

PCM-7510 Pulsed Current Source — Datasheet



Precision Pulse Control

The PCM-7510 is an air-cooled, high-power current source designed to drive laser diodes, bars, and arrays. The output current can be set from 10 A to 250 A. The pulse width is adjustable between 5 μ s to 5,000 μ s. The internal pulse repetition rate is 40 Hz to 6,000 Hz.

Ease of Setup and Operation

The PCM-7510 may be operated through its intuitive front panel controls. The color touch screen provides immediate visual confirmation and control of all operating parameters.

Complete System Integration

For automated applications, complete control of the instrument is provided through RS-232 computer interface. Up to four system configurations may be stored in internal non-volatile memory, providing instant recall of frequently-used configurations.

Low Inductance Output Cable

The laser diode is connected to the PCM-7510 through a low-impedance stripline cable designed to preserve the fidelity of high-speed current pulses.

Internal or External Gate

Conveniently located front panel BNC connectors allow the PCM-7510 to be externally triggered and synchronized for specialized interconnected equipment applications. The impedance of the gate input is selectable to either 50 Ω or 10,000 Ω . The synchronization output pulse is synchronized to the leading edge of the output current pulse and is active with internal or external gate.

External Power Supplies

The PCM-7510 requires two user-supplied power supplies, a +24 V DC and a High Voltage Power Supply. The output current is derived from the high voltage power supply which is connected to a large capacitor bank inside of the instrument.

Ordering Information

PCM-7510 Module



PCM-7510, 250 A, 150 μ s pulsewidth



PCM-7510, 50 A, 150 μ s pulsewidth

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Pulse Amplitude

| | |
|------------------------|--|
| Output Current Range | 10 A to 250 A |
| Setpoint Resolution | 1.0 A |
| Setpoint Accuracy | ± 1 % of full scale current |
| Current Overshoot | < 2 % |
| Current Rise/Fall Time | ≤ 10 μs for 10 - 64 A ≤ 5 μs for 65 - 89 A ≤ 4 μs for 90 - 159 A ≤ 3 μs for 160 - 250 A |

| | | |
|----------------------|--------------|---------------------|
| Polarity | Positive | |
| Maximum Output Power | Vforward (V) | Output Power (W) |
| See SOA graphs | 120 – 100 | 1250 |
| | 99 – 10 | (Vforward * 12.5 A) |
| | 9 – 5 | 100 |

Internal Gate

| | |
|----------------------|---|
| Frequency Range | 40 Hz to 6,000 Hz |
| Frequency Resolution | 1 Hz from 40 Hz to 299 Hz 100 Hz from 300 Hz to 6,000 Hz |

Tjitt(cc) (cycle to cycle jitter) ≤ 0.025 μs

| | |
|------------------------|---|
| Pulse Width Range | 5 μs to 5,000 μs |
| Pulse Width Resolution | 6400 ns from 40 Hz to 299 Hz 1600 ns from 300 Hz to 2499 Hz 25 ns from 2500 Hz to 6000 Hz |

External Gate

| | |
|---------------------|-----------------------|
| Frequency Range | ≤ 6,000 Hz |
| Trigger pulse width | 5 μs through 5,000 μs |

| | |
|-----------------------|-----------------------------------|
| Input Voltage Levels | 0 V, output off 5 V, output on |
| Termination Impedance | 50 Ω or 10,000 Ω |
| Connector | BNC |

Output Connector

| | |
|----------------------|---|
| DEI Cable Assembly | 6100-0007 |
| Molex connector type | 45714-0003 |
| Output Connector | Top contacts: Positive + Bottom contacts: Negative – |

Control Signals

| | |
|-----------------------------|--|
| Sync Termination | 50 Ω |
| Sync Connector | BNC |
| Current monitor | 0 V to 1.250 V 1 A output current = 0.005 V (typical) |
| Current monitor termination | 50 Ω |
| Current monitor connector | BNC |

Computer Interfaces

| | |
|--|-------|
| Supported interfaces | RS232 |
| Female DB9, pin 2 receive data, pin 3 transmit data, pin 5 ground. | |
| Baud rate 115200, 8 data bits, 1 stop bit, no parity, no hardware handshaking. | |

DC Power Requirements

| | |
|-------------------|-------------------|
| DC Voltage | +24 VDC ± 3 VDC |
| DC Current | 500 mA to 1500 mA |
| DC ripple voltage | ≤ 1% |

Connector on front Molex 42816-0212,
with 2 pins 42815-0042 (14-16 AWG wire)
Pin 1 = +24 V, Pin 2 = 24 V return

High Voltage DC Power Requirements

| | |
|-------------------|--|
| DC Voltage | Vforward +5 V to Vforward +10 V Acceptable range 10 V to 125 V DC |
| DC Current | 3 A + ~125% of average output current |
| DC ripple voltage | ≤ 1% |

Connector on rear Molex 42816-0612,
with 6 pins 42815-0042 (14-16 AWG wire)
Pins 1, 2, 3 = +Vin, Pins 4, 5, 6 = Vin return

General

| | |
|-----------------------------------|---------------------------|
| Size (HxWxD) | 17 cm x 19.6 cm x 52.6 cm |
| 4 Mounting holes #8 or M4 screws, | 11.43 cm x 51.12 cm |
| Weight | 12 kg |

| | |
|-----------------------|------------------------------------|
| Operating Temperature | 15 °C to 35 °C |
| Cooling | Air cooled, fan flow front to rear |

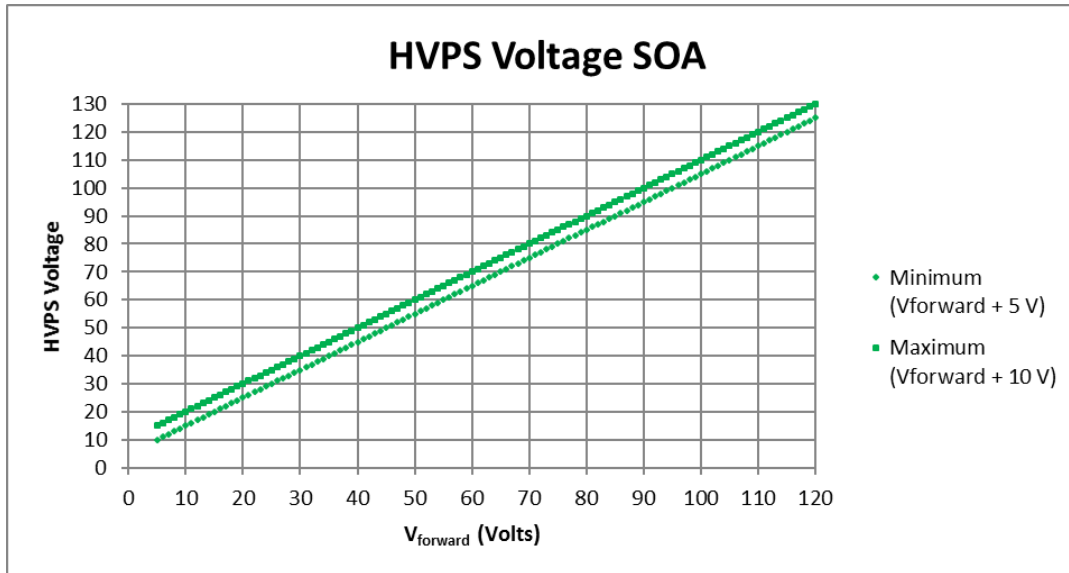
* Operation of instrument outside of the listed compliance voltage and maximum power limits can cause permanent damage to the instrument and/or load. Please see SOA graphs below for more information.

Notes

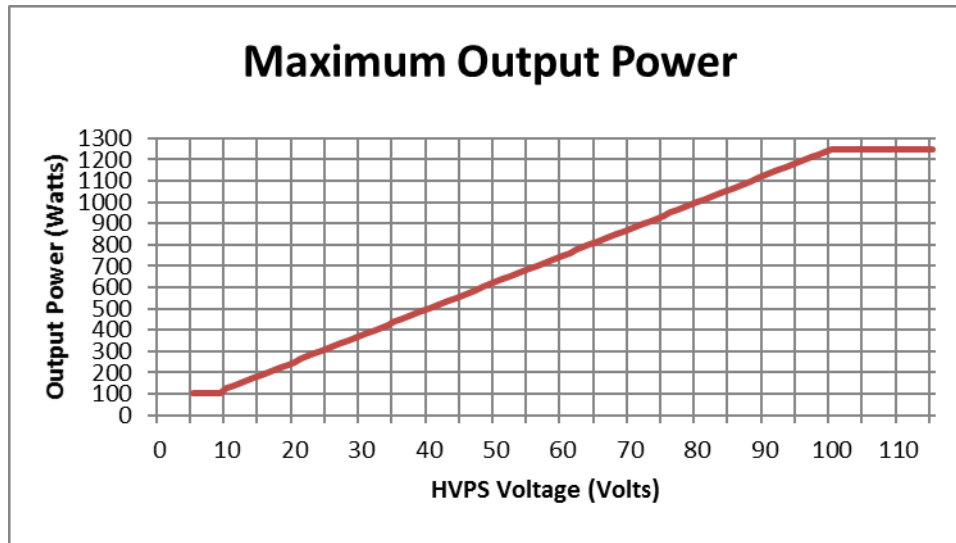
SYNC Output signal follows the internal or external trigger by about 5 ns to 15 ns. This signal coincides with the signals that start the output pulse. The SYNC Output goes from 0V to 5V as soon as the output stage starts to drive the output and falls from 5V to 0V as soon as the system turns off the output pulse. This signal can be used to run multiple systems in parallel by calibrating the external trigger pulses it account for variation in timing within the instrument.

The PCM-7510 current source meets or exceeds these specifications. All specifications are measured with a low inductance strip line interconnect cable to the laser diode. Specifications subject to change without notice.

Safe Operating Area



The “HVPS Voltage SOA” graph shows the full range of adjustability for the HVPS that is set based on the forward voltage of the laser being driven. Operation of the instrument outside of this range can result in permanent damage to the instrument, laser or both.



The graph above shows the maximum output power of the instrument for all HVPS voltage settings. Operation of the instrument above the graphed limit can result in permanent damage to the instrument, laser or both.