SI Scientific Instruments GmbH ... the better technology
Roemerstr. 67 | 82205 Gilching/Germany | Phone: +49 8105 77940 | E-mail: info@si-gmbh.de | Web: www.si-gmbh.de

PCM-7140 200A 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 20 A to 200 A, rise and fall times below 10 µs at 200 A, pulse widths from 25 µs to 7.5 ms, pulse repetition rates from single shot to 6500 Hz, and forward voltage from 0 V to 55 V.

System Operation

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

The system requires two DC supplies for operation: 12 V for housekeeping and a voltage ≤ 20 V above the laser diode's forward voltage.

Input / Output Cable

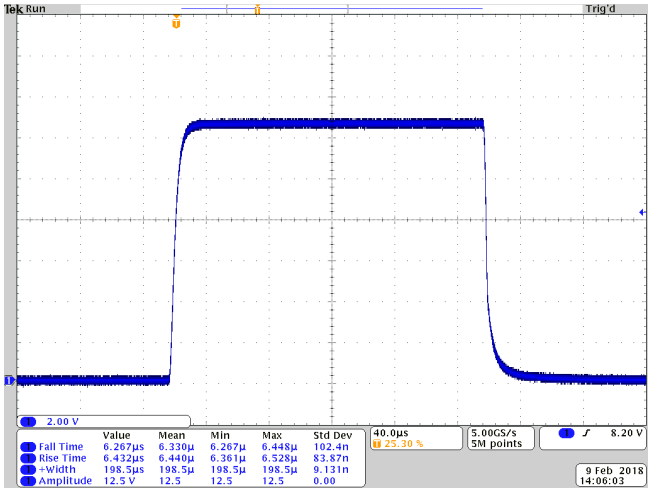
The laser or load is connected to the PCM-7140 with a 100 cm length of 18 AWG twisted pair cable (included). This same cable has the DC input connection from the high voltage power supply.

Liquid Cooling

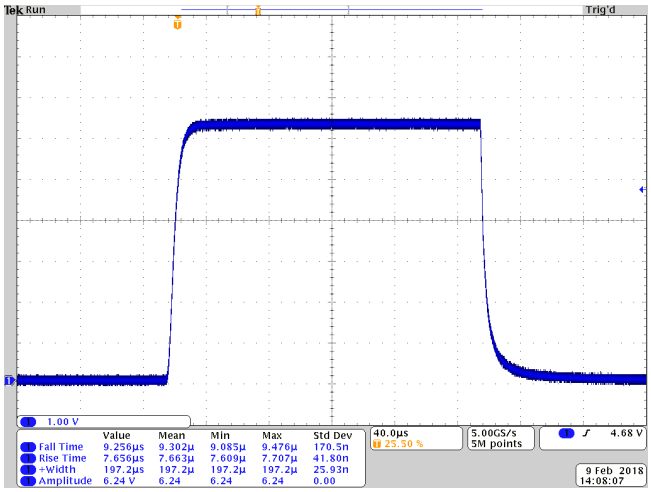
The PCM-7140 module is liquid cooled with a liquid temperature of 11 °C to 22 °C with a flow rate of 6 liters per minute. The connection type is 3/8" tubing.

Ordering Information

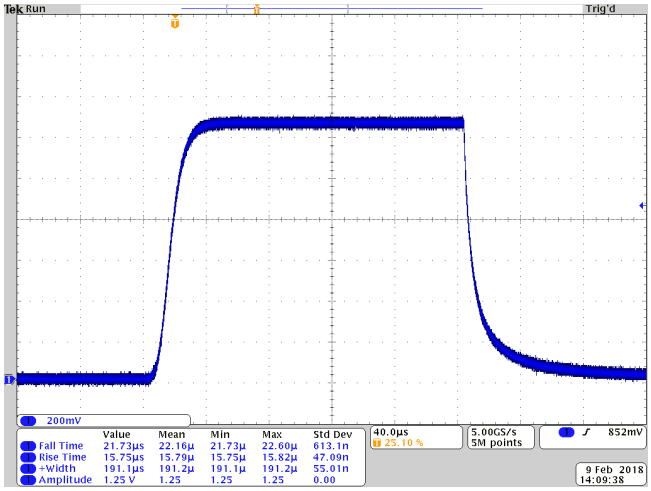
PCM-7140	PCM-7140 Pulser
	DC Input / Output Cable
	Load Board
	Control Board
	Control Signal Cable



200 A, 200 µs pulse width



100 A, 200 µs pulse width



20 A, 200 µs pulse width

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Pulse Amplitude

Output current range	20 A to 200 A
Setpoint accuracy	±1 % of full-scale current
Current overshoot	< 1 %
Current rise/fall time	≤ 20 µs : 5 A to 49 A ≤ 16 µs : 50 A to 99 A ≤ 10 µs : ≥ 100 A

Trigger (J3-Pin 6)

Frequency range	≤ 6500 Hz * See SOA graphs on next page
100% Duty Cycle	≤ 20 A * High Voltage = VForward + 5 V
Input voltage levels	0 V, output off 5 V, output on
Termination impedance	50 Ω
Trigger pulse width	25 µs to 7.5 ms
Delay (external to output)	≤ 1µs (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	≤ 0.5 µs

Analog Current Setpoint (J3-Pin 5)

Input voltage levels	0 V to 2.048 V 0.000 V: 0 A output 2.000 V: 200 A output
Termination impedance	>19 kΩ
Response time on change	≤ 0.5 µs

Current Monitor (J2)

Current monitor	0 V to 0.500 V 200 A output current: 0.500 V (typical)
Current monitor termination	50 Ω
Current monitorconnector	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 ± 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	5 V DC to 75 V DC (Maximum)
Current requirements	20.0 A

Output Current	High Voltage requirements
5 A to 20 A	Forward voltage + 5 V DC ± 5%*1
20.1 A to 99.9 A	Forward voltage + 12 V DC ± 5%*1
100 A to 200 A	Forward voltage + 20 V DC ± 5%*1

*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.

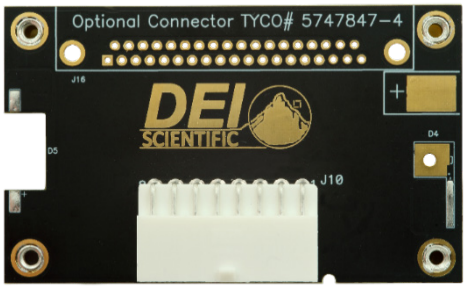
The PCM-7140 current source meets or exceeds these specifications.

All specifications are measured with 100 cm of 18 AWG twisted pair wire connecting the PCM-7140 to a low impedance/inductance load (HPL-2400-0.196).

Specifications subject to change without notice.

Control Board

Load Board



Safe Operating Area Graphs