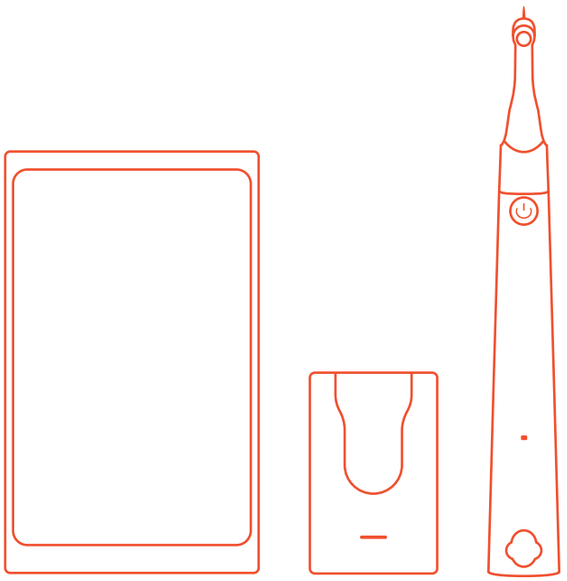
主图



文件名称 Name of the document	根管预备机英文说明书 Endo GT 系列 CE		代码 Code	14.02.09.174
尺寸 Size	205×235mm		出血尺寸 Hemorrhage line	6mm
材质&工艺 Material & Craftsmanship	材质： 工艺：	封面封底：200g 铜版纸 内　页：120g 铜版纸 哑膜 & 主图烫哑光橘金	版本 Version	V1.5
装订&注释 Binding & Annotation	装订： 备注：	胶封 ——	印刷颜色 Printing Colour	彩印 CMYK
设计者 Designer	兰华		设计日期 Design Date	2026.07.14

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WOODPECKER®

桂林市啄木鸟医疗器械有限公司

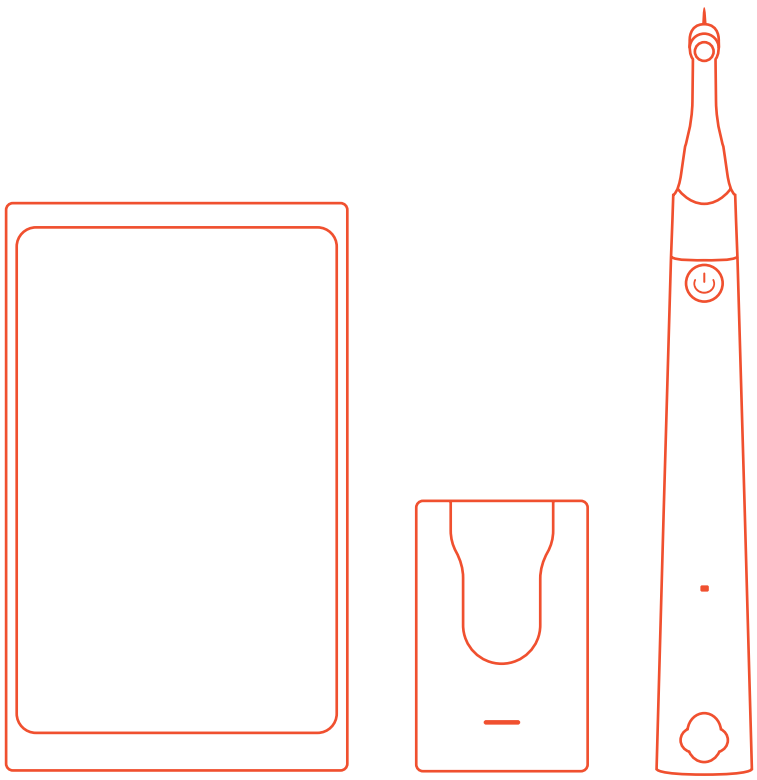
Guilin Woodpecker Medical Instrument Co., Ltd.

CE 0197

INSTRUCTIONS FOR USE

Endo GT Series

Endo Motor and Apex Locator Unit



Please read this IFU carefully before using the device for the first time.

ZMN-SM-1006 V1.5-20260715

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1. Introduction

Thank you for purchasing the Endo GT Series endodontic motor. This Woodpecker medical device is designed for professional use in clinical practice and is equipped with specialized tools for performing endodontic treatments.

Review all provided documentation carefully to ensure optimum safety for yourself and your patients, enhance clinical efficiency, and maximize technological benefits.

If you have received this medical device in error please contact your supplier immediately for return instructions.

The Endo GT Series endodontic motor is mainly used in endodontic treatment to perform mechanical instrumentation with engine-driven latch files and electronic working length determination with the built-in apex locator. It is a battery-operated portable endodontic motor electronically connected to its main unit, which is compatible with the most well-known rotary and reciprocating endodontic file systems. It can be used as an endodontic motor alone, as an apex locator to determine electronically the foramen position, and as an apex locator together with the endodontic motor. The Endo GT Series endodontic motor is a medical device that provides precise, controlled movements, with an apex locator embedded, which offers the advantage of accurate file position readings both alone and during the instrumentation procedure.

Guilin Woodpecker Medical Instrument Co., Ltd. is a leading manufacturer of dental and medical devices. Its ISO 13485-certified production system ensures industry-leading quality across its portfolio of surgical and dental equipment.



WARNINGS:

a. Before operating this unit, please read all the instructions thoroughly. The manufacturer is not liable for any damage resulting from improper use of this unit or for any purposes not covered by these instructions.
b. Use only for the intended use. Failure to comply with the operating instructions may result in serious injury to the patient or operator. Ensure you have read and understood these instructions before operating the device.
c. As per Endodontic Standards of Care, always use a rubber dam when performing endodontic treatment.
d. Do not insert any object into the base or handpiece.
e. Do not install near an explosive risk. Systems are not designed to operate in the presence of anesthetic gases or any other flammable gas (e.g., nitrous oxide, sevoflurane).
f. Only connect to medically certified power sources. Use only the medical-grade supplied power adapter.
g. Do not use dry heat sterilization on any of the device's components.
h. Do not make repairs or alterations to the device without prior consent from the manufacturer or distributor.

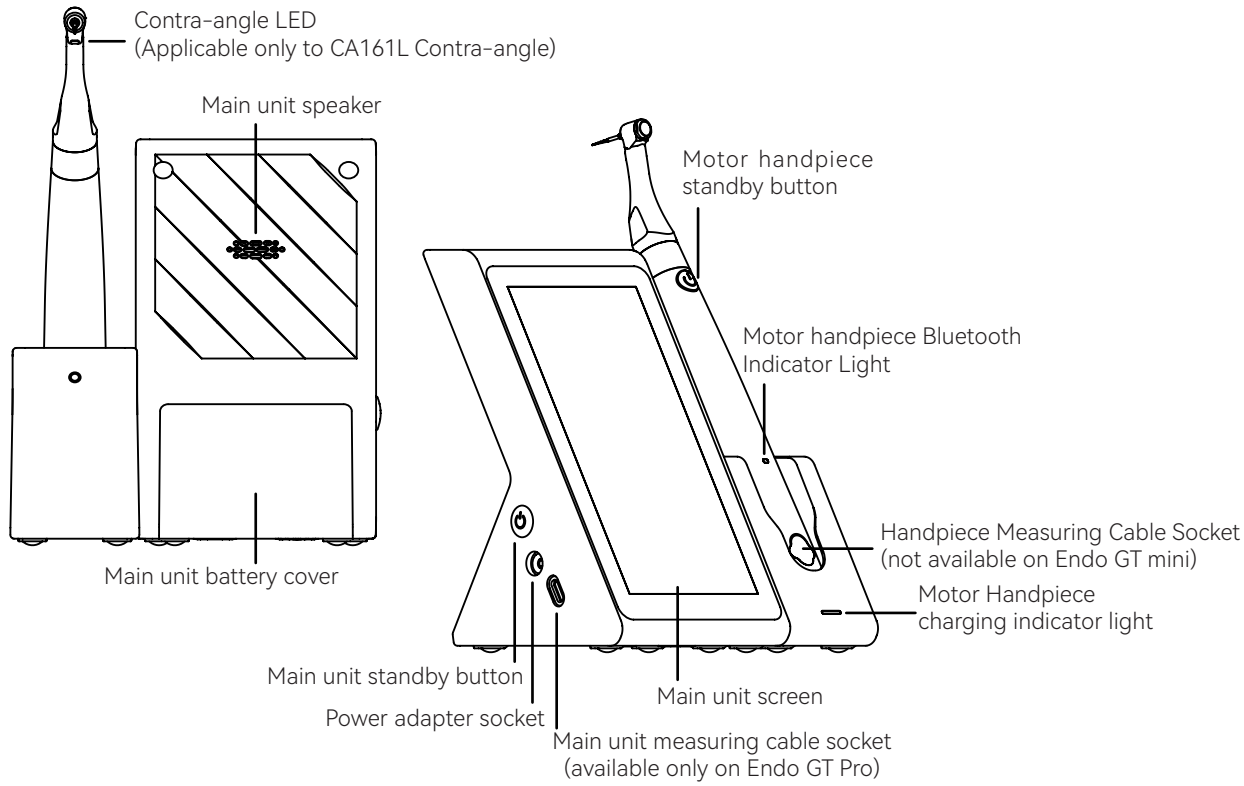
1.1 Product overview

The Endo GT series, including Endo GT mini, Endo GT, and Endo GT Pro, is primarily designed for endodontic treatment.

The Endo GT and Endo GT Pro come with a built-in apex locator. These devices can operate in three modes: motor only, apex locator only, or a combination of both. This versatility allows for the preparation and enlargement of root canals with real-time displays of apex locator readings.

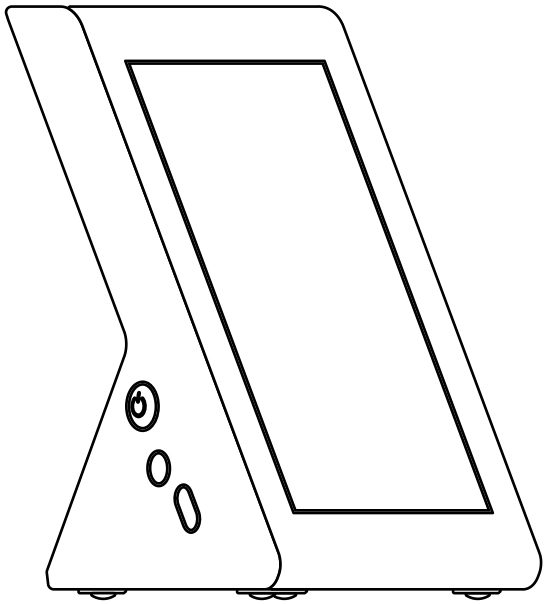
The main unit (base) of Endo GT Pro also supports apex locator alone functionality.

1.2 Product configuration

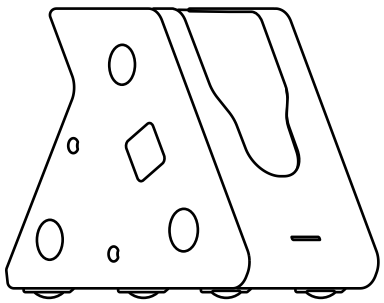


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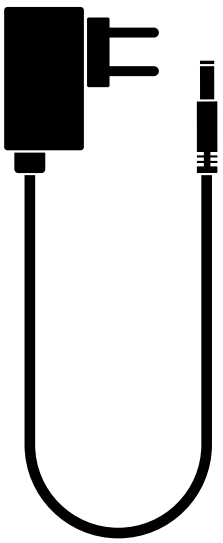
The Endo GT mini model does not include a measuring cable, file clip, lip hook, touch probe, or protective silicone cover.



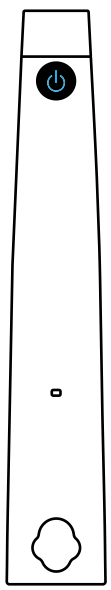
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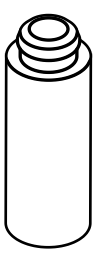
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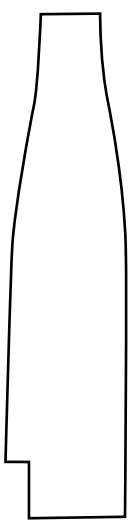
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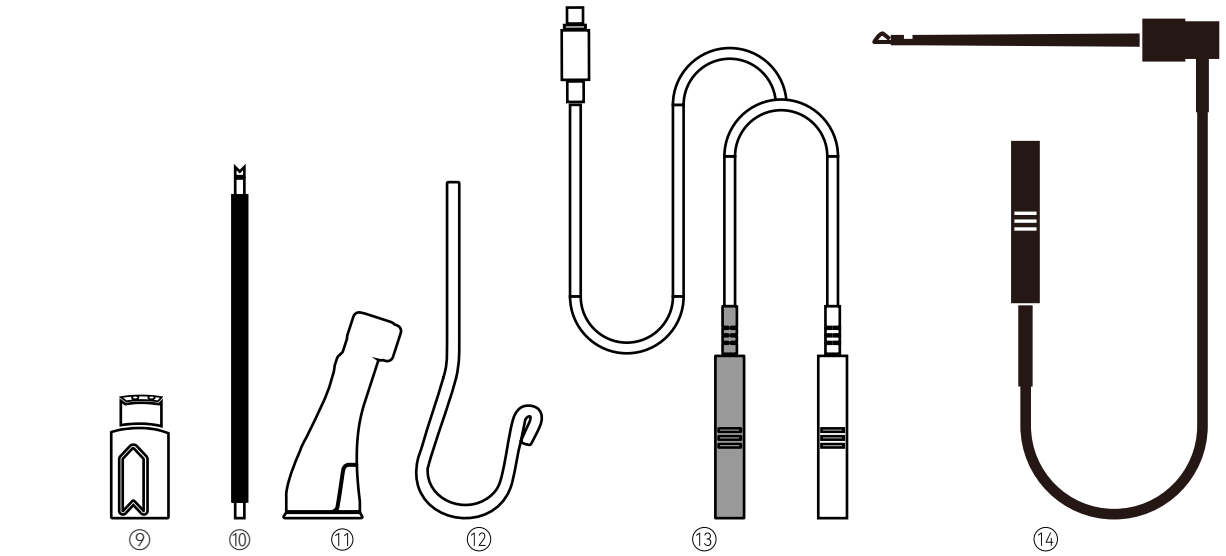


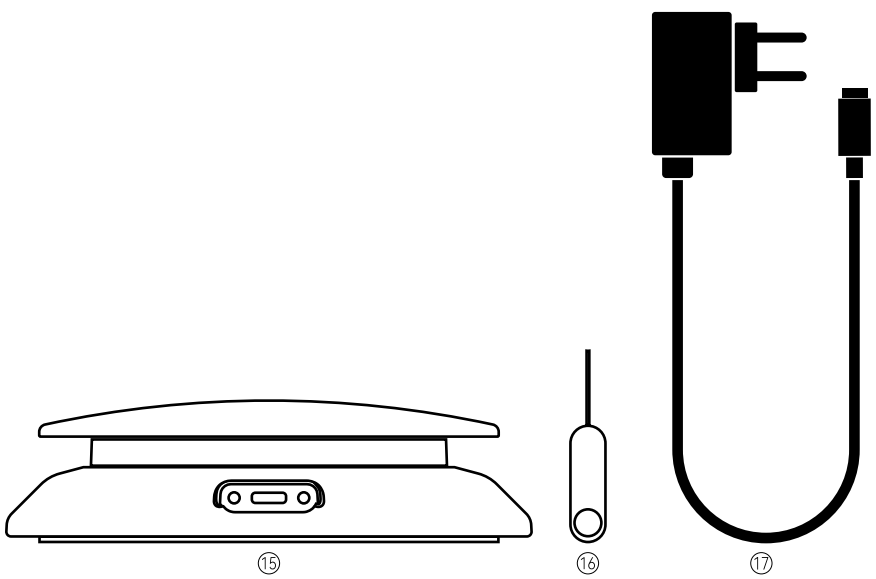
⑦



⑧

① Main unit
② Charging base
③ Power adapter
④ Motor handpiece
⑤ Contra-angle
⑥ Spray nozzle
⑦ Handpiece OTA Upgrade Adapter
⑧ Disposable sleeve





⑨ Tester
⑩ Touch probe
⑪ Protective silicone cover
⑫ Lip hook
⑬ Measuring cable
⑭ File clip
⑮ Wireless foot pedal (PF-2)
⑯ Foot pedal thimble
⑰ Power adapter (PF-2)

IMPORTANT:

1. Accessories included with the model Endo GT mini correspond to Item Numbers 1 through 8.
2. Accessories included with the model Endo GT correspond to Item Numbers 1 through 14.
3. Accessories included with the model Endo GT Pro correspond to Item Numbers 1 through 17.

1.3 Indications for use

1.3.1 Intended purpose

The Endo Motor and Apex Locator Unit is a cordless endodontic motor with integrated root canal length measurement capability. It can be used as an endodontic motor for the preparation and enlargement of root canals or as a device for measuring canal length. The device enables root canal enlargement while monitoring the position of the file tip inside the root canal.

IMPORTANT:

The Endo GT mini model does not support electronic measuring of root canal length (no apex locator integrated).

1.3.2 Intended users

Dentists. Operation of this medical device is limited only to certified, capable, and qualified dental professionals in their regular place of business. The operator must master and comply with the rules of dental practice, adhering to the principles of medical hygiene and the science behind the cleaning, disinfection, and sterilization of medical devices.

This medical device may be used regardless of the characteristics of the (adult) operator, such as weight, age, height, sex, and nationality. The operator should wear gloves.

Operators should not have:

- Uncorrected vision problems.
- A disability of the upper limbs (gripping a rotary tool).
- Hearing impairment that prevents recognition of audio signals.
- Cognitive impairments affecting the ability to follow device settings, file sequences, or treatment protocols.

Special operator training:

No special training other than basic professional training is required to operate this medical device.

WARNING

WARNINGS:

a. This medical device may be used regardless of the characteristics of the patient, such as weight (except for children), age, height, sex, and nationality. Operation of this medical device (Endo GT and Endo GT Pro) is not recommended in the following patient population: implanted heart pacemaker patient (or other electrical equipment), patients who had been cautioned against the use of small electrical appliances (such as electric shavers, hair dryers, etc.) infants, patients with medical complications, allergic patients, patients with a clinical site not suited for the treatment.
b. Treatment should be limited to the patient's buccal cavity only.

1.3.3 Intended patients

Patients who need root canal preparation, enlargement, or canal length measurement. This medical device is designed for use with children, teenagers, adults, and seniors.

WARNING

WARNINGS:

a. The device conforms to applicable electromagnetic compatibility standards. Operators must ensure that no electromagnetic interference causes an increased risk (the presence of radio frequency emissions, electronic devices, etc.).

For Endo GT and Endo GT Pro:

b. Interference may occur when used on patients wearing a pacemaker. This system emits electromagnetic fields, which present potential risks. Implantable devices, such as pacemakers and ICDs (implantable cardioverter defibrillators), may malfunction.
c. Before using this product, ask patients and operators whether they are wearing an implanted device. Explain the reason for your question.
d. Determine the risk/benefit ratio and contact your patient's cardiologist or applicable specialist before carrying out the treatment.
e. Keep this product away from implanted devices.

1.4 Contraindications

a. Dentists with cardiac pacemakers are prohibited from using this device.

b. Patients with cardiac pacemakers (or other implanted electronic devices) are prohibited from using this device.

c. Hemophilia patients are prohibited from using this device.

d. Use with caution in patients with heart disease, pregnant women, and young children.

1.5 Device safety classification

1.5.1 Type of operation mode: Intermittent operation

a. When the speed is ≤ 1200 rpm, operate continuously for 10 minutes and stop for 5 minutes.
b. When the speed is > 1200 rpm, operate continuously for 6 minutes and stop for 20 minutes.

1.5.2 Type of protection against electric shock: Class II equipment with internal power supply

1.5.3 Degree of protection against electric shock: The contra-angle, file clip, touch probe, and lip hook are Type B applied parts.

1.5.4 Ingress protection (IP) rating:

a. Ordinary equipment: IPX0 (not protected against water).
b. Wireless foot pedal: IPX1 (Protected against vertically falling drops)

1.5.5 Safety in flammable atmospheres: Not suitable for use in the presence of flammable anesthetic mixtures with air, oxygen, or nitrous oxide.

1.5.6 Applied parts: Contra-angle, lip hook, file clip, touch probe, protective silicone cover.

1.5.7 List of detachable parts: Lip hook, file clip, touch probe, contra-angle.

1.6 Primary technical specifications

1.6.1 Battery:

- Main unit lithium battery: 11.1 V / 2600 mAh
- Motor handpiece lithium battery: 3.7 V / 1200 mAh
- Wireless foot pedal lithium battery: 3.6V/750mAh

1.6.2 Power adapter

Power adapter for main unit (UES24LCP-150160SPA):

- Input: 100V-240V ~ 50Hz/60Hz, 800mA
- Output: 15V ⎓ 1.6A

Power adapter for PF-2 (UES06WNCP-050100SPA):

- Input: 100V-240V ~ 50Hz/60Hz, 0.2A
- Output: 5V ⎓ 1.0A

1.6.3 Main unit input power: 100V-240V~ 50Hz/60Hz, 0.8A—0.3A

1.6.4 Torque range: 0.4 N·cm ~ 5.0 N·cm (4 mN·m ~ 50 mN·m)

1.6.5 Speed range: 50 rpm ~ 3000 rpm (This speed range is only for the Contra-angle with a 6:1 reduction ratio)

1.6.6 Contra-angle models CA161L and CA161 use precision gear transmission with a 6:1 reduction ratio.

1.6.7 Software release version: V1

1.6.8 Wireless charging:

- Frequency range: 110–205 kHz
- Maximum RF output power: 25.27 dBuA/m @ 3m

1.6.9 Bluetooth and frequency ranges:

- Motor handpiece Bluetooth frequency range: 2402-2480 MHz, Maximum RF output power: -6.41 dBm
- Main unit Bluetooth frequency range: 2402-2480 MHz, Maximum RF output power: 4.12 dBm
- Main unit WiFi frequency range: 2412-2472 MHz, Maximum RF output power: 14.93 dBm
- Wireless foot switch Bluetooth frequency range: 2402-2480 MHz, Maximum RF output power: 0.26 dBm

1.7 Working environment

1.7.1 Ambient temperature: +5 °C to +35 °C

1.7.2 Relative humidity: 30% to 75%, non-condensing

1.7.3 Atmospheric pressure: 70 kPa to 106 kPa

WARNINGS:

- Read this instruction manual thoroughly before operating for the first time.
- This device shall be operated exclusively by professionally qualified dentists within qualified dental clinics or dental hospital settings.
- Do not directly or indirectly place this device near heat sources. Operate and store this device in a reliable environment.
- This device requires special precautions regarding electromagnetic compatibility (EMC) and must be installed and used in strict accordance with the EMC information provided. Avoid operating this device near fluorescent lamps, radio transmitters, remote control systems, or handheld and mobile high-frequency communication equipment.
- During electromagnetic interference (EMI) events in specific diagnostic/therapeutic procedures, this motor may fail to halt or be unable to initiate operation, compromising treatment progress.
- Prolonged use of the reciprocating motion mode may cause the motor handpiece to overheat. Allow it to cool down before reusing. If overheating occurs frequently, please contact your local distributor.
- Use only the original contra-angle. Use of unauthorized accessories may result in malfunction or potential harm.
- Do not modify the device. Unauthorized alterations may compromise safety standards and put patients at risk. The manufacturer assumes no liability for any modifications made to devices.
- The motor handpiece cannot be autoclaved. Clean its surface with a neutral pH disinfectant or ethyl alcohol, then dry it with a fluffy cloth.
- Do not press the contra-angle's push button until it stops rotating. Pressing it prematurely may cause damage to the contra-angle.
- Do not remove the contra-angle until the motor handpiece stops rotating; otherwise, the contra-angle and the gear inside the motor handpiece may be damaged.
- Confirm whether the file is well installed and locked before starting the motor handpiece.
- Incorrectly replacing lithium batteries may pose significant risks. Always use the original battery and follow the replacement steps provided in the instructions.
- For long-term storage, please recharge the battery to approximately 50% every 6 months to maintain the health of the lithium-ion battery.
- Use only the original power adapter. Third-party adapters may damage the lithium battery and control circuitry.
- Do not place the device in areas where it is difficult to disconnect the power supply.Disconnecting the power adapter will separate the device from the mains power.
- Remove the battery if the main unit is not used for a long time.
- Before using the instrument, ensure that it is securely locked in place.
- Do not use continuous rotary instruments in left-cutting reciprocating mode if the forward angles are larger than the reverse angles.
- Never use left-cutting reciprocating endodontic files (i.e., Wave One, Wave One Gold, InnoOne, ReciShaper, Edg-eOne Fire, ESR, and similar) in forward rotary mode.
- Do not use left-cutting reciprocating endodontic files (i.e., Wave One, Wave One Gold, InnoOne, ReciShaper, EdgeOne Fire, ESR, and others) in CW/CCW/ATR mode.
- If the TorqueSense® mode is not applied, always use the torque and speed settings recommended by the instrument manufacturer.
- Wireless charging generates heat, which may increase the surface temperature at the tail of the motor handpiece. Monitor temperature changes to avoid user discomfort.

IMPORTANT:

Endo GT Series motors feature TorqueSense (Real Time Automatic Torque Setup), ATR (Adaptive Torque Reverse function), torque-controlled auto-reverse, auto-stop, apex locator-controlled apical stop, auto-start, and apical reverse, which may help prevent endodontic file separation for the operator. The aforementioned features will not entirely halt endodontic file separation due to the nature of the endodontic instruments and instrumentation itself. Factors like canal morphology, obstructions, calcifications, patient and tooth age, presence of foreign materials, retreatment, instrument type, and number of uses, among others, are key aspects that determine the risk of endodontic file separation during

instrumentation and cannot be surpassed by the motor file separation prevention features.

2. Installation and Settings

CAUTION:

Have all the connections between your device and the power grid made by a certified dental installation technician. The power grid to which the motor is connected must comply with the applicable international standards.

2.1 Unpacking and installation

• Woodpecker units undergo thorough checks before shipment. Conduct an inspection promptly after delivery.

• Remove the box and its accessories from their original packaging and place them on a flat surface. Do not install direct or indirect sources of heat.

• Verify the contents of the box, referring to Section 1.2 “Product Configuration”.

• Do not bend the power cord, which may cause damage.

• All supplied accessories have not been sterilized.

• Place the base on a stable, horizontal surface with a slope no greater than 5°.

2.2 Disinfection and sterilization (before initial use and each subsequent use)

To ensure aseptic conditions during treatment and reduce cross-contamination risks, the following core components require rigorous cleaning, disinfection, and sterilization prior to initial use and each subsequent treatment; specific sterilization procedures are detailed in Section 11.

• **Contra-angle:** Engineered with an integrated precision gear transmission system (Gear Ratio 6:1), this component must undergo cleaning, disinfection, and sterilization in accordance with the specified procedures before initial use and after each subsequent use. Lubrication must be performed prior to sterilization.

• **Lip Hook, File Clip, Touch Probe, and Protective Silicone Cover:**

These components directly contact the patient’s oral tissues and dental instruments, so they must be thoroughly cleaned, disinfected, and sterilized immediately after each use.

• **Disposable sleeve:**

Although it is designed for single use, its package integrity must be verified prior to use. After installation, its surface must be cleaned and disinfected.

2.3 Installing the Contra-angle

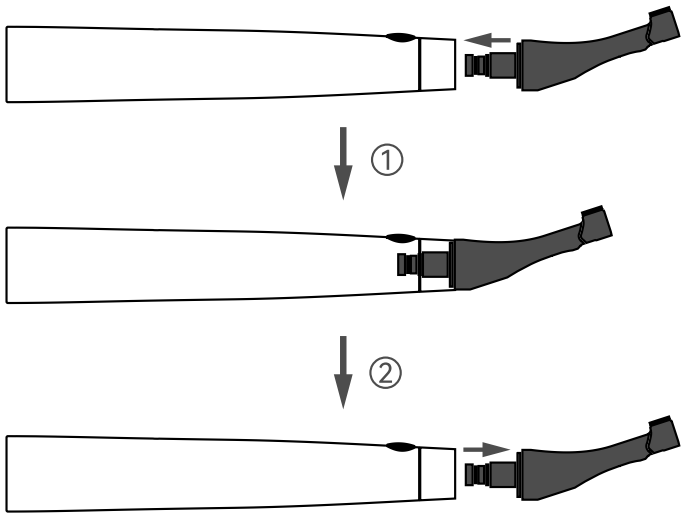
2.3.1 Pre-installation Preparation

• Ensure the motor handpiece is in a halted status (indicator light is not flashing) to prevent injury from accidental activation during installation.
• Visually inspect the contra-angle (Model CA161L and CA161) for absence of contamination, deformation, or component damage. Its internal 6:1 precision gear transmission system must be used exclusively with original motor units only.
• For initial use or after prolonged storage, verify that the contra-angle has been cleaned, lubricated, and sterilized in accordance with the specified procedures.
• The expected service life of the contra-angle is 10 years, but may vary depending on the frequency and duration of clinical use, as well as the difficulty of the root canals being treated.

2.3.2 Installing the Contra-angle

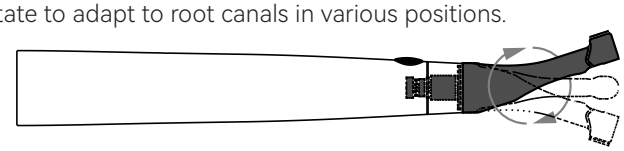
1. Securely hold the motor handpiece while horizontally aligning the contra-angle handpiece with the coupling port. Gently insert until slight resistance is felt, without forcing.
2. Continue pushing steadily until an audible click is heard, confirming locking engagement.
3. Post-installation check:

The contra-angle must be flush with the motor handpiece housing (no visible gap), exhibit zero looseness during gentle rotation, and have a secure connection.



IMPORTANT:

The contra-angle can freely rotate to adapt to root canals in various positions.



2.4 Turn on the main unit and verify Bluetooth connection status

2.4.1 Turn on the main unit

• Press the standby button briefly on the main unit to activate the device. The screen will first display the product model and then transition to the last-used operation mode, confirming successful initiation.

WARNING:

The motor handpiece cannot be started while charging or in apex locator only mode.

2.4.2 Verify Bluetooth connection status

After turning on the main unit, observe the Bluetooth indicator light on the motor handpiece:

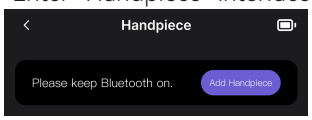
• A solid blue light indicates a successful Bluetooth connection to the main unit.
• No indicator light means the motor handpiece is not connected or the Bluetooth pairing has failed — this requires immediate re-pairing (see Section 2.4.3).

2.4.3 Bluetooth connection procedure (when unconnected)

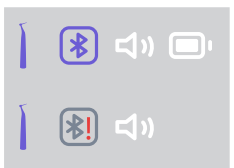
1. Turn on the motor handpiece.



2. On the main unit interface: Tap “Settings” → Enter “Handpiece” interface → Tap “Add Handpiece”.



3. From the Bluetooth device list:
• Select the target handpiece's serial number → Tap "Start Connection".
• Upon successful pairing, "Connected" will be displayed beside the serial number.
• At the same time, the Bluetooth indicator icon in the motor handpiece status section on the upper side of the main unit will also change accordingly.
The specific meanings are shown in the figure below:



Motor handpiece is connected

Motor handpiece connection failed.
Please reconnect.

IMPORTANT:

• When using the same motor handpiece, Bluetooth pairing is required only during the initial use; subsequent startup will automatically establish a connection between the handpiece and the main unit.
• The main unit's default auto-off time is 60 minutes, which can be adjusted to 30, 60, or 90 minutes as needed.
• If the motor handpiece is activated independently while the main unit is powered off, it will operate using the last saved settings.

2.5 Installing the protective silicone cover

IMPORTANT:

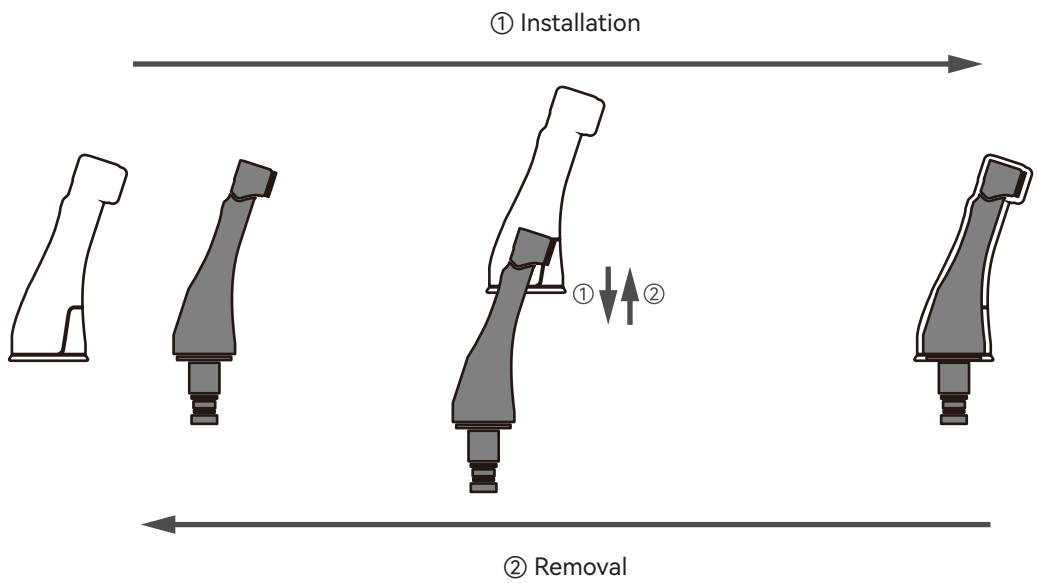
This step is required in Guided Instrumentation (motor combined with apex locator mode)

① Installation

Put the protective silicone cover onto the contra-angle.

Warnings

The silicone cover must completely encase the contra-angle handpiece.



② Removal

When removing the protective silicone cover, pull it straight out slowly.

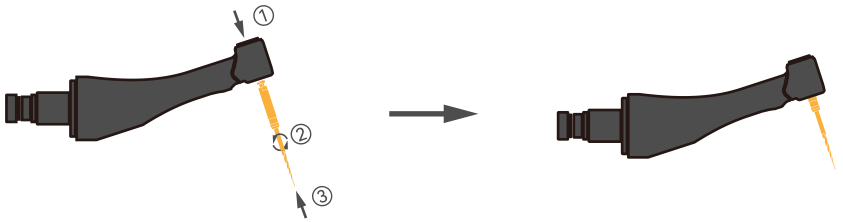
Warnings

The silicone protective cover must be cleaned, disinfected, and sterilized according to Section 9 after each use.

2.6 Mounting and Removal Files

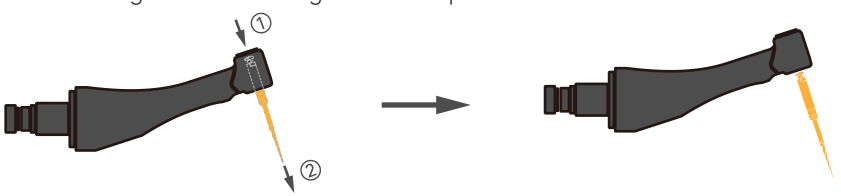
2.6.1 Mounting Files

1. Preparatory Steps: Ensure that both the motor handpiece and contra-angle have completely stopped running (no signs of any rotation) to avoid file ejection or hand injuries caused by accidental activation during operation.
2. File Insertion: With one hand, press the push button on the contra-angle, hold the file shank with the other, gently rotate the file, and insert it into the contra-angle's chuck.
3. Lock Verification: When the file is fully inserted, a slight "click" sound will be heard. Then gently pull and rotate the file to confirm that it is securely locked, with no signs of looseness or wobbling.



2.6.2 Removal of Files

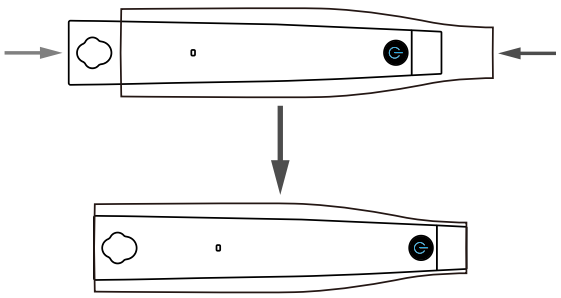
1. Stop-Verify Protocol: Confirm that the file has stopped rotating completely and that both the motor handpiece and contra-angle are motionless.
2. Extraction Procedure: Depress the push button on the contra-angle. While maintaining the button depressed, gently extract the file to prevent bending or chuck damage from abrupt force.



IMPORTANT:

• Using fatigued or damaged files may result in file separation. Therefore, check the file before installation to ensure it is intact and free from bends, cracks, or deformation.
• After each installation, verify that the chuck system is functioning properly to ensure the file will not detach during treatment.
• Upon completion of root canal preparation, carefully remove the instrument from the patient's mouth to avoid causing injury.
·Shank type and dimensions:
The contra-angle handpiece uses files with a Type 1 shank in accordance with ISO 1797. The maximum shank diameter shall not exceed 2.350 mm, and the minimum clamping length is 9 mm.
·Maximum permissible overall length and working diameter of rotary instruments:
The maximum permissible overall length of rotary instruments used with the contra-angle handpiece is 46 mm, and the maximum working diameter is 1.20 mm.

2.7 Disposable sleeves



① Installation

1. Before each use of the handpiece, and after it has been cleaned and disinfected, put on a disposable sleeve. Remove the isolation sleeve from the box and insert it into the motor handpiece from the narrow end. Make sure the sleeve fits smoothly without any visible wrinkles.

2. Once the disposable sleeve is installed, wrap barrier film around the surface of the handpiece. After that, clean and disinfect the surface according to the procedures outlined in Section 11.

② Removal

After each use, carefully remove the barrier film and gently pull the isolation sleeve from the narrow end of the handpiece.

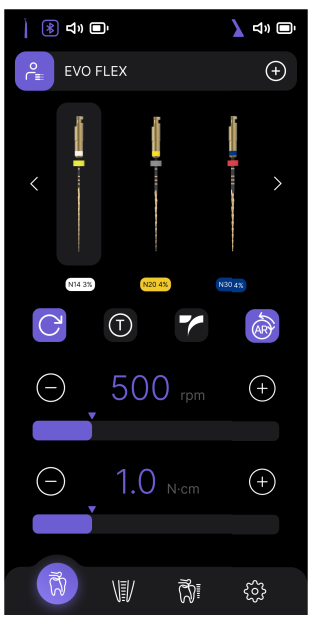
WARNING:

Isolation sleeves are not reusable.

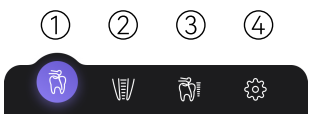
3. Basic Operations

3.1. Select the Operation Mode

01. Select the desired operation mode located at the bottom of the main display.
02. Select for ① motor only (or motor alone); ② apex locator only; ③ motor combined with apex locator (monitored instrumentation).



1

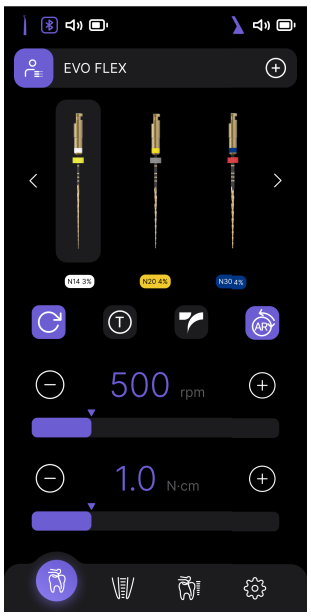


2

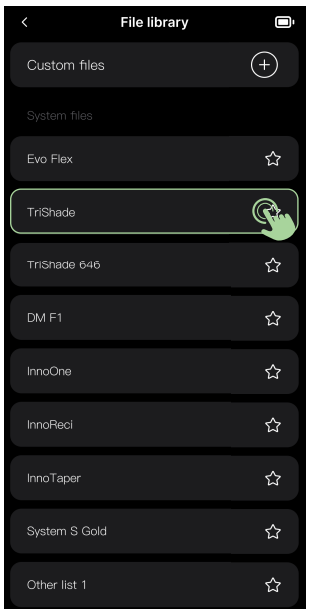
3.2. Select the File Sequence

01. On the main interface, tap the icon to select the desired file sequence.
02. On the “File library” interface, select the desired file sequence from the list.

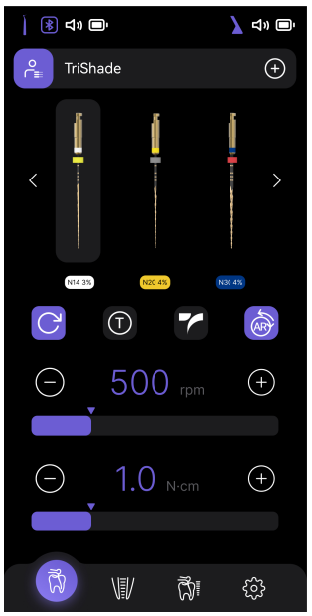
03. After making your selection, you will return to the main interface. The chosen sequence will adhere to the manufacturer's specifications, including operation mode (e.g., rotary or reciprocating), speed, and torque.



1



2



3

3.3. Selecting File Operation Mode (different from the file system manufacturer's default setting).

IMPORTANT:

Before changing the file mode (movement), ensure that it is fully compatible with the selected file design.
01. Tap the Mode button to open the "Mode setting" interface.
02. Select the desired mode and tap the "" button.
03. With the prompt "Confirm changing file parameters," choose to save changes either permanently or temporarily.

3.3.1. File Mode Operation Descriptions:

IMPORTANT:

The maximum rotational speed available is 3,000 rpm.

Mode	Icon	Description
CW		Rotation in a clockwise (forward) direction. This applies to engine-driven rotary files, including Largo, Peeso, and Gates Glidden drills. The speed of 50~3000rpm are available.
CCW		Rotation in a counterclockwise (reverse) direction. The speed of 50~3000rpm are available.
REC		Reciprocation kinematics refers to the alternating rotation with asymmetric angulations used in engine-driven files that cut in reverse (counterclockwise), such as Reciproc, Wave One, InnoOne, and ReciShaper. In this category of files, the reverse angle must be larger than the forward angle (for example, 150° for reverse and 30° for forward). The REC reciprocating motion can also be applied to rotary files (designed to cut clockwise or forward), which is common among most rotary files on the market. For this group of files, the reverse angle should be smaller than the forward angle (for example, 90° for forward and 30° for reverse). In the REC mode, the speed of 50~500rpm are available, the angle of 20° ~ 400° are available, step 5°.

ATR		Adaptive Torque Reverse function is a hybrid kinematic option controlled by a set torque value adjusted by the operator. When the torque reaches the threshold determined by the operator, the file's motion shifts from rotary (clockwise) to reciprocating. Once the file is released and falls below the established torque threshold, the motion returns to rotary movement. The speed of 50~500rpm are available, and the forward angle of 60° ~400° and the reverse angle of 20° ~ 400° are available, step 5°.
SGP		Safety Glide Path mode is an alternate rotary movement (also known as oscillation) involving equal angular displacements (e.g., 90° forward and 90° reverse). It is designed to gently cut dentin while advancing slowly apically. The speed of 50~500rpm are available, And the Angle of 20° ~400° are available, adjustable every step 5°.

Woodpecker Exclusives (unique movements offered only by Woodpecker)

a. TorqueSense™

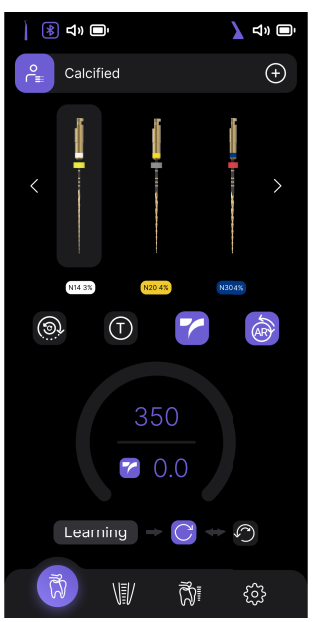
IMPORTANT:

TorqueSense mode is for use only with rotary files designed for clockwise rotation, at speeds up to 500 RPM.

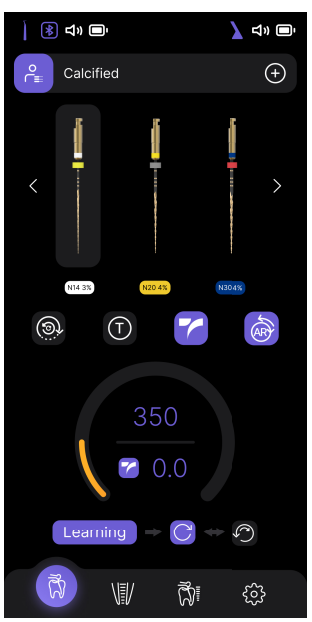
TorqueSense is a real time automated torque detection mode that learns the torque applied in the region where the file contacts the dentin walls upon insertion into the canal. It calculates the optimal torque limit for that specific moment in the instrumentation process.

When the user inserts the rotary file into the canal and encounters a specific level of resistance, the motor automatically begins to assess the torque requirement. This learning process lasts for two seconds. During this brief interval, the user will hear an intermittent beep, and the display will indicate that the system is in the learning phase. Following the two-second learning phase, the motor will determine the ideal torque for the file's cutting action in that particular area. At this juncture, the user will hear a short, continuous beep, and the display will present the calculated torque value provided by TorqueSense.

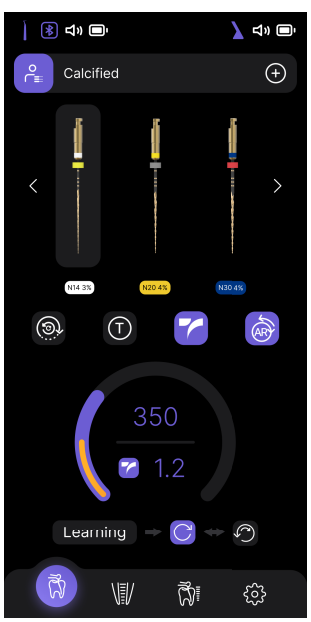
If the user applies apical pressure to the file and reaches the torque threshold established by TorqueSense, the motor will initiate reciprocation at the angles designated by the user. Should the user cease cutting by retracting the file, TorqueSense will reset and commence the learning process anew upon encountering resistance during the next application.



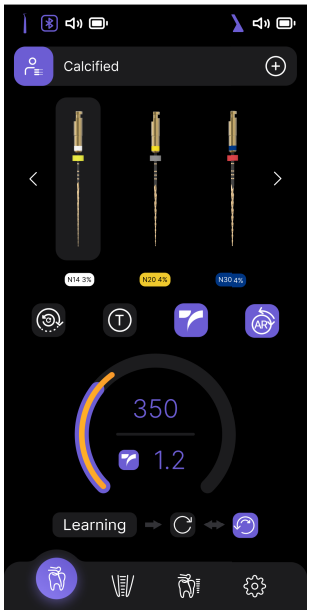
①



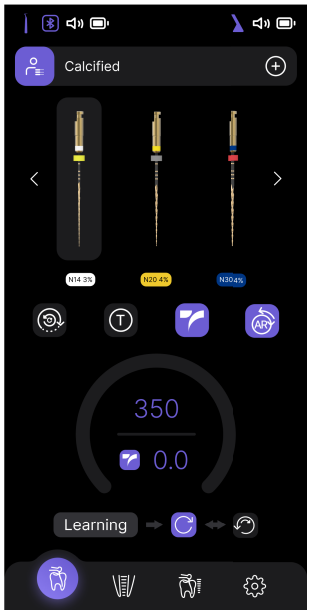
②



③

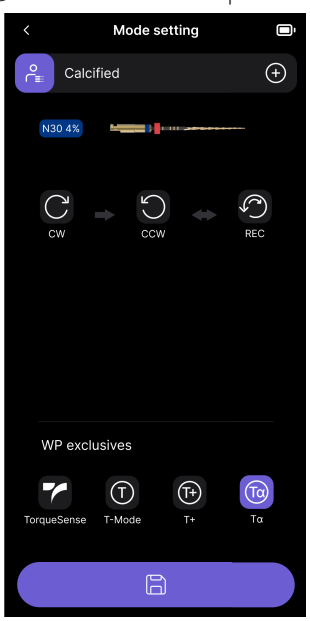


④



⑤

① TorqueSense has been selected.
② Initiating learning phase (2 seconds).
③ TorqueSense torque value calculated.
④ TorqueSense value validated. Movement transitions to reciprocation.
⑤ File withdrawn. TorqueSense reset.



b. T-Mode

Application: Severely curved canal
Step 1: Safe ledge bypassing
Perform a “watch-winding” motion at a fixed 90° to go over the ledge.
Step 2: Ledge reducing
Press the main button to switch to CW / CCW/ REC / ATR mode for ledge reducing.

c. T-Mode α

Application: Double-curvature canal with two ledges (one ledge at each curvature)
Step 1: REC or CW or CCW or ATR
Step 2: REC or CW or CCW or ATR
Step 3: REC or CW or CCW or ATR

d. T-Mode+

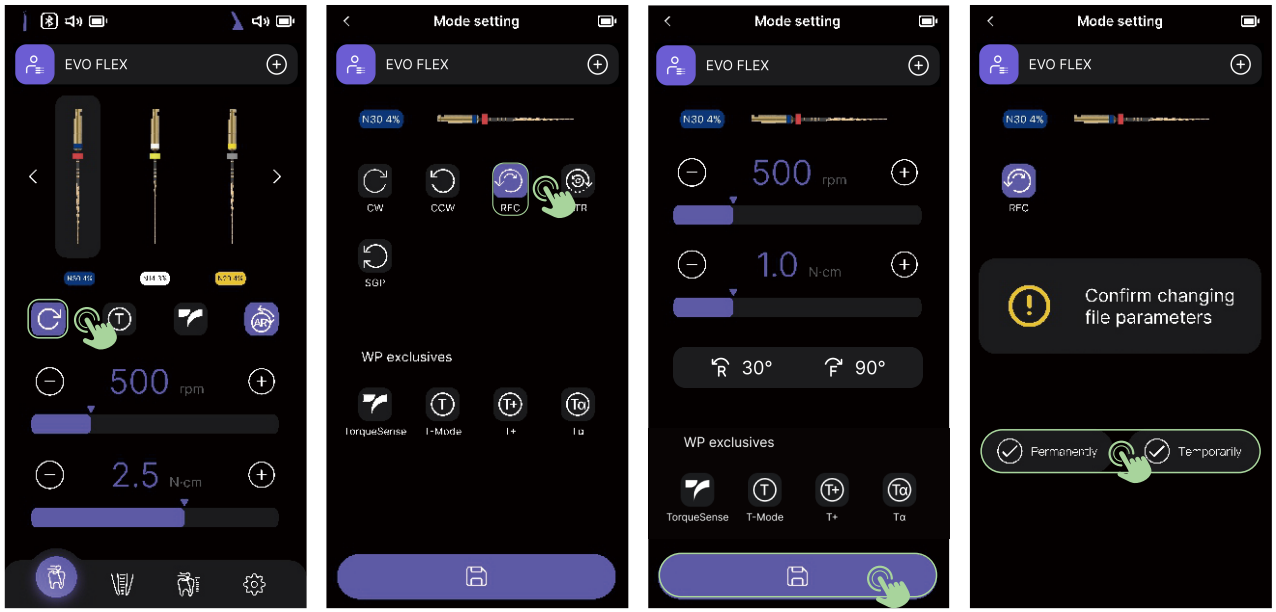
Application: Severely curved canal or double-curvature canalwithout ledges, good for MTA obturation without sonics
Step 1: SGP mode
Step 2: REC or CW or CCW or ATR
Step 3: REC or CW or CCW or ATR

3.4. Setting file operation mode parameters

IMPORTANT:

Before changing the file operation mode, ensure the selected file is compatible with the desired movement.
01. Tap the Mode button and enter “Mode setting” interface.

02. Long-press the selected mode to edit parameters (speed, torque, angle).
03. Tap the “ ” button to save changes.
04. When prompted “Confirm changing file parameters”, choose to save permanently or temporarily.



1 2 3 4

4. Operations Modes

4.1. Apex Locator and Motor Combined with Apex Locator Modes

IMPORTANT:

The Endo GT mini model does not support electronic measuring of root canal length (no apex locator integrated).
The Endo GT and Endo GT Pro endodontic motors offer three distinct operating modes to accommodate the preferences of the user. These modes include:
a. Motor only (operating the motor independently),
b. Apex locator only (used with a hand file for electronically determining the foramen position),
c. Combined mode (or monitored instrumentation), where the motor works in conjunction with the apex locator.

In combined mode (or monitored instrumentation), the motor operates simultaneously with the apex locator, providing real-time readings while the endodontic file is being advanced inside the canal.

IMPORTANT:

a. Prior training in typodont models or extracted teeth is recommended to familiarize oneself with the equipment and its features.
b. If the operator is not trained in the use of the motor concurrently with the apex locator (motor and apex locator combined mode or monitored instrumentation), it is recommended to use the motor-only mode. Operators can always use the apex locator only mode first to determine the working length and then use the motor only mode for instrumentation.
c. Basic training and knowledge about the operating principles of the electronic working length determination (apex locator) are necessary to operate the apex locator only mode.

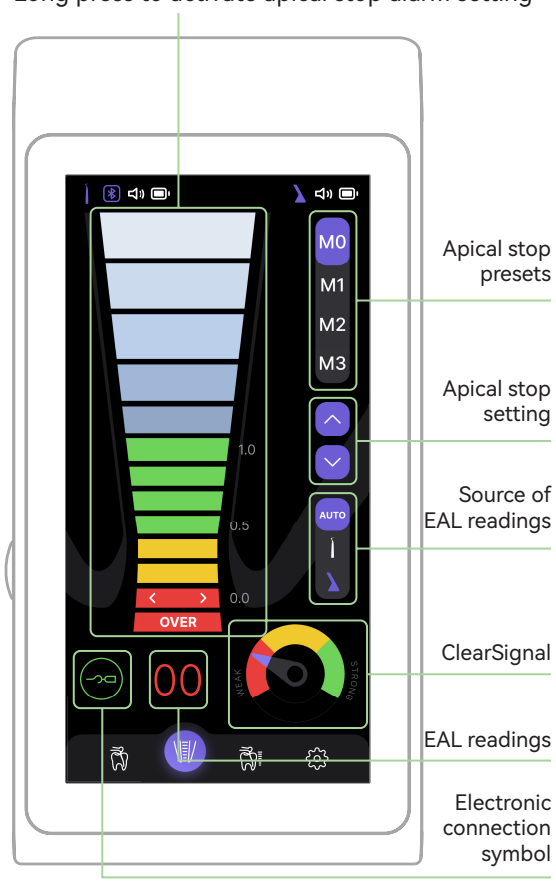
WARNING:

According to the Endodontic Standards of Care, always use rubber dam isolation when performing endodontic treatment.

CAUTION:

• Do not use this unit in apex locator or combined mode on patients with pacemakers.

Long press to activate apical stop alarm setting



Color zone definitions:

• Blue zone: The file tip is located at the beginning of the apical third (approximately 4 mm distance to the foramen exit).

• Green zone: File tip located at the apical third.

• Orange zone: File tip approaches the apical foramen.

• First red bar: File tip is at the foramen exit (foramen equator) position (±0.5 mm)

• Second red bar ("OVER"): File tip exceeds the apical foramen position to the PDL or beyond (indicating over-instrumentation).

4.2. Use the main unit to perform the apex locator function only (only Endo GT Pro)

1. Insert the measurement wire's Type-C connector into the root canal measurement port (labeled APEX) on the lower left side of the main unit.

2. Plug the lip hook into the white socket of the measurement wire and connect the file clip to the gray socket.

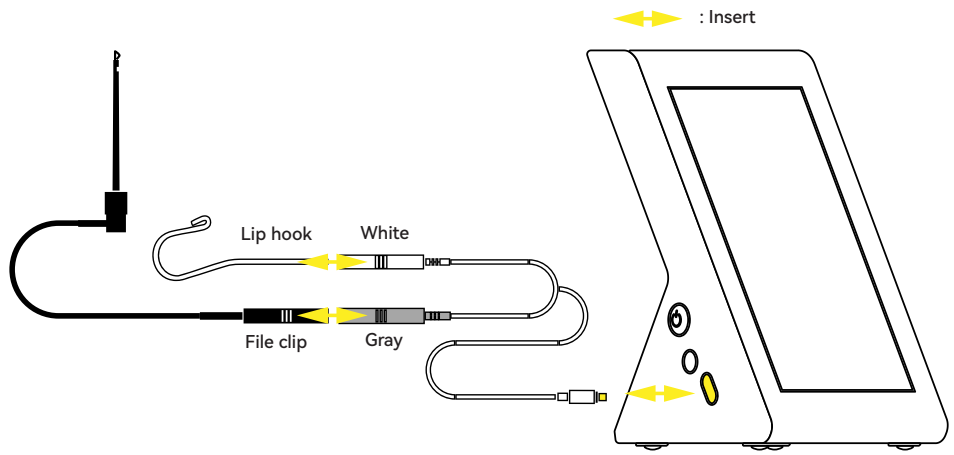
3. Power on the device provided to initiate the electronic working length determination. The display of the main unit will indicate the file's position in relation to the foramen's position (0.0).

4. Insert a hand file with the appropriate diameter and adjust it to the temporary working length, which should be approximately 4-5 mm shorter than the length indicated by the radiographic image of the canal. Once the file is properly positioned, secure it in the file clip.

5. As the file approaches the foramen exit, the main display will show the electronic measurements and the position of the file tip in relation to the foramen. The numbers do not reflect the position in millimeters but serve as a reference for the proximity to the foramen.

6. When the file reaches the foramen position (0.0), adjust the rubber stopper to align with the reference point, such as the incisal

edge or the tip of the cuspid. Remove the file and measure the distance between the stopper and the file tip using an endo ruler; this distance indicates how far the foramen exit is. Determine the working length according to your preferred technique.



WARNING:

The motor handpiece is not required in this mode.

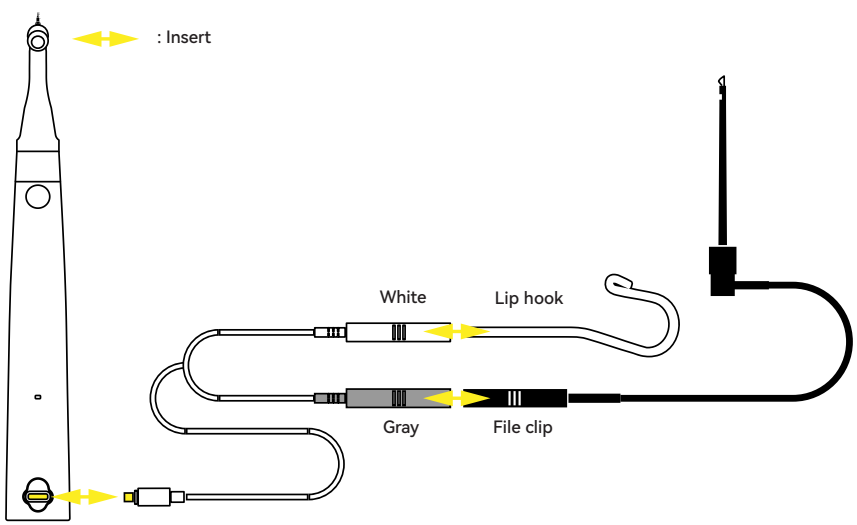
4.3. Perform the apex locator alone function using the apex locator built into the motor handpiece (only Endo GT and Endo GT Pro models).

1. Insert the measurement wire's Type-C connector into the root canal measurement port (APEX) located at the lower end of the motor handpiece.

2. Plug the lip hook into the white socket of the measurement wire and connect the file clip to the gray socket.

3. Power on the device according to the instructions provided to initiate the electronic working length determination. The main unit's display will indicate the file's position in relation to the foramen's position (0.0).

4. Insert a hand file with the appropriate diameter and adjust it to the temporary working length, which should be approximately 4-5 mm shorter than the length indicated by the radiographic image of the canal. Once the file is appropriately positioned, secure it in the file clip.



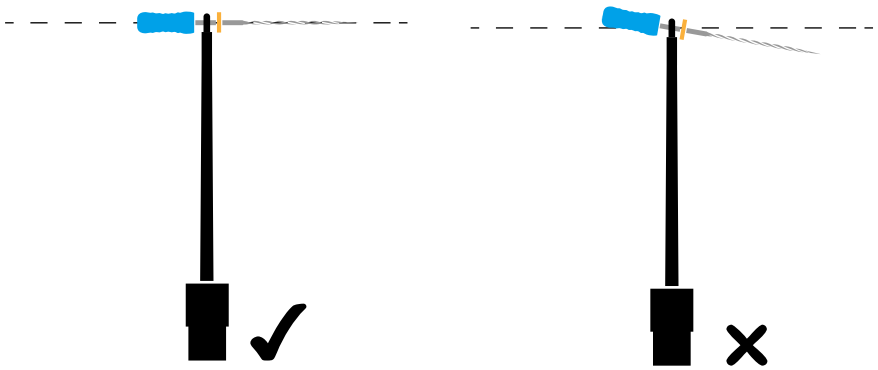
5. When the file reaches the foramen position (0.0), adjust the rubber stopper to align with the reference point, such as the incisal

edge or the tip of the cuspid. Remove the file and measure the distance between the stopper and the file tip using an endo ruler; this distance indicates how far the foramen exit is. Determine the working length according to your preferred technique.

WARNING:

• In this mode, the motor handpiece is powered but not in use. Do not pull the wire by hand when inserting or removing the Measuring cable and file clip.

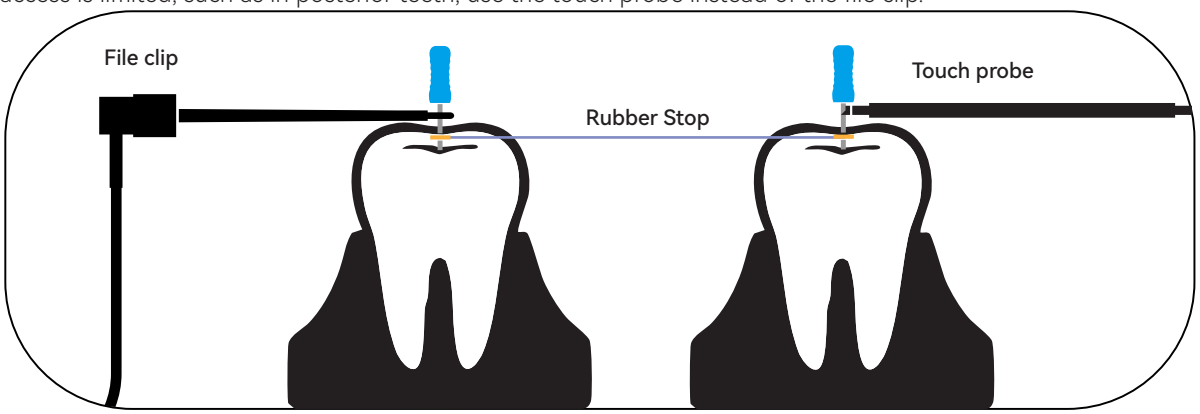
• Do not use a worn file clip, as this may lead to inaccurate measurements. Always grip the file as shown in (a) and avoid the incorrect grip demonstrated in (b).



(a) (b)

• When the file reaches the foramen position (0.0), adjust the rubber stopper to align with the reference point, such as the incisal edge or the tip of the cuspid. Remove the file and measure the distance between the stopper and the file tip using an endo ruler; this distance indicates how far the foramen exit is. Determine the working length according to your preferred technique.

• If access is limited, such as in posterior teeth, use the touch probe instead of the file clip.



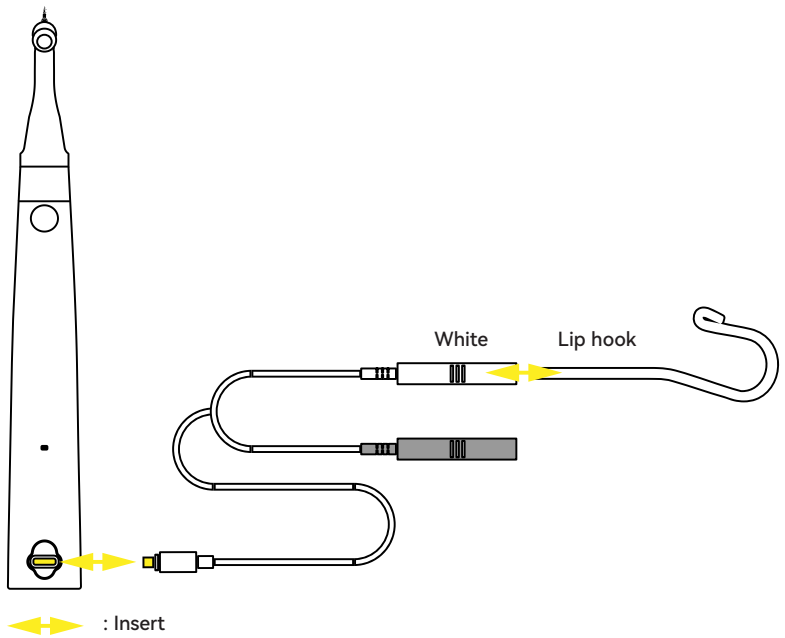
4.4. Perform the instrumentation with the apex locator's concomitant electronic measurement using the apex locator built into the motor handpiece (only Endo GT and Endo GT Pro)

1. Connect the contra-angle to the motor handpiece and then attach a suitable rotary file to the contra-angle.

2. Insert the measuring cable's Type-C connector into the root canal measurement port (APEX) located at the lower end of the motor handpiece.

3. Plug the lip hook into the white socket of the measuring cable, leaving the gray socket unused.

4. Power on the handpiece. Once the file starts operating inside the canal, the main display will show the electronic measurements and the position of the file tip relative to the foramen exit.



WARNING:

Choose 0.0 position for the foramen exit electronic location.

4.5. ClearSignal™ feature

Clearsignal is a unique feature of Woodpecker that indicates whether the electronic signal is consistently passing through the canal trajectory as a stable signal (strong) or if there are any disturbances or interruptions (weak) affecting the signal between emission and reception. The ClearSignal indicator activates when the output signal is detected and remains active until the operation ends.



1. If the ClearSignal dial shows a weak signal, or even if the dial is oscillating between the red and yellow areas, the user needs to execute the following:

a. Check all cable connections and ensure that the lip clip is in contact with the mucosa.
b. Fill the canal with an electrolytic solution up to the level of the pulp chamber floor.
c. Verify that the file clip is contacting the file (apex locator in stand-alone mode).
d. Ensure that the tip of the hand file touches at least two-thirds of the dentinal walls. If the tip is loose, switch to a larger diameter file until the tip contacts the dentin walls in the apical third (apex locator in stand-alone mode).
e. Confirm that the engine-driven file being used is compatible with the apex locator mode, as some engine-driven files on the market may not allow for electronic signal transmission (only functioning in combined motor and apex locator mode).

4.6. Connection test (test before each use)

Check the electronic connection under the apex locator in the alone mode

Use the file clip to clamp the hook. If all the indicator bars on the screen are fully lit and “-1” (Note: “-1” indicates that the Display Number feature needs to be enabled.) is displayed while the electronic connection symbol remains active, this indicates that the connection is solid. If this is not the case, it suggests that either the measurement wire or the file clip is poorly connected or damaged and needs to be replaced.

Check the electronic connection under the apex locator in motor combined with apex locator mode.

1. Connect the contra-angle, motor handpiece, measurement wire, and lip hook according to the preparation with the apex locating function.
2. Insert the file.
3. Apply moderate pressure with the lip hook to ensure contact with the file.
4. The LCD should display all measurement bars, “-1”, and a stable electronic connection symbol. If this is not the case, it indicates that either the measurement wire or the clip is poorly connected or damaged and needs replacement.

WARNING:

The motor handpiece is not required in this mode.

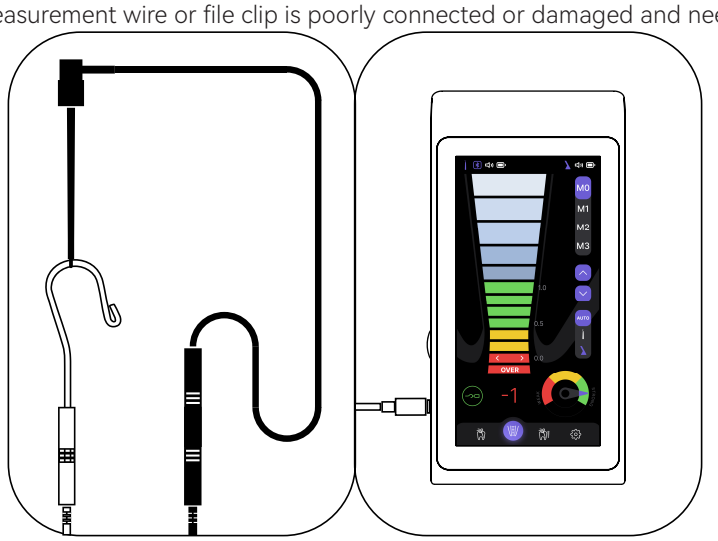
2.8.4 Connection test (test before each use)

Check the electronic connection under the apex locator in the alone mode

Use the file clip to clamp the hook. If all the indicator bars on the screen are fully lit and “-1” is displayed while the electronic connection symbol remains active, this indicates that the connection is strong. If this is not the case, it suggests that either the measurement wire or the file clip is poorly connected or damaged and needs to be replaced.

Check the electronic connection under the apex locator in the motor combined with apex locator mode

1. Connect the contra-angle, motor handpiece, measurement wire, and lip hook according to the preparation with the apex locating function.
2. Insert the file.
3. Apply moderate pressure with the lip hook to ensure contact with the file.
4. The LCD should display all measurement bars, “-1”, and a stable electronic connection symbol. If this is not the case, it suggests that either the measurement wire or file clip is poorly connected or damaged and needs to be replaced.



WARNING:

1. Conduct a connection test before using the apex locator in apex locator only mode each time.
2. Conduct a connection test before using the apex locator in motor with apex locator or monitored instrumentation mode

each time.

4.7. Testing the device using the tester

The tester can be used to check if the apex locator of the device is functioning correctly.

a. Remove the measuring cable from the device.

b. Insert the tester into the measuring cable port of the device.

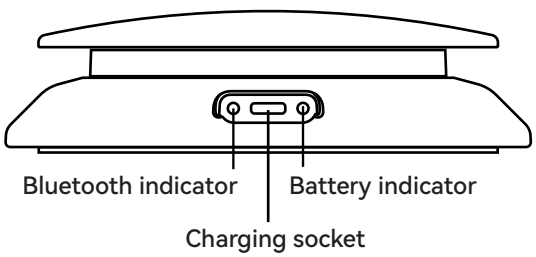
c. Ensure the charging base is connected to the motor handpiece, then turn on the device. The main unit of the Endo GT Pro can also be tested separately.

d. If the screen displays a reading within ±1 bar of the 0.0 scale, the device is functioning normally.

WARNING:

a. Apex locators' measurement wire is a delicate part of the device. Even though it is flexible, do not bend or angle it. Store the wire stretched out. It is impossible to perceive if any damage is present caused by improper handling of the wire due to the polymer protection.
b. The wire connectors are also sensitive. Because a very weak electronic signal is used during the electronic measurement, any interruption will cause malfunction and misreading. Make sure that the connections between the measurement wire and the base and the measurement wire and the two terminals are tightly connected.
c. Always carefully dry the terminals after cleaning. Do not leave humidity on the connectors. All connections must be clean, free from debris, corrosion, patina, and oxidation.
d. If the wire connection test fails, contact the distributor to replace the measurement cable/connectors.

4.8. Connection and Operation of Wireless Foot Pedal (Applies exclusively to Endo GT Pro)



4.8.1. Connection

1. Press and hold the wireless foot pedal for 3 seconds until its Bluetooth indicator starts flashing to enter pairing mode.
2. Ensure the motor handpiece is powered off. Press and hold the standby button for 5 seconds until the Bluetooth indicator light starts flashing to enter pairing mode.
3. Press and hold the "" button at the bottom of the foot pedal using the pedal thimble. A solid Bluetooth indicator light on the wireless foot pedal confirms a successful connection with the motor handpiece.

4.8.2. Operation: Upon successful connection, the motor handpiece rotates when the wireless foot pedal is depressed and immediately stops rotating upon pedal release.

4.8.3. Deactivate the wireless foot pedal: If the wireless foot pedal is inactive for 5 minutes, it will automatically turn off or press and hold the "S" button at the bottom of the foot pedal using the pedal thimble to turn off.

IMPORTANT:

If the activation fails, the wireless foot pedal may be out of power. Please ensure it is fully charged before use.

4.9. Apex Locator Settings

4.9.1. Functional Description

The built-in Endo GT apex locator measures the electronic capacitance and impedance values between the endodontic file and

the apical foramen within the root canal. It uses the Radicular Spectral Attenuation Coefficient, an exclusive state-of-the-art algorithm by Woodpecker for accurate foramen location. It shows the position of the file tip in relation to the foramen exit in real-time, assisting in determining the working length after locating the foramen exit equator. This function should only be used with endodontic files that have metal shanks and is not a substitute for radiographic examination. It is suggested that a periapical radiograph should be taken during treatment to confirm the depth of preparation.

4.9.2. Device Connection and Testing (refer to 4.6)

4.9.3. Configuring Apex Locator Settings

1. Access the Settings Interface: From the main menu, select “Settings” and tap “Apex Locator Settings” to enter the parameter setting interface.
2. Display Number: The number 13 to -1 on the screen do not indicate that the distance to the apex is 13 mm or -1 mm. It just reminds the operator that the file is getting close to or away from the apical foramen.
3. Apical Stop Settings

In the “Apical Stop Settings” interface, adjust preset position using up/down arrows. Relative distance markers are used instead of absolute measurements in millimeters from the foramen exit.

a. Use the up and down arrows to position the inner arrows in the desired positions. Tap the M0-M3 memory positions to save.
b. To have an alarm beep while determining the foramen position, first locate the inner arrows aligned with the first red bar at 0.0, then tap M0.

IMPORTANT:

During operation, when the file approaches the selected position, the device emits an audio alert (see “Sound Selection”).

4. Sound Selection

The system offers three default calibration sounds for user selection. Adjust the alert type for when the file nears the foramen position to align with the operator’s habits.

5. Apex Locator Sensitivity

Adjusts the device’s response threshold to electrical impedance changes within the root canal, adapting to different canal conditions:

- L (Low sensitivity): In cases of significant exudate, bleeding, or apical resorption, the risk of false positives, such as misidentifying overextension, is reduced.
- Default: For use in standard situations (dry/minor exudate), balancing precision and stability.
- H (High sensitivity): To enhance the detection of subtle position changes in calcified narrow canals or multiple foraminal exit anatomies.

Tap “Apex Locator Sensitivity” and select the corresponding button for “L,” “Default,” or “H” (a purple dot indicates selection).

WARNING:

The motor handpiece cannot be started while charging or in apex locator only mode.

4.10. Setting for motor combined with apex locator mode (Monitored Instrumentation)

4.10.1. Description

When used in combination with the apex locator mode, the Endo GT allows for the simultaneous operation of canal mechanical instrumentation and apex locator functions. This enables real-time monitoring of the file tip position during root canal preparation. As the file approaches or reaches the apical foramen, the device automatically adjusts the speed and provides a light signal. This helps control the depth of preparation and reduces the risk of over-instrumentation.

IMPORTANT:

a. Prior training in typodont models or extracted teeth is recommended to familiarize oneself with the equipment and its features.

b. If the operator is not trained in the use of the motor concurrently with the apex locator (motor and apex locator combined mode or monitored instrumentation), it is recommended to use the motor-only mode. Operators can always use the apex locator only mode first to determine the working length and then use the motor only mode for instrumentation.
c. Basic training and knowledge about the operating principles of the electronic working length determination (apex locator) are necessary to operate the motor combined with the apex locator mode.

WARNING:

According to the Endodontic Standards of Care, always use rubber dam isolation when performing endodontic treatment.

Auto Start

1. Function: When activated, the device will automatically start motor rotation upon detecting a stable electronic signal after the file enters the root canal, eliminating the need to manually press the switch.
2. Operation: Tap the switch to the right of "Auto Start." Purple indicates ON (default is OFF), and grey indicates OFF.

IMPORTANT:

Auto Start is contraindicated for cases with large, immature, or resorbed apical foramina, excessive exudate, or wet conditions, as these may cause false triggers. Disabling is recommended.

Auto Slow Down

1. Function: When the apex locator detects that the file is approaching the apical foramen (e.g., entering the orange zone), the motor automatically reduces speed (e.g., from the preset 300 RPM to 150 RPM). (Only for CW and CCW mode)
2. Operation: Tap the switch to the right of "Auto Slow Down." Purple indicates ON (default is ON), and grey indicates OFF.

Auto Stop

1. Function: When enabled, if the tip file passes the foramen exit, the device automatically stops motor rotation without the need to press the switch manually.
2. Operation: Tap the switch to the right of "Auto Stop". Purple indicates ON, and grey indicates OFF.

Handpiece LED for apical stop

1. Function: When the file approaches the apical foramen, the motor handpiece's LED flashes, providing dual visual and tactile alerts for procedures with restricted visibility.
2. Operation: Tap the switch to the right of "Handpiece LED for apical stop." Purple indicates ON (the default is OFF), and grey indicates OFF.

Apical Action

1. Function: Configures motor behavior when the file reaches the apical foramen.
2. Description of actions when the file tip reaches the apical foramen exit:
Reverse: Motor automatically switches to non-cutting direction rotation (e.g., clockwise → counter-clockwise).
• Off: the motor maintains its current operating state (continuous forward/preset-direction rotation, speed, and torque unchanged) without additional actions.
• Stop: The motor powers off and remains stationary.

Operation: Tap the "Apical Action" option and select the corresponding radio button for "Reverse", "Off", or "Stop" (a purple dot indicates selection).

5. File Sequence Settings

5.1. Creating a user-customized file sequence.

01. On the main display, select the sequence you want to customize and tap the "+" button to create a new customized sequence.

02. On the "Creating new sequence" interface, select "New user-customized sequence"

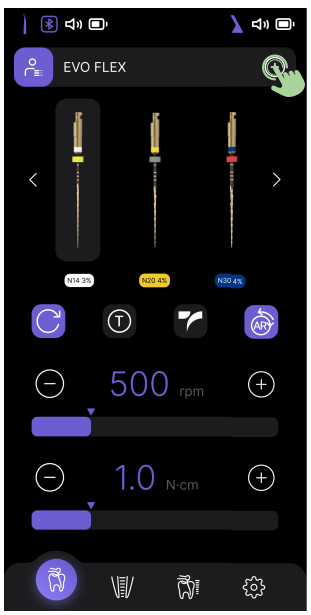
03. Enter the desired name for your new sequence (e.g., Calcified). Tap the "Add files" button to open the "File Library" interface. Select the file system from which you wish to retrieve your files.

04. In the "Add files to Calcified" interface, select files from the desired sequence and tap "Add selected files."

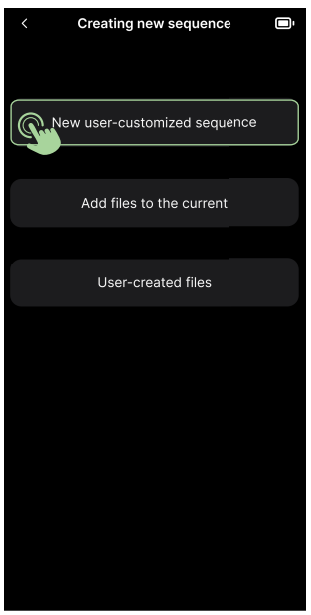
05. On the “Adjust your file sequence” interface, arrange, delete, or add more files from other systems by tapping “Add more files from library”. Tap the “ ” button to save your new customized file sequence and return to the main display.

06. Review your newly customized file sequence in the “File Library” interface by tapping “ ”.

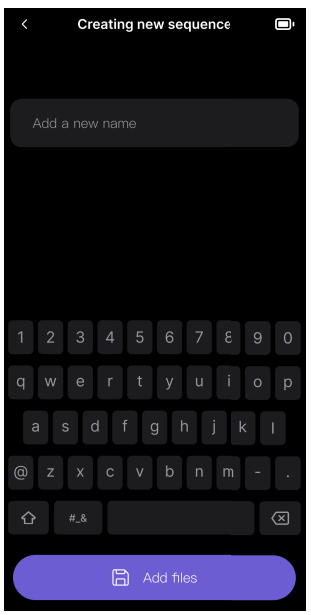
07. Select the newly created file sequence.



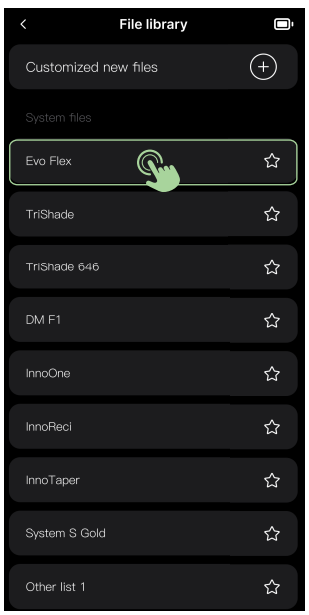
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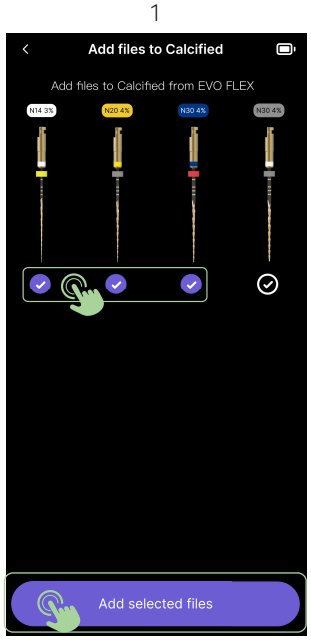
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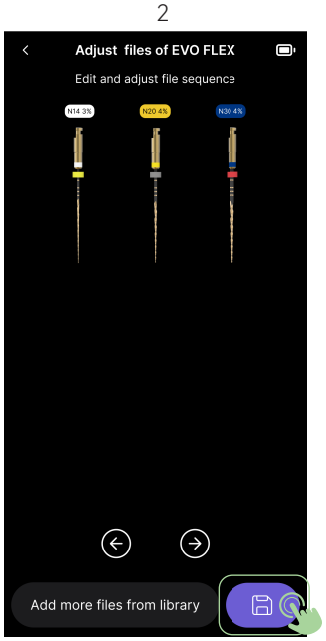
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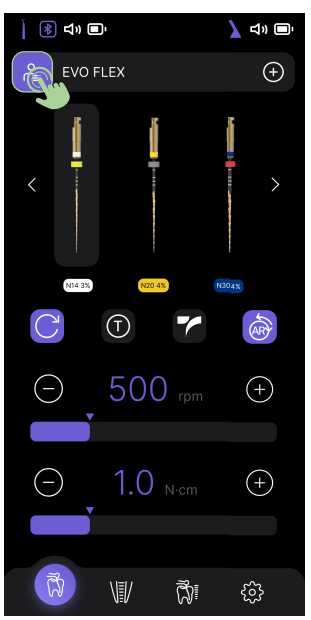
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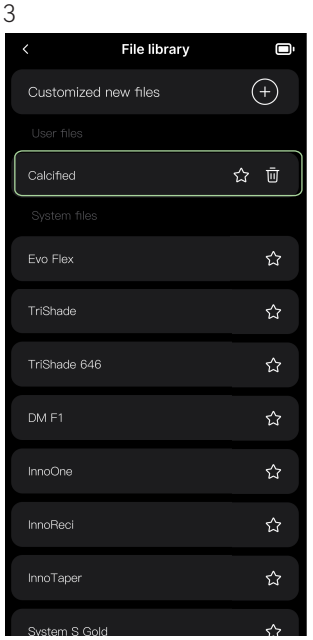
5



6



7



5.2. Modifying the custom file sequence.

01. On the main display, select the sequence you want to customize and tap the “+” button to add files from the library.

02. On “Creating new sequence” interface, select “Add files to the current”.

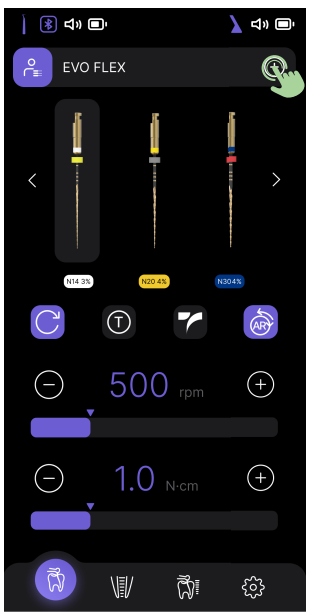
03. On the “File library” interface, select the source file system from the existing library.

04. Select the desired files from the sequence and tap “Add selected files”.

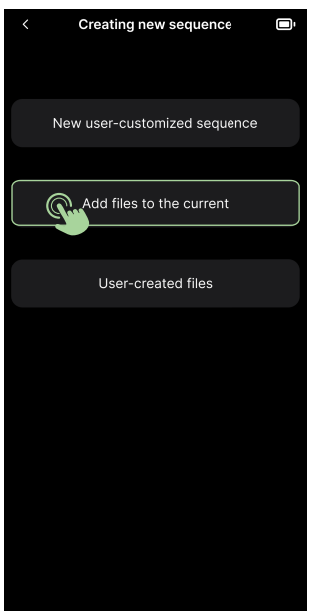
05. To adjust the file position in the sequence, select the file and tap the arrows. You can also add additional files from the library or remove files from the sequence.

06. Tap to save changes.

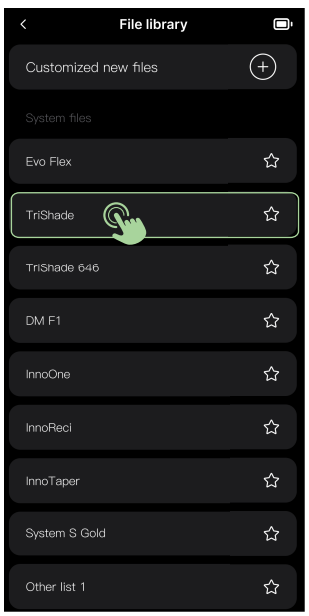
07. Check your customized file sequence on the main interface.



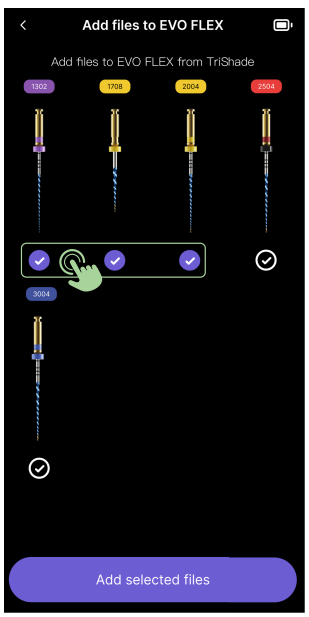
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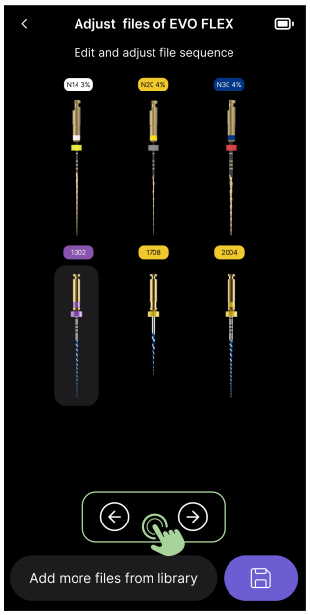
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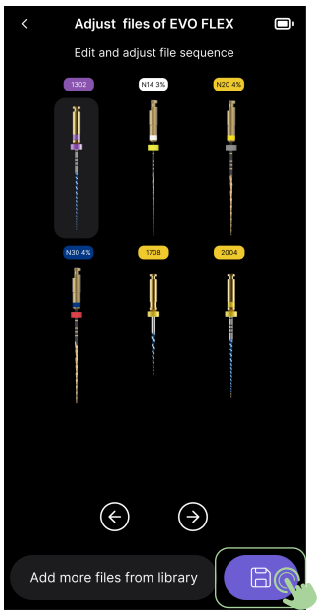
3



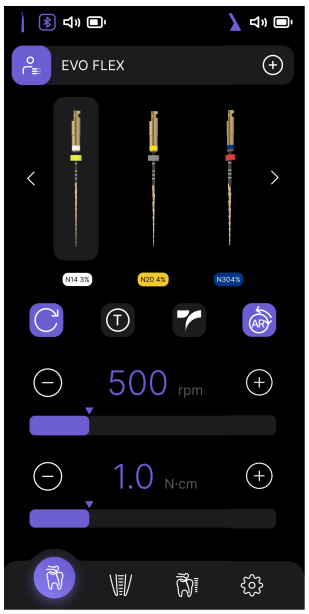
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7

5.3. Creating and adding a new file (not from the library) to a sequence

01. On the main display, select the sequence you want to customize and tap the "⊕" button to add a new customized file to the sequence.

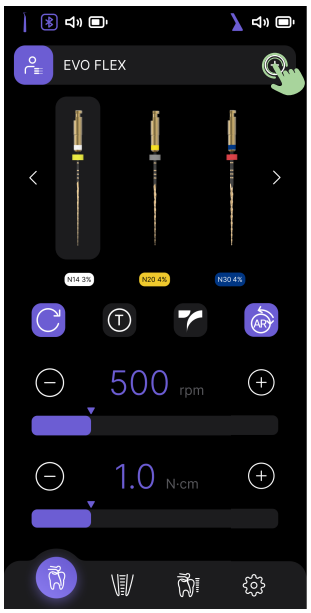
02. On "Creating new sequence" interface, tap "Add files to the current".

03. On "File library" interface, select "Custom files" and tap the "⊕" button to create a new file.

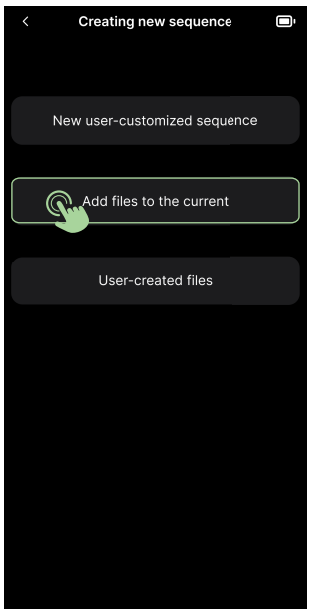
04. On the "Creating new file" interface, enter or select the desired parameters for the new file. The "File name" is mandatory (e.g., ZF 17 05).

05. Tap the "💾" button to save changes and return to the "File library" interface. Tap "Customized new files" to view the newly created file.

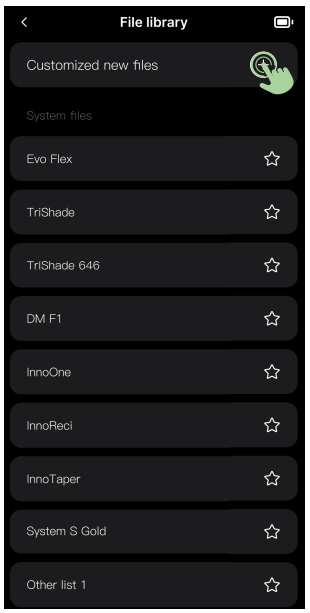
06. On the "Adjust files to" interface, select the newly created file and add it to the sequence.



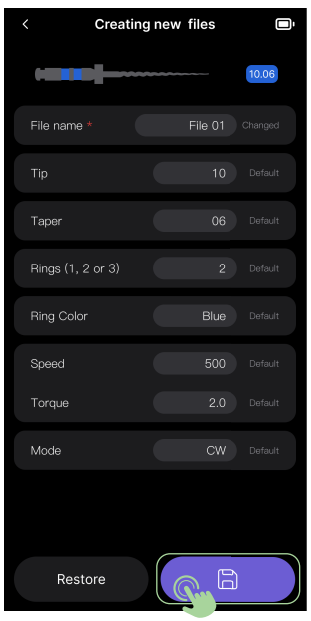
1

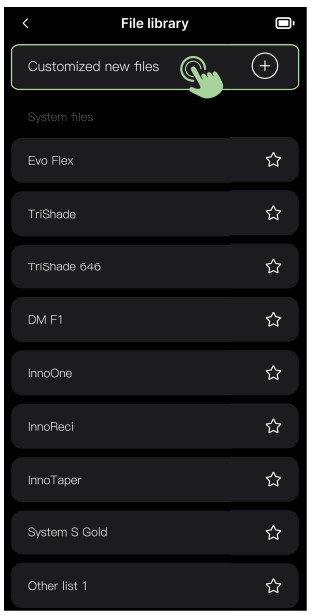


2

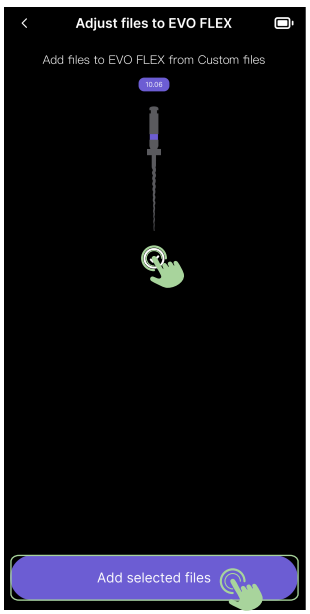


3





4-5



6

5.4. Changing file operation mode parameters

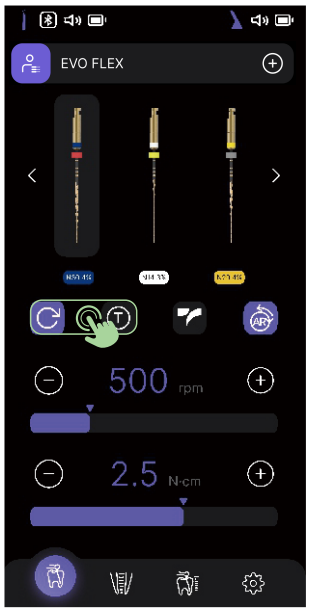
IMPORTANT:

Before changing the file operation mode, ensure the selected file is compatible with the desired movement.

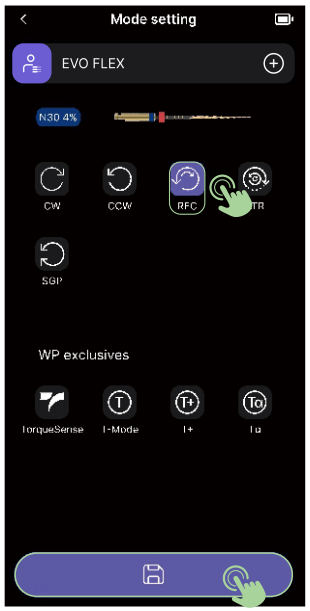
01. Tap the Mode button and enter “Mode setting” interface.

02. Select the desired mode and Tap the “ ” button.

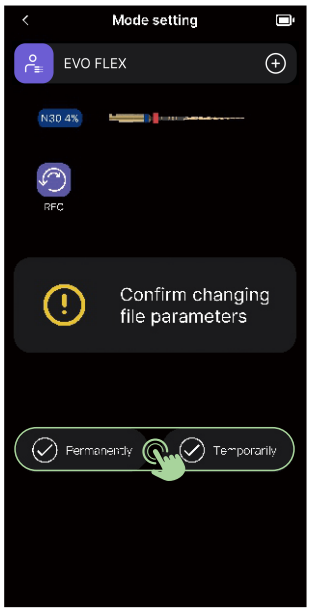
03. When prompted “Confirm changing file parameters”, choose to save permanently or temporarily.



1



2



3

5.5. Editing file operation mode parameters

IMPORTANT:

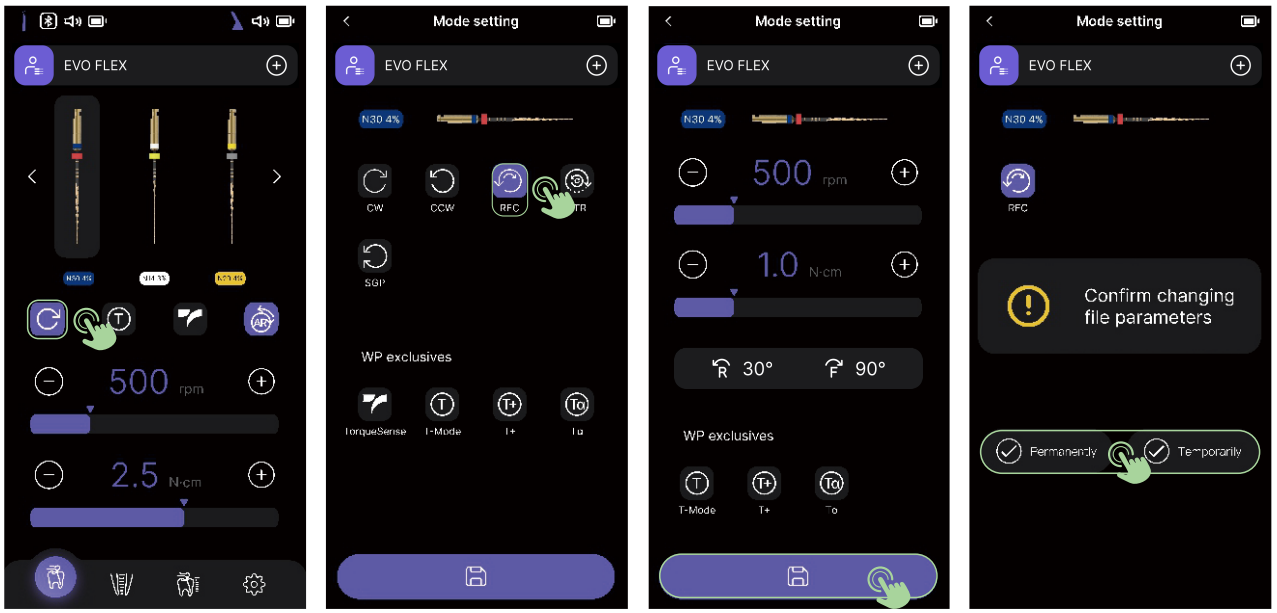
Before changing the file operation mode, ensure the selected file is compatible with the desired movement.

01. Tap the Mode button and enter “Mode setting” interface.

02. Long-press the selected mode to edit parameters (speed, torque, angle).

03. Tap the “ ” button to save changes.

04. When prompted “Confirm changing file parameters”, choose to save permanently or temporarily.

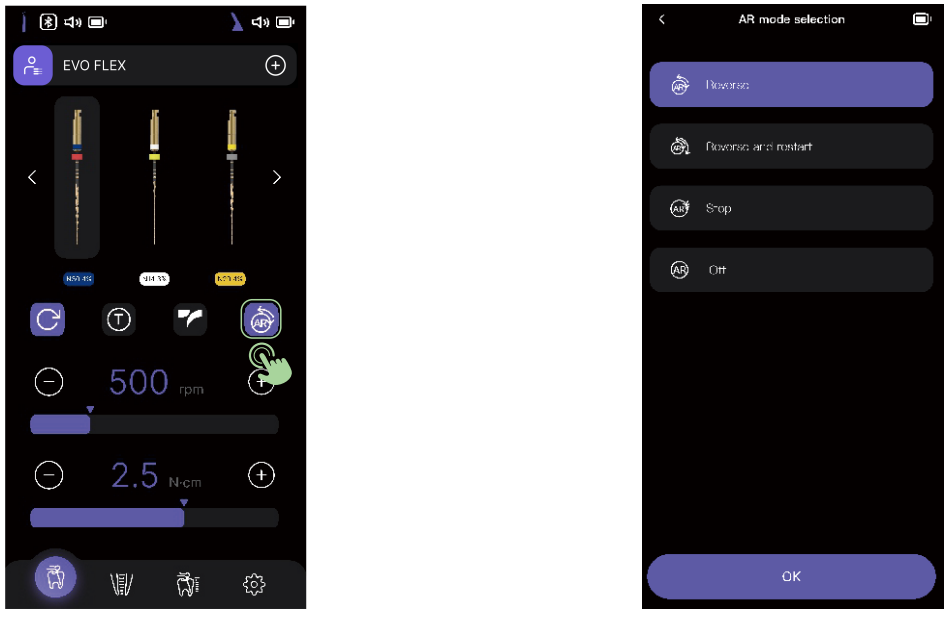


1 2 3 4

5.6. Auto Reverse (AR) Mode Settings

01. Tap the AR mode button ( ) to enter “AR mode selection” interface.

02. Select the desired mode and tap “ OK ” to save.

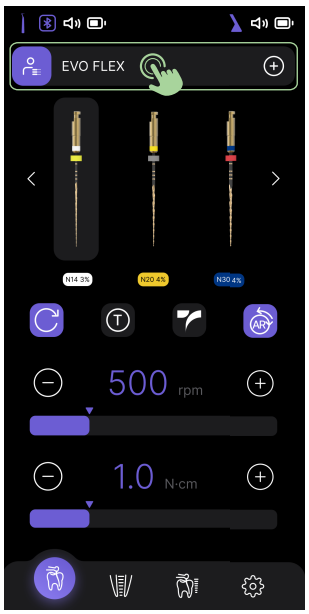


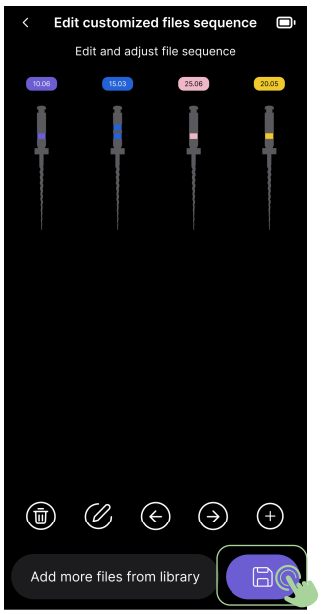
1 2

5.7. Other Notes

1. On any operational interface, tap the file system name shown in the figure above to access and view all files within that system. For files in this system, you can tap the "✎" icon to modify default parameters of any custom file.

2. To add additional files to this file system, tap the "⊕" icon in the lower-right corner to add system default files or create custom files. After adding all required files, tap the "💾" icon in the lower-right corner for the updated file system to go into effect.





6. Software Update

There are two methods to update the device (main unit) operating system (firmware):



6.1. Update via USB:

a. Contact the supplier or distributor to obtain the installation package. Transfer the upgrade package to a USB flash drive.

b. Power off the main unit.

Remove the battery and insert the USB flash drive into the USB port located beneath the battery compartment.

c. Plug in the power adapter.

d. The screen will display the system upgrade progress. Once the upgrade is complete, unplug the power adapter, remove the USB flash drive, and power on the main unit.

e. The system will now be successfully upgraded.

6.2. Update with Wi-Fi:

a. Tap settings on the main display. Tap general settings on the settings interface, navigate to the “System Information” interface. From there, select the “Update Software Version Online” button to enter the online software update interface.

b. Input your Wi-Fi name and password to connect to the network. After establishing the connection, tap “Check for Updates.” If a new version is available, the download process will begin.

c. Once the download is complete, click “Upgrade System.” After the “System Updated” notification appears, restart the main unit to finish the upgrade.

6.3. Upgrade of Handpiece

a. Ensure that the handpiece is powered off. Next, insert the blue OTA upgrade adapter into the handpiece handle. Once inserted, the standby button light and the Bluetooth indicator light on the handpiece will flash simultaneously, indicating that it has entered upgrade mode.

b. Click the handpiece upgrade control on the main unit interface, and the progress bar on the screen will start to display the update progress. When the progress bar shows 100%, it means that the upgrade program has been transmitted successfully.

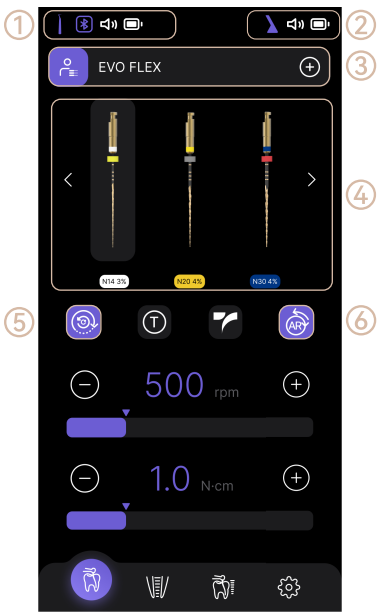
c. Remove the blue handpiece OTA upgrade adapter from the handpiece, press and hold the handpiece’s standby button to power off, then restart the handpiece, and the handpiece program upgrade is completed.

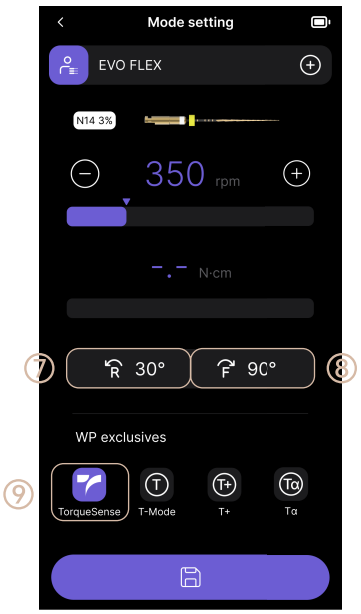
IMPORTANT:

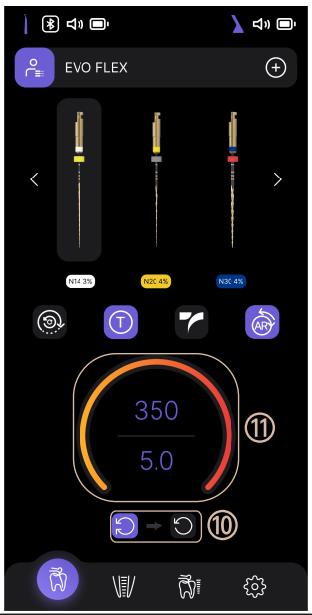
If the handpiece upgrade fails, unplug the blue handpiece OTA upgrade adapter, then press and hold the handpiece standby button until both the power indicator and Bluetooth indicator turn off. Reconnect the blue handpiece OTA upgrade adapter, press the standby button, and when the handpiece standby button light and Bluetooth light flash, it indicates that the handpiece has re-entered upgrade mode and will restart the upgrade process.

7. Operation Interface Description

7.1 Motor Only Mode (without concomitant electronic measurements)

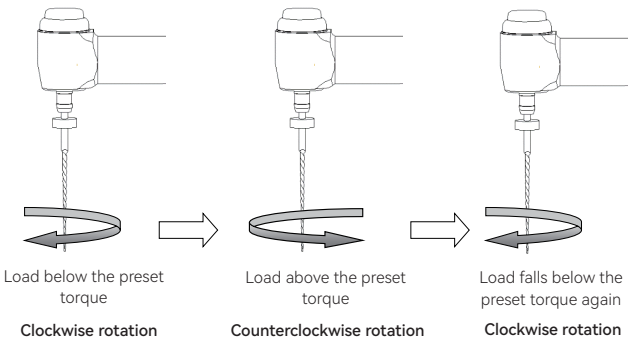
<table>
<tr><th>Interface</th><th>NO.</th><th>Icons' meaning and usage</th></tr>
<tr><td rowspan="6">Motor Handpiece Status: Standby

</td><td rowspan="3">①</td><td>: Bluetooth connection between motor handpiece and main unit</td></tr>
<tr><td>: Handpiece volume</td></tr>
<tr><td>: Motor handpiece battery level</td></tr>
<tr><td>②</td><td>Main unit volume and battery level</td></tr>
<tr><td>③</td><td>Current file sequence name</td></tr>
<tr><td>④</td><td>Swipe left or right to switch between files in the same sequence, or click on the file name to preview all files in the current file sequence.</td></tr>
<tr><td>⑤</td><td>File mode operation.</td></tr>
<tr><td>⑥</td><td>Auto reverse function status. Purple indicates it is enabled, while gray indicates that the function is off.</td></tr>
</table>

Motor Handpiece Status: Standby 	⑦	The forward rotation angle is always greater than the reverse rotation angle, when it is TorqueSense
	⑧	Adjustment of Forward Rotation Angle in Reciprocating Mode
	⑨	TorqueSense™ — Real Time Auto Torque Setting Woodpecker introduces innovative intelligent torque determination through dentin resistance analysis. The Endo GT Series intuitively learn the torque required to cut dentin and automatically set the ideal torque for each portion of the canal. This ensures sufficient tailored cutting power while protecting against torsional fatigue and file separation. · The motor automatically detects torque and determines the ideal safety threshold based on the file's cutting surface area. · Proprietary technology automatically switches to a secure right-cutting reciprocating mode when torque exceeds the tailored torque threshold. · No need to pre-set torque values for different files.

Interface	NO.	Icons' meaning and usage
Motor Handpiece Status: Active 	⑩	The T-mode running status. Purple indicates the current mode is active.
	⑪	Real-time torque status display. Yellow zone: Torque is below 60% of the set value Orange zone: Torque reaches 60%-80% of the set value Red zone: Torque reaches 80%-100% of the set value

7.2. Automatic reverse function

If the load exceeds the preset torque value during operation, the file will automatically switch to reverse rotation mode. Once the load falls below the preset value, the file will revert to forward rotation.



IMPORTANT:

a. The automatic reverse protection function works only in clockwise rotation and reciprocation modes.
b. When the automatic reverse function is activated in reciprocating mode, the system will switch to reverse rotation if the load exceeds the preset torque value and the forward angle is greater than the reverse angle. Conversely, if the forward angle is less than the reverse angle, the rotation will switch back to forward.
c. This function is disabled in rotation counterclockwise, TorqueSense and ATR modes.
d. If the battery icon on the base screen indicates low battery and there is insufficient remaining power to allow the motor handpiece to reach the maximum torque value, the automatic reverse function may not operate correctly. Please charge the motor handpiece's battery promptly.
e. If the motor handpiece remains under load for an extended period, it may automatically stop due to overheating protection. In such cases, turn off the motor handpiece and allow it to cool down before resuming use.

7.3. Apex locator mode

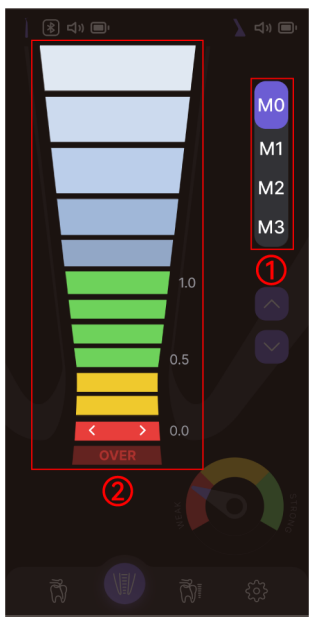
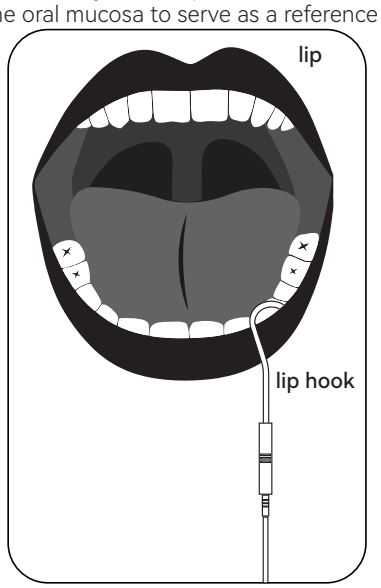
IMPORTANT:

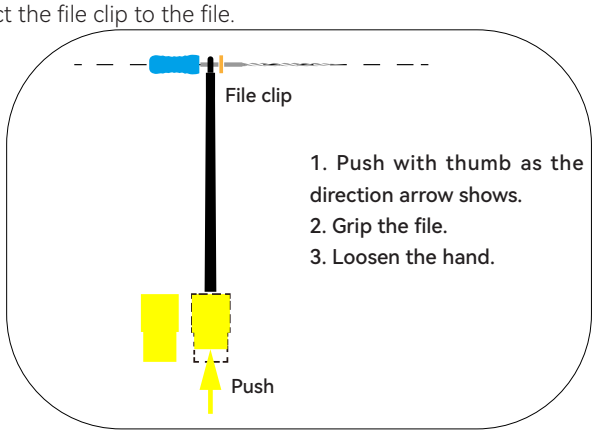
The Endo GT mini model does not support electronic measuring of root canal length (no apex locator integrated).

WARNING:

WARNING

1. According to the Endodontic Standards of Care, always use rubber dam isolation when performing endodontic treatment.
2. The motor handpiece cannot be started while in apex locator only mode.

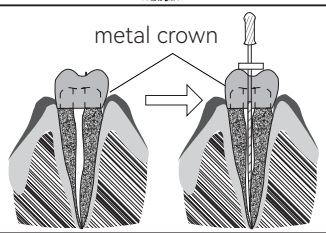
<table>
<tr><th>Interface</th><th>NO.</th><th>Icons' meaning and usage</th></tr>
<tr><td rowspan="2">
</td><td>①</td><td>a) Four memory apical stop alarms.
b) Adjustment: Long-press the 0.0–1.0 scale area on the screen to display the up/down arrows and adjust the saved apical stop settings.</td></tr>
<tr><td>②</td><td>a) Connect accessories and perform a connection test according to Section 2.8.
b) Place the lip hook securely on the patient's labial commissure, ensuring good contact with the oral mucosa to serve as a reference electrode.


c) Connect the file clip to the file.


d) When the indicating bar reaches the 0.0 position on the scale, the file has arrived at the foramen exit, also known as the foramen equator. Depending on the technique chosen, maintain or subtract 0.5-1.0 mm to determine the working length.
When the indicating bar reaches the red area marked "OVER," it indicates that the file has exceeded the apical foramen.</td></tr>
</table>

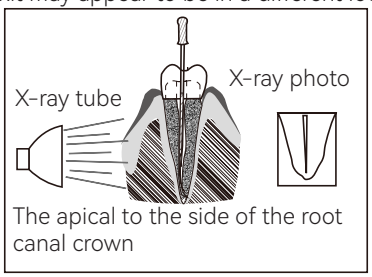
WARNING:

Accurate measurements are challenging to obtain if the root canal conditions are shown as below:

	Large apical foramen Root canals with an excessively large apical foramen due to apical resorption from osteoclastic inflammatory cell reactions or incomplete development (open apex) cannot be accurately measured. The measurement result may be shorter than the actual foramen position.
	Bleeding or irrigant overflow Accurate measurements cannot be obtained if blood or chemical solutions overflow from the canal opening and touch metallic restorations. In such cases, dry the pulp chamber and ensure that no liquid is in contact with metallic restorations.
	Crown or metal restorations Accurate measurements cannot be obtained if the file comes into contact with a metallic restoration that is touching the gingival tissue. To prevent this, widen the opening at the top of the crown so that the file does not touch the metal before taking a measurement.
 Too dry	Extremely dry canal If the canal is very dry, signal transmission through the dentin may be affected. To maintain appropriate root canal moisture, irrigation with an electrolytic solution (e.g., sodium hypochlorite) is recommended.

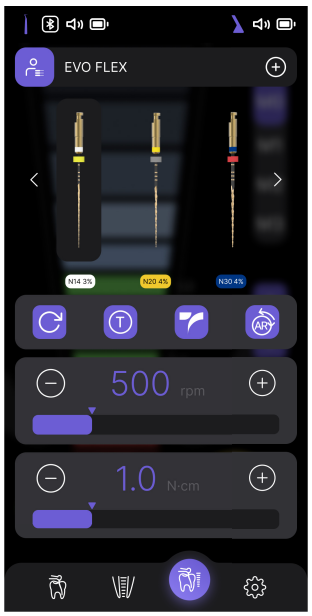
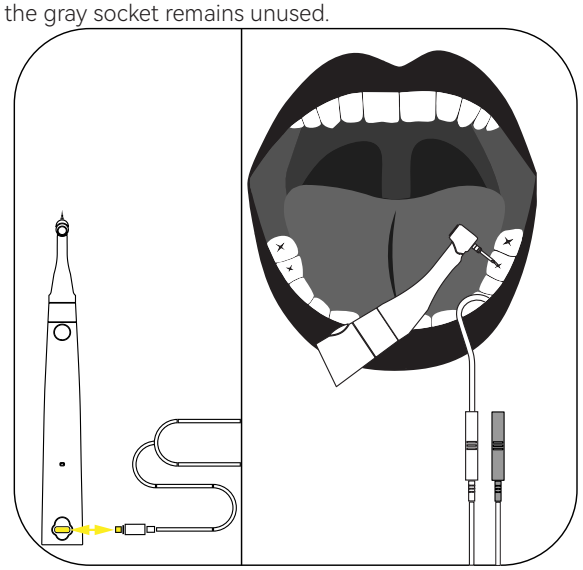
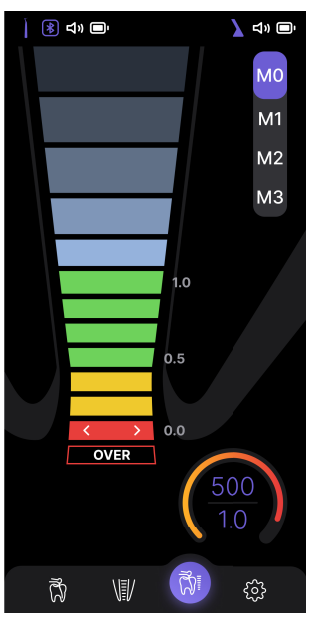
Discrepancy between the apex locator electronic reading and the radiographic images

The electronic reading might not perfectly match the radiographic image measurement with the traditional Ingle technique. This discrepancy does not necessarily indicate a malfunction of the apex locator or an error with the X-ray itself. The X-ray image may not accurately reveal the position of the foramen exit due to the angle of the X-ray beam and the nature of a two-dimensional image. As a result, the foramen exit may appear to be in a different location than its actual anatomical position.



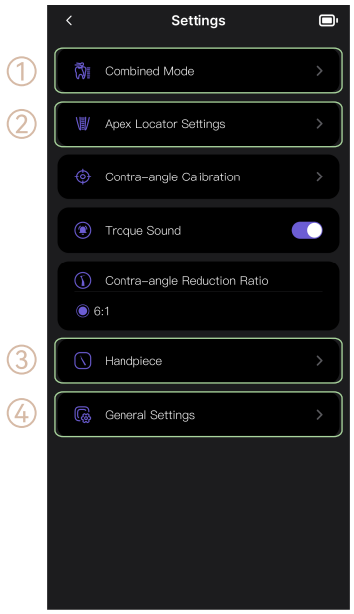
Monitored Instrumentation.

Motor combined with the apex locator electronic measurement mode

Interface	Icons' meaning and usage
Motor Handpiece Status: Standby 	The meaning of each icon corresponds to those in two other modes. 1. When using the Motor combined with the apex locating mode, the measuring cable must be connected to the motor handpiece. 2. The white socket is connected to the patient's labial commissure via the lip hook, while the gray socket remains unused.  3. Set parameters of automatic functions as needed (See Section 4.5)
Motor Handpiece Status: Active 	

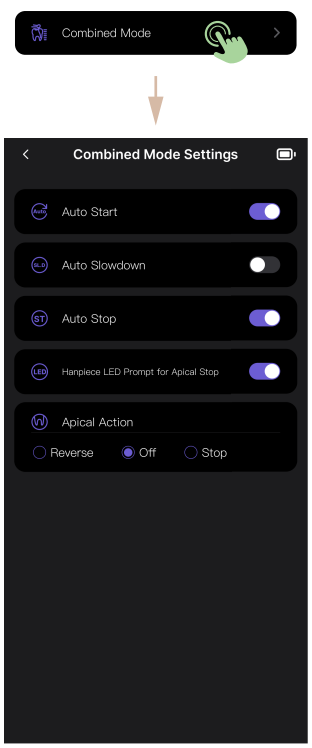
7.4 User settings interface

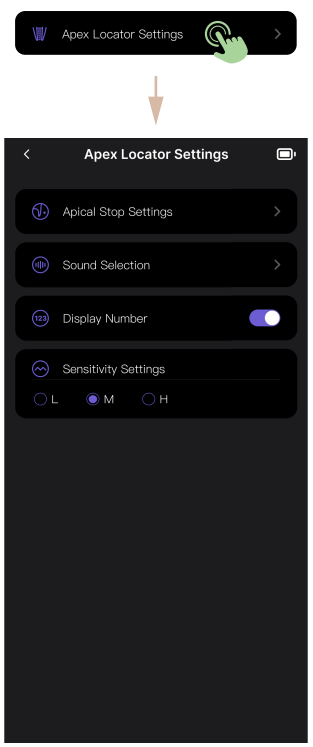
Icon Meaning

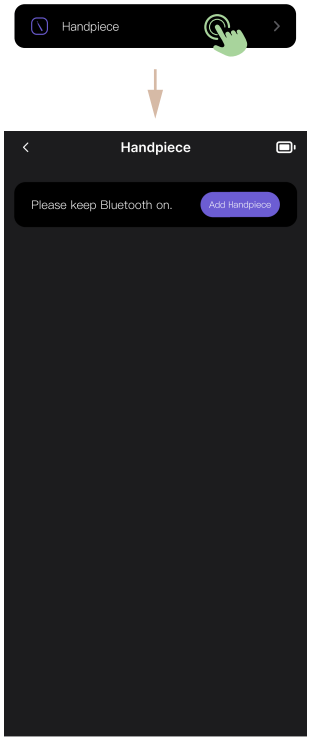


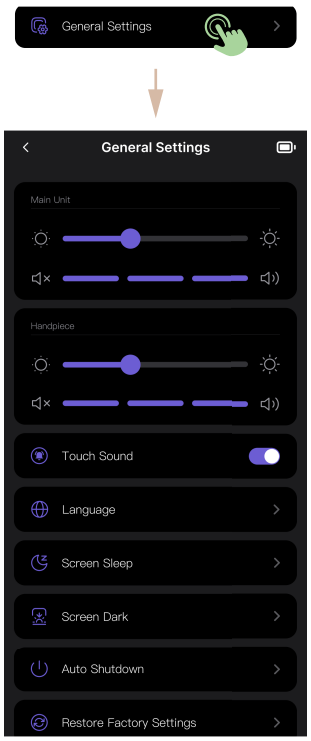
①: Preparation with apex locating function settings
②: Apex locator settings
③: Motor handpiece management
④: General Settings

Secondary Interface









8. Handpiece Calibration

8.1. Handpiece torque calibration

This function reduces torque fluctuations caused by replacing or high-temperature sterilizing the contra-angle, ensuring improved torque accuracy.

WARNING:

It is recommended to calibrate the contra-angle when replacing it or after every 1-2 months of use under normal operating conditions.

8.2. Handpiece calibration procedure

a. Properly connect the contra-angle to the motor handpiece (do not install the file).

b. In the “Settings” interface, tap on “Calibration” to enter the calibration menu.

c. Follow the on-screen instructions to start the motor handpiece and initiate the calibration process. The main unit will display [Calibrating]. Avoid performing any other operations during this time.

d. The motor handpiece will gradually accelerate from the lowest to the maximum rated speed to automatically measure the inertia and no-load resistance of the counter-angle. After the Endo motor handpiece stops, the LED light on the contra-angle will illuminate. The brightness will ramp up, then ramp down, and finally deactivate completely.

e. Once calibration is complete, the charging base screen will display [calibration successful]. Tap “Confirm” to return to the settings menu.

9. Battery Charging

Battery Icon	Icon Meaning
	Full battery
	2 bars of battery
	1 bar of battery
	Low battery. Please charge immediately.
	Battery critically low! The device will shut down soon.
	Charging
	Charging complete

9.1. Main unit charging

a. Before first use, connect the power adapter to the main unit for charging.

b. When the main unit indicates a low battery, stop using it and charge it immediately to avoid treatment delays.

c. After charging is complete, unplug the power adapter.

9.2. Motor handpiece charging

a. The motor handpiece has a built-in rechargeable lithium battery and supports wireless induction charging.

b. Handpiece wireless charging:

- Ensure the charging base is magnetically coupled to the main unit.
- Place the handpiece onto the charging base alignment area. The blue charging indicator will flash during charging and show steady illumination when fully charged.

IMPORTANT:

It is recommended to fully charge the handpiece before its first use.
- When the motor handpiece battery icon on the main unit indicates a low battery, stop using the handpiece and charge it to avoid delaying treatment.
- The motor handpiece cannot be started while charging.

9.3. Battery replacement

If the battery continues to drain rapidly after charging, it may need to be replaced.

Battery replacement steps for the main unit:

a. Use a Phillips screwdriver to remove the screws on the battery cover of the base and open the cover.
b. Remove the lithium battery and replace it with a new one of the same specification.
c. Close the battery cover and tighten the screws.

IMPORTANT:

If the lithium battery needs to be replaced, please contact the manufacturer or an authorized local dealer. Do not attempt to disassemble or replace it yourself.

10. Troubleshooting

If a malfunction occurs, refer to the checklist below before contacting your distributor. If the issue remains unresolved after following the suggested actions, the product may be faulty. Inform your distributor.

Issues	Possible Causes	Solutions
Installation		
After the motor handpiece is activated and the Bluetooth status shows "ᛒ!", it indicates a failed connection between the handpiece and the main unit.	1. Bluetooth pairing failed 2. The handpiece is too far from the base	1. Reconnect the motor handpiece to the main unit via Bluetooth. 2. Place the handpiece closer to the main unit and restart both.
The contra-angle cannot be calibrated.	The calibration procedure may have been interrupted by increased resistance in the contra-angle.	1. If calibration has been interrupted, calibrate the motor handpiece again to rule out the possibility of a motor fault. 2. Clean and lubricate the contra-angle. 3. Start the calibration procedure again.
The motor handpiece cannot be charged	Poor contact between the charging base and the main unit	Clean the charging contacts with a soft cloth dipped in medical alcohol. Reconnect the charging base to the main unit magnetically and place the motor handpiece on the base.
Automatic reversal of the file when unloaded.	The contra-angle may contain debris	1. Clean and lubricate the contra-angle. 2. Start the calibration procedure again.
Apex Locator WARNING After measuring the root canal length, it must be confirmed by taking an X-ray. 1. At the moment the endodontic file is inserted into the root canal, the indicator bar may fluctuate significantly; however, it will automatically return to normal as the file advances toward the apex. 2. If the test line or connector becomes detached during root canal length measurement, the measurement process will stop immediately.		
Inaccurate Root Canal Measurement	Is the lip hook properly positioned at the labial commissure?	Ensure secure placement of the lip hook.
	Are all wires and connectors fully inserted?	Ensure that all connectors are securely and properly seated.
	Is the measuring cable damaged?	Touch the file clip and lip hook to verify full-scale deflection of the measurement bar.

Unstable Measurement Bar	Does the lip hook contact the oral mucosa?	Reposition the lip hook for consistent tissue contact.
	Is the file clip contaminated?	Clean the file clip contacts.
Measurement Bar Fluctuation (Symptoms: Premature apex reading, low ac- curacy, erratic display)	Is there blood/irrigant overflow at the root canal orifice?	Clean root canal, crown surface, and root canal orifice to eliminate current leakage caused by blood/irrigant overflow contacting crowns or gingiva.
	Is the root canal filled with fluid?	When initial contact with fluid in a filled root canal causes transient bar fluctuation, advance the file to the apex to obtain a stable measurement.
	Is there debris/irrigant on the tooth surface?	Clean the tooth surface thoroughly.
	Is the file contacting the gingiva?	Avoid gingival contact.
	Are pulpal remnants present?	Remove pulpal debris (measurement impossible with significant remnants).
	Is the file contacting a metal crown?	File contact with metal crowns causes current leakage through the gingiva and inaccurate measurement. Avoid file- crown contact.
	Is there carious tooth structure?	Avoid measurement through caries (causes a gingival short-circuit).
	Are there lateral root canals or root fractures?	Lateral canal orifices and root fracture lines create electrical shunts, causing immediate apex display on the measurement bar. Confirm diagnosis radiographically.
	Is there an incomplete crown preparation causing gingival current leakage? Is periapical pathology present at the apex?	Periapical pathology (e.g., osteolysis) may compromise measurement accuracy. For incomplete crown preparations, cement a provisional crown before measurement.
	Is the file clip damaged?	Replace file clip.
	Is the file clip contaminated?	Clean file clip contacts.
Unstable electronic reading.	The file diameter is too thin	Use a larger diameter file. Ensure that the tip of the file is in contact with at least two-thirds of the dentin walls. Pre-flare the canal with larger files in the cervical and middle thirds before selecting the appropriate file for electronic measurement. Avoid using thin files in large canals.
The display doesn't show any progress of the file.		Perform the apex locator test. Section 2, 2.5.2

Display showing no or partial progression of the file towards the apical area/ foramen.		1. Poor connection. Check all connections and ensure the lip hook is contacting the oral mucosa, and the file clip is clean and free of debris. Perform the wire connection test. Section 2. 2. If required, fill the canal with an electrolytic solution (e.g., Sodium Hypochlorite, Saline, etc.). 3. The endodontic file tip is not touching the internal canal walls. Replace the file with a larger diameter file. If the behavior persists, the measuring cable or file clip may need to be replaced, and/or the device should be sent in for service- contact the distributor.
Failure on the wire connection test.	Poor connection or damaged measuring cable.	1. Make sure the measuring cable is connected correctly. 2. If the behavior persists, the measuring cable may need to be replaced and/or the device should be sent in for service.
No progression on the display indicators, even when the file is moving towards the apical area.		1. Replace the endodontic hand file with a bigger diameter file. Ensure that the tip of the file touches 2/3 of the dentin walls. First, place the file in the TEMPORARY working length, and then, with the file inside the canal in place, connect the file clip. 2. Ensure the canal is filled with irrigant. 3. The file clip is not connected correctly to the endodontic file. 4. Check all connections and ensure the lip hook is contacting the oral mucosa and the file clip is clean and free of debris. Perform the wire connection test. If the behavior persists, the measuring cable may need to be replaced, and/or the device should be sent in for service.
The OVER indication appears accompanied by repeated beeps.		The file tip has progressed beyond the apical foramen. Move the file back until the 'OVER' indication disappears.
The file position indicators exhibit unstable performance with erratic behavior. The OVER indication flashes even in the cervical third of the canal.	1. Is the lip hook making good contact with the mucosa? 2. Dirty (oxidation present) file clip. 3. Blood or other fluids overflowing the access cavity.	1. Make sure the lip clip makes good contact with the oral mucosa. 2. Clean the file clip with 70-80% ethanol. If oxidation persists, replace the file clip. 3. If blood or other fluids are overflowing the access cavity, they may create a conductive path outside the canal and cause incorrect measurements ("OVER" indication, unstable readings, etc.). Check the rubber dam isolation, use caulking or flowable composite to repair rubber dam leaks. You may use tissue control substances to control gingival tissue bleeding. Clean and dry the pulp chamber and tooth crown thoroughly. A large volume of vital, inflamed pulp can cause a short circuit, giving an erratic "OVER" position. Remove 2/3 of the canal content (preflaring) and restart the reading.

Measurement results are too short or too long. Apparently, poor accuracy.	1. Is the canal filled with blood or chemical solutions? 2. Is the tooth surface covered with tooth debris, smear layer, or chemical solutions? 3. Is the file touching the gingival tissue? 4. Vital, inflamed pulp tissue is present in large volume inside the canal. 5. Is the file touching the metal restorations? 6. Are proximal surfaces presenting caries lesions? 7. Is there external resorption, or is the tooth fractured? 8. Is there a lesion at the apex?	1. The canal length indicator may suddenly swing when it touches the surface of fluids inside the canal, but it will return to normal as the file advances toward the apical third. 2. Clean the entire tooth surface. 3. The file touching the gingiva invagination to the access cavity might lead to incorrect readings or cause the canal length indicator to suddenly jump all the way to the "OVER" position. 4. If a large amount of vital, inflamed pulp tissue is left inside the canal, particularly in wide canals such as upper incisors and canines, it may cause incorrect measurements. Preflare the canal. Proceed with copious irrigation. Try again with a larger diameter file. 5. Touching metal restorations with the file may create a conductive path outside the canal and cause incorrect measurements ("OVER" indication, unstable readings, etc.). 6. Deep caries may create a conductive path outside the canal, which can cause incorrect measurements ("OVER" indication, unstable readings, etc.). 7. The canal length indicators may jump to the "OVER" position when they reach a resorption area or a fractured root tooth. A chronic lesion can destroy the apical foramen through resorption and cause incorrect measurements.
Motor only. Motor and apex locator combined (Monitored Instrumentation)		
Different noise during rotation or reciprocation	Lubrication	Proceed with contra-angle lubrication
Motor handpiece overheating	Prolonged use in the reciprocating mode or at high speed	Allow the device to cool down and restart the motor handpiece.
Continuous rotary file blocks in the root canal	Incorrect file settings or excessive pressure on the file	Change the rotational direction by tapping the "" button to turn it into "". Start the handpiece, reverse the file rotation, and gently withdraw the file.
The file stops during the instrumentation.	Speed and torque settings	Each file system has specific specs for speed and torque. Consult the files' instructions to set up the speed and torque values properly.
The file is reversing or stopping during instrumentation.	Torque settings. Apical pressure.	Ensure that the torque value for each file is correct. Low torque values will influence the file's performance. Be gentle during the instrumentation. If the file doesn't progress apically, retrieve the file. Preflaring. Use smaller diameter files for the glide path. Use hand files of a small diameter to open space for the engine-driven files. Use an endodontic lubricant and ensure that the canal is filled with irrigant during instrumentation.

The handpiece doesn't start automatically, slow the rotation, stop, or reverse the rotation direction near the foramen.	The built-in apex locator is not performing the electronic reading.	1. Poor connection (measuring cable or connectors). Check all connections and ensure the lip hook is contacting the oral mucosa. 2. Ensure that the endodontic file is designed to be used concomitantly with electronic signal passage. 3. Fill the canal with an electrolytic solution, if required (i.e., Sodium Hypochlorite, Saline, etc.). 4. The endodontic file is not touching the internal canal walls. Replace the file using a larger diameter file. 5. If the behavior persists, the measuring cable may need to be replaced, and/or the device should be sent in for service – contact the distributor.
Erratic measurement. The motor is slowing down, stopping, or reversing during the instrumentation.	The built-in apex locator is not performing the electronic reading correctly.	Review all troubleshooting related to the Apex Locator only mode. In some cases, the motor and apex locator mode will not perform stable instrumentation due to adverse conditions of the case. Perform the electronic reading with the apex locator only mode, and use the motor only mode.

11. Cleaning, Disinfection, and Sterilization

11.1 Foreword

The main unit, motor handpiece, AC adapter, charging base, measurement wire, and tester must be cleaned and disinfected for hygiene and safety purposes.

To prevent contamination, the contra-angle, lip hook, file clip, protective silicone cover, and touch probe must be cleaned, disinfected, and sterilized before each use.

This applies to the first use as well as all subsequent uses.

11.2 General recommendations

11.2.1 Use only a disinfecting solution that is approved for its efficacy (VAH/ DGHM-listing, CE marking, FDA, and Health Canada approval) and in accordance with the DFU of the disinfecting solution manufacturer.

11.2.2 Do not place the contra-angle in a disinfectant solution or in an ultrasonic bath.

11.2.3 Do not use chloride detergent materials.

11.2.4 Do not use bleach or chloride disinfectant materials.

11.2.5 For your own safety, please wear personal protective equipment (gloves, glasses, mask).

11.2.6 The user is responsible for maintaining product sterility during the first use and all subsequent procedures. Additionally, the user is responsible for identifying and avoiding the use of damaged or contaminated instruments, even after sterilization, where applicable.

11.2.7 The water quality must comply with local regulations, especially for the final rinsing step or when using a washer-disinfectant.

11.2.8 To sterilize the endodontic files, refer to the manufacturer's instructions for use.

11.2.9 The contra-angle needs to be lubricated after cleaning and disinfection, but before sterilization.

11.3 Cleaning and disinfection steps for the main unit, motor handpiece, AC adapter, charging base, measurement wire, and tester

Before and after each use, all components that have come into contact with potentially infectious materials should be cleaned using towels soaked in a disinfectant and detergent solution (a bactericidal, fungicidal, and aldehyde-free solution) approved by

VAH/DGHM listing, CE marking, FDA, or Health Canada.

Warning:

Do not sterilize the main unit, motor handpiece, AC adapter, charging base, measurement wire, or tester using steam sterilization.

11.3.1 Pre-use processing

Before each use, the handpiece, charger, and base must be cleaned and disinfected. The specific steps are as follows:

Warning:

The main unit, motor handpiece, AC adapter, charging base, and measurement wire cannot be cleaned or disinfected using automatic equipment. Manual cleaning and disinfection are required.

11.3.1.1 Manual cleaning steps:

1. Place the handpiece, charger, and base on a clean workbench.
2. Soak a soft cloth completely with distilled or deionized water, and wipe all surfaces of the components (handpiece, charger, base, etc.) until they are visibly clean and free of stains or debris.
3. Wipe the surfaces with a dry, soft and lint-free cloth.
4. Repeat the above steps at least 3 times.

IMPORTANT:

a) Use distilled or deionized water at room temperature for cleaning.

11.3.1.2 Manual disinfection steps:

1. Soak a clean, soft cloth with 75% alcohol.
2. Wipe all surfaces of the handpiece, charger, base, and other components with the soaked cloth for at least 3 minutes.
3. Dry the components with a soft, lint-free cloth.

Notes:

a) The cleaning and disinfection must be performed within 10 minutes before use.
b) Disinfectants must be applied immediately after preparation and should not produce foam.
c) In addition to 75% alcohol, you can use non-residue disinfectants such as Oxytech from Germany, but you must respect the concentration, temperature and time specified by the disinfectant manufacturer.
d) After cleaning and disinfecting the handpiece, you must install a disposable sleeve before use and repeat steps 1, 2 and 3 to clean the disposable sleeve (For detailed installation steps, see section 2.5).

11.3.2 Post-op processing

After each use, clean and disinfect the handpiece, charger, and base within 30 minutes. The specific steps are as follows:

Tools: Nap-free soft cloth, tray

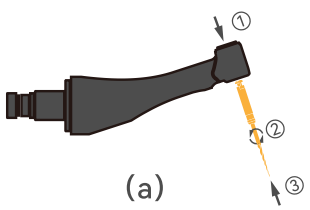
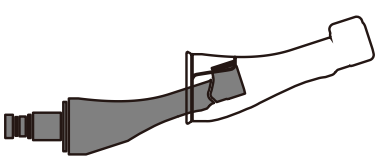
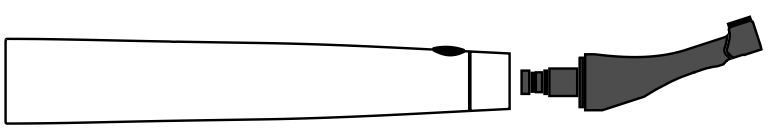
1. Remove the contra-angle from the handpiece, place it in a clean tray, and then remove the disposable sleeve.
2. Soak the nap-free soft cloth with distilled water or deionized water, and then wipe all the surfaces of the components, such as the handpiece,
charger, base, etc., until the surface of the component is not stained.
3. Wet the dry, soft cloth with 75% alcohol and wipe all surfaces of the handpiece, charger, base, and other components for 3 minutes.
4. Put the handpiece, charger, base, and other components back into the clean storage area.

Note:

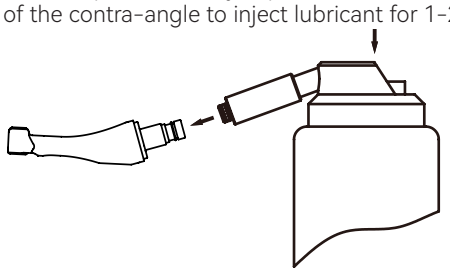
a) The cleaning and disinfection must be performed within 10 minutes before use.
b) The disinfectant must be used immediately; no foaming is allowed.
c) In addition to 75% alcohol, you can use non-residue disinfectants such as Oxytech from Germany, but you must respect

the concentration, temperature, and time specified by the disinfectant manufacturer.

11.4 The cleaning, disinfection, and sterilization of the contra-angle, lip hook, file clip, protective silicone cover, and touch probe are described in this section. Unless otherwise stated, they will hereinafter be referred to as “products”.

Warnings	The use of strong detergents and disinfectants (alkaline pH > 9 or acidic pH < 5) will shorten the product lifespan. In such cases, the manufacturer assumes no responsibility.
Resistance to sterilization procedures	These products have been designed to withstand a high number of sterilization cycles, and the materials used in their manufacture were selected accordingly. However, with each repeated preparation, thermal and chemical stress may cause product aging. The maximum number of sterilization cycles is 900.
Preparation at the point of use	The post-operative process must be carried out immediately, no later than 30 minutes after the completion of the operation. The steps are as follows: Remove the shanks/files and disconnect the contra-angle from the motor handpiece. Remove gross soiling of the instrument with cold water (<40℃) immediately after use. Don’t use hot water (>40℃), as this can cause the fixation of residues which may affect reprocessing outcomes.
Transportation	The products should be safely stored and transported to the point of reprocessing to avoid any damage and environmental pollution.
Preparation for reprocessing	The products must be reprocessed in a disassembled state. a) Press the push button and pull out the shank/file. b) When removing the protective silicone cover, pull it straight out slowly. c) When inserting and removing the contra-angle, ensure the handpiece is powered off beforehand. Disassembling steps  (a)  (b)  (c)

Pre-cleaning	Tools: tray, soft brush, clean and dry soft cloth Perform manual pre-cleaning until the handpiece is visibly clean. Rinse the bur chuck under running water for at least 10 seconds. Clean the surface with a soft-bristle brush. Note: The water temperature should not exceed 40℃ during washing; otherwise, proteins may coagulate and become difficult to remove.
Cleaning	Regarding cleaning/disinfection, rinsing and drying, it is to distinguish between manual and automated reprocessing methods. Automated reprocessing methods should be preferred, especially because they offer better standardizing potential and improve industrial safety. Automatic cleaning The washer-disinfectant should meet the requirements of the ISO 15883. Place the products in the washer-disinfectant carefully. Ensure that products cannot move freely in the washer-disinfectant. Contra-angles must not come into contact with one another. Start the program: • 4min pre-washing with cold water (<40℃); • Emptying • 5min washing with a mild alkaline cleaner at 55℃; • Emptying • 3min neutralizing with warm water (>40℃); • Emptying • 5min intermediate rinsing with warm water (>40℃); • Emptying • Drying the device at 80℃ for 15min The automated cleaning processes have been validated using 0.5% Neodisher MediClean forte (Dr. Weigert)
Disinfection	Automated thermal disinfection in washer/disinfector under consideration of national requirements in regards to A0 value (see Disinfection EN 15883). A 5-minute disinfection cycle at 93℃ has been validated for this device to achieve an A_0 value of 3000.
Drying	Drying outside of the instrument through the drying cycle of washer washer-disinfectant. If necessary, additional manual drying can be performed with a lint-free towel. Insufflate the cavities of instruments by using sterile compressed air. If your washer-disinfectant does not have an automatic drying function, please dry the device after cleaning and disinfection. The drying method is as follows: 1) Spread a clean white sheet of paper (or white cloth) on the flat table. Place the products on it, and then dry the contra-angle with filtered, dry compressed air (maximum pressure: 3 bar). When no liquid is sprayed on the white paper (or white cloth), it indicates that the products are completely dry. 2) The products can also be dried directly in a medical drying cabinet (or oven). The recommended drying temperature is 80 ℃, and the time should be 15 minutes. Notes: 1) Dry the products repeatedly if necessary (refer to section “Drying”). 2) The air used for drying must be filtered by a HEPA. 3) The products should be dried in a clean area.

Maintenance	1. Functional test and visual inspection Visually inspect the cleanliness of the handpiece. Perform functional test according to instructions for use. If there are still visible stains on the device after cleaning, the entire cleaning The process must be repeated. Before packaging and sterilization, make sure that the contra-angle has been maintained according to the manufacturer's instructions. If the device is obviously damaged, smashed, detached, corroded, or bent, it must be discarded and not used again. If any accessory is found to be damaged, please replace it before use. The new accessories for replacement must be cleaned, disinfected, and dried. 2. Use a lubricant to lubricate the handpiece and dry it prior to sterilization. Aim the nozzle of lubricant bottle to the air hole at the end of the contra-angle to inject lubricant for 1-2 seconds. 
Packaging	The products should be promptly packaged in a medical sterilization pouch (or a dedicated sterile holder or box). Precautions 1) Use only legally marketed or FDA-cleared sterilization pouches; 2) The packaging environment and related tools must be regularly cleaned to ensure cleanliness and prevent the introduction of contaminants. 3) Avoid direct contact between different metals during packaging.
Sterilization	Sterilize instruments using a fractionated pre-vacuum steam sterilization process (in accordance with EN 285, EN 13060, or EN ISO 17665), while complying with the regulations of the respective country. Minimum requirements: at least 4 min at 132°C/134 °C (in EU: 5 min at 134 °C, in US: 4 min at 132°C) Flash sterilization is not allowed on lumen instruments!
Storage	Sterilized products should be stored in a dry, clean, and dust-free environment. For specific storage guidelines, refer to the product label and instructions for use.

Note:

1. File Clip, touch probe, and lip hooks: Manufacturer-recommended maximum of 400 sterilization cycles.

2. CA161 Contra-angle Handpiece : Manufacturer-recommended maximum of 500 sterilization cycles.

3. CA161L Contra-angle Handpiece : Manufacturer-recommended maximum of 250 sterilization cycles.

Note: Exceeding these limits may compromise product integrity.

12. Storage, Maintenance, and Transportation

12.1 Storage

12.1.1 The device should be stored in an environment with a relative humidity of 10% ~ 93%, atmospheric pressure of 70 ~ 106 kPa, and a temperature range of −20°C ~ +55°C.

12.1.2 Avoid storing the device in excessively hot conditions. High temperatures may shorten the lifespan of electronic components, damage the battery, or deform/melt plastic parts.

12.1.3 Avoid storing the device in excessively cold conditions. Otherwise, condensation may form as the device warms to room temperature, potentially damaging the PCB.

12.2 Maintenance

12.2.1 This device does not include user-serviceable parts. Repairs must be performed by authorized personnel or an authorized service center.

12.2.2 Store the device in a dry environment.

12.2.3 Do not drop, hit, or shake the device.

12.2.4 Do not apply pigments, paint, or other substances to the device.

12.2.5 Do not perform on-site repairs of Endo GT series. Repairs must be carried out by the dealer/distributor or manufacturer.

12.3 Transportation

12.3.1 Avoid excessive impact and vibration during transportation. Handle with care and do not place the device upside down.

12.3.2 Do not transport the device together with hazardous materials.

12.3.3 Avoid direct sunlight, rain, or snow exposure during transportation.

13. Environmental Protection

Please dispose of the device under local regulations and environmental laws.

14. After-sales Service

1. From the date of purchase, if the device malfunctions due to quality issues during regular operation, the company shall provide repair services upon presentation of the warranty certificate. Specific terms, including warranty duration and coverage, shall be implemented per the provisions stated in the warranty certificate.

2. For technical documentation required for component repair (including circuit diagrams, parts list, legend descriptions, calibration specifications, and technical data), please contact the manufacturer for acquisition.

15. European Authorized Representative

EU REP MedNet EC-REP C IIb GmbH
Borkstrasse 10 · 48163 Muenster · Germany

Hereby, Guilin Woodpecker Medical Instrument Co., Ltd., declares that [Endo Motor and Apex Locator Unit] complies with the essential requirements and other relevant provisions of Directive 2014/53/EU.

16. Symbol Instruction

	A possibly dangerous situation that could result in serious bodily injury		Application instructions and other important information.
	Follow the instructions for use		Indoor use only
	Stand-by		Manufacturer
	Class II equipment		Date of manufacture

SN	Serial number		Type B applied part
LOT	Lot number	UDI	Unique Device Identification
	Bluetooth indicator light	APEX	Measuring cable socket
	Charging Indicator Light		18650*3 lithium battery
	Do not dispose of the product into the ordinary municipal waste or garbage system	134°C	Sterilizable in a steam sterilizer (autoclave) at the temperature specified
	Keep dry		Fragile, handle with care
	Recyclable packaging materials	93% 10%	Humidity limitation
+55°C -20°C	Temperature limitation	106kPa 70kPa	Atmospheric pressure for storage
IPX0	Ordinary equipment	CE 0197	CE marked product
15V ⎓ 1.6A	Rated Output at Adapter Receptacle	EU REP	Authorised Representative in the EUROPEAN COMMUNITY
MD	Medical Device		Polarity of DC power connector
~	Alternating Current		

17. Statement

All rights to modify the product are reserved by the manufacturer without prior notice. Product images are for reference only. GUILIN WOODPECKER MEDICAL INSTRUMENT CO., LTD. reserves the right of final interpretation.

Patents owned by GUILIN WOODPECKER MEDICAL INSTRUMENT CO., LTD protect the industrial design, internal structure, and other aspects. . Any unauthorized copying or counterfeiting will be subject to legal liability.

18. Electromagnetic Compatibility

Warning:

Without Woodpecker's explicit consent, unauthorized changes or modifications to the device may cause electromagnetic compatibility issues affecting this or other nearby devices.

Special precautions regarding electromagnetic compatibility (EMC) must be observed for this device. Installation and use should follow the EMC information provided in this manual. Portable and mobile radio frequency communication equipment may affect this device. The following cables must be used to meet electromagnetic emission and anti-interference requirements:

Name	Cable length	Shielded?	Remark
Power adapter connecting cable	1.8m	NO	/
measuring cable	1.6m	NO	/
File clip	0.2m	NO	/

Except for cables (transducers) sold as spare parts of internal components, the use of accessories and cables (transducers) other than those specified may result in increased emission or reduced immunity of the device or system.

The device or system should not be used in close proximity to or stacked with other devices. If such usage is necessary, it must be confirmed that the device operates normally under this configuration.

18.1 Guidance and manufacturer's declaration-electromagnetic emission

Guidance and manufacturer's declaration - electromagnetic emissions		
The Endo Motor and Apex Locator Unit is intended for use in the electromagnetic environment specified below. The customer or the user of the Endo Motor and Apex Locator Unit should ensure that it is used in such an environment.		
Emissions test	Compliance	Electromagnetic environment -guidance
RF emission CISPR 11	Group 1	The Endo Motor and Apex Locator Unit uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference with nearby electronic equipment.
RF emission CISPR 11	Group B	The Endo Motor and Apex Locator Unit is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emission IEC 61000-3-2	Group A	
Voltage fluctuation/flicker emission IEC 61000-3-2	Complies	

18.2 Guidance & declaration - electromagnetic immunity

Guidance & declaration — electromagnetic immunity			
The Endo Motor and Apex Locator Unit are intended for use in the electromagnetic environment specified below. The customer or the user should ensure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge (ESD) IEC 61000-4-2	±8 kV contact ±2 kV, ±4 kV, ±8 kV, ±15 kV air	±8 kV contact ±2 kV, ±4 kV, ±8 kV, ±15 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	±2kV for power supply lines	±2kV for power supply lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	±0.5 kV, ±1 kV line to line	±0.5 kV, ±1 kV line to line	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 IEC 61000-4-11.	0 % U_T, 0.5 cycle at 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315° 0 % U_T, 1 cycle and 70% U_T, 25/30 cycles at 0° 0% U_T, 250/300 cycle	0 % U_T, 0.5 cycle at 0°, 45°, 90°, 135°, 180°, 225°, 270° and 315° 0 % U_T, 1 cycle and 70% U_T, 25/30 cycles at 0° 0% U_T, 250/300 cycle	Mains power quality should be that of a typical commercial or hospital environment. If the user of the Endo Motor and Apex Locator Unit requires continued operation during power mains interruptions, it is recommended that the Endo Motor and Apex Locator Unit be powered from an uninterruptible power supply or a battery.

Power frequency (50/60 Hz)magnetic field IEC 61000-4-8	30A/m	30A/m	Power frequency magnetic fields and proximity magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
Proximity magnetic fields IEC 61000-4-39	CW 8A/m for 30kHz Pluse modulation 2.1kHz, 65A/m for 134.2kHz Pluse modulation 50kHz, 7.5A/m for 13.56MHz.	CW 8A/m for 30kHz Pluse modulation 2.1kHz, 65A/m for 134.2kHz Pluse modulation 50kHz, 7.5A/m for 13.56MHz.	
NOTE U_T is the a.c. mains voltage prior to the application of the test level.			

18.3 Guidance & declaration – electromagnetic immunity concerning conducted RF & radiated RF

Guidance & Declaration – Electromagnetic immunity			
The Endo Motor and Apex Locator Unit is intended for use in the electromagnetic environment specified below. The customer or the user of the Endo Motor and Apex Locator Unit should ensure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment – guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz 6 Vrms in ISM bands & amateur radio bands	3 Vrms 150 kHz to 80 MHz 6 Vrms in ISM bands & amateur radio bands	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 Endo Motor and Apex Locator Unit, including cables specified by the manufacturer. Otherwise, performance degradation of this device may occur.
Radiated RF IEC 61000-4-3	10 V/m 80 MHz to 2.7 GHz 385MHz-5785MHz Test specifications for ENCLOSURE PORT IMMUNITY to RF wireless communication equipment (Refer to table 9 of IEC 60601-1-2:2014 + A1:2020)	10 V/m 80 MHz to 2.7 GHz 385MHz-5785MHz Test specifications for ENCLOSURE PORT IMMUNITY to RF wireless communication equipment (Refer to table 9 of IEC 60601-1-2:2014 + A1:2020)	

18.4 Declaration – RF parameter of Bluetooth and Wi-Fi

Declaration – RF parameter of Bluetooth and Wi-Fi				
Types	Frequency band of transmission	Type of Modulation	Frequency characteristics	Effective radiated power
Bluetooth	2402 ~ 2480 MHz	GFSK	2.4G wireless technology	4.87 dBm
Wi-Fi	2412 ~ 2472 MHz	DSSS/ CCK/ BPSK/ QPSK/ 16QAM/ 64QAM	2.4G wireless technology	21.16 dBm

Scan and log on to the website
for more information

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