

# Are LXI and Ethernet-Enabled Instruments the Same?

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During a recent customer visit, I was asked about the differences between LXI and Ethernet-enabled instruments. Why LXI? Since LXI is a standard built on other standards, including 802.3 LAN, what do LXI instruments offer beyond simple LAN-enabled instruments?



I used a simple illustration to highlight several distinct differences. Back in 2004, before leading test and measurement companies joined together to create LXI, LAN-enabled instruments were becoming common as more vendors put LAN interfaces on their products. The problem, discovered during customer meetings with some leading integrators, was interoperability.

Integrators and test engineers described a Tower of Babel where each vendor did things a little bit differently. They spent tedious hours with instrument manuals and vendor support lines trying to get instruments to talk to one another. Many of these designs were well engineered, but a lack of standardization prevented easy interoperability.

The LXI Consortium was formed to change all that. From the beginning, LXI was designed around the needs of systems integrators and test engineers. The consortium strove to simplify the integrator's life by making systems easier to configure, troubleshoot, and operate. We included inputs from systems integrators and test engineers into the specification, resulting in predictable operation and powerful tools to simplify setup, operation, and debugging. Independent of the vendor, addressing is the same, triggering is the same, default conditions are the same, and error notification and behavior are the same.

LXI went further, ensuring interoperability through rigorous testing, multivendor PlugFests, and multivendor cooperation. Borrowing techniques used by many computer-industry forums to provide a consistent user experience, LXI became the only test and measurement standard that requires testing by an independent agency to guarantee

conformance to the specification and multivendor interoperability. No other test and measurement industry specification does this. Before an instrument can ship, it must pass minimum performance and interoperability requirements, and a driver must be posted for it. When you see the LXI logo, you know what you're getting.

By reducing variables, LXI simplifies interface design for vendors and assures common behavior for users. Features such as instrument Web pages for identification and control, driver APIs, and uniform triggering streamline system discovery, setup, and operation. Time-aware features like timestamps and event logs give unprecedented visibility into system performance, making troubleshooting fast and easy. All LXI instruments behave the same way on the network, removing uncertainty for systems designers using instruments from multiple vendors.

The results from LXI's focus on interoperability are dramatic and easy to see. The LXI sponsored Multi-Vendor Demo System (MVDS), chaired by The Mathworks and populated by National Instruments, Data Translation, and most vendors offering LXI instruments, integrates systems to demonstrate common applications. Progress has been stunning.

The latest MVDS PlugFest sessions were nonevents because everything worked quickly, easily, and with no user intervention. Simply plug the instruments into the network and let automatic discovery, addressing, and configuration tools take over. It's as simple as configuring a printer to a PC.

We've come a long way since the first Ethernet-enabled instruments showed up. LXI's focus on consistency, ease of use, and interoperability has made great contributions to the industry and confirms LXI will become the dominant test interface for systems integrators.

I'm proud of the progress made by the LXI Consortium to ensure systems go together quickly and easily, freeing integrators to work on more important tasks. LAN done right—that's the difference between LAN-enabled and LXI.