

Full Spectrum  
Manufacturing



Research  
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## FULL SPECTRUM LASER CONTROLLER

### Technical Reference Manual



Easy to use Manual or Auto



Full Spectrum Laser Controller With 50 Watt ULS Laser

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**FULL SPECTRUM LASER CONTROLLER**

# Technical Reference Manual

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## 4 Enable Function

The enable is used as a emergency laser shut off or a safety interlock if the enable pin does not see a TTL signal high +5 VDC no signals are sent to the laser effectively shutting the laser off.

You may use the +5 VDC available on pin one for enabling the laser on. The enable default is set low so the laser will not fire without a +5 VDC enable signal present.

## 5 Full Spectrum Laser Controller General Specifications

5a	Power Input	+5 VDC
	Signal output	0-99% Duty Cycle PWM 5KHZ
	Gate input "Default Logic Low"	TTL Logic (High +5 VDC) (Low 0 VDC)
	Clock Frequency	5 kHz +/- 5% Accuracy
	Enable Input "Default Logic Low"	TTL Logic (High +5 VDC) (Low 0 VDC)
	Length	6.25 Inches
	Width	4.125 Inches
	Height	1.5 Inches
	Weight	12.3 Ounces
	<i>Environmental Specifications</i>	
	Operating Temperature	0° - 40° Celsius
	Humidity	0 - 80% Non-Condensing



## FULL SPECTRUM LASER CONTROLLER

### To Operate in Manual

1. Set Toggle switch to manual
2. Plug in the power supply
3. The red "Power" LED should be lit
4. Hook the (White Wire) "Enable" to the (Red Wire) "+5 VDC"
5. The red "Enable" LED should be lit
6. Hook (Green Wire) "Laser Gate" to the (Red Wire) "+5 VDC"
7. The red "Laser" LED should be lit
8. Hook (Purple Wire) "Duty Cycle Output" and (Black Wire) "Ground" to Laser
9. The Laser Power can be set with the "Power" Knob

### To Operate in Auto

1. Set toggle switch to Auto
2. Plug in the 5-volt power supply
3. The red power light should be lit
4. Pin #12 on the D B15 must have +5 volts on it
5. The enable light should be lit
6. Pin #4 on the D B15 must have +5 volts on it
7. The Laser light should be lit
8. The power can now be set by making the data inputs 1-7 high

Example:

Data input	1	2	3	4	5	6	7
Binary value	1	2	4	8	16	32	64
	0	0	1	1	1	1	0

32+16+8+4=60 or ½ power      120=full power

#### DB 15 CONNECTOR DIAGRAM



NOTE: PIN #4 AND PIN #12 NEED TO BE HIGH TO FIRE THE LASER



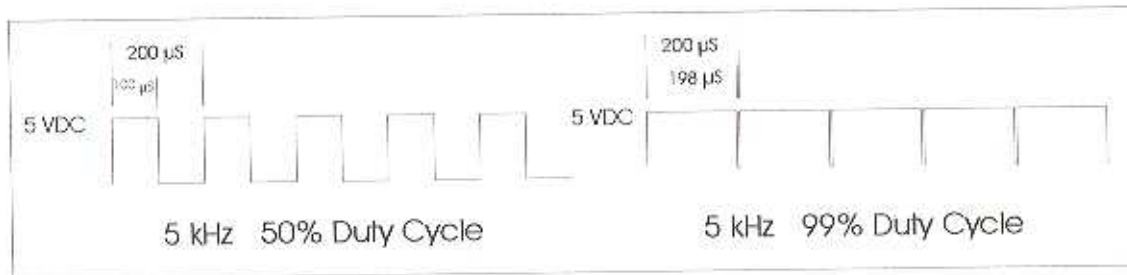
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## 2 *Laser Controller Output*

This laser power controller is used to digitally modulate the RF amplifiers that excite the plasma within the resonating chamber of the laser. This is accomplished by using a clock frequency square wave of 5kHz and varying the duty cycle of that square wave from 0-99%. Commonly referred to as a pulse width modulated signal.

2a



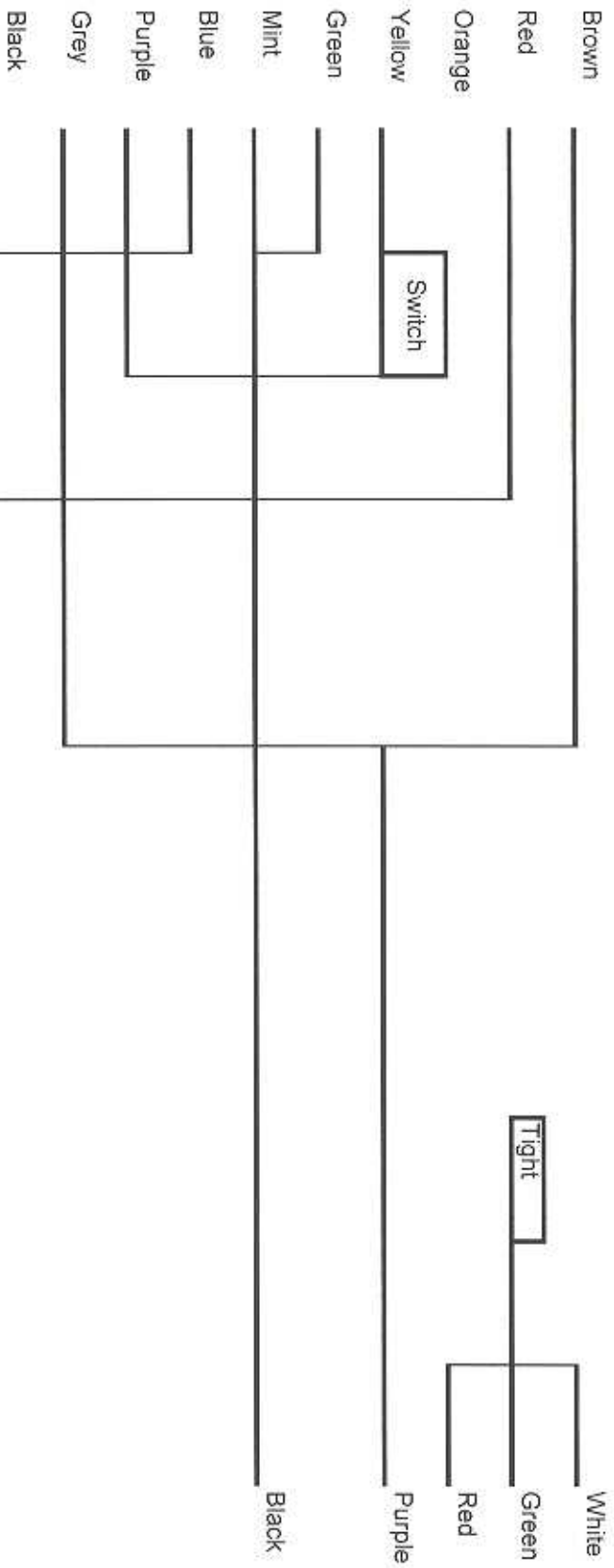
## 3 *Gating Function*

The "Gate" is used to turn on and off the laser with a TTL Logic high / low signal. This signal if externally generated should have an amplitude of 0 VDC for "Laser off" and +5 VDC for "Laser on"

You may use the +5 VDC available on pin one for gating the laser on. The gates' default is set low so the laser will not fire without a +5 VDC signal present.

Laser

Laser Controller



Use only one wire

NEG 5vdc

470 ohm

POS 5vdc

Tight

Switch