

Synchronization of Multiple Vantage Systems for Imaging with Large 2D Arrays

Imaging with Large 2D Arrays

Verasonics has developed an elegant solution for accurate phase synchronization of up to eight (8) Vantage systems for fully parallel acquisition with up to 2048 channels. Synchronization is facilitated by Verasonics' new Synchronization Module that is connected to each Vantage system using common HDMI. Each system uses its own host controller, and is able to perform image reconstruction in real time with its locally acquired data. One Vantage system is designated the "Primary" and it provides the 250 MHz clock, the triggers, and other synchronization signals to the Synchronization Module. The Module redistributes accurately phase aligned clock and trigger signals to all systems, including the Primary. Acquisition sequences running independently on the controllers are synchronized using a 'MultiSysSync' program command tagged to one event in an acquisition loop.



Verasonics' new Multi-System Synchronization Module allows synchronous operation of up to 8 Vantage systems

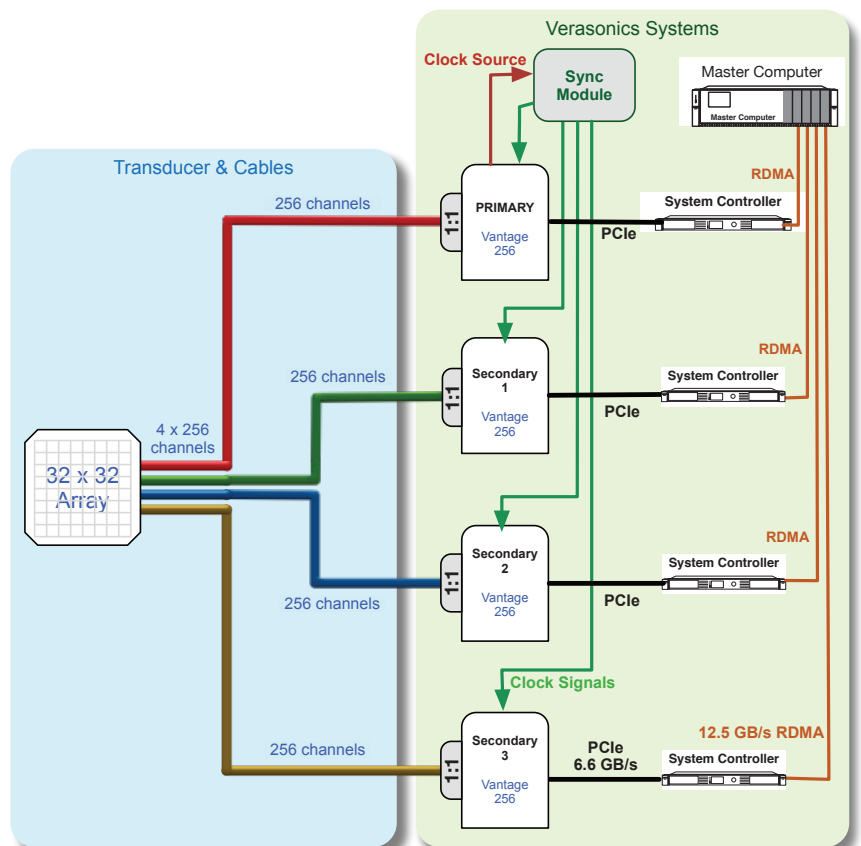
Phase Accurate Synchronization of Acquisitions

The synchronization process works by placing all system sequences in a "Wait for Trigger" state. When the Primary sequence arrives at the sync point, it enters the wait state and sends a trigger signal to the Synchronization Module. The Module then triggers all systems, including the Primary, and these start their acquisitions to within a fraction of a nanosecond of each other because they all share the same master clock.

Each controller may store its data for post-acquisition reconstruction of the combined coherent data set, or transfer the data to the Primary for immediate processing (at a frame rate that depends on the data transfer speed between computers). The user may configure their local network as needed, based on their application.

A block diagram for a 32x32 array directly connected to four Vantage 256 systems synchronized using the Synchronization Module illustrates how simple the synchronous acquisition setup can be.

System Diagram for 3D Imaging System
32x32 Matrix Array — 1024 elements
4 Vantage 256 systems



Key Points

- New Synchronization Module for phase accurate multi-system acquisition
- Simple wiring using only HDMI cables
- Simple programming
- Application Note and example acquisition script included

Multiple System Synchronization Wiring

[2 to 8 systems]

