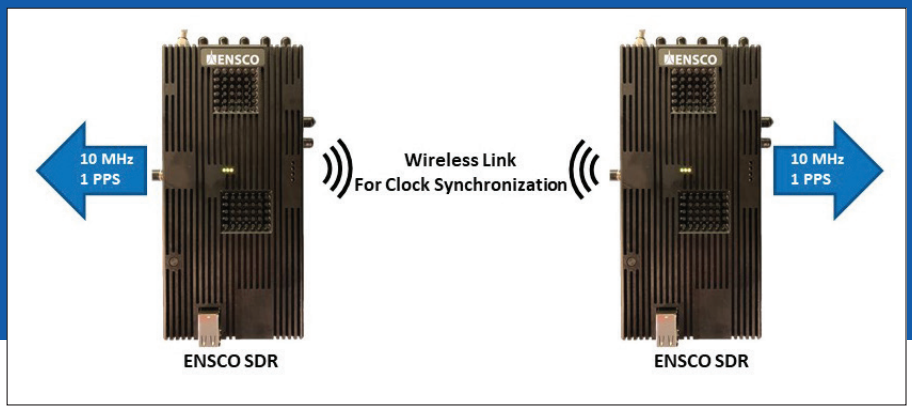
ENSCO
Ideas to Reality®

Coherent Link Technology (CLT)

Wireless Distributed Time and Frequency Synchronization



Technology Summary

ENSCO's Coherent Link Technology (CLT) is a high-precision time dissemination and synchronization capability that simultaneously provides distance and speed measurements between software-defined radios (SDR) using a wireless Radio Frequency (RF) link and ENSCO's patented Timing, Communications and Ranging (TCR) technology.

This multi-faceted technology enables tracking the relative position of a mobile, distributed network of SDRs. The measurements also enable disciplining of remote clocks relative to a master clock based on fractional baseband offset and frequency offset estimates between the clocks in the SDRs. The estimates use a combination of baseband and carrier phase measurements. The inclusion of carrier phase measurements enables picosecond-level time synchronization precision.

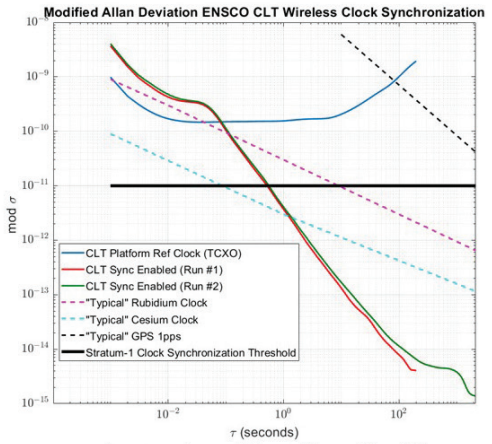
Capabilities

- Rapid synchronization (< 10 ms)
- Measurements support SDR positioning
- Operates in GPS-denied environments
- Robust to multipath for operation in real-world, dynamic environments
- Demonstrated time synchronization stability < 10 ps
- Demonstrated frequency syntonization stability < 1 x 10^{-11} fractional frequency

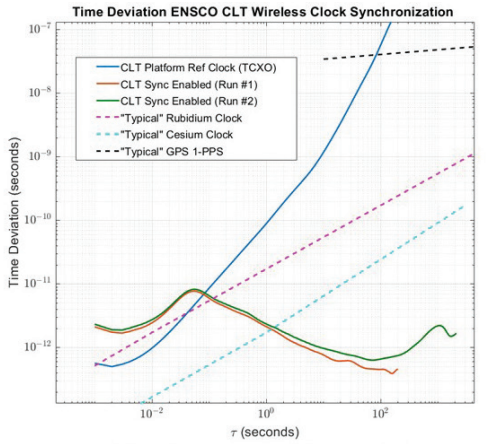
Applications

ENSCO CLT technology enables a wide range of applications that require high precision time/frequency synchronization:

- Wireless and mobile synchronization of a remote clock(s) to a local master clock
- Wireless and mobile synchronization of time and clock reference on distributed radios to an absolute reference such as Universal Coordinated Time (UTC)
- Phase coherent reference signal generation
- Virtual phased array RF communications or RADAR applications (using "virtual links" between distributed, mobile antennas)



Stratum-1 precision achieved in ~0.5s



< 10 ps time sync precision maintained

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