



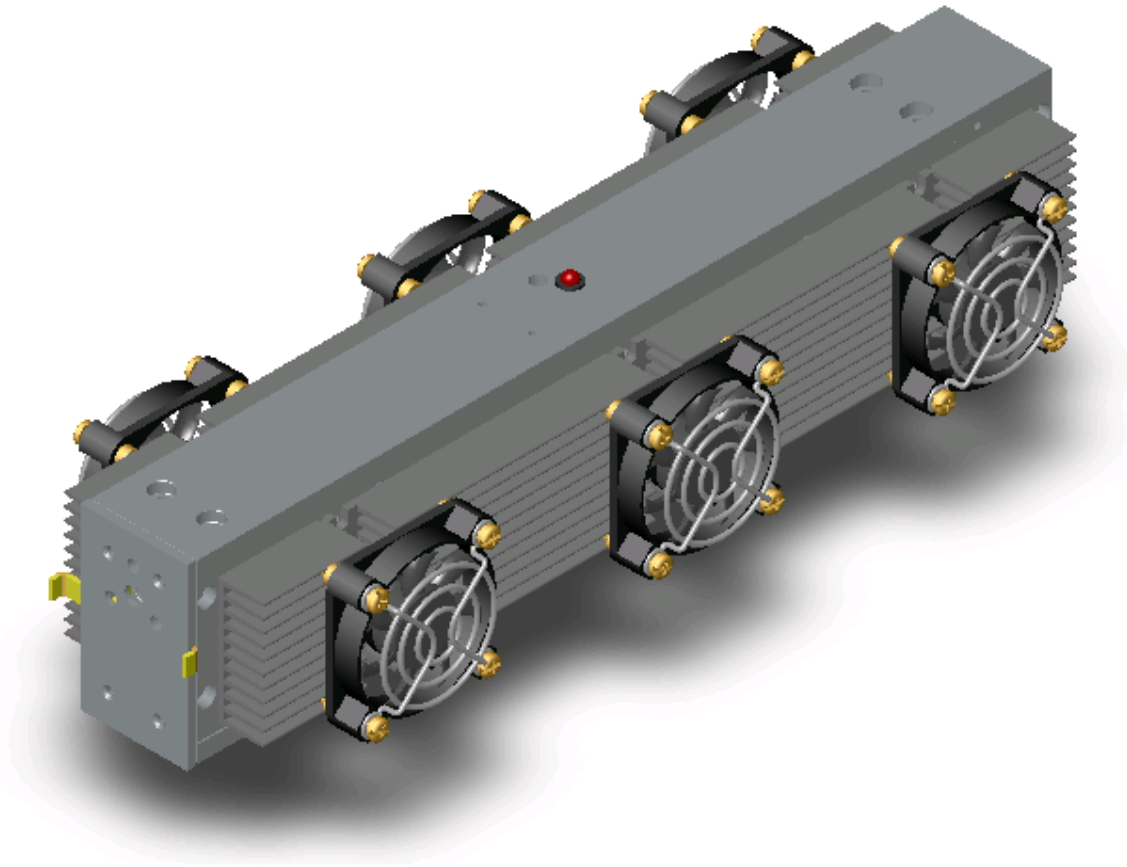
Access Laser Company

Lasy5 Operator Manual

Lasy 5---5 Watts of Standard Laser Power

Lasy 5P---20 Watts of Super-pulse Peak Power

Lasy 5D---Customer Selectable between Standard and Super-Pulsed



Rev E

Access Laser Company

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Operating Instructions

Access Laser Company would like to thank you for your purchase of this product. We shall remain dedicated to your development and customer service needs. If you have any questions, concerns, or comments, please feel free to contact us at any time.

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Section 1

Safety Regulations

Laser Safety

Warning: Always wear eye protection when operating the Laser.

△ CAUTION: The standard Lasy-series laser produces laser radiation at around $10.6\mu\text{m}$. This wavelength at more than 0.5 Watts can cause mild to severe burns if skin or eyes are exposed to the beam or scattered radiation. This wavelength is invisible and requires special equipment to detect or view. Always take special precautions to block the beam from unintentional reflection. Never use organic materials such as plastic or wood as a beam block. Avoid using materials such as Copper, Aluminum, or Gold, which are highly reflective and may cause the beam to unintentionally scatter. This is a CLASS IV laser.

△ CAUTION: Use of controls, adjustments or the performance procedures other than those specified herein may result in hazardous radiation exposure. To prevent direct exposure to laser beam, do not try to open the enclosure.

Safety Labels

Top: (from right to left)

1. Aperture Label
2. Laser Warning Label
3. Compliance/ noncompliance (OEM) label
4. Identification Label

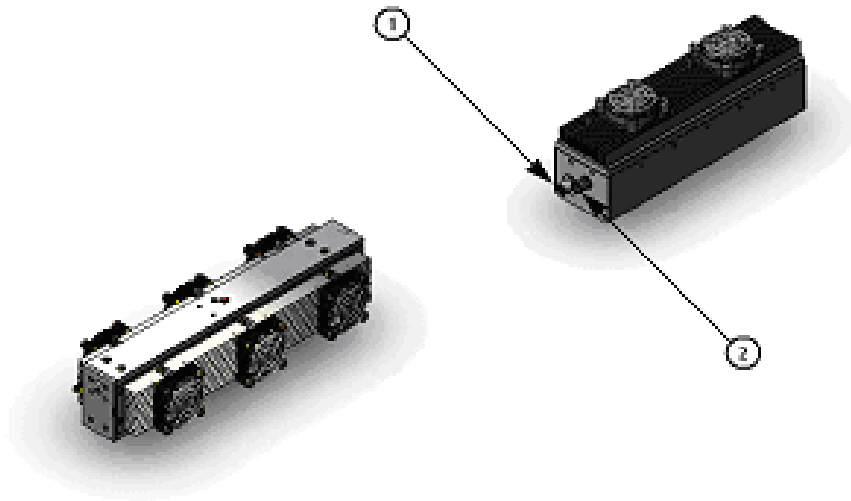


Front:

1. Laser Shutter

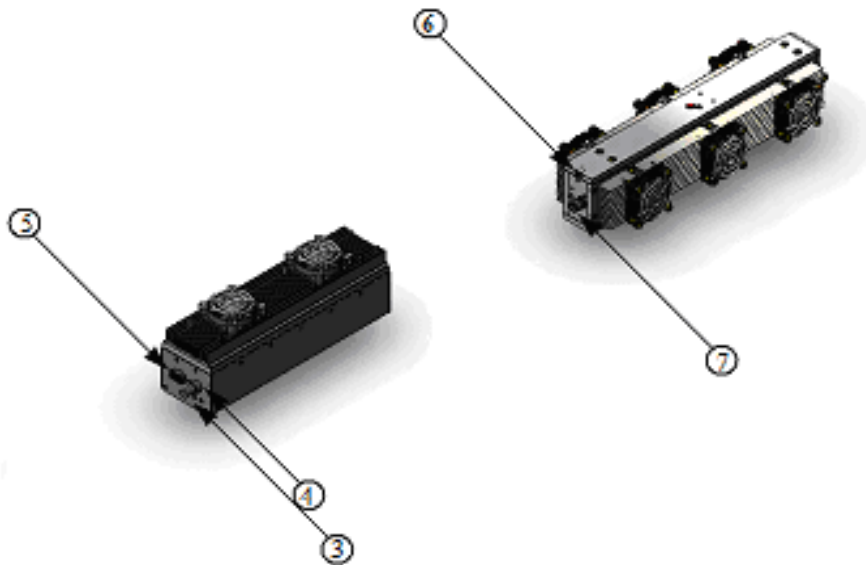


Front View



1. 6 Pin Mini Din Laser Interlock
2. TNC RF Output

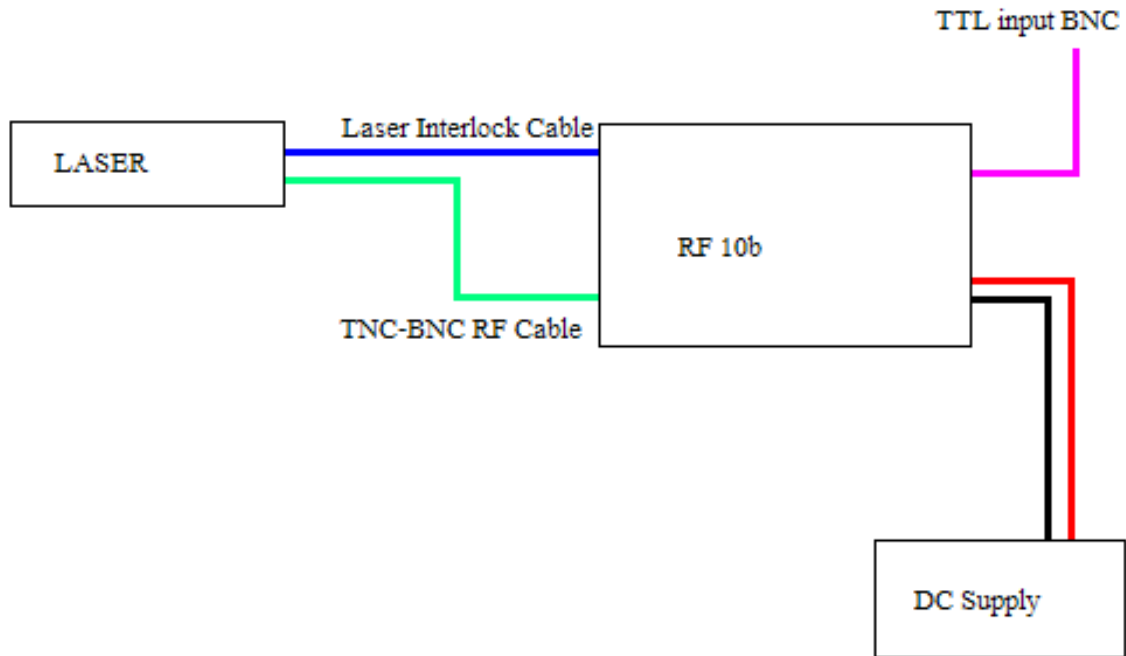
Rear View

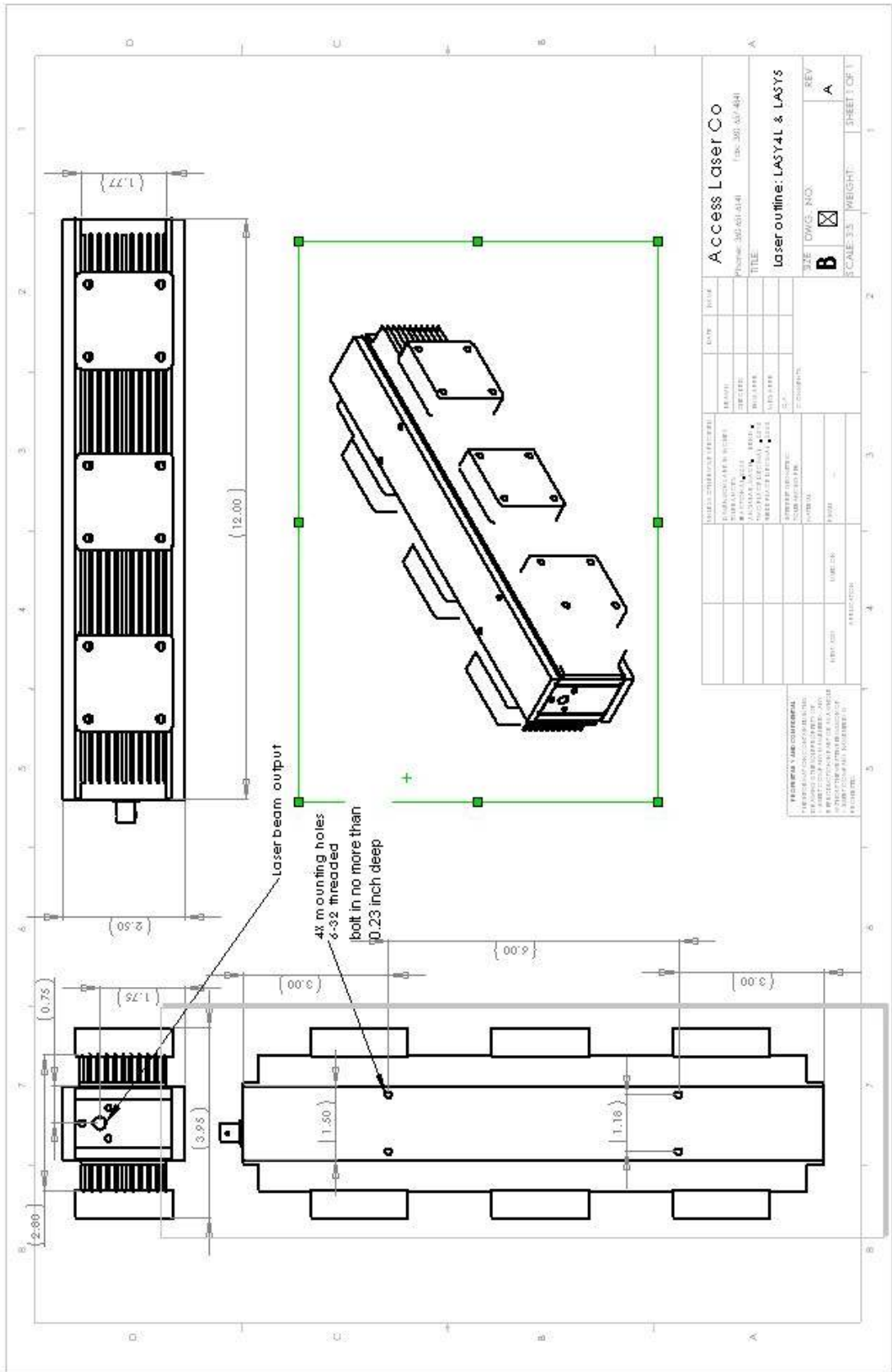


3. DC input
4. BNC TTL Gate Input
5. Connector for optional controller

6. Mini USB Laser Interlock Input
7. BNC RF Power Input

Wiring Diagram





Section 2 Laser Operation

Laser Specifications

Model	LASY-5	LASY-5P
CW power	5	4 (average)
Peak power	5	20
M ²	< 1.1	< 1.1
Beam waist dia.	2.4 mm	2.4 mm
Waist location	Output coupler	Output coupler
Full Div. Angle	5.5 mrad	5.5 mrad
Pw stability	±10%	±10%
Wavelength (µm)	Around 10.6	Around 10.6
Rise time (µs)	200	70
Fall time (µs)	200	90
Supply Voltage	28 VDC	48 VDC
Supply Current	7 Amp	4 Amp
Cooling Req	Forced air	Forced air
Working Temp	5-40 C	5-40 C
Dimensions(inch)	12x3.8x3	12x3.8x3

Lasy-5D behaves as Lasy-5 or Lasy-5P depending on the DC supply used

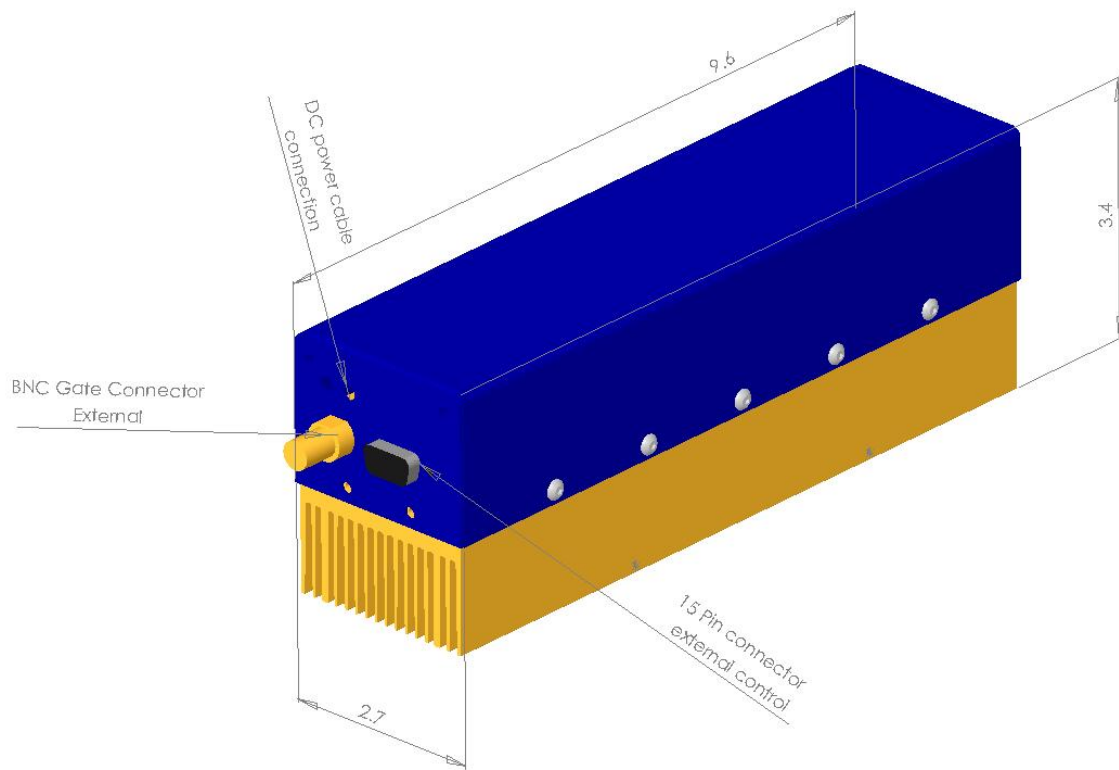
Operation Procedure

- Verify that the Laser has been directed towards an intended target, such as a power meter, or a beam-blocking device.
- Verify the mechanical Laser Shutter, if there is one, is in the Open Position.
- Connect the DC interlock cable between the Laser and its RF driver.
- Connect the Laser to the RF Output connectors of the RF driver using the RF power cable provided.
- The laser is controlled by applying 5V DC (20mA) to the TTL Gate on the RF driver (0V=Off /5V= On). The RF driver can be modulated at frequencies from 0 Hz to 100 kHz, but optimal gating frequency is 1-15 kHz.
- Make sure the enabling plug on the D-Sub15 connector is installed on the RF driver.
- Connect the appropriate DC supply to the RF driver (28 VDC for Lasy-5, up to CW operation and 48 VDC for Lasy-5P, super pulsed).
- For super pulse operation of Lasy-5P and Lasy-5D using a 48V DC supply the laser is designed to be run up to 30% duty cycle and pulse length up to 450 µs. **WARNING: Running above 30% duty cycle or 450 µs pulse length may damage the RF driver. Internal protection program will interrupt user signal beyond these parameters, making the output inconsistent.**

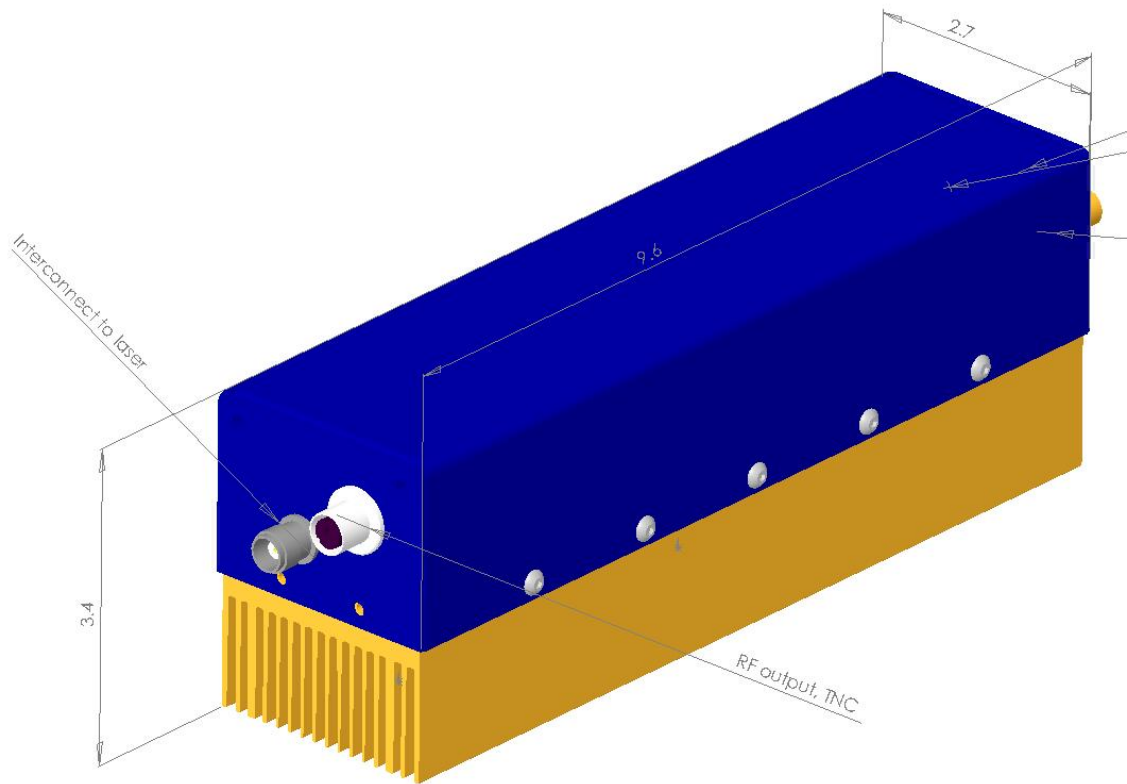
Section 3 RF Driver Specifications

Model	RF10b	RF10b-P	RF-10b-D
Features	Standard	Super pulse driver	Smart driver that can be either standard or super pulsed
Frequency	External TTL Control Input up to 100 KHz Built in plasma ignition signal at 2.5 kHz 40.68 MHz		
Supply Voltage	28 VDC, 7 A	48 VDC, 4 A	28 or 48 VDC, 7A or 4 A
Output power	120 w up to CW	300 w up to 30% or 450 μ s	120 w up to CW or 300 w up to 30% or 450 μ s
Cautions:	<ol style="list-style-type: none"> 1. Never connect the DC to the RF driver with the wrong polarity, or the RF driver will be damaged. 2. Never operate the RF driver without its output properly connected to the laser. 3. Do not block the air flow to and from the heat sink. Or the RF driver will be damaged. 4. If the fans fail on the RF driver stop it immediately. 5. Do not gate the RF driver at frequencies above 100 kHz. 		

RF Driver Dimensions: 9.6 inch X 3.4 inch X 2.7 inch



View from input end



View from the output end

RF-10b Custom Interface

OEM Custom controls and signals at the D-sub15 connector (*Slanted red lettering indicates factory configuration*):

Pin #	FUNCTION	Low (ground)	High (5 V)
1	Output, 5 VDC, 20 mA capacity	N/A	N/A
2	Output, Connecting to a red LED to indicate power ready. The red LED has to be in series with a 390 ohm current limiting resistor to ground.	N/A	N/A
3	Do not use	N/A	N/A
4	Do not use	N/A	N/A
5	Input, AVC (Pin 11) and Gate (Pin 10) control	Enables AVC together with Pin 10	<i>Disables AVC, only Gate (Pin 10) works</i>
6	Do not use	N/A	N/A
7	Input, Laser enable	<i>Disable Laser</i>	Enable laser
8	Input, 5 second delay control	Delay off	<i>Delay on</i>
9	Input, Discharge-conditioning (at 2.5 kHz) control	off	<i>on</i>
10	Input, Gate, same as BNC input	<i>Laser off</i>	Laser on
11*	Input, AVC (Analog Voltage Control: 0-5 Volts corresponding to 0-100% duty cycle at 5 kHz.)	<i>Laser off</i>	Laser fully on
12-14	Check with factory for details	N/A	N/A
15	Ground		Do not do it

* Note on PIN 11 input voltage: 1 Volt corresponds to 20% duty cycle, 3 Volt corresponds to 60% duty cycle, etc.

Section 4 Controller (for safety models)

Model: LC-3

Features:

Safety key switch
Safety interlock
Power Adjustment
External Gate



Operation Procedure

- Make certain the D-Sub15 connector on the RF driver is available to accept the connector on the end of the controller.
- Make certain that the 3 position switch is in the middle, placing the laser in standby “STBY” mode.
- Install the LC-3 D-Sub15 connector, the Red “POWER” LED should light
- Turn the key switch from the “OFF” position to the “ON” position, the Green “READY” LED should light after ~5 seconds.
- If running the DC voltage at 28V switch into “0-100%” mode, the Red “MODE” LED should light up. The knob will adjust from off to CW (Continuous Wave) (0-100%) as it is turned Clockwise.
- If running the DC voltage at 48V with super-pulsed laser switch into “0-25%” mode, the Blue “MODE” LED should light up. The knob will adjust from off to a maximum duty cycle of 25% at 2.5 kHz as it is turned Clockwise.
- The TTL Gate on the controller can be used to turn off the laser by applying ground. When the ground is removed or 5V is applied the laser will turn on at the duty cycle setting determined by the knob position. The gate can be modulated as necessary up to 100 kHz
- The interlock connector on the LC-3 can be connected to a user provided safety switch or door switch, to have the laser turn off. It is a 1/8” stereo jack, the two wires must remain shorted together for the laser to operate. The connector is self-shorting, so if not using the interlock there is no need to plug anything into it.
- If any of the interlocks are triggered or the DC power is interrupted the Keyswitch will need to be cycled OFF and back ON to turn the laser back on.