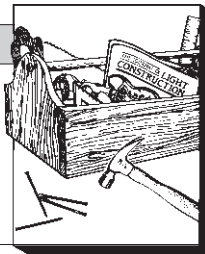


Rethinking Level and Plumb

by Clayton DeKorne



The Smart Level may be the first fully electronic device to replace one of our beloved old hand tools: bubble vial levels. But the sense of craftsmanship, formerly associated with traditional tools, is promoted, not lost, by the use of the Smart Level's advanced electronics. Indeed, this tool gives builders more than an image of high-tech; it opens up whole new capabilities for levels.

For starters, it measures accuracy in tenths of a degree and can be reset with the push of a button (really) to verify that the reading is correct. How often I have discovered my conventional levels have been knocked out of true only after I have nailed a project home! Moreover, the tool, described as "a digital inclinometer," measures all angles between 0° (level) and 90° (plumb). And it will measure these angles in degrees, percent of slope, and inches/foot of pitch. Thus, it can be used to set the pitch of roofs, skylights, stairways, drainage lines, and grades.

The Sensor

The sensor module is the heart of the Smart Level. It contains a small circuit board powered by a 9-volt battery and has four buttons — on/off, reset, mode, and range — and a LCD screen. The three different angle measures — degree, percent, and pitch — are selected by pressing "mode." A fourth mode, which displays a pair of dots stacked like a colon (:), is also included. This is supposed to be an analog to the conventional bubble for those who resist reading numbers. But because this doesn't look much like a bubble, it seems to take an abstract leap to read it.

The sensor can be adjusted to three different ranges of accuracy using the range button. The first is accurate to within 0.1%. This level of precision almost defies human perception but appeals to my sense of perfection. Next is an accuracy range of 0.2% which is useful for framing. Two tenths of a degree corresponds to a bubble just touching the line. The last range is to within 0.5% or about 3/16 inch in 2 feet. This corresponds to a bubble split by the line and seems almost useless.

In addition to the digital reading, the LCD shows an arrow pointing up or down to indicate what direction to rotate the rail to get to level or plumb. This in itself can save time when explaining to a slow helper which way to go. The LCD also indicates a low battery. And, perhaps most ingenious of all, the readout flips when the level

is turned over so you never have to read the numbers upside down.

Recalibrating the module takes about ten seconds. With the level on a flat surface, press the reset button. Then turn the level around, set it in the same place, and press the button again. The sensor reads equal and opposite angles and bisects them to find true level.

The sensor has been designed to take the rigors of the job site. It is



The Smart Level precisely measures angles between 0% and 90% — in addition to level and plumb. The LCD readout remains upright even when the level is flipped over.

encased in a polycarbonate plastic housing with large radius ends that distribute the stress of impact. To test this I dropped the module from chest high and watched it bounce across the floor. It suffered no perceptible shock (although I did in watching it fall) and after resetting, it continued to give reliable measurements. The module is also waterproof, much like a diving watch is. The buttons and the battery compartment are sealed in neoprene and are independent from the inner circuits, which have been dipped in epoxy.

The Rails

The rails are both unconventional and exceptionally sturdy. Instead of the usual rectangular shape, the Smart Level rails have a triangular profile. Thus, the level can't tip over. The wide aluminum base has a slight cup to it so only the edges contact the surface. This keeps small debris from altering the reading. An aluminum I-beam runs the length of the rail which is encased in marine-grade teak, and

the entire assembly is through-bolted. Teak is one of the most weather-resistant and stable woods available. And, as of this year, the company is using only plantation-grown teak so as not to contribute to tropical deforestation.

The manufacturer touts "ergonomic," claiming that the rail has been engineered for the worker. This seems true in that the handholds (which also accept the modules) are large enough for a gloved hand. And though the rail is heavier than most others, it is comfortable to hold. But the ergonomics breaks down when trying to draw level and plumb lines on a wall. The level has no stable surface in this dimension so it has to be rolled on its back and pressed against the wall. The handholds then become useless. And unless the wall is perfectly plumb the reading can be altered significantly. Here my old level comes in handy to hold the Smart Level per-

pendicular to the wall.

The module can be inserted into any 2-, 4-, or 6-foot rail, or it can be used independently as a torpedo level. The sensor module sells for \$80 and the rails cost \$25, \$50, and \$75 for a 2-, 4-, and 6-foot size, respectively. While this may seem expensive, the added cost buys you added accuracy, easy recalibration, and the capacity to measure angles. And a comparable set of good quality conventional levels could easily cost \$180.

One contractor I know ordered only the module and the 2-foot rail. He plans to use this to monitor the wooden levels he already owns. And because the module can be calibrated to read true for any rail, he believes that it can be used with any straight edge, such as a length of aluminum I-beam or even a long 2x4. It sounds like a smart way to begin.

The Smart Level is only available direct from the manufacturer. For information, contact Wedge Innovations, 532 Mercury Drive, Sunnyvale, CA 94068; 800/762-7853. ■