

PCX-7410 10A Pulsed/QCW And 5A CW Laser Diode Driver



- 10A Pulsed/QCW and 5A CW maximum output current
- >18V output, drives up to 10 diodes simultaneously
- User-selectable output polarity
- 50ns to 500ms pulse width ranges with 25ns resolution
- 100KHz maximum frequency (internal trigger), 1MHz (external trigger), and single-shot modes
- RS-232 and GPIB computer interfaces
- Store & recall up to 5 system configurations

The PCX-7410 is a high power CW and pulsed current source designed to drive diode lasers, bars and arrays. It delivers current pulses variable from 10mA to 10A, pulse widths variable from 50 nanoseconds to 500 milliseconds with rise times <30 nanoseconds, and pulse repetition frequencies variable from single shot to 100KHz (1MHz when externally triggered) and CW.

The output polarity of the PCX-7410 is user-selectable via the front panel or computer interface, accommodating both common anode and common cathode laser diodes.

The PCX-7410 offers the unique capability of providing both pulsed/QCW and CW (DC) outputs. It can serve as a CW driver at currents from 10mA to 5A, and as a pulsed/QCW driver at currents from 10mA to 10A. Furthermore, the output may be biased to any CW current from 10mA to 5A, then pulsed above this bias current at up to 10A maximum.

The PCX-7410 can be triggered internally from 2 Hz to 100 KHz with three-digit frequency resolution. External and single-shot (front panel push-button) trigger modes are also supported. In external trigger mode, the maximum trigger frequency is 1MHz.

The PCX-7410 may be operated through its intuitive front panel controls. The backlit display provides immediate visual confirmation of all operating parameters, including output CW and pulsed current setpoints and amplitudes, 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. An analog current monitor and a synchronization output are provided for monitoring of the current to the laser diode.

For automated applications, complete control of the driver is provided through both an RS-232 and a GPIB computer interface. Up to five system configurations may be stored in internal non-volatile memory, providing instant recall of frequently-used configurations.

Connection to the laser diode is made through an innovative rear panel, low impedance ribbon cable, designed to preserve the fidelity of high-speed, large-amplitude current pulses. The output connector is interlocked, so that the PCX-7410 is disabled when the connector is removed.

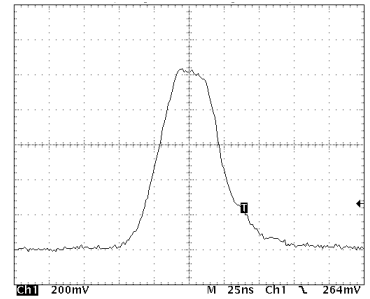
The PCX-7410 features advanced circuitry to protect both the diode and driver. At turn on, and at any time the output is not enabled, the PCX-7410's output is electronically shorted to ground, ensuring that no current flows through the diode. In addition, the PCX-7410 has independent, user-adjustable current and voltage limits. These provide fail-safe mechanisms to prohibit the user from setting the current amplitude setpoint above the user-set current limit or from operating above the user-set voltage limit.

Safety features of the PCX-7410 include a separate laser enable switch, an output cable safety interlock, remote interlock, and delayed output enable.

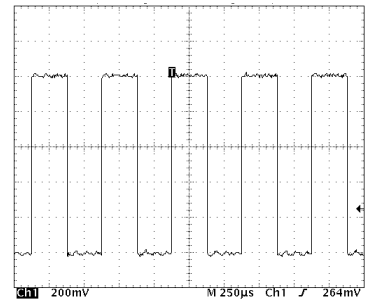
SPECIFICATIONS

PARAMETER	VALUE
PULSE OUTPUT	
Polarity	Positive or Negative, user-selectable via front panel or computer interface
Current Range	10mA to 10A
Maximum Voltage	>18V
Maximum Duty Cycle	95% in pulsed mode at full current, CW (DC) at up to 5A
Pulse Current Resolution	10mA
Pulse Rise Time	<30ns (10%-90%)
Pulse Width	50ns to 500ms and CW
Pulse Width Resolution	25 Nanoseconds below 1 Microsecond 50 Nanoseconds from 1 Microsecond to 10 Microseconds 3 Digits Above 10 Microseconds
Pulse Recurrence Frequency	Single Shot, 2Hz to 100KHz internal, >1 MHz externally triggered ⁽¹⁾
Frequency Resolution	3 Digits
Frequency Accuracy	25ppm
Over/undershoot	<5%
Rate Jitter, 1 st Sigma	30E-9 x Rate Period
Ripple	<1%
Output Connector	DB37 with a stripline connector, rear panel
CW (DC) BIAS CURRENT	
Current Range	10mA to 5A
Maximum Voltage	>18V
Bias Current Resolution	10mA
Bias Ripple	<0.5% of maximum
MONITORS	
Sync Monitor	TTL output into high impedance
Sync Monitor Connector	Type BNC, Front Panel
Current Monitor	20A/1V into 50Ω
Current Monitor Connector	BNC, Front Panel
FAULTS	
Faults (Displayed On the Front Panel/Computer Interface)	Interlock, Pulse Over-current, CW Over-current, Power Supply Limit, Over-voltage, Over-temperature
TRIGGER INPUT	
Format	TTL into 50Ω
Minimum Trigger Pulse Width	100ns
Input Trigger Connector	BNC, Front Panel
GENERAL	
Control Modes	Front Panel, RS-232, GPIB
Interlock	Rear Panel DB-15 (Control Port) and magnetic sensor for DB-37 connector
Input AC Power	90-240VAC, 50/60Hz
Dimensions (Approximate)	8.5"W x 3.5"H x 13"D
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE	

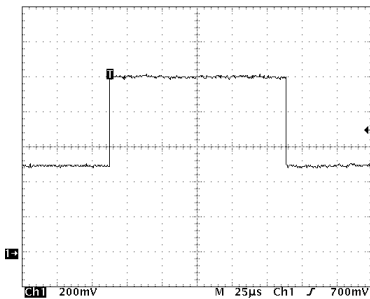
⁽¹⁾ At pulse repetition frequencies >1MHz, duty cycle should be limited to <50%.



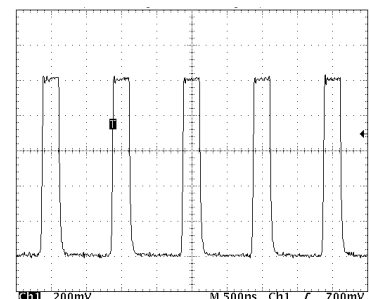
50ns Minimum Pulse Width, <30ns Rise And Fall Times, 10A Output (2A/Vert. Div.)



50% Duty Cycle, 250µs Pulse Width, 2KHz Freq. 10A Output (2A/Vert. Div.)



10A, 126µs Pulse On 5A Bias Current (Ground Indicated By "1" Marker)



1MHz Frequency (Externally Triggered) 250ns Pulse Width, 10A Output (2A/Vert. Div)

