

General Manual

Vereo™ Fiber Laser Marker



Copyright © 2014 TYKMA™ Inc. All rights reserved.

This document contains information covered by copyright.

Any information contained in this manual may be subject to change without prior notice. All product or program names mentioned in this document are registered trademarks owned by the respective companies. Windows™, Windows™XP and Windows™ 7 are trademarks of the Microsoft Corporation. They are only used in this document for editorial purposes.

All information and contents in this document are property of TYKMA Inc. and cannot be shown, distributed, modified and/or reproduced through electronic, mechanical or any other way, without written consent from TYKMA Inc.

Published: June, 2014

TYKMA Technologies
P.O. Box 917
931 E Water Street
Chillicothe, OH 45601
Toll Free: 877-318-9562
Fax: 740-779-9910
www.permanentmarking.com

Contents

	Page
1) Contents _____	3
2) Technical Specifications _____	4
3) Laser Safety _____	5
4) Introduction _____	14
5) Machine Overview _____	15
6) System Setup _____	16
7) Touch Screen Interface _____	19
8) System Operation _____	21
9) Maintenance _____	31

Technical Specifications

Your VERO™ Laser Marker is available in different laser models, options, and accessories depending on marking application and customer specifications. Please reference your Sales Order for system details.

VEREO™ Laser Marker

- * Class 4 Laser Mode Operation
- * Integrated Focus Finder
- * External Axis Control
- * Touchscreen Display for Machine Control and Laser Setup
- * One-plug 110/220VAC Operation
- * Laser programming software included
- * Air-Cooling
- * Total System Weight - 60 Lbs

--Laser Specifications:

- * Laser Source - Solid State Fiber
- * Wavelength 1060-1080nm
- * Average Power 10, 20, or 30W(+/- 10%) Depending on Model
- * Frequency Range 1-200K (10-20W), 1-1000K (30W)
- * Red Pointing laser, wavelength 635 nm, Class 2M
- * Focusing lense: FL 160mm (Optional FL100, 254S, and 254L)
- * Marking field: 100 mm x 100 mm with FL160

Laser Safety

The VERO™ is a Class 4 laser marking system designed, developed, and manufactured in accordance with EC directives, DIN EN 60825-1, ANSI Z136.1, and Complies with FDA Performance Standards for Laser Products.

Class I laser systems are completely safe for operators to use under normal working conditions. However, it may be possible during machine maintenance or physical modification to be exposed to direct and/or scattered laser radiation. The following section describes laser basics and potential safety hazards they may produce in these unlikely circumstances.

The word laser is an acronym for Light Amplification by Stimulated Emission of Radiation. In this document, the word laser will be limited to electromagnetic radiation-emitting devices using light amplification by stimulated emission of radiation at wavelengths from 180 nanometers to 1 millimeter. The electromagnetic spectrum includes energy ranging from gamma rays to electricity. Figure 1 illustrates the total electromagnetic spectrum and wavelengths of the various regions.

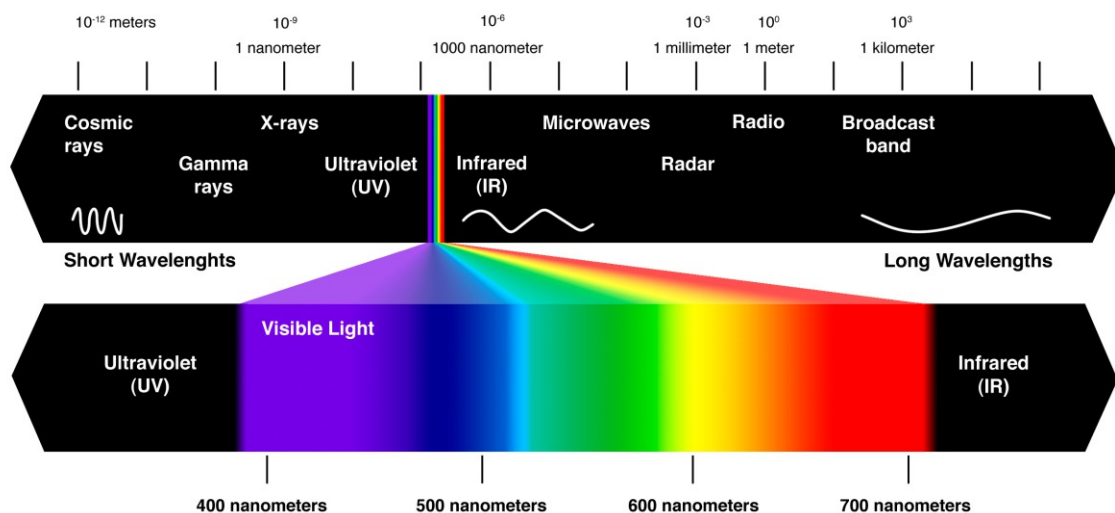


Figure 1. Electromagnetic Spectrum

The primary wavelengths for lasers include the ultraviolet, visible and infrared regions of the spectrum. Ultraviolet radiation for lasers consists of wavelengths between 180 and 400 nanometers (nm). The visible region consists of radiation with wavelengths between 400 and 700 nm. This is the portion we call visible light. The infrared region of the spectrum consists of radiation with wavelengths between 700 nm and 1 mm.

The color or wavelength of light being emitted depends on the type of lasing material being used. For example, if a Neodymium:Yttrium Aluminum Garnet (Nd:YAG) crystal is used as the lasing material, light with a wavelength of 1064 nm will be emitted. Table 1 illustrates various types of material currently used for lasing and the wavelengths that are emitted by that type of laser. Note that certain materials and gases are capable of emitting more than one wavelength. The wavelength of the light emitted in this case is dependent on the optical configuration of the laser.

While not strictly adopted by OSHA, the ANSI standard, Z136.1-2000, "Safe Use of Lasers", is considered an appropriate guideline for ensuring a safe environment where lasers are present. The ANSI standard requires that companies using Class IV lasers have a designated Laser Safety Officer (LSO). The LSO is one who has authority to monitor and enforce the control of laser hazards. Typically the Industrial Hygiene department or the company Safety Specialist oversees the implementation of laser safety.

Laser Safety

OSHA information concerning laser hazards can be assessed through the following link:

http://www.osha-slc.gov/dts/osta/otm/otm_iii_6.html

Common Laser Hazards

Other than the light that is emitted, lasers generate the same hazards as many other types of equipment. Common hazards are high voltage, compressed gases and intense radio frequency energy. The presence of these hazards depends upon the specific laser technology employed. For example, pulsed CO₂ lasers can generate internal voltages in excess of 25,000 volts and often contain large capacitors capable of delivering over 200 Joules of energy. These lasers have interlocked enclosures, which should not be defeated. When opening the enclosures of these lasers, capacitive discharge procedures should be understood and strictly followed.

Pulsed lasers also typically use a flowing gas design, requiring connection to a cylinder of compressed gas. While most laser gases are very safe, pressurized cylinders can be hazardous and must be properly restrained during use and transportation.

Radio frequency energy can cause severe burns. Only trained personnel should service laser equipment employing RF generators (like sealed CO₂ lasers). Connections carrying RF energy should never be touched during operation.

Often materials being marked give off fumes and gases. Sometimes these gases are noxious or even toxic. Fumes from laser marking should be controlled with an adequate fume extraction system. When in doubt, a chemical analysis of the fumes is suggested to determine if any fume hazards exist.

Light Hazards

Laser systems are typically designed to prevent a beam from directly contacting a person. Risks, therefore, are more a result of unintentional reflected light. Reflected light falls into two categories, diffuse and specular. Diffuse reflections result when reflective surface irregularities scatter light in all directions. Diffuse reflections are typically much safer as the energy is split into many directions.

Specular reflections are mirror-like reflections and can reflect close to 100% of the incident light. Because such a large percentage of the energy can be redirected, specular reflections are more hazardous. Note that as the diameter of the laser beam increases, the ability to cause damage decreases. Laser intensity is measured in power or energy over a measured area (W/cm²). While focused laser beams produce a very small spot size (and very intense energy) at the mark point, they are typically safer than unfocused beams because the laser beam size spreads out much more rapidly as the distance from the mark point increases.

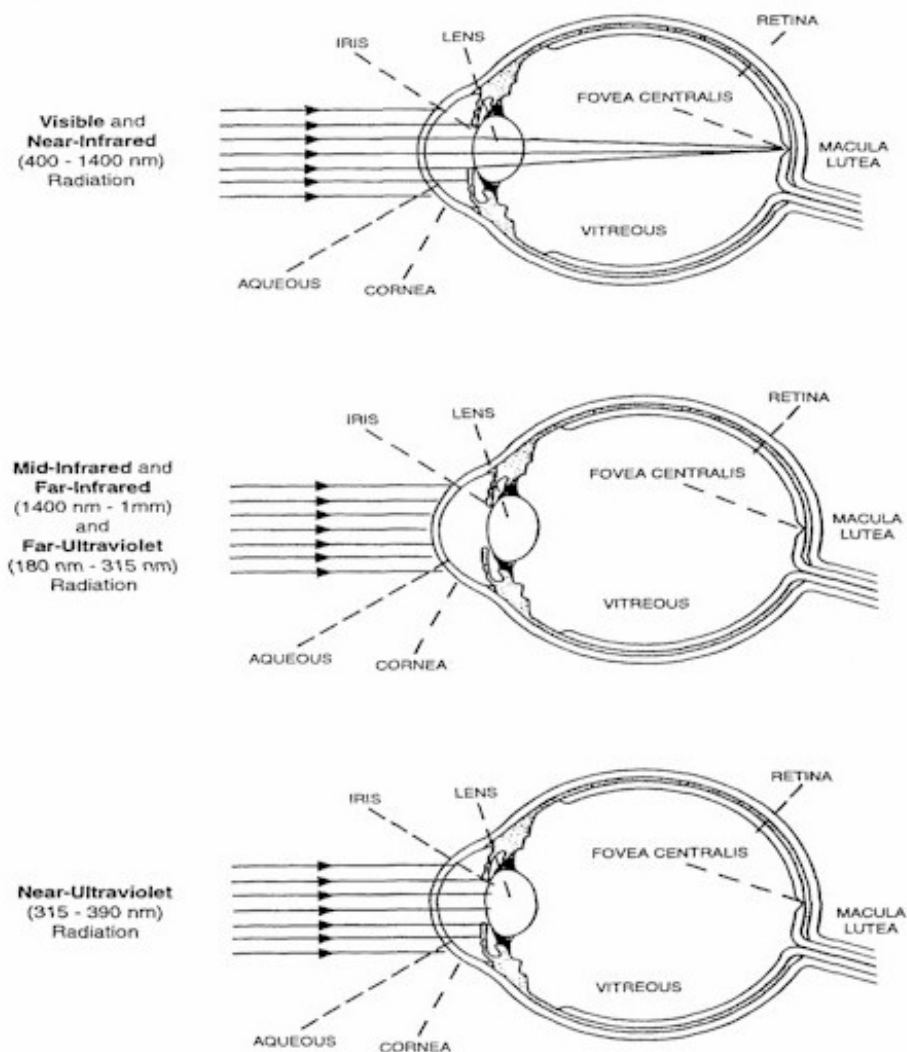
While specular reflections are more hazardous, they are much less common. Most laser marking systems can be designed to eliminate specular reflective surfaces in the beam path.

Laser Safety

Laser Radiation Effects on the Eye - Visible Light and Infrared-A (400-1400 nm)

The marking laser most commonly used in this category is the Q-switched Nd:YAG laser, which operates at a typical wavelength of 1,064 nm. Eye exposure to this laser beam is more hazardous since at this wavelength the laser beam is transmitted through the eye and focused onto the retina. Exposure may initially go undetected because the beam is invisible and the retina lacks pain sensory nerves. Visual disorientation due to retinal damage may not be apparent to the operator until considerable thermal absorption has occurred. Since the energy is concentrated by the eye's lens, the strength of the laser beam that is required to damage the eye is significantly less. Figure 2. shows various laser wavelengths and their effect on the eye.

Figure 2.
OCULAR ABSORPTION SITE vs WAVELENGTH



Laser Safety

While specular reflections are more hazardous, they are much less common. Most laser marking systems can be designed to eliminate specular reflective surfaces in the beam path.

Visible Light and Infrared-A (400-1400 nm)

The marking laser most commonly used in this category is the Q-switched Nd:YAG laser, which operates at a typical wavelength of 1,064 nm. Eye exposure to this laser beam is more hazardous since at this wavelength the laser beam is transmitted through the eye and focused onto the retina. Exposure may initially go undetected because the beam is invisible and the retina lacks pain sensory nerves. Visual disorientation due to retinal damage may not be apparent to the operator until considerable thermal absorption has occurred. Since the energy is concentrated by the eye's lens, the strength of the laser beam that is required to damage the eye is significantly less.

Laser Radiation Effects on Skin

Skin effects are generally considered of secondary importance with lasers used for most marking applications. High power infrared lasers, like those used in cutting and welding applications, pose a larger skin effect hazard. Lasers emitting radiation in the visible and infrared regions produce effects that vary from mild reddening to blisters and charring. These conditions are usually repairable or reversible. However, de-pigmentation, ulceration, scarring of the skin and damage to underlying organs may occur from extremely high powered lasers.

Maximum Permissible Exposure (MPE)

The MPE is defined in ANSI Z-136.1-1993 as "The level of laser radiation to which a person may be exposed without hazardous effect or adverse biological changes in the eye or skin." The MPE is not a distinct line between safe and hazardous exposures. Instead they are general maximum levels to which various experts agree should be occupationally safe for repeated exposures. The biological effects of laser radiation are dependent on the wavelength and exposure duration. The goal of any control measures is to ensure that any laser radiation contacting a person is below the MPE.

Nominal Hazard Zone (NHZ)

In many marking applications, and most packaging applications, it is not practical to fully enclose the area where the laser beam is delivered onto the product. In these instances, it is necessary to define an area of potentially hazardous laser radiation. This area is called the Nominal Hazard Zone (NHZ). The NHZ is the space within which the level of direct, scattered or reflected laser radiation exceeds the MPE. The purpose of a NHZ is to define an area in which control measures are required. The Laser Safety Officer should determine the NHZ and the control measures to protect the laser worker from exposure to radiation above the MPE.

Laser Safety

To quote the OSHA Technical Manual, Section III, Chapter 3: “This (NHZ), is an important factor since, as the scope of laser uses has expanded, controlling lasers by total enclosure in a protective housing or interlocked room is limiting and in many instances an expensive overreaction to the real hazards.”

Carefully designed guarding can eliminate any real light hazards associated with laser radiation during equipment operation. This guarding can often be of very simple design. For example, the infrared emissions from a CO2 laser can be blocked by clear polycarbonate (lexan) sheet. Often a simple tunnel through which the product passes while being marked provides reliable, adequate protection, preventing unsafe exposure from the direct beam or any diffuse reflections.

Control Measures

Certain control measures need to be in place wherever there are lasers in use. The extent of the control measures is a function of the type of equipment installed, the nature of any shielding, and any maintenance procedures that may be undertaken. These control measures include:

Engineering Controls

Engineering controls include proper shield interlock designs (when required), and safe system operation controls, as in situations where the laser will be integrated into another control system.

Electrical Hazards

The use of lasers or laser systems can present an electric shock hazard. This may occur from contact with exposed utility power utilization, device control, and power supply conductors operating at potentials of 50 volts or more. These exposures can occur during laser set-up or installation, maintenance and service, where equipment protective covers are often removed to allow access to active components as required for those activities. The effect can range from a minor tingle to serious personal injury or death. Protection against accidental contact with energized conductors by means of a barrier system is the primary methodology to prevent electrical shock.

Additional electrical safety requirements are imposed upon laser devices, systems and those who work with them by the federal Occupational Safety and Health Administration (OSHA), the National Electric Code and related state and local regulations. Individuals who repair or maintain lasers may require specialized electric safety-related work practices training.

Laser Safety

Personal Protective Equipment - Protective Eyewear



In the case of virtually all laser marking installations, personal protective equipment is limited to the use of proper eyewear. Protective eyewear must be chosen with regard to the wavelength of the laser light and, where appropriate, the wavelength of any light emitted from the material surface during the marking process.

Table 2. Optical Densities for Protective Eyewear for Q-Switched Nd:Yag

<i>Power</i>	<i>Wavelength (? m)</i>	<i>OD 0.25 seconds</i>	<i>OD 10 seconds</i>	<i>OD for 600 seconds</i>	<i>OD for 30,000 seconds</i>
<i>Nd:YAG (Q-switch)^b</i>	<i>1.064^a</i>	<i>---</i>	<i>4.5</i>	<i>5.0</i>	<i>5.4</i>

Laser Safety

Administrative and Procedural Controls

These controls largely involve access to the laser-controlled area. Any controls put in place during abnormal conditions, such as equipment repair and maintenance; and general safety rules (such as insisting the equipment be operated with shielding removed) are “at risk” situations based on individual company management policies.

Table 3. Control Measures for the Four Laser Classes

k ▲H▲- ë"ÿ Üÿ	Classification					
	1	2a	2	3a	3b	4
Engineering Controls						
Protective Housing	X	X	X	X	X	X
Without Protective Housing	Laser Safety Officer establishes alternative controls					
Interlocks on protective housing	?	?	?	?	X	X
Service Access Panel	?	?	?	?	X	X
Key Control	--	--	--	--	?	X
Viewing Portals	--	--	MPE	MPE	MPE	MPE
Collecting Optics	MPE	MPE	MPE	MPE	MPE	MPE
Totally Open Beam Path	--	--	--	--	X NHZ	X NHZ
Limited Open Beam Path	--	--	--	--	X NHZ	X NHZ
Enclosed Beam Path	None required if protective housing in place					
Remote Interlock Connector	--	--	--	--	?	X
Beam Stop or Attenuator	--	--	--	--	?	X
Activation Warning Systems	--	--	--	--	?	X
Emission Delay	--	--	--	--	--	X
Temporary Laser Controlled Area	?	?	?	?	--	--
	MPE	MPE	MPE	MPE		

Laser Safety

Table 3 continued. Control Measures for the Four Laser Classes

k ▲H▲- ë"ÿÜëÿ	Classification					
Remote Firing and Monitoring	--	--	--	--	--	?
Labels	X	X	X	X	X	X
Area Posting	--	--	--	?	X NHZ	X NHZ
Administrative and Procedural Controls						
Standard Operating Procedure	--	--	--	--	?	X
Output Emission Limitations	--	--	--	--	LSO Determines	
Education and Training	--	--	?	?	X	X
Spectator Controls	--	--	--	--	?	X
Service Personnel	?	?	?	?	X	X
	MPE	MPE	MPE	MPE		
Laser Fiber Optic Systems	MPE	MPE	MPE	MPE	X	X
Eye Protection	--	--	--	--	?	X
					MPE	MPE
Protective Windows	--	--	--	--	X	X
					NHZ	NHZ
Protective Barriers and Curtains	--	--	--	--	?	?
Skin Protection	--	--	--	--	X	X
					MPE	MPE
LEGEND	X = shall ? = should -- = no requirement NHZ = NHZ analysis required ? = shall if enclosed Class 3b or 4 MPE = shall if MPE is exceeded					

Laser Safety

Warning Signs and Labels

All laser equipment must be labeled indicating hazard classification, output power/energy, and lasing material or wavelength with words and symbols as indicated below:

Class 4 laser equipment: DANGER, Laser Radiation (or laser symbol) - Avoid Eye or Skin Exposure to Direct or Scattered Radiation

Labels and warning signs should be displayed conspicuously in areas where they would best serve to warn individuals of potential safety hazards. Normally, signs are posted at entryways to laser controlled areas and labels are affixed to the laser in a conspicuous location.



Universal Laser Warning Sign

**EXPOSURE TO THE LASER BEAM
MAY CAUSE PHYSICAL BURNS AND
CAN CAUSE SEVERE EYE DAMAGE.**

Proper use and care of this system are essential to safe operation.



Danger Sign

Exposure to the laser beam possible when interlocks are defeated

**EXPOSURE TO THE LASER BEAM
MAY CAUSE PHYSICAL BURNS AND
CAN CAUSE SEVERE EYE DAMAGE.**



Universal Avoid Exposure Sign

Conclusion

Laser marking systems can be operated safely and in compliance with national and regional safety requirements, often with very simple shielding and controls. The above material has been produced as guide for your company. It is the responsibility of each company to develop a laser safety program that complies with the national standard.

Introduction

Thank you for purchasing the TYKMA™ VEREO™ Laser Marker. Ideal for single or multiple part marking on all metals, hard plastics, and painted or anodized materials. Mark text, graphics, barcodes, 2D, Data Matrix™, UID codes and much more.

If, at any time, you experience difficulties or have installation or operation questions, please call TYKMA™ 24/7 - toll free at 877-318-9562 for technical assistance.

Let's Get Started!

LIFT THE YELLOW FIBER AND LASER SCANHEAD OUT FIRST AND PLACE ON THE WORKBENCH SECURELY. BE CAREFUL NOT TO EXCESSIVELY BEND THE YELLOW FIBER OPTIC CABLE CONNECTING THE LASER RACK TO THE MINILASE™ KEON WORKSTATION, WARRANTY IS VOID IF CABLE IS BROKEN. THEN, LIFT THE VEREO LASER RACK OUT AND PLACE ON WORKBENCH NEXT TO LASER SCANHEAD. THEN, SECURELY ATTACH THE LASER SCANHEAD TO YOUR TOOLPOST OR INTEGRATION HARDWARE.

Once set in place remove the protective sheet wrap from the machine. Please locate the following items included inside of your VEREO™ OEM box and set aside for installation:

One (1) 15' Power Cord

One (1) 10' DB25 Laser Head Cable

One (1) USB Communication Cable

One (1) USB Stick (with Manuals & Software)

One (1) Laser Control Dongle

One (1) Hardware Interlock Dongle

Machine Overview

Your VERO™ Laser Marker comes configured as a Class 4 Laser Marking System ready for marking right out of the box. Each system is configured based on application and laser type so please check your order confirmation for exact system configuration. Please reference the below diagram for identification of components and terms used in this manual.



- 1) Laser Rack
- 2) Laser ScanHead
- 3) Laser Rack Touchscreen
- 4) Main Power & Ports (on back)
- 5) Air Intake (under front of rack)
- 6) Vent (on back)
- 7) Laser Lens

System Setup

STEP 1: Connect the supplied Power Cord to the Input Power port on the Rack. Plug in the other end of the Power Plug into a Power Strip with Surge Protection. TYKMA highly recommends the use of surge protection for safe operation of your laser marking system.

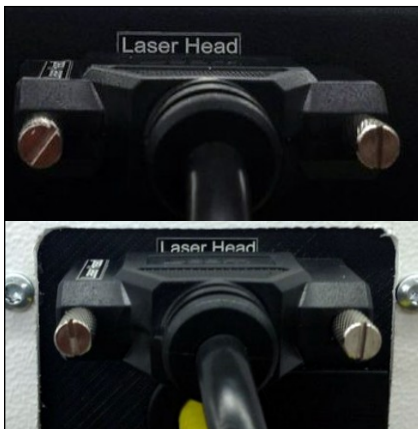
STEP 2: Connect DB25 Laser Head Cable to the laser rack and laser scanhead.

STEP 3: Plug in Hardware Interlock Dongle

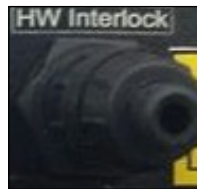
STEP 4: Plug in USB communication cable from Rack to PC.

STEP 5: Plug in Laser Control Dongle

STEP 6: Power ON your system by pressing the rocker switch next to the power port on the Rack.



Step 2: Laser Head Cable



Step 3: Hardware Interlock Dongle



Step 4: USB Cable



Step 5: Laser Control Dongle

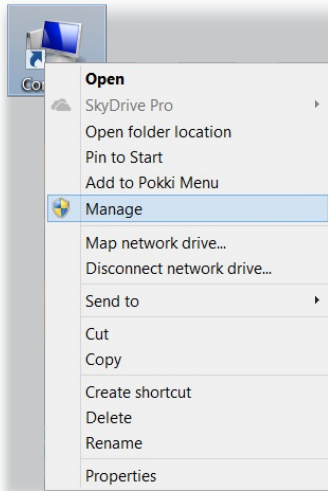


Step 6: Power

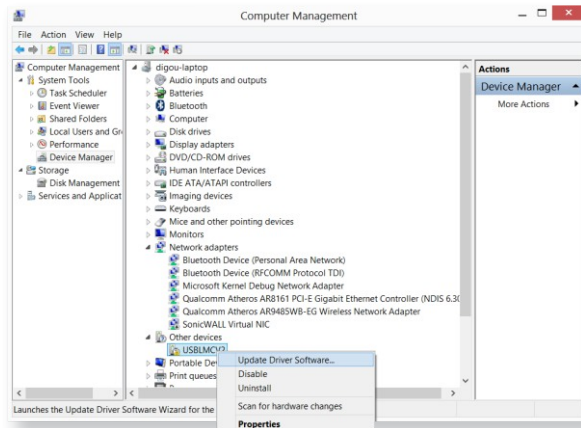
Driver/Software Installation USB Driver Installation...

Step 1: Right click on “My Computer” & select “Manage” to install USB Drivers

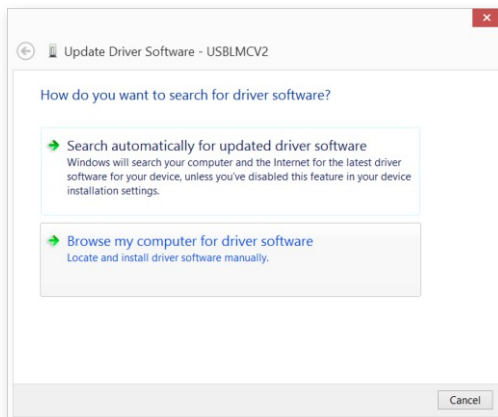
If prompted to Install Drivers proceed to Step 3



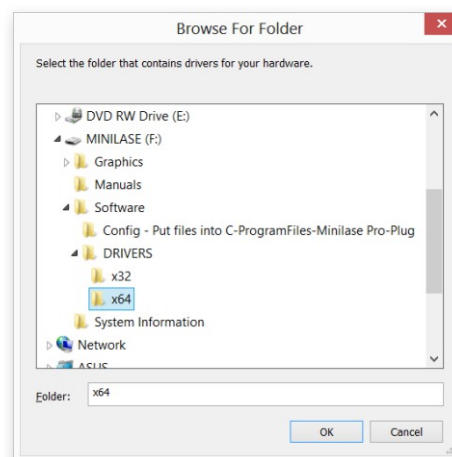
Step 2: Locate “USBLMCV2” and click “Update Driver Software”



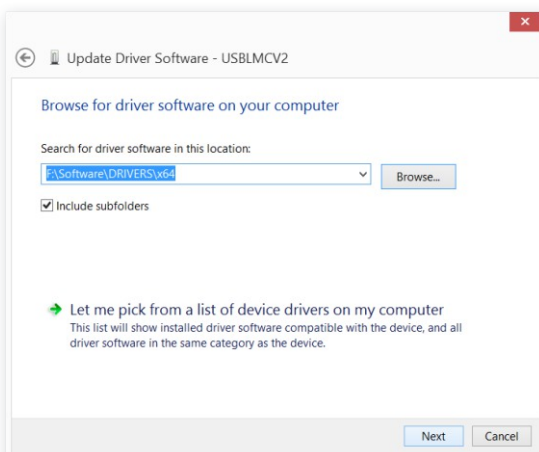
Step 3: Click “Browse my computer for driver software”



Step 4: Locate the drivers folder on the USB Stick and Select 32 or 64 bit folder, Click OK



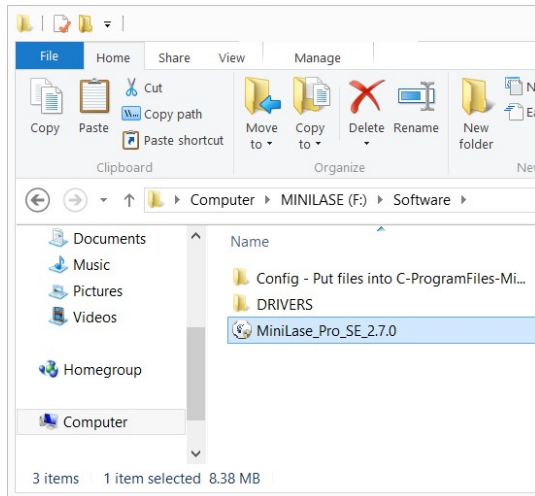
Step 5: Click next to finish Driver Installation



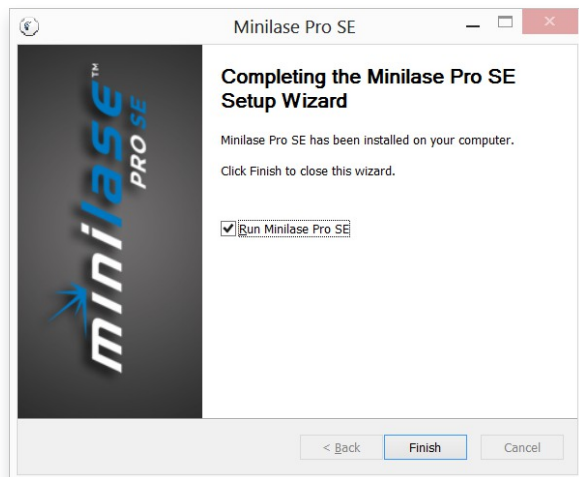
Follow the instructions on the following page to install Minilase™ Pro Software...

Driver/Software Installation Continued Software Installation...

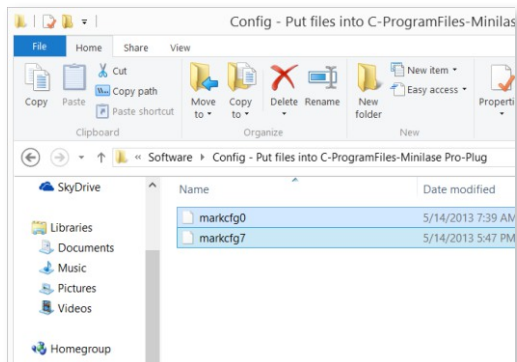
Step 6: Locate “Minilase_Pro_SE”
Installation file and double click



Step 8: Click “Finish” to complete the
install



Step 9: Locate “markcfg0” &
“markcfg7” on the USB Stick in the
“Software\Config” folder

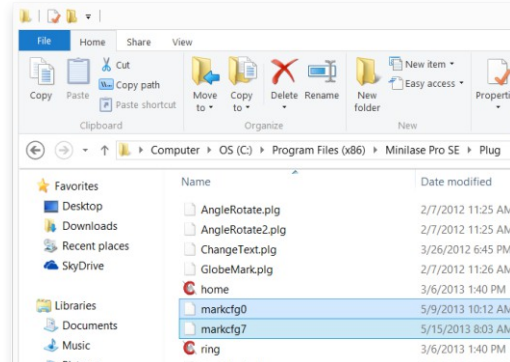


Step 7: Click on “Install”.



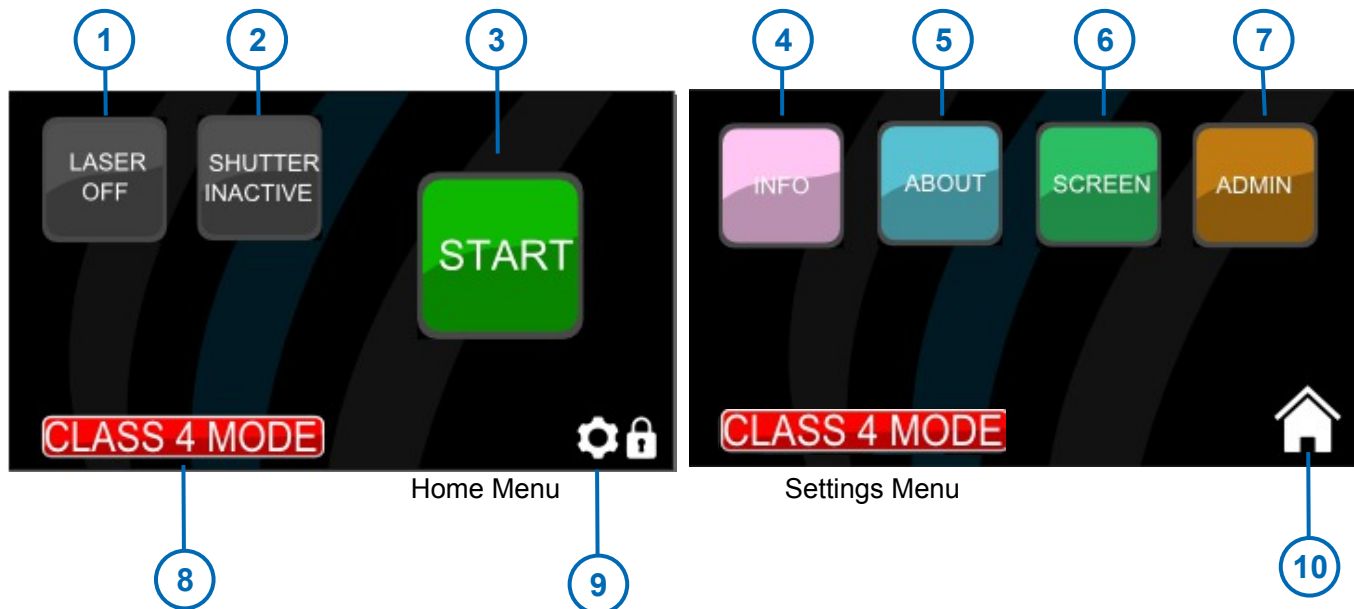
*** Every laser has a specific set of
configuration files that contain lens
corrections and proper system settings.
Follow the following steps to install
these files and complete the installation.

Step 10: Copy these files and paste into
C:\Program Files(x86)\Minilase Pro SE\Plugin.
Software Installation is now complete



Touch Screen Interface

Reference the figure below for Touch Screen Interface layout and descriptions on next page.



- | | |
|----------------------------|---------------|
| 1) Laser On/Off | 8) Class Mode |
| 2) Shutter Active/Inactive | 9) Settings |
| 3) Start | 10) Home |
| 4) Info | |
| 5) About | |
| 6) Screen | |
| 7) Administrator Options | |

Touch Screen Interface

- 1) Laser On/Off - Turns the laser engine on and off. Will prompt for password when turning on. Default Password is 89562, this can be changed by administrator.
- 2) Shutter Active/Inactive - Activates and Deactivates the shutter when the laser engine is running, and bypass dongle is installed.
- 3) Start - Start marking. In Class 4 Mode Safety Glasses must be worn and Safety Procedures adhered to.
- 4) Info - Laser Engine Information (Operating Hours, Machine Temperature, Etc.)
- 5) About - Rack Information (Hardware Version, Software Version, Etc.)
- 6) Screen - Screen Options
- 7) Admin - Administrator Options, password options
- 8) Class Mode - Displays that the system is operating in Class 4 mode.
- 9) Settings - Brings up the settings menu.
- 10) Home - Brings back the Home menu.

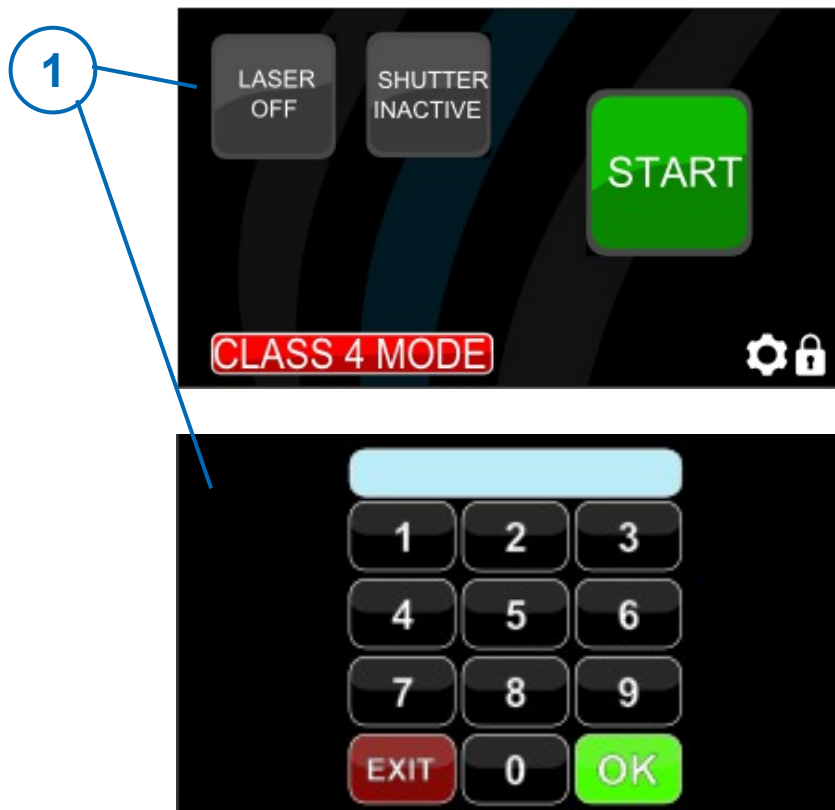


Password Screen

System Operation

STEP 1

Turning on the Laser - Press the “Laser On/Off” button on the touchscreen. You will then be prompted to enter a password. The default password is 89562, the password can be changed by the Administrator. Please wait 5-10 seconds for the laser to warm up.



System Operation

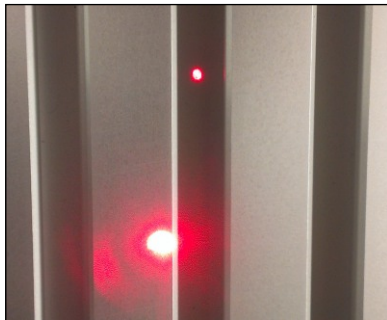
STEP 2 Open Minilase Pro SE - Locate the “Minilase Pro SE” link on the desktop and double click to open.

STEP 3 Verify System Status - Confirm the Laser and Computer are connected by opening the software. Should the laser not be connected the software will state “No Dongle Present”. If you have no connection contact TYKMA Service & Support (1-877-318-9562).

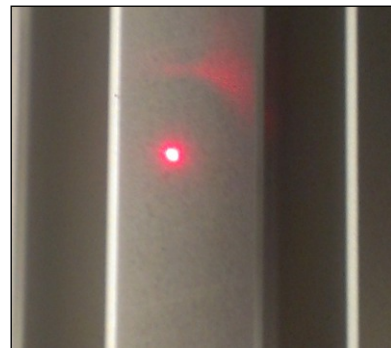


Step 2: Open “Minilase Pro SE”

STEP 4 Focus the Laser - Move Scanhead up or down to converge the 2 red aiming beams together.



Step 4: Aiming Beams not Focused

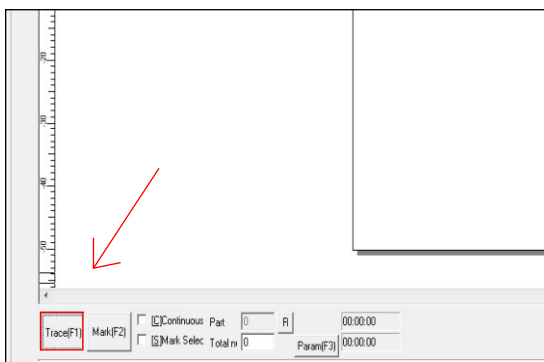


Step 4: Aiming Beams in Focus (converged)

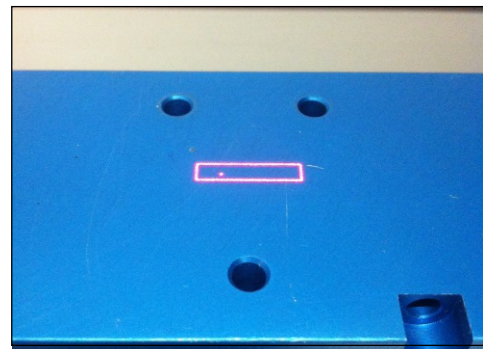
System Operation

STEP 5 Preview Laser - After creating your text and/or graphics for laser marking you may then use the “Trace” function to align your mark to your part. Click the button that says “Trace”. You will see a red outline simulation under the Laser Scanhead. Move your part or move the mark to align to the desired location. When completed with alignment click “Stop” to close the screen.

***Please refer to the Minilase™ Pro SE Software Manual for instructions on creating graphics and configuring laser settings



Step 5: “Trace”



Step 5: “Trace”

STEP 6 Marking with the Laser - To mark with the laser, open the shutter on the laser, then press “Start” or click the “Mark (F2)” button, this will start the marking for all active objects on your workspace.



System Operation

STEP 6 continued... **Marking with the Laser** - After clicking “Mark” a pop up window will appear and the Laser will be marking. “Laser Emission” will be indicated on both Touch Screens, and the Main Menu will be displayed once marking is complete.



Technical Information

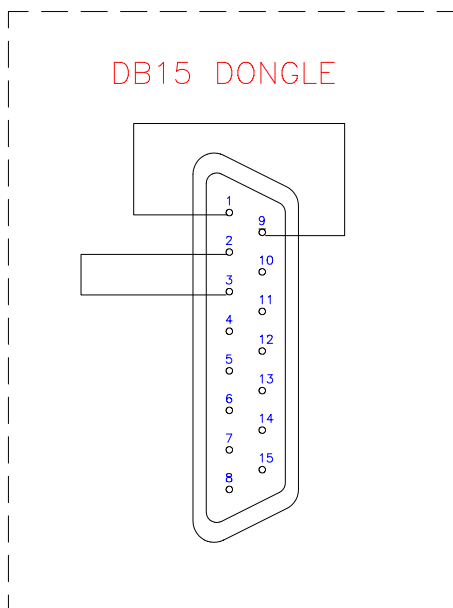
Your VEREO™ Laser Marker is a technical Laser for the technical user. The following pages contain necessary electrical wiring configurations and specifications to properly interface with the VEREO™ Laser Marker.

The VEREO™ Laser Marker can be operated utilizing the built in DB 15 Laser Control Port located on the back of the unit. The following shows 2 different options for controlling the VSE Laser Marking System.

Option 1 - Safety Bypass w/ Dongle

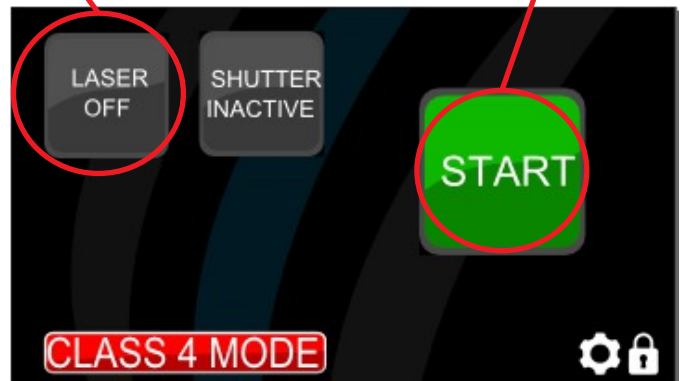
The system comes supplied with a DB15 Dongle which can be plugged into the Laser Control port on the Vereo. This Dongle bypasses the necessary safety circuit for E-Stop and Shutter in order to operate the laser.

*****Caution** - This will bypass safety circuit of the laser. Protective eye wear must be worn. In this mode the laser can be used after a “Laser On” command is given. To enable “Laser On” click on the appropriate icon on the touchscreen and enter the Administrator 4 digit key. After Laser On it is possible to Start the laser marking by use of the Start button on the touchscreen or Start can be initiated via the Software Start Function. See following screen shots for Dongle Reference and touch screen Functionality.



Press to turn Laser On

Press to Start the Marking



Enter Password
Default Password 89562



Technical Information

Option 2 - Integration Wiring

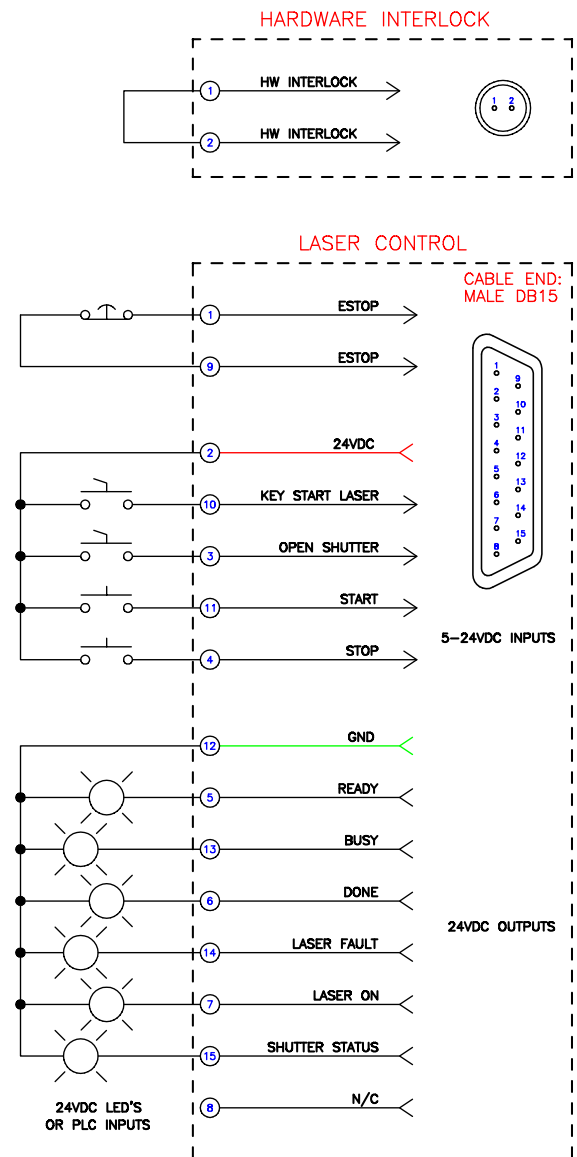
The Laser Control Port on the Vereo is a DB15 Connection for integration of the Vereo Laser Rack into a machine cell or automation. Provided are I/O control for E-Stop, Laser Start, Shutter Control, and base Outputs for monitoring the laser. Reference DB15 Pinout below.

Laser Control DB15 PIN layout

Function	DB15 Pin
E-Stop Dry Contact	1
E-Stop Dry Contact	9
Supply	2
Laser - Key Start	10
Laser - Open Shutter	3
Start	11
Stop	4
Ground	12
Ready	5
Busy	13
Done	6
Laser Fault	14
Laser ON Status	7
Laser Shutter Status	15
N/C	8

*Inputs are 5-24VDC

*Outputs are 24VDC



Technical Information

Option 2 - Integration Wiring continued...

The I/O Port on the Vereo is a DB9 connector used for extended I/O functionality to communicate directly with the Minilase Pro SE laser software. This I/O can be used to select individual objects in Minilase Pro SE for selective marking. The I/O can also be used to trigger certain conditions within the Object Marking List to provide feedback to a PLC. Reference DB9 pinout below.

I/O DB9 PIN layout

Function	DB9 Pin
SE SOFTWARE INPUT 10	1
SE SOFTWARE INPUT 12	2
GROUND (0VDC)	3
N/C	4
SE SOFTWARE OUTPUT 6	5
SE SOFTWARE INPUT 11	6
SE SOFTWARE INPUT 13	7
N/C	8
SE SOFTWARE OUTPUT 5	9

*Inputs are 5-24VDC

*Outputs are 24VDC

Technical Information

The VERO™ Laser Marker is an air cooled system. Air is pulled in through the front of the rack and pushed out of the back. The operating temperature range for the Laser Rack is 32°F to 113°F, anything above or below those temperatures can compromise the Laser. As well the Relative Humidity range for the VERO is from 5% to 95% (non condensing).

Note, there is no IP (Dust and water) rating for this assembly. The Laser integrator must provide suitable air filtering to prevent dust build up in the Air Intake and Air Discharge vents.



Trouble Shooting Information

If there is a fault with the VERO™ Laser Marker the touchscreen will display the fault as with GREEN or RED. Reference the table below for fault information.



Fault	Color
System Ready	None
Hardware Interlock Fault	Red - Interlock faulted, machine must be reset
HW Watch Dog Fault	Green - The controller must be reset
SW Watch Dog Fault	Green
E-Stop Occurred	Red - Disengage E-Stop to proceed
Door Interlock Fault	Green
Software Not Ready	Green
Laser Not Started	None
Laser Fault	Green
Motor Fault	Green

Maintenance Schedule

Your VEREO™ Laser Marker requires little maintenance since it is air cooled and has very few mechanical or moving parts.

Maintenance Schedule:

Below is the recommended maintenance schedule for the VEREO™ Laser Marker.

Cooling Fan Filter - Rack - Replace every 3 months (shorter intervals may be required in dirty / oily environments). See "Cooling Fan Filter Replacement" procedure.

Laser Lens - The focusing lens on your laser should be cleaned once every 3 months (shorter intervals may be required in dirty / oily environments). See "Laser Lens Cleaning" procedure.

Please see the following pages for information on performing routine maintenance.

Maintenance Procedures

Cooling Fan Filter Replacement

The cooling fan on the back of the Rack has a removable cover. Push down and out on the fan cover to gain access to the replaceable filter media. See picture below.



Step 1



Step 2

Maintenance Procedures

Laser Lens

The laser focusing lens on the VERO™ Laser Marker should be cleaned once every 3 months (shorter intervals may be required in dirty / oily environments).

Use a mixture of 90% water 10% Acetone to clean the lens using a lint free cloth. Visually inspect the lens for cleanliness and scratches or cracks.



Warranty Information

TYKMA reserves the right to change the information and specification contained in this manual without prior notice.

TYKMA expressly warrants the equipment it manufactures as set forth in the standard Terms and Conditions of sale. TYKMA makes no other warranties, expressed or implied, including and without limitation, warranties as to merchantability of fitness for use.



TYKMA Technologies
P.O. Box 917
931 E Water Street
Chillicothe, OH 45601
Toll Free: 877-318-9562
Fax: 740-779-9910
www.permanentmarking.com