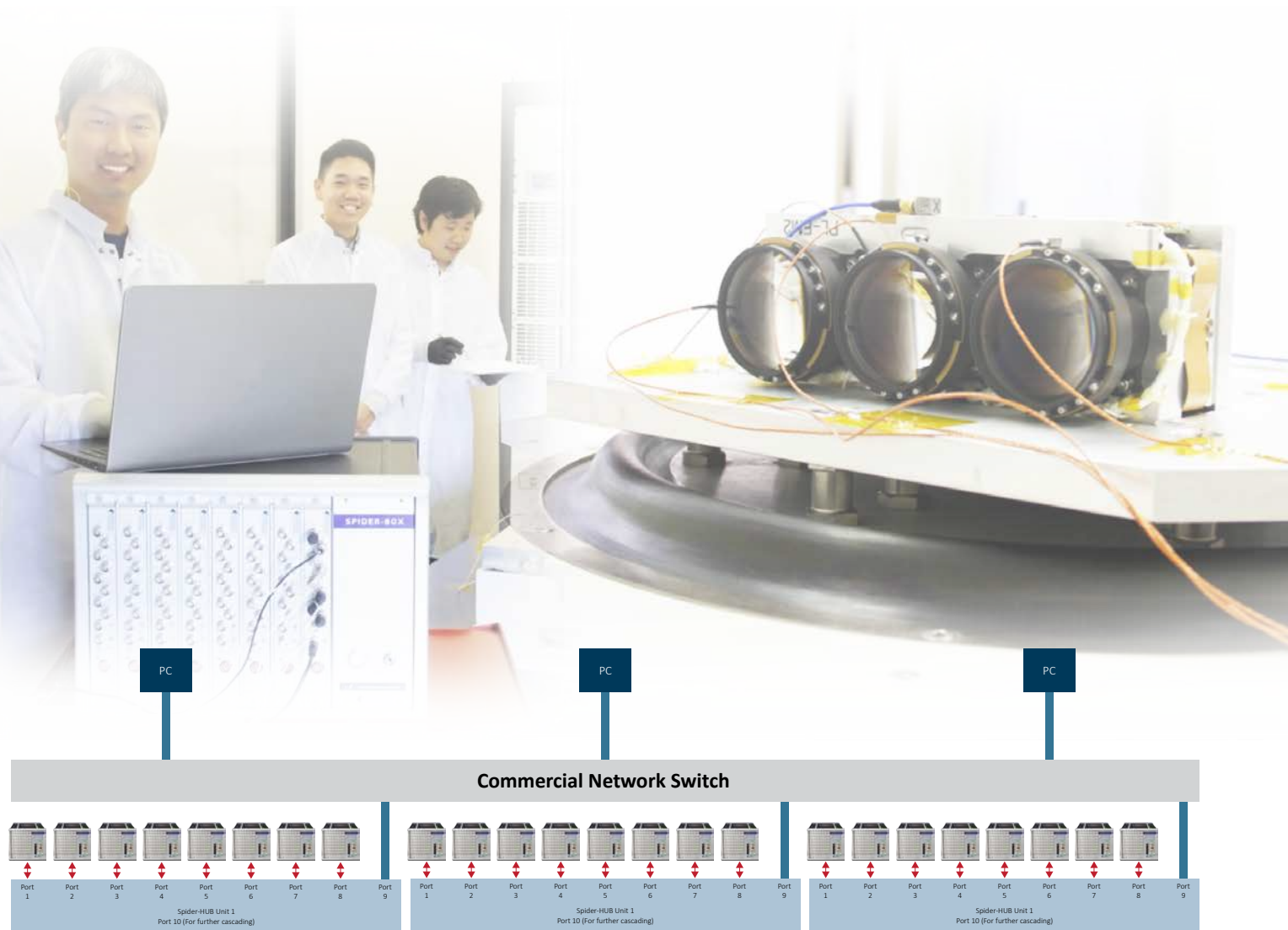




RUNNING MULTIPLE LARGE CHANNEL SYSTEMS ON A NETWORK IN REAL-TIME

by James Zhuge, Ph.D., Crystal Instruments President

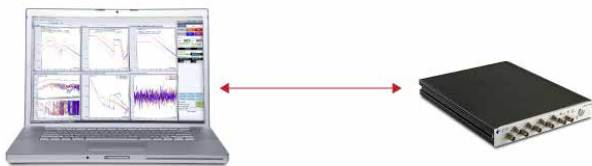


The Ethernet based network structure of Crystal Instruments Spider Systems provides the maximum flexibility and scalability for the configuration of test and measurement instruments in the lab environment. With the implementation of IEEE 1588 Precision Time Protocol (PTP), the same Ethernet connection used for data transmission also provides time clock synchronization. This advanced technology is applied to CI Spider systems, ensuring the possibility of nearly any topology of device and computer connections. In theory, the user will be able to access the test instruments on the network at any time and any distance, with electrical physical limitations as their only limit.

In practice, however, it is not a trivial task to allow multiple users to run multiple instrument systems on the same Ethernet network. This is mainly due to the fact that each Spider system must have its own time clock, or, as we call it, "PTP Sync Domain". If the PTP Sync Domain is not carefully configured, the master clock on one Spider system may affect those of the others. If this happens, the clocks on all the Spider modules in the system will be inaccurate. The systems will fail to run reliably.

Let's enumerate a few typical network configurations using the CI Spider system:

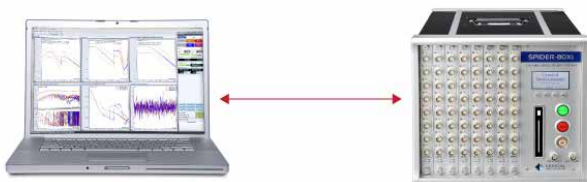
Case 1: One PC connected to one Spider device directly



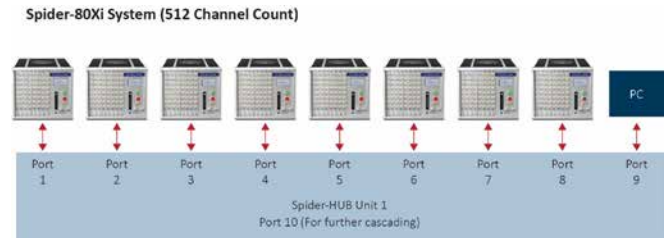
Case 2: One PC connected to multiple single-Spider devices through a commercial switch



Case 3: One PC connected to a single chassis with multi-module Spider system



Case 4: One PC connected to multiple chassis, each with multi-module Spiders



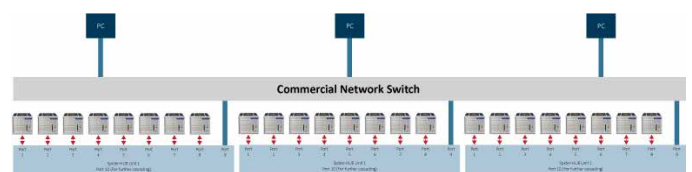
Case 5: Multiple PCs connected to multiple single-Spider devices through a commercial switch



Case 6: Multiple PCs connected to multiple chassis, each chassis with multi-module Spiders



Case 7: Multiple PCs connected to a multiple Spider system, each spider system has multiple chassis



The seven cases described above have covered all the topology options for Spider system configurations in the laboratory environment. Many issues must be considered, such as setting up appropriate permissions and access for PCs to have within the network of devices in a Spider system, issues regarding how to deal with real time conflict if more than one PC is trying to access the same Spider system, and so forth.

The principle of configuration is that if the Spiders reside in ONE system, then they must use the Spider-HUB for time synchronization. If they are used separately in different systems, then commercial switches like one from Cisco can be used.

The application engineers at Crystal Instruments can assist you to

make the best and most reliable choices for your project. Contact
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