

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

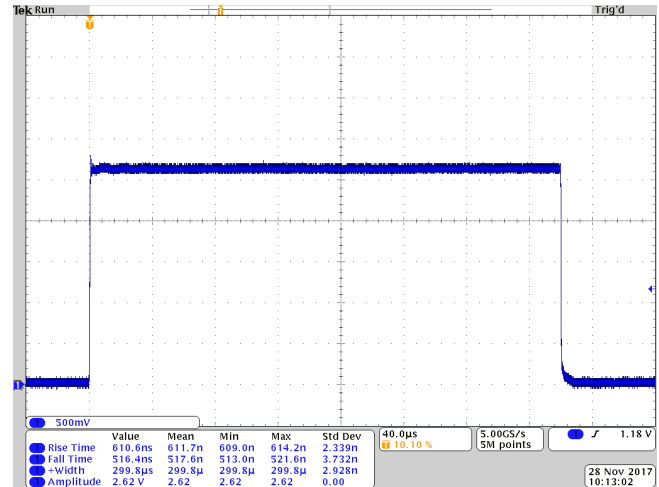
The laser or load is connected to the PCM-7140 with a 100 cm length of 18 AWG twisted pair cable (included). This same cable has the DC input connection from the high voltage power supply.

Liquid Cooling

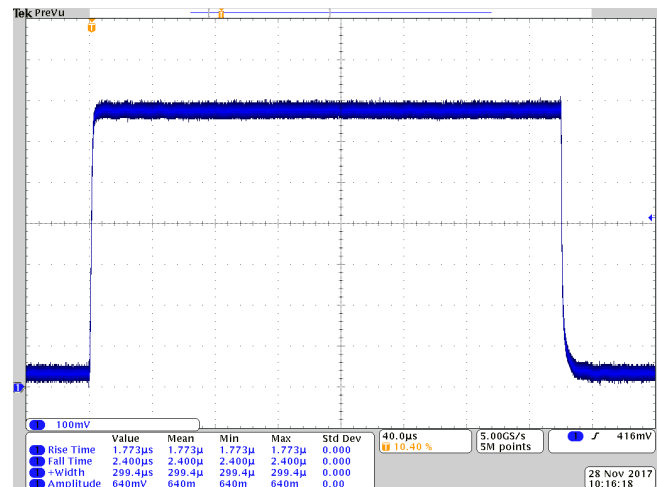
The PCM-7140 module is liquid cooled with a liquid temperature of 11 $^{\circ}$ C to 22 $^{\circ}$ C with a flow rate of 6 liters per minute. The connection type is 3/8" tubing.

Ordering Information

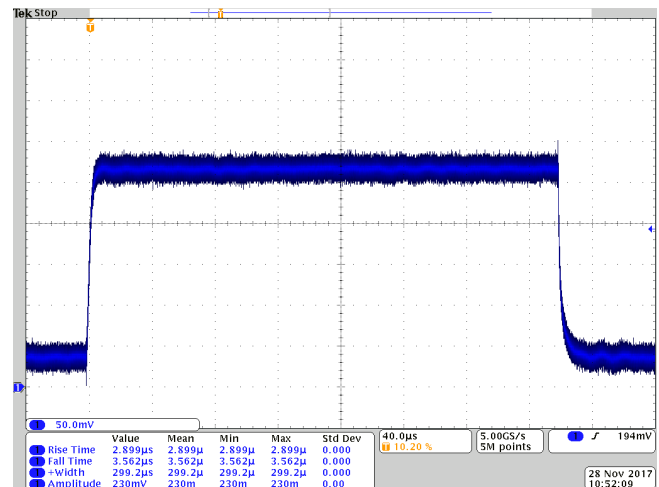
- PCM-7140 PCM-7140 Pulser
- DC Input / Output Cable
- Load Board
- Control Board
- Control Signal Cable



1000 mA, 300 μ s pulse width



250 mA, 300 μ s pulse width



100 mA, 300 μ s pulse width

Pulse Amplitude

| | |
|------------------------|--|
| Output current range | 0.1 A to 1.0 A |
| Setpoint accuracy | ±1 % of full-scale current |
| Current overshoot | ≤ 1 % : 0.100 A to 0.499 A ≤ 5 % : 0.500 A to 1.0 A |
| Current rise/fall time | ≤ 5 μs : 0.1 A to 0.499 A ≤ 2 μs : 0.500 A to 1.0 A |

Trigger (J3-Pin 6)

| | |
|----------------------------|---|
| Frequency range | ≤ 100 kHz |
| 100% Duty Cycle | ≤ 1.0 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 | 1 μs to 100% duty cycle |
| 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: 1.0 A output |
| Termination impedance | >19 kΩ |
| Response time on change | ≤ 0.5 μs |

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 ± 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 ± 5%*1 |
| 100% Duty Cycle V _{Forward} + 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.

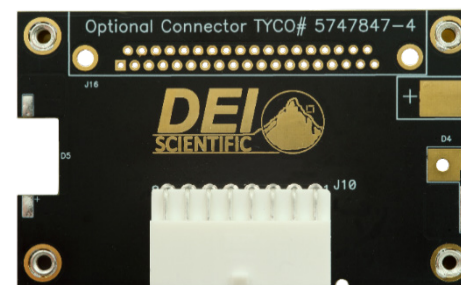
All specifications are measured with 100 cm of 18 AWG twisted pair wire connecting the PCM-7140 to a low impedance/inductance load (HPL-2400-2.653).

Specifications subject to change without notice.

Control Board



Load Board



Safe Operating Area Graphs

