Unlocking future potential

Unlockable and upgradeable, the test equipment you buy is not necessarily the test equipment you can end up with. **Tim Fryer** looks at this latest trend in the T&M sector.

Buying an instrument used to be straightforward, in as much you specified what you wanted and then found equipment to meet that specification. Obviously, this defines the limitations of what that instrument can be used for, but T&M companies over more recent years have introduced ways to make their instruments both more affordable and more flexible.

Instruments therefore became upgradeable, or scalable, to keep initial outlay to a minimum, while maximising the potential applications for that instrument. Allison Douglas, market development manager for Agilent’s Microwave & Communications Division, commented: “For the customer, one of the main advantages is the cost effectiveness of only paying for what they need at the time of purchase. The other main advantage is the flexibility of future upgrades to their existing equipment as needed for their evolving test requirements. Agilent equipment is designed with upgradability in mind, even for capabilities which do not exist today.” This philosophy covers many instrument types including signal analysers, signal generators and oscilloscopes.

Another T&M supplier has taken the theory a step further with its latest introduction. The MDO3000 series from Tektronix is fundamentally a mixed domain oscilloscope combined with a signal analyser. However, it can be much more – a logic analyser, protocol analyser, function generator and digital voltmeter. Hailey Percival, technical marketing manager EMEA, bench and midrange for Tektronix, explained: “The customers’ tool of choice to debug and verify their designs is the oscilloscope. The other instruments are used on an intermittent basis and it’s almost always a hassle and time sink to find and relearn whatever piece of equipment they need other than the scope for any given debug task. With the integration provided by the MDO3000 Series, customers can stay focused on the task at hand, regardless of debug tools required. Compared to the cost of sourcing standalone instruments customers can save up to 30% over buying comparable disparate instruments. The simplicity of using one instrument saves time setting up multiple instruments and learning six different interfaces.”

As with the Agilent equipment, most MDO3000 upgrades can be done by customers, including upgrading the spectrum analyzer to 3GHz.

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Hailey Percival
the user can decide how much or how little of this tool set to pay for initially. “All MDO3000s ship as standard with the ability to be upgraded using software keys,” continued Percival. “This allows us to be sensitive to customer requirements. The MDO3000’s upgradeability is what sets it apart from the upgrade process is for both our customers and our channel partners. Some upgrades involve hardware; the upgrade to add 16 digital logic channels includes a set of digital probes and accessories. Upgrading bandwidth to 1GHz is one of the few changes that requires a significant hardware change. To achieve this, the instrument must be returned for service.”

The wireless market is one area where customers can benefit from a flexible and scalable system, observes Douglas. “Here, the standards are constantly evolving and Agilent helps its customers keep pace with these standards through measurement applications that can be supported using a customer’s existing hardware solutions. Customers working on digital buses like USB or PCIe can also benefit by upgrading their existing instrumentation for new standards like the change from USB 2.0 to USB 3.0 or as they start working on other bus systems.”

The unlockable element is typically software. MDO3000s, for example, ship as standard with the ability to be upgraded using software keys. Measurement applications are usually software upgrades, while performance upgrades are either hardware or software. Agilent also has an e-delivery system for license key upgrades, so customers can have immediate access to the new functionality they have purchased.

Clearly, there are limits to the cost that manufacturers can build into the equipment to provide future upgrade opportunities. “We want to offer the product at competitive prices, so adding in a lot of extra cost is not acceptable,” said Percival. “We certainly build in some capability, connectors for example, in anticipation of users finding value in our value-added functions. However, our engineers work hard to build in functions while minimising incremental parts cost. Software features are great candidates for field upgrade capability. In the case of an oscilloscope, analogue channels are more challenging, due to the level of hardware-dependence.”

Which begs the question, how much flexibility are engineers willing to pay for? Percival believes they are demanding it now. “Customer’s design cycles are usually 12 to 18 months, but they typically buy new equipment every 5 to 7 years, so they have no idea what their next design will entail or what test equipment will be needed. The feedback we have received has been very favourable regarding purchasing what they need now and having the confidence that, as their requirements change, their equipment can be upgraded to meet their test needs. This is really becoming a customer expectation – the ability to increase the performance of a scope and add functionality over time as their test needs change or their budget allows.”

Going down the route of planned or optional upgradeability is, therefore, a useful way of smoothing capital expenditure, but will it be more expensive to buy a piece of equipment and gradually release functions through upgrading and unlocking, than buying a fully specified piece of equipment in the first place?

“It depends,” said Douglas, “there are too many factors to take into account. Prices for upgrades versus buying an option with an initial purchase are either on par or a small uplift. Would a customer rather invest in a fully loaded instrument at the outset, or spread their capital investment over several pieces of equipment, or their investment over several years? We have found that our customers value the flexibility that comes with upgrades as compared to purchasing fully loaded new equipment.”

Michael Whitehead, measurement and control product specialist for T&M distributor Amplicon summed up the proposition from a manufacturer neutral perspective. “Unlockable/upgradeable instruments are a strong value proposition to Amplicon’s customers. We actively promote the upgradeability of T&M products because customers respond very positively to the flexibility, scalability and cost-effectiveness that these types of product present. It makes the customer’s initial decision on what model to buy much easier, because if the budget is tight, customers can consider saving cost on the initial purchase with the option to upgrade at a later date, without the high expense/wastage of buying new hardware.”