Voltage Drop Across High Current TEC Interconnect Cable

PURPOSE

This ILX Lightwave Technical Note compares the voltage drop across the standard and high-current interconnect cables available from ILX Lightwave, and identifies where each cable should be used.

All ILX current source and TEC interconnect cables are braid shielded, with twisted pair conductors to improve noise immunity. In addition, these cables are designed with mis-matched connector ends (gender and size) to prevent improper connections between the instrument and the device-mounting fixture.

MEASUREMENT SET-UP

A standard TEC cable and a high-current TEC cable were connected to a corresponding temperature control instrument, and then to a known resistive load. Current was sourced to the load, and the voltage drop across the cable was measured using a typical hand-held multimeter.

RESULTS

Table 1 compares the voltage drop measured across a standard cable (CC-505S) and a high-current cable (CC-501H) under two different current conditions. The voltage drop across the high-current TEC cable is roughly one-third of the voltage drop across the standard TEC cable.

All ILX Lightwave TEC interconnect cables use the same pin configurations and can be interchanged freely. However, as the test results show, the CC-501H cable should be used in any situation where voltage delivered to the load needs to me maximized. This becomes especially true when the device-under-test (DUT) and its controller are separated by a significant distance, or when controlling the DUT at higher currents.

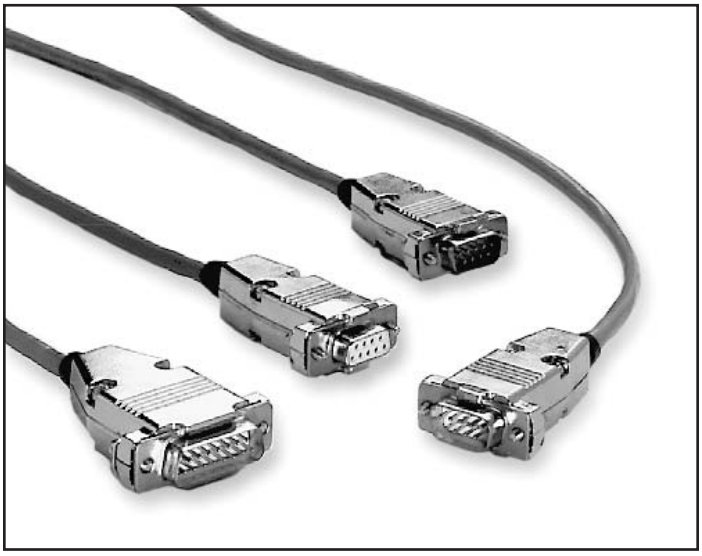

Table 1
Temperature Controller Interconnect Cables

			Voltage Drop	
Model	Notes	Length	3 A	6 A
CC-505S	Standard TEC cable	6 ft	787 mV	1.57 V
CC-501H	High-Current, unterminated	6 ft	257 mV	512 mV