

PCM-7140 1A Pulsed Current Source — Datasheet



Precision Pulse Control

The PCM-7140 is a compact pulsed current source designed to drive laser diodes, bars, arrays, or any low-impedance load. The key specifications are output current from 0.1 A to 1 A, rise and fall times below 1 μ s at 1 A, pulse widths from 1 μ s to 100% duty cycle, pulse repetition rates from single shot to 100 KHz, and forward voltage from 0 V to 60 V.

System Operation

The PCM-7140 output current may be set with an internal potentiometer or an external analog voltage. The pulse width and frequency is controlled with an external trigger source.

The system requires two DC power supplies for operation: 12 VDC for housekeeping and a high voltage power supply with voltage \leq 10 VDC above the laser diode's forward voltage.

Input / Output Cable

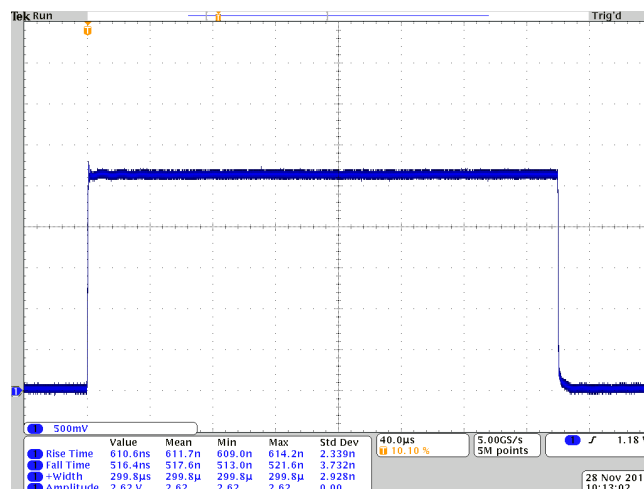
The laser or load is connected to the PCM-7140 with a 100 cm length of 18 AWG twisted pair cable (included). This same cable has the DC input connection from the high voltage power supply.

Liquid Cooling

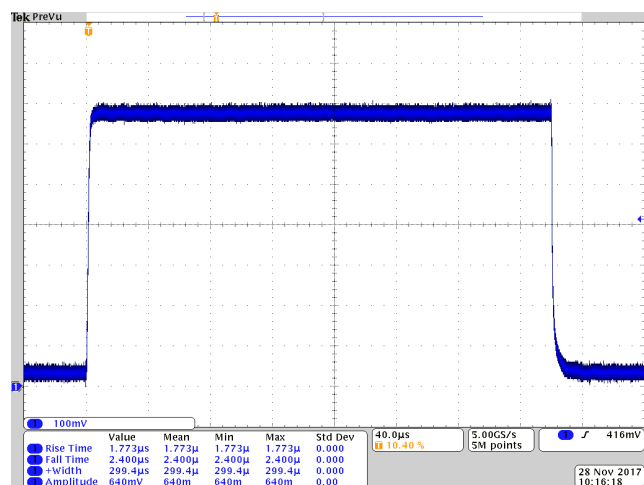
The PCM-7140 module is liquid cooled with a liquid temperature of 11 $^{\circ}$ C to 22 $^{\circ}$ C with a flow rate of 6 liters per minute. The connection type is 3/8" tubing.

Ordering Information

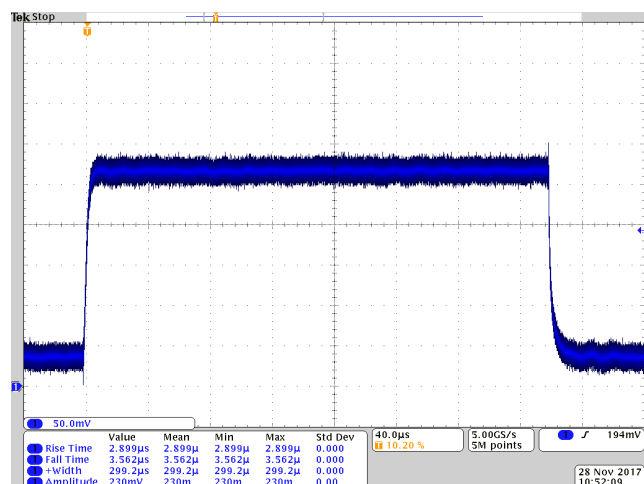
PCM-7140	PCM-7140 Pulser
	DC Input / Output Cable
	Load Board
	Control Board
	Control Signal Cable



1000 mA, 300 μ s pulse width



250 mA, 300 μ s pulse width



100 mA, 300 μ s pulse width

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Pulse Amplitude

Output current range	0.1 A to 1.0 A
Setpoint accuracy	$\pm 1\%$ of full-scale current
Current overshoot	$\leq 1\%$: 0.100 A to 0.499 A $\leq 5\%$: 0.500 A to 1.0 A

Current rise/fall time	$\leq 5\ \mu\text{s}$: 0.1 A to 0.499 A $\leq 2\ \mu\text{s}$: 0.500 A to 1.0 A
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Trigger (J3-Pin 6)

Frequency range	$\leq 100\ \text{kHz}$
100% Duty Cycle	$\leq 1.0\ \text{A}$ * High Voltage = VForward + 5 V
Input voltage levels	0 V, output off 5 V, output on

Termination impedance	50 Ω
Trigger pulse width	1 μs to 100% duty cycle
Delay (external to output)	$\leq 1\ \mu\text{s}$ (typical)

Current Setpoint Control (J3-Pin 4)

Input voltage levels	5 V or open: internal potentiometer control 0 V: external control
Termination impedance	9,000 Ω
Response time on change	$\leq 0.5\ \mu\text{s}$

Analog Current Setpoint (J3-Pin 5)

Input voltage levels	0 V to 2.048 V 0.000 V: 0 A output 2.000 V: 1.0 A output
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Termination impedance	$> 19\ \text{k}\Omega$
Response time on change	$\leq 0.5\ \mu\text{s}$

Current Monitor (J2)

Current monitor	0 V to 0.200 V 1.0 A output current: 0.165 V (typical)
Current monitor termination	50 Ω
Current monitor connector	SMB

Control Signal Connector (J3)

Connector	Molex #70553-0110
Pin 1:	12 V DC
Pin 2:	Return
Pin 3:	Return
Pin 4:	Current setpoint control
Pin 5:	Analog current setpoint
Pin 6:	Trigger

Liquid Cooling

Input Temperature	11 °C to 22 °C
Flow Rate	6 liters/minute
Connection	3/8" tubing, McMaster-Carr # 9336T2

12 V Power Specifications (J3-Pin 1)

Voltage requirements	12 V DC $\pm 5\%$
Current requirements	0.100 A

DC Input / Output Connector (J1)

Connector	TE AMP Connector 1-770974-0
Output +	Pins 1, 2, 3, 4
Output -	Pins 9, 10, 11, 12

DC Input +	Pins 13, 14, 15, 16
DC Return	Pins 5, 6, 7, 8

DC Input Power Specifications

High voltage range	0 V DC to 75 V DC (Max) (load +10 V)
Current requirements	1.2 A

Output Current

0 A to 1.0 A
0 A to 1.0 A

High Voltage requirements

Forward voltage + 10 V DC $\pm 5\%$ ^{*1}
100% Duty Cycle VForward +5 V DC

^{*1} Operation of instrument outside of this voltage can cause permanent damage to the instrument and/or load. Do not exceed 75 V DC.

General

Size (HxWxD)	8.3 cm x 11.0 cm x 13.75 cm
Weight	0.635 kg

Mounting screw size	6-32
Mounting hole placement	See Manual
Operating temperature	10°C to 40°C
Cooling	Liquid cooled

Notes

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

The PCM-7140 current source meets or exceeds these specifications.

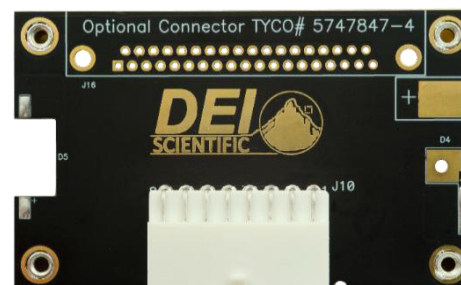
All specifications are measured with 100 cm of 18 AWG twisted pair wire connecting the PCM-7140 to a low impedance/inductance load (HPL-2400-2.653).

Specifications subject to change without notice.

Control Board



Load Board



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Safe Operating Area Graphs

