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## Clock Trigger Node based on White Rabbit Technology for Distributed Trigger for Large Scale Neutron Detectors

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The new generation of neutron instrument will use large-scale neutron detectors to complete experiments efficiently and quickly, which means the large number of detector units, the large span of installation location and the complex and flexible experiment scheme. The traditional centralized trigger system and clock synchronization system often use star fan-out structure, and use dedicated links to fan out step by step, which is difficult to adapt to the needs of flexible triggering of different neutron detectors to set time window separately and switch between different trigger sources, along with the need of the wide range synchronization. In this paper, a distributed clock trigger node based on the White Rabbit (WR) high-precision time synchronization technology was preliminarily designed to realize clock synchronization through network links and complete distributed autonomous triggering, which could also be used as a timing card of PXIe chassis to further fan out the synchronous clock and trigger into each module in the chassis. The input trigger signal can be time-stamped by a clock trigger node, and then broadcast to multiple clock trigger nodes at different locations through WR network. These nodes can process the received message at the same time and generate the trigger autonomously according to the trigger timestamp and the set trigger delay, and then fan out it to other measurement modules through the trigger bus of the chassis. Such a distributed clock triggering system gives consideration to flexibility, integration and universality.

### Minioral

Yes

### IEEE Member

No

### Are you a student?

Yes

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