

## Laser Distance Meter Update

by William B. Tracy, AIA, MBA, NCARB

August, 2009

In 2004 I posted a whitepaper on my web site about laser distance meters (LDMs). In it, I presented a case for throwing out your measuring tape because LDM prices were becoming so cheap that the benefits and economies of using LDMs were obvious for professionals like architects, engineers and appraisers who need accurate building measurements. It seems that Moore's Law applies to more than computers, since the prices of laser distance meters have also been falling, and their capabilities at any given price point are expanding. This whitepaper presents and compares a few new LDM units to help you decide what may be right for your professional needs.



As in my previous whitepaper, I went to Amazon.com, searched for laser distance meters and selected three of the lower-cost units – all around \$100 or about 75% less than the prices for the lowest priced LDMs available five years ago. I bought the units myself so the opinions herein are unbiased by any gifts from the manufacturers. For comparison, I included the LDM that I primarily depend upon as a professional building metrologist, the Disto a8. A table comparing each of the four units is on

the last page of this whitepaper. There were a few surprises.

The lowest cost unit in the group is the \$99.95 Prexiso X2. This is the first real laser I have seen priced below \$100. All of the sub-\$100 digital measuring devices I have seen previously were acoustic devices that use sound waves rather than light waves for the actual measuring. Some of these acoustic units incorporate a laser pointer but don't be fooled. Acoustic units have nowhere near the accuracy of an LDM and are not suitable for professional use. The X2 is limited in range to 98 feet and its accuracy of +/-0.08" deteriorates slightly at distances over 33'. This is acceptable for professional measurements in smaller buildings like houses and rooms inside most buildings. However, if you have to measure longer dimensions in large office buildings or warehouses, which often exceed 100', the X2 may not work for you.



My biggest concern about the X2 is that it will not display units in decimal feet. It will only format units as feet-inch-fractions, inches or meters. Measuring with decimal feet is important to me because my business is focused on measuring square footage, where all dimensions must be reduced to decimal feet to compute areas. To use the X2, I would have to convert every dimension from feet-inch-fraction format to decimal feet, an extra step that takes time and is a source of possible errors. The surprise here was that the packaging for the Prexiso X2 indicated that it would display decimal feet, which is not true.

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I selected the Fluke 411D because of the fine reputation of the company for its measuring devices, which are widely used by electricians and others in the construction industry. This unit came with a slightly higher price tag of \$109.00, so I was expecting a little higher quality unit than the Prexiso X2. I was surprised that the Fluke unit appears to be functionally identical to the lower-priced Prexiso unit. The buttons are arranged differently and there are other cosmetic differences, but the display, capabilities and limitations of the Fluke LDM are nearly identical to the Prexiso unit. I would not be surprised if the same company OEM'd the innards of both machines. The instructions that come with the Fluke were easier to understand for an English-speaking person like myself. This may make it worth the additional \$9.05, but if function is your focus, it does the same job and has the same limitations as the Prexiso X2.

Like Fluke, Bosch is a name you see frequently on tools on a construction site. I have been pleased with the quality of the Bosch tools that I own and expected a quality Bosch LDM. Unlike the Fluke unit, the Bosch DLR165K exceeded my expectations, even at the higher price point of \$113. Its range of 165' is significantly better than



100', making it better suited for many professionals. It also has some features found on some units costing many times more. A tripod socket is one feature that is good for shooting longer dimensions. You can effectively double the range of the unit by mounting it on a tripod set up in the middle of the dimension that you are measuring and taking two dimensions (which can be added by the LDM) while turning it 180°. This unit allows you to measure from four reference points on the unit – the front edge of the unit, the tripod socket, the back of the unit and an extension pin that permits shooting from corners or through blinds. The Prexiso and Fluke units provide only two reference points – front and back. The Bosch LDM can store a dimension in its memory, which can be a time saver since you do not have to stop and write down a dimension every time you shoot one. Its 4 AAA batteries are rated for an amazing 30,000 dimensions. Most importantly to me, it will display units in decimal feet, in addition to meters and feet-inches-fractions.

Despite the slightly higher price, the Bosch DLR15K totally blows away both the Prexiso and Fluke LDMs and is clearly the preferred unit in this price range for professionals like architects and appraisers who need accurate and low-cost LDMs. However, there are many other LDMs available with increasing capabilities and prices ranging upward to \$1,000. Some of their capabilities easily justify the higher prices for those who need them. To appreciate this, I have included a comparison with a top-of-the-line unit made by Leica, a highly respected manufacturer of surveying equipment that also makes the total station, the workhorse of land and construction surveying.



The Disto a8 lists for about \$995 (prices under \$500 can be found on the Internet), and is one of the most advanced hand-held LDMs made by Leica. Its range of 660 feet makes it suitable for measuring all but the most gigantic of big box retail or industrial buildings. It's accuracy of  $\pm 0.06''$  actually exceeds most construction tolerances, which can be annoying when you realize that most walls that appear flat are in fact not perfectly flat. This is information you wouldn't have to deal with when using measuring tapes and less precise LDMs. When shooting distances over 200' a tripod is necessary to hold the laser spot reasonably steady, and a reflector card is needed for dimensions greater than 330'. This unit has a tripod socket and you can set its reference point to the socket, as well as to the front, back, or extension pin (which automatically sets if the extension pin is opened). It can store 30 dimensions, so you can shoot a lot before having to stop and write them down. Even better, some other Disto units have Bluetooth capability to transfer dimensions wirelessly to an appropriately equipped laptop, so you never have to write down a dimension. The Disto a8 is weather resistant, a good feature to have on construction sites.

One feature of this unit for which I waited a long time is its built-in inclinometer. When you are measuring an occupied building, it is common to encounter furniture and equipment that prevents your shooting a horizontal dimension. The a8 has a built-in bubble level (unlike the other units reviewed here), but the inclinometer allows you to shoot at any vertical angle and the unit will calculate the horizontal distance. Next time you are measuring the inside of a fire stair or some goofy architecture, think about that. Neat! The a8 has many other capabilities that are less critical to my day-to-day needs but may be important for yours. Some of its lower-priced cousins (all the way down to about \$200) may be a better fit to your particular needs, so I would encourage you to do your homework before purchasing a LDM.

The comparison chart on the next page looks at each unit reviewed on a feature-by-feature basis. Please keep in mind that this whitepaper was written in August of 2009 and we have observed that technology is constantly improving while prices continue to fall. I will continue to rely upon my Disto a8 when I go out to do a measuring job, but my Bosch DLR165K is my new travelling buddy.

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Feature/Property		Fluke 411D	Prexiso X2	Bosch DLR165K	Disto a8
Dimensions		L: 4.65"	L: 4.84"	L: 4.00"	L: 5.83"
		W: 1.97"	W: 1.97"	W: 2.25"	W: 2.52"
		H: 1.02"	H: 1.02"	H: 1.25"	H: 1.42"
Weight w/battery		3.4 oz	3.5 oz	6.3 oz	9.3 oz
Typical Accuracy		+/- 0.12"*	+/- 0.08"*	+/- 0.12"	+/- 0.06"
Maximum range		100'	98'	165'	660'
Units	Feet & inches	YES	YES	YES	YES
	Inches	YES	YES	NO	NO
	Decimal feet	NO	NO	YES	YES
	Meters	YES	YES	YES	YES
Weather resistant		NO	NO	NO	YES
Time delay release		No	No	No	YES
Measure plane		Front or back	Front or back	Front or back Tripod or ext. pin	Front or back Tripod or ext. pin
Min/max function		NO	NO	NO	YES
Triangular function		Height	Height	Height	YES*
Add (accumulate)		YES	YES	YES	YES
Memory		None	None	One dimension	30 dimensions
Bubble level		NO	NO	NO	YES
Battery		AAA(2)	AAA(2)	AAA(4)	AA(2)
Max measurements		3,000	3,000	30,000	5,000
Triopd mount		NO	NO	YES	YES
Price paid		\$109.00	\$99.95	\$113.21	\$1,000.00
Notes		* Up to 33' in favorable conditions	* Up to 33' in favorable conditions		*Inclinometer slope corrections