5.2 Electrical Connections

All electrical and communication connections for the laser are made through one fifteen-pin connector located on the back of the laser. Figure 4 below shows the pin positions of the mating connector on the wire harness. Figure 5 details the circuits inside the laser attached to the pins.

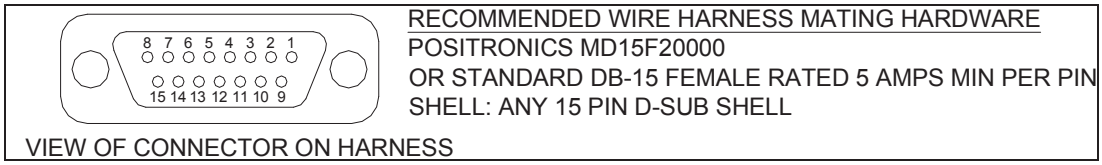

Figure 4 – Laser Connector Pin Diagram

Pin Number	Input Name	Laser Input/Output	Wire Size	Description
1	+48V	Power input	20 AWG	+48 volt power; do not swap polarity.[1]
2	Laser Diode	Optically isolated input	20-24 AWG	+5 V signal on pin 2 will turn on the red laser pointer (when available).
3	Temperature Warning[5]	TTL Output	22 AWG [0.33mm^2]	HI= Normal Low= Fault Return on pin 14
4	Modulation +	Optically isolated input	20-24 AWG	Laser modulation signal is connected between pins 4 and 12.
5	Laser Diode Return	Optically isolated input	20-24 AWG	Optically isolated return signal for “Laser Diode” (pin 2).[3]
6	Interlock +	12 volt source (only use for interlock)	20-24 AWG	Connect safety switches between pins 6 and 13 to enable laser. Do not use this pin as a power source for other purposes.
7	Laser Status	TTL Output	20-24 AWG	TTL Output. Return on Pin 14
8	Power Ground	Power input	20 AWG	Power ground.[2]
9	+48V	Power input	20 AWG	+48 volt power; do not swap polarity.[1]

10	+D	RS485 +	20-24 AWG	Half-duplex communication port.
11	-D	RS485 -	20-24 AWG	Half-duplex communication port.
12	Modulation -	Optically isolated return signal	20-24 AWG	Optically isolated return signal for "modulation +" (pin 4).[3]
13	Interlock -	Interlock return	20-24 AWG	See description for Pin 6.
14	Signal Return	Ground reference	20-24 AWG	Return for "Laser Status +" (Pin 7), Temp warning Pin 3 RS485 ground reference and externally sourced interlock.
15	Power Ground	Power input	20 AWG	Power ground.[2]

Notes:

1. Pins 1 & 9 are internally connected, and it is recommended that both pins be connected to the external power supply.
2. Pins 8 & 15 are internally connected, and it is recommended that both pins be connected to the external power supply return.
3. Pins 5 & 12 are internally connected. This ground is capacitively coupled to chassis ground and is provided as an isolated ground for the customer.
4. Pins 7 & 14 are TTL and can source up to 20mA.
5. Temperature warning operates in the following manner:
    - Temperature exceeds 60C: Pin 3 goes low as a warning. The laser will continue operating.
    - Temperature exceeds 70C: Pin 7 goes low as a fault. The laser will stop operating.
    - After over-temp:
        a. Temperature falls below 60*C: Pin 3 goes high. Laser still does not operate.
        b. Temperature falls below 48*C: Pin 7 goes high. Laser able to operate if modulation is applied.
    - On initial power-up:
        a. Temperature is below 0*C: Pin 7 goes low as a fault. Laser will not operate.
        b. When temperature is above 0*C: Pin 7 goes high. Laser able to operate if modulation is applied.
    - 0*C is not monitored if laser is already running as the gas is energized and low temperature shouldn't cause problems.

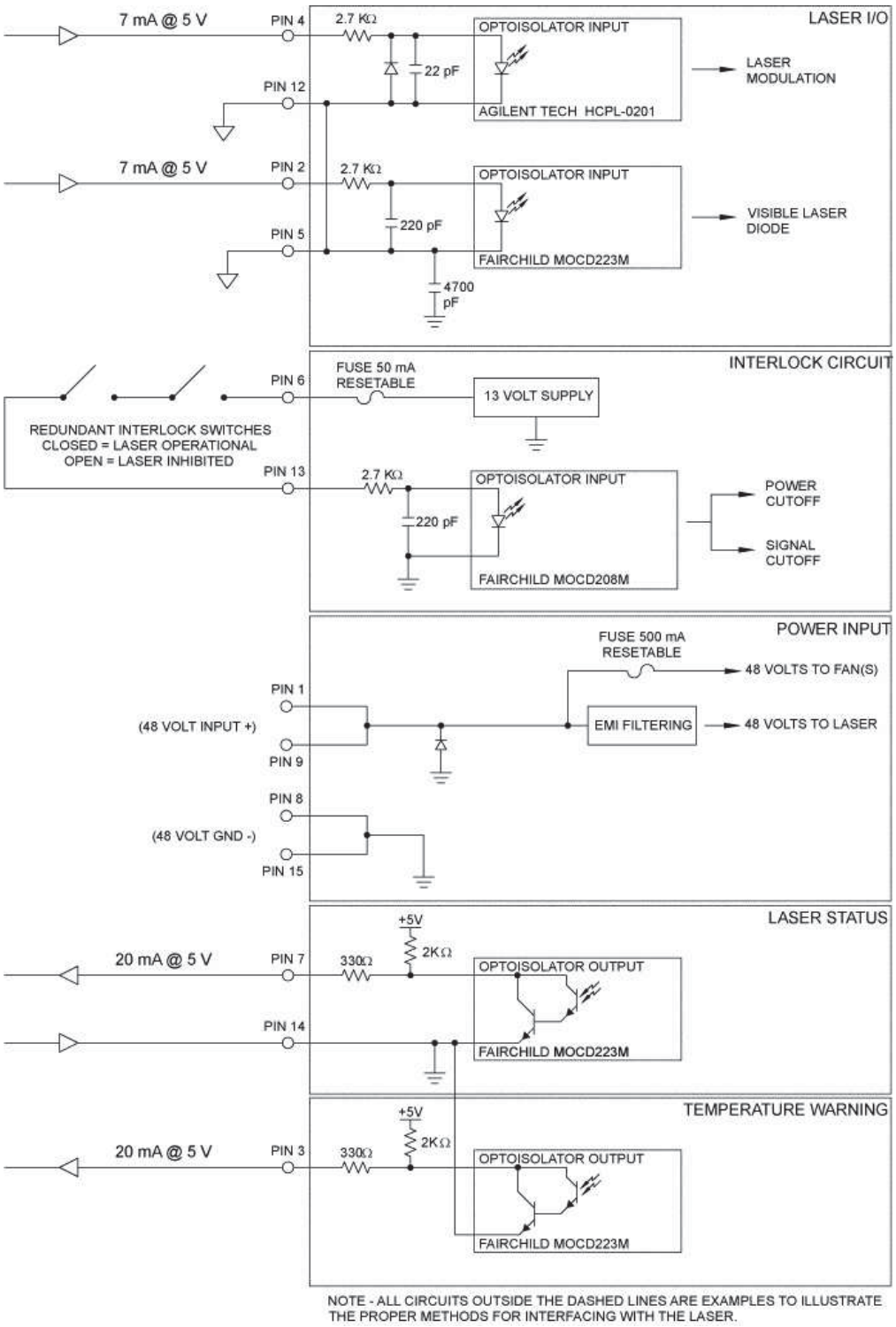

Figure 5 – Laser Interconnect Schematic