



# SHINING 3D<sup>®</sup>

## Aoralscan 3 Wireless Manual






V1.0.0

# Foreword

## General

The manual (hereinafter referred to as "the Manual") introduces the functions, installation, usage and maintenance of the Aoralscan 3 Wireless (hereinafter referred to as "the Scanner").

## Safety Instructions

| Signal  | Meaning  |
|---|--|
|  | Additional information for particular situation.   |
|  | Improper actions or conditions that may damage the product or cause injury, and consequently void your warranty or service contract or lose the patient data or system data. |
|  | The safety instructions that you must precisely follow to avoid injury. Failure to observe can cause damages to your product, or result in personal injuries, or even death. |

### Release Date

|              |           |
|--------------|-----------|
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|--------------|-----------|

## About the Manual

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- Updates to hardware and/or software components are made regularly; therefore, some of the instructions, illustrations, and specifications mentioned in the Manual may differ slightly from your particular situation.

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# 1. Read This First

Aoralscan 3 Wireless is an intraoral scanner that works with the supplied software programs. By performing intraoral scanning directly and digitally acquiring and saving the 2D/3D color images of teeth and gingiva, the Scanner is available for patients with needs of orthodontic, implant, and restoration.

The Manual provides important procedures and information on how to operate the scanner and configure the IntraoralScan software correctly and safely. Before attempting to operate the product, read the Manual 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, model

Product name: Intraoral scanner

Model: Aoralscan 3 Wireless

### 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, 311258

### III. Contact Information

#### **Manufacturer**

Shining 3D Tech Co., Ltd.

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

[www.shining3ddental.com](http://www.shining3ddental.com)

#### **Customer Support**

Email: [dental\\_support@shining3d.com](mailto: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](mailto:peter@lotusnl.com)

## **Product performance**

### **- Appearance and structure**

The appearance should be: Smooth, no cracks, no stains, no obvious deformation.

Flexible and reliable for operation.

### **- Function control and display**

Function control: After pressing the scanning button, determine whether the front end of the scanner flashes normally.

The scanner has the function of 3D image processing.

Scanning speed: It takes no more than 3 minutes to scan a single jaw model.

Calibrator: With its self-checking function, the calibrator can check whether its inner components work normally.

Battery charge: The user can charge the device.

Wireless connection: With its wireless transmission function, the user can connection the scanner and computer without wires.

### **-Software Function**

The software provides guidance for the users to understand the operations. It has backward function as well.

The users can add requirements of jaw, tooth and treatment.

The software will scan teeth according to the requirements.

It allows users to edit the scanned data such as repairing holes and selecting data.

The functions include checking undercut, bite areas and texture, smoothing the model (optional), orthodontic simulation (optional), AccuDesign (optional) and checking oral report (optional).

The software displays the battery status of the device in real time. When the battery is lower than 20%, the software will remind the user. Please replace the battery when it is lower than 10%.

The software displays the device status in real time.

The software displays the device temperature in real time. When the device is too hot, please stop using it and put it back to the cradle.

The camera window automatically adopts the scanner types.

### **-User Access Control**

Normal user access control. Users can log in via their login name and password.



## -Performance

Dental scan imaging: The scanner scans the teeth, gingiva or a teeth model to form a 3D digital model and the users can check the 2D and 3D imaging of the scanned object (such as teeth) on the display respectively.

Accuracy: Under normal conditions, the scanner is used to scan against a standard (e.g., a plaster standard known to be similar in size to a tooth), obtain its three-dimensional stereoscopic data, and measure key dimensions to obtain measured values.

Heating of the entrance part of the scanner tip: Under normal working conditions, the intraoral scanner should have heating and anti-fogging function when entering the mouth under working condition.

Quick heating of the scanner tip: The scanner tip can be heated within 30s.

## -Environment Requirement

Irradiance: Under normal use of the intraoral scanner, the irradiance is not greater than  $1\text{mW}/\text{cm}^2$  (Refer to IEC 62471:2006 Photo-biological safety of lamps and lamp systems.).

## - Data interface

USB 3.0, data storage format shall include 3D digital model format .stl, .ply and .obj.

## Main Structural Composition

The Scanner consists of Scanner body, scanner tip, power adapter, cradle, USB cable, calibrator, rechargeable batteries, charging case and software. The software carrier is USB flash drive, and the software release version is 1.



### Caution

- 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.
- Do not insert wireless USB network card in the computer. USB wireless network card will cause USB bandwidth occupation, limiting camera performance.

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) Use dust cap when you leave the scanner unworking.
- 3) After using scanner tip, use alcohol to wipe and then use autoclave to sterilize it. (121°C, 102.9kPa for 30 minutes; 134°C, 205.8kPa for 4 minutes). Use alcohol to wipe the scanner body. Use dust-proof cloth to wipe the scanning window to ensure the window keeps dry.
- 4) Operating temperature: 10°C to 30°C, relative humidity: 30%–80%.
- 5) Storage/transport temperature: -20°C to 60°C, relative humidity: 30%–90%.
- 6) Air pressure: 70 kPa–106 kPa.



Caution

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

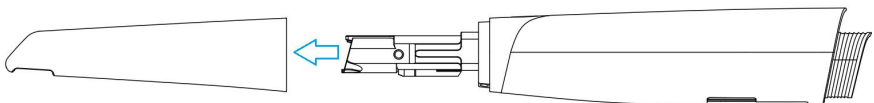
#### VI. Production date and life cycle

The production date is shown on the product label. Life cycle: 8 years.

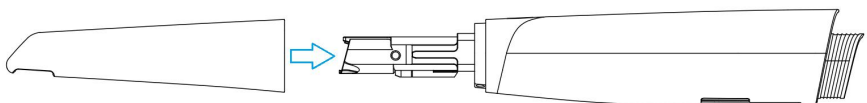
#### VII. The list of accessories, including accessories, wear and tear replacement cycle and instructions on how to replace.

Scanner tip as a wear and tear products can be recycled up to 100 times, after which it needs to be replaced.

- ( 1 ) Disconnect the scanner power, hold the scanner tip firmly with thumb and index finger on both sides, and then gently slide the scanner tip out of the scanner as shown in the figure.



- ( 2 ) Hold the scanner tip firmly with your thumb and index finger on both sides and gently attach the scanner tip to the scanner with the tip facing down.



Caution

Do not place your fingers on the lens of the scanner tip when removing and attaching the scanner tip, because this might cause damage to the lenses.

- ( 3 ) Try to gently shake the scanner tip to ensure that it locks into place and is stable.



#### Caution

- The Aoralscan 3 Wireless intraoral scanner should not be used in close proximity or stacked with other equipment, and if it must be used in close proximity or stacked, observe to verify proper operation in the configuration in which it is used.
- Using cables or accessories other than those specified for use with the scanner might result in increased emissions or decreased immunity of the device.
- Interruptions during electrostatic testing can be recovered within 5s without affecting basic performance.

## 1.2. Intended Use

**This is an scanner that works with the supplied software programs. By performing scanning directly and digitally acquiring and saving the 2D/3D color images of teeth, gingiva and oral mucosa, the Scanner is available for patients with needs of orthodontic, implant, and restoration.**



#### Note

- Benefits to be achieved: As a device that applies a probing optical scanner tip, this scanner can directly scan inside the patient's mouth to obtain three-dimensional morphology and color texture information of soft and hard tissue surfaces such as teeth, gums, and mucous membranes in the oral cavity, facilitating comfortable data capturing for patients, reducing stress for medical care, and improving efficiency for following processing.
- The scanner satisfies CE related requirements.



#### Warning

- Do not use the scanner for purposes other than those intended and expressly

stated above.

- This product is designed and intended for use by persons with professions of dentistry and dental laboratory technology. The product cannot be operated by the patients themselves. The user is solely responsible for determining whether the scanner is appropriate for a particular patient case.
- Do not misuse the scanner, and do not use or operate the software programs incorrectly.
- The clinical environments where the scanner and the software programs can be used include dental clinics, dental hospitals, and dental laboratories.
- Only trained medical personnel may use the scanner and the supplied software programs. When under an adverse event, inform the relevant notified authorities and competent authorities.
- 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, and furthermore the data is sufficient both spatially and temporally for the measurement approach being used.
- The images acquired by the scanner must be interpreted by a qualified medical professional. The software in no way interprets these images or provides a medical diagnosis of the patient being examined.

### **1.3. Contraindications**

No known contraindications (or side effects).

### **1.4. Warnings**

Before using the Aoralscan 3 Wireless, read warnings and Safety information on chapter 2.

- 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 and its cradle. Water, moisture, etc. may cause a short circuit in the electronic components and lead to malfunction.
- If the scanner tip 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 drop or apply shock/vibration to this scanner and its cradle. Strong impacts may damage the components inside.
- 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.
- 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 verify normal operation in the configuration in which it will be used.

## **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 handing 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**

The scanner must be reprocessed prior to disposal in order to prevent cross-contamination.

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 cords, 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 on the set of Aoralscan 3 Wireless. 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.

- 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.

- Ensure that the connection is performed correctly. See 5.1 Connect the Scanner.

- Use only medical grade devices with the scanner in the medical environment.

- 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.

- Check the scanner and components for sharp edges.

- 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.

- During use, always pay attention to abnormal conditions of the scanner and the patient. In case of abnormal conditions, you need to stop using it immediately. Consult technical support staff promptly.

- 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 supplied accessories and approved software with the scanner in order to achieve the designed performance.















- Do not use a power adapter other than the one supplied with the package.





- Connecting the scanner to an unknown power adapter is very dangerous and may lead to fire or explosion.
- Using cables or accessories other than those specified for use with the scanner might result in increased emissions or decreased immunity of the device.
- The supplied medical grade power adapter should only be connected to a grounded power socket.
- 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.
- 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. If you accidentally drop the scanner, you **MUST** dispose the scanner tip immediately and do not use the same tip again. The mirror in the tip might shatter into small pieces, and using it again poses the highest risk of causing serious injury to the user and patient.
- The scanner might heat up to above the normal body temperature, yet this short- term exposure and contact with small areas will not pose a health or safety hazard to the patient.
- The scanner may interfere with pacemakers and ICDs, and use of the scanner on patients with pacemakers and ICDs is prohibited.
- Never place any objects or load on the scanner and its cradle.
- 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**

Table 2-1 Labels and symbols on the scanner/carry box/package



| Symbol  | Explanation   |
|---|---|
|    | To indicate that caution is necessary when operating the device or control close to where the symbol is placed, or to indicate that the current situation needs operator awareness or operator action in order to avoid undesirable consequences. |
|    | Indicate that the contents of the transport package are fragile and the package shall be handled with care.   |
|    | Indicate that the transport package shall be kept away from rain and in dry conditions.   |
|    | Indicate correct upright position of the transport package.   |
|    | Indicate that the marked item or its material is part of a recovery or recycling process.   |
|    | Indicate the maximum and minimum temperature limits at which the item shall be stored, transported or used.   |
|    | Indicate the acceptable upper and lower limits of relative humidity for transport and storage.  |
|   | Indicates the medical device manufacturer.  |
|  | Indicate the date on which a product was manufactured.  |
|  | Indicates the manufacturer's serial number so that a specific medical device can be identified.   |
|  | Device fulfills the requirements of the European Regulation 2017/745 given on the EU Declaration of Conformity.   |
|  | Indicate the item is a medical device.  |
|  | Class II equipment.   |
|  | Type BF applied part. To identify a type BF applied part complying with IEC 60601-1.  |

|   |  |
|---|--|
|  | Class 1 laser product.   |
|  | Signify that the instruction manual/booklet must be read.            |
|  | Indicates the need for the user to consult the instructions for use. |
|  | Indicate the unique device identifier information.                   |

## 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+AMD2:2020 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 in order to ensure the safety of patients, operators and the environment.

## 2.4. FCC Compliance Statement

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

- (1) This device may not cause harmful interference;
- (2) This device must accept any interference received, including interference that may cause undesired operation.



### Note

- The grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. Such modifications could void the user's authority to operate the equipment.
- 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.
- In the DFS band, 20M and 40M were turned off by software in band 2A and band 2C
- This device complies with FCC radiation exposure limits set forth for an uncontrolled rolled environment. Cradle should be installed and operated with a minimum distance of 20cm between the radiator and your body.
- This device for operation in the band 5150-5250 MHz is only for indoor use.

## **2.5. Electrical Safety**

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

### **2.5.1. Electrical**

- IEC 60601-1:2005+AMD1:2012+AMD2:2020 Medical electrical equipment – Part 1: General requirements for basic safety and essential performance
- IEC 60601-1-2:2014+AMD1:2020 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+AMD2:2020 Medical electrical equipment – Part 1-6: General requirements for basic safety and essential performance – Collateral standard: Usability
- IEC 60601-1-9:2007+AMD1:2013+AMD2:2020 Medical electrical equipment–Part 1-9: General requirements for basic safety and essential performance–Collateral Standard: Requirements for environmentally conscious design

- IEC 62366-1 2015+AMD1:2020 Medical devices–Part 1: Application of usability engineering to medical devices

### **2.5.2. Classification**

- Type of protection against electric shock: Class II
- The degree of protection against electric shock: Type BF applied apart
- Enclosure protection: IPX0
- Degree of protection against incoming liquids: Common device.
- 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
- Nominal voltage:

Power adapter input/output: 12V, 3.0A ;

Incoming current of the device: 3.0A ;

- Pollution degree 2



#### **Warning**

- Shock hazards exist if the power adapter is damaged or is not properly grounded. Use only the supplied medical grade power adapter.
- 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 its tip or cable is damaged. Contact technical support for replacement of the damaged equipment (see Contact information on chapter 1).
- To avoid risk of electrical shock hazards, always inspect the scanner and cable connections before use.
- 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 the Aoralscan 3 Wireless shall comply with IEC 60950.

### **2.5.3. EMC Notice**



#### **Caution**

- Aoralscan 3 Wireless meets the EMC requirements.
- Users should install and use the EMC information provided in the random file.
- The performance of Aoralscan 3 Wireless might be affected by a portable or mobile RF communication device. 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

- Aoralscan 3 Wireless should not be used in proximity to or on top of other devices. If it must be, observe to verify that it works properly in the configuration in which it is used.
- This device is not intended for use in residential environments and may not provide adequate protection for radio reception in such environments.
- With the exception of cables sold by the manufacturer of Aoralscan 3 Wireless as spare parts for internal components, the use of accessories and cables other than those specified may result in an increase in transmission power or a decrease in immunity of Aoralscan 3 Wireless.

### Essential Performance

During the continuous scanning process, the scanned image should be acquired normally.

#### Cable List:

| No. | Name                         | Length (m) |
|-----|------------------------------|------------|
| 1   | Power line of adapter        | 1.5        |
| 2   | Power line of scanner        | 2.0        |
| 3   | Cable of calibrator          | 1.5        |
| 4   | Cable of cradle and computer | 1.0        |

**Electromagnetic Emissions**

Medical electrical equipment such as the Aoralscan 3 Wireless requires special precautions regarding electromagnetic compatibility, and must be installed and put into service according to the following electromagnetic tables.

The Aoralscan 3 Wireless is intended for use in the electromagnetic environment specified below. The customer or user of the Aoralscan 3 Wireless should assure that it is used in such an environment.

Table2-2

| Guidance and Manufacturer's Statement - Electromagnetic emission   |            |   |
|--|------------|---|
| Aoralscan 3 Wireless is intended to be used in the following electromagnetic environment. The purchaser or user of Aoralscan 3 Wireless should ensure that it is used in this electromagnetic environment: |            |   |
| Emission Measurement   | Conformity | Electromagnetic Environment - Guidelines  |
| RF emissions<br>CISPR 11   | Group 1    | The Aoralscan 3 Wireless uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment. |
| RF emissions<br>CISPR 11   | Class B    | The Aoralscan 3 Wireless is suitable for use in all locations ,including domestic and direct connection to the residential public low-voltage supply grid for domestic use.                   |
| Harmonic emissions IEC 61000-3-2   | Class A    |   |
| Voltage fluctuations/flicker according to IEC 61000-3-3  | Applicable |   |

**Interference immunity**

The Aoralscan 3 Wireless is intended for use in the electromagnetic environment

specified below. The customer or user of the Aoralscan 3 Wireless should assure that it is used in such an environment.

| <b>Guidance and Manufacturer's Statement - Electromagnetic emission</b>  |   |   |  |
|--|---|---|--|
| Aoralscan 3 Wireless is intended to be used in the following electromagnetic environment. The purchaser or user of Aoralscan 3 Wireless should ensure that it is used in this electromagnetic environment: |   |   |  |
| <b>Immunity test</b>   | <b>IEC 60601 test levels</b>  | <b>Compliance level</b>   | <b>Electromagnetic environment–guidance</b>  |
| Electrostatic discharge (ESD)<br>IEC 61000-4-2   | ±8 kV contact<br>±2 , ±4 , ±8 , ±15 kV air  | ±8 kV contact<br>±2 , ±4 , ±8 , ±15 kV air  | Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, a relative humidity of at least 30% is recommended.  |
| Electrical fast transient/burst<br>IEC 61000-4-4   | ±2 kV for power supply lines  | ±2 kV for power supply lines  | Mains power quality should be that of a typical commercial or hospital environment.  |
| Surge<br>IEC 61000-4-5   | ±0.5, ±1 kV line(s) to line(s)  | ±0.5, ±1kV line(s) to line(s)   | Mains power quality should be that of a typical commercial or hospital environment.  |
| Voltage dips, short interruptions and voltage variations on power supply input lines<br>IEC 61000-4-11   | 0% U <sub>T</sub> (100% dip in U <sub>T</sub> ) for 0.5/1 cycle<br><br>70% U <sub>T</sub> (30% dip in U <sub>T</sub> ) for 25/30 cycles<br><br>0% U <sub>T</sub> (100% dip in U <sub>T</sub> ) for 250/300 cycles | 0% U <sub>T</sub> (100% dip in U <sub>T</sub> ) for 0.5/1 cycle<br><br>70% U <sub>T</sub> (30% dip in U <sub>T</sub> ) for 25/30 cycles<br><br>0% U <sub>T</sub> (100% dip in U <sub>T</sub> ) for 250/300 cycles | Mains power quality should be that of a typical commercial or hospital environment. If the user of the Aoralscan 3 Wireless requires continued operation during power mains interruptions, it is recommended that the Aoralscan 3 Wireless be powered from an uninterruptible power supply or a battery. |

|  |        |        |   |
|--|--------|--------|---|
| Power frequency<br>(50/60 Hz)<br>magnetic field<br>IEC 61000-4-8                     | 30 A/m | 30 A/m | <p>Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.</p> <p>If image distortion occurs, it may be necessary to position the Aoralscan 3 Wireless further from sources of power frequency magnetic fields or to install magnetic shielding. The power frequency magnetic field should be measured in the intended installation location to assure that it is sufficiently low.</p> |
| <b>NOTE:</b> $U_T$ is the a.c. mains voltage prior to application of the test level. |        |        |   |

#### Guidance and manufacturer's declaration—electromagnetic immunity

| <b>Guidance and Manufacturer's Statement - Electromagnetic emission</b>   |   |                         |   |
|---|---|-------------------------|---|
| Aoralscan 3 Wireless is intended to be used in the following electromagnetic environment. The purchaser or user of Aoralscan 3 Wireless should ensure that it is used in this |   |                         |   |
| <b>Immunity test</b>  | <b>IEC 60601 test levels</b>                        | <b>Compliance level</b> | <b>Electromagnetic environment – guidance</b>   |
| Conducted RF  | 3 Vrms<br>150 kHz to<br>80 MHz outside<br>ISM bands | 3 V (effective value)   | <p>Portable and mobile RF communications equipment should be used no closer to any part of the <b>Aoralscan</b>, including cables, than the recommended separation distance calculated from the equation appliance to the frequency of the transmitter.</p> <p><b>Recommended separation distance:</b><br/> <math>d = 1.2 \sqrt{P}</math></p> |



|                             |   |   |  |
|-----------------------------|---|---|--|
| EC 61000-4-6<br>Radiated RF | 6 Vrms<br>ISM bands between<br>150 kHz and<br>80 MHz<br><br>3V/m<br>80 MHz to 2.5 GHz | 6 V (effective value)<br>ISM bands between<br>150 kHz and 80 MHz<br><br>3 V/m | IEC 60601-1-2: 2014<br><br>$d = 1.2 \sqrt{P}$ 80 MHz to 800 MHz<br>$d = 2.3 \sqrt{P}$ 800 MHz to 2.5 GHz IEC 60601-1-2: 2014<br><br>Where $P$ is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and $d$ is the recommended separation distance in meters (m).<br><br>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey <sup>a</sup> , should be less than the compliance level in each frequency range <sup>b</sup> . Interference may occur in the vicinity of equipment marked with following symbol: |
|-----------------------------|---|---|--|

#### Guidance and manufacturer's declaration–electromagnetic immunity

| Guidance and Manufacturer's Statement - Electromagnetic emission  |                       |                  |  |
|---|-----------------------|------------------|--|
| Aoralscan 3 Wireless is intended to be used in the following electromagnetic environment. The purchaser or user of Aoralscan 3 Wireless should ensure that it is used in this |                       |                  |  |
| Immunity test   | IEC 60601 test levels | Compliance level | Electromagnetic environment – guidance |

**NOTE 1:** At 80 MHz and 800 MHz, the higher frequency range applies.

**NOTE 2:** These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.

<sup>a</sup> Field strength from fixed transmitters, such as base stations for radio (cellular/ cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the Aoralscan 3 Wireless is used exceeds the applicable RF compliance level above, the Aoralscan 3 Wireless should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as reorienting or relocating the Aoralscan 3 Wireless.

<sup>b</sup> Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.

<sup>c</sup> The ISM (industrial, scientific and medical) bands between 150 kHz and 80 MHz are 6.765 MHz to 6.795 MHz; 13.553 MHz to 13.567 MHz; 26.957 MHz to 27.283 MHz; and 40.66 MHz to 40.70 MHz.

To limit exposure to electromagnetic interference from nearby equipment that can degrade image quality or launch warning messages, it is necessary to position the Aoralscan 3 Wireless further from sources of electromagnetic interference or install electromagnetic shielding to block unwanted interference. The customer or the user of the Aoralscan 3 Wireless should operate the device under EMI conditions that minimize power supply transients, mechanical interactions, vibration, and thermal, optical, and ionizing radiation.

### **Separation distances**

The Aoralscan 3 Wireless is intended for use in the electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the Aoralscan 3 Wireless can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the Aoralscan 3 Wireless as recommended below, according to the maximum output power of the communications equipment.

Recommended separation distances between portable and mobile RF  
communications equipment and the Aoralscan 3 Wireless

## Guidance and Manufacturer's Statement - Electromagnetic emission

Aoralscan 3 Wireless is intended to be used in the following electromagnetic environment. The purchaser or user of Aoralscan 3 Wireless should ensure that it is used in this electromagnetic environment:

| Rated maximum output power of transmitter (W) | Separation distance according to frequency of transmitter (m) |   |  |
|---|---|---|--|
|   | IEC 60601-1-2: 2014   |   |  |
|   | 150 kHz to 80 MHz<br>$d = 1.2 \sqrt{P}$                       | 80 MHz to 800 MHz<br>$d = 1.2 \sqrt{P}$ | 800 MHz to 2.5 GHz<br>$d = 2.3 \sqrt{P}$ |
| 0.01  | 0.12  | 0.12                                    | 0.23                                     |
| 0.1   | 0.38  | 0.38                                    | 0.73                                     |
| 1   | 1.2   | 1.2                                     | 2.3                                      |
| 10  | 3.8   | 3.8                                     | 7.3                                      |
| 100   | 12  | 12                                      | 23                                       |

For transmitters rated a maximum output power not listed above, the recommended separation distance  $d$  in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where  $P$  is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.

**NOTE 1:** At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.

**NOTE 2:** These guidelines may not apply in all situations. Electromagnetic propagation

The medical electrical equipment is suitable for the professional healthcare environment per 60601-1-2:2014. 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.



Warning

- Using cables or accessories other than those specified for use with the scanner

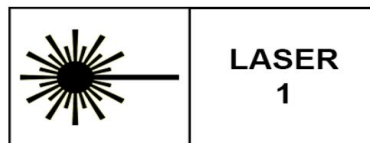
might result in increased emissions or decreased immunity of the device.

- 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 Aoralscan 3 Wireless, 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.

## 2.6. Biological Safety

Meets biological criteria: ISO10993-5: 2009 (Biological evaluation of medical devices — Part 5: Tests for in vitro cytotoxicity); ISO10993-10: 2021 (Biological evaluation of medical devices — Part 10: Tests for skin sensitization); ISO10993-23: 2021 (Biological evaluation of medical devices — Part 10: Tests for irritation)

## 2.7. Laser Protection



This product is a class 1 laser product and is only for maintenance, replacement and removal by professional personnel of the manufacturer or its designated agent (if necessary). If the device is not used, removed or replaced as required, the normal use of the device may be affected and laser radiation may occur. If a laser component is faulty, contact the manufacturer for help.

This product is a class 1 laser product according to "IEC 60825-1:2014 Safety of laser products-Part 1: Equipment classification and requirements", without harmful laser radiation. Users will not be exposed to laser radiation if they operate the equipment correctly according to the instructions.

Users should be aware of optical radiation protection. Bright light is projected from the scanner tip during scanning. As with other light, there may be a temporary reduction

in vision or visual residuals. Do not look directly into the light projected by the scanner tip or shine the light into the eyes of others.

## 3. Scanner

### 3.1. Brief Introduction

The Aoralscan 3 Wireless is designed to provide powder-free intraoral color scanning with higher speed of 20 FPS, bringing greater accuracy and less time-lag for image acquisition. It can be used to scan a single tooth, multiple teeth, and whole dental arches. Dental Order System Module helps manage the patient information and share data with others. Scan module assists you in acquiring 3D digital images of teeth and soft-tissue areas, and supports exporting scan data (in STL/OBJ format) to CAD/CAM systems for different purposes of dental care.

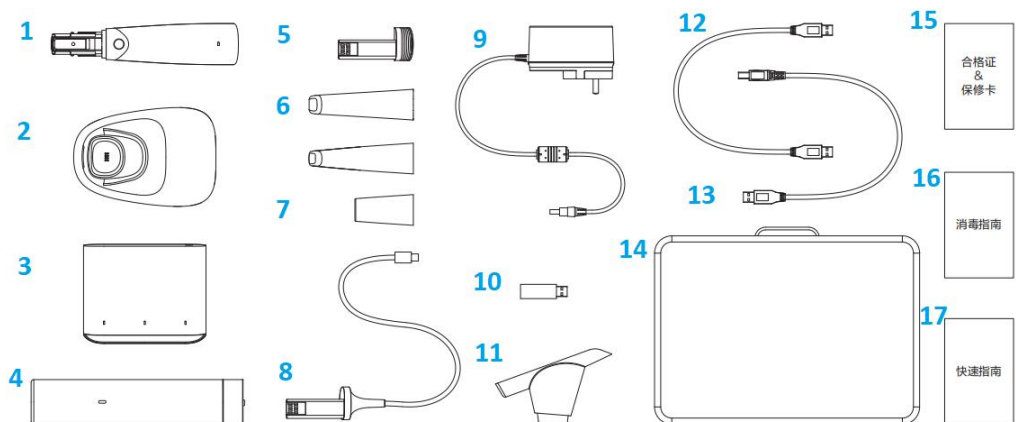
### 3.2. Unpack the Package

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. | Name | Quantity | Description |
|-----|------|----------|-------------|
|-----|------|----------|-------------|

|    |                        |   |  |
|----|------------------------|---|--|
| 1  | Scanner body           | 1 | For collecting model data  |
| 2  | Cradle                 | 1 | <p>1. Used to hold the stationary scanner when the scanner is not in use.</p> <p>2. Charge the scanner.</p> <p>3.As wireless AP.</p> <p>4. Wired mode for powering the scanner.</p> <p>Power adapter: 100-240 V~, 0.7-0.3A, 50/60 Hz, protection class: IP20</p> <p>Power input: 12V, 3A</p> |
| 3  | Charging case          | 1 | <p>For charging the scanner's battery.</p> <p>Power adapter: 100-240 V~, 0.7-0.3A, 50/60 Hz, protection class: IP20</p> <p>Power input: 12V, 3A</p>  |
| 4  | Calibrator             | 1 | Used to calibrate the scanner.   |
| 5  | Rechargeable batteries | 3 | Powering the scanner in wireless mode  |
| 6  | Scanner tip            | 5 | 4 standard tips and 1 mini tip   |
| 7  | Dust cap               | 1 | Protects the scanning tip from dust ingress.   |
| 8  | Spare cable            | 1 | Detachable USB 2.0 cable (2m) for scanner  |
| 9  | Power adapter          | 1 | For cradle and charging case power supply  |
| 10 | USB flash drive        | 1 | Including the software installation package  |
| 11 | Adapter of the cradle  | 1 | The scanner on the wired mode can be put on the adapter of the cradle.   |
| 12 | USB cable              | 1 | For calibrator ( 1.5m )  |
| 13 | USB cable              | 1 | For scanner ( 2m )   |

|    |                                  |   |   |
|----|----------------------------------|---|---|
| 14 | Package box                      | 1 | / |
| 15 | Warranty & Quality certification | 1 | / |
| 16 | Disinfection guidelines          | 1 | / |
| 17 | Quick start guide                | 1 | / |



#### Warning

- AC plug types vary by country/region.
- Using accessories, peripherals, or cables not supplied with the product or recommended by Shining3D Corporation can affect the device in the form of increased emissions or decreased immunity to external EMI/EMC occurrences. Non-specified peripherals, and cables in some cases, can also increase leakage current or compromise the safety of the grounding scheme.
- Using accessories or power supply units other than those specified may cause the warranty to void and result in increased emissions, decreased EMI immunity of the device, or even damages to the device and personal injuries.
- Use of other accessories results in non-compliance.
- Place the USB flash drive in a safe place for later usage.



#### Note

We recommend that you keep all the original packaging components in a safe place in case you need to transport or dispose of the scanner in the future.



### 3.3. Hardware Overview

#### 3.3.1. Scanner Tip and Scanner body

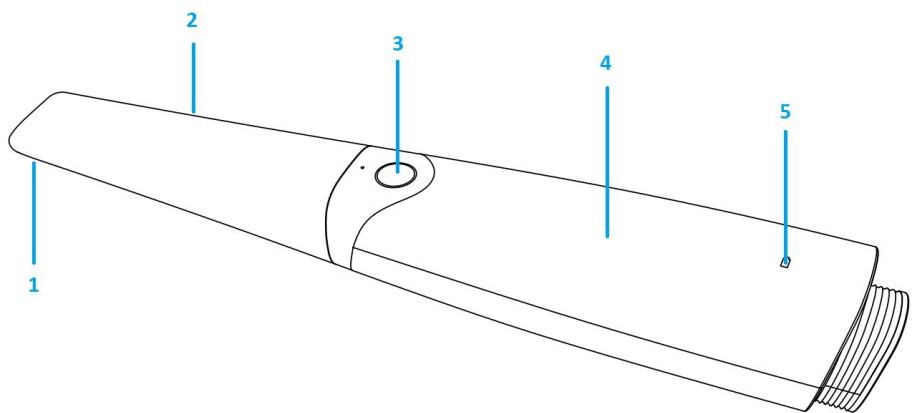


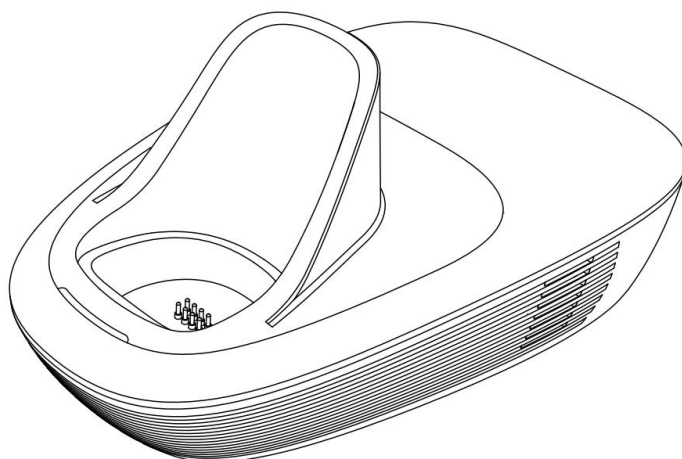
Table 3-1 Introduction of scanner tip and scanner body

| No. | Item              | Description   |
|-----|-------------------|---|
| 1   | Heating component | The heating component ensures successful scanning by preventing fogging on the lens.  |
| 2   | Scanner tip       | Use the scanner tip to scan the upper, lower or full jaw.<br>The scanner tip can be recycled up to 100 times.<br>The scanner can identify tips with different sizes and adjust the breadth of the camera according to the tip size automatically. |

|   |              |   |
|---|--------------|---|
| 3 | Button       | <ul style="list-style-type: none"> <li>• When the scanner isn't connected with the computer:<br/>Press the button to connect the scanner and the computer via Wi-Fi.</li> <li>• When the scanner is connected with the computer: <ul style="list-style-type: none"> <li>- If the scanner is dormant state, press the button to awake it;</li> <li>- If the scanner is on the working state, press the button to start scanning. Press again to pause scanning.</li> <li>- Double press to the new step.</li> <li>- Long press to enter the button interface.</li> </ul> </li> </ul> |
| 4 | Scanner body | <p>Rotate the scanner body during scanning to obtain the best scanning angle. During the scanning process, the scanner body may heat up, but the temperature will not cause harm to users and patients.</p>   |

|   |           |   |
|---|-----------|---|
| 5 | Indicator | <p>The colors of the indicator on the scanner:</p> <ul style="list-style-type: none"> <li>● Orange: the scanner works abnormally and needs your attention. It can be abnormal connection, malfunction, loose connection of the scanner tip, and WiFi disconnection.</li> <li>● Green: the scanner is on working state (scanning/ pausing), heating state or standby state.</li> <li>● Flashing green: scanner charge is below 20%.</li> <li>● Breathing green: the scanner is on standby state.</li> <li>● Extinguished: the scanner is on dormant state, low-charge state or unconnected.</li> </ul> <p>The colors of the indicator on the cradle:</p> <ul style="list-style-type: none"> <li>● Orange: the scanner works abnormally and needs your attention. It can be abnormal connection and malfunction.</li> <li>● Green: the scanner is fully charged.</li> <li>● Flashing green: the scanner is charging.</li> <li>● Extinguished: the cradle is not connected to the power supplies.</li> </ul> |
|---|-----------|---|

### 3.3.2. Scanner Cradle



Cradle indicator:

Chassis indicator status description:

Orange : device initialization or device abnormal, need your attention. Such as connection abnormalities, equipment failure.

green is always on: scanner charging is complete or the cradle is in normal working condition.

green blinking: the scanner is charging.

Extinguished: not connected to power.

Charging case indicator status description.

green blinking: charging in progress

green is always on: charging is complete

green off: battery not inserted or not inserted in place (not charging)

Description of the calibration instrument indicator light:

Orange light: during initialization or calibration instrument abnormal.

Green light: normal operation in progress



Note

- If the scanner is idle, please put it on the cradle. Then the camera and projector will stop working and save the working log.
- When the cradle is connected to power supplies and the scanner is put on the cradle for 30 minutes, the scanner will automatically enter the dormant state.

- When the cradle is not connected to power supplies and the scanner is put on the cradle for 10 minutes, the scanner will automatically enter the dormant state.
- When the scanner is not put on the cradle and not moved for less than 3 minutes, the scanner will be still on working state. For more than 3 minutes, it will enter the standby state. After 10 minutes, it will enter dormant state and the indicator will turn breathing green.
- The scanner tip will be heated even if the scanner is on standby or dormant state.

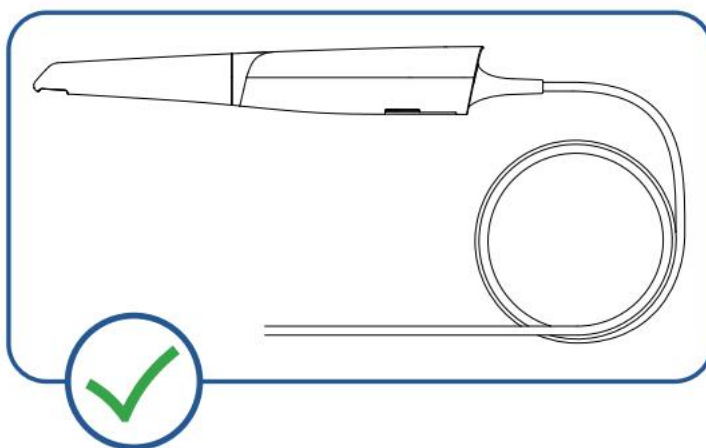
cradle using.

The distance between the scanner body and the cradle is recommended to keep within 5 meters, the signal is better.

### 3.3.3. USB Storage

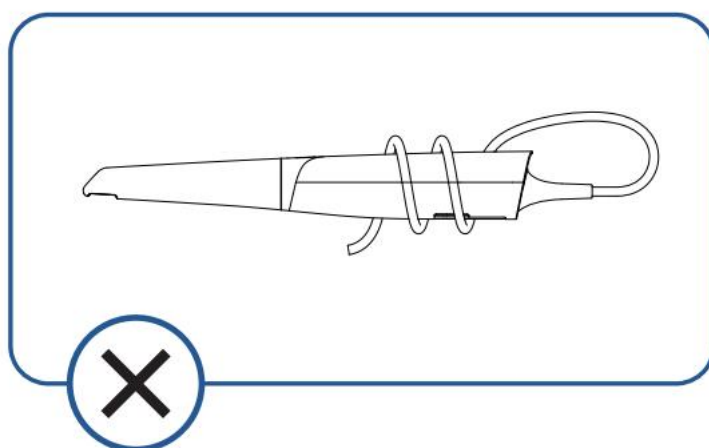
To prevent the USB cable from getting damaged by excessive bending or twisting, you should loosely coil the cable and avoid making kinks or sharp bends.

Up to 30,000 uses of the scanner tail cable.



Caution

Do not roll the cable over the handle of the scanner or even bend the cable sharply. The illustration below demonstrates improper cable storage.



### 3.4. Software Overview

The Aoralscan 3 Wireless is designed to operate with the software programs (on the USB), which include four modules:

- Calibration module

Calibrate the scanner.

- Dental order system module

Designed to manage and store patient data, including cases, prescriptions, and restoration information, realizing functions such as order creation, editing, searching, scanning and deletion, as well as uploading, downloading, previewing and tracking of scanned order and data.

- Scan module

The interface guides you through the entire scanning process of acquiring intraoral digital images with the scanner.

- Pre-design module

Mainly for users to be more convenient to use in the design software. Use the feature to adjust coordinates, mark tooth position, extract margin lines.

#### 3.4.1. System Requirements

Before installing and running the supplied software programs, your computer shall meet the following requirements:

| Name          | Description                  |
|---------------|------------------------------|
| <b>CPU</b>    | Intel Core i7-8700 or higher |
| <b>Memory</b> | 16 GB or higher              |

|                           |  |
|---------------------------|--|
| <b>Hard disk drive</b>    | 256 GB SSD or above  |
| <b>Graphic card (GPU)</b> | NVIDIA RTX 2060 6GB or higher  |
| <b>Operating system</b>   | Windows 10 Professional (64-bit) or later versions of Windows operating system |
| <b>Display Resolution</b> | 1920 × 1080, 60Hz or higher  |
| <b>I/O ports</b>          | More than 3 type-A USB 3.0 (or higher) ports                                   |



Note

Your PC shall meet the safety requirements of IEC 60950.

### 3.4.2. Install the Software

The USB flash drive contains the software program.



Caution

- Install the software programs in accordance with the instructions given here.
- When the installation is completed, do not plug the power adapter to the wall

outlet or turn on the scanner yet.

- (1) Insert the supplied USB flash drive into the USB port of your PC.
- (2) Find the file and run it as administrator.
- (3) The Installation Wizard window appears to start the installation.
- (4) Specify a language from the drop-down list.
- (5) Click OK.
- (6) Follow the on-screen instructions to complete the installation.

When done, an shortcut icon will be displayed on your desktop for quick access.

## 4. Set the Scanner

### 4.1. Connect the Scanner

The scanner can be connected in wired mode or wireless mode.



Caution

- Ensure the supplied software programs are installed on your computer before the connection.

- If the accuracy of the equipment decreases or if the equipment does not work properly, please consult technical support promptly.
- Install the scanner in accordance with the instructions stated in the Manual.
- Use the scanner only in dental laboratories, dental clinics, and equivalent environment.
- Do not install, place, and use the scanner in dusty and damp environment or in the areas of temperature extremes or in direct sunlight.
- Prepare a flat surface, e.g. your desk, for the scanner and the cradle. Do not place them on a slanted surface.
- Before the installation is completed, do not plug the power adapter into the wall outlet or turn on the scanner until you are instructed to do so.
- Always hold the scanner firmly when lifting from the stand or when using the scanner. Do not shake the scanner.
- Always return the scanner to the cradle when it is not in use. Do not place the scanner in heated or wet surfaces as this can cause damage to the scanner.
- It is normal that the scanner gets warm when in use. Do not block the ventilation holes on the bottom of the scanner. If the scanner overheats, the scanner will stop working.

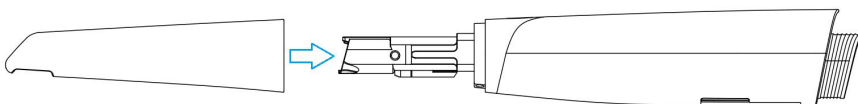


#### Warning

Ensure that you use only the supplied power adapter, power cable, and USB cable.

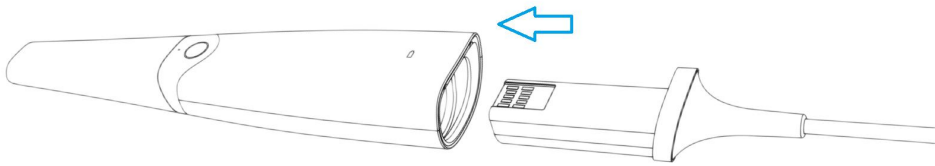
#### Follow the steps to connect the scanner in the wired mode:

- (1) Push the scanner tip hard to the scanner main body to ensure firm attachment.

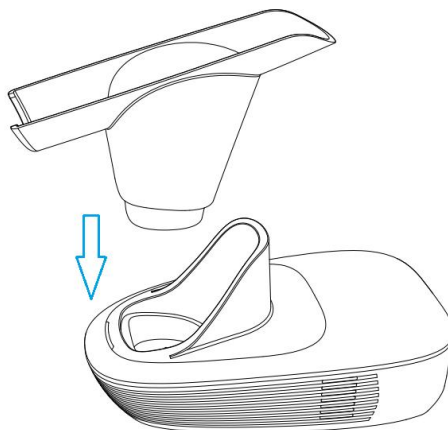


- (2) Push the spare cable hard to the scanner and ensure the firm attachment.





(3) Insert the adapter of the cradle downward into the cradle.

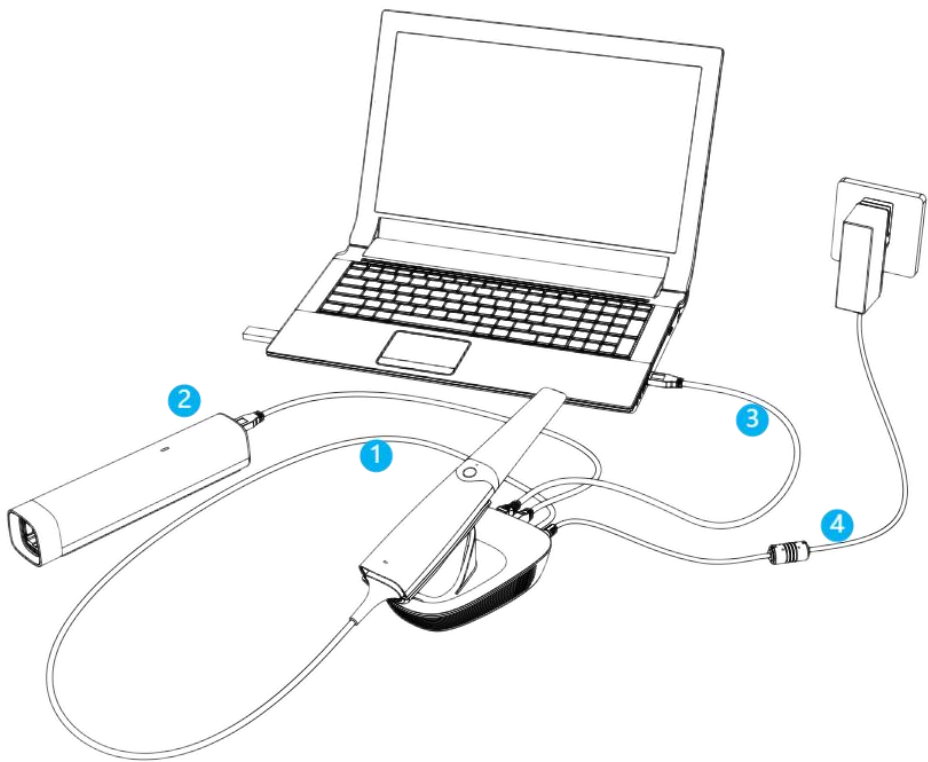


(4) Connect the USB cable line of the scanner to the USB 3.0 port on the cradle as ① shows.

(5) Connect the calibrator and cradle via spare wire as ② shows.

(6) Connect one end of the USB 3.0 cable line to the cradle and the other to the USB 3.0 port on the computer as ③ shows.

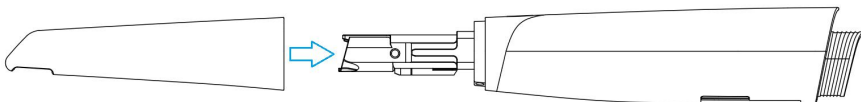
(7) Plug the round splice of the power adapter into the power port on the cradle and connect it to the power supplies as ④ shows.



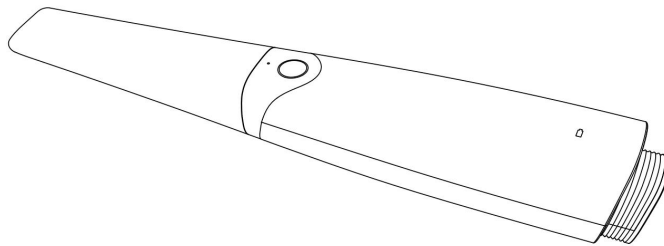
(8) Double-click the shortcut icon on the desktop to launch the software.

**Follow the steps to connect the scanner in the wireless mode:**

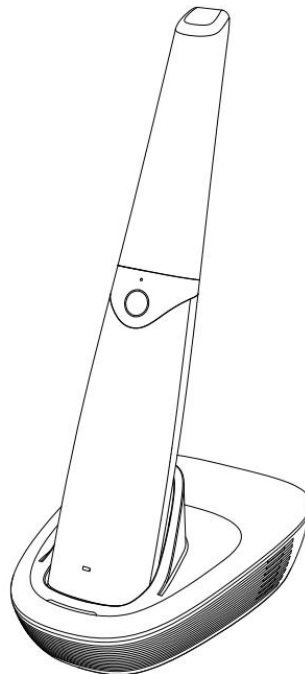
(1) Push the scanner tip hard to the scanner main body to ensure firm attachment.



(2) Push the scanner hard and ensure the whole device is firmly attached.



(3) Insert the scanner into the cradle.



(4) Click the shortcut icon on the desktop to launch the software.

(5) Enter the interface of device connection and connect it via wireless AP binding.



#### Note

- Once connected, the software will search the bound device for re-connection next time.
- The software will re-connect the device via WiFi when unexpected power outage during scanning.

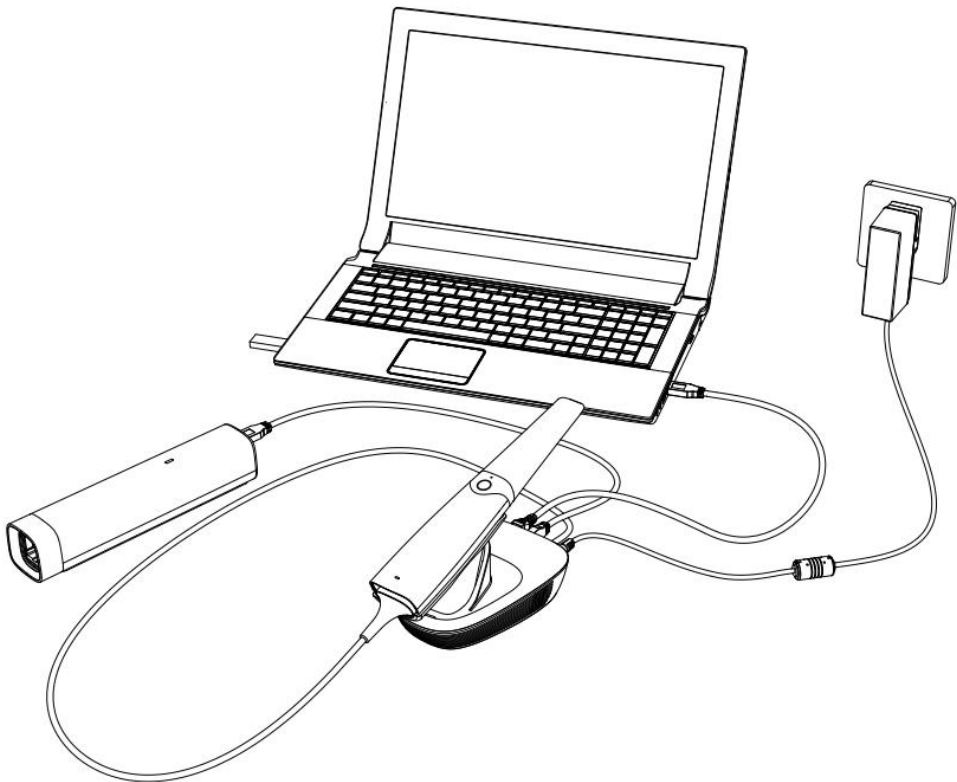
## 4.2. Calibrate the Scanner

Under these circumstances, we recommend that you shall execute the calibration for the scanner to ensure the accuracy of scanned data:

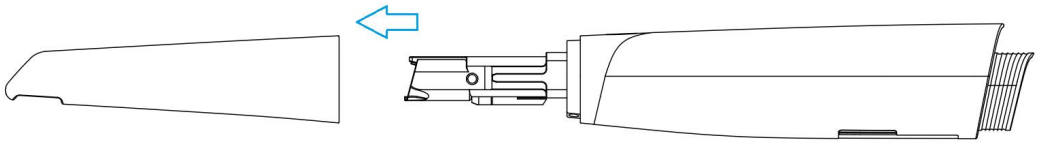
- The initial setup of the scanner is completed.
- The scanner has been used for a period of time (e.g. 2 weeks).
- The scanner is accidentally dropped.
- Scanner brightness adjustment is recommended once every 3 months.

**Follow the steps below to perform the calibration:**

(1) The LED light of the scanner body turns green when the power connection is working properly.



(2) Hold the scanner tip firmly with your thumb and forefinger on both sides, and then gently slide the tip off from the scanner.



#### Note

- Do not place your finger(s) on the mirror of the tip when detaching as this may result in damage to the mirror.
- Store the detached tip in a safe place, e.g. a dental instrument tray, for future use.

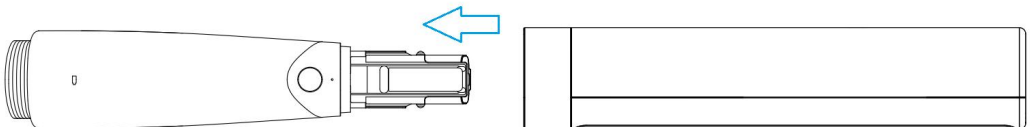
(3) Connect the calibrator and your computer with the supplied USB 3.0 cable.



#### Note

The scanner can be connected with a all-in-one machine or external touch screen.

(4) Gently slide the calibrator onto the front end of the scanner.



(5) Click the calibration icon on the main interface to display the calibration interface.

(6) Ensure the scanner is plugged into the calibrator firmly. Click **Start**. Calibration begins.

(7) The message prompting successful calibration appears once the calibration is completed. Click OK to exit.



#### Note

Normally the calibration takes approximately 7 minutes.

(8) Click “x” on the top right corner to exit the calibration interface.

(9) Gently slide the Calibrator off the scanner.



Caution

Make sure that the Calibrator is removed from the scanner after the calibration is done. Otherwise, the Calibrator temperature may get very high.

(10) Reattach the scanner tip to the scanner for later use or put the dust cap onto the scanner to prevent damage and dust.

### **4.3. Disconnect the Scanner**



Caution

- Do not attempt to directly disconnect the scanner by removing the power cable and USB cable.

- Do not roll the cable over the handle of the scanner or even create any sharp bends in the cable after you disconnect the scanner.

**Follow the steps below to safely disconnect the scanner:**

(1) Quit the scanning software.

(2) Disconnect the USB data line from the cradle and scanner.

(3) Right-click the “Safely Remove Hardware” icon on Windows taskbar and select “Eject Flash Drive”.

(4) Unplug the USB flash drive and keep it in a safe place for future use.

(5) Unplug the power adapter from the wall outlet and remove the power plug from the power port on the cradle.

## 5. Scanning Preparations



### Warning

Concerning hand hygiene and personnel safety when performing a scan, you must wear clean surgical gloves through the whole process.

### 5.1. Intraoral Environment

- Make sure there is no foreign body or blood in the mouth after gargling. Stop the bleeding if necessary.
- If necessary, ask the patient to keep the tongue still and move it to the other side of the mouth.
- Consider using a dental three-way syringe to blow dry or a tampon to dry the tooth surface before starting the scan.
- Turn off the oral light on the dental chair and start scanning.
- Consider using aspirators and tampons to keep the surfaces dry during scanning.
- If necessary, consider using an oral mirror to help create space while working in the narrow area between the teeth.

### 5.2. Scanner Preparation

- Ensure that the scanner tip, scanner body, and cradle are properly pre-cleaned, disinfected, or sterilized. See Pre- cleaning, disinfection, and sterilization on chapter 7.
- Ensure that the scanner tip has no scratches or is not damaged. Additionally, the tip is firmly attached to the front end of the scanner body.
- Ensure that the scanner connection is ready; it is correctly connected to a power source and powered on, and IntraoralScan is launched and ready to work.
- To avoid condensation on the mirror of the tip when scanning, the scanner tip must have been warmed up. See 6.4 Heat the Scanner Tip.
- Calibrate the scanner and verify the accuracy of the acquisition regularly. See 5.2 Calibrate the Scanner.

### 5.3. Scanning Position and Path

- Avoid direct light from any light source, e.g. dentist chair lamp, to shine on the

area you are working on.

- Hold the scanner steady by resting it on the tooth surface and keep the scan tip window in the range of -1 mm to 16 mm from the teeth.
- When scanning, slowly move the scanner and simultaneously check the scan results on the screen to ensure that the scanning is of good quality.
- When scanning, the scanner tip should be centered over the teeth, and each movement should align with the cross-hairs, following the lower and upper dental arch shapes.
- A complete scan data of a single area includes the surfaces of occlusal, lingual, buccal, interproximal contacts of the adjacent teeth, and 2-3 mm buccal gingiva.
- A complete scan data of a single case includes the lower jaw, upper jaw, and bite registration.
- When scanning, change the scanning angle to 35-55 degrees to create overlaps. It is important to achieve an overlap of at least 30% between each acquisition. If the overlap is small, it may cause the alignment to fail.
- To scan the occlusal surface of the teeth, hold the scanner at a 90-degree angle; to scan the buccal and lingual surfaces of the teeth, hold the scanner at a 45-degree angle.
- Inspect the scanned image in the 3D scan view window (IntraoralScan) and pay attention to warning messages.

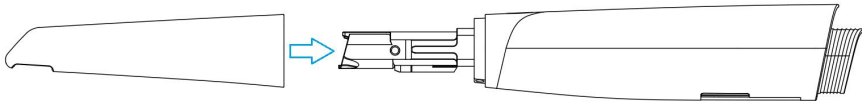
## **5.4. Heat the Scanner Tip**

To ensure optimal image quality, you should prevent condensation on the scanner mirror before each scan by heating the scanner tip.

**Please follow the steps to heat the scanner tip before starting an acquisition:**

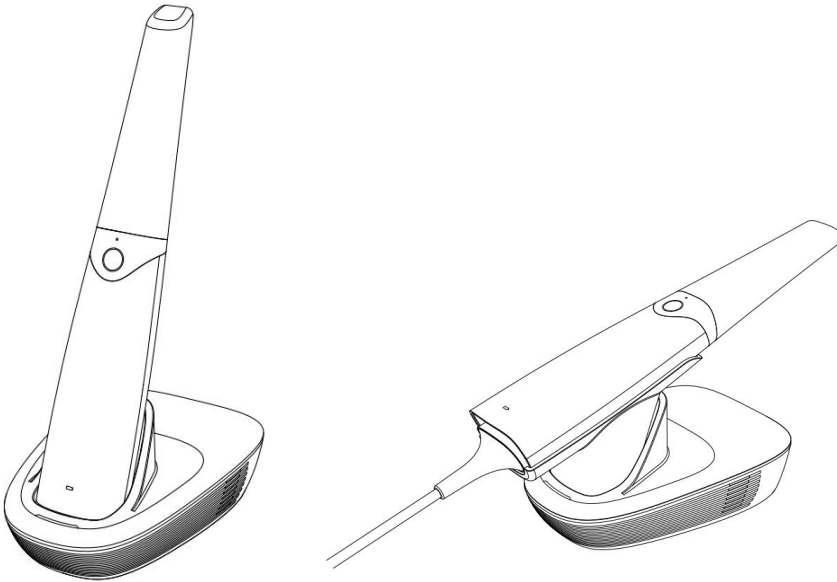
- (1) Ensure that the scanner tip, scanner body, and cradle are clean.
- (2) Gently and carefully attach the scanner tip to the scanner body, with the mirror facing downward.





(3) Connect the power supply to the Aoralscan 3 Wireless. See Connecting the scanner in chapter 4.

(4) Place the scanner in the cradle to secure it in place.



(5) When the LED ring light on the scanner body lights up green, the heater automatically turns on and detects the temperature.

If the temperature of the scanner tip is lower than the set point for anti-fogging, a notification message of pre-heating and current temperature appears.

When the message disappears, the warm-up is done. The scanner is now ready for an acquisition.



#### Note

- The heater helps keep the scanner tip temperature in a normal range.
- The scanner tip is being heated whenever power is supplied, even if the

scanner is in standby or sleep mode.

- If the heater does not reach the necessary temperature for preventing condensation during scanning, the message of “The scanner is pre-heating. Please wait” appears.

## 6. Clinical Case Quick Guide

### 6.1. Connection

For more details, see Chapter 4.

### 6.2. Register and Log in

If the customer has Shining 3D accounts, he can directly enter the account and password for login. If there are no Shining 3D accounts, please register an account. click **New User? Click here to register** to enter the registration interface.

### 6.3. Activate

**When the scanner is used for the first time, the user should online activate the device first.**

You need to confirm activation—click **Yes** to open the authorization tool, enter the organization name, name, mobile phone, and email, and click **Activate**. Please make sure that your computer has been connected to the Network. If you can't activate the device, please contact with us.

### 6.4. Calibrate

For more details, please see Chapter 4.2 Calibrate the Scanner. In order to ensure the scanning quality, regular calibration is required which is recommended every 15 days.

### 6.5. Create an Order

After logging in and entering the interface of the software. The user can create a new order or import orders.


Click “New Order” and enter information including order numbers, doctors, patients and technicians. Then select Dentistry Type and teeth to be scanned. Click “Save” to save the order.



Near-infrared Imaging: Click it and the user can check the caries with NIR imaging technology.

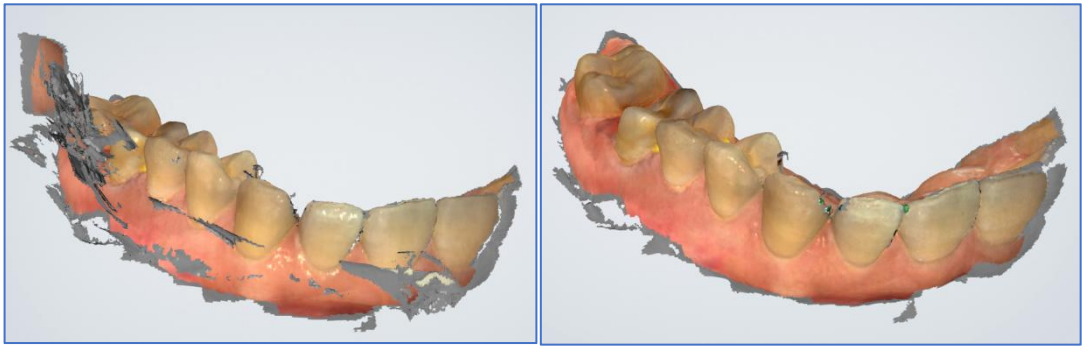
Click “Scan” and enter the scanning interface.

## 6.6. Scan Upper Jaw

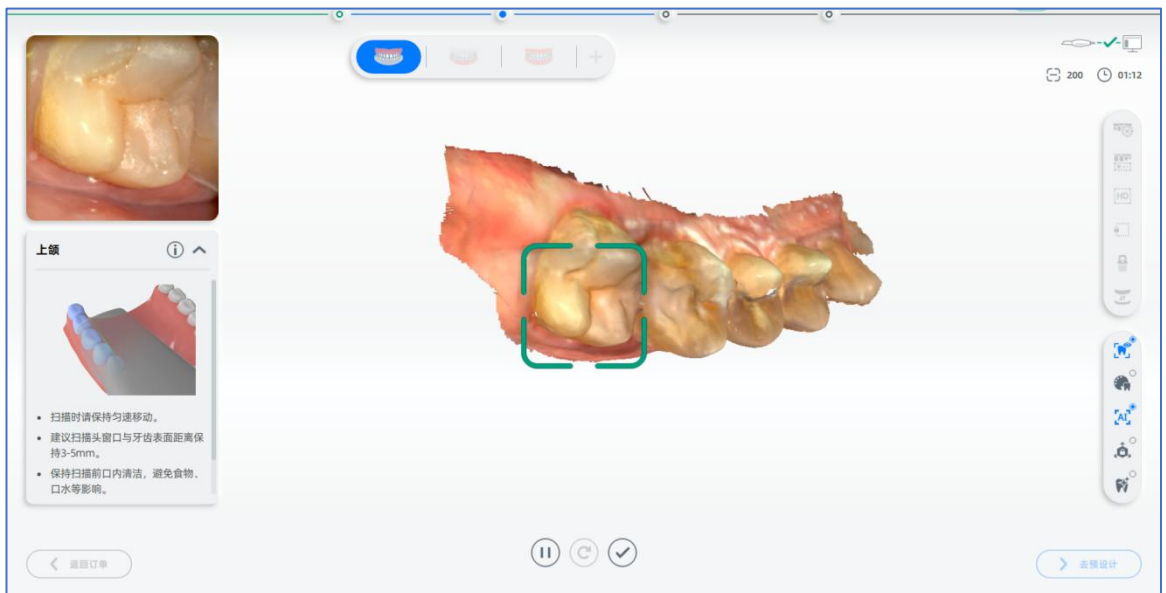
Please check whether the image on the camera window on the top right corner displays

normally. Then click , or press space bar or press the button on the scanner to start scanning.

Before scanning, click  on the right panel to open AI optimization, and this icon will turn into . Then the software will automatically delete unrelated data such as data of buccal and lingual soft tissues during intraoral scanning. See the following figure (with and without AI Optimization)




The green box shows the current scanning data. If the box turns into red, it indicates that the user is scanning the wrong place and needs to move the scanner tip to the place the red box shows.



When the scanner tip leaves the object or the scanning is paused, the green area means this area is not scanned. User can rescan the corresponding area accordingly.




After confirming that the scan is completed, click  or long press the space bar or long press the button on the scanner for over 3 seconds to save the data. The green tick in the lower right corner of the icon as shown below indicates that the scanning process is finished.

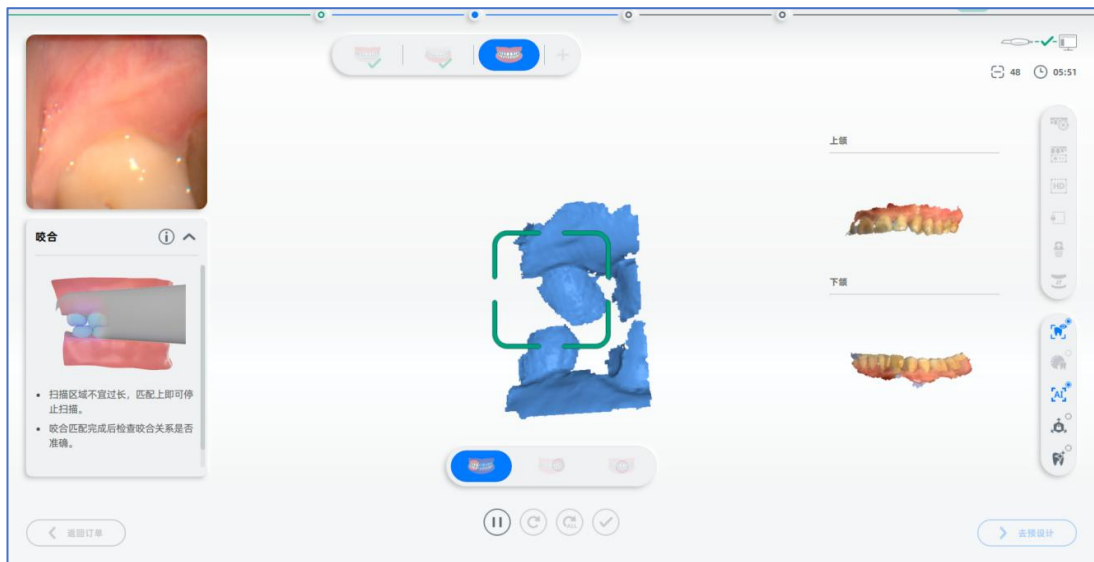
## 6.7. Scan Lower Jaw

The steps of scanning lower jaw are the same as that of upper jaw. When finishing scanning upper jaw, the software will enter the process of scanning lower jaw automatically.

## 6.8. Scan Whole Jaw

When finishing scanning upper jaw and lower jaw, the software will automatically enter the process of scanning whole jaw.

The user can click , or click space bar or press the button on the scanner to start scanning. The software will automatically align the model when it has obtained some data.




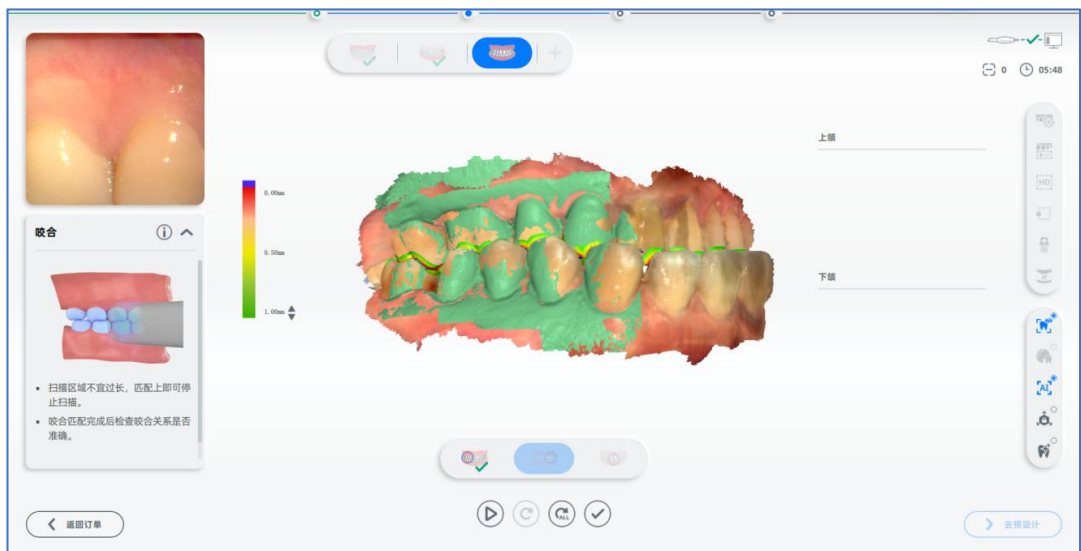
Before alignment




After alignment



Click  when finishing scanning upper jaw and lower jaw, and aligning the model. Press space bar or press the button on the scanner can pause scanning and check the mode as well.



Click , or long press space bar or press the button on the scanner for over 3 seconds to edit data.

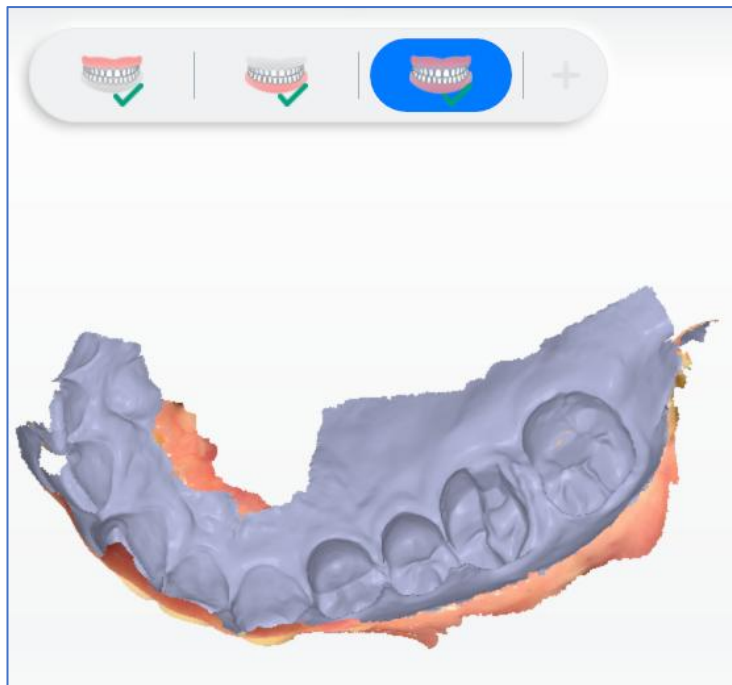
## 6.9. Check Scanning Results

Check the model data.

### 6.9.1. Check Upper/lower Jaw

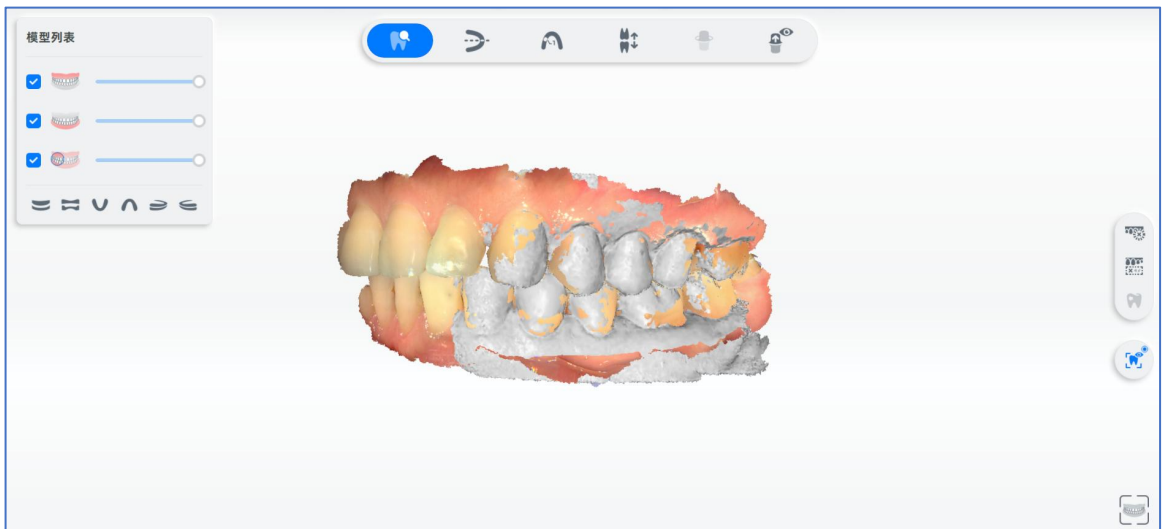


### 6.9.2. Check Occlusion






## 6.10.Pre-design



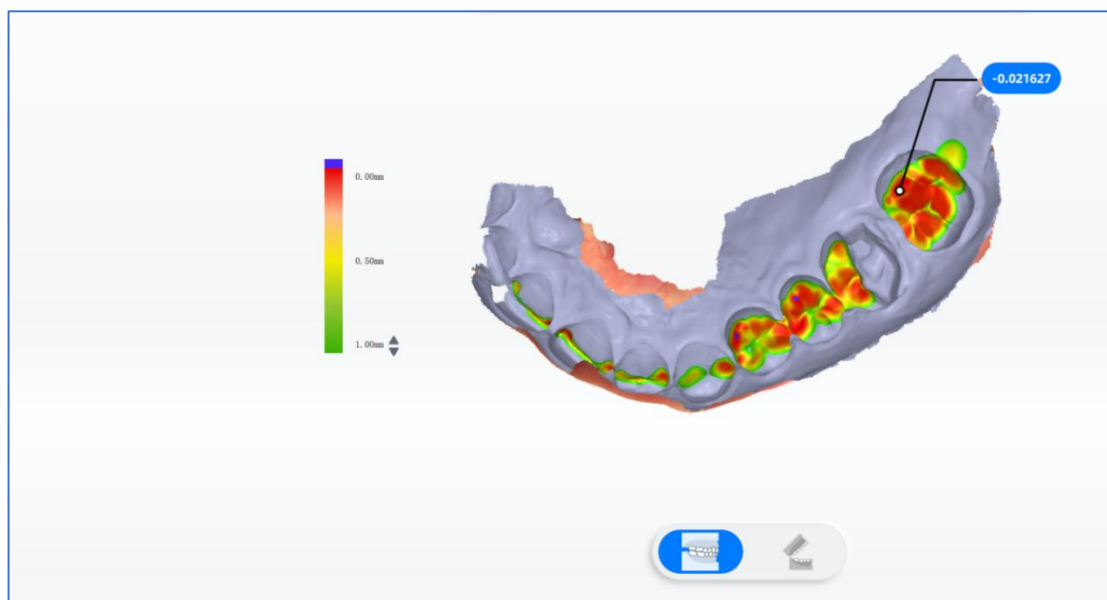
For more details of pre-design, please check the User Manual.










### 6.10.1. Occlusion Test

Click  under the "Pre-design" process to enter the occlusion detection interface.

- The green color indicates there is a distance between the two jaws.
- The red color indicates the touching area between the two jaws.
- The blue color indicates the bite-through area between the two jaws.

Double-click on the point of the model to detect the occlusal gap at that point.



- Switch upper and lower jaws: Switch by clicking the upper jaw icon  and the lower jaw icon  on the upper left corner.
- Close/open jaw: Switch between the Close button  and then Open button  to see the occlusal result.
- Occlusion adjustment  : Click this icon to open the occlusion adjustment parameters.
  - ✧ Occlusion parameter values  : -0.05 mm, -0.10 mm, -0.15 mm. Three values are available to choose, and the default is -0.05 mm.
  - ✧ Cancel  : Cancel the adjusted bite parameters and exit.
  - ✧ Confirm  : Save the adjusted occlusion parameters and exit.
- Undo adjustment  : Undo the bite adjustment operation.

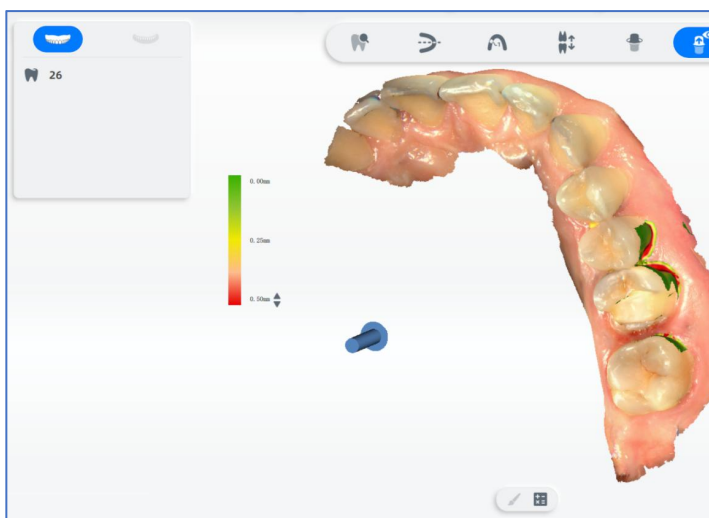
### 6.10.2. Check Undercut



Click on the right side of the software to open the undercut interface. You



can rotate the model to the appropriate view, double-click the view or click to recalculate undercut area.



### 6.10.3. AccuDesign



On the pre-design interface, click to enter the AccuDesign interface.

AccuDesign is a model generation software. Use it to generate solid or hollow model out of the scanned data by 3D scanner. You can add attachments to the model, such as text, frame, and drain hole in a convenient way. And then export file for 3D printing. For more details, please check the AccuDesign User Manual.

### 6.10.4. Orthodontic Simulation

Simulate orthodontic treatment solution, and view the expected effect according to



different treatment solutions. Click on the pre-design interface to enter the orthodontic simulation interface. Orthodontic simulation can be divided into tooth segmentation, modeling and tooth setup.



## Note

When creating a new order, select the Dentistry Type as Orthodontics to enable the orthodontic simulation function..









## Pre-processing

Edit the model data to make preparation for tooth segmentation.

| Icon | Name                      | Description  |
|------|---------------------------|--|
|      | Adjust Coordinate         | Check the center position from 3 perspectives. Press left mouse button and move to adjust the center position of the model.<br>: Reset the coordinates of upper and lower jaw to the original position.  |
|      | Trim Model                | Delete unnecessary scanning data of the model. Change the brush size by dragging the slide. <ul style="list-style-type: none"><li>• Press left mouse button and move the cursor to delete model data.</li><li>• Scroll up and down the wheel to zoom in and out of the model.</li><li>• Press right mouse button and move the cursor to adjust the perspective of the model.</li></ul> |
|      | Edit Surface              | Remove image noise on the model and make the model surface smoother. Improve the quality of data.  |
|      | Perspective Control Panel | Check the model from different perspectives.   |

## Tooth Segmentation

Tooth segmentation will mark position of each tooth and distinguish them with different colors. You can edit, delete and add information to the tooth position. It is easy for you to check the expected effect of each tooth after orthodontics.

| Icon  | Name                 | Description  |
|---|----------------------|--|
|  | Modify Area          | If the tooth is not fully colored or too much color is painted, the tooth cannot be correctly identified. You need to manually adjust and edit the tooth area. Click <b>Area</b> to recolor the tooth.   |
|  | Adjust Frame         | Professionals are required to readjust each tooth direction. By three-dimensional coordinate system on each tooth, you can adjust the teeth orthodontics direction. <ul style="list-style-type: none"> <li>• Press the grey origin and move the 3D coordinate system.</li> <li>• Press left mouse button and move the cursor to adjust the direction of the coordinate.</li> </ul> |
|  | Change Tooth Number  | Click the number on the tooth to change it.  |
|  | Remove Teeth         | <ol style="list-style-type: none"> <li>1 Select the tooth needed to be deleted.</li> <li>2 Click  to delete its mark.</li> <li>3 Click  to confirm deletion.</li> </ol>  |
|  | Add Tooth            | Fill the teeth as needed. Click a missing tooth and add a tooth. You can set the tooth number and radius.  |
|  | Object Control Panel | Choose to display tooth number, texture, frame, area and features or not.  |

## Tooth Setup

Tooth setup shows and visualize the effect of orthodontics. Features are following:

- You can create your own plans (Maximum is 3) and preview the effect.
- The process of orthodontics is displayed by animation.
- You can setup the teeth manually.








Note

You can click Setup to enter setup interface if the segmentation is completed.



Create a Plan

| Icon  | Name        | Description   |
|---|-------------|---|
|  | Fit views   | Press Ctrl and select multiple plans. The treatment effect of plans is displayed by fit views.  |
|  | Measurement | Bolton Analysis: Refers to the proportion relation between the sum of crown widths of upper and lower anterior teeth and the sum of crown widths of all upper and lower dental arches. The proportion relation is divided into anterior ratio and whole ratio. Use the Bolton index to diagnose the incompatibility of tooth width between upper and lower dental arch. The Bolton index analysis assists in the diagnosis and analysis of the formation mechanism of malformation, and plays as a reference factor for treatment planning. |
|  | Rename      | Rename the treatment plan.  |
|  | Upload      | Export or upload your plan to Dental Cloud.   |
|  | Delete      | Delete the plan.  |

## Animation

Play the whole process of orthodontic treatment. Preview the effect of different treatment plans.

## Manual Setup



You can set up the tooth manually.

| Icon  | Name   | Description  |
|---|--------|--|
|  | Move   | Move the tooth.  |
|  | Rotate | Rotate the tooth with tooth root as the origin.                |
|  | Twist  | Twist the tooth from side to side with the root as the origin. |


### 6.10.5. Oral Report

When creating a new order, the doctor can select the case as “Check” to generate a report in the pre-design interface. Doctors can know relative information of the patient with the report.

## 6.11. Check the Save Path

Click  during “Create a New Order” on the panel to return to the order interface. Then click  to open the folder of the current orders.

## 6.12. Upload Order

Click  to upload finished orders to the dental cloud where you can transmit the orders to others.

# 7. Care and Maintenance

## 7.1. Pre-cleaning, Disinfection, and Sterilization

The whole set of Aoralscan 3 Wireless, including scanner tip, scanner body, and scanner cradle, requires proper care, cleaning, and handling. As individual part may be processed differently, read and follow the information and instructions given to help you effectively and thoroughly reprocess the set.

We suggest that you reprocess the Aoralscan 3 Wireless in the following order:

- (1) Scanner cradle care
- (2) Scanner body care
- (3) Scanner tip care



Warning

- All parts are shipped non-sterilized. Follow the instructions prior to initial use.
- Ensure that you have completely disconnected the power supply and all connections from the scanner.
- Follow the instructions given in the Manual to pre-clean, disinfect, and sterilize each part of the scanner. Using other methods not approved by Shining3D Corporation will damage your scanner and void your warranty.

- Using detergent, disinfection solutions or wipes, sterilization procedures other than those specified in the Manual may damage the product and void your warranty.
- Only sterilize the part(s) for which a sterilization method is specified. Do not attempt to sterilize all parts of the product. Shining3D Corporation is not liable for any damages due to improper sterilization.
- After sterilization, wait until each of the parts is at room temperature to prevent possible heat injuries to the user and the patient.
- To prevent cross-contamination, pre-cleaning, disinfection, and sterilization must be correctly performed after each use.
- When the scanner tip is detached from the scanner, always protect the subtle units and the inner optical components on the front end of the scanner body by putting on the supplied dust cap.

## 7.2. Scanner Body and Cradle Care

Both the scanner body and cradle require an intermediate-level disinfection.



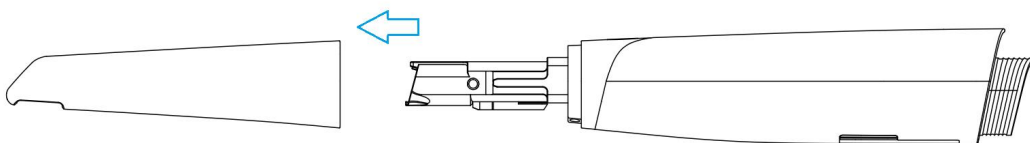
Warning

- Concerning hand hygiene and personnel safety when performing pre- cleaning and disinfection/sterilization, you must wear clean surgical gloves before you start.
- Always ensure that you have pre-cleaned and disinfected/sterilized the scanner body, scanner cradle, and scanner tip before each scan.
- The caring methods for the scanner cradle, scanner body, and scanner tip are different and must be executed separately. Before disinfecting the scanner body, you shall start with the cradle first.
- Ensure that the scanner tip is detached from the scanner, and the dust cap is put on the scanner when disinfecting the scanner body.

### Follow the steps below to complete the disinfection:

- (1) Disconnect the power of the Aoralscan 3 Wireless (see Disconnecting the scanner on chapter 4).
- (2) Hold the scanner tip firmly with your thumb and forefinger on both sides, and then gently slide the tip off from the scanner.





#### Note

Do not place your finger(s) on the mirror of the tip when detaching as this may result in damage to the mirror.

(3) Store the detached tip in a safe place, e.g. a dental instrument tray, prior to disinfecting the scanner body.



#### Caution

- When the scanner tip is detached, always protect the subtle units and the inner optical components on the front end of the scanner by putting on the supplied dust cap.

Do not attempt to clean the outer units and inner optical components on the front end of the scanner with any sharp objects or other such tools, which may result in scratches and damage to the scanner.

(4) Hold the scanner body with your hand.

(5) Use new cotton gauze moistened with 70%-75% solution of ethanol to wipe the surface of scanner body.



#### Caution

- Avoid using detergent of any kind as some detergents or surfactants might penetrate the surface of the scanner body.
- Do not clean the intake and exhaust vents with any sharp objects or other such tools.

(6) When done, store the scanner body in a clean and safe place.

(7) Use new cotton gauze moistened with 70%-75% solution of ethanol to wipe the surface of cradle.

(8) When done, store the cradle in a clean and safe place.

(9) Proceed to the cleaning, disinfection or sterilization of the scanner tip.

## 7.3. Scanner Tip Care

The scanner tip is the most essential part of the scanner as it is inserted into your patient's mouth during scanning. Therefore, the tip must be thoroughly cleaned and sterilized before and after each patient contact in order to prevent cross- contamination in your operation.



### Warning

- Concerning hand hygiene and personnel safety when performing cleaning and disinfection/sterilization, you must wear clean surgical gloves and goggles before you start.
- Cleaning the scanner tip is an essential step before effective disinfection or sterilization.
- When inserting the scanner tip into the disinfectant solution, be sure to follow the instructions on the disinfectant label and limit the time and depth that the tip is soaked within the minimum time recommended.
- The scanner tip can be sterilized under high temperature up to 100 times and must be disposed of afterwards. For more information on disposal, see Disposal on chapter 1.
- High-level disinfection and steam sterilization must NOT be combined.
- Apply only either of these methods to ensure the safe and effective reprocessing of the scanner tip, and thus to prevent damage of reusable tip.

Two effective and approved methods of cleaning and disinfection/ sterilization are recommended and described as below.

**Either should be used to reprocess the scanner tip between each patient contact:**

- Cleaning and High-level Disinfection
- Cleaning and Steam Sterilization

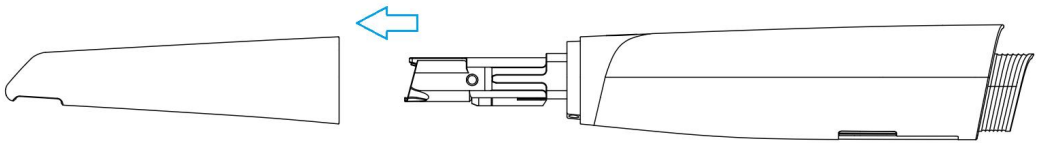
### 7.3.1. Cleaning and High-level Disinfection

Follow the steps below to perform cleaning and high-level disinfection:

(1) Disconnect the power of the Aoralscan 3 Wireless (see Disconnecting the

scanner on chapter 4).

- (2) Hold the scanner tip firmly with your thumb and forefinger on both sides, and then gently slide the tip off from the scanner body.



#### Caution

Do not place your finger (s) on the mirror of the tip when detaching as this may result in damage to the mirror.

- (3) Pay particular attention to inspect the mirror of the tip to ensure that the mirror is not cracked or broken and there is no scratch on it.



#### Caution

If the mirror of the tip has cracks or scratches, stop the cleaning process and contact your local distributor or service provider.

- (4) Gently clean the inner and outer sides of the tip using mild pH-neutral soap water and a soft brush for 3 minutes.

- When cleaning the inner surface of the tip, insert the soft brush into the tip from both the front and rear ends, and move the brush lightly in tiny circles.
- When cleaning the outer surface of the tip, move the brush lightly back and forth, and repeat for each side.

- (5) Repeat the previous step for at least two times.

- (6) Rinse the tip thoroughly with sterile water.

- (7) If you notice stains, fingerprints, or smears on the mirror surface, repeat the previous step.

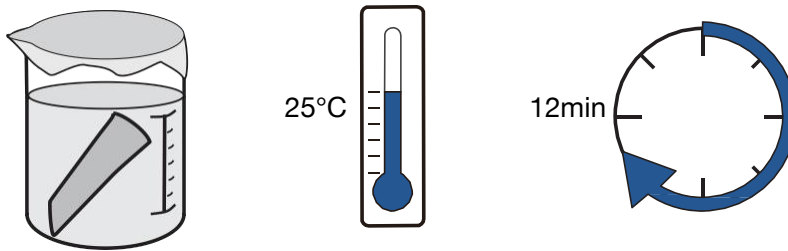
- (8) Dry the tip carefully with a clean, soft lens tissue or lint-free cloth.

- (9) Pay particular attention to inspect the mirror surface of the tip again to make sure that the cleaning is done properly and the mirror is not damaged during the cleaning

process.

(10) Carefully fill the container with a disinfectant solution, such as phthalaldehyde at a concentration of 5.5g/L (depending on the brand of disinfectant used). In the event of a leak, follow the disinfectant manufacturer's instructions for handling.

(11) Immerse the cleaned tip into the disinfectant and leave it for at least 12 minutes at 25°C.



(12) Prepare a large container of sterile water, e.g. 2 L.

(13) Take out the tip from the disinfectant.

(14) Immerse the tip into the container of sterile water for at least 5 minutes.

(15) Take out the tip and manually flush it with at least 500 ml of sterile water.



Caution

Discard the rinse water. Always use fresh volumes of sterile water for each rinse.

Do not reuse the water for rinsing or any other purpose.

(16) Repeat the rinsing process (step 12 to 15) for at least two times for removing the residue of disinfection solution.

(17) Use a soft lint-free cloth to dry the tip.

(18) Pay particular attention to inspect the mirror surface of the scanner tip again to make sure that the disinfection is done properly and the mirror is not damaged during the disinfection process.

(19) Re-attach the scanner tip (see 10.3.3 Attach the Scanner Tip). Or if you attempt to store the scanner tip with other dental instruments, e.g. a dental instrument tray, ensure that it is thoroughly dry.

### **7.3.2. Cleaning and Steam Sterilization**

Follow the steps below to perform cleaning and steam sterilization:

(1) Disconnect the power of the Aoralscan 3 Wireless (see Chapter 4).

(2) Hold the scanner tip firmly with your thumb and forefinger on both sides, and then gently slide the scanner tip off from the scanner.



Caution

Do not place your finger(s) on the mirror of the tip when detaching as this may result in damage to the mirror.

(3) Hold the supplied dust cap with the triangle mark facing upward. Then, align the dust cap blocks to the matching slots on the front end of the scanner body.



Caution

If the mirror of the tip has cracks or scratches, stop the cleaning process and contact your local distributor or service provider.

(4) Gently clean the inner and outer sides of the tip using mild pH-neutral soap water and a soft brush for 3 minutes.

- When cleaning the inner surface of the tip, insert the soft brush into the tip from both the front and rear ends, and move the brush lightly in tiny circles.
- When cleaning the outer surface of the tip, move the brush lightly back and forth, and repeat for each side.

(5) Repeat the previous step for at least two times.

(6) Rinse the tip thoroughly with sterile water for at least 3 minutes.

(7) If you notice stains, fingerprints, or smears on the mirror surface, repeat the previous step.

(8) Dry the tip carefully with a clean soft lens tissue or lint-free cloth.

(9) Pay particular attention to inspect the mirror surface of the scanner tip again to make sure that the cleaning is done properly and the mirror is not damaged during the cleaning process.

(10) Fill the scanner tip lens with medical gauze.

(11) Put the wrapped scanner tip into an autoclave and sterilize it for 30 minutes at 121°C (or 4 minutes at 134°C). For the specific sterilization pressure, refer to the instructions of the autoclave (102.9kpa at 121°C is recommended; Or 205.8kPa at 134°C).

(12) Dry the sterilized tip for 30 minutes with the autoclave program before opening

the autoclave.

(13) Reattach the scanner tip.

### 7.3.3. Attach the Scanner Tip

There is a risk of damaging the mirror of tip if any improper actions are taken when attaching the tip to the scanner.

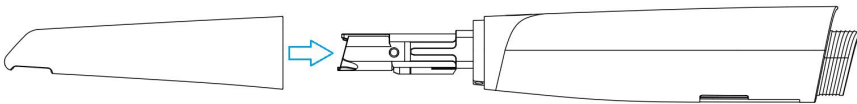


Warning

- Wear clean surgical gloves before you start.
- Ensure that the scanner cradle, scanner body, and scanner tip are pre-cleaned and disinfected/sterilized (see Scanner body care on chapter 7 and Scanner storage on chapter 7).

**Follow the steps below to complete the attachment:**

(1) Hold the scanner tip firmly with your thumb and forefinger on both sides, and then gently attach the tip facing downward to the scanner.

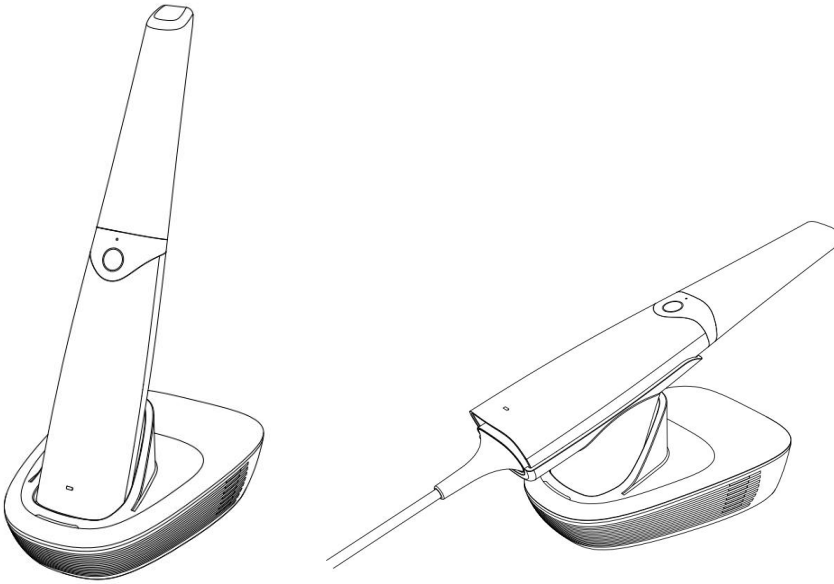


Caution

Do not place your finger(s) on the mirror of the tip when attaching as this may result in damage to the mirror.

(2) Try swiveling the scanner tip around to ensure it is locked into position and stable.

(3) Place the scanner in the cradle, and the set is ready for use.



## 7.4. Scanner Storage

In case you need to transport the device, we strongly recommend that you keep the original packaging after unpacking the Scanner. Shipping the device without its original packaging material may cause possible product damage and result in additional service fees.

If the original packaging is no longer available or damaged, carefully package each part of the scanner with bubble wrap to protect against any possible damage during transportation.

### 7.4.1.Storage for Transport

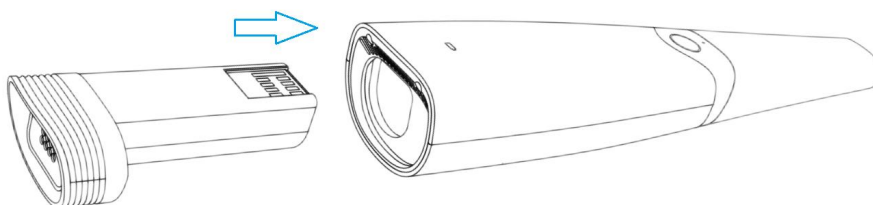
- Make sure that the scanner is clean before placing it in the original carry box/package to avoid any possible contamination.
- Place each part of the product, e.g. the tip, scanner body, cradle, power adapter, in the original package carefully and prevent kinks of the cable.
- Make sure that each cable is rolled up and tangle-free before placing it in the original carry box.
- Before closing the lid, make sure no part of the product is protruding from the package.

### 7.4.2. Daily and Long-term Storage

- Always place the scanner in the cradle when it is not in use.
- When the scanner tip is detached from the scanner body, always protect the subtle units and the inner optical components on the front end of the scanner by putting on the supplied dust cap.
- Ensure the scanner is clean before long-term storage.
- Avoid storing the scanner and accessories in areas of extreme temperatures or under direct sunlight.
- Before storing the scanner, make sure the scanner tip, scanner body and cradle are thoroughly dry.

## 7.5. Replace Battery

The software displays the connection status and battery usage of the device in real time. Please replace the battery when the device's battery is running low.



### 7.5.1. Battery Use

Under proper maintenance and normal use, the battery life is approximately 3 years, but as the lithium-ion battery ages, the capacity of the battery will decrease.

When replacing the battery, make sure the scanner is turned off.

Do not remove the battery or install/replace an unsuitable battery.

Do not charge the battery for an extended period of time. If the battery casing is scarred, please replace it in time to avoid causing problems such as liquid leakage and fire.

Not using the battery for a long time may cause the battery capacity to decrease and affect the service life and rechargeability. It is recommended that for long-term



storage, please charge the battery once every 3 months and try to keep the battery capacity at 30%~50% of the standard capacity.

#### 7.5.2. Battery storage

The best temperature for storing lithium-ion batteries is 0~25°C, avoid high temperature and humidity, please place the device in a cool and dry place.

When storing the battery, please keep it away from flammable and explosive items such as fire source.

## 7.6. Charging case using safety

Place the charging case away from sparks, dust and other corrosive occasions.

Please place it in a safe place where children cannot touch it.

Store in an environment free of dust, liquid, metal debris, etc. Please store in a clean and dry environment

# 8. Hardware Specification

## 8.1. Specifications

| Parameter             | Description   |
|-----------------------|---|
| Type Name             | Intraoral Scanner   |
| Model Name            | Aoralscan 3 Wireless  |
| <b>Scanner</b>        |   |
| Scan Field            | Standard tip: 16 mm × 12 mm<br>Mini tip: 12 mm × 9 mm                           |
| Scan depth            | 22 mm. -2mm to 20mm away from the front window plane of the scanner tip.        |
| Scan theory           | Non-contact scanner with the structured light (by customized projection system) |
| Dimension (L × W × H) | 215 mm × 47 mm × 40 mm (including the dust cap, without the battery)            |
| Weight                | 250 ± 20 g (without cables)   |
| Output                | STL、OBJ、PLY   |

|   |                         |
|---|-------------------------|
| Connector                                 | USB 2.0                 |
| Power                                     | 12V DC/3.0 A            |
| Scanning tip dimensions                   | 117mm × 34.5mm × 30.5mm |
| <b>Cradle</b>                             |                         |
| Dimension (L×W×H)                         | 160 mm × 111 mm × 78mm  |
| Weight                                    | 540 ± 20 g              |
| Output power of the cradle adapter        | 13V 3.0A                |
| <b>Charging case</b>                      |                         |
| Dimension ( L×W×H )                       | 143 mm × 109 mm × 42mm  |
| Weight                                    | 230 ± 20 g              |
| Output power of the charging case adapter | 13V 3.0A                |
| <b>Battery</b>                            |                         |
| Dimension ( L×W×H )                       | 85 mm × 37 mm × 28mm    |
| Weight                                    | 67± 5 g                 |
| Nominal voltage                           | 3.635V                  |
| Capacity                                  | 3500maH                 |
| Device Lifecycle                          | 8 years                 |

## 8.2. Environmental Requirements

Operating and storage requirements

- Operating temperature: 10°C–30°C

- Operating Relative humidity: 30%RH~80%RH
- Storage/Transport temperature: -20°C~60°C
- Operating altitude: < 3000m
- Storage/Transport Relative humidity: 30%RH~90%RH
- MTBF:10000 hours ( except light sources, battery, scanner tip and cables)
- Air pressure: 70 kPa~106 kPa