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Measurement of 4-wire Voltage Sense on an LDC-3916 Laser Diode Controller

TECH NOTE

This technical note presents the results of voltage measurements on a typical laser diode control system, and highlights the advantage of the 4-wire voltage sense capability in the LDC-3916 and LDC-3700B Series Laser Diode Controllers.

MEASUREMENT SETUP

The measurement setup is shown in Figure 1. Typical cables were connected from the current source of an LDC-3916 Laser Diode Controller to a resistive load. A special adapter was made for the 9-pin connector on the LDC-3916, so voltages could be measured directly at the connector. The current source was set to drive a constant current through the load. Voltages were measured across the current source (V source), resistive load (V load), and voltage sense connections on the LDC-3916 connector (V sense). Cable lengths, resistor values, and current source setpoints were changed to measure different conditions.

RESULTS

Results are shown in Table 1 for six different conditions. The four wire voltage sense of the LDC-3916 increases the accuracy of the voltage measurement across the load. Increased voltage measurement accuracy translates to better laser diode protection, particularly in test setups with high current drive, and/or long cable runs between the controller and the laser diode.

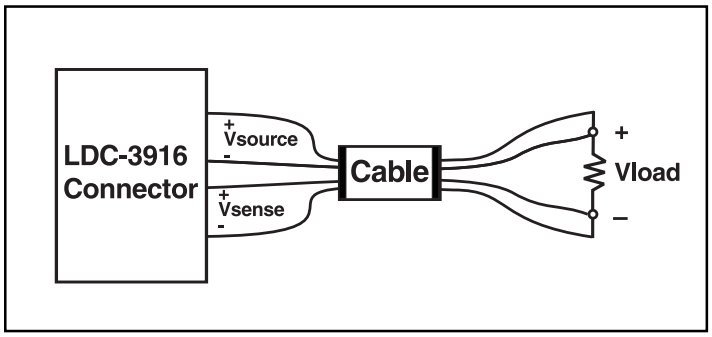


Figure 1. Measurement Setup.

	Current	Load	Cable	V source	V load	V sense
Case 1	250 mA	10 Ω	6 feet	2.66 V	2.50 V	2.50 V
Case 2	500 mA	10 Ω	6 feet	5.26 V	4.99 V	4.99 V
Case 3	1.0 A	5 Ω	6 feet	5.52 V	4.99 V	4.99 V
Case 4	250 mA	10 Ω	16 feet	2.84 V	2.50 V	2.50 V
Case 5	500 mA	10 Ω	16 feet	5.67 V	4.98 V	4.98 V
Case 6	900 mA	5 Ω	16 feet	5.71 V	4.49 V	4.49 V

Table 1. Results from Voltage Measurements.

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