Sync-N-Scale™ High-Availability Features

Does your clocking design depend on a single frequency source for all or part of your otherwise high-availability design? Have you deliberately partitioned your system into separate clock domains so that the whole thing won't be affected by a single oscillator failure? If either or both of these issues apply to your design, take a look at the new Sync-N-Scale™ clocking solution available from NEL Frequency Controls, Inc.

Granted, oscillator failures are unlikely event, but can occur. Sync-N-Scale™ is a distributed multi-node clocking technology that uses interconnected crystal resonances to achieve a locked synchronous frequency across all interconnected nodes. The multiple nodes are redundant, greatly increasing system availability above what a single oscillator can provide.

Your system needs Reliability, Availability and Serviceability (RAS):

- *Reliability* is the probability that a system will perform its intended function. Designing with simple components to avoid failures and incorporating redundancy help achieve reliability goals. Sync-N-Scale™ uses a simple operating principle and provides self fault detection capability – a must for redundant systems.
- *Availability* is the amount of time a device actually operates when it is needed to operate. Again, oscillator failures are unlikely, but the inherent redundancy of Sync-N-Scale ™ provides availability beyond what a single clock source can offer.
- *Serviceability* is the ability to monitor and fix system faults. Sync-N-Scale™ is fully hot-swappable, providing flexible repair options. The built-in fault detection capability can interface with system management logs to provide annunciation options and scheduled maintenance support.

Let's examine Sync-N-Scale™ architecture and see how RAS applies.

Sync-N-Scale™ is comprised of two major components: SXO and SCC units. SXO units are special oscillators that generate the system frequency and connect with neighboring SXO's. SCC units take the frequency signal from the interconnect bus, multiply it up or divide it down as needed for the local clock tree. There is a choice of logic families available to interface with the system (CMOS, HCSL, LVDS, PECL).

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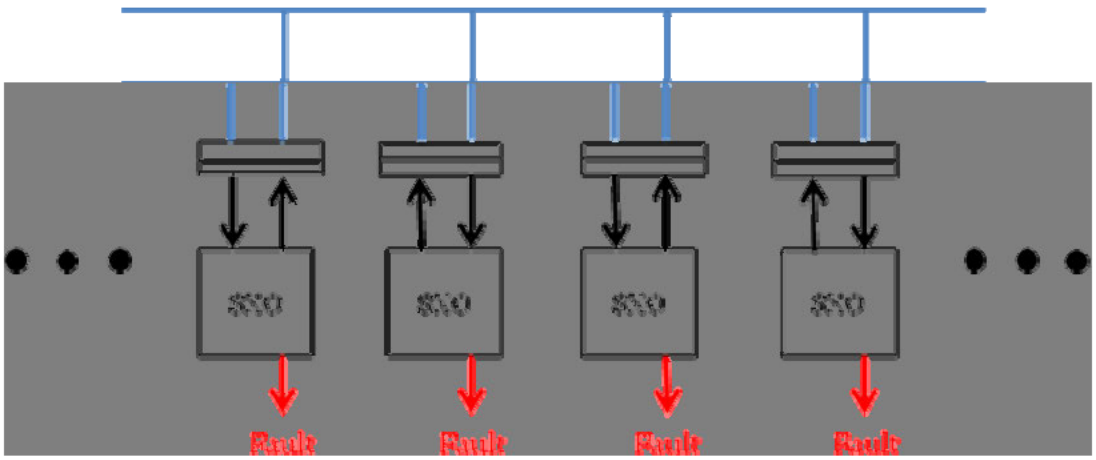
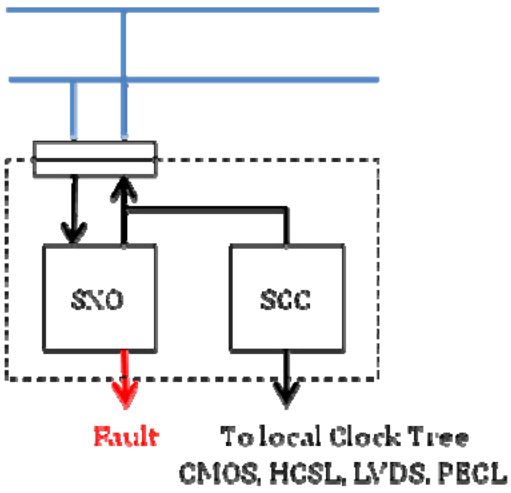


Sync-N-Scale™ uses two interconnecting buses connecting to the input and output from each SXO. Adjacent SXO's on the bus usually alternate the input and output connections, but maintaining a strict alternating pattern is not required. Spacing between the SXO's is arbitrary. The interconnecting bus is usually located on a chassis backplane and remains intact when SXO's are added or removed in any order.

Each SXO monitors itself for faults, ensuring that failures are apparent in redundant applications.

SCC units compliment the SXO at each clock node by multiplying or dividing the distributed frequency as needed for the local clock tree and supplying logic levels compatible with that tree.

A typical node would look like the following:



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When there are multiple SXO's present in the system, the clock sources are redundant, eliminating the traditional clock tree single point of failure. In addition, each SXO provides failure annunciation enabling the system to continually monitor the degree of redundancy in the system. Each SXO and SCC is hot-swappable allowing flexible repair or reconfiguration of the system.

Take a closer look at NEL's new Sync-N-Scale™ clocking solution. We are sure you will agree that no other clocking design offers as many RAS features, or as much flexibility, for your high-availability design.

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