NVPRO3

Perio · Restorative · Ortho

NV PRO3 Microlaser User Manual

This manual must be read thoroughly and understood prior to using the laser system.
CAUTION: Using the controls and adjustments or performing laser procedures, other than as specified herein, may result in hazardous radiation exposure.

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Welcome to your new NV PRO3 Microlaser!

Introduction

Congratulations on making the decision to implement soft-tissue laser dentistry into your practice!

Laser technology is currently being used in many areas of medicine and dentistry, particularly oral surgery, arthroscopy, gastroenterology, general surgery, dermatology and plastic surgery. The intended uses of laser devices include hemostasis, incision, excision, ablation, vaporization, and coagulation of tissue. In dentistry, usage of laser devices ranges from cosmetic surgery to treating periodontal disease. Laser technology has enabled dental professionals to provide less invasive treatment for many dental procedures, both preventative and restorative. As the dental laser industry has grown in recent years, so has the demand for portable soft-tissue lasers.

The NV Microlaser has been widely recognized for its convenience, portability & ease of use amongst dental soft-tissue diode lasers. The next-generation NV PRO3 Microlaser maintains the same features and ergonomic design as the NV, plus a redesigned lithium-ion battery with overcharge and undercharge protection, software updates and improvements, and additional preset procedural settings. This latest evolution in cordless soft-tissue lasers is now optimized for periodontal, restorative and orthodontic needs, enabling you to deliver the benefits of laser dentistry to a broader range of patient types, with ease.

Your decision to integrate laser science into your practice will yield many benefits, including increased patient comfort and production efficiency. You'll soon begin to experience these benefits and see the results that laser dentistry can provide, and your patients will become the ultimate beneficiaries of this cutting-edge technology. The sooner you and your staff are properly trained, the sooner your patients will begin to experience the results. Training requirements vary state by state, so it's important that you investigate the specific requirements with your state's Board of Dentistry. The same applies to the ability of Dental Hygienists to use Lasers, so we encourage you to investigate this dynamic as well.

The DenMat website, www.denmat.com, also provides information on new products, accessories, and educational assistance for you and your professional staff. If you have any questions regarding the use of your new laser, please call our toll-free support line at 1-800-4DENMAT (1-800-433-6628). We're here to help.

Thank you for choosing the NV PRO3 Microlaser!

Product Description

The NV PRO3 Microlaser consists of the following major modules and components:

Diode Assembly: The laser diode assembly contains one single-emitter laser diode of 2.0 watt output power (Class IV laser) lasing at 808 nm. The diode laser is directly coupled to a lens and aligned to the fiber optic inside the removable fiber tips, using a 2-axis alignment system (patent pending).

Heat Sink: The NV PRO3 Microlaser is designed to dissipate heat during normal operation. The laser module is mounted towards the tip of the unit, which acts as a heat sink during normal operation. The temperature is monitored by a sensor that prevents overheating.

Power Controller: The laser power controller provides electric power to the diode in either Continuous Wave Mode or Pulse Mode. It supplies approximately 2 VDC and current up to 4 A to the diodes. The controller contains a high-efficiency DC-to-DC converter that converts the battery voltage to the precise voltage needed for laser operation. This ensures that the majority of the energy is used for light and not converted into heat.

Lithium-ion Battery: Rechargeable lithium-ion battery with overcharge and undercharge protection.

Foot Pedal: The foot pedal contains a UL-approved commercial foot switch that controls initiation/termination of laser power wirelessly, using 2.4 GHz frequency.

Disposable Fiber Tip Delivery System: The delivery system is composed of a single-use plastic tip with a built-in 400 micron core multi-mode, optical quartz fiber. The fiber attaches to a custom-made steel connector, which attaches via a magnet onto the laser aperture component. The magnet acts as a guide and functions as an alignment mechanism, enabling a precise fit of the disposable tip onto the laser unit.

This design offers a simplified approach to fiber management:

- The fiber is factory-installed into the tip and requires no installation by the end user
- The tip is provided pre-scored which decreases setup time and reduces the likelihood of user error
- The complete component is fully disposable, which increases clean-up efficiency in the operatory

Indications for Use

The NV Laser is intended to be used for removal of soft tissue when removal of tissue is indicated by the clinician. The device may be used in the following areas: general and cosmetic dentistry.

Contraindications

All clinical procedures performed with the NV PRO3 Microlaser must be subjected to the same clinical judgment and care as with traditional techniques. Patient risk must always be considered and fully understood before clinical treatment. The clinician must completely understand the patient's medical history prior to treatment. Exercise caution for general medical conditions that might contraindicate a local procedure. Such conditions may include allergy to local or topical anesthetics, heart disease, lung disease, bleeding disorders, and immune deficiency, or any medical conditions or medications that may contraindicate use of certain light/laser type sources associated with this device. Medical clearance from the patient's physician is advisable when doubt exists regarding treatment.

- Not suitable for use in or around an MRI
- Do not use in an oxygen tent

Side Effects

- Temporary transient discoloration as with the thermal energy at the tissue surface
- Possible discomfort during healing and tissue recession

Warnings, Signage, Labels and Symbols

Interface and Wireless Signal

NOTE: 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. The 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 the user to correct the interference at his/her own expense.

Device Precautions

⚠ Changes or modifications not expressly approved by DenMat could void the user's authority to operate the equipment.

⚠ Laser Radiation - Avoid exposure to the eyes or skin from direct or scattered radiation.

⚠ This product contains no user serviceable components within the chassis. Visible and invisible radiation may be present when the cover is removed. Do not open the laser chassis under any circumstances.

⚠ US Federal law restricts this device to sale by or on the order of a licensed dentist. This product is for use by authorized personnel only.

⚠ Eyewear that protects your eyes from wavelengths other than 808 nm do not provide proper protection for use with this laser. Damage to the retina or cornea may be irreparable if exposed to direct, reflected or scattered radiation. Always wear protective eyewear when operating the laser.

⚠ Use of controls or adjustments, or performance of procedures other than those specified herein may result in hazardous radiation exposure.

⚠ Do not attempt to remove the cover from the laser chassis for the purpose of repairing the laser. Serious injury from electrical shock or laser radiation could occur. Removing the cover on the laser chassis will void the warranty.

⚠ Avoid prolonged exposure of the energy when working in and around the cervical areas of the tooth. Due to the thin layer of enamel in this area, the laser's energy may be absorbed by the hemoglobin in the pulp and pulpal hyperemia may occur. Extended exposure to laser energy could lead to pain and possible pulpal necrosis.

⚠ All combustible materials must be removed from the operations area or should be kept moist during the procedure. Laser can ignite preparation solutions containing alcohol, acetone or other solvents. DO NOT leave puddles of preparation solution in the operations area. Vapors may build up under surgical drapes and create a safety hazard. Never use the laser system in the presence of flammable anesthetic gases. The use of laser-safe endotracheal tubes and other laser-safe accessories is recommended. Many materials not normally considered flammable could be ignited in the presence of high oxygen and nitrous gas mixtures

⚠ Laser equipment not in use should be protected against unqualified use. The laser must be installed and operated according to CAN/CSA-Z386-92: Laser safety in healthcare facilities.

⚠ Do not touch the battery terminals and patient simultaneously.

⚠ Do not touch the gold charging pins located in the three charging ports while the power supply is connected to the base charger.

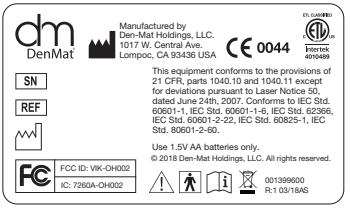
⚠ Do not touch the laser and the patient simultaneously while the laser is in the base charger.

Signage and Labels

DANGER Warning Sign:

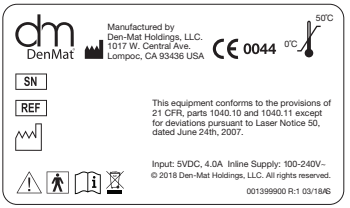
Each treatment area should have a DANGER warning sign posted at the entrance of the treatment area, which serves to warn people not to enter the treatment area without proper safety eyewear and protective clothing when the laser is in use. This warning can help avoid eye damage caused by inadvertent exposure to the laser.

Foot Pedal Label:



Foot Pedal Caution Label:

Base Charger Label:



Aperture Label:

Symbols Glossary

Consult instruction manual for use

Professional use only

Caution

Do not use if package damaged

Non-ionizing radiation

Indicates the system contains a laser

50°C
0°
Temperature limits

Fragile

Keep dry

Dispose of properly

Type BF applied part

Recycling

EC REP EU Representative

Manufacturer

Manufacture date

SN Serial number

REF Catalog number

CE European Conformity

0044 TUV Nord GMBH Notified Body number

Operating Conditions and Safety Considerations

Treatment Area

Always use the laser in a well-lit and ventilated area. The area around the laser must be free of standing water. Chemicals or gases that could cause combustion must not be present when using the laser. Use a high-volume vacuum to remove the laser "plume."

Provide high filtration masks for all personnel in the treatment area. The laser plume may contain viable tissue particulates.

⚠ If base charger is in the treatment area, DO NOT make contact with the charging pins and patient simultaneously.

Operating Conditions

Operating temperature should be between 6ºC and 30ºC.

Power or Performance Loss

In the event the laser has a loss of power or performance, stop using the laser immediately and contact DenMat at 1-800-4DENMAT (1-800-433-6628).

Safety Features

Audible Lasing Signal

An audible signal (high-pitched buzzing) sounds whenever the activation foot switch is depressed.

Software Lock

The NV PRO3 Microlaser is equipped with a software lock that requires proper code input on the wand prior to use (see page 11).

Emergency Laser Stops

The laser has multiple laser stop features in case the laser needs to be shut down immediately. The red Emergency Laser Stop button is located on the main body. If the laser needs to be immediately shut down, press and release the red button, remove the battery from the unit, remove the tip from the unit, or release the foot pedal.

Laser Firing Delay

There is a brief delay between depressing the foot switch and the onset of the laser activation. This allows the user adequate time to react if the foot switch is inadvertently depressed or laser operation should be aborted.

Overheat Protection

If diode reaches 60º C, the unit will go into cool-down mode and will require the user to input the password before the laser can be fired again. Press the up (▲) button in sequence four (4) times.

Safety Eyewear

The laser beam can cause eye damage when misused. When using the laser, everyone in the treatment area must wear safety eyewear with an optical density (OD) of 4 or better, which are designed for use with a 808 nm wavelength. The laser tip should never be pointed directly at the face, eyes, or skin. The nominal ocular hazard distance (NOHD) is 902 mm. While wearing OD-4 eye protection the NOHD is reduced to 9.2 mm.

Setting Up Your NV PRO3 Microlaser

Contents

NV PRO3 Microlaser Main Body
Lithium-Ion Batteries (2)
Pairs of Safety Glasses (3)
Base Charger
Power Supply for the Charger
Wireless Foot Pedal
AA Batteries for the Foot Pedal (2)
Disposable Tips — 5 mm (5); 7 mm (5)
Warranty Information Card
DANGER Warning Sign
User Manual
Pack of Carbon Film

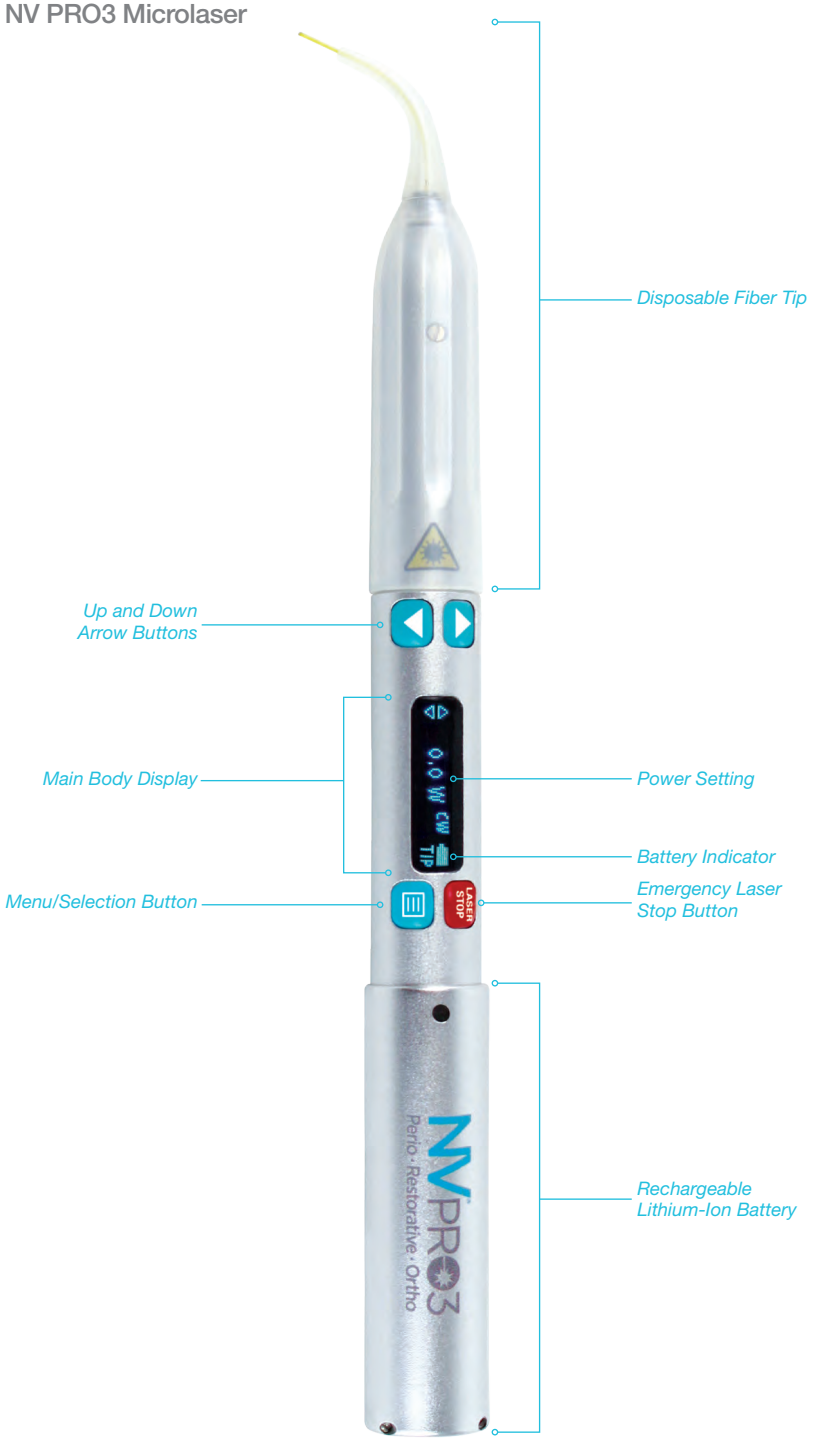
Unpacking the Container

No special assistance is required to unpack and assemble the NV PRO3 Microlaser. However, if you have any questions or concerns, call DenMat at 1-800-4DENMAT (1-800-433-6628).

Packaging should be inspected on arrival for evidence of shipping damage. Damaged packaging may indicate the presence of unsafe product and the device should not be used until carefully inspected. Damaged product should not be used and should be returned. Product must be handled, stored and opened in such a way that it is protected from inadvertent damage or contamination.

NOTE: The shipping container has been designed to safely transport the NV PRO3 Microlaser. We recommend that you keep the container in case you need to ship the laser back for service or repair.

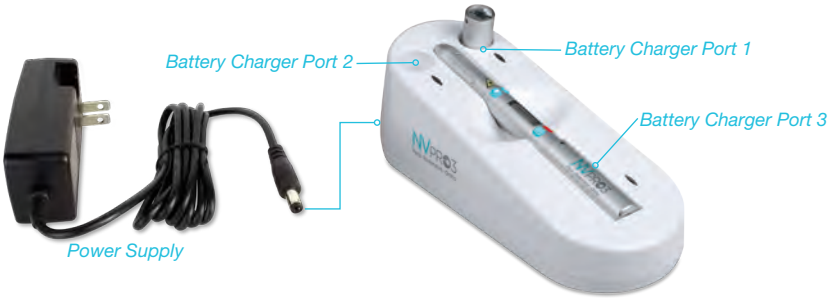
The NV PRO3 Microlaser



Assembling the Base Charger

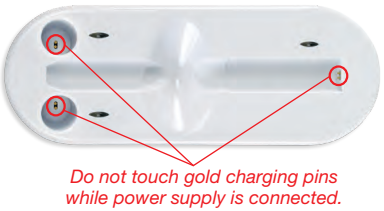
The base charger securely stores the laser unit and charges the batteries at the same time. You can charge up to three batteries: two in the dedicated battery charging ports and one in the resting slot for the laser.

Connect the provided power supply to the back of the base charger. The power supply can be used in outlets of 100~240 VAC.



⚠ If an incorrect power supply is used, the base charger will not charge the batteries and permanent damage may occur to the base charger.

⚠ Do not touch the gold charging pins located in the three charging ports while power supply is connected.



Assembling the Wireless Foot Pedal

The battery-powered wireless foot pedal is composed of a supporting plastic base and a foot switch which comes attached to the base. In order to power the foot pedal, insert the AA batteries that were provided with the laser.

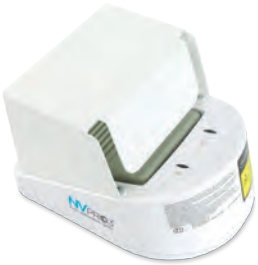
⚠ Before inserting the AA batteries, make sure that the laser is completely turned off and that the lithium-ion battery is not attached to the main body.

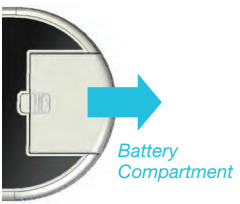
1. Turn the foot pedal upside down to locate the battery compartment.

2. Slide the lid open and insert the AA batteries.

3. Replace the lid and close the battery compartment. The green light indicates that the foot pedal is in standby mode.

NOTE: The manufacturer recommends replacing the AA batteries after 100 hours of continued operation. During use, if the red battery light comes on, the foot pedal AA batteries need to be changed.





Charging the Lithium-Ion Batteries

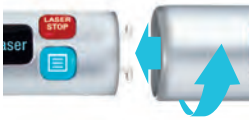
The laser comes with two rechargeable lithium-ion batteries, allowing you to have a fully charged battery available at all times. The battery provides up to 20 minutes of continuous operation at 1.2 watts of power when fully charged.

The NV PRO3 lithium-ion batteries are partially charged when shipped. Prior to using the laser for the first time, you must fully charge all lithium-ion batteries provided with the laser. Use only the approved base charger that is included with your laser.

⚠ Failure to follow these instructions may result in a voided warranty.

Attaching a Lithium-Ion Battery

To attach a battery to the main body, match the two pins (male) located on the main body with the slots (female) located on the battery, and insert the pins into the slots. Twist the battery clockwise until it firmly locks into place.



Line up pins on main body with slots on battery, and twist clockwise to lock

To store or recharge the laser, first remove the disposable tip, if one is attached. Place the laser flat in the slot by tipping it slightly upward and inserting the end of the battery first and then lowering it into the resting slot.

⚠ Do not place the laser upright in the vertical battery charging ports.

⚠ Do not touch the laser and the patient simultaneously while the laser is in the base charger.

⚠ Do not touch the battery terminals and patient simultaneously.

Recharging a completely discharged battery takes approximately 1 hour. The LED lights on the base charger indicate the amount of charge remaining. If the light is amber, the battery is charging. When the light is green, the battery is fully charged.

Attaching a Disposable Fiber Tip

Each disposable fiber tip is pre-scored, pre-stripped and protectively wrapped in its own package. Tips must only be used for a single procedure and then properly disposed of.

The tip slips easily onto the shaft of the main body, aligning on the ridges. The main body contains a magnet which snaps the tip into place and aligns it with the laser diode.

The disposable tip can be attached in six different positions, allowing you to access difficult areas during surgical soft-tissue procedures. The main body display will provide visual verification indicating that the tip is properly attached and the laser unit is on standby waiting to be used.

⚠ The disposable fiber tips are supplied non-sterile by the manufacturer and must be discarded in an infectious waste container (SHARPS) after each use. Sponges used for cleaning fibers should be disposed of in a bag for contaminated soft products. There is no reuse or resterilization procedure indicated.

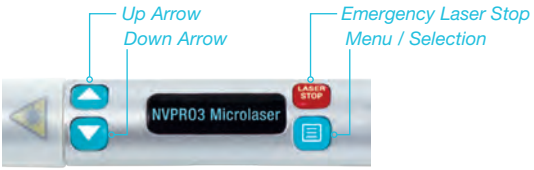
⚠ Steeply bending or improperly securing the disposable fiber tip may lead to damage to the laser delivery system and/or harm the patient or user.

Operating Instructions

⚠ Do not touch the laser and the patient simultaneously while laser is in the base charger.

Main Body Display Features

All operations and procedures are conveniently located on the laser OLED display unit. The red Emergency Laser Stop button puts the laser in ready mode. The Menu/Selection button allows you to easily cycle through the various options. The Up and Down Arrow buttons increase and decrease the power. You also use the Up and Down Arrow buttons to scroll through the options when you are using one of the menus.



Entering Ready Mode (Software Lock)

1. Firmly press the red Emergency Laser Stop button alongside the OLED display.
2. The laser welcome screen will flash and will immediately display “Enter Key _ _ _ _”
3. Press the Up Arrow (▲) button in sequence four (4) times, until four check marks fill in the blanks. This represents the correct password.

Selecting the Appropriate Settings for the Procedure

You can control all operations by navigating with the Menu/Selection button. Press the Menu/Selection button to display the options and press it again when you want to make a selection. Within each menu, you can view the specific options by pressing the Up and Down Arrow buttons.

The main menu options are:

Press 1x - Laser Mode - choice of Continuous Wave or Pulse operation

Press 2x - Procedures - list of all preset procedures in alphabetical order

Press 3x - Aiming Beam - adjust brightness of the aiming beam

Press 4x - Beep Volume - control the beeping intensity

Selecting a Mode

1 Press the Menu/Selection button 1x for Laser Mode.

The display shows Laser Mode.

2 Press the Up or Down Arrow buttons to scroll through the Laser Mode options.

In this case, the first option shown is Continuous Wave Mode. Continue to press the Up or Down Arrow buttons to change the laser to Pulse Mode.

3 To make a selection, press the Menu/Selection button again.

Continuous Wave Mode and Pulse Mode

The NV PRO3 Microlaser delivers laser energy in either a Continuous Wave (CW) or Pulse Mode (⎍⎍). Selecting the appropriate mode is important for controlling the temperature of the target tissue as well as using an efficient amount of energy.

Continuous Wave Mode	Pulse Mode
Continuous Wave (CW) mode is generally the fastest way to ablate tissues. However, heat can build up and damage the target and adjacent tissues. Cool the tissues using periodic blasts of air from a triplex syringe and high speed suction. You may want to use water to cool areas where there is prolonged exposure to the laser beam. When the laser is in CW mode, the amount of power delivered is equal to the power setting that has been selected. **For example, a 1.0 W power setting in CW Mode generates an average power output of 1.0 W.**	Pulse Mode serves as an alternate form of laser energy delivery. Pulsing of the laser energy reduces the average power emitted and allows for some cooling of the tissue between energy emissions. In Pulse Mode, the NV PRO3 Microlaser is programmed to deliver ten pulses per second (fixed), each with a pulse duration of 0.05 seconds (fixed), resulting in a duty cycle (percentage of time within each second that the laser is emitting energy) of 50%. Thus, when the laser is in Pulse Mode, the average power delivered is equal to 50% of the power setting that has been selected (displayed on the OLED). **For example, a 2.0 W power setting in Pulse Mode generates an average power output of 1.0 W** (equivalent to the average power output of a 1.0 W power setting in CW Mode).
⚠ Do not use an air syringe when you have an opening in soft tissue adjacent to or within the surgery site. An air embolism may occur as a result of air that may be captured within the tissue during the cooling process.	

Selecting a Preset Procedure

1 Press the Menu/Selection button 2x for Procedures.

The display shows Procedures.

2 Press the Up and Down Arrow buttons to scroll through the Procedure options.

In this case, the first option shown is Aphthous Ulcer. Continue to press the Up or Down Arrow buttons to browse through the other procedures.

3 To make a selection, press the Menu/Selection button again.

After selecting a procedure, you can manually adjust the power settings if needed by pressing the Up or Down Arrow buttons. The image below demonstrates the main power screen after a preset procedure is selected. It happens to be a Continuous Wave Mode procedure. It also shows the battery is fully charged.

Below is a list of all 12 preset procedures in the alphabetical order that they are displayed:

Order	Procedure	Mode	Power
1	Aphthous Ulcer	Pulse	1.4 W
2	Biopsy	Continuous	1.2 W
3	Class V Restoration	Continuous	1.2 W
4	Cuspid Exposure	Continuous	1.0 W
5	Frenectomy	Continuous	1.2 W
6	Gingivectomy	Continuous	1.0 W
7	Hyperplasia	Continuous	1.2 W
8	Implant Recovery	Continuous	1.2 W
9	Laser Troughing	Continuous	1.0 W
10	Operculectomy	Continuous	1.5 W
11	Recontouring	Continuous	1.0 W
12	Sulcular Debridement	Continuous	0.8 W

NOTE: See page 18 for a full list of common procedures and recommended power settings that can also be performed using the NV PRO3 Microlaser.

Adjusting the Aiming Beam Brightness

1 Press the Menu/Selection button 3x.

The display shows Aiming Beam.

2 Press the Up and Down Arrow buttons to scroll through your Aiming Beam options (Low, Medium, High).

In this case the first option shown is High. Continue to press the Up or Down Arrow buttons to browse through the other options.

3 To make a selection, press the Menu/Selection button again.

Adjusting the Beeping Volume

1 Press the Menu/Selection button 4x.

The display shows Beep Volume.

2 Press the Up and Down Arrow buttons to scroll through your beeping volume options (Low, Medium, High).

In this case the first option shown is High. Continue to press the Up or Down Arrow buttons to browse through the other options.

3 To make a selection, press the Menu/Selection button again.

Tip Initiation Instructions

If the procedure requires an initiated tip, increase the laser output power to a value of 0.6 W by pressing the Up Arrow (▲) button until 0.6 W is reached.

Touch a piece of carbon film with the end of the tip and depress the foot switch to activate the laser.

When laser emission begins, move the tip back and forth over the surface of the carbon film. You will observe a rapid melting/vaporization of the film and the tip should become dark.

Performing the Procedure

⚠ Always test the laser before inserting into the patient's mouth.

The laser is activated by the wireless foot pedal. Depress the foot pedal to activate the laser and perform the procedure. Use short, quick, brush-like strokes at the lowest power that you can to perform the treatment.

Maintenance Information

Cleaning and Disinfection Instructions

The NV PRO3 Microlaser is not supplied in sterile condition, nor must it be sterilized before use. The following disinfecting procedures are recommended before initial use and after each subsequent use.

Caution should be taken when disinfecting the laser to avoid damaging the external and internal electrical components. If using a liquid disinfectant, apply to a gauze or soft cloth and then wipe down the laser. Do not use abrasive materials to clean the laser. Place a protective barrier material such as cellophane over the control panel and LED screen prior to treating the next patient. Failure to follow these instructions may result in a voided warranty.

⚠ Do not spray the disinfectant directly on the laser unit, because it could damage the OLED display.

⚠ Do not use abrasive materials to clean the laser.

Tip Disposal

The disposable fiber tips are supplied non-sterile by the manufacturer and must be discarded in an infectious waste container (SHARPS) after each use. Sponges used for cleaning fibers should be disposed of in a bag for contaminated soft products. There is no reuse or resterilization procedure indicated.

Battery Disposal

Batteries contain toxic materials and should not be disposed of in landfills or incinerators. Dispose of depleted batteries as directed by your local solid waste handling regulations. To dispose of the battery, we recommend www.call2recycle.org to locate a recycling facility near you (U.S. and Canada only).

Storage Conditions

Storage temperature should be between 0ºC and 50ºC.

Procedures Guide

The table below may assist you in selecting the most conservative power settings for many common laser procedures. These settings are provided for your guidance only. It is at your discretion as the operator to modify these settings on a patient-by-patient basis, in order to deliver the safest and most effective treatment.

Soft-Tissue Procedures

Procedure	Technique	Tip	Mode	Power
Bacterial Decontamination	Non-contact	Non-initiated	Continuous	0.8 -1.0 W
Biopsy	Contact	Initiated	Continuous	1.2 W
Biostimulation	Contact	Initiated	Continuous	1.0 W
Class V Restoration	Contact	Initiated	Continuous	1.0 W
Cuspid Exposure	Contact	Initiated	Continuous	1.0 W
Distal Wedge	Contact	Initiated	Continuous	1.5 W
Draining Abscesses	Contact	Initiated	Continuous	1.2 W
Fibroma	Contact	Initiated	Continuous	1.2 W
Frenectomy	Contact	Initiated	Continuous	1.2 W
Gingivectomy	Contact	Initiated	Continuous	1.0 W
Gingivoplasty	Contact	Initiated	Continuous	1.0 W
Hemostasis	Contact	Initiated	Continuous	1.5 W
Hypertrophic Tissue	Contact	Initiated	Continuous	1.5 W
Hyperplasia	Contact	Initiated	Continuous	1.2 W
Implant Recovery	Contact	Initiated	Continuous	1.2 W
Laser Troughing	Contact	Initiated	Continuous	1.0 W
Operculectomy	Contact	Initiated	Continuous	1.5 W
Ovate Pontic	Contact	Initiated	Continuous	1.2 W
Recontouring	Contact	Initiated	Continuous	1.0 W
Sulcular Debridement	Non-contact	Non-initiated	Continuous	0.8 -1.0 W
Tissue Tag	Contact	Initiated	Continuous	1.2 W
Tongue Tie	Contact	Initiated	Continuous	1.2 W

Hard-Tissue Procedures

The NV PRO3 Microlaser is not intended to be used for hard-tissue procedures. The diode laser is attracted to melanin, hemoglobin and, to some extent, water and oxygenated hemoglobin. Avoid prolonged exposure when working in and around the cervical areas of the tooth. Because of the thin layer of enamel in this area, the laser's energy may be absorbed by the hemoglobin in the pulp, and pulpal hyperemia may occur. Extended exposure to laser energy could cause pain and pulpal necrosis.

Quick Start Guide

Prepare for Use

1. Ensure that anyone within the treatment area is wearing safety eyewear with an optical density (OD) of 4 or better, which are designed for use with a 808 nm wavelength.

2. Connect the power supply to the back of the base charger.

3. Ensure at least one lithium-ion battery is fully charged before initial use.
    a. Place the lithium-ion battery into one of the ports on the base charger for two hours or until the indicator light on the charger becomes green.

4. Insert the AA batteries into the battery compartment on the bottom of the wireless foot pedal.
    a. One of the indicator lights will become green, indicating that the foot pedal is in standby mode.

5. Attach the lithium-ion battery to the main body.

6. Attach a disposable fiber tip to the main body.

7. Press the red Emergency Laser Stop button to put the laser into ready mode
    a. The OLED display will light up, confirming the laser is on.
    b. The laser welcome screen will flash and the OLED display will then show "Enter key _ _ _ _."

8. Enter the password by pressing the Up (▲) button in sequence four (4) times

9. Select the appropriate power settings for your procedure
    a. Select a Laser Mode (Continuous Wave or Pulse)
    b. Select a Preset Procedure
    c. Adjust the Aiming Beam (Low, Medium, High)
    d. Adjust the Beeping Volume (Low, Medium, High)

Perform the Procedure

10. Initiate the Tip
    a. Touch a piece of carbon film with the end of the tip and depress the foot switch to activate the laser.
    c. Move the tip back and forth over the surface of the film until the tip becomes dark.

11. Test the laser before inserting into the patient's mouth.

12. Depress the foot pedal to activate the laser. Use short, quick, brush-like strokes at the lowest power that you can to perform the treatment.

After the Procedure

13. Remove the disposable tip and discard in an infectious waste container (SHARPS).

14. Place the NV PRO3 Microlaser in the resting slot on the base charger.

Service and Support

Calibration

We suggest that your practice establish an internal verification program for your laser. Verification is recommended a minimum of once per year based on average usage.

Repairs and Returns to DenMat

Should you encounter technical issues with your NV PRO3 Microlaser, please contact DenMat Customer Care at 1-800-4DENMAT (1-800-433-6628). A Customer Care Representative will assist you and attempt to troubleshoot your issue over the phone.

If it is determined that your laser needs to be returned to DenMat for service or repair, a Return Material Authorization ("RMA") number will be provided to you. The RMA number must appear on the outside of the shipping container. Any returns sent to DenMat without a RMA will not be eligible for processing.

NOTE: For a complete explanation of the NV PRO3 Limited Product Warranty, please reference the Warranty Information Card that was included with your initial purchase.

Specifications

Dimensions of Base Charger:	2.7" H x 2.9" W x 8.0" L
Dimensions of Laser:	6.9" L x 0.65" diameter
Weight:	1.9 ounces
Laser classification:	Class IV laser device
Delivery system:	Optical Fiber
Wavelength:	Laser 808 nm ± 5 nm
Maximum power:	2 Watts ± 20%
Aiming beam wavelength:	650 ± 10 nm
Aiming beam power:	0.5 mW max
Beam divergence:	617 mrad
Power range:	0.1 watt to 2.0 watts
Pulse frequency:	Fixed 10 Hz
Pulse duration:	Fixed 0.05 seconds
Duty cycle:	Pulse Mode: 50% Continuous Wave Mode: 100%
Audible notification:	Yes
Power requirements:	100-240 VAC @ 50 to 60 Hz
Charger current:	0.6 Amps
Battery:	Rechargeable lithium-ion
20 minutes continuous lasing time @ 1.2 watts	8 hours standby time
Wireless Foot Pedal frequency:	2.4 GHz
Foot Pedal power source:	AA Batteries (provided)

Compliance

FCC Statement

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

This product has been tested and complies with the specifications for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used according to the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which is found by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment or devices
- Connect the equipment to an outlet other than the affected receivers
- Consult a dealer or an experienced radio/TV technician for assistance

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

Industry Canada Statement

This Class B digital apparatus complies with Canadian ICES-003 and RSS210.

Operation is subject to the following two conditions:

1. This device may not cause interference, and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

Guidance and Manufacturer's Declaration

Electromagnetic Emissions

The NV PRO3 Class IV Soft-Tissue Laser System is intended for use in the electromagnetic environment specified below. The customer or user of the model NV PRO3 should assure that it is used in such an environment.

Emission	Compliance	Electromagnetic environment-guidance
RF emissions CISPR 11	Group 1	The NV PRO3 uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment. The wireless transmitter in the foot pedal is battery powered only and does not connect to public mains.
RF emissions CISPR 11	Class B	The NV PRO3 is suitable for use in all establishments, including domestic establishments and those directly connected to the public low voltage power supply network that supplies buildings used for domestic purposes.
Power Line Harmonics IEC/EN 61000-3-2	Class A	
Power Line Flicker IEC/EN 61000-3-3	Complies	

Guidance and Manufacturer's Declaration

Electromagnetic Immunity

The NV PRO3 Class IV Soft-Tissue Diode Laser System is intended for use in the electromagnetic environment specified below. The customer or the user of the Model NV PRO3 should assure that it is used in such an environment.

Immunity Test	IEC 60601 Test Level	Compliance	Electromagnetic Environment — Guidance
Electronic Discharge (ESD) IEC 6 1000-4-2	Contact ± 6 kV Air ± 8 kV	Contact ± 6 kV Air ± 8 kV	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical Fast Transient/burst IEC 6 1000-4-4	Power line ± 2 kV I/O lines ± 1 kV	Power line ± 2 kV No I/O lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 6 1000-4-5	±2 kV Common ± 1 kV Differential	±2 kV common mode ±1 kV differential mode	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 6 1000-4-11	>95% dip in U_T for 0,5 cycle 60% dip in U_T for 5 cycles 30% dip in U_T for 25 cycles >95% dip in U_T for 5 seconds	>95% dip in U_T for 5 seconds 60% dip in U_T for 5 cycles 30% dip in U_T for 25 cycles >95% dip in U_T for 5 seconds	Mains power quality should be that of a typical commercial or hospital environment. If the user of the NV PRO3 requires continued operation during power mains interruptions, it is recommended that the NV be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 6 1000-4-8	3 A/m at 50 Hz	3 A/m	If image distortion occurs, it may be necessary to position NV PRO3 further from sources of power. The power frequency magnetic field should be measured in the intended installation location to assure that it is sufficiently low.

NOTE: U_T is the AC mains voltage prior to application of the test level.

The NV PRO3 Class IV Soft-Tissue Diode Laser System is intended for use in the electromagnetic environment specified below. The customer or the user of the Model NV PRO3 should assure that it is used in such an environment.

Immunity Test	IEC 60601 Test Level	IMMUNITY Level	Electromagnetic Environment — Guidance
			Portable and mobile RF communications equipment should be used no closer to any part of the NV PRO3, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 Vrms	**Recommended separation distance** d=1,2√P 150 kHz to 80 MHz
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2,5 GHz	3 V/m	d=1,2√P 80 MHz to 800 MHz d=2,3√P 800 MHz to 2,5 GHz where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in metres (m). Field strengths from fixed RF transmitters, as determined by and electromagnetic site survey, a should be less than the compliance level in each frequency range. Interference may occur in the vicinity of equipment containing a transmitter. 

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

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

a) Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, and electromagnetic site survey should be considered. If the measured field strength in the location in which the NV is used exceeds the applicable RF compliance level above, the NV should be observed to verify normal operation. If abnormal performance is observed, the additional measures may be necessary, such as re-orienting or relocating the NV PRO3.

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

Recommended separation distances between portable and mobile RF communications equipment and the NV PRO3

The NV PRO3 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the NV PRO3 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the NV PRO3 as recommended below, according to the maximum output power of the communications equipment.

Rated maximum output power of transmitter W	Separation distance according to frequency of transmitter m		
	150 kHz to 80 MHz 1,2	80 MHz to 800 MHz 1,2	800 MHz to 2,5 GHz 2,3
0,01	0,12	0,12	0,23
0,1	0,38	0,38	0,73
1	1,2	1,2	2,3
10	3,8	3,8	7,3
100	12	12	23

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

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

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