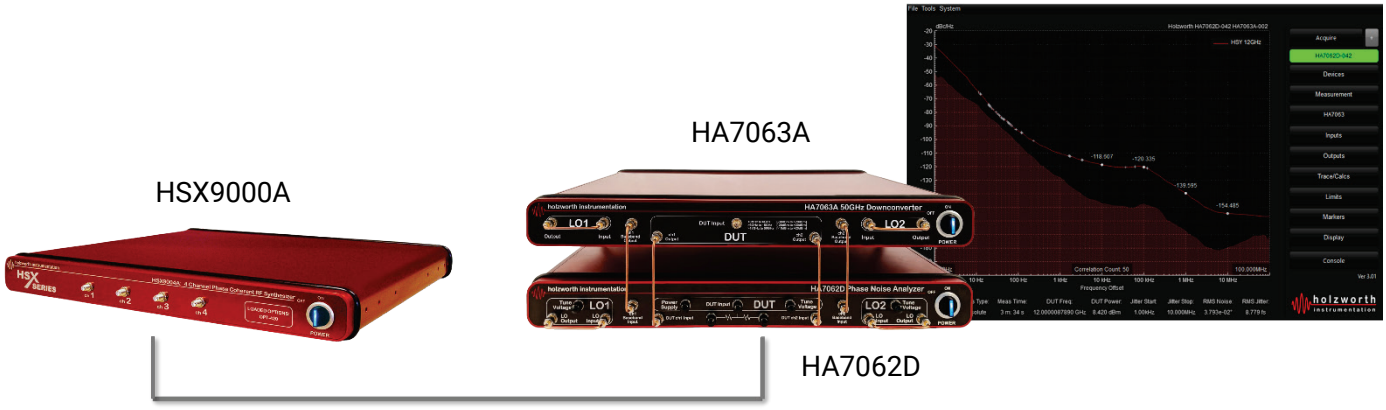
Holzworth

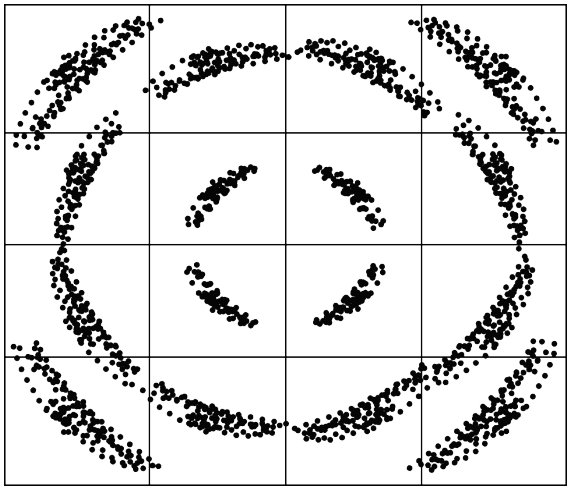
IMS 2023 Demo Write-up

Phase Noise Analysis

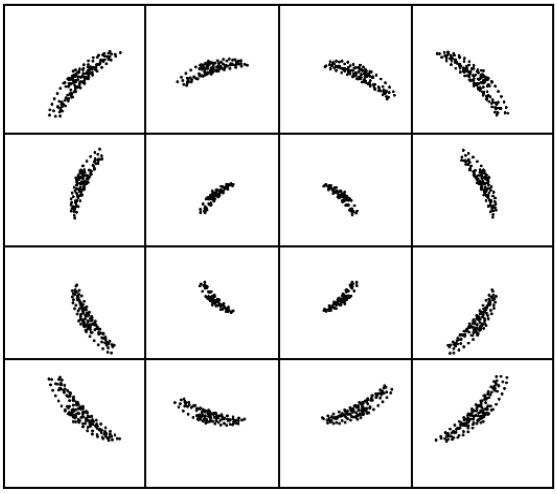


Demonstration Overview

Today's communication systems (e.g., 5G and Wi-Fi) utilize high order modulation to achieve fast data rates. However, symbol errors can slow the data flow. When symbol errors exist, one potential source is poor phase noise of system local oscillators (LOs). To troubleshoot, engineers can utilize low phase noise synthesizers as an LO substitute or measure the LO's phase noise. This demonstration highlights the capabilities of the Holzworth HSX9000A series of multi-channel RF synthesizers with the ULN ultra-low phase noise option and the Holzworth HA7062D series of real-time phase noise analyzers used in conjunction with a Holzworth HA7063A 50 GHz downconverter.



16 QAM Modulation with a Poor Phase Noise LO



16 QAM Modulation with a Low Phase Noise LO

Target Users for Phase Noise Analysis & Low Phase Noise Synthesis

Target users include design engineers and technicians engaged in design, verification, and troubleshooting of RF and microwave communication systems.

Product Overviews

HSX9000A Series Multi-channel RF Synthesizers

The HSX Series RF synthesizers offer industry-leading phase noise and spectral purity as a multichannel CW signal source. The compact 1U chassis allows from 1 to 4 independently tunable channels (frequency / phase offset / amplitude) to optimize channel density within test system racks where space is limited. Application-specific frequency options can be configured to cover combinations of 10 MHz to 3 GHz, 6 GHz, 12 GHz, 20 GHz, and 40 GHz. Each broadband channel output provides accurate power levels from as low as -110 dBm up to as much as +18 dBm. Holzworth's unique multi-loop architecture provides the ultimate in frequency accuracy, channel-to-channel stability, and phase coherency.

KEY FEATURES AND SPECIFICATIONS:

- Up to 4 independently controlled phase coherent channels
- Ultra-low phase noise (ULN) option available
- Mix or match 3, 6, 12, 20, & 40 GHz channels
- 40 GHz phase noise: -115 dBc/Hz 10 kHz offset (ULN option)
- Compact 1U form factor
- +18 dBm to -110 dBm

HA7062D Series Real-time Phase Noise Analyzer

The HA7062D Real-time Phase Noise Analyzer offers a unique combination of accuracy, speed, flexibility, and reliability in a compact form factor. Control is easy through an intuitive GUI or simple remote commands. This makes them ideal for use in the lab and production.

KEY FEATURES AND SPECIFICATIONS:

- DUT input: 10 MHz to 26 GHz, opt 40 GHz
- Measurement bandwidth: 0.1 Hz to 100 MHz
- Automated absolute and additive (residual) measurements
- Only analyzer available that allows actual noise floor measurements
- Real-time cross correlation
- Extremely fast measurement speeds

HA7063A 50 GHz Downconverter

The HA7063A is a heterodyne downconversion system that seamlessly integrates with Holzworth real-time phase noise analysis products that results in a calibrated frequency extension. The HA7063A enables both absolute and additive (residual) measurements to 50 GHz, without the need for external mixers.

Company Overview

Holzworth

Holzworth Instrumentation is a leader in high-performance phase noise analyzers and signal generators for test and measurement solutions in government, commercial, and academic environments.

Resources for More Information

Visit info.wtcom.com/ims-2023 to learn more about T&M solutions from Holzworth.