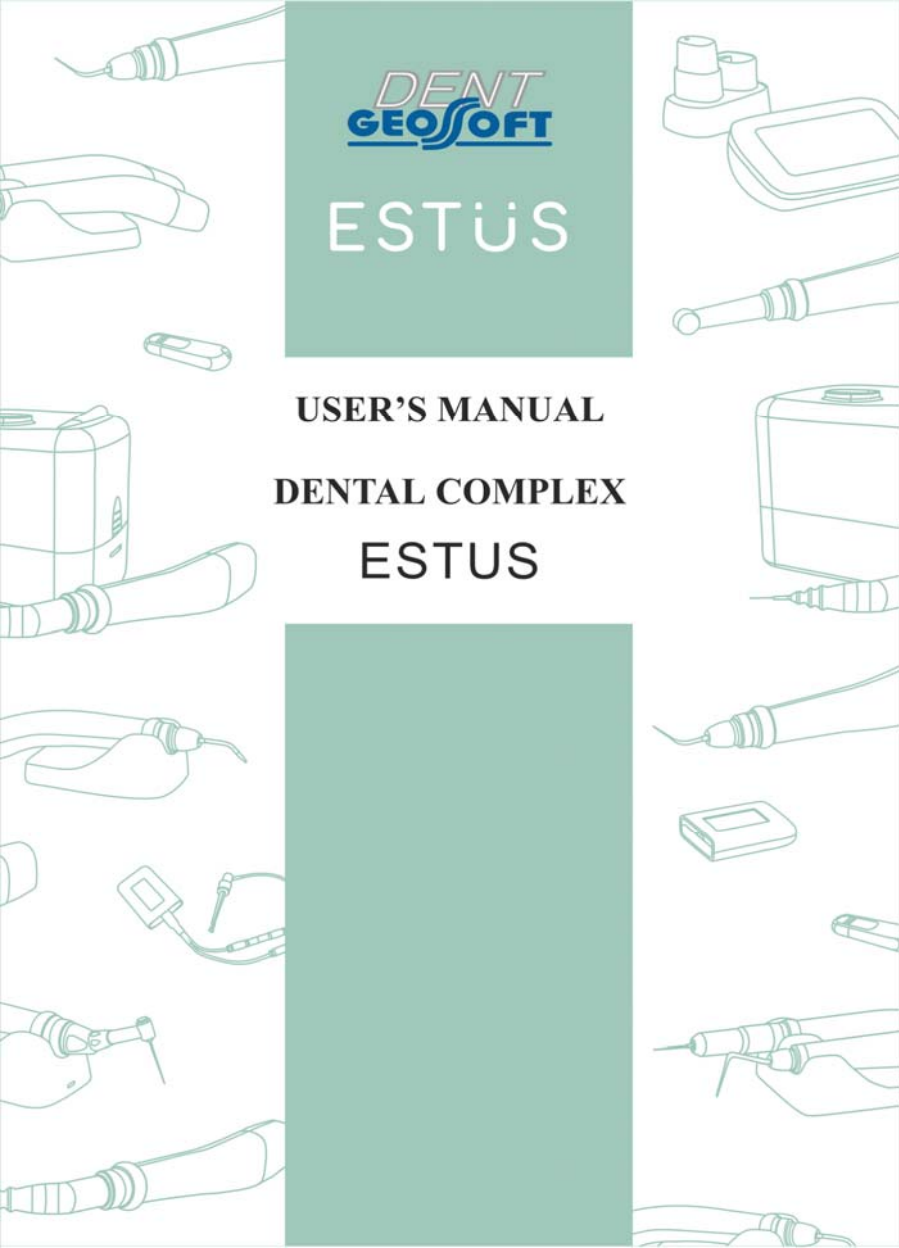
DENT GEOSOFT

ESTüS

USER'S MANUAL

DENTAL COMPLEX

ESTUS



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JSC Geosoft Dent
Russia

1. GENERAL INFORMATION

The “Estus” dental complex is designed for carrying out procedures in the field of dentistry and consists of the following devices:

- Endodontic motor «Estus Drive» (including Irrigation pump «Estus Pump» and Smart stand-Apexlocator «Estus Smart-B»),
- Device for root canal obturation «Estus Pack-Fill»,
- Device for electric dental pulp testing «Estus Pulp»,
- Dental light curing device «Estus Light»,
- Endodontic ultrasonic scaler «Estus Sonic»,
- Apexlocator «Estus Apex»,

The listed devices are connected via a radio channel to a common Apexlocator - Control unit "Estus Multi"

With the help of the Estus Multi control unit, it becomes possible to

process of setting them up and provide a more visual indication of their operating parameters. Data transmission and reception between Estus Multi and other devices of the Estus dental complex is carried out via radio channel.

2. PREPARATORY STAGE

For “Estus Multi ” and other devices of the “Estus” dental complex joint work it is necessary to create pair with the devices on radio channel.

The detailed information on pair creating is in the “Estus Multi” User’s Manual *(Step 12/ p. 12.2 "Setting "Creating/Deleting pair" function).*

After creating pair with “Estus Multi ” the icon of the paired device on the “Estus Multi ” screen changes **GREY** into **MINT**, and after the device switching on - into **LILAC**.

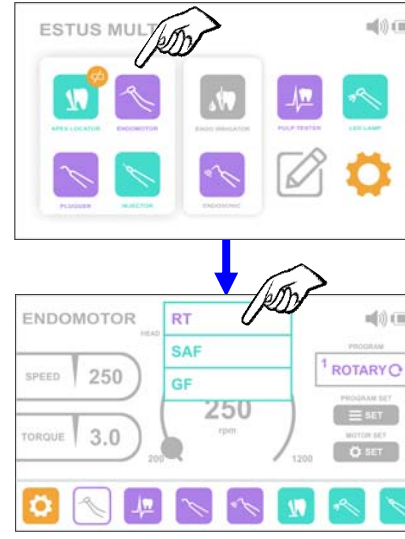
3. OPERATION OF ESTUS DRIVE ENDOMOTOR WITH ESTUS MULTI

Step 1. ENDOMOTOR mode activation

Step 1.1. Manual activation

A) Click on the ENDOMOTOR icon in the "ESTUS MULTI" menu.

B) Click on the box HEAD and in a drop-down list choose the required mode corresponding to the type of the connected head to the ESTUS DRIVE handpiece - RT, SAF or GF.



Step 1.2. Automatic activation

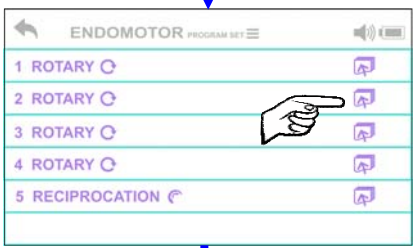
Set the working head in the "Estus Drive" handpiece socket and press the handpiece ring switch. The "ESTUS MULTI" screen automatically activates the endomotor mode corresponding to the set head.

Step 2. Working with the RT head.

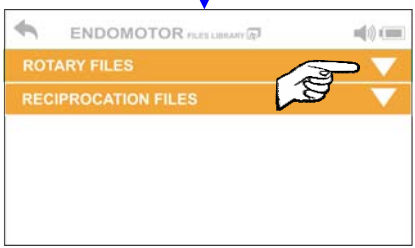
Step 2.1. Editing the working sequence of files

In this setting, it is possible to select and remember a sequence of any five files.

A) Click on the PROGRAM SET button to open the files editing box.
By default, the screen displays a list of files saved in the “Estus Drive” handpiece memory.

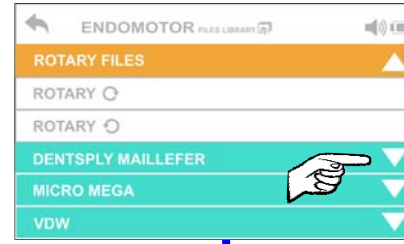


B) To change the type of the current file and / or its parameters, click on the icon on the right.

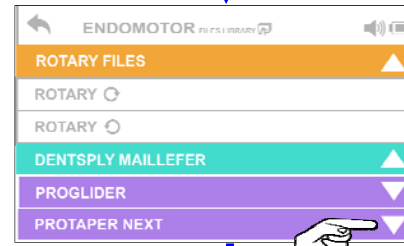


C) In the drop-down FILES LIBRARY, select the required file, moving along the chain:
File type >
(for ex., ROTARY FILES)

> **manufacturer firm** >
(for ex., DENTSPLY MAILLEFER)

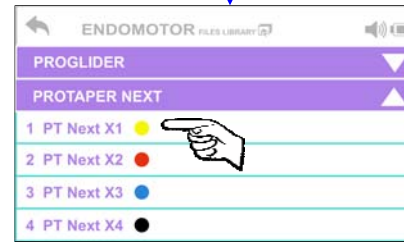


> **system name** >
(for ex., PROTAPER NEXT)



and

> file designation
(for ex., PT Next X1)



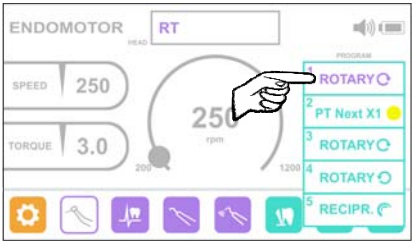
with:

ROTARY - any Rotary file, rotating clockwise

ROTARY - any Rotary file, rotating counterclockwise

RECIPROCATION - any Reciprocation file

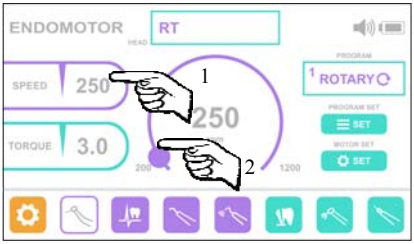
D) To exit the editing box after making all the necessary changes, click on the arrow in the upper left corner of the screen.



Step 2.2. Choosing the working file
Click on the PROGRAM box and in the drop-down list choose one of the five working files

After clicking on the line with the file designation, the parameters loaded for this file from the library (speed and torque for Rotary files or rotation angle clockwise and counterclockwise for Reciprocation files) automatically appear in the main program box.

Step 2.3. Speed rotation adjusting for ROTARY-files



To change the current speed value click on the **SPEED** button and with the circular regulator set the required value in the range of 200 - 1200 rpm with a step 50/100 rpm

The maximum allowable file rotation speed depends on the specified limit torque (see Step 2.4).

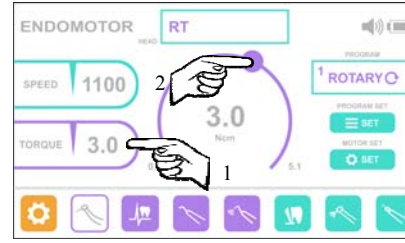
The maximum speed values at a preset torque are shown in the table below:

Preset torque , Ncm	<=3,0	3,1-3,2	3,3-3,5	3,6-3,7	3,8-4,0	4,1-4,2	4,3-4,5	4,6-4,8	4,9-5,1
Max. speed , rpm	1200	1100	1000	900	800	700	600	500	400

For safe root canal preparation, at the speed gets higher than the maximum allowable value, the set value of the limit torque is automatically reduced.

Step 2.4. Limit torque adjusting for ROTARY-files

To change the current torque value click on the **TORQUE** button and with the circular regulator set the required torque value in the range of 0,2 - 5,1 Ncm with a step 0,1 Ncm



The maximum allowable limit torque depends on the speed set for it (see Step 2.3).

The maximum torque values at a preset speed are shown in the table below:

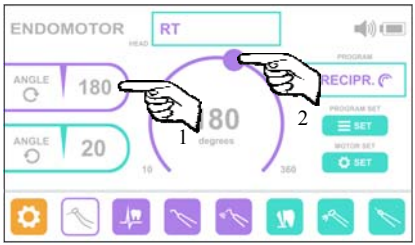
Preset speed, rpm	<=400	500	600	700	800	900	1000	1100	1200
Max. torque, Ncm	5,1	4,8	4,5	4,2	4,0	3,7	3,5	3,2	3,0

For safe root canal preparation, at the torque gets higher than the maximum allowable value, the set speed value automatically decreases.

At the speed and torque choosing use the Ni-Ti instruments manufacturer recommendations. To avoid the instrument damage during the canal processing be sure not to set the speed and/ or torque value higher than the manufacturer recommendation

Step 2.5. Rotation angle clockwise and counterclockwise adjusting for RECIPROCATION-files

To change the current rotation angle value clockwise or counterclockwise, click on **ANGLE** button or **ANGLE** button accordingly

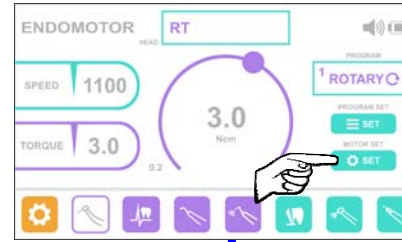


and with the circular regulator set the required angle value from 10 to 360° (with a step 10°).

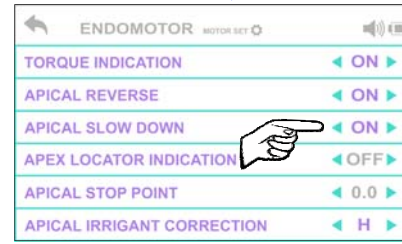
Clockwise and counterclockwise rotation angles could not have equal values. Equal angle values setting is blocked by the program.

Step 2.6. Endomotor general settings

A) Click on the MOTOR SET button to open the endomotor setting box.



B) To change the setting current state/value use the left -right arrows in the line of the parameter.



Settings description:

- **TORQUE INDICATION** - switch on/off of the current torque indication on the «Estus Drive" handpiece LED scale during the motor rotation.

- **APICAL REVERSE** - switch on/off of the apical reverse function at achieving the preset localizing point in the root canal (apex or preset stop point) during the simultaneous operation of the motor with the build-in apexlocator.

- **APICAL SLOW DOWN** - switch on/off of the motor rotation slow down function at the approaching to the preset localizing point in the root canal (to the apex or the preset stop point) during the simultaneous operation of the motor with the build-in apexlocator.

- **APEXLOCATOR INDICATION** - switch on/off of the current distance to the apex point indication on the "Estus Drive" handpiece LED scale during the simultaneous operation of the motor with the build-in apexlocator.

- **APICAL STOP POINT** – apical stop point setting (shifting of the localizing point in the root canal during the simultaneous operation of the motor with the build-in apexlocator) with 0.0 is the apex point and 0.1-1.0 is the apical stop point value.

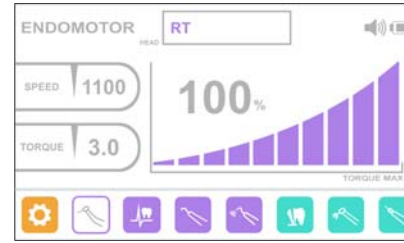
- **APICAL IRRIGANT CORRECTION** - switch on/off the function of the apexlocator measurements correction depending on the used irrigating solution in the root canal during the simultaneous operation of the motor with the build-in apexlocator (with H - sodium hypochlorite, C - chlorhexidine, E - EDTA or OFF - function is switched off).

Correction function allows to improve the measurement accuracy depending of the irrigant type: sodium hypochlorite, EDTA or chlorhexidine.

Step 2.7. Indication in the mode of rotation of the motor with the RT head

During the rotation of the motor with RT head "Estus Multi" screen displays the following:

1) the current torque value if the **ROTARY** file is used, the apexlocator circuit is open and the **TORQUE INDICATION** function is not off (see Step 2.6)



or

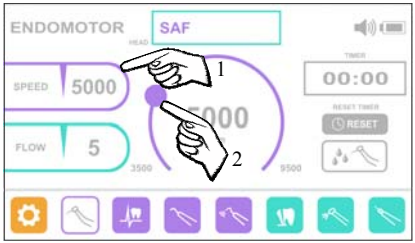
2) the current distance to apex, if the apexlocator circuit is closed and the **APEXLOCATOR INDICATION** function is not off (see Step 2.6)

or

3) the current time from the motor start moment, if both functions -**TORQUE INDICATION** and **APEXLOCATOR INDICATION** are off (see Step 2.6)

Step 3. Working with SAF head.

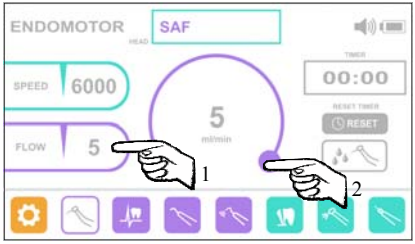
Step 3.1. Motor speed rotation adjusting



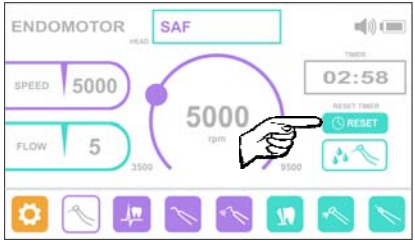
To change the current speed value click on the **SPEED** button and with the circular regulator set the required value in the range of 3500—9500 rpm with a step 500 rpm

Step 3.2. Irrigating solution feed rate (pump efficiency) adjusting

To change the current speed value click on the



FLOW button and with the circular regulator set the required value in the range of 1 - 5 ml/min with a step 1 ml/ min



Step 3.3. Timer reset (zeroing)

For timer reset click on the TIMER RESET button.

Time value in the TIMER box is 00:00

Step 3.4. Pump status indicator

"Estus Pump" status indicator:

- pump on.

- pump off.

*Motor starting in SAF mode is impossible without "Estus Pump" connection. Prior to the motor starting ensure that the pump status indicator is active (the indicator should be colored **MINT**)*

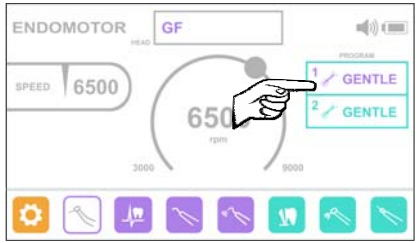
Step 3.5. Indication in the mode of rotation of the motor with SAF head

During the rotation of the motor with SAF head "Estus Multi" screen displays the current motor rotation time from the last timer reset (see Step 3.3)

Step 4. Working with GF head.

Step 4.1. Choosing the working file

Click on the PROGRAM box and in the drop-down list choose one of the two working files



Step 4.2. Motor rotation speed adjustment

To change the current speed value use the circular regulator. Set the required speed value in the range of 3000 - 9000 rpm with a step 500 rpm

Step 4.3. Indication in the mode of rotation of the motor with GF head

During the rotation of the motor with GF head “Estus Multi” screen displays the current motor rotation time from the motor since its start.

Step 5. Warning indicators

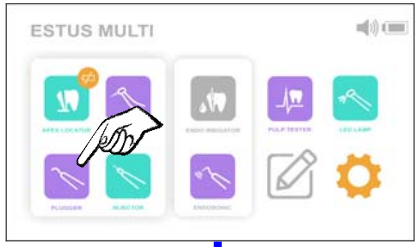
Indicator	Cause of indication	Actions
	Warning of the unsuccessful micro-motor system auto calibration	Start the motor once again. If the "drop" indicator appears, lubricate or replace the head. If it did not help, apply to the service department.
	The apex-locator measuring circuit continuity is broken	See Table Troubleshooting in case of the built-in apexlocator measuring circuit continuity breaking in the «Estus Drive" endomotor User's Manual.

4. OPERATION OF ESTUS PACK PLUGGER WITH ESTUS MULTI

Step 1. PLUGGER mode activation

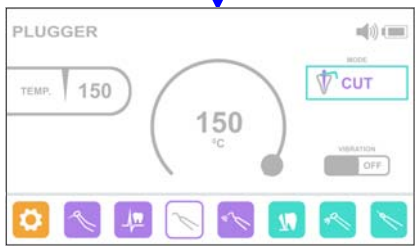
Step 1.1. Manual activation

Click on the PLUGGER icon in the “ESTUS MULTI” main menu.

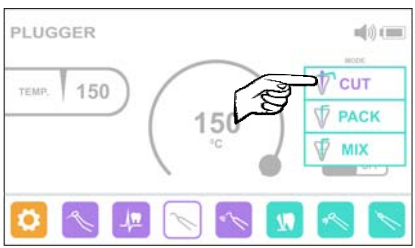


Step 1.2. Automatic activation

Press the ring switch of the “Estus Pack” handpiece. The thermoplugger mode is automatically activated on the “ESTUS MULTI” screen.



Step 2. Working mode choosing



Click on the MODE box and in the drop-down list choose one of three working modes: CUT, PACK, MIX.

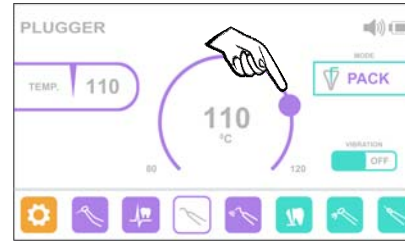
To activate PACK+ (with vibration) mode, being in the main mode PACK click the VIBRATION button ON, to return to the PACK mode (without vibration) - click the button OFF.

CUT and MIX modes fully correspond to the CUT and MIX thermoplugger modes at it autonomous operation (*for more details see "Estus Pack-Fill" User's Manual*). Working parameters changing in these modes is IMPOSSIBLE.

In the PACK modes (with vibration or without vibration) a user can change the thermoplugger working temperature.

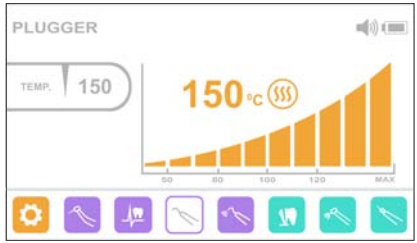
Step 3. Working temperature adjusting in the PACK modes

To change the current temperature value use the circular regulator.
Set the required temperature value in the range of 80°C - 120°C with a step 10°C.



Step 4. Indication in the mode of thermoplugger heating and cooling

In the mode of thermoplugger heating and cooling the “Estus Multi” screen displays the current temperature scale



During heating process the scale is colored **ORANGE**, at cooling - **LILAC**

Step 5. Warning indicators

Indicator	Description
	Displayed in the thermoplugger heating mode
	Displayed in the thermoplugger cooling mode
	Thermoplugger is not installed, failed or the inauthentic thermoplugger is installed. Install or replace the thermoplugger.

5. OPERATION OF ESTUS FILL INJECTOR WITH ESTUS MULTI

Step 1. INJECTOR mode activation

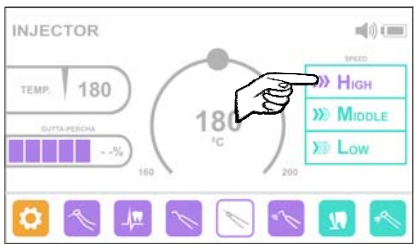
Step 1.1. Manual activation

Click on the INJECTOR icon in the "ESTUS MULTI" main menu.

Step 1.2. Automatic activation

Press the ring switch of the "Estus Fill" handpiece. The injector mode is automatically activated on the "ESTUS MULTI" screen.

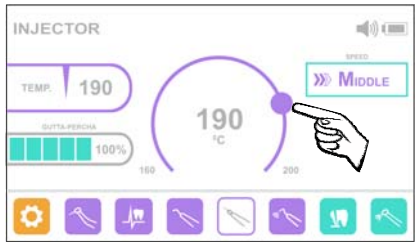
Step 2. Selecting the gutta-percha speed level delivery (feed rate)



Click on the SPEED box and in the drop-down list choose one of three speed levels: HIGH, MIDDLE, LOW.

Step 3. Working temperature adjusting

To change the current temperature value use the circular regulator.
Set the required temperature value in the range of 160°C - 200°C with a step 10°C.

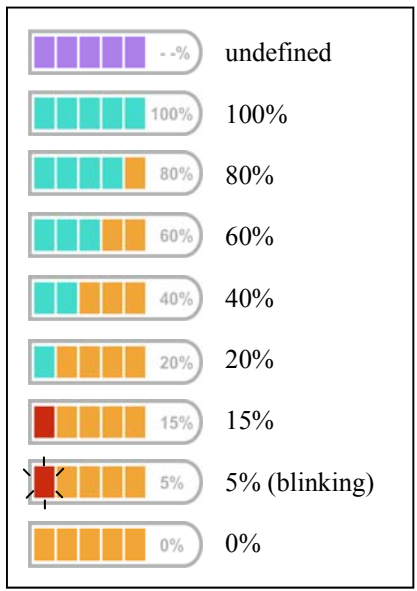


Step 4. Indicator of gutta-percha residue level

GUTTA-PERCHA indicator displays the gutta-percha residue in the heater liner in percent from the initial gutta-percha obturator length.

At the indicator readings from 6 to 15%, it is recommended to insert the new gutta-percha obturator into the heater liner.

If the readings are <=5% - a new gutta-percha obturator must be installed in the heater.



Step 5. Indication in the mode of gutta-percha heating, injection and cooling

In gutta-percha heating and cooling mode “Estus Multi” screen displays the scale of the current temperature.

At heating the scale is colored **ORANGE**, at cooling - **LILAC**

The readings on GUTTA-PERCHA indicator is changed during gutta-percha injection (see Step 4)

Step 6. Warning indicators

Indicator	Description
	Displayed in gutta-percha heating mode
	Displayed in gutta-percha cooling mode
	Heater, injector needle or motor problem. For more details see the Table The list of the possible problems (failures) at the “Estus Fill” handpiece operation in “Estus Pack-Fill” User’s Manual

6. OPERATION OF ESTUS PULP
PULP TESTER WITH ESTUS MULTI

Step 1. PULP TESTER MODE ACTIVATION

Step 1.1. Manual activation

Click on PULP TESTER icon in the “ESTUS MULTI” main menu.

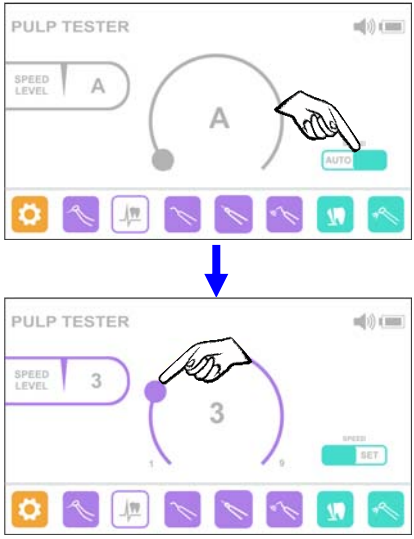
Step 1.2. Automatic activation

Press the ring switch of the “Estus Pulp” handpiece. The pulp tester mode is automatically activated on the “ESTUS MULTI” screen.

Step 2. Changing the rate of rise of the diagnostic current

By default, the program has an automatic diagnostic current rise rate (Auto) mode in the entire range of values.

To change the rate of current rise:



A) Click on the SPEED button in SET box, to return to auto-mode click the SPEED button in AUTO box.

B) Using circular regulator set one of nine rates of current rise levels. 1 is minimum, 9 - maximum.

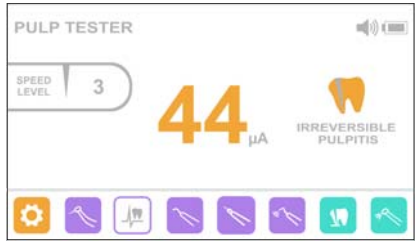
Step 3. Indication during the diagnostics process

During the diagnostic process the “Estus Multi” screen displays the current value of diagnostic current from 01 to 80 μA

After the end of the procedure, the screen displays the diagnostics

result with a preliminary diagnosis.

The variants for preliminary diagnoses are presented in the table below.



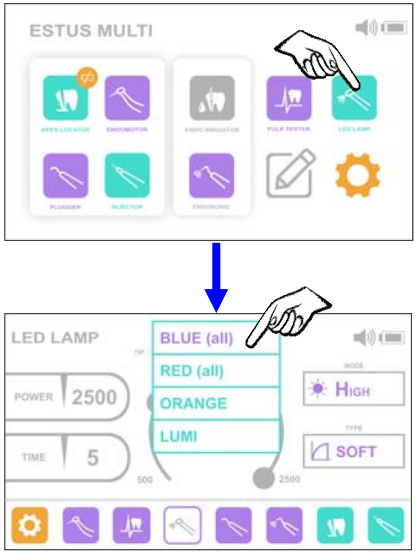
Displayed indicator	Diagnostic current value	Preliminary diagnosis
	02 – 09 μA	HEALTHY
	10 –24 μA	REVERSIBLE PULPITIS
	25 –44 μA	IRREVERSIBLE PULPITIS
	45 –80 μA	POSSIBLE PULP NECROSIS

7. OPERATION OF ESTUS LIGHT PHOTOACTIVATOR (LED LAMP) WITH ESTUS MULTI

Step1. LED LAMP mode activation

Step1.1. Manual activation

A) Click on the LED LAMP icon in the “ESTUS MULTI” main menu.



B) Click on the TIP box and in the drop-down list choose the required working mode, corresponding to the connected tip type of ESTUS LIGHT - BLUE, RED, ORANGE or LUMI

Step1.2. Automatic activation

Press the ring switch of the «Estus Light" handpiece. The photoactivator mode is automatically activated on the "ESTUS MULTI" screen.

Step2. Working mode choosing

Click on the MODE box and in the drop-down list choose one of four working modes: High, Middle, Low or Favorite, where:

High, Middle, Low modes fully correspond to H, M, L photoactivator modes at its autonomous operation *(for more details see the «Estus Light" photoactivator User's Manual)*.

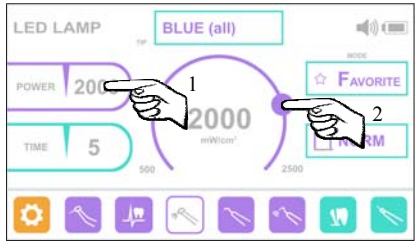
Working parameters changing in these modes is IMPOSSIBLE

Favorite (☆) mode is optional, in which a user can set his (her) own parameters for every tip type.

Step 3. Operation with the tips of the types BLUE and RED

Step 3.1. Adjusting of the emitter light intensity in Favorite mode

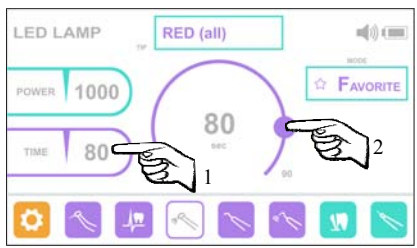
To change the light intensity current value click on the **POWER** button and with circular regulator set the required light intensity value in the range of 500 - 2500 mW/cm^2 with a step 500 mW/ cm^2 for "BLUE" type tips or



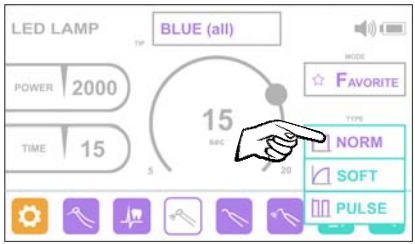
in the range from 300 to 1500 mW/cm^2 with a step 100 mW/cm^2 for "RED" type tips.

Step 3.2. Adjusting of the exposure time in Favorite mode

To change the exposure time current value click on the **TIMER** button and with the circular regulator set the required time value in the range 5 - 20 sec with a step 5 sec for a tips of the BLUE type or in the range of 30 - 90 sec with a step 10 sec for the tips of RED type.



Step 3.3. Choosing the emission type in Favorite mode
(only for the tips of the BLUE type)



Click on the TYPE box and in the drop-down list choose one of three emission types : NORM, SOFT or PULSE.

NORM - Normal mode. The preset photoactivator light intensity is constant during the whole polymerizing cycle.

SOFT - Soft start mode. The photoactivator light intensity gradually rises to the preset value during first several seconds from the exposure start and then remains constant.

PULSE - Pulse mode. The photoactivator light intensity changes impulsively with 2 Hz frequency from the maximum (preset) value to the minimum allowable value during the whole polymerizing cycle.

Step 3.4. Indication in photoactivator emission mode

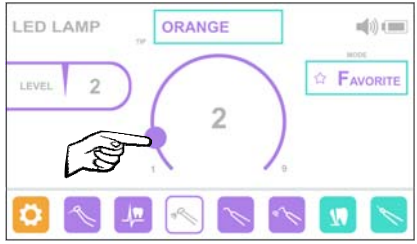
When working with BLUE or RED tips while the photoactivator emission, the “Estus Multi” screen displays the remaining exposure time before the photoactivator is automatically turned off.

Step 4. Operation with tips of ORANGE and LUMI type

Step 4.1. Adjusting of the emission brightness level in Favorite mode

To change the current emission brightness level use the circular regulator.

Set one of nine brightness levels. 1 - minimal brightness, 9 - maximal.



Step 4.2. Indication in photoactivator emission mode

When working with ORANGE or LUMI tips during the photoactivator emission, the “Estus Multi” screen displays the current exposure time from the moment the photoactivator was started.

8. OPERATION of ESTUS SONIC WITH ESTUS MULTI

Step 1. ENDOSONIC mode activation

Step1.1. Manual activation

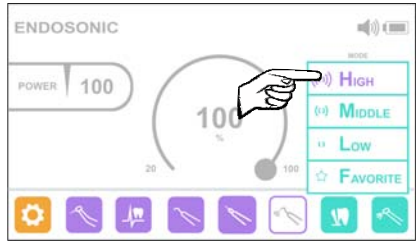
Click on the ENDOSONIC icon in the “ESTUS MULTI” main menu.

Step1.2. Automatic activation

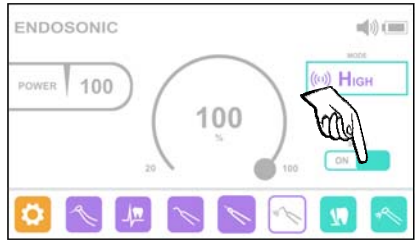
Press the ring switch of the «Estus Sonic” handpiece. The endoscaler mode is automatically activated on the “ESTUS MULTI” screen.

Step2. Working mode choosing

Click on the MODE box and in the drop-down list choose one of four working modes: High, Middle, Low or Favorite.



To activate High+SCAN (with frequency scanning function) mode, being in the main mode HIGH click the SCAN button ON. To return to the HIGH mode (without frequency scanning function) - click the button OFF.

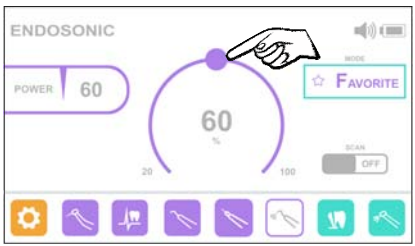


High+SCAN, High, Middle, Low modes fully correspond to H-SCAN, H, M, L endoscaler modes at its autonomous operation *(for more details see the «Estus Sonic" endodontic ultrasonic scaler User's Manual)*.

Working parameters changing in these modes is IMPOSSIBLE

Favorite (☆) mode is optional, in which a user can independently set the value of ultrasound power from the provided range.

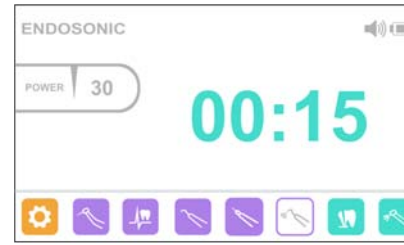
Step 3. Adjusting of the ultrasound power in Favorite mode



To change the current ultrasound power value use the circular regulator.
Set the required power value in the range of 20 to 100% from the maximum possible value of the ultrasound power of the endoscaler. The adjustment step is 10%

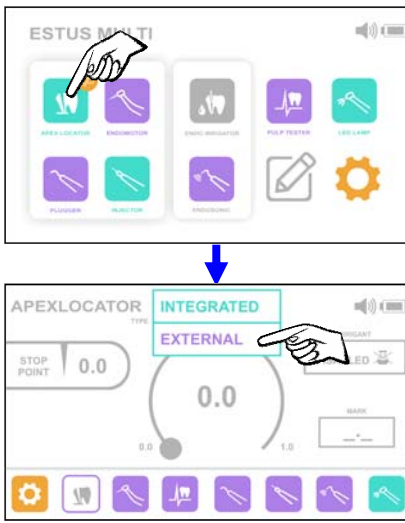
Step 4. Indication in the operating mode of the endoscaler

In the operating mode of the endoscaler, the “Estus Multi” screen displays the remaining time before the endoscaler is automatically turned off.



9. OPERATION of ESTUS APEX WITH ESTUS MULTI

Step 1. APEXLOCATOR mode activation



Step 1.1. Manual activation

A) Click on the APEXLOCATOR icon in “ESTUS MULTI” main menu.

B) Click on the TYPE box and in the drop-down list choose the apexlocator type - EXTERNAL

Step 1.2. Automatic activation

Close the measuring circuit of apexlocator “Estus Apex”. “ESTUS MULTI” screen displays automatic activation of the external apexlocator mode.

Step 2. Setting and indication

All further settings of the apexlocator working parameters and indication in the measuring process are corresponded to the setting and indication of the built-in “Estus Multi” apexlocator (*for more details see “Estus Multi” apexlocator User’s Manual*)

10. SAVING SETTINGS

All settings of the “Estus” dental complex devices, preset using the paired “Estus Multi ” control unit, are automatically saved in the devices memory when a wireless connection is established between the products and remain unchanged when the “Estus Multi ” is disconnected or absent - in autonomous operation mode of the devices.

To return to the devices factory settings, use the appropriate function individually for each device (*see the User’s Manual for this device, Step. “Return to factory settings”*) or the “Factory settings” function in the “Estus Multi ” control unit (*see the User’s Manual for “Estus Multi”, Step 12 “General device settings” / “12.5. Factory settings”*).

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