

CASE STUDY

THE TEST FUNCTION HAS ALWAYS BEEN AMONG THE MOST CHALLENGING PROCESSES IN ELECTRONICS MANUFACTURING. HOW CAN TEST EQUIPMENT KEEP AHEAD OF THE SUBASSEMBLIES IT NEEDS TO VALIDATE?



FLEX 30

Evidence exists to show that it can be done. Northamptonshire-based ATE Solutions has been leading the test challenge for almost 30 years. The company has evolved with the test sector and has helped to drive and shape that evolution to become the UK's leading provider of Automatic Electronic Test solutions.

The ATE Solutions range of modular functional test systems successfully address most of the challenges presented by modern circuit technology. They deliver the validation required by manufacturers of some of the world's

most critical electronics assemblies used in sectors from avionics, aerospace and defence to medical devices. Built on PXI instrumentation platforms and typically deploying industry-standard test interface hardware, the company's Flex products are used in an impressive array of applications across the UK. But the agenda for the ATE Solutions business, and that sought by most of its customers, is to solve test problems. Test systems are just a part of the solution.

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Technical Director Steve Lees formed ATE Solutions in 1988. During the past three decades, the test industry has changed dramatically. There are fewer test equipment manufacturers. And fewer test solutions businesses. But there's an increasing number of legacy test systems forging ahead despite test sector and board technology evolution. That reality continues to present opportunities for Steve and his team of problem solvers at ATE Solutions.



"Problem solving expertise, based on almost thirty years of test experience, is a significant differentiator for us," Steve claims, citing an example of test technology for braking system control boards on London Underground trains. "This is legacy test equipment in its truest form and has been operating virtually unaltered for 25 years," he explains. "Now TfL wants the engineering contractor that supports those sub-assemblies to keep everything running for a further 20 years! Now that's a test challenge, so the company came to us for a solution that will deliver the test confidence required for another two decades, while remaining fully compatible with the existing test procedures."

At the other end of the technology spectrum, being arguably unique in what is clearly a diminished UK test sector also provides great opportunities for ATE Solutions. "Our experience creates a rare level of expertise in applying imaginative thinking to new test challenges presented by emerging technologies," says Steve. A perfect example is a recent test application created for LED array testing. LED lighting is proliferating and demand escalating, so manufacturing productivity improvements are invaluable. An in-line automatic test system built around an ATE Solutions Flex platform slashed product test times to 10 seconds per Panel and immediately delivered a huge increase in throughput.

"We were the only people with expertise in ATE, vision systems and in-line test handling," explains Steve. Those skills were bought together to develop a production system for the customer that delivers a 100% automatic test on every LED array. It verifies the operation, intensity and colour temperature of each LED chip, using vision technology built into the test platform. The innovation comes into play with design elements such as our integration of a 3CCD camera and a prism to split the light from the LEDs into the three camera chips, giving an accurate and unambiguous optical test. "

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Steve also talks of applications that include test hardware and software solutions to support a company that manufactured a wide range of infrared beam fire detectors used in large internal spaces.



"The business had loads of models and product variants, so chose to consolidate its range into one common set of electronics to optimise production," Steve explains. That streamlining programme demanded new test fixturing for the consolidated product – but every old product featured custom hardware in each fixture. "We moved all that hardware – PSUs, Relay cards, DAC modules and breakout boards – into the Flex 10 tester. Now to calibrate a DAC, you simply take it from the ATE system, rather than undertake the tedious task of removing lots of DAC modules from different fixtures. And it simplifies the fixturing: an optimised fixture should contain only wires," adds Steve. It's just one example highlighting that even the company's entry-level ATE system is a truly configurable platform.

Returning to the London Underground test challenge, Steve draws parallels with other legacy test system users.

"We still support some Marconi test systems and many are going strong, notably the sturdy Marconi 511 benchtop testers." But ATE Solutions is continuing to convert some of its legacy customers to its Flex range of test systems for a variety of compelling reasons: "A modern, modular ATE system can be configured to replicate the functions of a legacy tester, so familiarity is maintained. New test systems are easier to operate with contemporary software and user interfaces, and can feature the latest instrumentation to expand or speed up the test," explains Steve. In addition, old testers take a long time to fault-find and the replacement parts, if still available, can be exorbitant: "the market price for an eight-inch floppy drive can be £3,000!" reports Steve, from a position of first-hand experience.

In the London Underground braking board application, ATE Solutions replaced the customer's legacy Marconi 511 with its top-selling Flex 40 tester – a two-bay, floor-standing chassis that offers a huge

amount of space for instrumentation. The Flex 40 was configured with new versions of the same hardware and new test programs to replicate and emulate the original functions. "It's easier to calibrate, it's supported by us, and it's an opportunity for the customer to finally be able to integrate the test function into its Factory Management System. But mostly it's about delivering the confidence to the customer going forward," Steve concludes.

There are further reasons to be imaginative about replacing legacy test systems with new ATE technology. As Steve explains: "No one's getting younger. We observe that critical test expertise is rarely passed on to, or taken up by, new engineers. The cost of the test engineer is frequently overlooked in determining the commercial justifications for testing, or for upgrading test equipment, particularly in decisions that continue to test in the way 'it's always been done'. Until, that is, your engineers retire, and that knowledge goes with them."

Steve thinks that the lack of skill coming up through the industry, coupled with the increasing imperative on contract manufacturers to test boards and provide test documentation (sometimes to component level), will continue to drive the test sector. "It's not just a lack of expertise on legacy test hardware but also in legacy software. How many engineering graduates leaving university today know anything about the MS-DOS used in old Marconi platforms?" Steve asks.

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