name	Description
	Brush	Click the brush and hold, move the cursor to select the area and calculate the undercut value.
	Calculate	Click to calculate undercut value.
	Auto-fill	Adjust the size of the model to be adaptive to the interface.

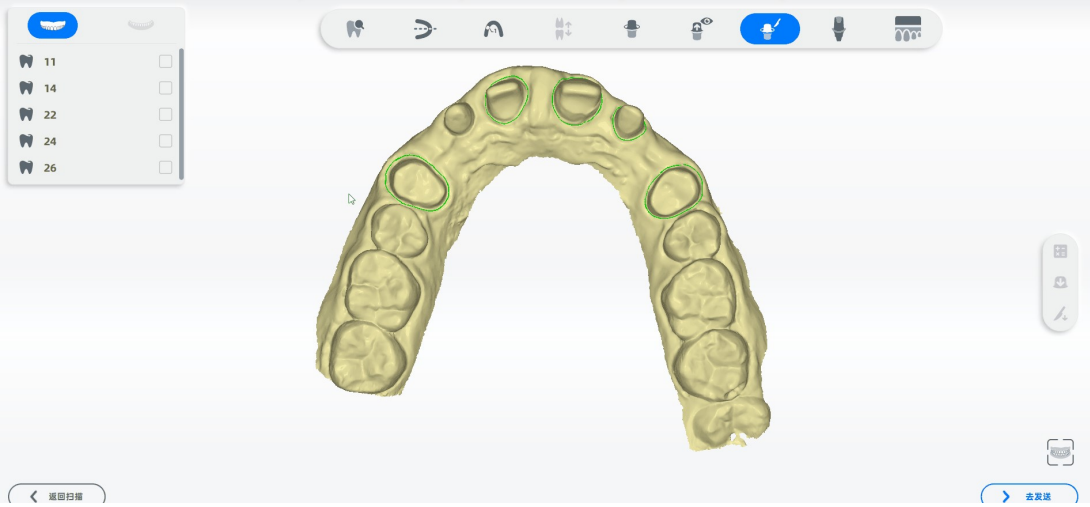
7.8. Modified Model

After marking teeth and drawing margin lines, you can set the undercut direction, fill the undercut and sink margin lines on the **Modified Model** interface.



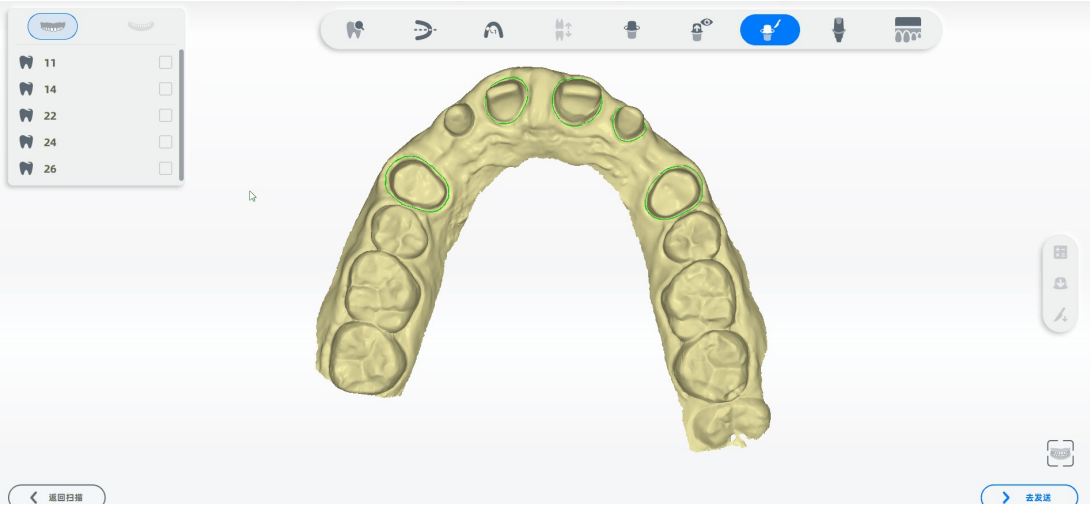
Steps

1 In the upper left tooth mark list, click a tooth in the upper or lower jaw to adjust the margin line again, if needed.



2 Check one or more teeth in the tooth mark list in the upper left corner.

3 Click  to enter the **Undercut Direction** interface to set the undercut direction.



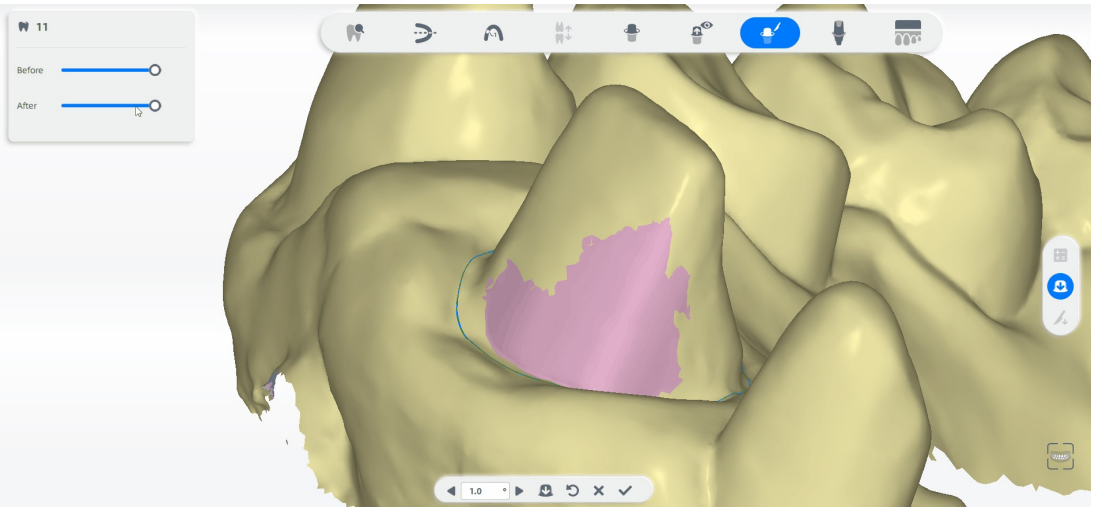
4 Click on the bottom to set the undercut direction.

5 Click to confirm.

Note

After filling the undercut or sinking the margin line, drag the slider in the upper left corner of the interface to view the comparison.

- Click and set the value at the bottom of the interface to fill the undercut.
- Click and set the value at the bottom of the interface to sink the margin line.
- Drag the slider to compare the effect.



7.9. Screw Channel Sealing

Screw Channel Sealing is a digital alternative to using wax to fill the abutment opening. It ensures the design software creates the accurate internal structure of the restoration during crown design, reducing the need for additional polishing and improving design efficiency. Additionally, sealing retains some traces of the original opening, aiding technicians in identifying the correct direction for creating the opening

during the design process.

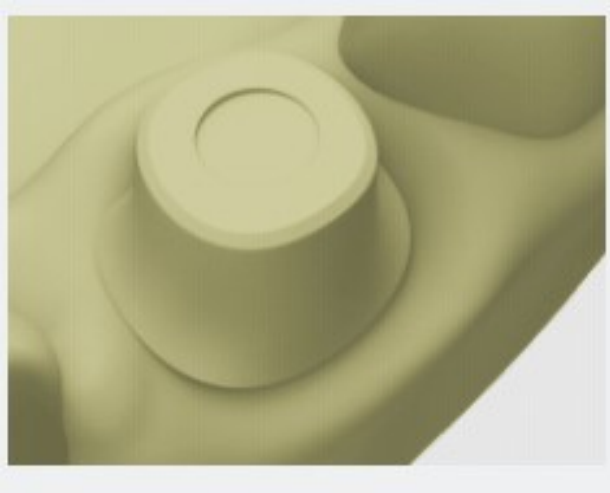
Check  to enter the sealing function. The practical methods include four-point mode, line-drawing mode and point-marking mode.

Note

Click the marked tooth on the upper-left menu and the model will be displayed in the center of the certain tooth.

7.9.1. Four-point mode

Four-point mode refers to double-click the left mouse button around the abutment opening to mark four green points. After selecting four points, the lines will be drawn automatically, sealing the targeted data.



1 Click  and move the slider to enter four-point mode.

2 Double-click four green points around the opening of the abutment, automatically

drawing the sealing line.

3 Click  to seal the targeted data.

7.9.2. Line-drawing mode

Click  to enter line-drawing mode. On the to be sealed abutment, hold the left mouse button and move the cursor to manually draw the sealing line.

7.9.3. Point-marking mode

Point-marking refers to mark points by clicking to draw the sealed line manually.

Note

The magnetic effect is accessible when marking points, and helps the line automatically cling to the abutment's edge.

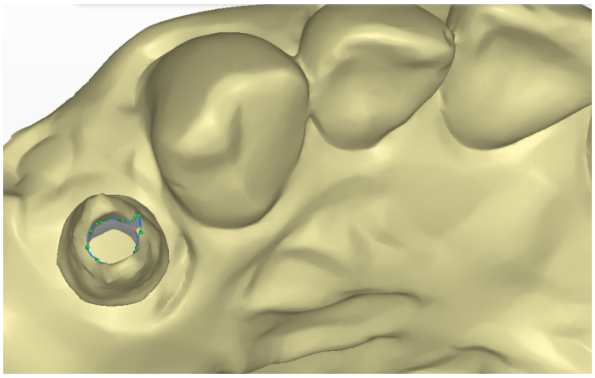
1 Click  to check point-marking mode.

2 (Optional) Click  to enable **Magnetic Effect**.

Magnetic effect allows lines to automatically cling to the abutment's edge.

3 Click the left mouse button to add green points around the abutment opening.

Double-click the left mouse to draw sealing lines.



Note

After drawing, check the green points and move them to make adjustment if needed.

4 Click  to seal the targeted data.

Function buttons

Icons	Description
	Delete. Click to delete the current sealing line.
	Undo. Undo the last operation.
	Redo. Redo the last operation.
	Reset. Click to reset the operation.
	Auto-fill. Adjust the size of the model to be adaptive to the interface.

7.10.  AccuDesign

Click  to enter AccuDesign.

Note

- This function needs to be authorized.

The system is to recognize the upper jaw and the lower jaw automatically.

More details can be found in AccuDesign Manual.

After finishing the pre-design process, the order with the scanned data can be sent to target labs.

8. Export

DentalScan supports docking with the third-party software including Exocad and DentalWings by sharing database.

Steps

1 To enter the sending order interface, click  on the order list, or click **Go to Send** on the pre-design interface.

2 Click **Export** to open **Export Option** pop-up.

3 Enter **Folder Name**.

4 Click  to set Export Path.

5 Click **CAD Type** and select a design software.

6 Click **Confirm** for saving and exporting the file.

9. Care and Maintenance

The scanner requires proper care, cleaning and handling. As individual parts must be processed differently, follow the instructions below to ensure the device is ready for use and maintenance.

Cleaning

- Ensure that the scanner is powered off and disconnected from your PC before cleaning.
- Use the CaviWipes to remove any contaminant on the scanner body.

- Visually inspect the device to ensure all the outer surfaces are clean.
- Use the lens cleansing cloth in the package to gently wipe the lens.
- Please clean the dust once a month.
- Using detergent, disinfection solutions or wipes, or sterilization procedures not described in this Instructions may cause damage to your product and void your warranty.

Storage and Maintenance

Do not use the device if any damage is detected to the scanner parts and accessories.

10. Hardware Specifications

10.1. Specifications

Parameter	Description
Type name	Desktop Dental 3D Scanner
Model name	AutoScan-DS-EX Pro(C)
3D Scanning area	100x100x75(mm)
Scanning depth	60mm
Scanning principle	Structured Light 3D Scanning
Scanning Speed	Upper/Lower 10s, Impression 25s
Resolution	2.4MP
Accuracy	≤10μm
Light Source	Blue Light
Wavelength	450nm±1nm
Dimension (L × W	260×270×420（mm）

Parameter	Description
× H)	
Weight	5KG
Output data format	STL/OBJ/PLY
Interface	USB 3.0
Input	60w (24V, 2.5A)
OS	Windows 10 / Windows 11(64-bit)
Lifecycle	5 years

10.2. Environmental Requirements

Operating and storage requirements	Description
Work temperature	10℃~30℃
Scanner storage/transport temperature	-30℃~ 60℃
Working relative humidity	30%RH～80%RH
Scanner storage/transport relative humidity	10%RH ～90%RH
Air pressure	70 kPa~106 kPa