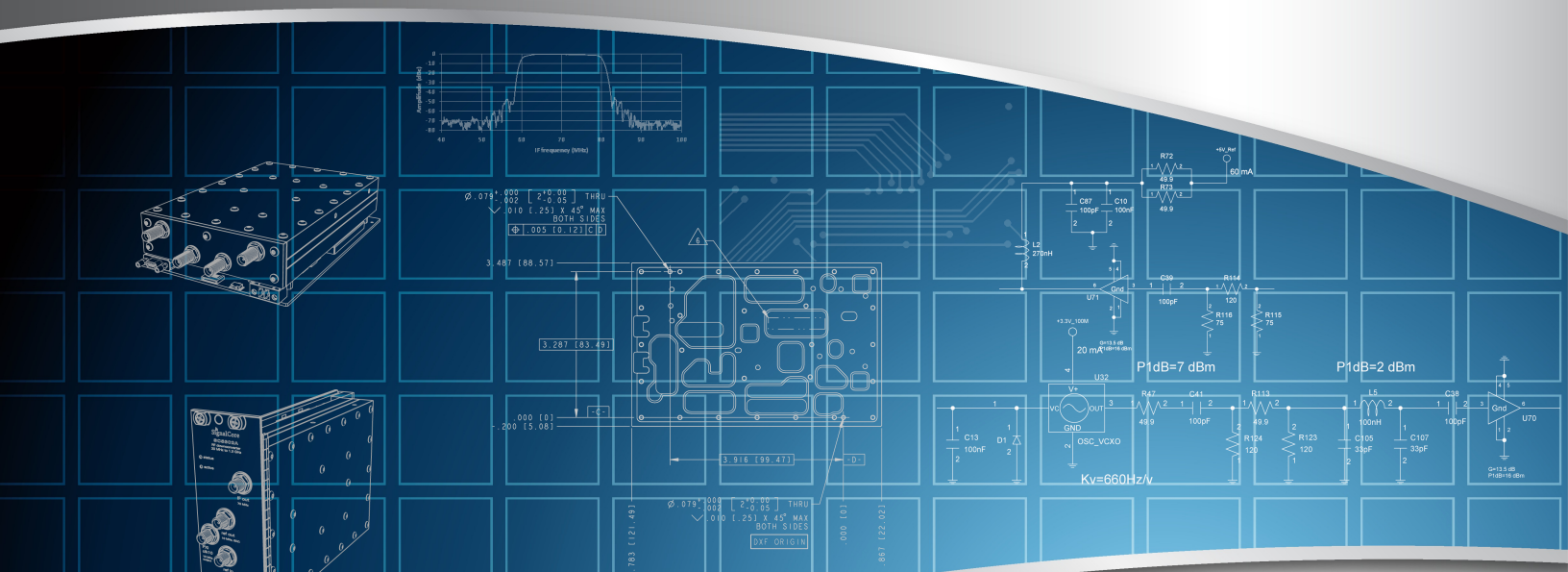
SignalCore™

PRESERVING SIGNAL INTEGRITY



Instrumentation Grade
RF & Microwave Subsystems

Precision Frequency Translation

SignalCore's frequency translation products are designed to meet today's demanding wireless applications. Offered in small form factor modules with an outstanding price-to-performance-ratio, SignalCore products are the clear choice for your integration needs. These products use the superheterodyne topology, exhibit low phase noise, high dynamic range, excellent flatness response and low spurious content. These modules are easily integrated with standard communication interfaces, and come with extensive Windows, LabVIEW, and C/C++ support, simplifying the task of building customized systems. Now you can focus on system-level design and leave the core functionality and performance to us.

Core Modules

SC5306B & SC5406B – 1 MHz to 3.9 GHz RF Downconverter and Upconverter

PXI/ PXI Express Models

SC5305A & SC5405A – 1 MHz to 3.9 GHz RF Downconverter and Upconverter

SC5302A – 1 MHz to 1.3 GHz RF Downconverter

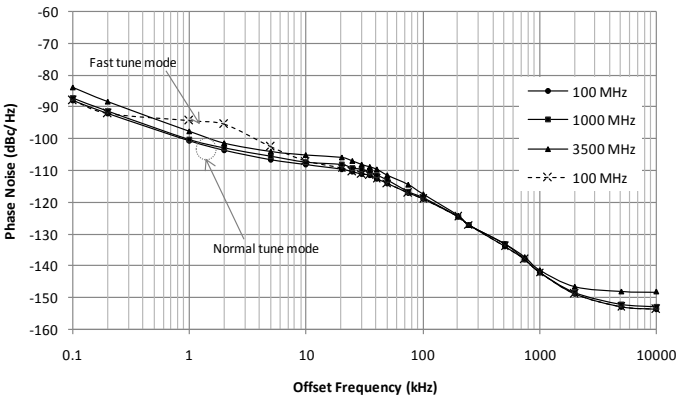
Core Module with 3U Control Card

(1.3 GHz SPI interface board shown)

SC5303A – 1 MHz to 1.3 GHz RF Downconverter

KEY FEATURES - 1 MHz to 3.9 GHz Downconverter

- Low residual phase noise < -107 dBc/Hz at 10 kHz
- 1 Hz tuning resolution (exact frequency)
- 10 / 20 / 40 MHz signal bandwidth
- Input SNR dynamic range > 150 dBc/Hz
- Residual spurs < -100 dBm
- 3rd order intermodulation 80 dBc at -20 dBm mixer level
- Image rejection > 120 dB
- LO leakage < -120 dBm
- Internal RF preamplifier



Typical single sideband phase noise for 3.9 GHz downconverter models

KEY FEATURES - 1 MHz to 3.9 GHz Upconverter

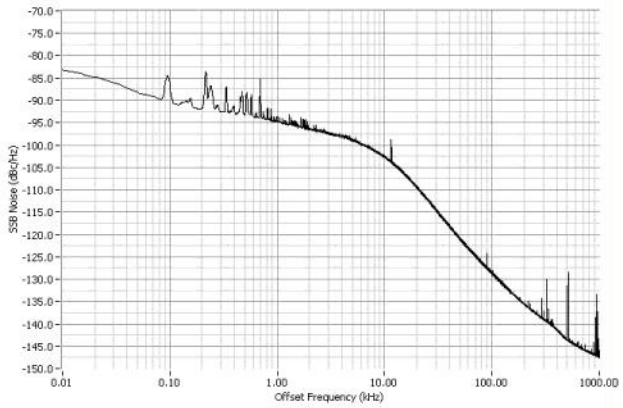
- Low residual phase noise < -107 dBc/Hz at 10 kHz offset, -140 dBc/Hz at 1 MHz offset, 1 GHz carrier
- 1 Hz tuning resolution (exact frequency)
- Signal bandwidth 20 / 40 MHz
- Output SNR dynamic range > 150 dBc/Hz
- <-110 dBm to 15 dBm output levels with 0 dBm at input
- Output spurious signals < 75 dBc typical
- 3rd order intermodulation < 70 dBc at 0 dBm output level
- LO leakage < 80 dBc
- Internal IF sine-tone generation

9.345 GHz X-Band Dual Channel RF Downconverter

The SC5360A is a 9.345 GHz, dual channel, dual-stage conversion, super-heterodyne downconverter with integrated local oscillators (LOs) that delivers superior performance. Designed initially for EW, it meets demanding applications such as X-band radar systems, communication systems, spectral monitoring systems, and as a subsystem component in customized precision test equipment designs.

The standard output IF is 140 MHz with a 3 dB bandwidth of 40 MHz and exhibits no spectral inversion. Both channels are driven directly by common LOs, making the SC5360A desirable for applications that require dual coherent reception of signals in a compact size. The SC5360A is designed to ease system engineers in their efforts in creating embedded applications like signal intelligence or radar systems where the requirements demand high quality, compact RF modules. Given the combination of low phase noise, high dynamic range, excellent flatness response and low spurious content, SignalCore's product offerings are the clear choice for frequency translation.

SC5360A – 9.345 GHz X-Band Dual Channel RF Downconverter



KEY FEATURES

- Low residual phase noise < -125 dBc/Hz at 100 kHz offset
- Signal bandwidth 40 MHz
- Noise figure 4 dB typical
- Output IP3 > 30 dBm
- LO leakage < -100 dBm
- Other X-band frequency options available

APPLICATIONS

- Weather radar
- Satellite communication
- RF instrumentation
- Software-defined radio
- Signal intelligence
- Deep space communication

Custom Design Capabilities

SignalCore is committed to providing our customers with high performance and low cost instrument grade subsystems, whether or not they are part of our current catalog. We know the industries we serve, and we realize that there will always be a need for something not even the deepest catalog offering can provide.

If you have custom requirements, please contact our sales team at (512) 501-6000 or email us at sales@signalcore.com. Our innovative design capabilities, rich engineering talent, agile product development and outstanding customer service combine to take challenging design-to-spec problems and quickly turn them into cost effective customized solutions that meet or exceed customer requirements.

Our Committment

SignalCore is committed to quality and compliance worldwide. To meet our customer's expectations and to satisfy our global commitment to high-quality product design, manufacturing and service, SignalCore operates on a fundamental process of continuous improvement. Where applicable, our products are fully tested to ensure conformity to all global EMI standards and to meet the environmental and ruggedness standards of each industry we serve. All SignalCore products are manufactured to be fully RoHS compliant. SignalCore designs and manufacturers its entire product line at its headquarters in Austin, Texas, U.S.A.

Precision Frequency Translation

6 GHz IQ Transceiver Core

To meet the demands of modern communication systems, SignalCore offers a line of direct RF-to-baseband and baseband-to-RF frequency conversion modules. Our IQ modulator and demodulator modules have a 400 MHz to 6 GHz tuning range and support 1 Hz tuning resolution with high SNR. Combined with one of our 25 MHz to 6 GHz signal sources (with two independently-tunable channels each with 1 Hz micro-step tuning resolution), these modules create a beautifully compact, high-performance 6 GHz IQ transceiver core with all the flexibility needed to meet customized applications. The dual-channel source allows rapid configuration of systems with different transmit and receive frequency requirements. Build your system from scratch using all three, or use individual modules to complement existing systems components.

These modules support phase coherency, making them ideal for use in the increasing popular and demanding phase-coherent system development market segment. They may be deployed into a wide spectrum of coherent channel applications such as phase array and multiple-input, multiple-output (MIMO) systems. By providing separate, stand-alone modules for the local oscillators and signal chain paths, multiple phase-coherent channels can be driven from a common synthesizer module. This modular approach allows our customers to configure any number and type of phase-coherent channels needed for their particular application.

SC5412A / SC5413A Direct IQ Modulator	SC5505A / SC5506A Dual Channel Signal Source	SC5312A / SC5313A Direct IQ Demodulator
• 400 MHz to 6 GHz	• 25 MHz to 6 GHz	• 400 MHz to 6 GHz
• DC to 160 MHz baseband	• Low residual phase noise < -115 dBc/Hz at 10 kHz offset, 1 GHz carrier	• DC to 160 MHz baseband
• Output SNR > 140 dB		• Noise floor < -165 dBm/Hz
• Output IMD > -70 dBc	• Low phase spurious content <-70 dBc	• Input IP3 > 20 dBm
• LO feed-through calibration	• Tuning resolution 1 Hz	• DC offset calibration
• Output range > 90 dB	• Output levels < -50 dBm to 10 dBm	• Adjustable gain > 60 dB
• 0 to 90 dB attenuation	• Spurious signals < -75 dBc typical	• 0 to 60 dB attenuation range
• Compact size	• Channel isolation > 70 dB	• Size - 5.75" x 3.75" x 0.75"
• Low cost	• Low cost	• Low cost

Signal Sources

SignalCore's line of instrument-grade synthesized RF and microwave CW sources are designed to meet demanding high-performance applications. Available in multiple platforms and various communication options (USB, RS-232, SPI, and PXI Express), our signal sources employ multiple phase-locked loop architectures to produce low phase noise signals. Our 10 GHz signal source modules are YIG oscillator-based, and both the 20 GHz and 6 GHz source modules are VCO-based that have performance of a big-box instrument packed into a module that fits in the palm of your hand. All modules exhibit low phase noise performance, and have an automatic leveling control (ALC) circuit to ensure precise amplitude control over frequency and temperature.

Our signal source modules can be used as standalone CW signal sources, or as LO sources for frequency conversion systems like SignalCore's IQ modulators and demodulators. They are developed to meet the requirements of many modern applications such as wireless device testing, software-defined radio research, point-to-point radio, multichannel coherent systems, and other academic, military and commercial programs.

Extremely low cost for their frequency coverage, SignalCore signal source modules provide phase noise and spurious response levels that are unmatched in compact-size frequency synthesizers.

SC5503B – 10 GHz Signal Source Core Module

SC5505A – 6 GHz Dual Channel Source PXI Express

SC5511A – 20 GHz Signal Source Core Module

SC5502A – 10 GHz Signal Source PXI Express

SC5506A – 6 GHz Dual Channel Source Core Module

SC5510A – 20 GHz Signal Source PXI Express

SC5502A / SC5503B
10 GHz Signal Source

- 50 MHz to 10 GHz
- Low phase noise < -121 dBc/Hz at 10 kHz offset, 1 GHz carrier
- Tuning resolution 1 Hz (exact frequency)
- Output range - 60 dBm to +10 dBm
- 2nd order harmonics < -20 dBc
- Spurious signals < -75 dBc typical
- Communicate via USB, RS-232, SPI, and PXIe

SC5505A / SC5506A
6 GHz Dual Channel Signal Source

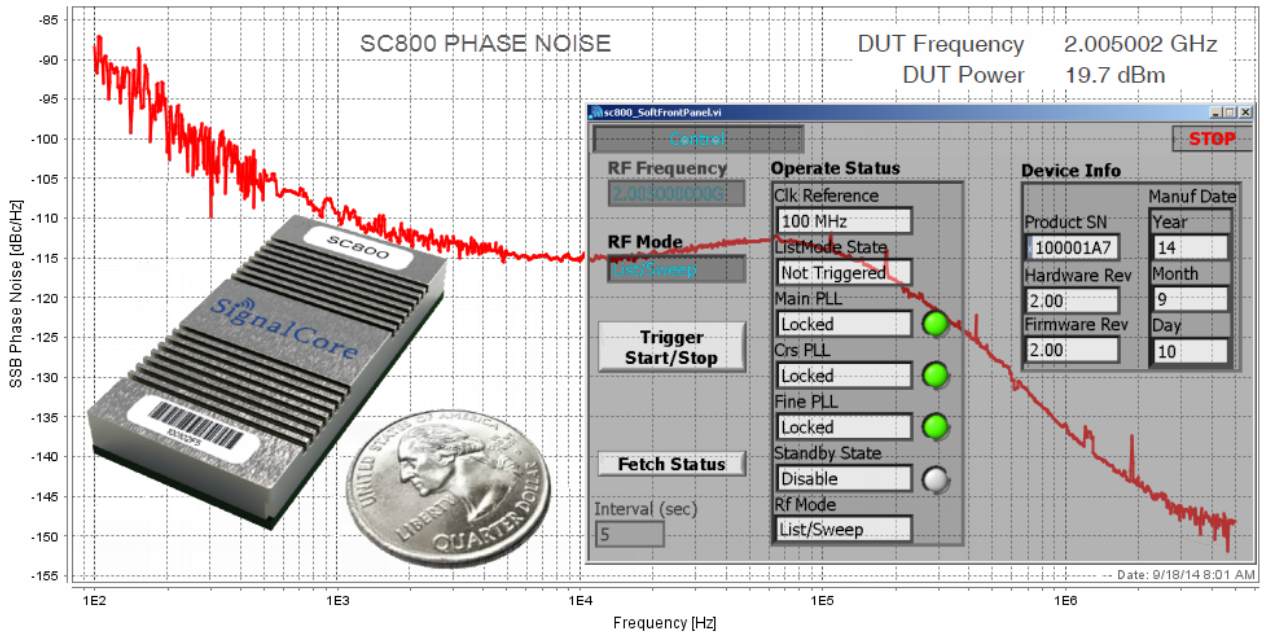
- 25 MHz to 6 GHz
- Low phase noise < -115 dBc/Hz at 10 kHz offset, 1 GHz carrier
- Low phase spurious content < -70 dBc
- Tuning resolution 1 Hz
- Output levels < -50 dBm to 10 dBm
- Spurious signals < -75 dBc typical
- Channel isolation > 70 dB

SC5510A / SC5511A
20 GHz Signal Source

- 100 MHz to 20 GHz
- Low phase noise < -118 dBc/Hz at 10 kHz offset, 10 GHz carrier
- Tuning resolution 1 Hz (exact frequency)
- Output levels < -30 dBm to 10 dBm
- Spurious signals < -70 dBc typical
- Communicate via USB, RS-232, SPI, and PXIe
- Modular, compact size, low cost

nanoSynth® Integrated 6 GHz SMT Synthesizer

The SC800 nanoSynth® is a fully integrated broadband CW signal synthesizer that combines multiple PLL, DDS, and frequency dividers into a rugged and miniature 2″x1″ surface mount package. The output frequency range is 25 MHz to 6 GHz with average output power of +10 dBm. Tuning at 1 Hz resolution, the multiple PLL architecture eliminates close-in phase spurs that are associated with fractional-N PLLs. The SC800 has low phase noise better than -112 dBc/Hz at 10 kHz offset from a 1 GHz carrier. The SC800 integrates low noise linear regulators and an output RF amplifier to greatly improve the pushing and pulling performance. To simplify user communication with the device, an onboard microprocessor performs all necessary computations to control and set the output frequency, reducing the number and complexity of instruction registers.



KEY FEATURES

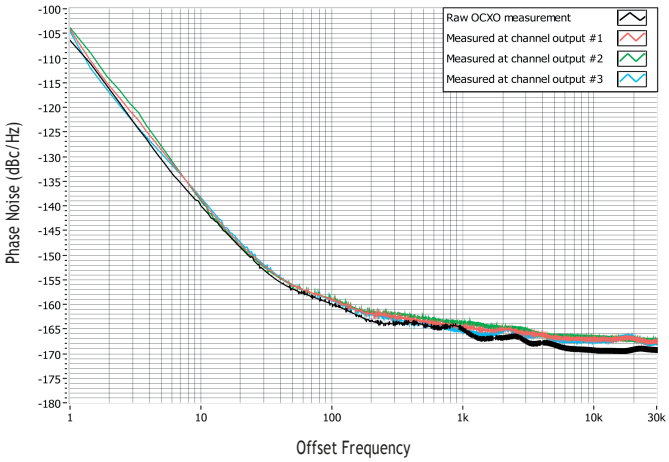
- Frequency range 25 MHz to 6 GHz
- Low residual phase noise < -112 dBc/Hz at 10 kHz offset from a 1 GHz carrier
- Tuning resolution 1 Hz (exact frequency)
- Rugged and miniature 2″x1″ SMT package
- Frequency list mode
- Single supply operation

APPLICATIONS

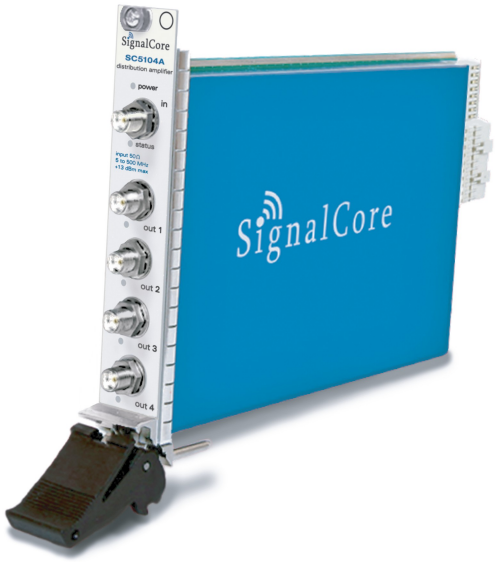
- Test and measurement equipment
- Wireless communication equipment
- Point-to-point and cellular infrastructure
- Frequency converter local oscillator
- Digital data converter clock source
- Network equipment

Signal Distribution

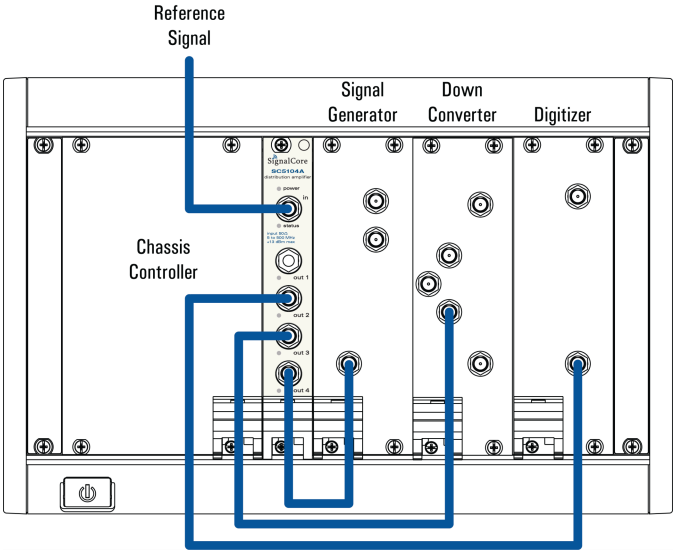
SignalCore's distribution amplifier is among the best industry solution for routing precision signals between multiple instruments without loss of signal integrity. Our low-cost distribution amplifier provides an accurate replication of the input signal. Our distribution amplifier solves impedance matching problems common to passive dividers that siphon away signal power and reduce dynamic range. SignalCore's distribution amplifier is a PXI Express-based module that integrates perfectly into industry-standard PXIe-based instrumentation systems.



Spectral phase noise plot comparing the direct signal measurement of a precision 10 MHz OCXO with measurements taken through various channels of the SC5104A



SC5104A – 4 channel broadband 5 MHz to 500 MHz low phase noise distribution amplifier for PXI Express



Typical distribution amplifier signal routing in a PXI-based system

BROADBAND DISTRIBUTION AMPLIFIERS

- Broadband operation from 5 MHz to 500 MHz
- High signal-to-noise dynamic range of 169 dB
- Low spurious content < -100 dBc measured at 100 MHz
- Flatness response > ±2.5 dB
- Status indication of channel level threshold
- Ultra-low residual (additive) phase noise < -167 dBc/Hz at 10 kHz offset, 100 MHz carrier

APPLICATIONS

- Clock distribution
- RF signal distribution
- Electronic industries
- Research and development labs
- Signal monitoring
- Computer manufacturing

Company Overview

SignalCore designs and manufactures high-performance, innovative, and cost effective electronic radio frequency (RF) and microwave instrumentation-grade subsystems. We serve customers worldwide in research and development laboratories, universities, and both the private and public sector industries of telecommunications, broadcasting, aerospace, defense, and electronics manufacturing.

"Our mission is to provide our customers with high-performance, flexible, small form factor, and cost effective sub-systems, enabling their integration into customized, high-end RF and microwave solutions. "

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SignalCore™
Preserving Signal Integrity

All SignalCore products are proudly designed and manufactured in the U.S.A.