

# PCX-7401 Pulsed Precision Current Source — Datasheet



## Precision Pulse Control

The PCX-7401 offers the capability of providing both pulsed and bias outputs. A modern internal trigger source is capable of two modes of operation: duty cycle and single shot. External trigger is available for additional flexibility.

## Low Inductance Output Cable

Connection to the laser diode is made through an innovative low-inductance stripline cable, designed to preserve the fidelity of high-speed current pulses. The output connector is interlocked so that the PCX-7401 is disabled when the cable is removed.

## Output Protection

The PCX-7401 features advanced circuitry to protect both the laser diode and instrument. At turn on, and at any time the output is not enabled, the PCX-7401's output is electronically shorted to ground, ensuring that no current flows through the laser diode. Safety features of the instrument include a separate output enable key switch, an output cable safety interlock, and an external enable control signal.

## Ease of Setup and Operation

The PCX-7401 may be operated through the intuitive front panel controls. The color LCD provides immediate visual confirmation of all operating parameters.

## Store and Recall User Settings

All system configurations may be stored and recalled in the internal non-volatile memory.

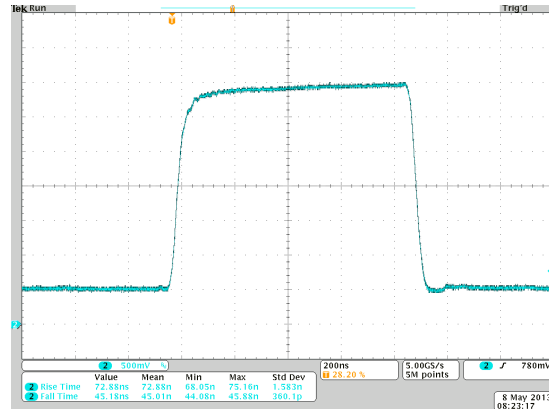
## Complete System Integration

Automated applications can utilize RS-232, USB, or Ethernet computer interfaces.

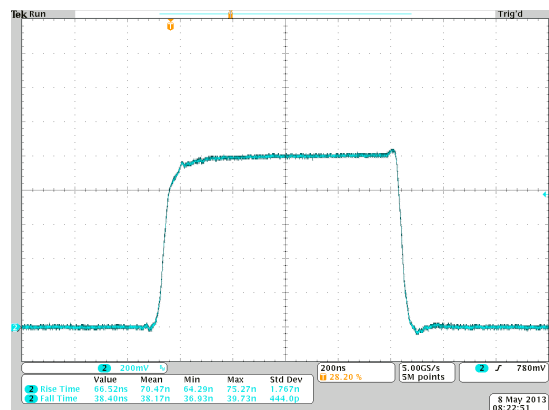
## Ordering Information

PCX-7401	Precision Pulsed Current Source
6045-0003	Output Stripline Cable
6045-0097	Laser Output PCBA
PCA-9550	Current/Voltage Monitor Cable
PCA-9410	BNC Shorting Connector

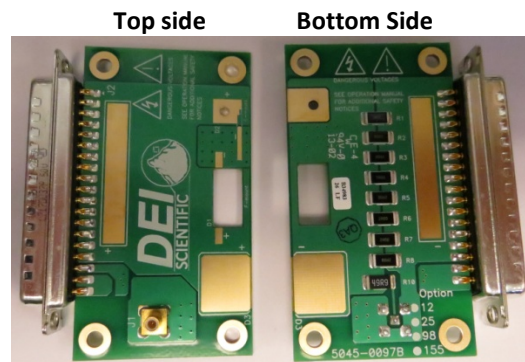
Each PCX-7401 is delivered with a Output Stripline Cable, Laser Output PCBA, Current/Voltage Monitor Cable and BNC shorting connector.



**3.000 A output with 0.500 A bias**



**1.000 A output with 0.000 A bias**



**Laser Output PCBA**

On the laser output PCBA above, the current monitor (J1) has a ratio of 125 mV/A, with a 50  $\Omega$  termination.

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## Pulse Amplitude

Output Current Range	0.000 A to 3.000 A
Setpoint Resolution	0.001 A
Setpoint Accuracy*	± 0.001 A
Compliance Voltage	≤ 15 V
Overshoot	< 2 %
Maximum Output Power	54 W

## Bias Amplitude

Bias Current Amplitude	0.000 A to 0.550 A
Bias Current Resolution	0.001 A
Bias Current Accuracy	± 0.001 A

## Output Parameters

Pulse Width Range	100 ns to DC
Rise/Fall Time	≤ 100 ns
Polarity	Positive

## Internal Trigger

Frequency Range	5 Hz to 1.000 MHz
Frequency Resolution	5 Hz to 995 Hz: 5 Hz 1 kHz to 49.9 kHz: 100 Hz 50 kHz to 1 MHz: 1000 Hz
Frequency Accuracy	± (0.01 x setpoint + 2) Hz
T <sub>jitter(cc)</sub> (cycle to cycle jitter)	≤ 25 ns
Duty Cycle Range	1 % to 99 %
Duty Cycle Resolution	0.01 %
Duty Cycle Accuracy	± (0.01 x setpoint + 2.5) %

## Internal Single Shot Trigger

Pulse Width Range	200 ns to 1.0000 s
Pulse Width Resolution	200 ns to 5,000 ns: 100 ns 6 μs to 1,000 ms: 1 μs
Pulse Width Accuracy	200 ns to 5,000 ns: ± 5 ns 6 μs to 50 μs: ± 100 ns 51 μs to 250 μs: ± 250 ns 251 μs to 500 μs: ± 2 μs 501 μs to 2,000 μs: ± 5 μs 2001 μs to 10,000 μs: ± 50 μs 10,000 μs to 65,535 μs: ± 250 μs 65.536 ms to 100 ms: ± 500 μs 100.001 ms to 1,000 ms: ± 2,000 μs
Pulsed Bias Output**	Main Pulsewidth: Fixed Bias 200 ns to 100 μs: 2 μs 100.1 μs to 350 μs: 10 μs 350.1 μs to 1,000 ms: 25 μs

## Trigger Sync Output

Termination	Requires 50 Ω
Connector	BNC
Output Voltage Levels	0 V to 4.5 V
Delay (sync to output)	~ 100 ns

## External Trigger

Frequency Range	≤ 2,000,000 Hz
Minimum Pulsewidth	100 ns
Delay (external to output)	~ 130 ns
Termination Impedance	50 Ω or 10 kΩ
Connector	BNC
Input Voltage Levels	0 V to 5 V 5 V = Output to load 0 V = No output to load

## Computer Interface

RS232, Ethernet, USB

USB Driver Support	Windows 8, Windows 7, Windows XP, Linux, and MAC OS X
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## General

Power Requirements	47 Hz to 63 Hz 100 VAC to 120 VAC ± 10% 220 VAC to 240 VAC ± 10%
AC Inrush Current (typical)	35 A/115 VAC 70A/230 VAC
AC Connector Type	NEMA C-14
Size (H x W x D)	10.66 cm x 29.21 cm x 51.06 cm
Weight	7.8 kg
Operating Temperature	15° C to 40° C
Cooling	Air cooled
User interface	Color LCD with touch screen

## Notes

\* Current accuracy +/- 1 mA for output currents with pulse frequency below 100 kHz. Current accuracy between 100 kHz and 1 MHz is:  
 $+0 \text{ mA} / -X \text{ mA}$  Where  $X = ((\text{Output frequency in Hz}) * (\text{current setpoint in A}) / 31,000)$

\*\* In single shot mode bias is a fixed pulsewidth before and after the main pulsewidth, as shown above.

Warranty—One year parts and labor on defects in materials and workmanship.

The PCX-7401 current source meets or exceeds these specifications.

All specifications are measured with a low inductance stripline interconnect cable to the laser diode, with less than 4 nH total inductance.

Specifications information subject to change without notice.