张满喜
2026.04.03

YSDENT®

CE 0197

YSDENT®

User Manual

Endo Motors



C-SMART-I PILOT

Foshan COXO Medical Instrument Co.,Ltd.
No. 17, Guangming Ave., New Light Source Industrial Base, Nanhai National High-tech Zone, Foshan 528226, Guangdong P.R. China
Web:www.coxotec.com

EU REP **Lotus NL B.V.**
Koningin Julianaplein 10, 1e Verd, 2595AA, The Hague, Netherlands.
E-mail: info@lotusnl.com
Tel: +31644168999

Software Version: Ver1.0
User Manual Ver: 1.0
Date: 2026.4.3
AE1419

Guidance & Declaration - electromagnetic immunity			
The model C-SMART-S PILOT is intended for use in the electromagnetic environment specified below. The customer or the user of the model C-SMART-I PILOT should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test**	**Compliance level**	**Electromagnetic environment - guidance**
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz 6 Vrms in ISM and amateur radio bands	3 Vrms 150 kHz to 80 MHz 6 Vrms in ISM and amateur radio bands	Portable and mobile RF communications instrument should be used no closer to any part of the model C-SMART-I PILOT, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance** $d = [3,5/V1] \times P^{1/2}$ Mininum separation distances for higher IMMUNITY TEST LEVELS shall be calculated using the following equation: $E = [6/d] \times P^{1/2}$ Where P is the maximum power in W, d is the minimum separation distance in m, and E is the IMMUNITY TEST LEVEL in V/m.
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 communicati on equipmen (Refer to table 9 of IEC60601-1-2: 2014+A1:2020)	10 V/m 80 MHz to 2.7 Ghz 385MHz-5785MHz Test specifications for ENCLOSURE PORT IMMUNITY to RF wireless communicati on equipmen (Refer to table 9 of IEC60601-1-2: 2014+A1:2020)	

Contents

1. Safety **1**

2. Intended Use **2**

3. Contraindication **2**

4. Components and Accessories **3**

5. Installation **5**

5.1. Connecting the Contra-angle 5

5.2. Attaching the Contra-angle Silicone Cover 5

5.3. Connecting the File 5

5.4. Connecting the Measuring Wire 6

6. Operation **7**

6.1. Power On/Off 7

6.2. Bluetooth Connection 7

6.3. Mode Selection 8

7. Motor-Only Mode **9**

7.1. Interface Description 9

7.2. Program Switching 10

7.3. File Selection 11

7.4. Working Mode Settings 11

7.5. Setting Speed,Torque,and Reciprocating Angle 13

7.6. Start Operation 14

8. Apex Locator Mode **15**

8.1. Interface Description 15

8.2. Connection Testing 15

8.3. Adjusting the Preset Apical Position 16

8.4. Measurement 16

9. Combined Mode **17**

9.1. Interface Description 17

9.2. Adjust Parameters 18

10. Endo Activate Mode **19**

10.1. Interface Description 19

10.2. Adjust Parameters 19
11. Standalone Handpiece Operation 20
11.1. Mode Selection 20
11.2. Working Mode Settings 20
11.3. Adjusting Parameters 20
12. Setting 21
13. Maintenance 24
13.1. Bluetooth Re-Pairing 24
13.2. Charging 24
13.3. Battery Replacement 26
13.4. Lubrication 27
14. Cleaning, Disinfection and Sterilization 28
15. Troubleshooting 30
15.1. Troubleshooting and Solutions 30
15.2. Error Codes 32
16. Technical Specifications 33
17. Operating, Transport and Storage Operating 34
18. Guarantee 34
19. Disposal of Medical device 34
20. Symbols 35
21. Guidance and manufacturer's declaration-EMC 36

Guidance & Declaration – electromagnetic immunity			
The model C-SMART-I PILOT is intended for use in the electromagnetic environment specified below. The customer or the user the model C-SMART-I PILOT should assurethat they are used in such an environment.			
Immunity test	**60601 test level**	**Compliance level**	**Electromagnetic environment guidance**
Electrostatic discharge (ESD) IEC 61000-4-2	±8 kV contact ±2 kV, ±4 kV, ±8kV, ±15 kV air	±8 kV contact ±2 kV, ±4 kV, ±8kV, ±15 kV air	Floor 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 ±1 kV for Input/output lines	±2kV for power supply lines	Mains power quality should be that of atypical commercial or hospital environment.
Surge IEC 61000-4-5	±0.5 kV, ±1 kV line to line ±0.5 kV, ±1 kV, ±2 kV line to ground	±0.5 kV & ±1 kV line to line	Mains power quality should be that of atypical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5 % U_T (>95% dip in U_T) for 0.5 cycle <5 % U_T (>95% dip in U_T) for 1 cycle 70% U_T (30% dip in U_T) for 25/30 cycles <5% U_T (>95 % dip in U_T) for 5/6 sec	<5 % U_T (>95% dip in U_T) for 0.5 cycle <5 % U_T (>95% dip in U_T) for 1 cycle 70% U_T (30% dip in U_T) for 25/30 cycles <5% U_T (>95 % dip in U_T) for 5 sec	Mains power quality should be that of a typical commercial or hospital environment. If the user of the instrument requires continued operation during power mains interruptions, it is recommended that the instrument be powered from a uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3A/m	3A/m,50/60Hz	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE: U_T is the a.c. mains voltage prior to application of the test level.			

21. Guidance and manufacturer's declaration-EMC

This product needs special precautions regarding EMC and needs to be installed and put into service according to the EMC information provided, and this device can be affected by portable and mobile RF communications device.

Warning:

- Do not use a mobile phone or other devices that emit electromagnetic fields, near the device. This may result in incorrect operation of the device.
- This device has been thoroughly tested and inspected to assure proper performance and operation!
- This device should not be used adjacent to or stacked with other device and that if adjacent or stacked use is necessary, this device should be observed toverify normal operation in the configuration in which it will be used
- Use of accessories, transducers and cables other than those specified or provided by the manufacturer of this equipment could result in increased electromagnetic emissions or decreased electromagnetic immunity of this equipment and result inimproper operation.
- This equipment is not use with hf surgical equipment.

Serial number	Name	Cable Length (m)	Shielded wire	Remarks
1	AC adapter cable	2.4m	No	\
2	Measuring Wire	1.3m	No	\

Guidance and manufacturer's declaration - electromagnetic emissions		
The model C-SMART-I PILOT is intended for use in the electromagnetic environment specified below.		
Emissions test	**Compliance**	**Electromagnetic environment - guidance**
RF emissions CISPR 11	Group 1	The model C-SMART-I PILOT use RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emission CISPR 11	Class B	The model C-SMART-I PILOT is suitable for use in all establishments other than domestic and those directly connected to the public lowvoltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/flicker emissions IEC 61000-3-3	Complies	

01. Safety

Note:

Failure to follow this instruction may result in device damage.

Warning:

Failure to follow this warning may cause injury to the patient.

Please read the safety warnings carefully before using this device.

1) The device must be used within the scope mentioned in the manual.The manufacturer accepts no liability for damage resulting from improper use.
2) Before using the contra-angle, please read the instruction manual of the contra-angle carefully.
3) The AC adapter plug is a segmented device for grid power supply, and should not be placed in places where it is difficult to disconnect the device.
4) When using an external power supply, make sure that the voltage is within the voltage range indicated on the power AC adapter, otherwise it may cause injury to the operator or patient.
5) The use of non-original accessories, especially the use of other contra angle,AC adapter or batteries may be dangerous to the patient or operator, as well as causing damage to the instrument;
6) Use a file that meets the specifications and is in good condition. Otherwise, the file may break during operation and cause injury.
7) The accessories of this product have not been sterilized before leaving the factory. The accessories must be cleaned, disinfected and sterilized in strict accordance with the requirements in Chapter 14 before use. Please perform a test run before each use to ensure that there are no abnormalities before use.
8) Please wait until the operation has completely stopped before loading and unloading root canal files or contra-angle.
9) When cleaning the device, ensure that no cleaning agents enter the internal components, to prevent short circuits and malfunctions.
10) To avoid electric shock, do not insert other objects into the device.
11) When improper use or physical damage causes serious abnormalities in the instrument, stop using it and turn it off immediately. Private modification of this instrument is strictly prohibited. If repairs are required, only the manufacturer and authorized dealers can open the instrument
12) The device has electromagnetic interference, do not use it around patients with cardiac pacemakers. Do not use around electronic surgery.
13) Unstable voltages and electromagnetic fields may interfere with normal device operation.
14) For disposal of the batteries and other accessories of this device, please observe local ordinances.

15) This equipment is for professional use only.
16) Inspect the device before each use to ensure there are no abnormalities.
17) The file clip must not come into contact with any metal body. For example, amalgam fillings or metal shell crowns on teeth must not come into contact with the oral mucous.
18) If the device shows beyond the apex when the tip of the file has not reached the apex in the Apex Locator Mode, it indicates or suggests the presence of dead pulp or other strong electrolytes in the root canal.
19) If the measurement values too low,verity whether the root canal is excessively dry, and confirm findings with an X-ray if necessary.
20) Incorrect replacement of lithium batteries causes unacceptable risks, and untrained personnel causes hazards (source) (such as over temperature, fire or explosion). Users should not replace the battery without authorization.
21) The device surface may exceed 41°C during operation. It is recommended to work for 5min and stop for 1min.
22) Service life:
Motor Handpiece: 10 years Contra-angle: 5 years.
Measuring Wire: 15, 000 uses.
File Clip and Lip Hook: 250 uses of Sterilization.

02. Intended Use

1) The Endo Motor is an endodontic treatment motorized handpiece with root canal measurement capability. It is intended to enlarge the canals while monitoring the position of the file inside the canal.
2) The device must be used exclusively in hospitals, clinics, or dental offices by qualified dental professionals.
3) This device is applicable to pediatric, adult, and geriatric patients requiring dental surgical procedures. However, motor parameter settings must be appropriately adjusted according to the oral physiological characteristics and clinical conditions of patients in different age groups.

03. Contraindication

- Patients with implanted pacemakers or other electronic devices who have been advised to avoid small electrical appliances (e.g. electric shavers, hair dryers) should not use this device.
- Patients with heart disease, pregnant women, and children should use with caution.
- This device cannot be used for the preparation of severely bent root canals.
- Do not use this device for dental implantation or other dental surgeries except for pulp.

20. Symbols

	Caution		General warning
	Class II equipment		Note
	Serial number		Keep dry
	Indoor use only		Refer to instruction manual/booklet
	Direct current	MD	Medical device
	Type B applied part		Do not dispose of the product into the ordinarymunicipal waste or garbage system
	Thermodisinfectable		Fragile, handle with care
	Sterilizable in a steam sterilizer (autoclave) at the 134°C		This way up
	Protect from heat and radio-active sources		Keep away from sunlight
EU REP	Authorized representative in the European Community/European Union	REF	Catalogue number
	Date of Manufacture		Manufacturer
LOT	Batch code	CE 0197	CE Marking

17. Operating, Transport and Storage Operating

Operating Environment		Transport and Storage Environment	
Operating temperature	+5℃ – +40℃	Storage temperature	-10℃ – +55℃
Operating humidity	≤80%	Storage humidity	≤93%RH
Atmospheric pressure	80kPa – 106kPa	Atmospheric pressure	50kPa – 106kPa

18. Guarantee

1) The product and technical service is responsible by the manufacturer and the technical department will provide technical supportfor you when there are technical problems.
2) The motor handpiece and main unit guaranteed for 24 months from the date of purchase.
3) The contra-angle is guaranteed for 12 months from the date of purchase.
4) The accessories are guaranteed for 6 months from the date of purchase.
5) The guarantee is valid for normal usage conditions. Any modification or accidental damage will render the guarantee void.
6) The supplier can provide, upon request, circuit diagrams, component lists, notes,calibration specifications, or other information necessary to assist the user's qualified technicians in the repair of parts of the device which are designated as repairable by the manufacturer.

19. Disposal of Medical device



The device and its packaging are designed to be as environmentally friendly as possible. Follow your local and country-specific laws, directives, standards and guidelines for disposal.

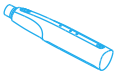
- Medical device
- Waste electrical equipment
- Packaging

04. Components and Accessories

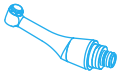
(Note: Please see the packing list for configuration quantity details)



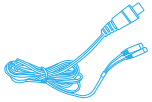
Main Unit



Motor Handpiece



Contra-angle



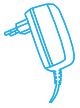
Measuring Wire



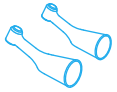
File Clip



Lip Hook



AC Adapter



Contra-angle Silicone Cove



Wrench

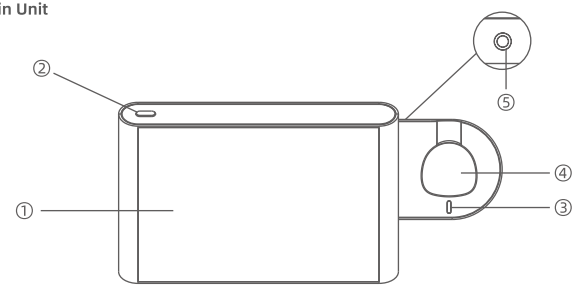


Spray Nozzle

Warning :

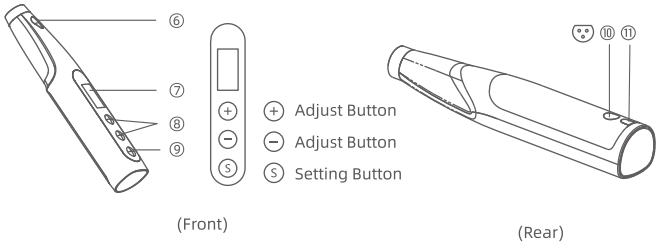
- For quantities of each component, please refer to the packing list.
- If the battery, adapter, or contra-angle is damaged, use only original parts from the manufacturer or authorized dealers and follow the manualfor replacement.

Main Unit



① Touchscreen.
② Main Unit Power Switch.
③ Handpiece Charging Indicator-Refer to section "13.2".
④ Handpiece Charging Base.
⑤ Adapter Socket-Refer to section "13.2".

Motor Handpiece



⑥ ON/OFF Button: Long press to power on/off; Press to start/stop the motor.
⑦ Display Screen.
⑧ Adjust Button "+/-".
⑨ Setting Button "S".
⑩ Measurement Cable Port: Connects to the measuring wire and tester.
⑪ Silicone Plug.

16. Technical Specifications

Adapter	Input: AC100V-240V~50/60Hz Output: DC10V 1.5A
Input power	35VA
Main Unit Battery	Lithium ion battery (DC7.4V 2600mAh)
Handpiece Battery	Lithium ion battery (DC3.7V 1200mAh)
Speed (6:1)	100-3000r/min
Torque (6:1)	0.6-5.0N·cm
Protection against electric shock	Type B applied part
Classification of Protection against Electric Shock	Class II (AC adapter)
Degree of Protection (IEC 60529)	IPX0
Operation Mode	Short-time Operation
Applied Part	Contra-angle, File Clip, Lip Hook
Overvoltage category	Class II
Pollution degree	Degree 2

Cybersecurity

Operating Environment	Functions only between the main unit and handpiece; not compatible with other devices.
Security Software	No external network connection; not compatible with third-party software.
Data and Device (System) Interface	Bluetooth 2.4G
User Access Control Mechanism	Main unit and handpiece must be paired ; not open to external access.
Software Environment	No external network connection; not compatible with other software.
Security Software Updates	No external network connection; security software and updates not supported.
Modulation Mode	GFSK
Frequency Range Transmission Power	2400 MHz - 2483.5MHz (2.4G ISM band) -23dBm - 0dBm (programmable via software) -23dBm - 0dBm (programmable via software)

11) **Caries touching the gums**
In this case, electrical leakage through the caries infected area to the gums will make it impossible to obtain an accurate measurement.

12) **Blocked canal**
The meter will not move if the canal is blocked.
Open the canal all the way to the apical constriction to measure it.

13) **Extremely dry canal**
If the canal is extremely dry, the meter may not move until it is quite close to the apex. In this case, try moistening the canal with oxydol or saline.

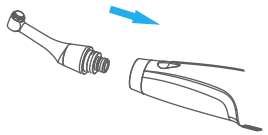
15.2. Error Codes

Error Type	Possible Cause	Solution
E1–Screen Communication Error	● Main control circuit malfunction ● Abnormal connection between the screen and mainboard	Power off and restart the device. If the problem persists, contact your dealer or the manufacturer for service.
E2–Bluetooth Error	● Main Unit Bluetooth circuit malfunction ● Main Unit Bluetooth communicationerror	Power off and restart the device. If the problem persists, contact your dealer or the manufacturer for service.
The handpiece shows a red Bluetooth icon	● Motor handpiece Bluetooth circuit malfunction ● Motor handpiece Bluetooth communication error	Power off and restart the device. If the problem persists, contact your dealer or the manufacturer for service.

05. Installation

5.1. Connecting the Contra-angle

1) Align the contra-angle with the motor handpiece and insert it horizontally until a "click" sound confirms secure attachment.
2) The contra-angle can rotate 360° freely.



Warning:
- Before each use, inspect the motor handpiece and contra-angle for damage.
- Handle the contra-angle carefully to prevent damage from drops or impact.
- Do not connect or disconnect the contra-angle while the motor is running.

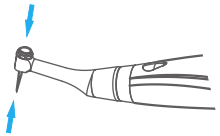
5.2. Attaching the Contra-angle Silicone Cover

1) Hold the lower part of the contra-angle.
2) Slide the contra-angle silicone cover upward from the bottom until it fully cover the working area of the contra-angle.
3) Ensure that the contra-angle silicone cover fits snugly against the contra-angle with no looseness.



5.3. Connecting the File

1) Hold down the push button on the contra-angle.
2) Insert the file and rotate it slightly until it aligns with the latch groove and slips intoplace. Release the button to lock the file securely.

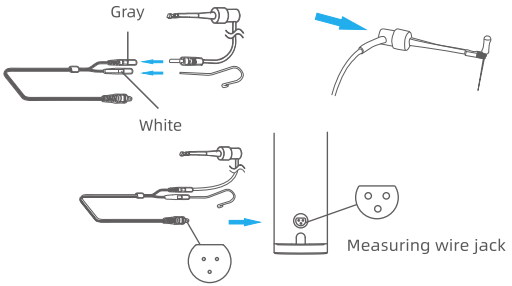


Warning:

- Ensure the file is properly installed to prevent it from flying out during use and causing personnel injury.
- The rod of the file must comply with the requirements of Type 1 rod in ISO 1797.
- Select a suitable file according to root canal preparation needs.
- Files are consumable. Replace worn-out files promptly to prevent breakage.
- Do not use bent, twisted or otherwise damaged files.
- Use files step-by-step, from small to large, preferably of the same type.
- Turn off the device before inserting or removing files.
- Press the push button during file insertion/removal to avoid damage to the chuck mechanism and the file.

5.4. Connecting the Measuring Wire

1) Connect the lip hook to the white jack on the measuring wire,and the file clip to thegray jack on the measuring wire.
2) Press the push button on the file clip to insert the file, then release to lock.
3) Connect the measuring wire plug to the socket on the back of the handpiece. Ensure it is fully inserted for stable operation.



Warning:

- Do not bang or bump the plugs when they are inserted.
- Do not use damaged or deformed file.
- Do not wrap the measuring wire around the device.
- The file clip is required only in Apex Locator Mode . It is not needed in Combined Mode .

15.1.1. EMR (Electric Measurement of Root canal length)

Accurate measurement cannot be obtained with the root canal conditions shown below.

1) **Root canal with a large apical foramen**
   Root canal that has an exceptionally large apical foramen due to a lesion or incomplete development cannot be accurately measured. The results may show shorter measurement than the actual length.

2) **Root canal with blood overflowing from the opening**
   If blood overflows from the opening of the root canal and contacts the gums, this will result in electrical leakage and an accurate measurement cannot be obtained. Wait for bleeding to stop completely. Clean the inside and opening of the canal thoroughly to get rid of all blood, and then make a measurement.

3) **Root canal with a chemical solution overflowing from the opening**
   An accurate measurement cannot be obtained if some chemical solution is overflowing from the canal opening. In this case, clean the canal and its opening. It is important to get rid of any solution overflowing the opening.

4) **Broken crown**
   If the crown is broken and a section of the gingival tissue intrudes into the cavity surrounding the canal opening, contact between the gingival tissue and the file will result in electrical leakage and an accurate measurement cannot be obtained.
   In this case, build up the tooth with a suitable material to insulate the gingival tissue.

5) **Fractured tooth**
   Fractured tooth will cause electrical leakage and an accurate measurement cannot be obtained.

6) **Leakage through a branch canal**
   A branch canal will also cause electrical leakage.

7) **Re-treatment of a root filled with gutta-percha**
   The gutta-percha must be completely removed to eliminate its insulating effect. After removing the gutta-percha, pass a small file all the way through the apical foramen and then put a little saline in the canal, but do not let it overflow the canal opening.

8) **Crown or metal prosthesis touching gingival tissue**
   Accurate measurement cannot be obtained if the file touches a metal prosthesis that is touching gingival tissue. In this case, widen the opening at the top of the crown so that the file will not touch the metal prosthesis before taking a measurement.

9) **Cutting debris on tooth**
   Thoroughly remove all cutting debris on the tooth.

10) **Pulp inside canal**
    Thoroughly remove all the pulp inside the canal. Otherwise an accurate measurement cannot be obtained.

Sterilization (For EU)	Sterilization of instruments by applying a fractionated pre-vacuum steam sterilization process (according to EN 285 / EN 13060 / EN ISO 17665) under consideration of the respective country requirements. Minimal requirements: 3 min at 134 °C In EU, 5 min at 134 °C is required. Maximal sterilization temperature: 137ºC
Storage	Storage of sterilized instruments in a dry, clean and dust free environment at modest temperatures refer to label and instructions for use.
Reprocessing validation study information	The above-mentioned reprocessing process (cleaning, disinfection sterilization) has been successfully validated.
Additional Instructions: None	
It is the duty of the user to ensure that the reprocessing processes including resources, materials and personnel are capable to reach the required results. State of the art and often national law requiring these processes and included resources to be validated and maintained properly.	

15. Troubleshooting

15.1. Troubleshooting and Solutions

If you find that the device is not operating normally during use, Please refer to the following methods for device maintenance.

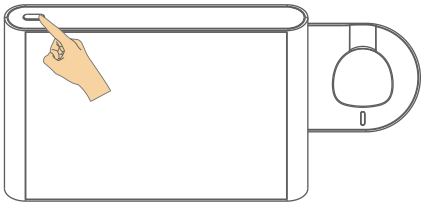
Problem	Cause	Solution
Cannot turn on the power	The battery is low	Please charge in time
	Battery failure	Contact the dealer or manufacturer
Cannot charge the battery	The AC adapter is not reliably connected	Check that the AC adapter connection is reliable
	Dirty magnetic connection	Wring out a clean, damp cloth and wipe off the soiled area
The battery is running out quickly	The charging time for the battery is too short	Charging time for more than 5 hours
	Battery aging	Contact the dealer or manufacturer
Apex locator imprecise / not sensitive	Measuring wire connection unreliable	Reconnect the measuring wire or you can contact the file clip to lip hook directly to check theconnection status
	The measuring wire has an open circuit or a short circuit	Replace measuring wire
Cannot start the motor/ motor does not work	Low voltage protection	Please charge in time
	Contra-angle stuck	Clean or replace the Contra-angle
	Contra-angle wear, resistance becomes larger	Enter the System Setting and run the calibration procedure. If the calibration fails, replace the Contra-angle

※ Endo Motors should only be serviced by specialized technicians.

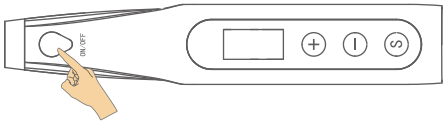
06. Operation

6.1. Power On/Off

Main Unit: Press and hold the main power switch to power the device on or off.



Handpiece: Press and hold the ON/OFF button on the handpiece to power it on or off.



Note:

Before starting the device, you may need to charge the host and handpiece.

For details on the charging method, see "13.2".

6.2. Bluetooth Connection

After the main unit and handpiece are powered on, the handpiece will automatically connect to the main unit via Bluetooth.

Note:

The bluetooth connection status is displayed on the status bar of the main unit and on the handpiece screen:

Blue: Connected

Gray: Not Connected

If "E2 Bluetooth Error" appears, restart the device. If it still doesn't work, contact support.

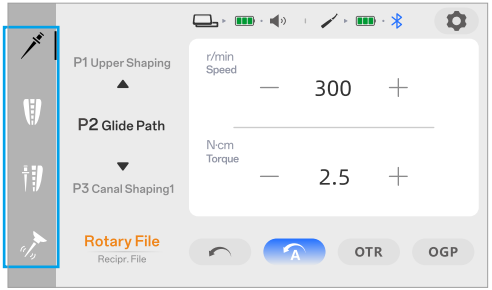
Note:

- In case of a bluetooth connection failure requiring re-pairing or handpiece replacement, refer to "13.1 Bluetooth Re-pairing".
- If a bluetooth connection failure occurs, the device supports operation in standalone handpiece mode, refer to "11. Standalone Handpiece Operation".

6.3. Mode Selection

Tap the function icon to select the desired mode. The selected icon will be highlighted.
The device supports the following modes:

- Motor-only mode
- Combined mode (motor + apex locator)
- Apex locator mode
- Endo activate mode



	• Wipe the outer surface of the handpiece with the soft cloth. • Clean the chuck, gaps and threads: brush back and forth with a soft brush under running tap water to remove contaminants. • Rinse handpiece with tap water until all visible contaminants have been removed. • Remove any liquid residue with a lint-free cotton cloth, then dry at 30°C. • Checked that if the devices were clean or broken after cleaning. If the cleaning is not good enough, repeat the cleaning procedure. • Do not put a handpiece into a container containing a cleaning solution. If the internal liquid is not cleaned and the drying is incomplete, the internal parts may be corroded.
Automated Cleaning (For EU)	Regarding cleaning/disinfection, rinsing and drying, it is to distinguish between manual and automated reprocessing methods. Preference is to be given to automated reprocessing methods, especially due to the better standardizing potential and industrial safety. Automated Cleaning: Put the instrument into the machine on a tray. Connect the instrument with the WD by using suitable AC adapter and start the program: • 4 min pre-washing with cold water (<40°C) • Emptying • 5 min washing with a mild alkaline cleaner at 55°C • Emptying • 3 min neutralizing with warm water (>40°C) • Emptying • 5 min intermediate rinsing with warm water (>40°C) • Emptying The automated cleaning processes have been validated by using 0.5% neodisher MediClean forte (Dr Weigert) Note Acc to en ISO 17664 no manual reprocessing methods are required for these devices. If a manual reprocessing method has to be used, please validate it prior to use.
Automated Disinfection (For EU)	Automated Disinfection: Automated Thermal Disinfection in washer/disinfector under consideration of national requirements in regards to A0-Value (see EN 15883). A disinfection cycle of 5 min disinfection at 93°C has been validated for the device to achieve an A0 value of 3000.
Manual Drying (For US)	Use compressed air to blow dry the internal pipes and external surfaces separately.
Automated Drying (For EU)	Automated Drying: Drying of outside of instrument through drying cycle of washer/disinfector. If needed, additional manual drying can be performed through lint free towel. Insufflate cavities of instruments by using sterile compressed air.
Functional Testing, Maintenance	Visual inspection for cleanliness of the instruments and reassembling. Functional testing according to instructions of use. If necessary, perform reprocessing process again until instrument is visibly clean.Defective accessories should be immediately discarded. The defects include: Plastic deformation and corrosion Maintenance is not required. Instruments oil must not be used.
Packaging	Pack the instruments in an appropriate packaging material for sterilization. The packaging material and system refer to EN ISO 11607. (For US) Please use the sterilization bags which are approved for its efficacy by FDA. Recommended sterilization bag: SIGMA Sterilization Pouch and Roll 510(k) Number: K202462.
Sterilization (For US)	Sterilizable parts: Contra-angle, File clip, Lip hook, Contra-angle Silicone Covers Sterilization method: Gravity-Displacement Steam Cycle Sterilization conditions: 135℃, 10 minutes Drying Time: 30 minutes

14. Cleaning, Disinfection and Sterilization

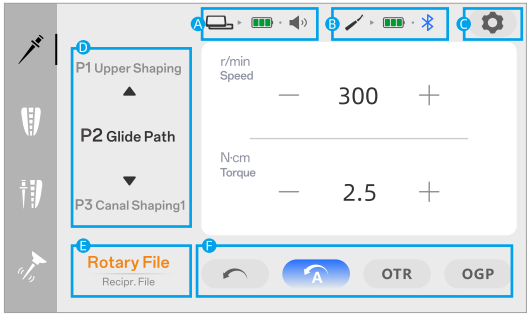
Device	Contra-angle, File clip, Lip hook, Motor handpiece, Main unit, Measuring Wire, AC adapter, Contra-angle Silicone Covers. The procedure for cleaning, disinfection and sterilization applies only to the accessories Contra-angle, File clip, Lip hook, Contra-angle Silicone Covers.
ADVICE	Reprocessing procedures have only limited implications to a surgical instrument. The limitation of the numbers of reprocessing procedures is therefore determined by the function / wear of the device. There is no limit of maximum allowable reprocessing cycles. The device should no longer be reused in case of signs of material degradation. In case of damage the device should be reprocessed before sending back to the manufacturer for repair.
Reprocessing Instructions	
Preparation at the Point of Use	Disconnect the Contra-angle from handpiece, the File clip from the measuring wire and the Lip hook. Remove gross soiling of the instrument with cold water (<40°C) immediately after use. Don't use a fixating detergent or hot water (>40°C) as this can cause the fixation of residuals which may influence the result of the reprocessing process. Store the instruments in a humid surrounding.
Transportation	Safe storage and transportation to the reprocessing area to avoid any damage and contamination to the environment.
Preparation for Decontamination	The devices must be reprocessed in a disassembled state. Only Contra-angle, File clip, Lip hook, Contra-angle Silicone Covers can be cleaned and disinfected with automated methods and sterilized with steam sterilization process. Do not sterilize the Motor handpiece and AC adapter. The Motor handpiece and AC adapter cannot be cleaned and disinfected in a washer/disinfector. For these parts, only general wipe decontamination is possible!
Decontamination of other parts than Contra-angle, File clip, Lip hook, Contra-angle Silicone Covers	After operation, take out the Motor handpiece and AC adapter on the work bench. Soak a soft cloth completely with distilled water or deionized water, Decontamination and wipe all the surfaces of these components, until the surface of the parts the components is visually clean. For decontamination, soak a dry soft cloth with 75% alcohol or other Contra-angle, File clip, disinfects which are approved for its efficacy by VAH/DGHM LISTING and CE marking, FDA and Health Canada Approval lighting device: Wipe all surfaces of Motor handpiece, AC adapter and other components with the wet soft cloth for about 3 minutes. Please follow the instructions of manufacturer of disinfectant swipe the surface of the component with a dry soft lint-free cloth.
Pre-Cleaning	Following instruction are only relevant for Contra-angle, File clip, Lip hook, Contra-angle Silicone Covers! Not use automated cleaning, disinfection and sterilization for other parts than Contra-angle, File clip, Lip hook,Contra-angle Silicone Covers in this system! Do a manual pre-cleaning, until the instruments are visually clean. Submerge the instruments in a cleaning solution and flush the lumens with a water jet pistol with cold tap water for at least 10 seconds. Clean the surface with a soft bristol brush.
Manual Cleaning (For US)	Recommend using 3M multienzyme cleaning agent at a concentration of 5mL/1L distilled water. ● Soak the soft cloth in detergent and wring it out.

07. Motor-Only Mode

Tap the Motor-only mode icon on the main unit to enter this mode.

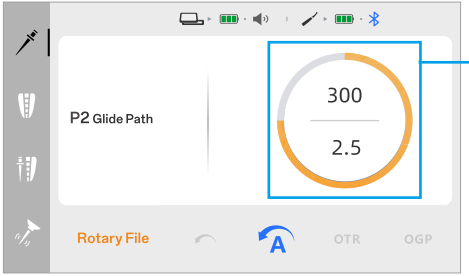
7.1. Interface Description

Main Unit Interface



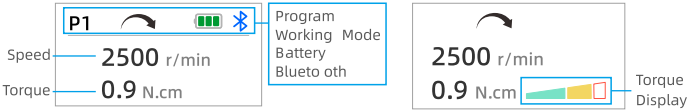
(Standby)

A.Main Unit Status Bar	Displays main unit battery level and main unit key tone status: On / Off Battery Level Charging
B.Handpiece Status Bar	Displays handpiece battery level and bluetooth connection Gray-Not connected / Blue-Connected
C.Settings	D.Program Selection
E.File Selection	F. Working Mode Selection



(Working)

Handpiece Interface



(Standby) (Working)

7.2. Program Switching

Main Unit:

Press the program button ▲ ▼ to switch between programs.

Handpiece:

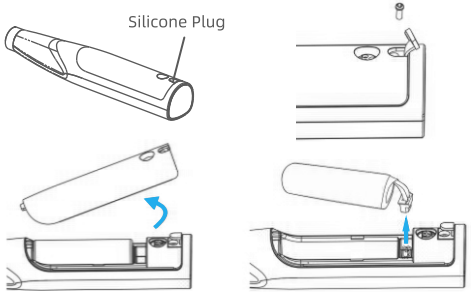
Press the "S" button to cycle through programs. The screen displays the current program number.

Note:

P1-P5 are preset and storable programs.

- P1: Upper Shaping
- P2: Glide Path
- P3-P5: Canal Shaping 1 / 2 / 3

Each program allows independent configuration of speed, torque, and working mode.



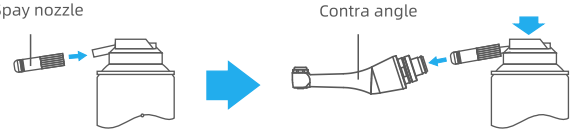
(Handpiece)

Warning:

- Always use the original designated batteries (Main Unit: JW-Y2S-2.6; Handpiece: LI-ION16500-JW-No24). Use of non-original batteries may damage the device.
- Do not use leaking, deformed, or damaged batteries.
- Do not replace the battery with wet hands, as this may cause a short circuit or allow liquid to enter the device.

13.4. Lubrication

1) Remove the contra-angle from motor handpiece;
2) Remove the file from the contra-angle;
3) Mount the tip nozzle into the spray can port and align the nozzle to the contra-angle, Spray lubricating oil into contra-angle until clean liquid flows out.



Warning:

- When the head overflows with clean liquid, the entire cleaning and maintenance steps should be repeated.
- It is recommended to inject lubricating oil before sterilization.

Note:

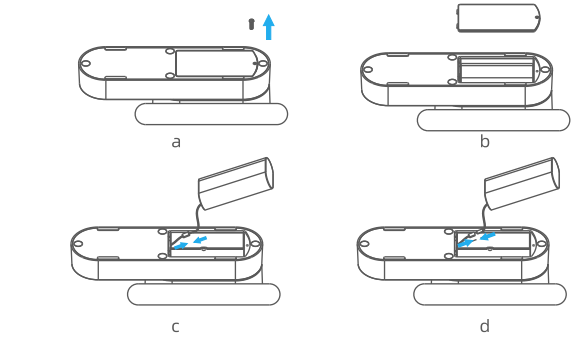
- If over current occurs, charging stops automatically.
- The indicator flashes and "E3" appears on the screen.
- resume charging, disconnect power or turn off the device first.

Warning:

- Keep the charging environment dry.
- Do not connect measuring wires, testers, or similar accessories while charging.
- Use only the original power adapter to avoid short circuits or device damage.
- Do not charge in humid environments.
- Charge the handpiece only with the designated main unit.
- After charging, disconnect the power adapter and unplug the connector.
- If not in use for an extended period, charge at least once a month.

13.3. Battery Replacement

1) Open the rubber cover or remove the screw.
2) Remove the battery cover as shown in the illustration.
3) Remove the old battery.
4) Connect the new battery.
5) Install the cover and its screw or rubber cover.

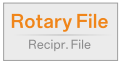


(Main unit)

7.3. File Selection

Note:

When the main unit and handpiece are connected, the file type can only be set on the main unit.

Press the file selection button 

on the main unit screen to switch the file type.

- **Rotary file:** Adjustable speed, torque, working mode
- **Reciprocating file:** Adjustable speed, torque, reciprocating angle

7.4. Working Mode Settings

Note:

When the main unit and handpiece are connected, the working mode can only be set on the main unit.

Tap the mode button on the main unit interface to select the working mode.

1) **Reverse Mode**
   The motor rotates continuously in the counterclockwise direction.
   This mode is suitable for delivering root canal drugs such as calcium hydroxide.

Note:

- When the motor operates in reverse rotation, a "beep-beep" sound is emitted.
- The reverse setting is not retained after stopping. When the motor stops, the rotation mode automatically returns to Auto Reverse.

2) **Auto Reverse Mode**
   - During operation, when the torque reaches the trigger torque, the motor will automatically reverse.
   - During operation, when the load is reduced, the motor automatically resumes forward rotation.
   - During reverse rotation, if the torque exceeds the overload threshold, the motor stops and enters standby mode.



Forward rotation | Load reaches trigger torque Reverse rotation | Load is reduced Resume forward rotation

3) OTR Mode（Adaptive Torque Reverse）

- During operation, when the torque reaches the trigger torque, the motor performs reciprocating motion at the selected angle.
- During operation,when the load is reduced, the motor automatically resumes forward rotation.
- The reverse angle and angle difference can be adjusted.

Example:

- Reverse angle180°, Angle difference 90°, then the forward angle is 270°.
- When the torque reaches the trigger torque,the motor will reciprocate by reverse 180° and forward 270°.



Forward rotation | Load reaches trigger torque Reciprocate rotation | Load is reduced Resume forward rotation

Note:

Application:

Suitable for continuous rotary files. The file motion follows a cycle of: "Press → Engage → Withdraw" , with overall advancement into the root canal.

Parameter Recommendations:

- Reverse angle: 90°
- Angle difference: 90°

Settings:

- Reverse angle: set on the standby interface.
- Angle difference: set in the settings interface.

Charging status display:

-  Main uint charging display
-  Handpiece charging display

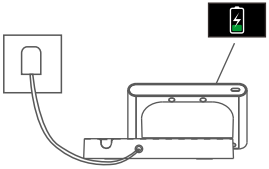
13.2.2. Charging operation

1) Main Unit Charging:

Connect the adapter to the rear port of the main unit. the charging status is

shown as follows:

When main unit charging, the screen displays the charging symbol and status. After 3 minute of inactivity, the symbol will disappear, you can press the ON/OFF button or touch the screen tocheck the charging status.



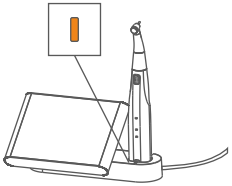
2) Handpiece Charging:

- **Adapter Charging:**
  Connect the adapter to the main unit's rear port and place the handpiece on the main unit's charging dock to charge.
- **Internal Wireless Charging:**
  When the main unit has sufficient battery, it can wirelessly charge the handpiece via its internal battery without connecting the adapter.

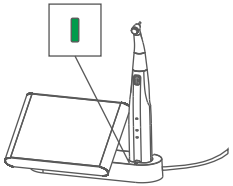
Note:

When the host battery is low, this function is unavailable and the button is displayed in gray.

The handpiece charging light will illuminate flashing orange, indicating battery is charging and will show constant green when fully charged.



Orange (Charging)



Green (Fully Charged)

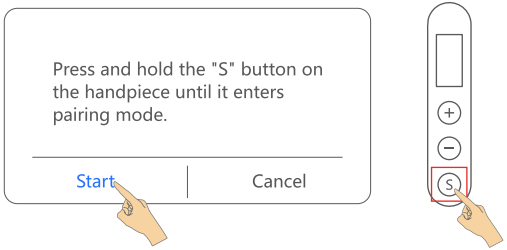
13. Maintenance

13.1. Bluetooth Re-Pairing

This operation is only required when replacing the handpiece or main unit, or if the bluetooth disconnects automatically.

13.1.1. Connecting

1) Enter Settings, Tap the "Start" button, and follow the pop-up prompts.
2) Long press the handpiece "S" button until it enters bluetooth pairing mode.



3) If the pairing is successful, the Setting on the main unit will display "Paired".



13.1. 2. Disconnecting

Tap the "Unpair" button to disconnect. Follow the on-screen prompts.

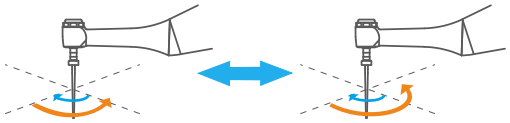
13.2. Charging

13.2.1. Battery Level Display

- Sufficient Battery（≥60%）
- Medium Battery（20%-60%）
- Low Battery（≤20%）
- Critical Battery Level.The device will automatically shut down.Please stop operation immediately and recharge.

4) **OGP Mode (Ledge Removal Mode)**
   - The motor operates in reciprocating motion at the preset angle to assist file advancement through ledges.
   - The forward angle and angle difference can be adjusted.

Example:
- Forward angle 90°, Angle difference 30°, then the reverse angle is 120°.
- The motor performs reciprocating motion in the order A → B → A → B.



Equal angle reciprocating rotation
A: Forward 90° Reverse 90°

Set angle for reciprocating rotation
B: Forward 90° Reverse 120°（90°+30°）

Note:

Application:
Suitable for continuous rotary files. The file performs a “pecking” motion, with overall withdrawal from the root canal.

Parameter Recommendations:
- Forward angle: 90°
- Angle difference: 90°

Settings:
- Forward angle: set on the standby interface.
- Angle difference: set in the settings interface.

Warning :
Do not apply excessive force during root canal preparation. Excessive force may result in file deformation or breakage.

7.5. Setting Speed,Torque,and Reciprocating Angle

Main Unit:
Tap the "-/+" button to adjust parameters.

Handpiece:
Press the "-/+" button on the handpiece to adjust the speed.

Note:

When the main unit and handpiece are connected:

- The handpiece supports speed adjustment.
- Torque and angle parameters can only be adjusted on the main unit.

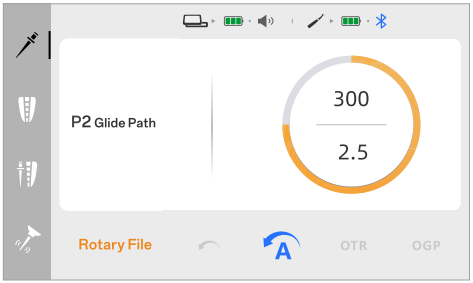
7.6. Start Operation

7.6.1. Start/Stop Operation

Press the ON/OFF button on the handpiece to start the motor.
Press the ON/OFF button again to stop the motor.

7.6.2. Operation Status Display

During operation, the main unit displays preset parameters, while a circular bar shows real-time torque.
When the torque approaches or reaches the preset value, the system performs the corresponding action based on the selected working mode.



Note:

Handpiece and the main unit torque display synchronization:

When the load reaches 50% of the preset torque, the torque bar displays .



When the load approaches the preset torque limit, the torque bar displays .



9) **OTR Angle Difference**
Set the difference between the forward angle and the reverse angle in the OTR mode.

10) **Auto Stop**
Turn on or off the auto start and stop function of the root canal.
When turn on:
The motor automatically starts when the file is inserted into the canal and stops when the file is withdrawn from the canal.

11) **Auto Slowdown**
Turn on or off the auto slowdown function.
When turn on:
- When the file tip reaches the apex measurement value "2.0" position, or the torque reaches 30% of the preset torque, the motor auto slowdown;
- When exiting to above the apex measurement value "2.0", the motor resumes the preset speed.

When turn off:
- The motor always runs at the preset speed.

Note:

The endo auto start only when triggered automatically. If the motor is started manually via the on/off button, it will not stop automatically when exiting the canal, even if the function is enabled.

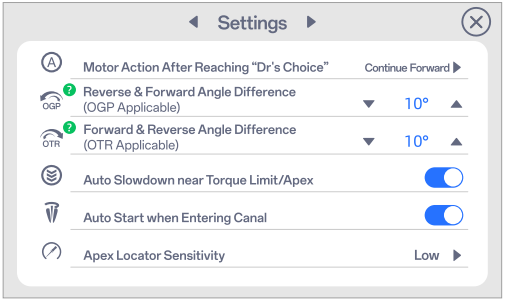
12) **Apex Locator Sensitivity**
Three sensitivity levels are available: High, Medium, and Low.

Warning:

- Connect the contra-angle before calibration.
- Do not touch the file or apply pressure to the motor, otherwise the calibration will fail.
- The screen displays "completed", indicating that the device is functioning normally.
- If the screen displays "failed":
  1) Check for any obstructions or debris in the contra-angle and clean it thoroughly.
  2) Ensure the battery is sufficiently charged.
  3) Repeat the calibration process.If the problem persists, contact the manufacturer or authorized service center for assistance.

6) Handpiece Pairing

Refer to section "13.1 Bluetooth Re-Pairing".



(Second page of setting interface)

7) Preset Apical Motor Action

Set the motor action when the file reaches the preset apical position: maintain forward /auto reverse/auto stop.

Note:

The motor action reaches the preset apical, which only takes effect when the measuring wire is connected and the Combined Mode is enabled.

8) OGP Angle Difference

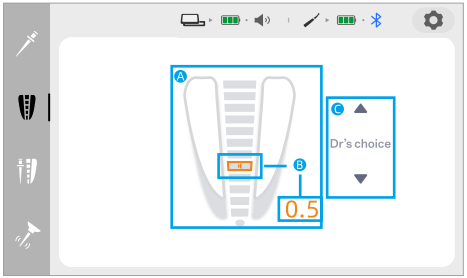
Set the difference between the reverse angle and the forward angle in the OGP mode.

08. Apex Locator Mode

Upon connecting the attachments as specified in Section "5.3", the device will automatically enter Apex Locator Mode .

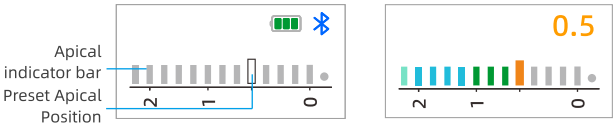
8.1. Interface Description

Main Unit Interface



A. Apical indicator bar	Displays the real-time position relationship between the file tip and the apical foramen.
B. Preset Apical Position	Set the target position of the file tip for root canal length measurement. The number indicates the relative distance between the file tip and the apical foramen-the smaller the number, the closer to the apex.
C. Adjustment Button	Used to adjust the preset apical position

Handpiece Interface



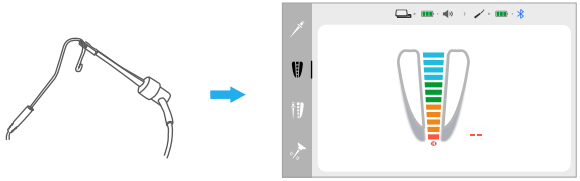
(Standby) (Working)

8.2. Connection Testing

It is recommended to conduct inspections prior to measurement or when measurement accuracy is uncertain.

Instructions:

- Contact the lip hook with the metal part of the file clip.
- Check that all indicator bars on the main unit display illuminate.
- If all indicator lights turn on as shown below, the connection is functioning properly.



Warning:

If all the indicator bars do not light up, an accurate measurement cannot be made. In this case, stop using the device immediately and have it repaired.

8.3. Adjusting the Preset Apical Position

Main Unit:

Press the ▲ ▼ button on the screen to set a custom apex reference position.

Handpiece:

Press the " - /+ " button briefly to adjust the preset apical position.
When the file tip approaches or reaches the reference position, the device emits an audible alert and executes corresponding motor actions according to the settings (e.g., maintain Forward /Auto reverse/Auto stop, see Chapter 12 for details).

8.4. Measurement

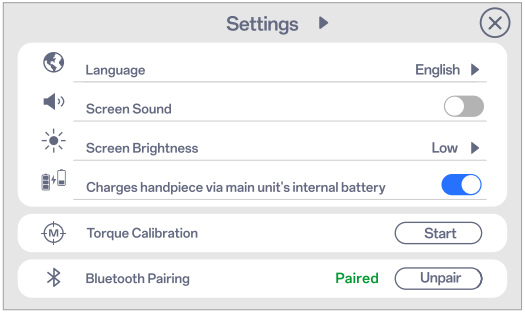
Warning:

- Prohibit contact between the lip hook, file clip, and measuring wire with power sources (e.g., power sockets).
- Ensure all connectors are securely in place.

1) Place the lip hook securely on the patient's lip, opposite to the tooth being measured.
2) The numbers do not represent an absolute length. It simply indicates the relative file position towards the apical foramen. These numbers are used to help determine the working length.

12. Setting

Press the settings icon on the main interface to enter the settings menu.



(First page of setting interface)

1) **Language**
   Select the display language of the system.
   Available languages: English, French, German, Italian, Spanish and Portuguese.
2) **Sound**
   Press the button to turn the main unit sound on or off.
3) **Screen Brightness**
   Three levels of brightness can be selected: Low/Medium/High.
4) **Wireless Charging**
   When the external power supply is not connected, control whether the main unit wirelessly charges the handpiece.
5) **Torque Calibration**
   The calibration function is designed to reduce the discrepancy between the set and actual torque of the motor and contra-angle.

   Calibration steps:

   - Press the "Start" button and follow the on-screen instructions.
   - Once calibration is complete, the motor will stop, and the main unit returns to the settings interface.

11. Standalone Handpiece Operation

When bluetooth connection is lost,the handpiece supports the following standalong Functions, including:
Motor-Only Mode, Apex Locator Mode, Combined Mode.

11.1. Mode Selection

Motor-Only Mode: After bluetooth disconnection, the handpiece enters the Motor-Only Mode interface by default.

Apex Locator Mode: If the measuring wire is connected, the handpiece enters the Apex Locator Mode interface by default.

Combined Mode : If the measuring wire is connected, press the ON/OFF or "S" button to switch from Apex Locator Mode to the Combined Mode interface.

Note:

- If Bluetooth disconnects during operation, the handpiece maintains its current mode until the motor stops.
- After reconnection, the handpiece syncs with the main unit settings.
- When used alone, the handpiece is not supports the Endo Activate Mode.

11.2. Working Mode Settings

Under Apex Locator Mode and Combined Mode, press the "S" button to switch the working modes:

- **Reverse Mode:** The motor continues to rotate counterclockwise.
- **Auto Reverse Mode:** During operation, when the torque reaches the trigger torque, the motor will automatically Auto Reverse.During operation,when the load is reduced, the motor automatically resumes forward rotation, see 7.4 for details.
- **Reciprocating Mode:** The motor rotates reciprocally at the preset angle.

11.3. Adjusting Parameters

Under the Motor-Only Mode and Combined Mode:

- Press the "S" button to adjust torque or reciprocating angle.
- Press the "+/-" button to adjust the speed.

Under the Apex Locator Mode:

- Press the "+/-" button to adjust the preset apical position.

3) Indicate area description:
   - Blue Zone:There is slow beeping sound when the file reaches 1.0-2.0.
   - Green Zone:The beeping sound Interval become frequently when the file reaches 0.5-1.0.
   - Orange Zone:There is fast beeping sound when the file reaches 0.0-0.5.
   - Red Zone:Sustained beep sounds when the file reaches or exceeds the preset apical position.



4) During the measurement process, the apex indicator bar displayed on the handpiece is synchronized with the main unit.

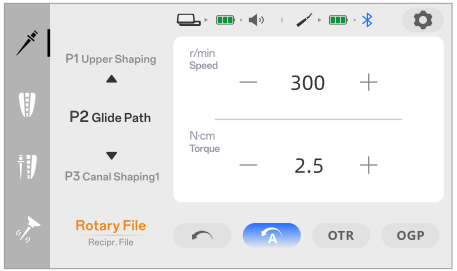
09. Combined Mode

Connect the contra-angle and file, refer to section "5.1 and 5.2".
Connect the measuring wire and handpiece, refer to section "5.3".
Check the apex locator connection, refer to section "8.2".

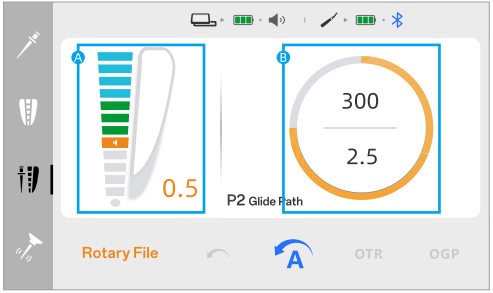
Press the  icon button on the main unit device to activate this mode. Alternatively, press the ON/OFF button on the handpiece within Apex Locator Mode interface to enable the Combined Mode.

9.1. Interface Description

Main Unit Interface



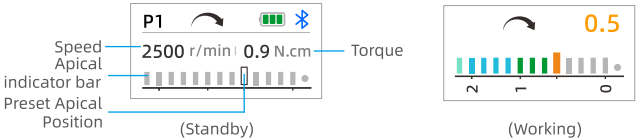
(Standby)



(Working)

A. Apical indicator bar	Displays the position relationship between the file tip and the apical foramen.
B. Torque progress bar	Display current torque changes and preset parameters.

Handpiece Interface



(Standby) (Working)

9.2. Adjust Parameters

Program Selection, File type Selection,.Parameter adjustment, and working mode, please refer to "7.2-7.5" for details.

Apex measurement parameter settings are not displayed in this mode. To adjust them, go to the Apex Locator Mode interface.

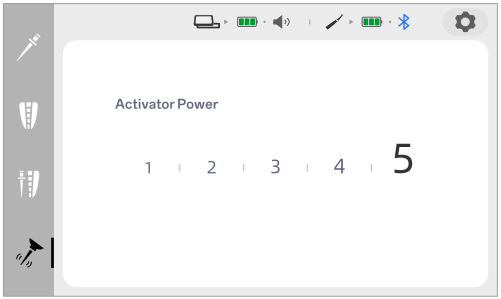
10. Endo Activate Mode

Connect the contra-angle, refer to section "5.1".

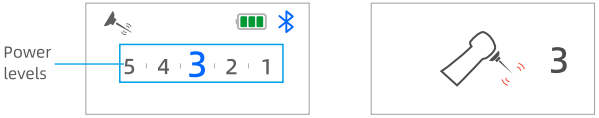
Press the  icon button on the main unit device to enter the Endo Activate Mode.

10.1. Interface Description

Main Unit Interface



Handpiece Interface



(Standby) (Working)

10.2. Adjust Parameters

Main unit:
Tap the number button on the screen to switch the power lever.

Handpiece:
Press the " - /+ " button to switch the power levers.