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PCX-9000 Series Datasheet

PCX-9000 Series
PULSED/CW LASER DIODE DRIVER



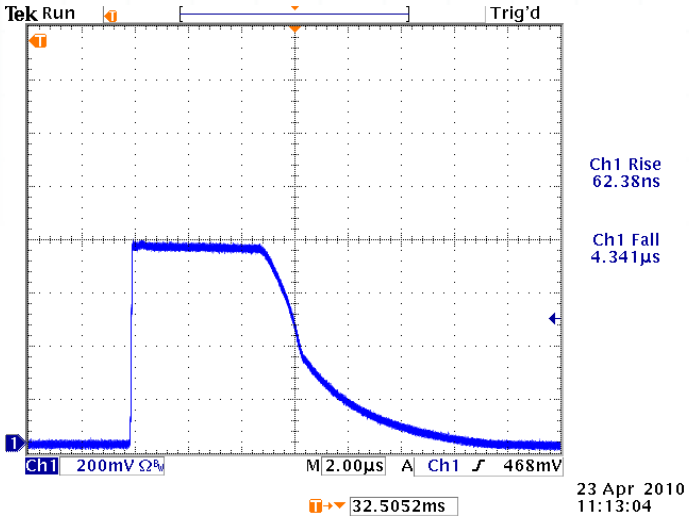
Features:

- Up to 600A of Output Current
- Adjustable 60A bias (simmer current)
- PCX-9600-X 600Amps at 24 Volts
- Internal Trigger 2KHz-25KHz
- External trigger 100KHz
- Pulse widths as low as 100ns(<4nH)
- GPIB, RS232 Ethernet communication included

The PCX-9000 Series of pulsed current sources are designed to drive laser diode bars and arrays as well as other high current applications requiring up to 600A at 24 Volts. The PCX-9000 is currently available in three output configurations, PCX-9200, PCX9400 and PCX-9600 which can drive the output up to 200A, 400A and 600A respectively. All three configurations are capable of supplying a bias current of up to 60A. The PCX-9200 and the PCX-9400 are available with an internal power supply for stand-alone operation or configured for use with an external 24V power supply.

System Overview

The PCX-9000 consists of four basic modules: A Graphical User Interface Board, a Communications Module, the Main Control Board and up to three identical 200 Amp Modules. The Graphical User Interface provides intuitive control of the PCX-9000. It is a microprocessor controlled touch screen that communicates to all modules through a simple combination of front panel controls and touch screen technology within the system. The Communications Module allows the user to use a computer to communicate to the instrument via RS232, GPIB or Ethernet. Communication settings are accessed easily through the touch screen menu and stored in non volatile memory so they are ready to be used upon instrument start up. The Main Control Board is the part of the system that generates Imon, Vmon and Sync outputs; key switch enable control; cable interlock; rear panel enable, bias input and external trigger input. In addition to the control functions, the main control board integrates the user interface, pulse modules, communication module and internal power supply (if equipped). Up to 3 each 200A modules provide the power for the PCX-9000 series.



The PCX-9000 laser diode driver product line will meet or exceed the following specifications. All specifications are measured with a low inductance strip line interconnect cable to the laser diode, less than 4nH total inductance:

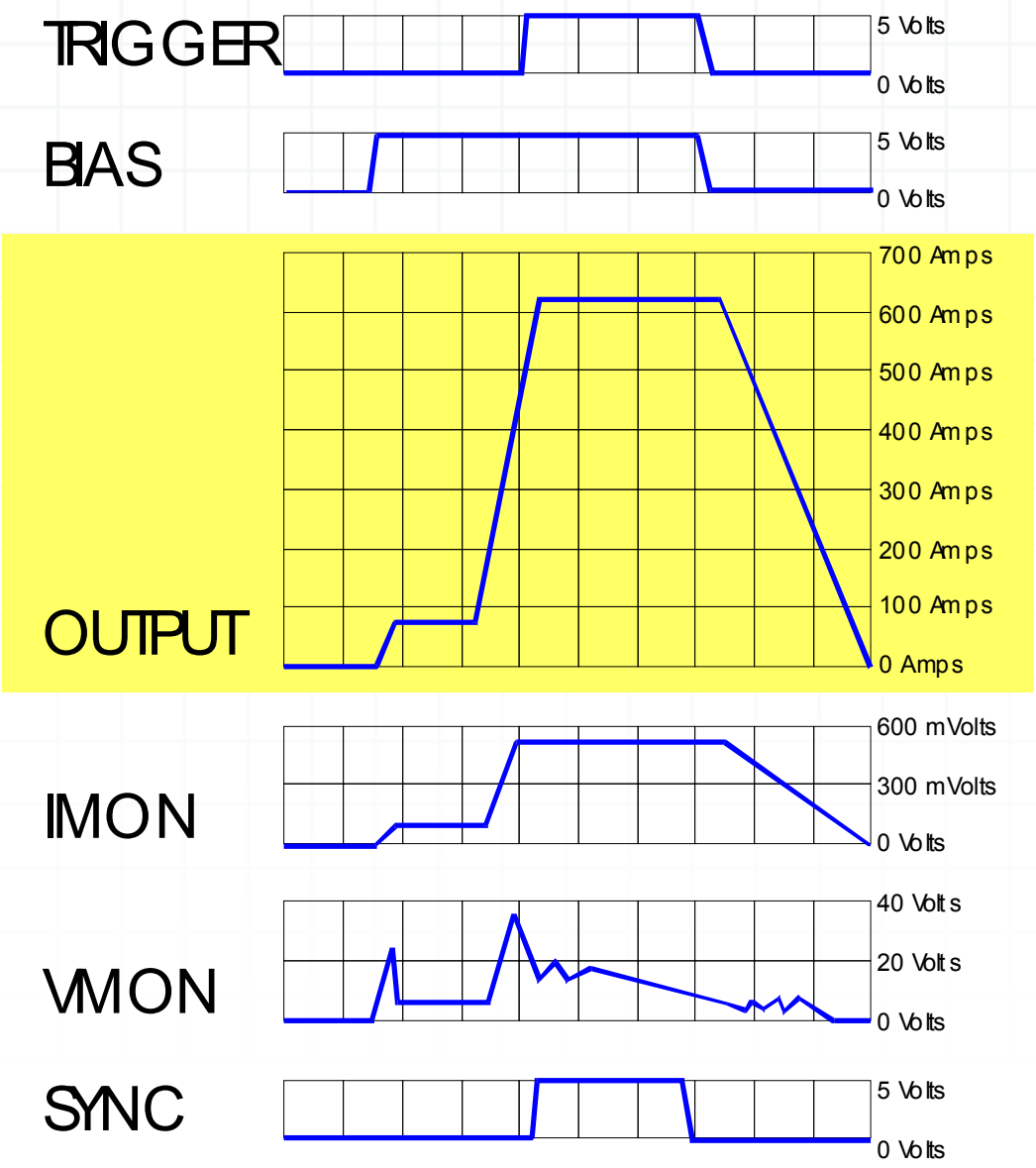
PARAMETER	VALUE
PULSE OUTPUT CURRENT	
Amplitude Range	150 to 600A (+25Amps - 0Amps) PCX-9600 100 to 400A (+25Amps - 0Amps) PCX-9400 50 to 200A (+25Amps - 0Amps) PCX-9200
Means Of Adjustment	Graphical User Interface / Computer Control
Output Polarity	Positive
Pulse Width	Adjustable width that is defined by input 'TRIGGER' Pulse Width. Acceptable Pulse Width >=75nSec
Bias Pulse Width	Adjustable width that is defined by input 'BIAS' Pulse Width logically ORed with the input 'TRIGGER' Pulse Width. Acceptable Pulse Width >= 75nSec
Pulse Rise Time	Fixed rise time < 100 nSec (output transition from 10% to 90% of peak current)
Pulse Fall Time	Fixed fall time <= 5 uSec (output transition from 90% to 10% of peak current)
External Pulse Recurrence Frequency Range	External Trigger <= 100kHz .1mHz to 100kHZ
Internal Pulse Recurrence Frequency Range	2000 Hz to 25kHz
Maximum Duty Cycle	Limited by Maximum Power Output Duty Cycle maximum = ((100%)* X) / ((24V)*(Bias Current + Pulse Current)) X=1200 Watts for internal power supply X=3700 Watts for external power supply
Maximum Output Power	1200 Watts Maximum with internal power supply. AC Voltage = [100 … 264] 3700 Watts Maximum with external supply.
External Trigger to Output Pulse delay	< 200nSec
Output Pulse Ripple/Droop	<=5% of output current
Skew From trigger (internal or external) to the output pulse	Pulse to pulse stability <=5nSec
Output Connector	DEI Cable Assembly Part Number 6100-0007
DIODE FORWARD VOLTAGE	
Vf	24V with internal power supply (Input DC Voltage – 4V) with external power supply
INPUT SIGNALS	
TRIGGER Input	0 to 5V. High = Output to Load. Low = No Output to Load PCB-Mounted BNC
BIAS Input	0 to 5V. High = Output to Load. Low = No Output to Load PCB-Mounted BNC
Type	Positive Level Trigger, 75nS minimum pulse width
Termination	50 Ohms / 10k Ohm Ohms
Input Voltage Levels	0 to 5V
OUTPUT SIGNALS	
SYNC Output See Note 1	50 Ohm output impedance. 0 – 5V

IMON Output	0 to ~550mV into 1M ohm load. (Corresponds to 0 – 600 Amp output) 1 Amp Output Current = ~9.09mV on IMON output
PARAMETER	**VALUE**
VMON	0 to ~50V into 1M ohm load. (Corresponds to 0 – 200 Volts on Output) 100 Volts on the Output = 25.5 Volts on VMON output
SAFETY CONTROLS	
Front Key Switch	This switch enables/disables the output of the system.
Output connector interlock magnetic switch	Without the output connector in place the output of the system is disabled.
REAR INTERLOCK signal	BNC connector Normal operation : Shorted Shield to Center Conductor Fault Condition : Shield not connected to center conductor (open)
COMPUTER CONTROL	
RS232	Baudrates supported: 9600, 19200, 38400, 57600, 115200 8 data bits. 1 stop bit. No Parity. No hardware handshaking.
GPIB	IEEE 488.1 (Supports single instructions and responses)
Ethernet	Supports DHCP and STATIC Addresses
GENERAL	
Operating Ambient Temperature	15C to 30C
Cooling	Air cooled. (Air flow right side to left side while looking at the front of the unit.)
Weight	~19 KG PCX-9600 without integrated AC/DC supply ~18 KG PCX-9400 with integrated AC/DC supply ~16 KG PCX-9400 without integrated AC/DC supply ~14 KG PCX-9200 with integrated AC/DC supply ~12 KG PCX-9200 without integrated AC/DC supply
Dimensions (H X W X D)	7” x 17” x 20”. 19” rack mount 4U
DC Power Requirements	**Only valid for systems that do not have integrated AC/DC supplies.**
DC Voltage	+24VDC -3 +5V (Not required with units that have internal ACDC supplies)
DC Ripple Voltage	<= 1% of regulated voltage
DC Current	[10 Amps … 120Amps] The current sourced by the users DC supply will determine the maximum output current and duty cycle. (see above section)
AC Power Requirements	**Only valid for systems that have integrated AC/DC supplies.**
AC Voltage	90 ~ 264 VAC
AC Voltage Frequency Range	47 ~ 63 Hz
AC Current	17Amps / 115 VAC 8 Amps / 230 VAC
Power Rating	1512 Watts with 100VAC ~ 264VAC (Supplies 24VDC @ 63 Amps) 1360 Watts with 95VAC ~ 99.9VAC (Supplies 24VDC @ 56 Amps) 1200 Watts with 90VAC ~ 94.9VAC (Supplies 24VDC @ 50 Amps)
Manufacture AC/DC Supply	Mean Well
Manufacture Part Number	RSP-1500-24

Pre-Production Advanced Information subject to change

NOTE 1: SYNC Output signal follows the internal or external trigger by about 5 to 15nS. 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 PCX-9xxx systems. Please contact DEI before connecting systems in parallel so that we can assist you.

The following timing diagram is for a PCX-9600 programmed for external trigger, with the customer providing the TRIGGER and BIAS input signals as shown with the output programmed to 550 Amps and the Bias programmed to 75 Amps. The Output Pulse, SYNC, IMON and VMON signals are approximate values.



** VMON output depends on the load and can vary from the above signal diagram. This system is a current controller, voltage is not controlled and is allowed to move so that the desired output current is achieved.

Standard Configurations:

Standard Configurations	I_{out}	Internal Power Supply	AC Line Voltage	External Power Supply No Included
PCX-9200-X	200A	-	Not Required	24V (4kW)
PCX-9200-I	200A	Yes	100-240V 2.5kW	-
PCX-9400-X	400A	-	Not Required	24V (4kW)
PCX-9400-I	400A	Yes	100-240V 2.5kW	-
PCX-9600-X	600A	-	Not Required	24V (4kW)

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