

### PCM-7510

FIXED PULSED/CW LASER DIODE DRIVER MODULE



#### Features:

- Output current up to 250 A
- Output power up to 1250 W
- Output voltage up to 120 V
- Touch screen operation
- RS232 computer interface

The PCM-7510 is an air-cooled, high power pulsed current source designed to drive laser diodes, bars and arrays. It delivers current pulses variable from 10 A to 250 A with up to 1250 W of total output power. Pulse widths can vary from 5  $\mu$ s to 5 ms, with rise times and fall times of 2 $\mu$ s to 10 $\mu$ s. An internal trigger provides pulse repetition frequencies from 40 Hz to 6000 Hz.

Operating the instrument is simple utilizing the color touch screen and intuitive graphical user interface. The instrument can also be controlled utilizing an standard RS232 interface with a few simple commands and queries.

The PCM-7510 can be externally triggered and synchronized for applications where multiple pieces of equipment are to be interconnected together and require special triggering and synchronization. Both of these features are provided via two conveniently located BNC connectors on the front panel. To improve interconnect signal integrity and reduce interconnect noise interference, the input impedance of the trigger is selectable for 50 $\Omega$  or 10 k $\Omega$ . The synchronization output pulse is synchronized to the leading edge of the output current pulse and is active independent of internal or external trigger selection.

The PCM-7510 requires two user-supplied power supplies, a +24 V DC and a High Voltage Power Supply. The output current is derived from the high voltage power supply which is connected to a large capacitor bank inside of the instrument.

## Specifications

The PCM-7510 laser diode driver will meet or exceed the following specifications. All specifications are measured with a low inductance strip line interconnect cable to the laser diode, with less than 4nH total inductance:

PARAMETER	VALUE										
<b>PULSE OUTPUT CURRENT</b>											
Amplitude	10 to 250 A resolution 1 A										
Means Of Adjustment	Computer Control and Front Panel Graphical User Interface										
Output Polarity	Positive										
Pulse Width (Adjustable)	[ 5 $\mu$ s to 5 ms ]										
Pulse Rise Time & Pulse Fall Time (rise time 10% to 90%) (fall time 90% to 10%)	<table> <thead> <tr> <th>Output Current (A)</th> <th>Time (<math>\mu</math>s)</th> </tr> </thead> <tbody> <tr> <td>10 – 64</td> <td>&lt; 10</td> </tr> <tr> <td>65 – 89</td> <td>&lt; 5</td> </tr> <tr> <td>90 – 159</td> <td>&lt; 4</td> </tr> <tr> <td>160 – 250</td> <td>&lt; 3</td> </tr> </tbody> </table>	Output Current (A)	Time ( $\mu$ s)	10 – 64	< 10	65 – 89	< 5	90 – 159	< 4	160 – 250	< 3
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Maximum Average Output Power	<table> <thead> <tr> <th>Vforward (V)</th> <th>Output Power (W)</th> </tr> </thead> <tbody> <tr> <td>120 – 100</td> <td>1250 *</td> </tr> <tr> <td>99 – 10</td> <td>( Vforward * 12.5 A ) *</td> </tr> <tr> <td>9 – 5</td> <td>100 *</td> </tr> </tbody> </table> <p>* See SOA graphs</p>	Vforward (V)	Output Power (W)	120 – 100	1250 *	99 – 10	( Vforward * 12.5 A ) *	9 – 5	100 *		
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120 – 100	1250 *										
99 – 10	( Vforward * 12.5 A ) *										
9 – 5	100 *										
Trigger to Output Pulse delay	1 $\mu$ s (typical)										
Output Pulse Ripple/Droop	$\leq$ 1% of output current										
Skew From trigger (internal or external) to the output pulse	Pulse to pulse stability $\leq$ 25 ns										
<b>INTERNAL TRIGGER</b>											
Frequency Range	40 Hz to 6,000 Hz										
Frequency Resolution	40 Hz to 300 Hz : 1 Hz resolution 300 Hz to 5,000 Hz : 100 Hz resolution										
Pulse Width Range	5 $\mu$ s to 5 ms										
Pulse Width Resolution	40 Hz to 300 Hz : 6,400 ns resolution 300 Hz to 2500 Hz : 1,600 ns resolution 2500 Hz to 6,000 Hz : 25 ns resolution										
<b>External Trigger (Input Signal)</b>											
Pulse Recurrence Frequency Range	$\leq$ 6 kHz										
Connector	BNC										
Termination	50 $\Omega$ / 10 k $\Omega$										
Input Voltage Levels	0 to 5 V High = Output to Load. Low = No Output to Load Positive Level Trigger. 5 $\mu$ s to 5 ms pulse width										

## OUTPUT SIGNALS

SYNC Output Located on front of instrument	***See Note 1 BNC 50 $\Omega$ output impedance. 0 – 5 V
IMON Output Located on front of instrument	BNC 0 to 1250 mV into 50 $\Omega$ load. (Corresponds to 0 to 250 A output) 1 A Output Current = 5 mV on IMON output
Pulsed Output Connector Located on rear of instrument	DEI Cable Assembly Part Number 6100-0007. End user should create a 2 layer PCB to interface Molex # 45714-0003. Top contacts: + ; Bottom contacts -

## SAFETY CONTROLS

Front Key Switch	This switch enables/disables the output of the system
Rear Enable signal Located on rear of instrument	BNC connector Normal operation : Shorted Shield to Center Conductor Fault Condition : Shield not connected to center conductor (open)

## COMPUTER CONTROL

RS232	Baudrates supported: 115200 8 data bits. 1 stop bit. No Parity. No hardware handshaking.
Connector	Female DB9. Pinout : 2 = Received Data (to PCM-7510), 3 = Transmit Data (from PCM-7510), 5 =
Located on front of instrument	Ground

## GENERAL

Operating Ambient Temperature	15°C to 35°C
Cooling	Air cooled. (Air flow from the front to the rear of the unit.)
Weight	25.6 pounds (~ 11.6 kg)
Dimensions (H X W X D)	6.7 in. x 7.7 in. x 20.7 in.
Mounting holes	4.5 inches x 20.125 inches (4x clearance holes for 8-32 or M4 screws)

## DC Power Requirements

DC Voltage	+24 $\pm$ 3 V DC
DC Ripple Voltage	$\leq$ 1% of regulated voltage
DC Current	500 mA to 1500 mA
Connector Located on front of instrument	Molex # 42816-0212, with 2 pins Molex # 42815-0042 (14 – 16 AWG wire) Pinout : Pin1 = 24 V; Pin 2 = 24 V return

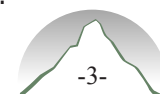
## High Voltage DC Power Requirements

DC Voltage	(Vforward + 5) V to (Vforward + 10) V Acceptable range 10 V to 125 V DC
DC Ripple Voltage	$\leq$ 1% of regulated voltage
DC Current	3 A + $\sim$ 125% of the average output current.
Connector Located on rear of instrument	Molex # 42816-0612, with 6 pins Molex # 42815-0042 (14 – 16 AWG wire) Pinout : Pin1,2,3 = + Vin; Pin 4,5,6 = Vin return

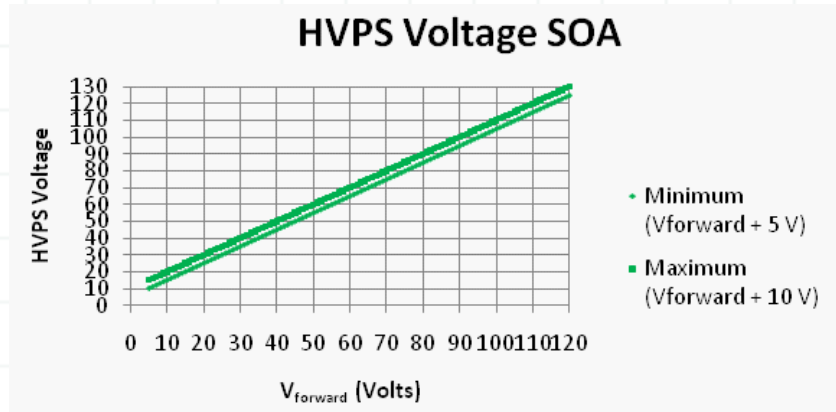
Pre-Production Advanced Information subject to change

NOTE 1: SYNC Output signal follows the internal or external trigger by about 5 ns to 15 ns. This signal coincides with the signals that start the output pulse. The SYNC Output goes from 0V to 5V as soon as the output stage starts to drive the output and falls from 5V to 0V as soon as the system turns off the output pulse. This signal can be used to run multiple systems in parallel by calibrating the external trigger pulses it account for variation in timing within the instrument.

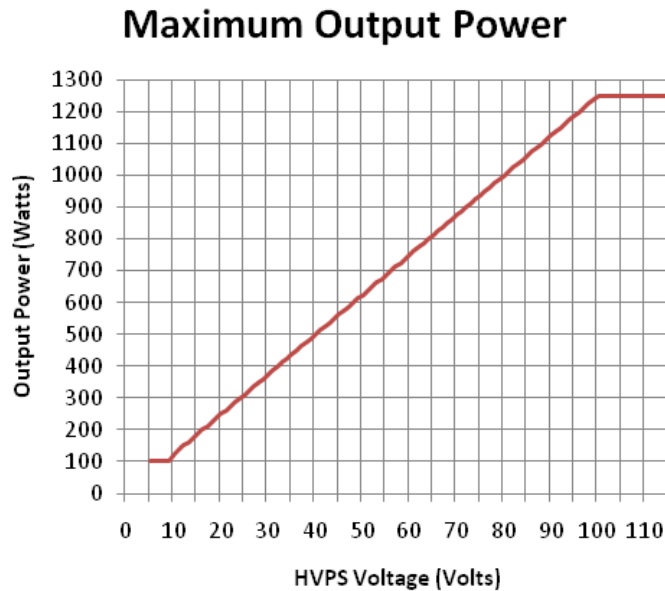
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Sales: **970.493.1901** or [sales@ixyscolorado.com](mailto:sales@ixyscolorado.com)  
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## Safe Operating Area



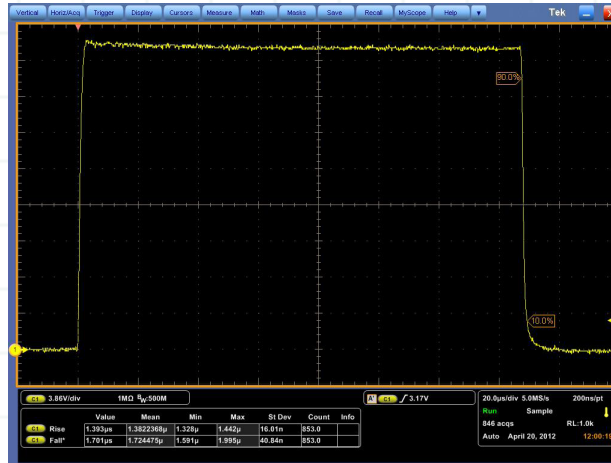
The "HVPS Voltage SOA" graph shows the full range of adjustability for the HVPS that is set based on the forward voltage of the laser being driven. Operation of the instrument outside of this range can result in permanent damage to the instrument, laser or both.



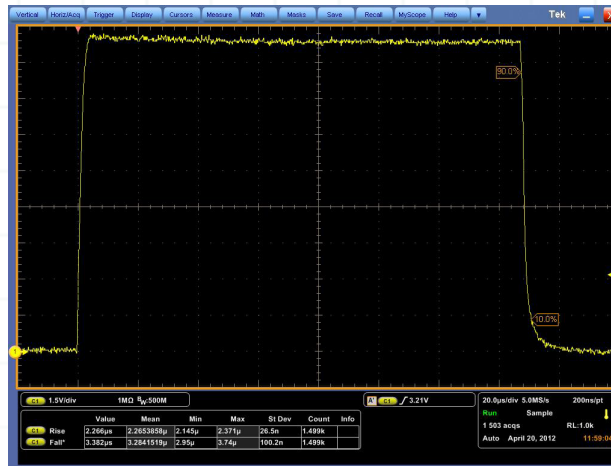
The graph above shows the maximum output power of the instrument for all HVPS voltage settings. Operation of the instrument above the graphed limit can result in permanent damage to the instrument, laser or both.

Scope shots of output:

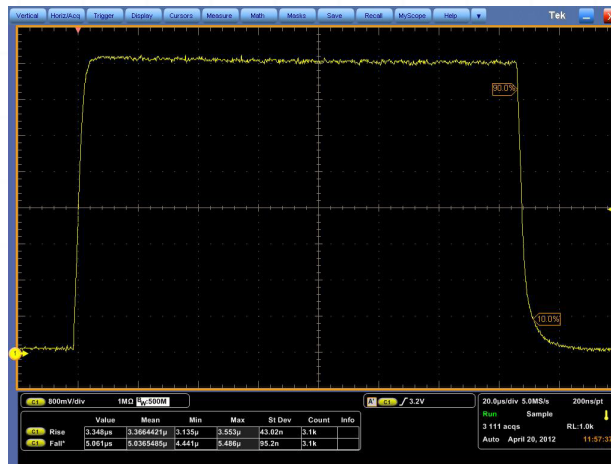
250 A



100 A



150 ns; 50 A



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Technical Support: [techsupport@ixyscolorado.com](mailto:techsupport@ixyscolorado.com)

