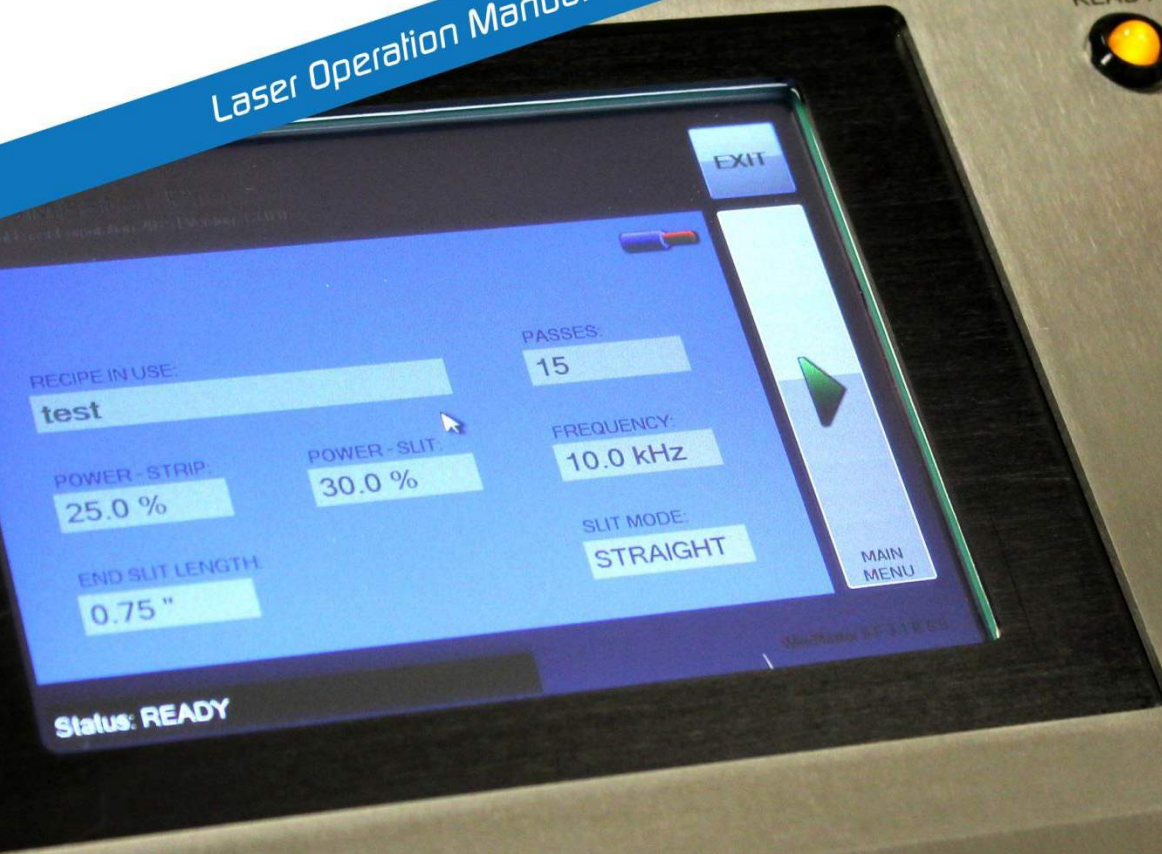


# NoNic™

benchtop

2015

Laser Operation Manual



Wire Stripping System

Quick, Easy, Damage-Free: NoNic™

**CLC** controllaser

WWW.CONTROLLASER.COM

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## Introduction

The **NoNic™ Benchtop** laser system is specifically designed for wire stripping applications that require a delicate and accurate method of removing wire insulation without causing any damage to the exposed wire underneath. The machine itself is strictly intended for this purpose in mind. This will optimize the time and efficiency of wire stripping while maintaining a consistent and high quality standard of literally every piece of material it encounters. Please **ALWAYS** exercise caution and strict safety measures when using the NoNic™ Benchtop laser system. It contains an active CO<sub>2</sub> laser, which should be handled with care and all operators should use proper judgment when using this system. The machine is fully enclosed with an interlocking door and adheres to all current CDRH standards.

This manual covers safety, system specifications, installation, maintenance, basic troubleshooting procedures, software, and operations. Diagrams and drawings may be included to assist in the description of components and layout of the NoNic™ Benchtop laser system.

### Product Feedback & Suggestions:

**Attention:** Marketing  
Control Laser Corporation  
7101 TPC Drive, Suite 100  
Orlando, Florida 32822  
**E-mail:** [sales@controllaser.com](mailto:sales@controllaser.com)

### Field Service Department:

**Phone:** 866-612-8619, Monday through Friday  
8:00 a.m. to 5:00 p.m. EST  
**Fax:** 407-926-3590, 24 hours a day, seven days  
a week  
**E-mail:** [service@controllaser.com](mailto:service@controllaser.com)

For information about CLC, visit our website at [www.controllaser.com](http://www.controllaser.com).

## WARNING

It is extremely important to read and understand the **Safety section** of this manual before attempting to operate the NoNic™ Benchtop laser system.

# Chapter Summary

## Technical Support Directory

This directory explains how to contact CLC for technical support by telephone, fax, and e-mail; how to order parts; and how to return components for repair. Information about technical support programs, training classes, and the CLC website are included.

## Chapter 1. Safety

This chapter describes how the NoNic™ Benchtop fulfills the performance requirements established by the United States Title 21, Code of Federal Regulations, Subchapter J (21 CFR). This chapter documents the user's responsibility and safety precautions.

All users should read and understand the safety chapter before attempting to operate the NoNic™ Benchtop laser system.

## Chapter 2. Installation

This chapter explains proper procedures for receiving, inspecting, and unpacking the NoNic™ Benchtop laser system. Space, environmental, and electrical requirements are described. Step-by-step instructions for installing safety interlocks and connecting electrical lines are included. Guidelines for moving and storing the system are also outlined.

## Chapter 3. System Function

This chapter provides diagrams and descriptions of the NoNic™ Benchtop controls and step-by-step instructions for system startup and shutdown.

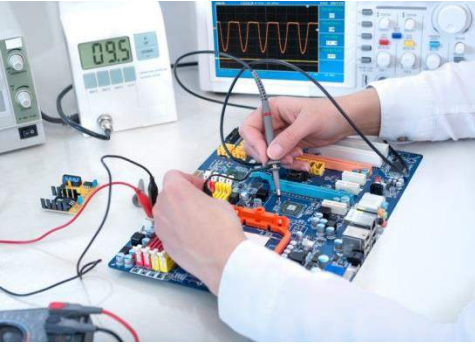
## Chapter 4. Laser Operation

This chapter describes the basic features of the NoNic™ Benchtop software. An overview of is provided as well as directions for navigating. Other topics include user login, creating and running jobs, and accessing other applications.

## Revisions

If any changes occur after the printing of this manual, a Revision Page will be included in the back of this manual.

# Technical Support Directory



## Field Service Support

A qualified maintenance technician should troubleshoot the laser system before contacting the Field Service department. Attempting to isolate the source of the problem will make it easier for the field service technician to assist you. Have the model name and serial number of the laser available when you contact Field Service. This information is located on the supplied Data Sheet in the Customer Service Manual.

## Support by Phone

The Field Service department can be contacted at **(866) 612-8619**, Monday through Friday, 8:00 a.m. to 5:00 p.m. Eastern Time. After 5:00 p.m., an answering service will take your message and notify a field service technician of your requirements by the next business day.

## Support by Fax

The Field Service department can be contacted by fax at **(407) 926-3590**, 24 hours a day, including weekends. Faxes received after business hours and on weekends will be responded to the next business day.

## Support by E-mail

The Field Service department can be contacted by e-mail at [service@controllaser.com](mailto:service@controllaser.com).

## Support by Website

Visit our website at [www.controllaser.com](http://www.controllaser.com) to learn more about Control Laser Corporation (CLC), our laser products, and various applications.

## Support by Forum

Visit our website support forums at [www.controllaser.com/forums](http://www.controllaser.com/forums) to troubleshoot your issues with our technicians and community contributors.

## Service and Maintenance Programs

The Field Service department offers several service and maintenance programs that provide expert on-site support from factory trained representatives. Programs may be purchased on a quarterly or annual basis.

Contact Field Service for details at **(866) 612-8619** or [service@controllaser.com](mailto:service@controllaser.com).

## Advanced Maintenance Training Seminars

Advanced maintenance training seminars are held periodically on-site at CLC. Contact Field Service for enrollment information at **(866) 612-8619** or [service@controllaser.com](mailto:service@controllaser.com)

## Parts Repair

If a laser component fails, contact Field Service immediately. Most repairs can be accomplished within 24-48 hours upon receipt of the component. Some power supply units may take additional time to replace/repair because they may require outside vendor participation.

Before returning any parts to CLC for repair/replacement contact Customer Service at (866) 612-8619. You will be supplied with a Return Material Authorization (RMA) number used to track the part during repair and shipping.

Return all components to CLC by United Parcel Service (UPS), Federal Express, or any local carrier that can track your package to:

**Attention:** (Use your RMA # here)  
Control Laser Corporation  
7101 TPC Drive, Suite 100  
Orlando, Florida 32837

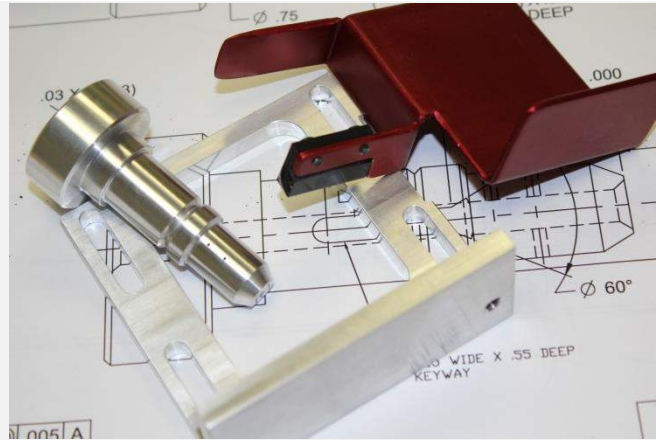


## Replacement and Spare Parts

In North America, replacement and spare parts must be ordered directly through CLC. Parts can be shipped overnight at the customer's request. Spare part kits and test equipment kits are also available.

To order parts or a current parts catalog contact Customer Service at Control Laser:

**Attention:** Customer Service  
Control Laser Corporation  
7101 TPC Drive, Suite 100  
Orlando, Florida 32822  
**Telephone:** (866) 612-8619  
**Fax:** (407) 926-3590



You may also view spare parts online via our website at [www.controllaser.com/shop](http://www.controllaser.com/shop)



# Safety 1

## Recommendation

Control Laser Corporation (CLC) recommends the Safety chapter be read thoroughly by all personnel before operating or performing maintenance on the NoNic™ Benchtop laser system.

## Compliance Statement

The NoNic™ Benchtop is certified by Control Laser Corporation as a Class I laser product in accordance with Title 21, Code of Federal Regulations, Subchapter J, (21 CFR).

### **Compliance may be verified by contacting:**

Office of Compliance (HFZ-312)  
Center for Devices and Radiological Health  
US Department of Health & Human Services  
2098 Gaither Road  
Rockville, MD 20850  
**Telephone:** (301) 594-4654

## Laser Radiation Wavelength

The NoNic™ Benchtop emits carbon dioxide (CO<sub>2</sub>) radiation at 10,600 nanometers (nm). The CO<sub>2</sub> laser poses the greatest risk of injury if the safety precautions in this manual are not followed. The specifications in the following chart are provided to assist the Laser Safety Officer (see Responsibility of the Laser User below) in evaluating the hazard potential of the laser. These specifications represent the “worst-case” potential for short-term, peak laser emission.

**Recommended Optical Density for Eyewear: NoNic™ Benchtop (CO<sub>2</sub>) - 3.9**

## Responsibility of the Laser User

The performance requirements are defined by the United States as the responsibility of the laser manufacturer. The responsibility of the user is the safe use of the laser defined in ANSI Z136.1; the American National Standard for the Safe Use of Lasers.

These standards require the user to appoint a Laser Safety Officer to oversee the use of this equipment. This individual shall have the authority and responsibility to evaluate, monitor, and enforce the control of laser hazards. See the appropriate standard: ANSI Z136.1 in the United States of America for the specific responsibilities of the Laser Safety Officer.

ANSI Z136.1 is issued by the American National Standards Institute (ANSI) as a recommended safety guide for the use of laser products in the United States of America. ANSI cannot enforce adherence to the guide. However, OSHA, the Occupational Safety and Health Administration, uses the guide as its inspection standard when it inspects workplaces that use lasers. Therefore, the guide carries the authority of the United States government. It is recommended the procedures outlined in the guide be followed when operating the NoNic™ Benchtop and the user contact local and state authorities to determine if any additional regulations may apply.

ANSI Z136.1-2000 may be ordered from:

**Laser Institute of America (LIA)**

13501 Ingenuity Drive  
Suite 128, Orlando, FL 32826-3009

**Telephone:** 407-380-1553

**Fax:** 407-380-5588

[www.ANSI.org](http://www.ANSI.org)

# Performance Requirements

21 CFR specifies certain performance requirements (features) that must be incorporated into or provided with each laser product for radiation safety purposes. These features with an explanation of their function in the NoNic™ Benchtop are described in the following sections.

## 1. Protective Housing

**The laser radiation emitted by a Class IV laser product must be contained within a protective housing at all points where access to radiation is not required during normal operation of the product in the performance of the function for which it was designed. [21 CFR 1040(f)(1)].**

The NoNic™ Benchtop is enclosed within a custom built Class I workstation designed to eliminate all radiation leaks and to comply with all current CDRH standards.

## 2. Safety Interlocks

**Any part of the protective housing that must be opened, removed or displaced during normal operation of the laser must be interlocked to prevent access to laser radiation. [21 CFR 1040.10(f)(2)].**

Dual Door Interlocks have been utilized to immediately eliminate any laser process in the event that the laser safe door is opened or ajar. Upon opening the part loading door, two spring-loaded interlocking switches release effectively eliminating all laser processes.

## 3. Beam Attenuator

**A beam attenuator (safety shutter) must be provided to enable the user to terminate lasing without turning off the master keyswitch or main power switch. [21 CFR 1040.10(f)(6)].**

The shutter terminates lasing by blocking the laser beam before it reaches the output optics. The NoNic™ Benchtop has an internal safety shutter that can only be opened by inserting a part into the machine and having the side door closed simultaneously. If either of these two conditions is not met, the safety shutter will continue to block the path of the laser beam.

## 4. Location of Controls

Controls which are necessary for operation of the laser must be located so they can operate without exposure to laser radiation. [21 CFR 1040.10 (f)(7)].



### a) Emergency Stop Switch

Press the Emergency Stop switch in to shut down the laser system.

The Emergency Stop switch turns off power to the laser. The control system remains on.

Turn the switch to the right to release the Emergency Stop switch (following the directional arrows).

### b) Keyswitch / Reset

The Keyswitch acts as a laser On/Off button. Turning the keyswitch clockwise to the ON position Resets and provides power to the laser. Turning the keyswitch counter-clockwise to the OFF position shuts only the laser down (not the computer / software).

## WARNING

Always exercise caution when using the laser with either the shutter in the On or Off positions at all times. The beam may still be active.

### c) Laser Controller

The Laser Controller is built in to the NoNic™ Benchtop laser system.

### d) Foot Switch / Pedal

Pressing the Foot Switch sends a Start Lase signal to the NoNic™ Benchtop laser system.

## 5. Labeling

Labels must be affixed to each laser to identify the manufacturer, certify compliance with 21 CFR, provide warnings to the user about the wavelength, level, and location of accessible laser radiation present, and give precautions that should be taken to avoid exposure to the laser radiation. [21 CFR 1040.10(g)].

Labels have been affixed to the NoNic™ Benchtop laser system in compliance with this requirement. Please note that all doors, panels, and the laser head have all been properly labeled with appropriate laser radiation warnings and cautions. See Figure 1-1, for pictures of all machine labels being used in accordance.

**NOTE:** Dates and Serial Number information on the Manufacturing Tag are only for image reference purposes, they **DO NOT** reflect the actual laser system being purchased. We include the following safety labels on our NoNic™ Benchtop laser product:



Figure 1-1 – NoNic™ Benchtop Laser Safety Labels  
(NOTE: Manufacturing Tag is not representative of customer's machine, REFERENCE IMAGE ONLY)

## 6. Documentation

**Instructions must be provided that will enable the user to safely operate and maintain the laser. [21 CFR 1040.10(h)].**

It is recommended that the supplied manuals be thoroughly studied by all personnel who have any responsibility for the laser prior to operation. The Operations manual gives instructions for proper operation and maintenance of the NoNic™ Benchtop. The manual also provides warnings and cautions that must be observed by the user to prevent unnecessary exposure to laser radiation.

## Classification of Laser Functions

Laser products are classified according to the maximum level of laser radiation within human access during operation only. Levels accessible only during maintenance or service do not affect the classification. Therefore, it is possible for class I or class II products to contain class IV lasers. It is the responsibility of the manufacturer to determine whether specific functions are operation, maintenance, or service. The following definitions apply:

**Operation** - Consists of functions by which the product accomplishes its intended purpose. These may include loading work pieces or documents and setting and manipulating external controls.

**Maintenance** - Consists of functions performed by the user to assure performance. These may include cleaning and replacement of expendables.

**Service** - Usually means repair. Service may be performed by specially trained service personnel or by sophisticated users following instructions specifically indicated as service instructions. Certain maintenance procedures will be considered service if they are infrequent, complex, or highly specialized.

The following chart lists the functions of operation, maintenance, and service associated with the NoNic™ Benchtop laser system described in this manual.

### WARNING

All personnel in the vicinity of the laser while it is in operation must follow all prescribed safety procedures and use appropriate safety equipment. This includes wearing laser eyewear with an optical density (OD) as recommended on page 6. Failure to follow these instructions may result in the exposure of personnel to hazardous laser radiation.



FUNCTION	CLASSIFICATION	REQUIRES LASING
Operation of Laser Controls	Operation	Yes
Cleaning Optics	Maintenance	No
Replacements of Electrical Assemblies & Components	Service	No
Replacement of Mechanical Components	Service	No
Troubleshooting & Repair	Service	See Note
Testing Following Repair	Service	See Note
Optical Alignment/Adjustment	Service	No
Programming	Service	No
Connections to Remote Interlock Connector	Service	No
Setup/Fixture Alignment	Service	No
Testing Marking (following repair, programming, setup)	Service	Yes

**NOTE:** Some troubleshooting and testing functions will not require the laser to be lasing.

## Electrical Safety

1. Disconnect main power line(s) before working on any electrical equipment if it is not necessary for the equipment to be operating.
2. After disconnecting power, wait at least five minutes for the capacitors to discharge through the bleeder resistors before touching any electrical equipment.
3. Do not short or ground the power supply output. The power supply is not electrically isolated from the power line. Protection against possible hazards requires proper connection of the ground terminal on the power cable and an adequate external ground. Check these connections at the time of installation and periodically thereafter.
4. Never work on electrical equipment unless there is another person nearby who is knowledgeable of the operation and hazards of the equipment and who is competent to administer first aid.
5. When possible, keep one hand away from the equipment to reduce the danger of current flowing through the body.
6. Special measurement techniques are required for this system. Ground references must be selected by a technician who has a complete understanding of the system operation and associated electronics.

## Use of Combustible Material

### **WARNING**

A fire or explosion could occur if the laser beam is allowed to contact flammable or combustible materials. Care must be taken to ensure that such materials are kept away from any part of the laser beam path.

# Laser Hazards

There are some highly dangerous laser hazards that should be considered when operating a laser. The collimated beam direct from the laser head or a mirror (without any focusing optics) contains sufficient heat energy to damage eyes, skin, or flammable materials for a considerable distance (possibly hundreds of feet or more) from the source. The focused beam contains much higher power density for marking, cutting or welding, but it is present only in a localized area near the beam focus. Past the focus, the beam pattern expands significantly, and there is a distance beyond which the power spreads over an area that is so large that the laser beam is no longer hazardous.

## Eye Injury

Because of the high degree of beam collimation, a laser serves as an almost ideal point source of intense light. A laser beam of sufficient power can theoretically produce retinal intensities at magnitudes that are greater than conventional light sources, and even larger than those produced when directly viewing the sun. Permanent blindness can be the result.

## Thermal Injury

The most common cause of laser-induced tissue damage is thermal in nature, where the tissue proteins are denatured due to the temperature rise following absorption of laser energy.

The thermal damage process (burns) is generally associated with lasers operating at exposure times greater than 10 microseconds and in the wavelength region from the near ultraviolet to the far infrared (0.315  $\mu\text{m}$ -103  $\mu\text{m}$ ). Tissue damage may also be caused by thermally induced acoustic waves following exposures to sub-microsecond laser exposures.

With regard to repetitively pulsed or scanning lasers, the major mechanism involved in laser-induced biological damage is a thermal process wherein the effects of the pulses are additive. The principal thermal effects of laser exposure depend upon the following factors:

1. The absorption and scattering coefficients of the tissues at the laser wavelength
2. Irradiance or radiant exposure of the laser beam.
3. Duration of the exposure and pulse repetition characteristics, where applicable.
4. Extent of the local vascular flow.
5. Size of the area irradiated.

## Toxic Injury

Fumes generated from cutting some plastics and other materials can be highly toxic. Any materials being processed should be evaluated to determine what fume collection and filtering is needed to ensure that the Threshold Limit Values (TLVs) for the byproducts are not exceeded.



# Installation 2

## Receipt and Inspection

The NoNic™ Benchtop laser system is thoroughly inspected and carefully packed before leaving the Control Laser Corporation (CLC) factory. The carrier assumes responsibility for the unit's safe delivery. Any claims for loss or damage sustained in transit must be made against the carrier. Carefully inspect the shipment upon receipt prior to signing for the delivery.

Ensure the container is in an upright position as marked by the container labels.

Check the shock and tilt indicators on the system. If one or more indicators are red inspect the system for damage. Contact the carrier immediately.

Any damage, loss, or discrepancies discovered during unpacking should be reported to the carrier immediately. Not immediately reporting damage or discrepancies of the shipment could result in the carrier refusing to honor a claim. All claims should be confirmed in writing as required by the carrier. For claim purposes, it is recommended all packing material be retained.

### **WARNING**

A fire or explosion could occur if the laser beam is allowed to contact flammable or combustible materials. Care must be taken to ensure that such materials are kept away from any part of the laser beam path.

## Unpacking

1. Ensure the shipping containers are in the upright position as labeled.
2. Cut and remove any bands or straps from the container.
3. Carefully remove any packing material from the equipment.
4. Check the packing list against the equipment received. Report any discrepancies to both the carrier and CLC Field Service department (407-926-3562).
5. Ensure all packing lists, manuals, drawings, and accessory packages are removed from the packing material before it is stored. It is recommended to retain all packing materials.
6. In the unlikely event the laser must be returned, pack the laser or parts in a suitable container for shipping. CLC is not responsible for any damage on returned laser or parts.

**NOTE:** The temperature where the laser is installed should not be less than 33°F (1°C) or greater than 93°F (33°C), non-condensing humidity.

## Space and Environmental Requirements

The NoNic™ Benchtop should be installed in an area as free as possible from the following:

1. Contaminants such as dust and oil mist.
2. Combustible and flammable materials such as explosive fumes and gases.
3. Corrosives such as acid vapors.
4. The system should not be subjected to high energy level radio frequency emissions such as a two-way radio or broadcasting equipment.

### WARNING

The infrared laser emissions might interfere with the infrared sensors of nearby equipment.

5. The floor or foundation where the laser is installed must be level and firm. It must not be subjected to vibration or shock.

**NOTE:** The temperature where the laser is installed should not be less than 33°F (1°C) or greater than 93°F (33°C), non-condensing humidity.

**IMPORTANT:**

Do not turn on the laser if there is any condensation on the output casing of either the laser head or the control unit. Remove the condensation with clean warm air.

Never place the unit in a location where excessive heat, moisture, or corrosive materials are present.

If the system is moved into the working location from a cold environment, leave the system for a few hours to warm up before installing it.

## Electrical Requirements and Connections

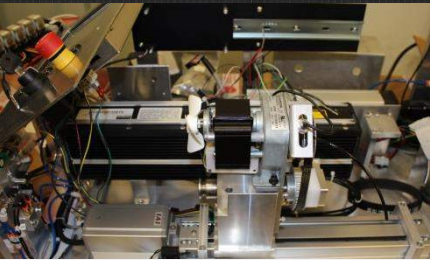
All NoNic™ Benchtop laser systems use a standard 115 VAC (+6%, -10%), 50/60 Hz electrical plug connection or an optional 230 VAC (+6%, -10%), (50/60 Hz). Also refer to the electrical data tag on the system control unit cabinet to verify the input power requirements.

## Moving and Storage

Confirm the system's power requirements can be met if moving the NoNic™ Benchtop from the original installation site. Check the environmental requirements outlined on [page #21](#), Space and Environmental Requirements.

During moving, do not subject the laser system to vibration, excessive cold or excessive heat.

The NoNic™ Benchtop can be stored for up to 5 years. The temperature of the storage area must be between 14°F to 140°F (-10°C to 60°C).



# System Function 3

## Laser Basics

*Laser* is an acronym for Light Amplification by Stimulated Emission of Radiation. Simply stated, the laser is a light amplifier.

Lasers amplify light by absorbing and emitting energy. Absorption can be either electronic on the atomic level or rotational/vibrational on the molecular level. The emitted energy is a high-intensity beam of laser light.

Lasers emit optical radiation which can be either invisible (infrared) or visible (laser pointer diode) light. Optical radiation is referred to as non-ionizing to distinguish it from ionizing radiation which is the type of radiation associated with X-rays and gamma rays. While overexposure to ionizing radiation such as frequent medical X-rays may cause health problems, the non-ionizing radiation emitted by lasers do not pose similar health risks even with frequent and long-term non-direct exposure.

Direct exposure to optical radiation can, however, pose serious health hazards to the skin and eyes. Lethal electrical hazards may also be present in all lasers. A laser-induced reaction on certain types of marking materials can release hazardous particles and gaseous products.

Review Chapter 1, Safety, for instructions on how to avoid eye, skin injuries and electrical hazards. Never operate or service the NoNic™ Benchtop laser system without following the safety procedures specified in the safety chapter of this manual.



## System Startup Procedure

Please observe the following guidelines for starting up the NoNic™ Benchtop:

1. Plug in the Laser System to a supplied Power Outlet.
2. Make sure the Red Emergency Stop Button is fully released (pulled-out).
3. On the back of the machine, turn the Main Breaker Switch to the ON position.
4. Insert the key into the keyswitch and turn clockwise to the ON position. This will initialize the laser and automatically home the system and startup the NoNic™ Benchtop laser software. Once the system has finished homing, the yellow light on the front panel will turn ON and the laser is ready for processing.

## System Shutdown Procedure

Please observe the following guidelines for shutting the laser system down:

1. Remove all processing materials [wires] from the machine.
2. Turn the Laser Keyswitch counter-clockwise to the OFF position and remove the Key (if necessary).
3. Press the Exit Button on the touchscreen to shut down the software and computer.
4. On the back of the machine, turn the Main Breaker Switch to the OFF position.
5. Now the Laser is Powered Down properly.

**NOTE:** The software only powers down after manually exiting through the touchscreen interface. The actual laser turns off (no beam delivery) once the keyswitch is in the OFF position.

## Emergency Shutdown Procedure

At any time, the laser and workstation can be manually shut down in the event of an emergency:

1. **Press the Red Emergency Stop button** on the front of the laser system. This immediately shuts down power to the laser (no beam delivery).

To release the Emergency Stop button, turn the switch to the right (following the directional arrows) and pull the switch out (towards you).





# Laser Operation 4

## Introduction

The NoNic™ Benchtop laser software is a unique windows based application designed around an easy-to-use touchscreen Graphical User Interface (GUI). It allows the users to create wire stripping and slitting recipes for processing wire stripping applications. The graphical programming environment was built around simplicity and only requires a user to enter some simple parameters in order to process wire jobs successfully. By utilizing this unique system and interface, it ensures that our process can be handled with extreme precision and is repeatable.

## Front Panel Layout

The front panel of the machine houses the touchscreen display interface, red emergency stop button, keyswitch, and status indicator lights. Please observe the status indicators and touchscreen display closely for system faults and warnings that can affect wire processing.



### **STATUS INDICATORS**

**Yellow Light (Laser Ready)** – Laser Beam Enabled and Ready, System Homed.

**Red Light (Laser On)** – Laser Processing is Active. Wait for light to shut off before removing part.

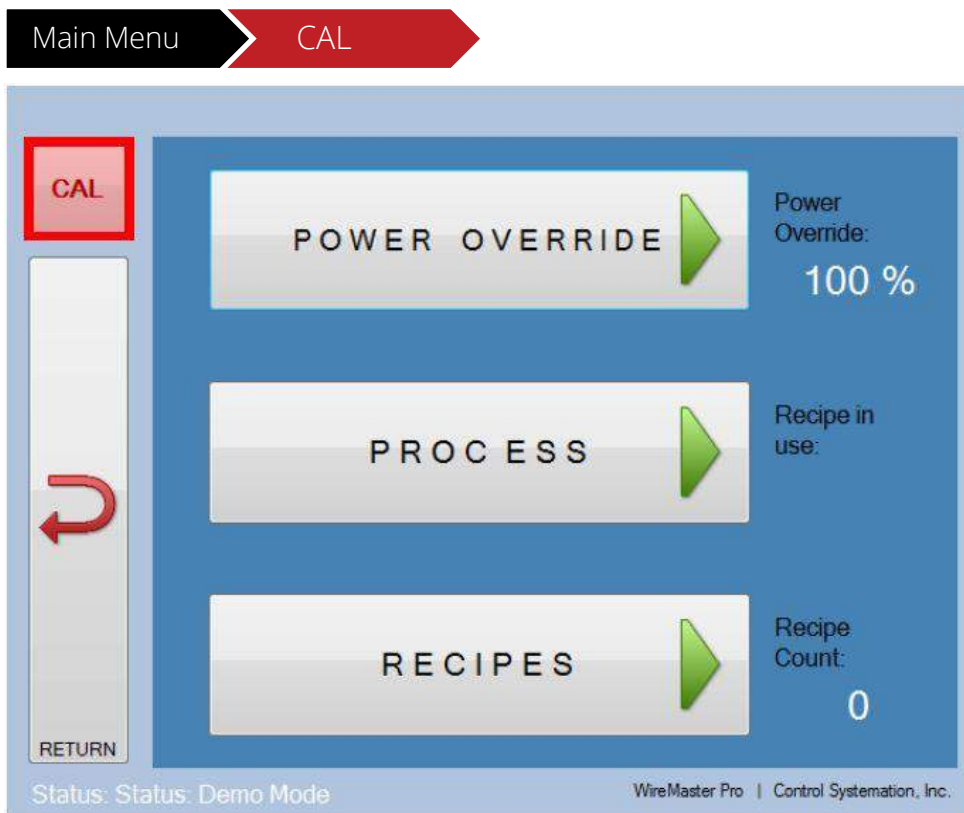
**Green Light (Part Present)** – Part Present and Inserted.

# System Calibration

The NoNic™ Benchtop laser system will need to be calibrated before starting to process any wire applications. The calibration is necessary to ensure that accurate processing will apply to all wire recipes. The lengths and process parameters may be thrown off if this calibration is not performed before lasing begins.

**NOTE:** Calibration should be performed any time it is suspected that there is an error. Routinely the machine should be calibrated once a week.

1. From the front screen press in order:



2. A password screen will be prompted, Enter CSI123 as the password to continue.

3. You'll be prompted to insert the 1.25" calibration rod (provided) and set the internal rotary slider adjustment until it stops against the rod at 1.25". Once set, press **Next** on the screen to proceed.



### Step 1

Move target to 1.25" position.

Next

Cancel

- You'll now be prompted to insert the 6" calibration rod (provided) and set the internal rotary slider adjustment until it stops against the rod at 6". Once set, press **Save** on the screen.



### Step 2

Move target to 6.0" position.

Save

Cancel

- At the Values Saved Dialog, press **OK** on the screen to finalize the settings. You are now finished performing system calibration and can now begin accurate wire processing.

### Values Saved

Calibration Complete

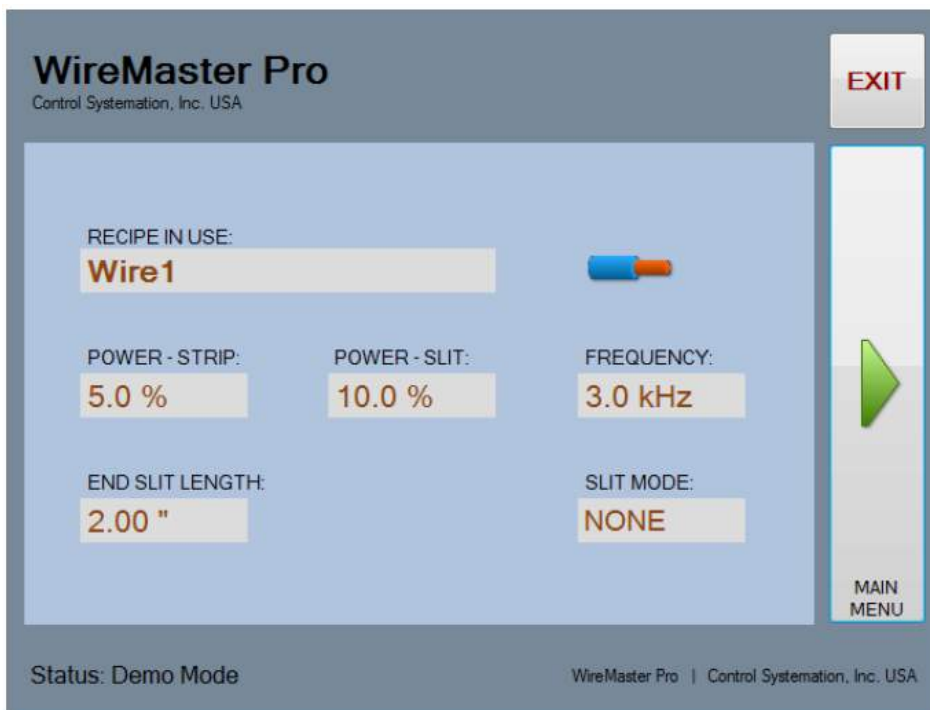
OK

## Understanding Recipes

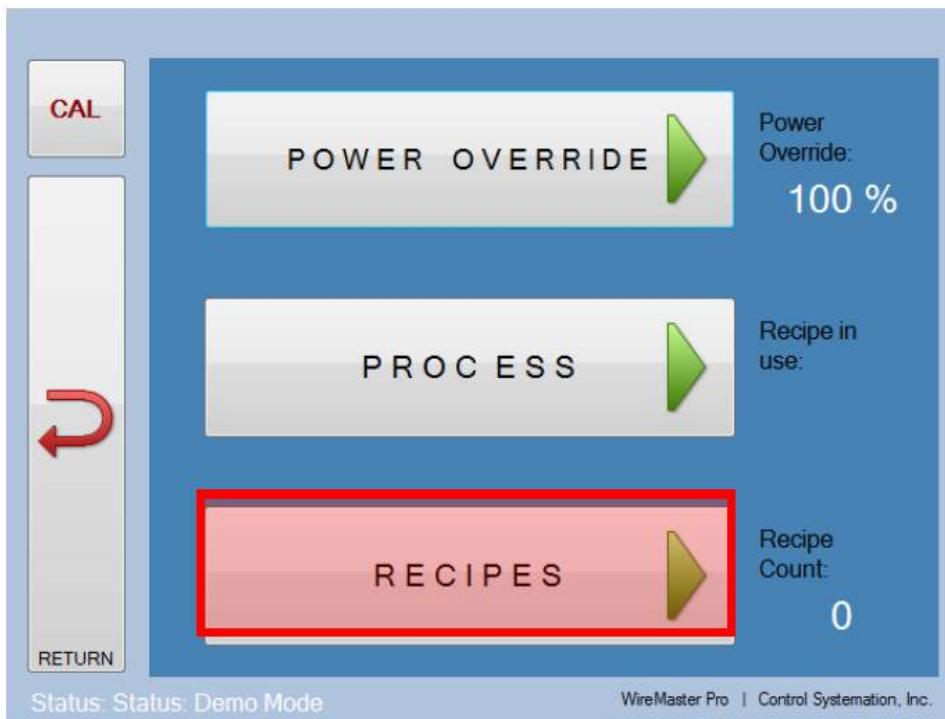
Before an operator can process any jobs, recipes **MUST** be created first for each type of wire. A recipe is a set of parameters designed to process an application to its desired specification. Recipes consist of laser power levels, frequency, processing speeds, and part specific strip/slit parameters. Each recipe can be saved and given a unique recipe name for reference. This allows the user to call up a saved recipe at any time depending on which wire is being processed. A new recipe should be created for each and every unique wire type to be processed.

## Creating a Recipe

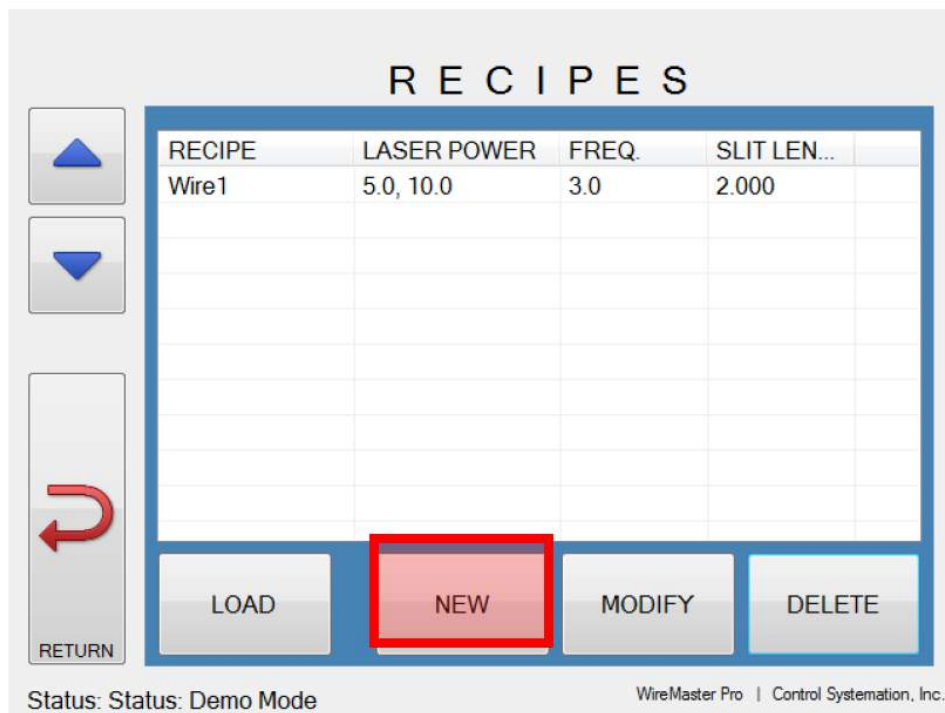
1. In the NoNic™ Benchtop software front screen, **press the Main Menu button.**



- Next, Press the Recipes Button to enter the recipe list.



- Press the NEW button to start creating a new recipe.





ADD NEW RECIPE

STRIP & SLIT: END ONLY SLIT MODE: NONE

FOR STRIPPING

LASER POWER: 25.0 %

LASER FREQUENCY: 10.0 kHz

SPIN START/STOP: 150 millisecc 150 millisecc

SPEED: 3.0 rev/sec

STRIP PASSES: 15

SAVE CANCEL NEXT

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Add New Recipe Benchtop 1 – Page 1

ADD NEW RECIPE

STRIP PASSES: 10

FOR STRIPPING FOR SLITTING

SPEED: 1.0 rev/sec 2.0 in/sec

SPIN START/STOP: 1200 millisecc 1200 millisecc

START DWELL STOP DWELL

SLIT BEAM DELAY: 300 millisecc

DISPLAY OFFSET: 0.000 inches

SAVE CANCEL PREV

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Add New Recipe Benchtop 1 – Page 2

## Stripping - Benchtop 1 Model

The values at the recipe creation screen (pictured above) coincide with the *Benchtop 1 Model* of the NoNic™. Values need to be entered for the following parameters in order to process an application properly.

**STRIP & SLIT:** END ONLY – Strips a defined end section of the wire.

**SLIT MODE:** NONE

**LASER POWER** - Enter the amount of lasing power from (range 1% - 99%). Power values can be entered for desired STRIPPING processing effect.

**LASER FREQUENCY** – Enter the laser frequency (range 5 – 20 kHz, typically 10)

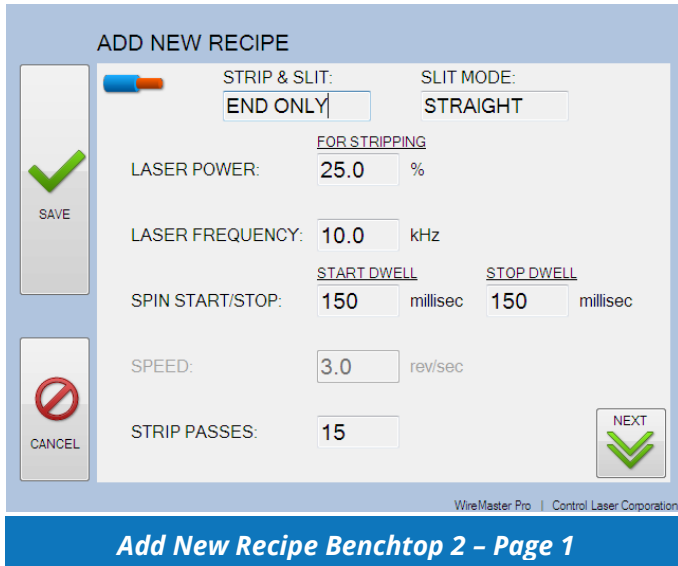
**SPIN START/STOP** – The time adjustment between the motor spinning and when the lasing begins/ends.

**STRIP PASSES** – The number of rotations the internal rotary turns to strip the wire.

**SPEED (Stripping)** – Stripping speed is set at 3.0 revolutions per second and cannot change.

**SLIT BEAM DELAY** – Not Available in this model.

**DISPLAY OFFSET** – Not Available in this model.



## Slitting - Benchtop 2 Model

The values at the recipe creation screen (pictured above) coincide with the *Benchtop 2 Model* of the NoNic™. Values need to be entered for the following parameters in order to process an application properly.

**STRIP & SLIT: END ONLY** – Strips a defined end section of the wire.

**SLIT MODE:**

NONE – Strips a defined end section of the wire without slitting.

STRAIGHT – A straight slit from the origin of the cut to the end of the wire

SPIRAL – A spiraling slit from the origin of the cut to the end of the wire

**LASER POWER - Enter the amount of lasing power from (range 1% - 99%).** Power values can be entered for desired SLITTING processing effect.

**LASER FREQUENCY** – Enter the laser frequency (range 5 – 20 kHz, typically 10)

**SPIN START/STOP** – The time adjustment between the motor spinning and when the lasing begins/ends.

**SPEED (Slitting)** – The speed at which the slide moves.

**SLIT BEAM DELAY** – The time adjustment when the stripping completes and slitting begins.

**END SLIT LENGTH** – Length of slit

**MID SLIT LENGTH** – Not Available in this model.

**GAP** – Not Available in this model.

- After all the necessary parameters have been entered, save the recipe by pressing the **Save** button on the left of the touchscreen.

### ADD NEW RECIPE

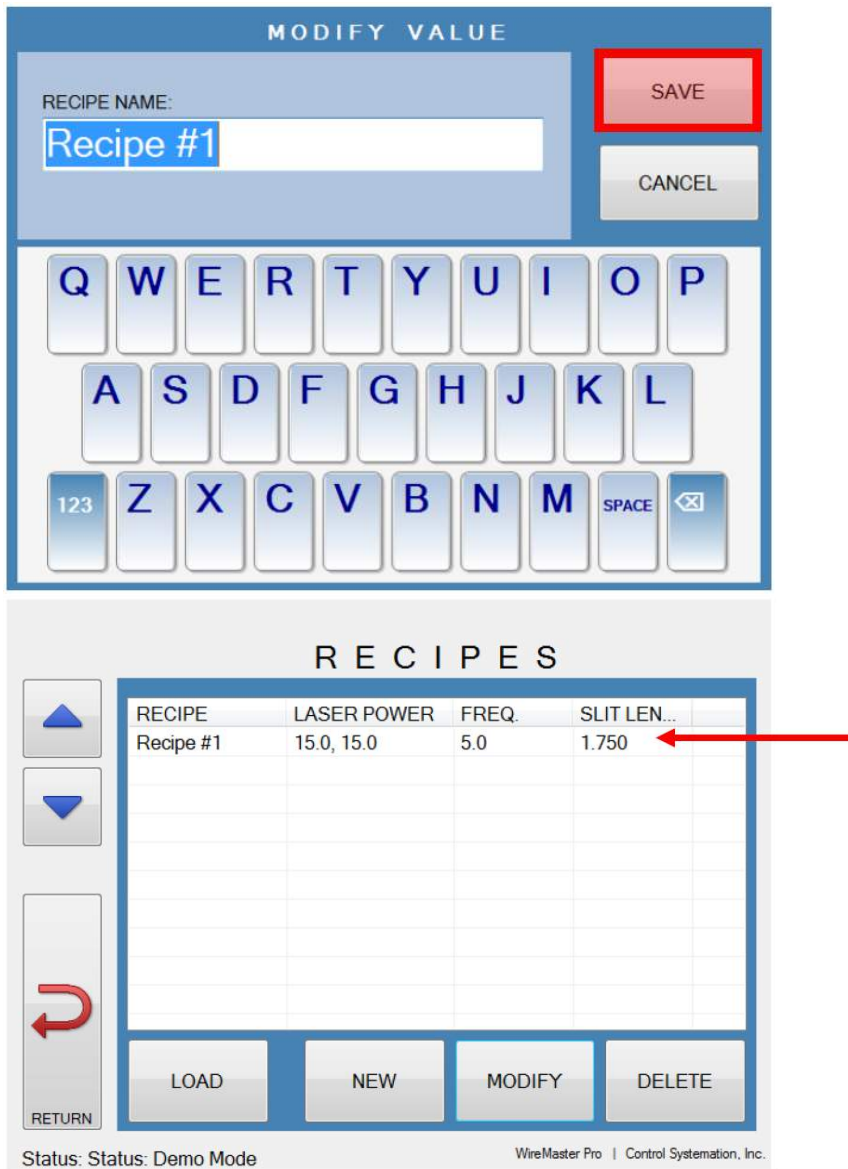
  
 SAVE

STRIP PASSES:	<input type="text" value="10"/>				 PREV.
SPEED:	<u>FOR STRIPPING</u>		<u>FOR SLITTING</u>		
	<input type="text" value="1.0"/> rev/sec	<input type="text" value="2.0"/> in/sec			
SPIN START/STOP:	<u>START DWELL</u>		<u>STOP DWELL</u>		
	<input type="text" value="1200"/> millise	<input type="text" value="1200"/> millise			
SLIT BEAM DELAY:	<input type="text" value="300"/> millise				
DISPLAY OFFSET:	<input type="text" value="0.000"/> inches				

  
 CANCEL

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5. Enter a name (MAXIMUM 8 CHARACTERS) by typing on the touchscreen and pressing **Save** after you are finished. Name your recipes carefully; you may be switching wire types often. These names should be easy to call upon when changing over from one wire to another (especially once you get a large list of recipes to keep organized).



6. Congratulations, you have now created your first recipe. Continue to create recipes for each individual wire type you intent to process with the NoNic™ Benchtop laser system. The recipe list will continue to populate as you add more recipes.

## Modify a Recipe

It may take multiple attempts to get a recipe just right. Some trial and error is necessary to establish accurate process parameters for each wire type. Therefore, we allow you to modify a recipe and make adjustments until it processes your wire correctly. To modify a recipe, follow the steps below.

1. First navigate to the recipe list screen to choose the recipe you wish to modify. Follow the touchscreen prompts (in order) to modify a recipe.

**From the front screen press in order:**

The diagram shows a sequence of four steps in arrow-shaped boxes: 'Main Menu' (black), 'Recipes' (blue), 'Choose your recipe from the list' (blue), and 'Modify' (red).

**R E C I P E S**

RECIPE	LASER POWER	FREQ.	SLIT LEN...
Recipe #1	15.0, 15.0	5.0	1.750
Recipe #2	25.0, 25.0	10.0	5.000

Navigation icons on the left: Up arrow, Down arrow, and a red curved arrow labeled 'RETURN'.

Buttons at the bottom: LOAD, NEW, **MODIFY** (highlighted with a red box), DELETE.

Status: Status: Demo Mode WireMaster Pro | Control Systemation, Inc.

2. Modify the process parameters, and press Save to update the changes.

**MODIFY RECIPE (Recipe #2)**

STRIP & SLIT: **END ONLY**      SLIT MODE: **NONE**

LASER POWER: **25.0** %      **25.0** %

LASER FREQUENCY: **10.0** kHz

END SLIT LENGTH: **5.00** inches

MID SLIT LENGTH: **0.00** inches

GAP: **0.00** inches

Buttons: SAVE, CANCEL, NEXT

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3. You will be prompted to make changes to the recipe name if you wish. It is not necessary to change the name of the recipe – it is your choice. Press Save once you are finished.

**MODIFY VALUE**

RECIPE NAME: **Recipe #2**

Buttons: SAVE, CANCEL

Virtual Keyboard: Q, W, E, R, T, Y, U, I, O, P; A, S, D, F, G, H, J, K, L; 123, Z, X, C, V, B, N, M, SPACE, [Enter]

- Now you have completed the recipe modification and may continue testing to see if your changes have improved your process.

## Delete a Recipe

Sometimes you may wish to delete a recipe completely from the recipe list. In order to delete a recipe, follow the steps below.

- First navigate to the recipe list screen to choose the recipe you wish to delete. Follow the touchscreen prompts (in order) to delete a recipe.

**From the front screen press in order:**

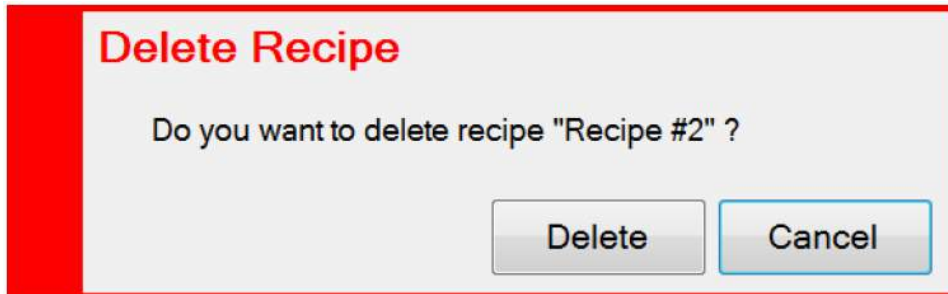
Main Menu → Recipes → Choose your recipe from the list → Delete

The screenshot shows the 'RECIPES' screen with a table of recipes. The 'DELETE' button is highlighted with a red box. The table has the following data:

RECIPE	LASER POWER	FREQ.	SLIT LEN...
Recipe #1	15.0, 15.0	5.0	1.750
Recipe #2	25.0, 25.0	10.0	5.000

At the bottom of the screen, there are buttons for 'LOAD', 'NEW', 'MODIFY', and 'DELETE'. The 'DELETE' button is highlighted with a red box. The status bar at the bottom shows 'Status: Status: Demo Mode' and 'WireMaster Pro | Control Systemation, Inc.'

2. As a precaution, we prompt you one final time before allowing you to delete your recipe. Press the Delete button if you wish to proceed with the recipe deletion. You will not be able to recover this recipe, once you press Delete.





## Processing Wires

The physical processing of wires is actually very simple once we have created the proper recipes for each part. There may be some trial and error at first in order to get the recipe perfected.

1. We will first load the recipe that will be used for the selected wire to process. Follow the touchscreen prompts (in order) to load your recipe shown below.

**From the front screen press in order:**

Main Menu > Recipes > Choose your recipe from the list > Load

RECIPE	LASER POWER	FREQ.	SLIT LEN...
Recipe #1	15.0, 15.0	5.0	1.750
Recipe #2	25.0, 25.0	10.0	5.000

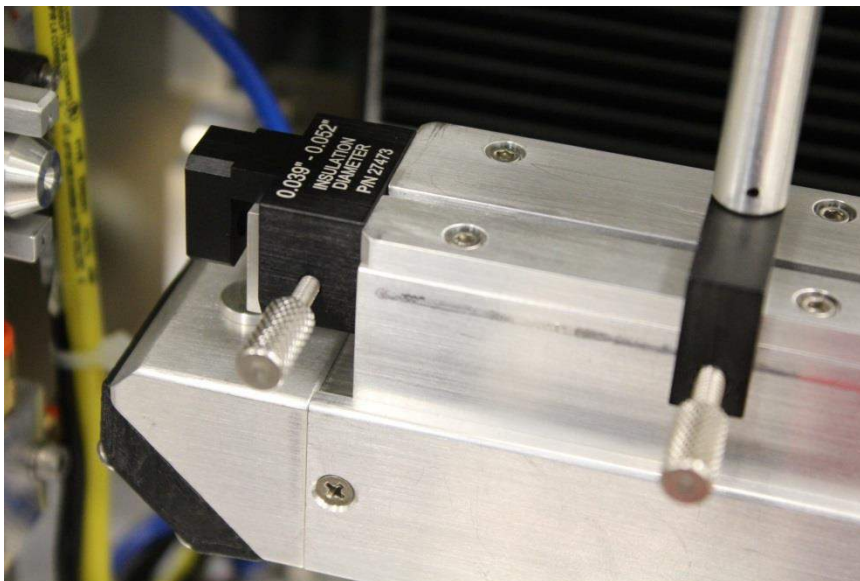
LOAD NEW MODIFY DELETE

Status: Status: Demo Mode WireMaster Pro | Control Systemation, Inc.

Once the recipe is loaded, the front screen will change to display your chosen recipe and parameters (see image below).



2. Select and install the correct sized wire guide adapter or "needle" into the NoNic™ Benchtop laser system (ex. 0.185" diameter wire should use the 0.160" – 0.200" needle). Make sure and tighten it down so it is locked into place securely.



- Adjust the wire stop to the desired depth indicated by the LED display.



- Select and insert the correct sized wire guide into the insertion hole on the left side panel of the laser system. The wire guide is determined by the diameter of the wire to be processed (ex. 0.141" diameter wire should use the 0.136" – 0.148" wire guide).



*Larger wire guides up to 0.200" in diameter available*



5. Once the selected wire guide is in place, we can now insert the wire through the smaller hole in the wire guide.
6. Now, pull the wire into the machine through the wire guide and insert it through the needle attached to the machine. Once the wire is through the attached needle, pull it all the way down to the desired stripping length and tighten it to the end piece.
7. When everything is securely in place, press the front button to begin the lasing process. Let the wire finish processing completely before removing. Remove the wire in exactly the reverse order that you loaded it.
8. Finally, check the part to ensure that the process worked successfully. Continue following the same steps to process more wires. Make sure to create/load a new recipe and change over any wire guides/needles to accommodate every new wire type you wish to process.

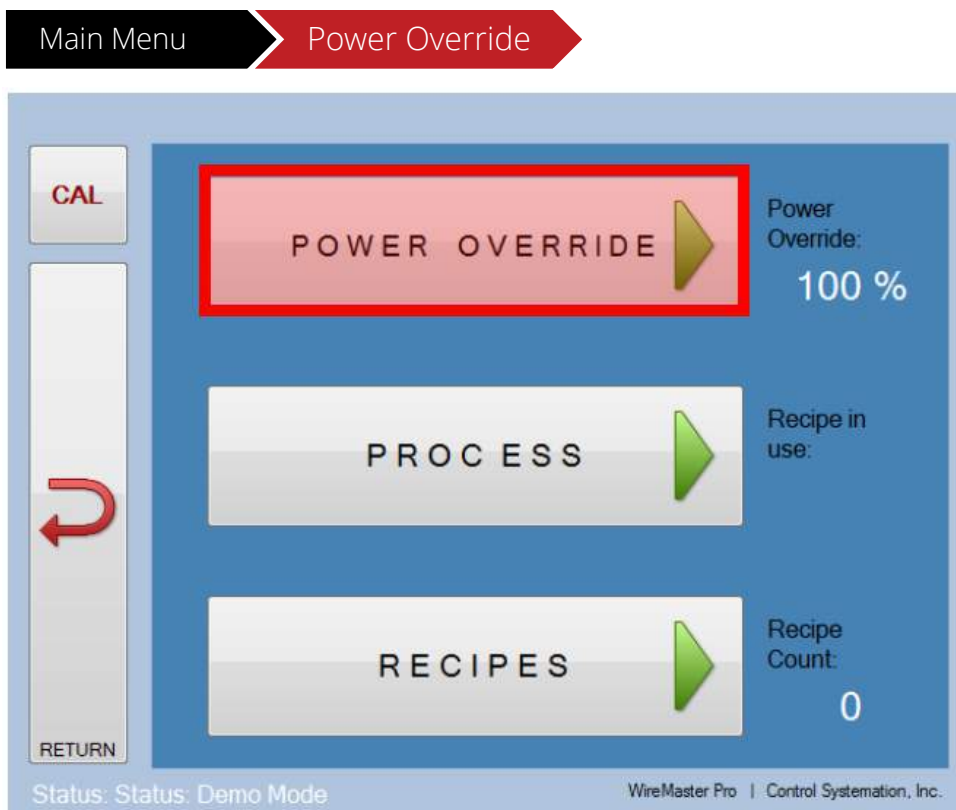


## Power Override

There may be a need over time to manually override the laser output power percentage. This can account for laser degradation over time or to equalize the power once you notice some recipes are not processing as expected. We allow for a global override adjustment so the user doesn't have to modify each recipe individually. This could become very tedious depending on the number of recipes created. One single change of the laser output power can quickly fix the quality of the process without having to make excessive changes to many different recipes all at once.

1. Follow the touchscreen prompts (in order) to adjust the power override.

**From the front screen press in order:**



2. Change the Power Override percentage to the value you wish to use. It may take multiple trials in order to get the power levels adjusted correctly. Save your changes to update the system.

The image shows a software interface titled "MODIFY VALUE". It features a text input field labeled "POWER OVERRIDE (%)" containing the number "115". To the right of the input field are two arrow buttons for increasing and decreasing the value. Further right are "SAVE" and "CANCEL" buttons. Below the input field is a numeric keypad with buttons for digits 0-9, a decimal point, a backspace key, and an "ABC" key.

**NOTE:** Exercise caution when making changes to the Power Override feature. It should only be adjusted if absolutely necessary.

## WARNING

Be careful not to over adjust the Power Override as it could make the laser unstable and could potentially be dangerous.

## Process Button

The process button allows the user to see the details and process parameters of the current loaded recipe. After pressing the button, the user will be taken to the recipe parameters screen. You can modify and make changes to the current recipe and Save your changes, if necessary.

