Choosing the right Test Platform

David Evans, product development manager at Amplicon discusses the options

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The Automated Test Equipment (ATE) market has evolved over the last 20 years from bespoke purpose built systems to modular configurable solutions that use the latest PC based technology. At the heart of this market are System Integrators pulling together the hardware and software for each new test system and delivering a bespoke solution to meet the customer's requirement.

Amplicon's new Test Systems Division has been developed to provide system integrators and end-users with the widest range of test system hardware available at a price that only a manufacturer and tier 1 distributor could offer. Apart from price and a wide product portfolio, Amplicon's test system customers also benefit from free technical consultancy and a product integration service that saves time in bolting together hardware allowing the customer to concentrate on their specific area of expertise.

Many suppliers are limited to the type of test system platform that they can offer, either by commercial agreements or lack of knowledge of the different platforms available. However, there are a number of options available each with their own advantages. Understanding what these are is critical to choosing the right solution.

A typical rackmount test system.

CompactPCI (cPCI)

Military and Aerospace manufacturers have favoured the Eurocard style architecture provided by the VME bus since the early 1990s and are still commonly used today. However, even with the development of a 64-bit variant, the VME bus only has a theoretical maximum speed of 40MB/s. The introduction of the PCI bus in desktop PCs with a bus speed of up to 132MB/s helped to stimulate the development of CompactPCI (cPCI). This standard leveraged the Eurocard design of VME and the speed of the PCI bus, to deliver a rugged compact industrial computer with improved cooling and faster Mean Time To Repair (MTTR). cPCI test systems are ideal for portable applications thanks to their card clamping mechanism but can often be substantially more expensive than an equivalent PC based test system.

PXI

PXI (PCI eXtension for Instrumentation) utilises the rugged, modular design of CompactPCI, and adds internal data lines and triggers for timing between events. Since most test systems use a monitor for display of readings, modular PXI oscilloscopes and other

PXI test instruments without a display can be integrated, saving valuable space. Front-loading PXI cards are quick to install and replace whilst providing easily accessible connections to the equipment under test. PXI systems can also be substantially more expensive than a PC based alternative but have some key features that make them ideal for professional systems.

LXI

Having seen the threat posed by customers migrating to a PXI architecture instead of using traditional bench-top instruments, several Test & Measurement product manufacturers formed the LXI consortium.

LXI, which stands for LAN eXtensions for Instrumentation utilises an Ethernet port and standard Ethernet networks to provide a distributed alternative to PXI. There are three classes of LXI, with different levels of triggering and timing. Class A has a Wired Trigger Bus (WTB) interface that provides a standardised capability of supporting trigger events between devices. Class B provides advanced synchronisation features with precision timing across the network. Class C devices provide just a standardised LAN and web browser interface without advanced timing or trigger functions.

Like PXI, individual LXI instruments require no display since the test system already has a monitor. In addition, LXI instruments do not require an expensive chassis and controller - just an Ethernet connection to the rest of the system.

Full height rackmount test system.

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PC based

Industrial PCs are commonly used as a platform for test systems although low cost desktop PCs can also be used in highly cost-sensitive applications where long term system stability is unimportant. Using a PC gives the greatest flexibility on processing power and storage capacity as well as a greater diversity of digital and analogue I/O data capture cards. With the advent of PCI Express, data acquisition speeds can now easily exceed the 132MB/s of the previously limited PCI bus. Another benefit of PC based test systems is the ability to run other relevant applications onboard performing several tasks on a single platform. However, this also highlights one of the pitfalls of using a multi-tasking PC and operating system – without dedicated triggering and synchronisation capabilities it can be difficult to get a deterministic response from a general purpose PC.

Benchtop digital multimeters

The Agilent 34410A and 34411A represent the latest generation of 6½ digit multimeters from Agilent. Building on the success of the standard 34401A, these new meters offer improved accuracy, expanded measurement capability, dramatically improved measurement speed and throughput and modern computer interfaces including LAN and USB. A front panel data logger function allows you to set the meter up to make unattended, paced measurements over a fixed time or number of events. The dual display offers measurement capabilities and ease when setting up and configuring the DMM. Improvements have been made in every facet to make the best DMM even better.

Why Amplicon?

In business, it is often said that to be competitive it is necessary to be cheaper or better than the competition. Amplicon's Test Systems Division was launched in recognition of the fact that the systems we produce are often superior in design and offer a cost effective alternative to what is currently available on the market. Many system integrators use Amplicon as a source of

Rackmount test system for a major oil & gas instrumentation specialist.

useful test system components such as data acquisition cards and Industrial PCs but are unaware of the integrated hardware solutions Amplicon can provide. In a recent application, Amplicon's innovative PC based test system provided a saving of over £100,000 compared to in-house development at a major oil & gas instrumentation specialist.

Amplicon's goal is to become the UK's premier source of hardware test system platforms, providing system integrators with an unrivalled service at an unbeatable price.