The Changing World of Test

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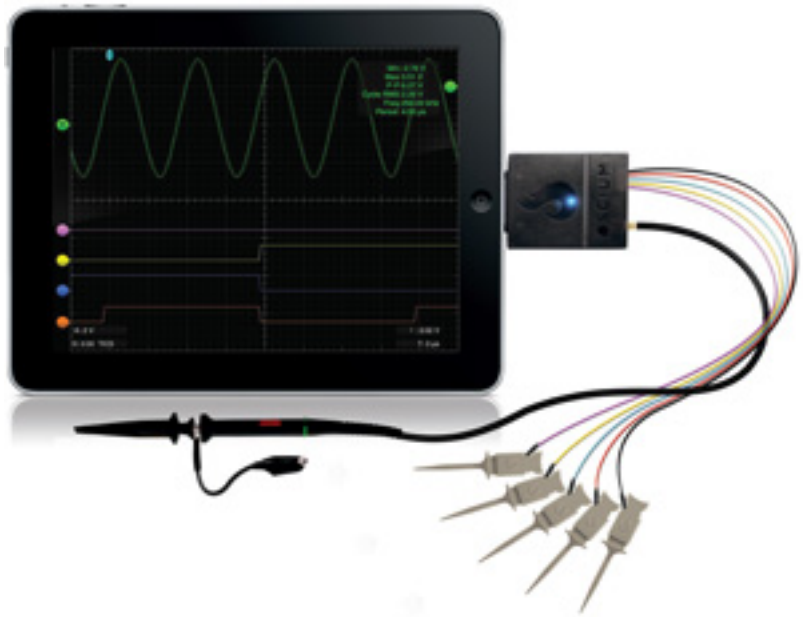
With global economic challenges and ever-present budget constraints, test engineers and product designers are constantly evaluating ways to test devices more efficiently, and with equipment that can be field-employed.

Portability is always paramount in a field engineer's thoughts. Battery-powered scopes and signal generators are becoming commonplace, but the ubiquitous iPhone and iPad has spawned a new era of test devices too. iMSO-104 is an oscilloscope adapter for Apple devices that fits in a pocket, and the resulting geo-tagged signal waveforms can be emailed back to headquarters, uniquely identifying the location where the observations were made.

With the increasing emphasis on low power, new test equipment that can accurately measure current consumption down to picoamps is becoming available. PocketPico, for instance, is a new, small USB-connected PC adapter which measures accurately down to 20pA.



Products are shipped worldwide and need to withstand rough handling. Testing real-world shipping and handling conditions to a realistic specification requires versatile, portable environmental test equipment. Tiny USB-connected dataloggers like those from MSR (Switzerland) can

measure a number of parameters simultaneously – vibration, temperature, humidity, voltage, etc.

Most products with a clock signal radiate unwanted emissions, so economical EMC/EMI testing is needed for products before they reach the manufacturing stage or the compliance lab. Changes for products in customers' hands can be ten times as expensive as getting the design right first. Handheld RF spectrum analyzers (e.g. Aim-TTi, Aaronia) make precompliance testing available to almost any engineer now. And increasingly, equipment is being designed with wireless capabilities, which can malfunction in the face of prevailing spurious RF emitters. Portable spectrum analyzers can identify these offending radiators quickly.

Built-in test, self-diagnosis and remote monitoring is gradually appearing in more products. It's much cheaper to have products accessible via internet access by an engineer, or have it call for help when malfunctions occur. Front-panel or board mount LED indicators can give instant health-checks, but now you can even build in oscilloscope capabilities into products in a tiny DIP module (Xprotolab). Remote PC control software is available either free or for a modest charge which allows an engineer to control an internet-connected computer from anywhere (e.g. Logmein or GoToMyPC).

Protocol verification is a task that is accomplished with affordable analyzers from a number of vendors for USB, SPI, I2C and other interface standards (e.g. SPI Storm, Ellisys Explorer, MQP USB500+, etc.) - some of which can perform automated testing.

Many oscilloscope manufacturers now use the open, multivendor LXI/LAN hardware standard. That, together with LabVIEW programming, allows test engineers to design versatile, automated networked test rigs that can serve multiple needs.

For rotating equipment, failure prevention is much more preferable than expensive repairs. In addition to routine preventive maintenance, one technique that is useful in preventing equipment damage is torque testing and load measurement. Piezo torque sensors can detect when a bearing is drying out or increased load is present due to wear or other hazard (see TorqSense).

With the product world changing so fast, it pays to keep pace with the best available testing solutions!

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