AXIe® and Mil-Aero Embedded Systems

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The AXIe standard is clearly focused at the test and measurement market. But that doesn't mean it can't find applications outside of instrumentation. One of those may just be Mil/Aero (Military and Aerospace) embedded systems.

AXIe is based on AdvancedTCA®, a successful industrial computing architecture deployed widely in telecom networks. There has been a lot of discussion in ATCA groups about being able to address the Mil/Aero market with either ATCA or MicroTCA®, a smaller derivative. Indeed, ATCA is a natural fit for network elements within Mil/Aero networks, and there have been a few deployments.

But what about ground or ship-based weapon systems? Here ATCA has not had much of a footprint. The VME family of products have had big market shares in this segment. It's not just loyalty to a form factor that drives it, there is also a major missing element: precision data convertors often used in radar systems and the like. Historically, ATCA has not delivered the precision data converters needed for the applications.

Enter AXIe. AXIe is focused on delivering high performance instrumentation in an open system form factor. Three segments address by AXIe today include semiconductor test, high-energy physics, and aerospace/defense. Products addressing the latter include very high performance arbitrary waveform generators and digitizers, which are often used to test radar and EW (Electronic Warfare) systems. But they are also capable of performing many of the key functions of the radar systems themselves. Take the digitizers from Agilent Technologies and Guzik Technical Enterprises, for instance. They range form 12-bit resolution digitizer at 1.8 or 3.6Gs/s, all the way to a 40Gs/s acquisition speed at 8-bits of resolution. Couple this with the high-density form factor that can pack dozens of synchronous channels into a 2U or 5U package, and you have the acquisition core of a radar system. Most AXIe digitizer blades also include onboard FPGAs for the fast local real time digital pre-processing needed.

The close architectural match to ATCA allows ATCA processors to be integrated with AXIe instruments into the same chassis. Alternatively, an external Cable PCIe connection can be used to control and access the AXIe system, whether from ATCA, VME, or any external controller for that matter. For that reason, it doesn't require integrators to even switch from VME: a PCIe link is all that's needed.

The small rack space of the horizontal AXIe chassis coupled with the cutting-edge digitizer performance of AXIe may just what is needed to address some of the Mil/Aero embedded applications.