

# PCX-6220 150A 40V QUASI-CW LASER DIODE DRIVER/PULSED CURRENT SOURCE



- Output Current Up To 150A
- Output Voltage Up To 40V
- 6kW Peak, 1.2kW Average Output Power
- Pulse Width < 50µs to 20ms
- 5KHz Maximum Frequency
- 50% Maximum Duty Cycle
- IEEE-488 (GPIB) and RS-232 Computer Interfaces

The PCX-6220 is an air-cooled, high power switch-mode pulsed current source designed to drive diode lasers, bars and arrays. It delivers current pulses variable from 1A to 150A, pulse widths variable from <50µs to 20ms, and pulse repetition frequencies variable from single shot to 5KHz at duty cycles up to 50%.

A microprocessor-controlled front-panel and RS-232/IEEE-488 interface provide individual control of each electronic function, while the backlit alphanumeric LCD display provides immediate visual confirmation of all operating parameters, including output current amplitude, pulse width, repetition frequency, duty cycle, and error and fault messages. In addition to stand-alone operation, the PCX-6220 can be externally triggered.

The output voltage, output current and average output power are continuously displayed on the front panel display. Instrument-quality analog current and voltage monitors and a synchronization output are also provided for real-time monitoring of the current and voltage to the laser diode.

Internal DC power supplies provide all necessary support power for the driver, allowing operation on 90-260VAC, 50-60Hz mains. No additional DC power supply or control pulse generator inputs are needed, making the PCX-6220 a complete laser diode driver solution.

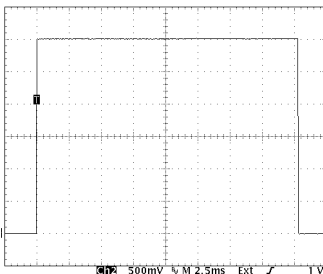
Connection to the laser diode is made through an innovative rear panel, low impedance stripline cable, designed to preserve the

fidelity of high-speed, large-amplitude current pulses. For operator safety, the output connector is interlocked, so that the PCX-6220 is disabled when the connector is removed.

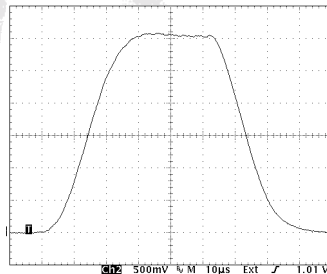
The PCX-6220 features advanced circuitry to protect both the diode and driver. A user-adjustable over-current limit provides a fail-safe mechanism to prohibit the user from setting the current amplitude setpoint above the user-controlled limit, protecting the laser diode from accidental over-drive. An over-voltage limit protects the diode from erroneous over-voltage conditions, and a temperature monitor protects the driver in the event of an over-temperature condition. At turn on, and at any time the driver is not enabled, the PCX-6220's output is electronically shorted to ground, ensuring that no current flows through the diode. In addition, the actual current through the diode is monitored in real-time. If the actual current ever exceeds the user-adjustable current setpoint, the driver truncates the output current pulse, electronically shorts the output to ground, and displays an error message on the front-panel display.

The PCX-6220 is power-factor corrected. The switch-mode design of the current source features low internal stored energy, and offers typical wall-plug to output connector efficiency >70%.

Safety features of the PCX-6220 include a laser enable keyswitch, an output cable safety interlock, remote interlock, and delayed output enable.

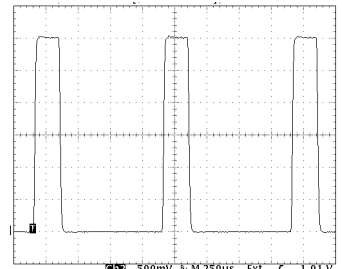


**20ms Pulse, 150A, 40V Output**  
2.5ms/Div horizontal scale,  
25A/Div vertical scale



**50µs Min. Pulse Width**  
**150A, 40V Output**  
10µs/Div horizontal scale,  
25A/Div vertical scale

**20% Duty Cycle.**  
**150A, 40V Output**  
250µs/Div  
horizontal scale,  
25A/Div vertical  
scale



**DIRECTED  
ENERGY  
INCORPORATED**

**SPECIFICATIONS**

PARAMETER	Value
<b>PULSE OUTPUT CURRENT</b>	
Current Amplitude Range	0A to 150A <sup>(1)</sup>
Voltage Polarity	Floating
Maximum Output Voltage	40V
Output Current Resolution	0.5A
Accuracy At $\geq 25A$ Setpoint	1%
Display Resolution	0.5A When the laser is off, the displayed value is the amplitude setpoint; when the laser is on, both the setpoint and the actual measured current are displayed.
Pulse Rise Time	<25 $\mu$ s (10%-90%)
Pulse Fall Time	<25 $\mu$ s (10%-90%)
Pulse Width	50 $\mu$ s to 20ms
Pulse Recurrence Frequency Range	Single Shot to 5KHz
Maximum Duty Cycle and Average Power	50% Maximum, 20% @ 150A, 40V output Maximum average output power is 1200W. Maximum duty cycle is dependent upon output voltage and current, but cannot exceed 1200W average output power or 75A average output current
Over/undershoot	<3%
Settling Time	<25 $\mu$ s (90% to 1% of final value)
Output Ripple	<1.5%
Jitter	<500ns shot-to-shot
Output Connector	High Current DSUB, Rear Panel
<b>CURRENT LIMIT</b>	
Range	10A to 165A
Resolution	1A
<b>TRIGGER IN</b>	
Type	Positive Edge Trigger
Trigger Input	TTL or +5V $\pm 1V$ , into 50 $\Omega$
Minimum Trigger Pulse Width	100ns
Input Trigger Connector	BNC, Front Panel
<b>SYNC MONITOR OUTPUT</b>	
Sync Monitor	TTL output into 50 $\Omega$
Sync Monitor Connector	BNC, Front Panel
<b>CURRENT MONITOR OUTPUT</b>	
CVR Monitor	50A/1V into 1 Meg $\Omega$ , typically within 1% of the displayed actual current
CVR Monitor Connector	BNC, Front Panel
<b>VOLTAGE MONITOR OUTPUT</b>	
Voltage Monitor	10V/1V into 1 Meg $\Omega$ , typically within 1% of the actual voltage
Voltage Monitor Connector	BNC, Front Panel
<b>GENERAL</b>	
Operating Temperature Range	0°C to +40°C
Cooling Requirements	Air cooled
Input AC Power	90-260VAC, 50-60Hz
Dimensions (H X W X D)	8 3/4" H x 17" W x 20" D Rack mount enclosure

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

(1) The current adjustment range is 0A to 150A, however the pulse performance is not characterized at output current less than 10A. Pulse fidelity (i.e. overshoot or ripple) may exceed specifications at current levels less than 10A.

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