FLUKE®

Handheld vs. bench DMMs — no longer a clear cut choice

Application Note

The decision of whether to purchase a handheld or a bench digital multimeter (DMM) used to be pretty simple. If you were doing design work or needed a high degree of accuracy, you went with a benchtop model. Today however, rapidly shrinking component technology has blurred the performance differences, resulting in handheld units with near benchtop capabilities.

There have always been tradeoffs of course. The accuracy and functionality of the benchtop meter came with a hefty price tag. And you also had to deal with portability issues when you needed to make a measurement in the field. Being able to take a bench DMM into the field usually meant paying extra for a rechargeable battery pack, if available, or having line power available at the remote location. All in all, it was an expensive and cumbersome solution for field work.

Feature rich

Today's handheld DMMs have many more features, more resolution, and significant accuracy improvements over their predecessors. As this trend of packing more features and capability into handheld test equipment continues, the decision of choosing between a handheld or bench DMM has been transformed into a matter of personal preferences rather than feature availability.

Accuracy and resolution usually found only in bench DMMs of the past are now pretty common in their handheld counterparts. For example, the Fluke 170 Series products have a basic V dc accuracy of up to 0.09 % and a resolution of 6000 counts. The Fluke 180 Series products are a step up with a resolution of 50,000 counts and a basic V dc accuracy of 0.025 %. All of these meters can be calibrated and have traceability to industry standards, just like their bench counterparts. With specifications like these, it's possible to maintain and calibrate equipment requiring the tightest of tolerances using handheld DMMs.

Early handheld DMMs were limited

The early handheld DMMs didn't have the accuracy, resolution and the advanced functionality necessary to be a versatile instrument on the bench. They also had small displays that were hard to read.

Since the first handhelds were introduced in the late 70s, DMMs have been transformed by user demand. The need to take benchtop capability out into the field came with advances in technology and the "electronification" of much of our world as electrical and electronic equipment became more complex over the years and circuit miniaturization put

greater capability in remote locations. In turn this drove the need to make troubleshooting, repair and calibration possible in the field.

Test equipment manufacturers like Fluke, responded to the need to have more than ac and dc measurement capability "on-site." Advances in circuit design have not only put more capability in a smaller package, but significant gains in computing power and lower power consumption rates have been realized as well. As a result, handheld DMMs have changed significantly.