China had decided to build a world-class spallation neutron source, called CSNS, to provide users a neutron scattering platform with high flux, wide wavelength range and high efficiency.

The PLC system from BECKHOFF are tested. It uses IEEE 1588 protocol to synchronize all modules. So we can timestamp all control data in PLC. All the modules will be time synchronized then to the first module. We test time accuracy in one module, multi-module, different module sequence, different cable length and various modules in system.

Traditional data in control system are marked in control computer. Now we want data are timestamp in PLC for time accuracy.

Signal send from output module for time accuracy test. Rising edge is about 50ns.

Time difference in two channel on one module. Only two 0ns, 10ns in result. So the local clock can be assume to be 100Mhz.

Multi-module Test

Typical time difference on two channel in a multi-module system. Time accuracy is better than 100ns.