PCM-7700 Pulsed Current Source — Datasheet

Precision Pulse Control

The PCM-7700 series of air-cooled, high-power current sources is designed to drive laser diodes, bars, and arrays with up to 200 A of current (load voltage to 25 V). The PCM-7700-48 has a built-in power supply; the PCM-7700-EX connects to an external supply for higher duty cycles. Both models feature pulse widths from 500 µs to 50 ms and pulse repetition rates from single shot to 1 kHz.

System Operation

The PCM-7700 output current may be set with a potentiometer on the included evaluation board or with an analog voltage. The pulse width is controlled by the trigger input.

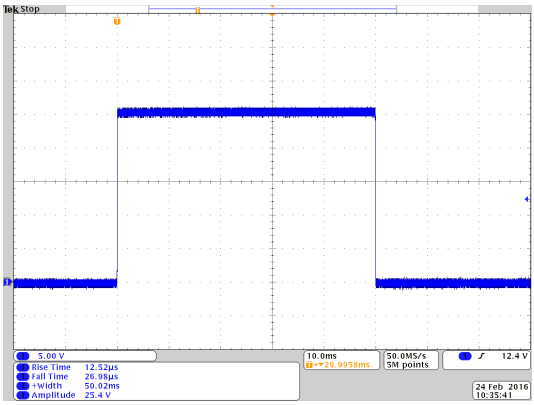
Digital and analog control modes are supported. In digital mode, an input voltage controls the pulse output current and an external trigger signal controls the pulse width. In analog mode, the output current follows the input voltage. Regardless of mode, the instrument must always be operated within the safe operating area (see SOA graphs below).

Complete System Integration

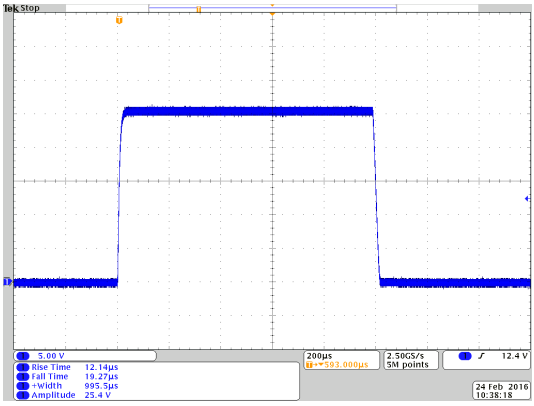
For automated applications, complete control of the instrument is provided through a DB15 male connector.

Ordering Information

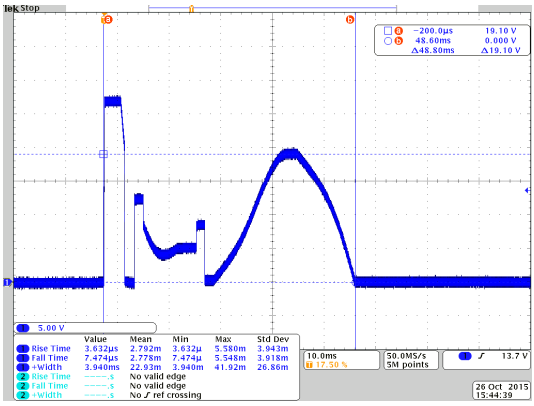
PCM-7700-48 Internal power supply version
PCM-7700-EX External power supply version



PCM-7700-48, 200 A, 50 ms pulse width, 1 Hz into a HPL-2400-0.126 load, Digital Control Mode.



PCM-7700-48, 200 A, 1 ms pulse width, 1 Hz into a HPL-2400-0.126 load, Digital Control Mode.



PCM-7700-48, 200 A full scale, into a HPL-2400-0.126 load, Analog Control Mode using the arb function of a Tektronix AFG3051C.

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Pulse Amplitude

Output Current Range	5 A to 200 A[1]
Setpoint Resolution	0.050 A
Setpoint Accuracy	± 1 % of full scale current
Current Overshoot	< 0.5 % of full scale current
Current Rise/Fall Time	≤ 75 µs (with I_{OUT} > 10 A)
Pulse width	500 µs to 50 ms
Polarity	Positive
Load Voltage	0 V to 25 V PCM-7700-48[2] 0 V to 25 V PCM-7700-EX[2]
Maximum Output Power	See SOA graphs

Gate

Frequency Range	Single-shot to 1 kHz
Input Voltage Levels	0 V: output OFF 5 V: output ON
Gate pulse width	500 µs to 50 ms (Digital Control Mode) 0 to ∞ ms (Analog Control Mode)
Termination Impedance	50 Ω
Connector	DB-15 pin 8

Current Setpoint

Input Voltage Levels	0 V to 10 V 0.000 V = 0 A output 10.000 V = 200 A output
Termination impedance	10 kΩ
Response time on change	≤ 5 µs
Connector	DB-15 pin 6

Enable Signals

Input Voltage Levels	0 V: Enable 5 V or open: Disable
Termination impedance	10 kΩ
Response time on change	≤ 200 ms
Connector	DB-15 pin 4 (EXT ENABLE 1) DB-15 pin 3 (EXT ENABLE 2)

Monitors

Current monitor	5 mV / A 200 A output current = 1.000 V (typical)
Current monitor termination	50 Ω
Current monitor connector	DB-15 pin 2
Voltage monitor	60 mV / V 30 V output = 1.800 V (typical)
Voltage monitor termination	1 MΩ
Voltage monitor connector	DB-15 pin 1

Output Connector

Output Connector	2 x Amp 1-770974-0 Pins 1 through 8 = Out – Pins 9 through 16 = Out +

Power Specifications

Voltage requirements	100 V AC to 240 V AC
Line frequency	50 Hz to 60 Hz
Power requirements	PCM-7700-48 is 1200 W PCM-7700-EX is 250 W
Connector Type	IEC 320-C14

General

Size (HxWxD) Weight	27 cm x 27 cm x 39 cm 15 kg
Operating Temperature	15 °C to 35 °C
Cooling	Air cooled (Air flow from rear to front)

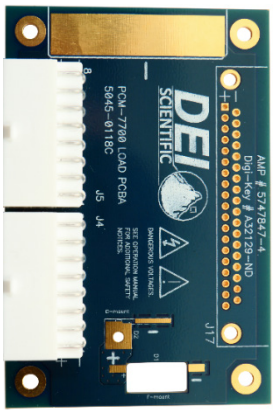
Notes

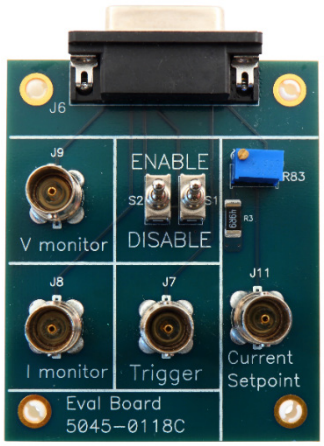
[1]Rise and fall time specifications valid from 10 A to 200 A

[2]Operation of instrument outside of the listed load voltage and maximum power limits can cause permanent damage to the instrument and/or load. Please see the SOA graphs in the manual for more information.

The PCM-7700 current source meets or exceeds these specifications. All specifications are measured using the standard included output cable and a HPL-2400 (low-inductance, high-power resistive load). Load not included. Specifications subject to change without notice.

Included Load Board and Evaluation Board





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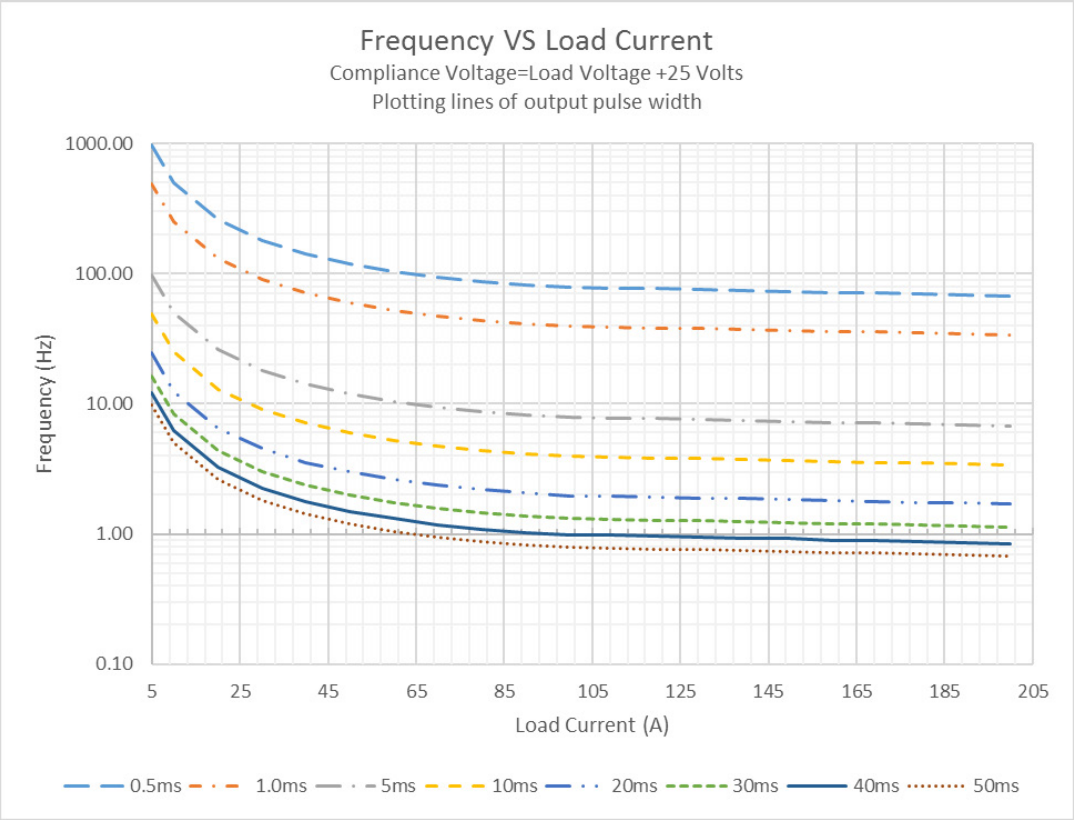
Safe Operating Area Graphs

IMPORTANT: Do not operate the instrument outside of the Safe Operating Area!

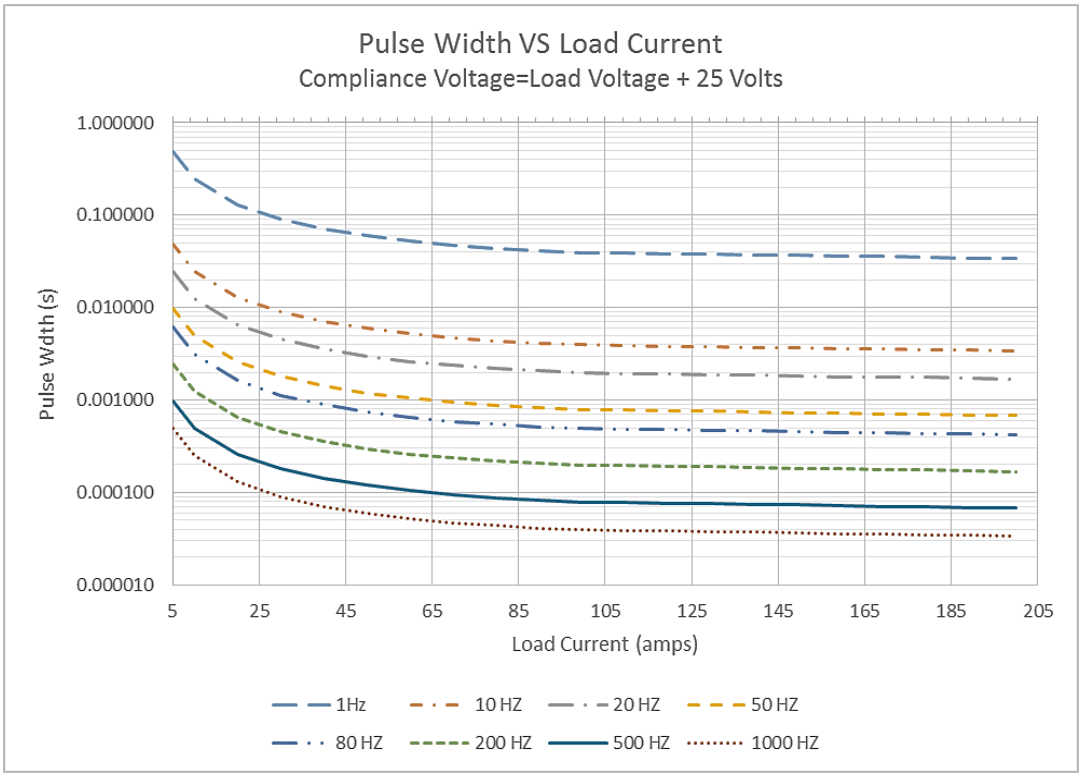
Although the PCM-7700's external triggering system allows it to operate outside the Safe Operating Area, such operation will result in permanent damage to the PCM-7700, the laser diode, or both.

The Safe Operating Area is below the line of each graph. Only operate the instrument in this Safe Operating Area.

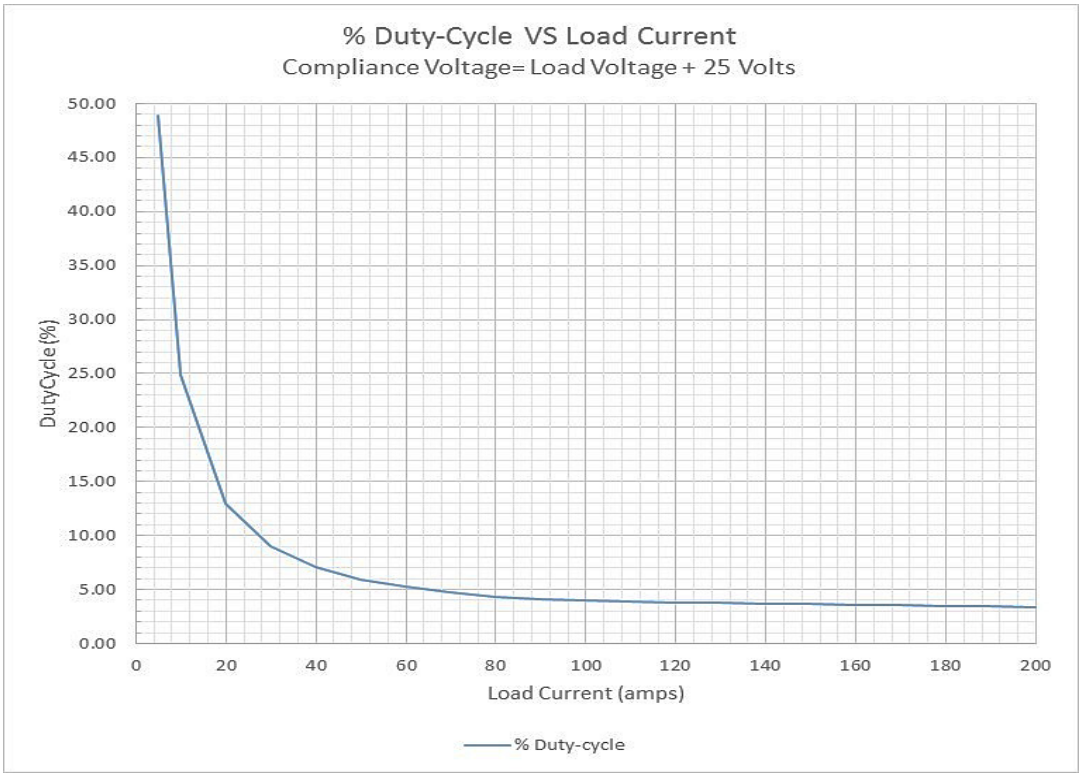


PCM-7700-48

The Safe Operating Area is below the line of each graph. Only operate the instrument in this Safe Operating Area.

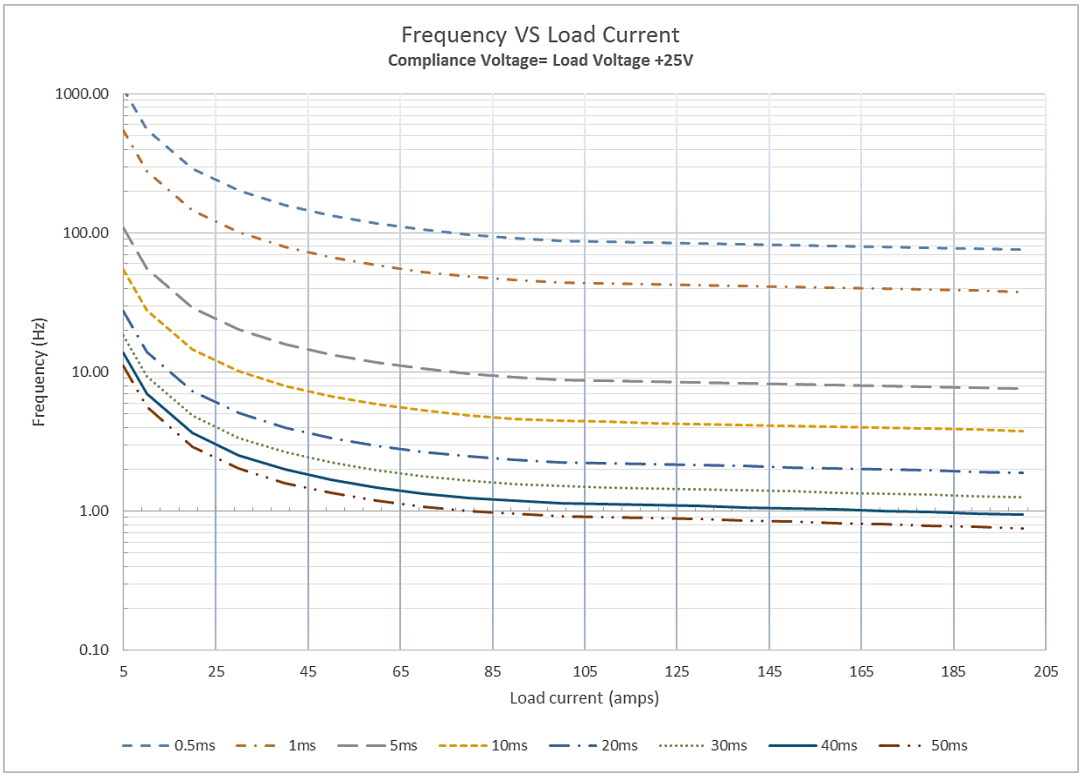


PCM-7700-48

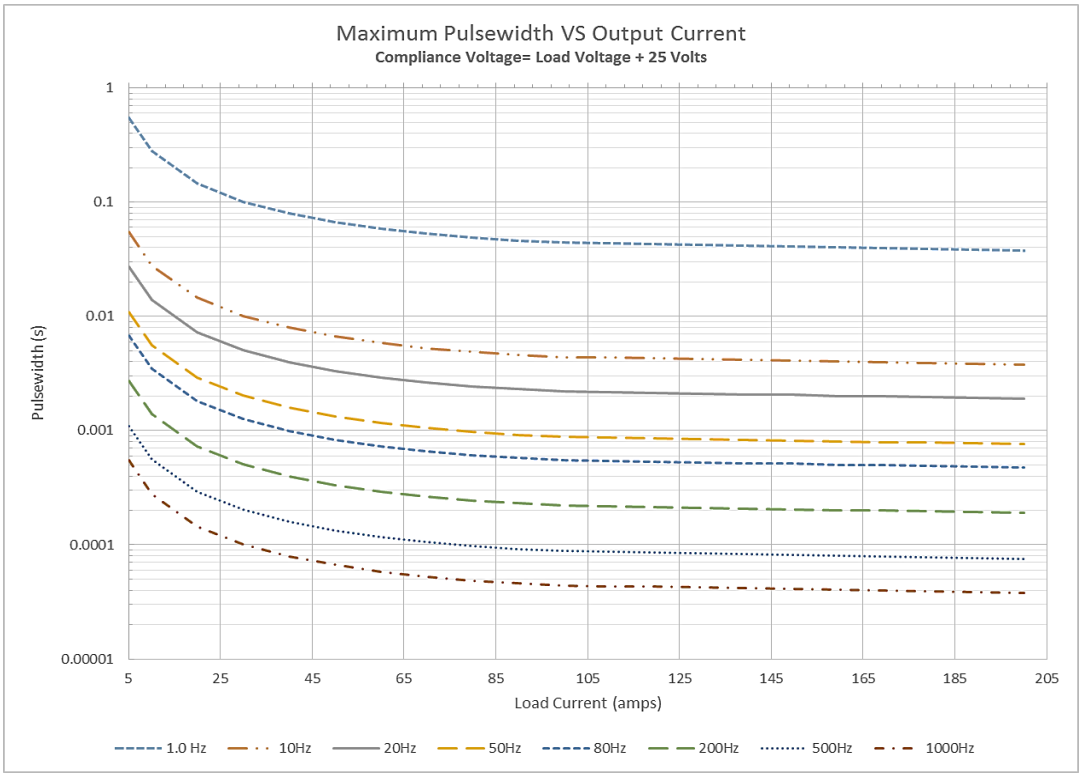


PCM-7700-48

The Safe Operating Area is below the line of each graph. Only operate the instrument in this Safe Operating Area.

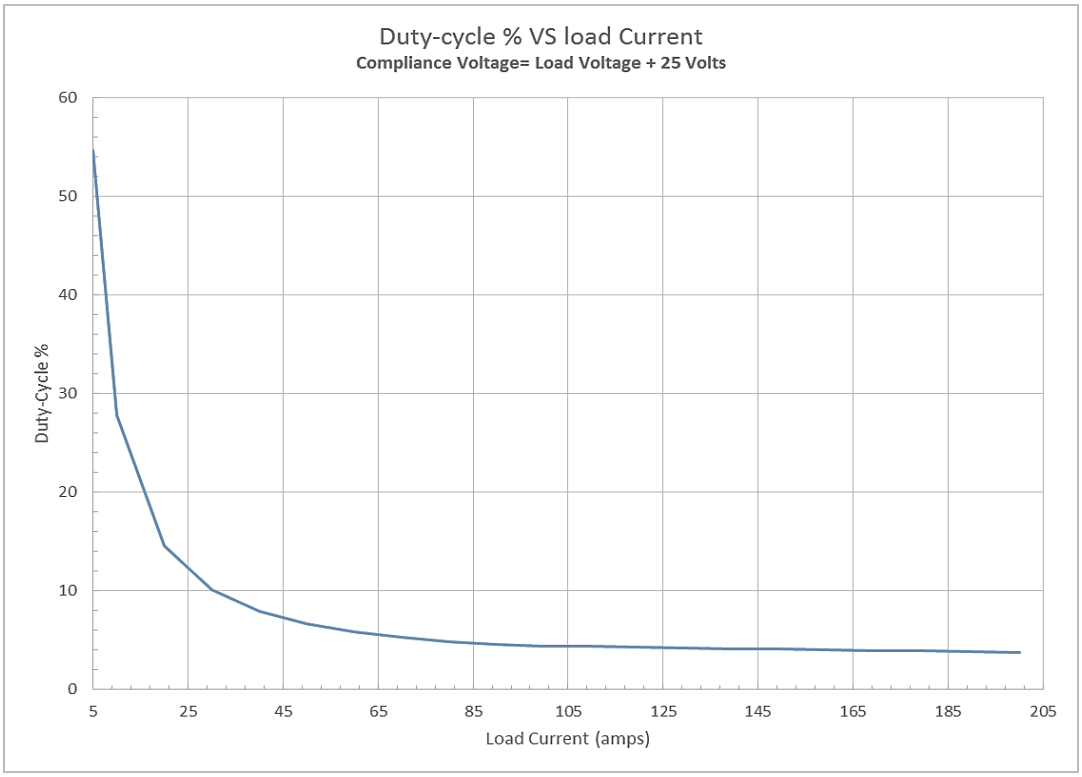


PCM-7700-EX



PCM-7700-EX

The Safe Operating Area is below the line of each graph. Only operate the instrument in this Safe Operating Area.



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