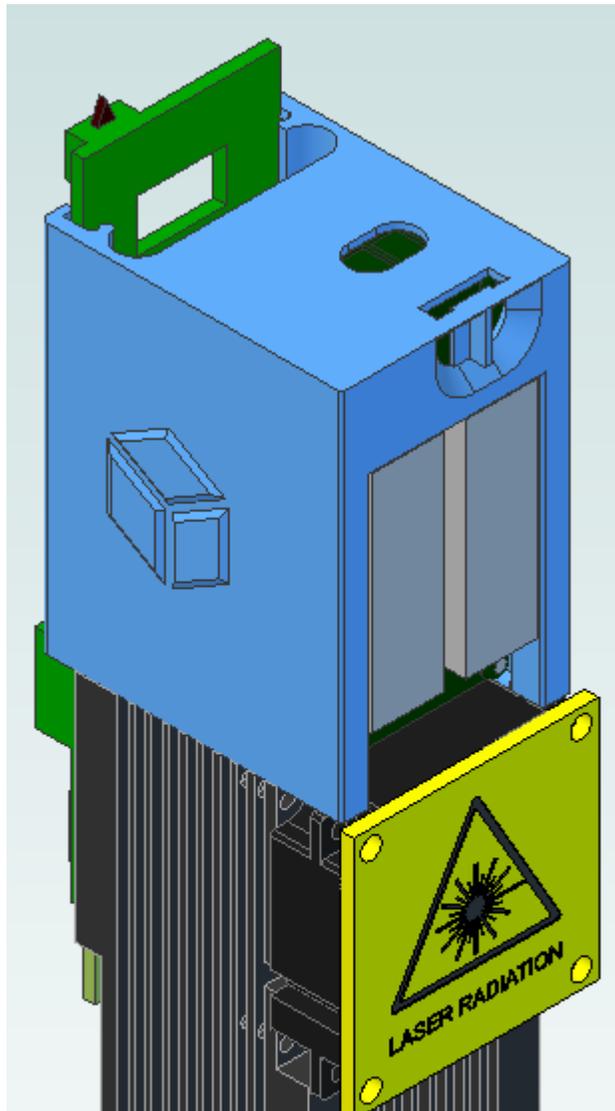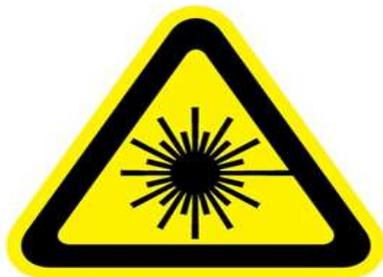# SHARK 6 LASER TOOL

⚠ DANGER

Laser Radiation Class 4.

Avoid eye or skin exposure to direct or scattered radiation.

Laser protective eyewear required.

Specifications:

6 Watt Optical Power @4.5 amps +/- 20 %

450nm, with visible red fringe light
Solid State Laser, operate at Room Temperature.
On/Off Time <5ms
Weight 305 grams.
Power supply, 12v 2 amps max
Interface, CanBus or TTL

controller

Integrated
Power Regulator

Current and Voltage
Display

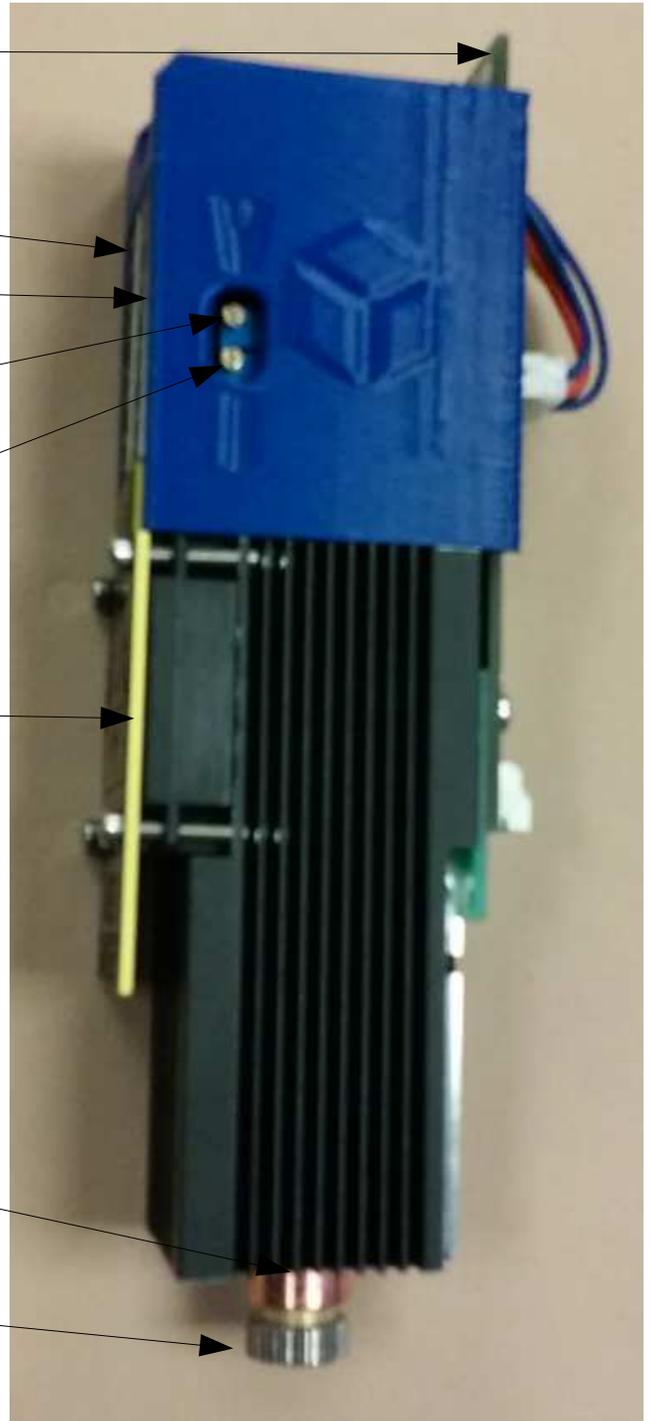Maximum Voltage Set,
Do not Adjust.

Maximum Current Set,
Do not exceed 4.5 A

Cooling fan

HEAT SINK:

Laser Diode

G2 Focusing Lens,
working distance:
35mm

Theory of Operation:

The Shark 6 is a 6+ watt Laser, 450nm wavelength.
USE EXTREME CAUTION:
Use Eye Protection, if you have no safety glasses,
Use your cell phone camera or web cam to avoid Directly
Looking at the laser beam.
NEVER try to cut Shinny or reflective objects.

The Shark 6 uses a 6Watt Laser Diode with special
Constant Current drive electronics. Normal power regulators
Will Destroy the Laser diode in fractions of a second, ONLY
Use with factory supplied Regulator.

High Power Laser Diodes are really a series of small laser
Diodes that are made on a silicon wafer. They Usually have
 a array of Small Laser Diodes that form parallel laser lines.
To help columnate the laser energy, there is a FAC lens,
(Fast Access Calumniator).
Then the energy beams are focused to a point using a specially
Coated Lens, to match the frequency of the Laser Diode Light.

The POWER of the Laser is determined by the Current flowing
Through the laser. Solid state lasers are less than 30% efficient
In most cases, so they will generate Heat as well as Light.
When the Diode Heats up, the resistance drops, that is why we
Use a special constant current power regulator.

We also use a Large cooling fan, and massive heat sink, to
Keep the laser Diode within a few degrees of ambient.
The Life of the Laser Diode is directly related to the operating
Temperature of the laser diode. A properly cooled laser diode
Can exceed 5000 hours of operation, which reduces your
Cost to use the laser to a few pennies an hour.

Using the Laser:

Caution!!!!! this is a dangerous tool if not used properly,
Use Proper eye-ware at all times, the frequency of this
Laser is 450nm, use Correct glasses for direct viewing.
Most safety glasses for this wavelength will have a greenish
Tint to them.

Uses:
This laser has been used to cut the following:
Paper,Foam,anodized aluminum, plastic

Wood Burning on most woods, with mixed results depending
On the Color of the grain of the wood.

Nice Marks can be made on stainless and aluminum using
TherMark or Cermark type Spray coating, then lasing the
desired mark or pattern. The final result is a BLACK enamel
Like mark that is very durable.

TIPS:
NEVER CUT FOAM with PAPER underneath.
The tiny sparks from the Paper will catch the Foam
On Fire.(The same is true of any combination of
Materials where the lower material emits tiny embers).

NEVER leave the laser to work unattended, there is
ALWAYS A FIRE HAZARD:

ALWAYS USE good ventilation when using the laser,
Many of the Plastics and other interesting materials to
Cut, will **emit toxic fumes**.

The Shark Laser was designed to operate with a 3d Printer.
It will be necessary to create Gcode to move the Laser Head
And also to Turn on and Off the Laser, so that the pattern
You desire can be created.

On a Hyrel Printer, you will need to enable the Laser head
Before it will respond to the ON/Off commands.
The M-Code is;
M106 Txx S100 ; this will enable the DC to the Laser Regulator
M106 Txx Pxxx ;Set normal operating power
Where Txx is the tool location,
Pxxx is the desired POWER in Percent.
Note that simply executing the M106 command does NOTE
Turn on the laser. You must actually do a G1 Move with a
"Ex" argument.
This was designed, so that you can use the same slicer
Program that you normally use, to make good Code for
Your laser, because the E argument will be automatically
Generated by the slicer.
There are several good DXF to G-Code applications online,
That are free of charge.
All you need to do is include a "Ex" argument on a G1 move
To make a mark with the shark V.
Example
M106 T11 S100   ;enable bulk power to laser,
M106 T11 P50   ;select head 1 , set power to 50%.
G0 X50 Y50   ; go to start position.
G1 F1000 X100   E.1 ;mark line to X100, 1000mm/min Feedrate
G1 Y100   E.1
G1 X50   E.1
G1 Y50   E.1 ;complete lasing test box.
M107   ; disable off laser
M30   ;End of program. ALWAYS USE THIS.

Maintenance:

NEVER LOOK AT THE LASER UNPROTECTED!!!!

Do NOT remove the lens from the laser, it will allow
Dust to get inside and Dust will cause Premature failure.

DO NOT ADJUST THE Voltage set point,
Do NOT adjust the I current set point above 4.5amps.

Do not operate the laser if the BODY of the laser is above
35 Degrees C.

Use excellent cross ventilation with cutting with the laser,
This will keep the lens from getting a coating on it from
The smoke and fumes, which will degrade the focus and
Overall performance of the laser.

Additional Help:
Check on YouTube and look for key words
SHARK 6 Laser for videos,
We are encouraging users to post often, how they have
Used their SHARK 6 to make fun and useful projects.

DISCLAIMER:

You MUST BE 18 Years old to purchase or operate this laser.
No warranty or guarantee is offered for the application of this
Product,

Use at your own risk.!!!!!!!

The user agrees to be ENTIRELY responsible for Safe Operation
Of this product.