TECH NOTE

USB Communication Speed of the LDX-3500B Laser Diode Driver

OVERVIEW

This technical note reviews the speed of L-I measurements taken from a butterfly packaged laser diode using an LDX-3565B laser diode driver generating 100, 500, and 1000 data points through the USB interface.

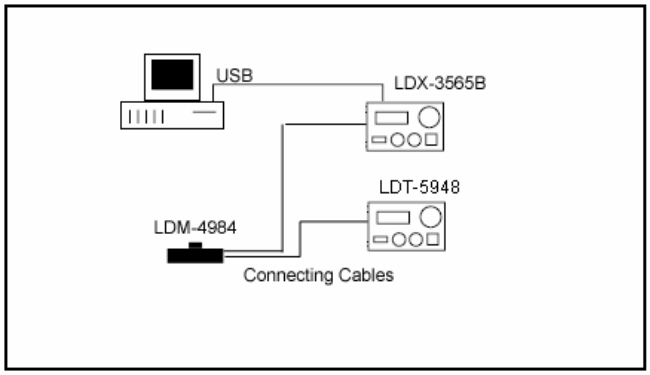

Figure 1. Measurement Setup Diagram

TEST SET UP

The measurement setup is shown in Figure 1. A test program was written in C# to control the LDX-3565B through the USB interface. The test program stepped the output current and recorded the photodiode output power. An LDT-5948 was used to control the internal TEC of the laser diode, which was mounted in an LDM-4984 Butterfly Laser Diode Mount. Testing was performed at a laser diode set temperature of 25ºC.

TEST PROCEDURE

Data was transmitted from a computer via USB 2.0. The program took the difference between the start current and stop current and divided the difference by the number of steps (for this test, 100, 500, and 1000 steps were used) to determine the correct step size. The laser was then turned on at the start current. After a 50ms delay to allow the drive current to settle, the first measurements for internal monitor photodiode (L), and laser diode forward current (I) were recorded from the LDX-3565B. The laser diode's drive current was then increased by one step size, and the process was repeated until the stop current was reached.

RESULTS

The results from this test can be seen in Table 1, which shows the amount of time (not including current settling time) required to run a 100, 500, and 1000 point L-I test using the USB interface on an LDX-3565B. A plot of time versus the number of points taken can be seen in Figure 2.

Number Of Data Points	USB Communication Time (s)
100	0.941
500	4.4
1000	9.15

Table 1. L-I Time Data

The results show that the times required to run a 100, 500, and 1000 point L-I tests with the LDX-3565B are 0.91s, 4.40s, and 9.15s respectively. This means that every step in an L-I test takes an average of 9.125ms to send and receive the two data points.

With the increased speed advantages of USB 2.0 reaching a maximum of 480Mbps this becomes an advantage over high speed GPIB communication, which can reach maximum speeds of 8Mbps.

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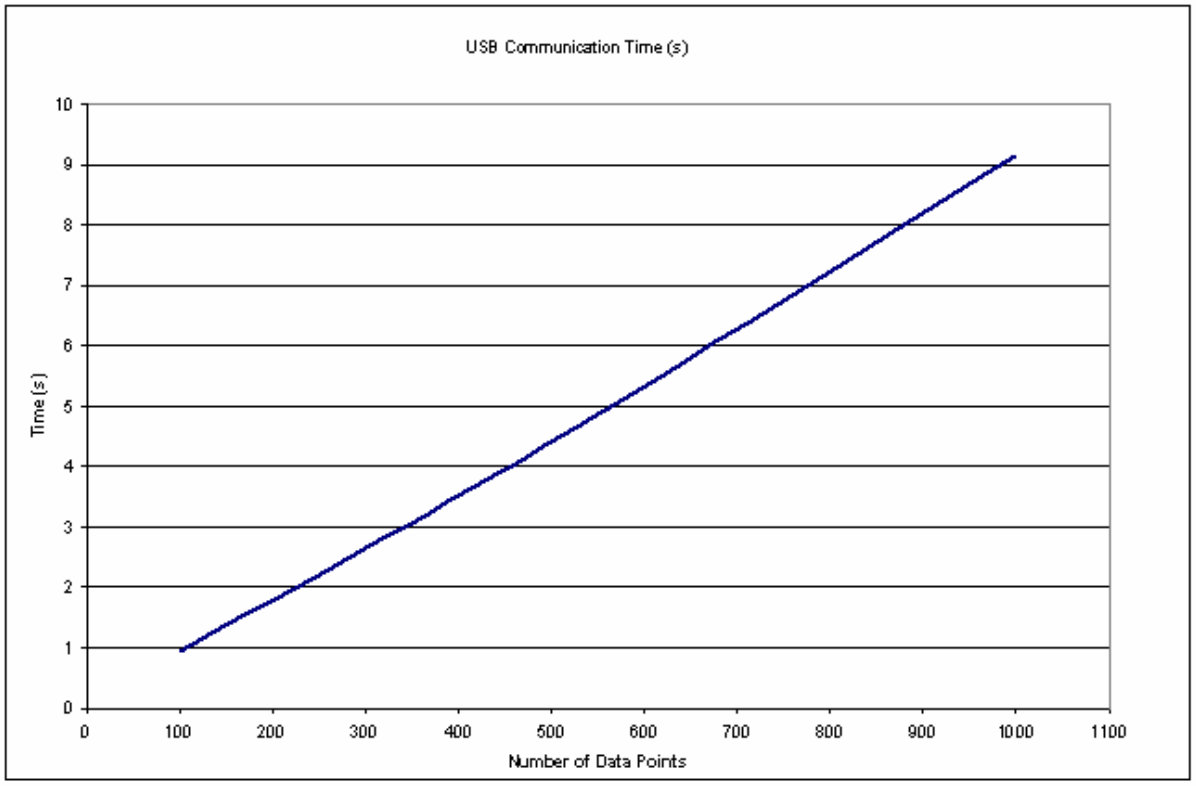

Figure 2. Graphical Representation for Communication Time Vs. Number of Data Points