

## Architecture for Ultra-Wideband Radio

**R**esearchers at the University of South Florida have invented a technique for generating, transmitting and detecting high speed pseudo-random sequences and signal modulation across a wireless interface using Ultra Wideband (UWB) pulses.

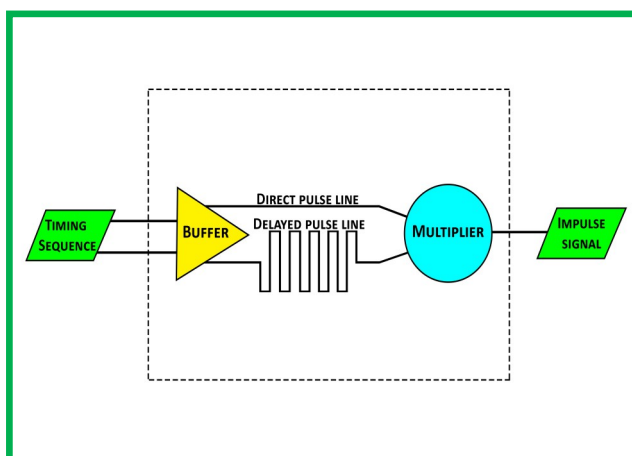
A desirable feature of UWB communication does not require baseband modulation. UWB is carrier-less, and provides the potential for reduced complexity and cost. The high speed nature of components required for UWB communications have been a source of potential implementation challenges. Typically, existing approaches rely on expensive custom ASICs or arrays of high speed Analog to Digital Converters (ADCs) having substantial processing requirements. Hence, there is a need for a technology that can simplify the processing methods and have noise immunity.

Researchers at USF have proposed a technology for generating, transmitting, detecting and processing radio signals that mitigate the challenges often associated with UWB communication implementations. One technique includes utilizing a transmitted reference approach, wherein the radio signal include pairs of UWB pulses each separated by a fixed time delay. The two pulses are then combined to provide for improved noise immunity. This technology enables a low cost implementation, with flexibility, improved logic resource efficiency and simplified processing requirements. This technology is applicable to a wide array of wireless communication technologies.

### ADVANTAGES:

- Improved design
- Flexible implementation
- Simplified processing requirements in a UWB radio
- Improved noise immunity

### UWB Radio Architecture Revamped



### A Block Diagram of an Illustrative Pulse Generator

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