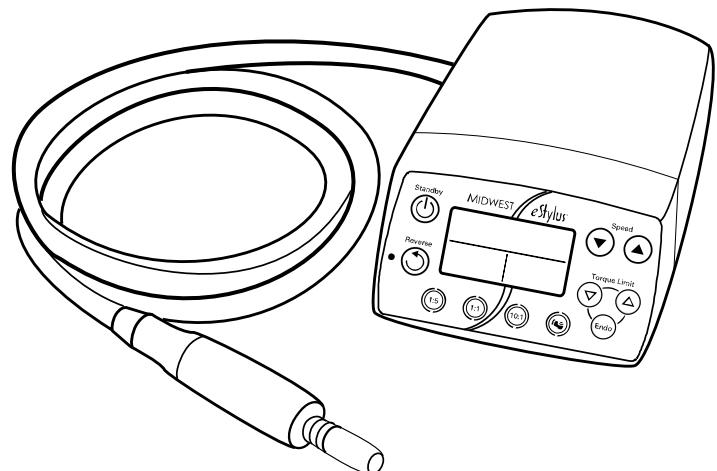


MIDWEST

eStylus™

Electric Motor System



**Installation, Maintenance  
and Operation Instructions**

Please read these instructions carefully and completely  
before operating the unit.



**DENTSPLY**  
PROFESSIONAL

# General Instructions

## CAUTION

U. S. Federal law restricts this device to sale by or on the order of a Dentist.

## Indications For Use

The eStylus™ system is an electric motor driven handpiece with various attachments intended for cutting, shaping, filing, drilling, cleaning and polishing procedures in general and endodontic dentistry.

## Contraindications

Do not use this electric motor system within the oral cavity when a soft tissue wound is present. Air exiting from the attachment and motor could enter a wound, leading to air embolism or infection.

The eStylus motor hose is not sterilizable, and other than as described in these instructions the eStylus motor is not sterilizable. The eStylus system does not have provision for delivery of sterile water. Therefore, the eStylus system is not recommended for use in procedures that require a sterilized motor and hose and/or a sterile water supply. The eStylus system should not be installed in a sterile field.

## Warning

ISO 11498 states "Dental low voltage electric motors shall not be used in the presence of a flammable anesthetic gas mixed with air, oxygen, or nitrous oxide." (Note: nitrous oxide by itself is not a flammable anesthetic gas.)

## Precautions

- This product is intended for use by dental professionals only.
- Before operating the eStylus Electric Motor System, carefully read and follow these instructions and save them for future reference. Observe all cautions and warnings.
- Attachments should be steam-sterilized between patients to prevent cross-contamination which could result in serious illness or even death from infectious organisms such as HIV (the virus that causes AIDS) or hepatitis B. **NOTE: Sterilize Before Use. Supplied Non-Sterile.**

## Precautions, continued

- Do not cut with the handpiece attachments unless you are sure the bur is secure.
- Do not extend burs outward from handpiece attachment head.
- Burs must be inserted all the way into chuck for proper bur retention.
- Extended burs could result in personal injury due to bur ejection, bent burs, or inadequate cooling.
- Never mount an attachment on a motor while it is running.
- Never press a gear ratio button, or the controller or remote control, while the handpiece is running.
- The endodontic "torque limit" feature is intended as an aid to help you reduce breakage of rotary NiTi endodontic files. It is not a substitute for your professional judgment and good clinical practice, such as:
  - selection of clinically appropriate files
  - selection of rotary speed and torque limit appropriate to each file and clinical procedure
  - establishing appropriate access and guide path
  - appropriate file advancement rate
  - proper use of lubricant and cleaning fluids
  - periodic cleaning of the file
  - examination of files for defects or wear
  - not using files beyond their recommended life
  - your tactile "feel" of the resistance that the file encounters.
- In order for your eStylus system to properly control speed and torque, it is essential that you set the gear ratio that corresponds to the attachment you are using. See the sections of this guide which describe how to select one of the pre-set gear ratios or enter a custom gear ratio in your eStylus controller.
- The eStylus motor normally provides chip-air and water to the attachment. If you are performing endodontic or other procedure for which chip-air and water spray may not be clinically appropriate, you should turn off chip-air and water at your dental unit or use an attachment that does not have chip-air and water spray (i.e. Midwest 10:1).

# Instructions For Use

## Precautions, continued

- Plug the eStylus external power supply only into a grounded AC main power outlet of the correct voltage, frequency, and current rating.
- Follow all the sterilization, cleaning, lubrication, and maintenance directions in these user instructions for the eStylus system. Use only Midwest parts and supplies. Failure to do so will void your warranty, can degrade product performance, and may lead to unsafe operation.
- Don't operate the eStylus system with air pressure exceeding 60 psi or less than 40 psi.
- Other than battery replacement, there are no user serviceable items in the eStylus electronic units or external power supply. Opening any of these units will void your warranty and can result in unsafe operation.

## Regulatory Statements

"This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense."

"This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation."

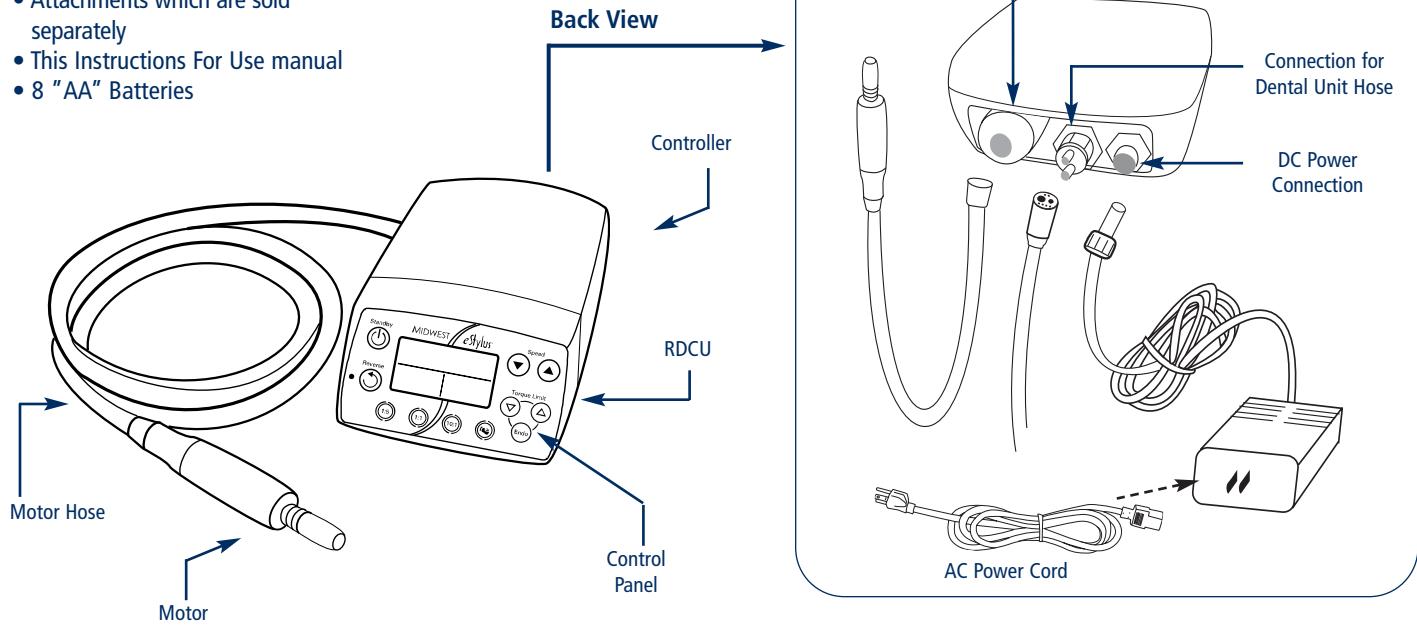
### Warning (Part 15.21)

"Changes or modifications not expressly approved by the party responsible for compliance could void the user's authorization to operate the equipment."

## Identifying The Parts of Your eStylus Electric Motor System

### Parts not shown:

- Controller mounting bracket
- Attachments which are sold separately
- This Instructions For Use manual
- 8 "AA" Batteries



# Instructions For Use

## Buttons on the RDCU

Standby



**Standby button.** Turns on and off the displays on the RDCU. If the RDCU has been put into Standby by pressing the Standby button, it will "wake-up" and the displays will come on as soon as you press the Standby button.

Reverse



**Reverse button** Press Reverse to operate the motor and attachment in the counter-clockwise (reverse) direction. Press the button again to return the motor to forward (clockwise) rotation. The green indicator light next to the Reverse button will display when the motor is running in reverse. The manual reverse mode should be periodically checked for optimum performance.

1:5



**1:5 button.** Press the Red 1:5 button if you are using a 1:5 (increasing) contra-angle attachment. The RDCU will display the appropriate bur speed and the 1:5 gear ratio. If you are using a 1:5 attachment, the maximum bur speed is 200,000 rpm.

1:1



**1:1 button.** Press the Blue 1:1 button if you are using a 1:1 straight or contra-angle attachment. The RDCU will display the appropriate bur speed and the 1:1 gear ratio. If you are using a 1:1 attachment, the maximum bur speed is 40,000 rpm.

10:1



**10:1 button** Press the Green 10:1 button if you are using a 10:1 contra-angle attachment. The RDCU will display the appropriate bur speed and the 1:1 gear ratio. If you are using a 10:1 attachment, the maximum bur speed is 4,000 rpm.

**Custom ratio button.** If you are using an attachment with a gear ratio other than 1:5, 1:1 or 10:1, you can use the custom ratio button (Yellow button with handpiece icon) to select from a list of custom ratios. The procedure for entering and selecting custom ratios is explained in detail later in these Instructions. Once you have selected a ratio equal to your attachment, the RDCU will display the appropriate bur speed and the gear ratio.

Speed increase and decrease buttons



**Speed increase and decrease buttons.** Press the up arrow to increase the maximum bur speed and the down arrow to decrease the maximum speed. While you are pressing the up and down arrows, the bur speed display will show the maximum bur speed you have set. Remember that the bur speed display will be correct only if you have set the correct gear ratio for the attachment you are using.

Endo



**Endo button.** Press the Endo button to turn Endo mode on or off. Endo mode differs from normal operation in several important ways, and is explained in more detail later in these Instructions. When the eStylus system is in Endo mode, the display will show "Endo" and the Torque Limit bar graph will be lit.

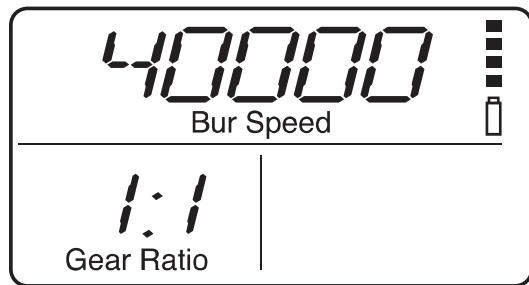
Torque Limit increase and decrease buttons



**Torque Limit increase and decrease buttons.** Press the up and down arrows next to the Endo button to select one of four Torque Limit values in Endo mode. Torque Limit is explained in more detail later in these Instructions. The display will show the torque limit value you have selected.

# Instructions For Use

## Displays on the RDCU



**Bur Speed Display.** Displays maximum bur speed of current gear ratio button that is pressed. When the foot pedal is depressed it will display the actual bur speed. If a ratio button is not pressed it will default to 1:1 (motor speed).

**Gear Ratio Display.** Displays the attachment gear ratio that was selected (1:5, 1:1, 10:1, or custom ratio).

**(Torque Limit Graph.** Not shown above; will display only when Endo button is pressed.) See page 9 for illustration.

**Battery Life Indicator.** The 4-part bar graph indicates the approximate amount of battery life remaining.

## Installation and Initial Set-Up

### Installation overview

The eStylus electronics are in three parts:

1. The main controller, which accepts the dental unit hose for air and water supply and then provides power, air, and water to the eStylus motor.
2. An external power supply which needs to be plugged into a grounded AC outlet and connected to the controller.
3. The Remote Control and Display Unit (RDCU) which has the displays and control buttons. Since the RDCU is battery powered and communicates to the controller without wires, it may be disconnected from the controller and mounted at any convenient location within the dental operatory. Alternately, the RDCU may be mounted to the controller.

## Installation and Initial Set-Up, continued

### Installation requirements

In order to install and use your eStylus system you will need the following:

- A hose from your dental unit or tray providing "drive air". The hose may be of the 4-hole, 5-hole, or 6-pin type. For proper connection with the eStylus controller, the hose end needs to meet ISO-3964.
- The "drive air" must have a minimum pressure of 40 psi and a maximum pressure of 60 psi, and must be controlled by the foot pedal on your dental unit.
- If you intend to perform procedures requiring spray water and chip air, the hose must also provide these from the dental unit.
- A grounded AC outlet providing 110 VAC, 50/60 Hz.
- Adequate space to mount the eStylus controller, RDCU, and external power supply.

### Locating and mounting the Controller and the RDCU separately

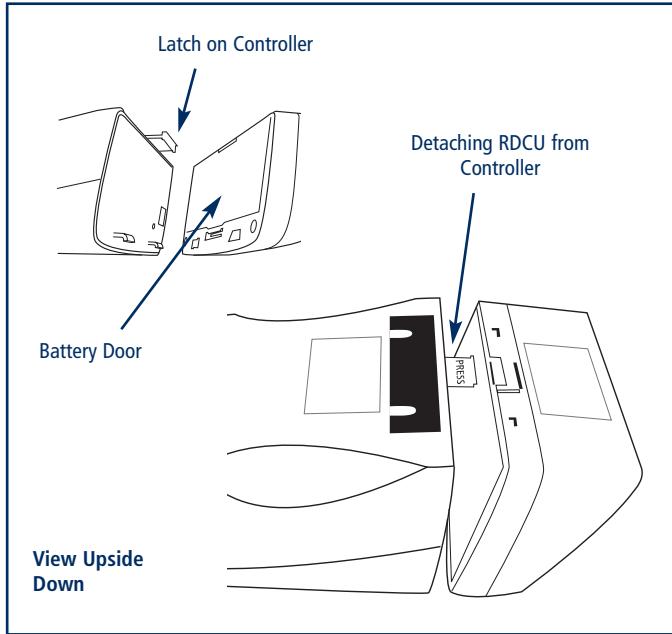
If you are installing the electronics with the RDCU separated from the controller, select a controller location which:

- Allows you to easily connect an existing handpiece hose from your dental unit to the rear of the controller. This hose should correspond to the handpiece hanger that you will use for the eStylus motor.
- Allows you to route the low-voltage power cord from the eStylus external power supply to the rear of the eStylus controller.
- Allows you to route the eStylus motor hose from the rear of the controller to the handpiece hanger on your dental unit or tray.
- Provides sufficient working reach of the eStylus motor hose.

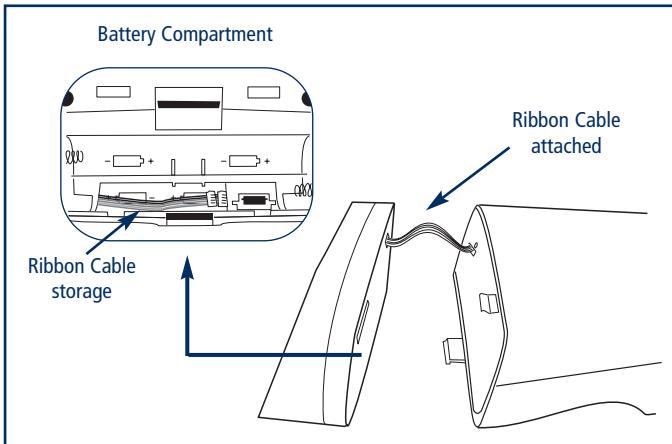
# Instructions For Use

## Installation and Initial Set-Up, continued

To detach the RDCU from the controller:



- There is a plastic latch on the underside of the controller. Press down on this latch, pull the lower portion of the RDCU away from the controller, then tilt and lift the RDCU to free it from the controller.



- If ribbon cable is attached, disconnect it from the controller.
- Open the battery door on the rear of the RDCU and disconnect the DC ribbon cable from the RDCU.
- Place DC ribbon cable in the compartment on the second row of batteries (see above).
- Install 4 AA batteries in the battery compartment of the RDCU and replace the battery door.

**Note: The batteries on the lower level will be placed over the ribbon power cable.**

To mount the RDCU:

- Select any convenient location in the operatory that provides visibility and access to RDCU buttons and displays.
- The RDCU may simply be set down, or may be attached to any convenient surface with the provided hook-and-loop fasteners.

To mount the controller:

- Attach the supplied controller mounting bracket in the desired location. The bracket has numerous slots on its upper surface so you can easily bolt it to underside of your dental unit tray.
- Slide the controller into the bracket.
- Alternately, simply place the controller on any convenient surface such as counter top or dental tray.
- Turn off the selected handpiece hanger valve and remove the hose from the hanger. Attach that hose to the 4-hole fitting on the rear of the controller.
- Route the eStylus motor hose to the selected handpiece hanger.
- Place the eStylus external power supply in a convenient location and plug the DC cord from the power supply into the back of the eStylus controller.

### Locating and mounting the Controller if the RDCU is attached

If you are installing the electronics with the RDCU mounted to the controller, select a location which:

- Allows you to easily connect an existing handpiece hose from your dental unit to the rear of the controller. This hose should correspond to the handpiece hanger that you will use for the eStylus motor.

# Instructions For Use

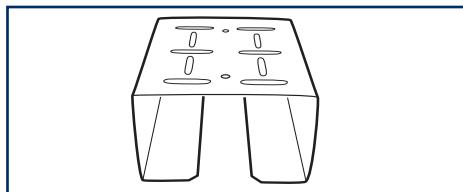
## Installation and Initial Set-Up, continued

### Locating and mounting the Controller if the RDCU is attached, continued

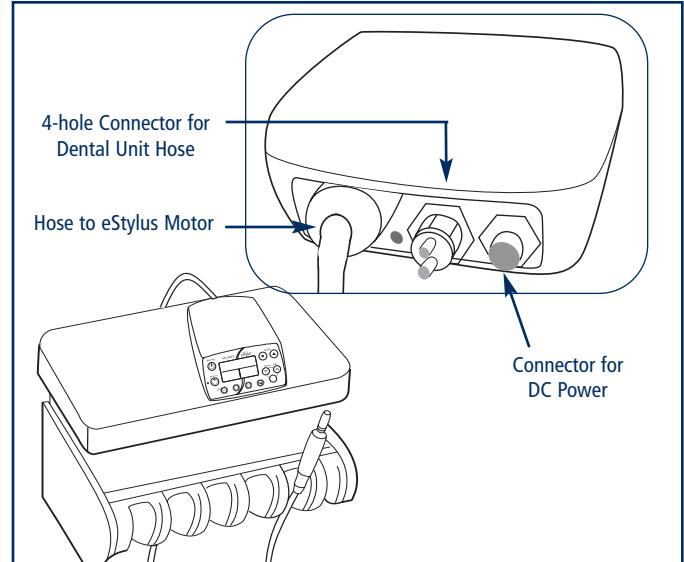
- Allows you to route the low-voltage power cord from the eStylus external power supply to the rear of the eStylus controller.
- Provides visibility and accessibility to the RDCU control panel.
- Allows you to route the eStylus motor hose from the rear of the controller to the handpiece hanger on your dental unit or tray.
- Provides sufficient working reach of the eStylus motor hose.

To mount the controller and attached RDCU:

- Attach the supplied controller mounting bracket in the desired location. The bracket has numerous slots on its upper surface so you can easily bolt it to underside of your dental unit tray.

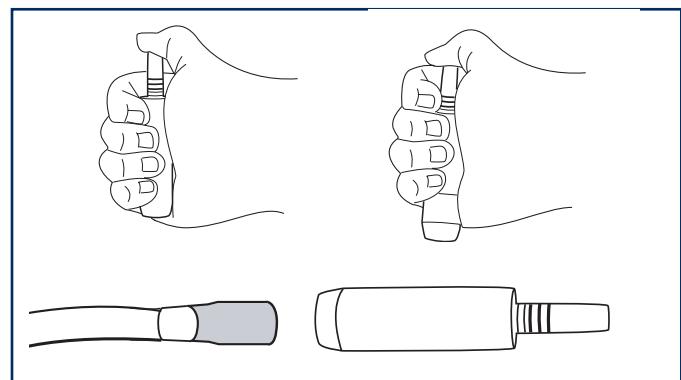


- Slide the controller and attached RDCU into the bracket.
- Alternately, simply place the controller and attached RDCU on any convenient surface such as counter top or dental tray, as shown below.
- Turn off the selected handpiece hanger valve and remove the hose from the hanger. Attach that hose to the 4-hole fitting on the rear of the controller.
- Route the eStylus motor hose to the selected handpiece hanger.
- Place the eStylus external power supply in a convenient location and plug the DC cord from the power supply into the back of the eStylus controller.



### Connecting the eStylus motor to its hose

To attach the eStylus motor on the hose from the controller:



- Firmly grasp the nose coupling of the motor and slide the end of the hose into the backend of the motor.
- Carefully align the respective pins and holes.
- Thread the end of the hose into the back-end of the motor, and turn it clockwise until the hose is snug on the motor.
- Place motor in dental unit hangar.

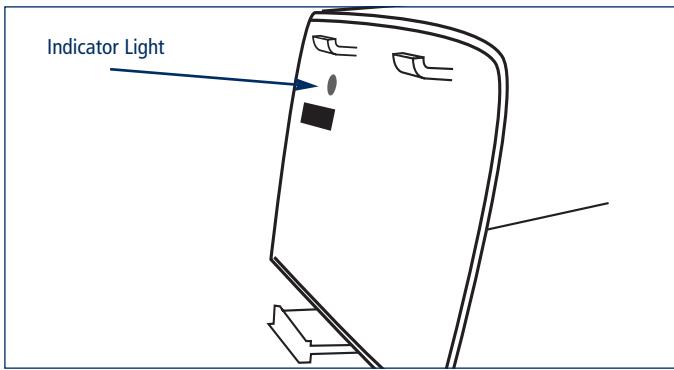
# Instructions For Use

## Installation and Initial Set-Up, continued

### Initial power-up

Once everything is mounted and all connections have been completed:

- Plug the AC cord from the external power supply into a grounded AC outlet.
- (If the RDCU is mounted separately from the controller, you should see a green power-on indicator light on the front of the controller.)
- The RDCU display will light up.



### Initial set-up — calibrating drive air pressure

For best performance, the eStylus controller must be calibrated so that maximum drive-air pressure from the dental unit foot-pedal corresponds to maximum motor speed. To calibrate air pressure:

- Make sure motor is attached to hose.
- Press Standby to clear the LCD.
- Hold the 10:1 button down first and then press the Standby button simultaneously.
- The display will read "Air cal."
- To calibrate fully depress and hold the foot pedal and press the Reverse button to save this pressure. The Reverse LED will flash 3 times to indicate the pressure has been saved.
- Press the Standby button to clear the screen.
- Press the Standby again to return to normal operation and press foot pedal to confirm calibration.

### Initial set-up — adjusting chip-air and spray water pressure

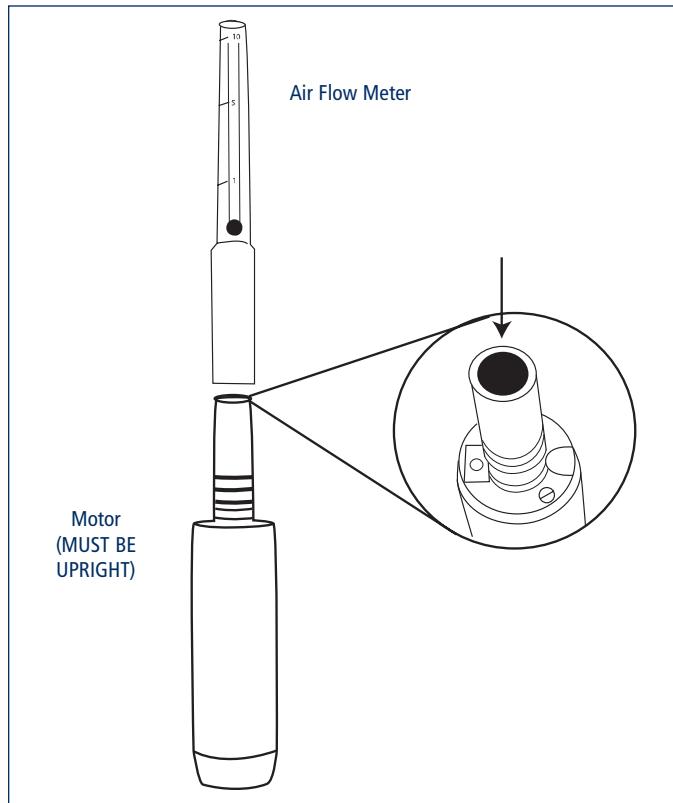
As with any handpiece, chip-air and spray water pressure should be adjusted in the dental unit for the desired spray.

- Attach a contra-angle to the motor and depress the foot pedal.
- If necessary, adjust chip-air and water pressure in the dental unit to achieve the desired spray.
- The recommended operating pressure for chip air is 30 p.s.i. and water is 8 p.s.i.

**Note: there are no valves or adjustments for chip-air or water in the eStylus controller.**

### Initial set-up — check for adequate cooling

- To check that you have adequate cooling, place the air flow meter (REF 874350) on the motor front coupling and fully depress the foot pedal. For best operation and motor life, the air flow meter should read 10 liters/min.



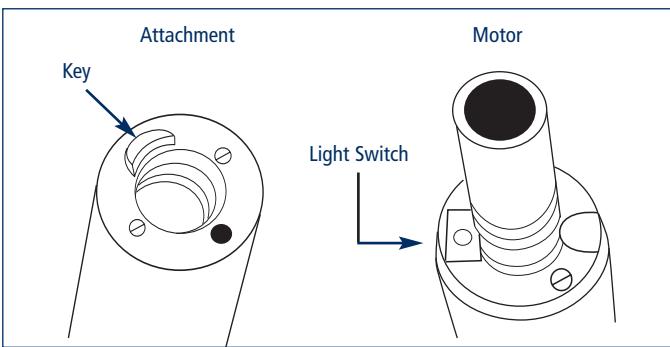
# Instructions For Use

## Operation

### Basic operation

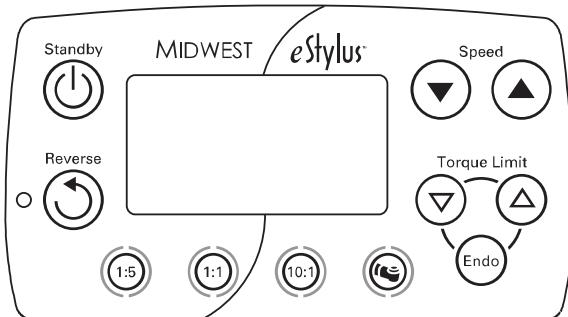
Make sure the eStylus controller is on. Press the Standby button on the RDCU if its display is not lit.

Select an attachment handpiece and attach it to the motor by pushing it onto the motor front coupling (ISO E-Type). Be sure you've pushed the attachment fully onto the motor coupling – you may need to rotate the attachment slightly to align key with light switch recess. You should hear a slight "click" and there should be no visible gap between motor and attachment.



Select the gear ratio on the control panel according to the attachment you have chosen. The color of the ring on the attachment should match the ratio button you choose on the control panel. The eStylus speed and torque control features and the bur speed display will work properly only if you have properly set the attachment gear ratio.

You may set a bur speed by using the Speed up and down arrows. The default motor speed is 40,000 rpm, and the corresponding bur speed will depend on the gear ratio used.



To display the speed set, press the Speed up or down arrow once. To change the speed hold down the up or down arrow until you have reached your desired speed.

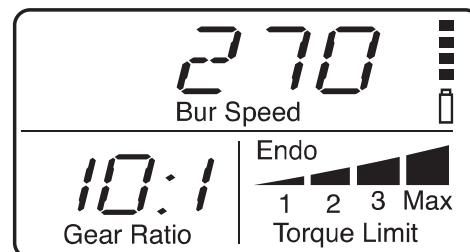
Use the foot pedal on the dental unit to start the motor and modulate motor speed up to the maximum.

### Endo mode operation

If you will be using the eStylus system to perform an endodontic procedure with rotary endodontic files. The Endo button must be pressed in order to switch the system to Endo mode. Endo mode has several important differences from basic operation:

- The "torque limiting" feature will briefly reverse the motor whenever the file torque exceeds the preset torque limit. Whenever the motor is auto-reversed, the handpiece illumination will momentarily dim as a signal to you.
- When you depress the foot pedal, the motor will run only at the maximum speed you set, rather than having a varying speed.
- The Torque Limit display will be lit.

Decide on the attachment that you will use and press the appropriate ratio button on the control panel. The default, and recommended, gear ratio and attachment for Endo mode is 10:1 reduction.



**CAUTION.** The Midwest 10:1 contra-angle attachment does not have chip-air and water spray ports. If you use a different attachment that does have water ports, be sure to turn off the spray water supply at your dental unit.

**CAUTION.** Endo mode may not perform properly if you use a reduction gear ratio less than 8:1.

# Instructions For Use

## Operation, continued

### Endo mode operation, continued

Select the appropriate motor speed by using the Speed up and down arrows.

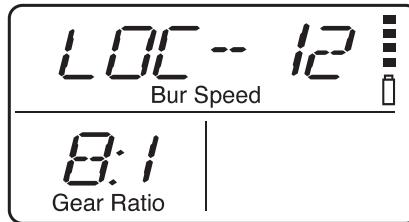
Select the appropriate Torque Limit by pressing the Endo up and down arrows.

SETTING	TORQUE LIMIT (gm-cm)
"1"	50
"2"	125
"3"	250
"MAX"	400

To turn on the motor, fully depress the foot pedal. When the foot pedal is fully depressed the motor speed will operate at the maximum speed you have set.

**CAUTION.** The endodontic "torque limit" feature is intended as an aid to help you reduce breakage of rotary NiTi endodontic files. It is not a substitute for your professional judgment and good clinical practice, such as:

- selection of clinically appropriate files
- selection of rotary speed and torque limit appropriate to each file and clinical procedure
- establishing appropriate access and guide path
- appropriate file advancement rate
- proper use of lubricant and cleaning fluids
- periodic cleaning of the file
- examination of files for defects or wear
- not using files beyond their recommended life
- your tactile "feel" of the resistance that the file encounters.



- Press Standby and clear the LCD Screen.
- Hold down the yellow Ratio button first, and then press the Standby button.
- Release these buttons. The bur speed portion of the display should show LOC followed by a number.
- Press the Speed up or down buttons until the display shows LOC 0, which indicates that this memory location does not have a ratio entered.
- Press the Torque up or down buttons to change the gear ratio, which will be displayed in the Gear Ratio section of the display.
- Press the Reverse button to save your selection. The Reverse light will flash three times to indicate that the value has been saved.
- Press Standby to return to normal operation.

**Note:** The custom gear ratio can also be used to preset various speeds for the 1:5, 10:1, and 1:1 attachment.

To locate a custom gear ratio:

- Press the yellow custom gear ratio button.
- The first saved gear ratio will be displayed.
- If more than one ratio is saved in the library, press the yellow button until the selected gear ratio appears.

### Deleting a custom gear ratio

To delete a custom ratio that you have previously entered:

- Hold down the yellow Ratio button first, and then press the Standby button.
- Release these buttons and the display should show LOC followed by a number.

## Special Features

### Adding a custom gear ratio

If you wish to use attachments with gear ratios other than 1:5, 1:1, or 10:1, you may store several custom ratios. These will be saved in the eStylus memory, and can be later recalled by pressing yellow the custom ratio button. To enter a custom gear ratio:

# Instructions For Use

## Special Features

- Press the Speed up or down buttons until the Bur Speed section of the display shows LOC followed by the number of the stored ratio you wish to delete.
- Press the Torque up or down buttons to change the gear ratio display to  $-:-$ .
- Press the Reverse button to delete your selection. The Reverse light will flash three times to indicate that the value has been deleted.
- Press Standby to return to normal operation.

### Changing the lamp off delay time

This feature allows you to change how long the illumination bulb will remain on after you release the foot pedal and the motor has stopped. To change the lamp-off delay

- Hold down the Speed up button first, and then press the Standby button.
- Release these buttons and the display should show the present value of the lamp off delay, in seconds.
- Press the Speed up or down buttons to change the delay time between 2 and 30 seconds.
- Press the Reverse button to save your selection. The Reverse light will flash three times to indicate that the value has been saved.
- Press Standby to return to normal operation.

### Attachment Calibration: Endo Button & Standby

This feature allows you to measure the friction torque of a particular attachment. The value of friction torque is then used to adjust and optimize motor control, particularly the Endo mode torque limit feature.

- Before entering this mode, the proper gear ratio must be selected and the attachment must be on the motor.
- Press and hold the Endo button and press the Standby button to initiate automatic attachment calibration setup.

- The display will show "AtCal". The motor will run for approximately 10 seconds, after which the LCD will go blank.
- Press Standby button once to return to normal operation.

### Changing the lamp brightness

This feature allows you to adjust the illumination intensity (brightness) supplied to the motor bulb. To change the brightness:

- Press Standby to clear the screen.
- Hold down the "Speed Down" button first, and then at the same time press the Standby button.
- The display will show "Lb" and a number between 500 and 900 mA.  
-- Note the factory default is 700 mA.
- Pressing the Speed Up or Speed Down buttons will change the value in 10 mA steps.
- Press the reverse button to save your selection. The reverse light will flash 3 times to indicate that the value has been saved.
- Press Standby to return to normal operation.

### Frequency change mode

This feature allows you to change frequency if the operator notices that the display is not functioning properly due to interference from another device on the same frequency. To change the frequency:

- First press Standby to clear the screen.
- Hold down the "Torque Up" button first, and then at the same time press the Standby button.
- Release these buttons and the display should show:  
-- "F-CHn9"  
-- "ID" - followed by a number  
-- "Ch" - followed by a number between 1 and 20
- The display will go blank signifying the frequency change took place.
- Press Standby to return to normal operation.

# Instructions For Use

## Special Features, continued

### Frequency match mode

This feature allows you to match the operational frequency of a particular Remote Display (RDCU) to the mating controller (CU). If either the RDCU or the CU is damaged, a new RDCU or CU can be matched to the operating unit to achieve a fully operational pair. To use the frequency match:

- Detach RDCU from the controller if attached.
- Place 4 "AA" batteries in RDCU.
  - Note: Frequency Match will not occur without batteries.
- Press and hold the "Torque Down" button and press the "Standby" button.
  - Note: Unlike other setup modes, the "Standby" button is not pressed first.
- The display will show "SynC".
- Unplug the CU power supply. Wait until the green power indicator light goes out, and then plug the CU back in.
- The display will clear indicating frequency match is complete.
- Press Standby for normal operation.

Use a suitable wipe moistened with disinfectant. Do not immerse the unit or spray disinfectant directly onto the unit.

It is recommended that you clean/disinfect the water lines within your eStylus controller, hose, and motor at the same time you clean/disinfect the water lines within your dental unit. It is recommended that you clean/disinfect water lines weekly, or as recommended by appropriate agencies such as OSAP. Simply leave the eStylus motor in place on the end of the eStylus hose while you are performing your normal water line cleaning and disinfection, allowing the cleaning/disinfection solution to flow out of the spray water hole of the coupling on the motor. Be sure to completely flush the cleaning/disinfection solution from the entire water line with water.

**Caution: Do not allow any liquids to enter the controller or RDCU housings. Liquids will damage the electronics and void your warranty.**

**Caution. Do not use bleach as a disinfectant for any component of the eStylus system. Bleach (sodium hypochloride) will cause corrosion of motors, attachments, and electronics.**

Listed below are several commonly available dental disinfectant solutions that are not known to damage the exterior surfaces of your eStylus Controller when used as directed.

MANUFACTURER	PRODUCT NAME
Biotrol	Birex
Huntington	Asepti-phene 1-28
Huntington	Asepti-steryl Aerosol
Huntington	Asepti-Wipe
Metrex Research	Cavicide
Palmero	Discide towelettes
PDI	Sanicloths
SultaPDIn	Lysol IC foam spray

***Note: Wipe disinfectant from surface. Liquid disinfectant can discolor or damage exterior surfaces if allowed to remain on surfaces for an extended time.***

# Instructions For Use

## Maintenance

Other than battery replacement, there are no user serviceable parts inside the eStylus controller and RDCU. Opening either unit will void your warranty and could cause unsafe operation.

### Replacing batteries in the RDCU

It is recommended that the batteries be replaced every 6 months. To replace batteries, simply open the battery door on the rear of the RDCU and install four new AA batteries. Use only Alkaline AA batteries. Do not mix battery types. Do not use expired batteries.

The RDCU display will show the approximate remaining battery life

### If batteries run down

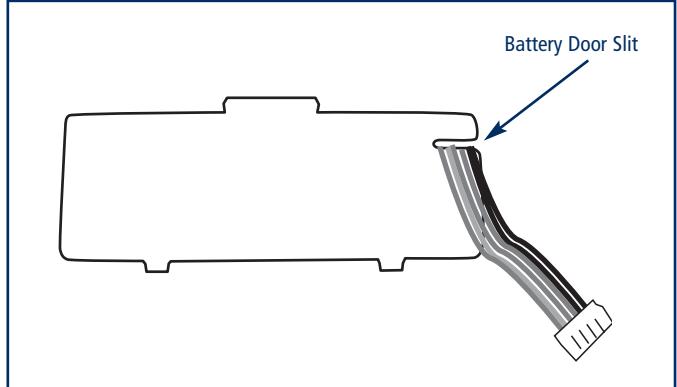
If the RDCU display panel is blank and does not reappear when you press Standby, the most likely cause is low batteries.

**Note: If the batteries run down, only the RDCU display and control functions are affected. The controller will continue to operate in whatever mode and settings were last used and you can still operate the motor from the foot pedal.**

To replace batteries, simply open the battery door on the rear of the RDCU and install four new AA batteries. Use only Alkaline AA batteries. Do not mix battery types. Do not use expired batteries

If the RDCU display panel becomes blank and you do not have fresh AA batteries readily available, you can operate the RDCU with DC power from the controller:

- Remove the Battery door from the RDCU.
- Once the batteries are removed you should see a cable tucked in the back of the RDCU.
- Pull the cable out and attach to the plug on the front of the controller and the plug of RDCU.



- Slide the cable in slit of battery door and close the door.
- The RDCU can remain detached from the controller or for your convenience it can remain attached to the controller.
- The RDCU display panel will illuminate and return to the previous displayed settings.

## Technical Specifications and Dimensions

External power supply	115/230 VAC, switchable, 50/60 Hz, 220 VA REF 763400
UL 2601-1 classification	Class I, Type B Applied Part IPX0
Fuse Type (T)	115V IN: 2A 250 V 230V IN: 1A 250 V
DC power to controller	26 VDC, 5 amps Intermittent Loading

### Recommended Transport and Storage Conditions

Temperature Range	within -40°C to +70°C
Relative Humidity Range	within 10% to 100%
Atmospheric Pressure Range	500 to 1060 hPa



Attention: Consult Instructions For Use Manual



Type B applied part



Medical Equipment with respect to electric shock, fire and mechanical hazards only in accordance with UL 2601-1, and CAN/CSA C22.2 No. 601.1



FCC ID: Q9X-MW874200  
Canada IC: 4681A-MW874200

# Instructions For Use

## Repair — Within the United States

### Midwest Air Repair™ Service

Should your Midwest eStylus Electric Motor system need repair, call 1-800-800-7202 to schedule a free pick-up.

Send to:

**DENTSPLY Professional Division**  
**Midwest Dental Products**  
Attn: Midwest Air Repair  
901 West Oakton Street  
Des Plaines, IL 60018-1884

### Provide the following information for your repair:

- Your complete name and address
- Dealer name and address
- Nature of repair

## Repair — Outside the United States

For customers Outside the United States, Contact your DENTSPLY Representative.

## Reorder Information: Accessories and Replacement Parts

The following products can be ordered through a DENTSPLY Professional authorized dental dealer.

REF	PRODUCT
874350	Motor air flow meter
874340	External power supply
874250	Replacement RDCU

For other replacements or spare parts, please contact DENTSPLY Professional Customer Service at 1-800-800-7202.

# Instructions For Use

## Fault Codes

The following fault codes have been established to help troubleshoot any problems or questions you have about the eStylus system.

### Error Code 1 : Communication error

**Description:** RDCU and CU not communicating  
**Probable Cause:** RF Interference in room  
Low batteries in the RDCU  
Hardware fault in the CU or RDCU  
**Method to clear:** Replace batteries in RDCU  
Try frequency match feature

If problem persists call the Handpiece Service Center at 1-800-800-7202

### Error Code 2 :

**Description:** Motor is supposed to spin, but is not spinning.  
**Possible Probable Causes:** No motor attached  
Motor defects such as worn or defective brushes  
Broken or defective motor hose  
**Method to clear:** Press and release any button

If problem persists call the Handpiece Service Center at 1-800-800-7202

### Error Code 3 :

**Description:** Motor is supposed to spin, but is not spinning.  
**Possible Probable Causes:** No motor attached  
Motor defects such as worn or defective brushes  
Broken or defective motor hose  
**Method to clear:** Press and release any button

If problem persists call the Handpiece Service Center at 1-800-800-7202

### Error Code 4 :

**Description:** Motor is not attached to hose  
**Possible Probable Causes:** No motor attached  
Motor defects such as worn or defective brushes  
Broken or defective motor hose  
**Method to clear:** Attach motor  
Press and release any button

If problem persists call the Handpiece Service Center at 1-800-800-7202

### Error Code 5 :

**Description:** Motor is not supposed to spin but is spinning  
**Possible Probable Causes:** CU motor transistor is damaged  
**Method to clear:** Unplug Controller and wait 5 minutes.  
Turn on again and see if system works.  
If not, CU may need to be replaced.

Call the Handpiece Service Center at 1-800-800-7202

### Error Code 6 :

**Description:** Motor current has reached 10A while it was being used  
**Possible Probable Causes:** Software did not respond in time to compensate for a sudden motor stall.

**Method to clear:** Press and release any button

If problem persists, Call the Handpiece Service Center at 1-800-800-7202

### Error Code 7 :

**Description:** Motor driver over temperature  
**Possible Probable Causes:**

**Method to clear the error:** Press and release any button

If problem persists, Call the Handpiece Service Center at 1-800-800-7202

### Error Code 8 :

**Description:** Motor spinning in wrong direction  
**Possible Probable Causes:** Defective reversing relay or relay drive circuit

**Method to clear:** Press and release any button

If problem persists, Call the Handpiece Service Center at 1-800-800-7202

# Warranty Information

## Limited Warranty

The electronic components (RDCU, Controller, and external power supply) of your Midwest e-Stylus Electric Motor System are guaranteed to be free of defects in materials and workmanship for a period of two (2) years, and the eStylus motor hose for a period of one (1) year, from date of purchase provided that the System has been operated and maintained as prescribed in these instructions (at the discretion of Dentsply Professional) and has not been subjected to apparent misuse, abuse or accident. All questionable, defective, or loose parts must be returned to the dealer, with proof of purchase, transportation prepaid.

The enclosed business reply card (warranty registration) must be filled out completely and returned within ten (10) days of purchase for this warranty to apply. Dentsply Professional makes no other guarantees, expressed or implied.

## Returns and Adjustments

A warranty claim must be made and promptly received by Dentsply Professional during the warranty period. If it becomes necessary to return a product for repair and/or adjustment, authorization must be first obtained from a representative of Dentsply Professional.

Any product returned for examination and/or warranty repair shall be sent insured via means of transportation specified by Dentsply Professional.

In all cases, Dentsply Professional has the sole responsibility for determining the cause and nature of failure, and the final determination of the warranty adjustment.

## Manufacturer Information

For technical support and repairs, call Dentsply Professional Customer Service at **1-800-800-7202**.

Outside the United States contact your DENTSPLY Representative:

### European Union Representative:

**DENTSPLY DeTrey GmbH**  
De-Trey Strasse 1  
D-78467 Konstanz - Germany 0086

### Canada:

**DENTSPLY Canade**  
161 Vinyl Court  
Woodbridge, Ontario  
L4L 4A3

Manufactured in the USA by:



**DENTSPLY Professional**  
A Division of DENTSPLY International  
901 West Oakton Street  
Des Plaines, IL 60018-1884 USA  
847-640-4800

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