THE PULSE OF THE FUTURE

PCX-7450

150A QUASI-CW LASER DIODE DRIVER/PULSED CURRENT SOURCE

- **Output Current Up To 150A**
- **Output Voltage Up To 120V**
- **Adjustable Rise & Fall Time [5µS..1mS]**
- **Pulse Width [15µS..5mS]**
- **5KHz Maximum Frequency**
- **Up to 120V out, drives up to 50 diodes simultaneously**
- **RS-232 Computer Interface**

The PCX-7450A is an air-cooled, high power pulsed current source designed to drive diode lasers, bars and arrays. It delivers current pulses variable from 20A to 150A, pulse widths variable from 15µS to 5mS, with rise times and fall times of 5µS to 1mS, and pulse repetition frequencies variable from single shot to 5 KHz with duty cycles limited by total power dissipation.

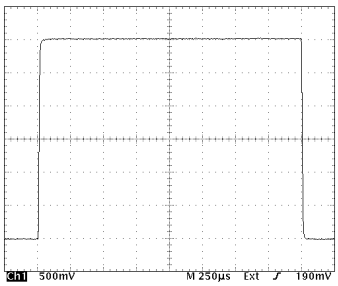
A microprocessor-controlled front-panel and RS-232 interface provide individual control of each electronic function, while the backlit display provides immediate visual confirmation of all operating parameters, including output current setpoint and amplitude, pulse width, repetition frequency, duty cycle, and error and fault messages. The front panel controls allow the user to set pulse width and frequency independently, or to set frequency and duty cycle, which then sets the pulse width accordingly. The front panel display monitors both the set points, and the actual current delivered to the diode. Analog current and voltage monitors and a synchronization output are also provided for monitoring of the current and voltage to the laser diode. In addition to stand-alone operation, the PCX-7450 can be externally triggered.

Pulse rise and fall times can be set independently from the front panel. Each can be independently adjusted in the range is 5µS to 1mS. The rise and fall are linear ramps.

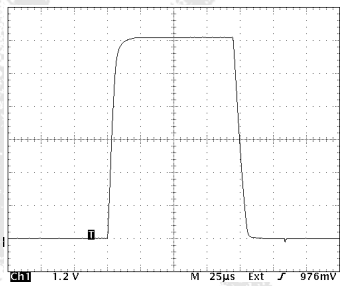
Connection to the laser diode is made through an innovative front panel, low impedance, high current stripline cable, designed to preserve the fidelity of high-speed, large-amplitude current pulses. The output connector is interlocked, so that the PCX-7450 is disabled when the connector is removed.

The PCX-7450 features advanced circuitry to protect both the diode and driver. At turn on, and at any time the driver is not pulsing, the PCX-7450's output is electronically shorted to ground, ensuring that no current flows through the diode except during the on period of the pulse. In addition, the actual current through the diode is monitored in real-time. If the actual current ever exceeds the user-adjustable current set point, the driver truncates the output current pulse, electronically shorts the output to ground, and displays an error message on the front panel display. In addition, the PCX-7450 has a factory-set hardware-controlled current-limit and an independent, user adjustable current limit. This provides a fail-safe mechanism to prohibit the user from setting the current amplitude set point above the user-controlled current limit..

Safety features of the PCX-7450 include a laser enable key-switch, an output cable safety interlock, remote interlock, and delayed output enable.



2mS Pulse, 150A, 100V Output
250µs/Div horizontal scale,
25A/Div vertical scale



6.5µS Rise, 9µS Fall
150A, 100V Output
25µs/Div horizontal scale,
25A/Div vertical scale

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DIRECTED ENERGY INCORPORATED

PCX-7450

150A QUASI-CW LASER DIODE DRIVER/PULSED CURRENT SOURCE

SPECIFICATION

PARAMETER	PCX-7450
Output Pulse Amplitude Range	20A to 150A
Output Current Resolution	0.1A
Accuracy At ~25A Set point	1%
Pulse Rise Time	Adjustable 5µS to 1mS
Pulse Fall Time	Adjustable 5µS to 1mS
Pulse Width	15µS to 5mS (Measured from beginning of rise to the of fall)
Frequency Range	Single Shot or 0.1Hz to 5kHz
Maximum Duty Cycle and Average Current	2% at 150A, 3% at 100A, 20% at 15A. The max. average output power is 300W, and the average current cannot exceed 3A.
Propagation Delay	Less than 2µS to start up ramp
Output Pulse Width Stability	~±0.5% at 1mS pulse width, 125A at 120V output voltage
Output Pulse Amplitude Stability	~±0.5% at 1mS pulse width, 125A at 120V output voltage
Output Pulse Flatness	~±0.1% at 1mS pulse width, 125A at 120V output voltage
Over/undershoot	<2%
Jitter	<10nS shot-to-shot
Output Connector	8 Pin High Current D-sub
COMPLIANCE VOLTAGE	
Range	5V to 120V
Resolution	1V
OVER CURRENT LIMIT	
Range	20A to 150A
Resolution	0.1A
TRIGGER IN	
Trigger Input	TTL or +5V ±1V, into 50Ω or 1kΩ, user selectable
Minimum Trigger Pulse Width	500ns
Input Trigger Connector	BNC, Front Panel
SYNC MONITOR OUTPUT	
Sync Monitor	TTL output into 50Ω
Sync Monitor Connector	BNC, Front Panel
CURRENT MONITOR OUTPUT	
CVR Monitor	50A/1V, typically within 0.5% of the displayed actual current
CVR Monitor Connector	BNC, Front Panel
VOLTAGE MONITOR OUTPUT	
Voltage Monitor	25V/1V, typically within 1% of the actual voltage
Voltage Monitor Connector	BNC, Front Panel
GENERAL	
Input AC Power	120-240VAC Nominal, 50/60Hz
Dimensions (H X W X D)	19" Rack Mountable, 3 1/2" x 17" x 16"
Weight	Approx. 20 lbs
Cooling	Air
Operating Temperature Range	10C to 35C
Safety	Complies with CDRH US21 CFR 1040.10

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