

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

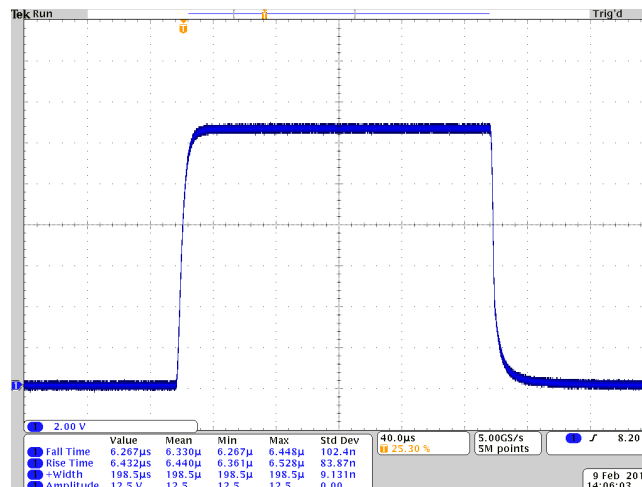
The laser or load is connected to the PCM-7140 with a 100 cm length of 18 AWG twisted pair cable (included). This same cable has the DC input connection from the high voltage power supply.

Liquid Cooling

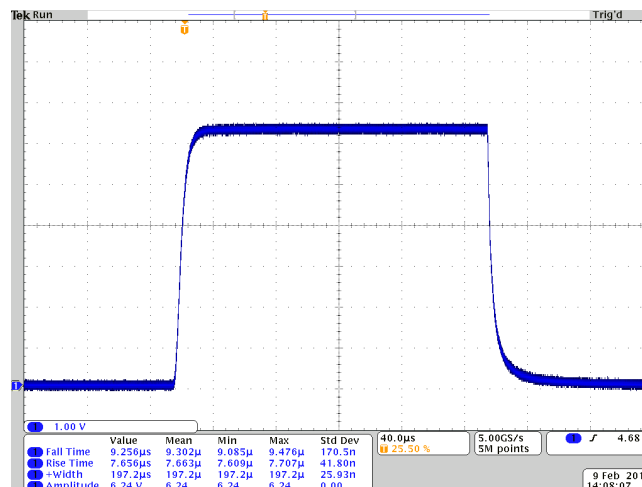
The PCM-7140 module is liquid cooled with a liquid temperature of 11 $^{\circ}\text{C}$ to 22 $^{\circ}\text{C}$ with a flow rate of 6 liters per minute. The connection type is 3/8" tubing.

Ordering Information

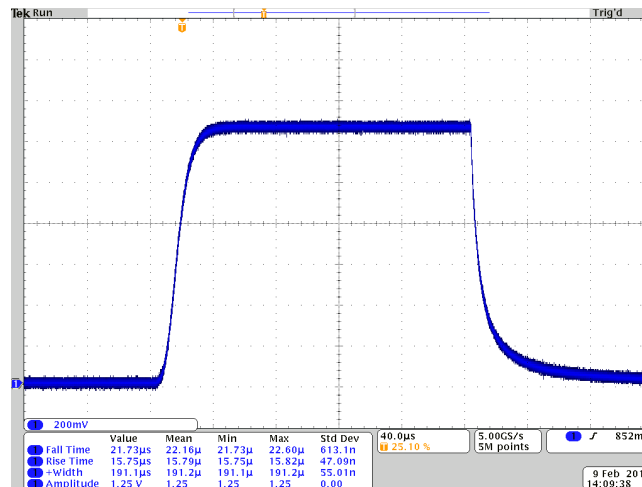
| | |
|----------|-------------------------|
| PCM-7140 | PCM-7140 Pulser |
| | DC Input / Output Cable |
| | Load Board |
| | Control Board |
| | Control Signal Cable |



200 A, 200 μs pulse width



100 A, 200 μs pulse width



20 A, 200 μs pulse width

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 = V _{Forward} + 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) | ≤ 1 μs (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 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 ± 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

| |
|------------------|
| 5 A to 20 A |
| 20.1 A to 99.9 A |
| 100 A to 200 A |

High Voltage requirements

| |
|--|
| Forward voltage + 5 V DC ± 5% ^{*1} |
| Forward voltage + 12 V DC ± 5% ^{*1} |
| 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.

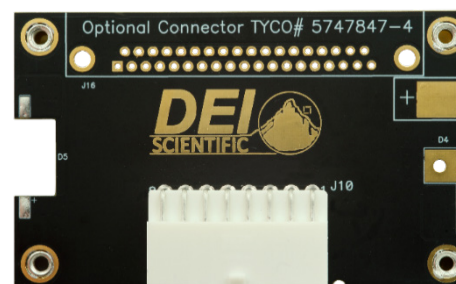
All specifications are measured with 100 cm of 18 AWG twisted pair wire connecting the PCM-7140 to a low impedance/inductance load (HPL-2400-0.196).

Specifications subject to change without notice.

Control Board



Load Board



Safe Operating Area Graphs

