Signal Core signal sources are designed to meet demanding RF and microwave applications in academia, military, and commercial markets. Our broadband CW signal sources offer low phase noise performance, fast frequency locking, and fine resolution tuning, all with robust and easy to use programming interfaces.
Designed to meet demanding high-performance applications, the SC5510A and SC5511A compact the performance of a big-box instrument into a module that fits in the palm of your hand. Our signal sources employ multiple phase-locked loop architectures to produce low phase noise signals. These modules are ideal for both single-stage RF conversion systems and dual-stage image suppression up and down converter systems. Full implementation instructions, GUI, driver software, and example code are provided with each module.

**20 GHz Signal Source**

**KEY FEATURES**

- Frequency range 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, or PXI Express
- Two independent source channels
Signal Sources

10 GHz YIG Based Signal Source

Extremely low cost for their frequency coverage, SignalCore signal source modules provide unmatched phase noise and spurious response levels. These modules employ a multiple phase-locked loop architecture as well as a YIG oscillator as the heart of its synthesizer. Frequency accuracy is provided by an onboard 10 MHz temperature compensated crystal oscillator (TCXO). The SC5503B and SC5502A can be used as a standalone CW signal source or as an LO source for frequency conversion systems such as the SignalCore IQ modulators and demodulators.

KEY FEATURES

- Frequency range 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
SignalCore’s dual channel CW signal sources provide independent frequency generation from 25 MHz to 6 GHz. Both channels have a common internal 10 MHz TCXO reference, which can be phase locked to an external source for frequency synchronization. The SC5505A and SC5506A are designed with the intent of being paired up with SignalCore IQ modulators and demodulators, such as the SC5413A and SC5313A, to form RF transceivers. They serve well as LO sources for multiple single stage downconverters or a dual stage downconverter and are ideal choices as a clock source for fast DAC and ADC applications.

**KEY FEATURES**

- Frequency range 25 MHz to 10 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 range ~ 50 dBm to +10 dBm
- Spurious signals < -75 dBc typical
- Channel isolation > 70 dB
- Dual independent CW signal source
The SC800 nanoSynth® is a fully integrated broadband CW signal source combining multiple PLL, DDS, and frequency dividers into a rugged and miniature 2” by 1” surface mount package. This signal source 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**

- 25 MHz to 6 GHz
- Low phase noise < -112 dBC/Hz at 10 kHz offset, 1 GHz carrier
- Tuning resolution 1 Hz
- 2” x 1” SMT package
- Frequency list mode
- Single supply operation

Test and Measurement Equipment
Wireless Communication Equipment
Point-to-Point & Cellular Infrastructure
Frequency Converter Local Oscillator
Digital Data Converter Clock Source
Network Equipment
SignalCore RF Upconverters are designed to meet today’s demanding wireless applications. They are high performance devices that can be easily integrated into many signal generation systems. They are well suited to pair up with our RF downconverters to form transceiver pairs.

With low phase noise, fine tuning steps, continuous broadband coverage, the ability to lock to a precision external reference source, and boasting high dynamic range, SignalCore Downconverters focus on preserving signal integrity for subsequent digitizing and signal processing, providing our customers with the tools they need for precise frequency translation.
6 GHz Triple Stage Upconverter

The SC5408A and SC5407A use superheterodyne topology while exhibiting 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. Driver and development software is provided, as well as a software GUI that allows users to easily control the device without having to write control software.

Key Features

- Frequency range ~ DC to 6 GHz
- Low phase noise < -100 dBc/Hz at 10 kHz offset, -140 dBc/Hz at 1 MHz offset, 1 GHz carrier
- 1 Hz tuning resolution
- Ultra bandwidth up to 320 MHz
- Output SNR dynamic range > 150 dBc/Hz
- < -110 dBm to 15 dBm output levels with 0 dBm at input
- 3rd order intermodulation < 72 dBc at 0 dBm output level
- Dimensions: 3.7" x 1.4" x 5.7" (core module)
- Communication interfaces: USB, RS232, SPI, PXIe
With this module, SignalCore offers a compact and modular high-performance triple stage heterodyne downconverter. Powered by a single rail +12V supply, the SC5308A uses a YIG oscillator as its tunable RF LO, contributing negligible noise to the down-converted RF signal. For PXI users, SignalCore offers SC5307A, a double slot PXI Express platform that has the same performance and functionality as the SC5308A.
Low phase noise < -107 dBc/Hz at 10 kHz offset, 
-140 dBc/Hz at 1 MHz offset, 1 GHz carrier

1 Hz tuning resolution

Signal bandwidth 20 / 40 MHz

Output SNR dynamic range > 150 dBc/Hz

< -110 dBm to 15 dBm output levels with 0 dBm at input

3rd order intermodulation < 70 dBc at 0 dBm output level

LO leakage < 80 dBc

Internal IF sine-tone generation
The SC5305A and SC5306B are three-stage superheterodyne downconverters that deliver superior image rejection over single stage conversion. These products have both high signal-to-noise dynamic range and high spurious free dynamic range. The excellent spurious free dynamic range is achieved by using low noise linear amplifiers, low loss mixers, and high performance solid state attenuators.

**Key Features**

- Low phase noise < -107 dBc/Hz at 10 kHz, 1 GHz
- 1 Hz tuning resolution
- 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
To meet the demands of modern communication systems, SignalCore offers a line of direct RF-to-baseband and baseband-to-RF frequency conversion modules. Combined with one of our 25 MHz to 6 GHz signal sources, these modules create a 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 transmitting and receiving frequency requirements.

### 6 GHz IQ Transceiver Core

**SC5412A / SC5413A**

- 80 MHz to 6 GHz
- DC to 160 MHz analog baseband
- Output SNR > 140 dB
- Output IMD < -70 dBc
- LO feed-through calibration
- 0 to 90 dB attenuation
- Compact size

**SC5312A / SC5313A**

- 300 MHz to 6 GHz
- DC to 160 MHz analog baseband
- Noise floor < -165 dBm/Hz
- Input IP3 > 20 dBm
- DC offset calibration
- Adjustable gain > 60 dB
- 0 to 60 dB attenuation range
- Size: 5.75” x 3.75” x 0.75”
Frequency Translation

6 GHz IQ Transceiver Core

These modules support phase coherency, making them ideal for use in the increasingly 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 application.

SC5505A / SC5506A
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
- Dual independent CW Signal Source
The SC5360B is a dual channel, dual-stage conversion, super-heterodyne downconverter with integrated local oscillators (LOs). The module is designed as a subsystem component in customized precision test equipment [designs] and meets demanding applications such as X-band radar systems, communication systems, and spectral monitoring systems. The SC5360B is intended to ease the efforts of system engineers in creating embedded applications like signal intelligence or radar systems where the requirements demand high quality, compact RF modules.

**Key Features**

- Low phase noise < -106 dBC/Hz at 100 kHz offset
- Signal bandwidth 40 MHz
- Noise figure 4.8 dB typical
- Input IP3 > -13 dBm
- LO leakage < -100 dBm
- Communicate via USB and SPI
Utilizing fast, high performance VCO tuning, the ability to lock to a precision external reference frequency, and boasting a wide dynamic range, the SC5303A downconverter ensures accurate preservation of any modulated based-band signal for digitizing and subsequent signal processing.

Key Features

- Low phase noise < -100 dBc/Hz at 10 kHz offset, 1 GHz carrier
- Signal bandwidth 20 MHz
- Measurement dynamic range > 180 dB
- Image rejection > 120 dB
- Tuning speed < 1 ms (settled to 0.1 ppm)
- Amplitude accuracy ±0.75 dB
- IF leakage < -120 dBm
- Communicates via USB, SPI, and RS-232
SignalCore provides high performance and flexible technology solutions. Our instrument grade RF and microwave subsystems are designed to meet today’s demanding applications.