CDIP
www.cdip.ru
info@cdip.ru
+7 (495) 956-20-22

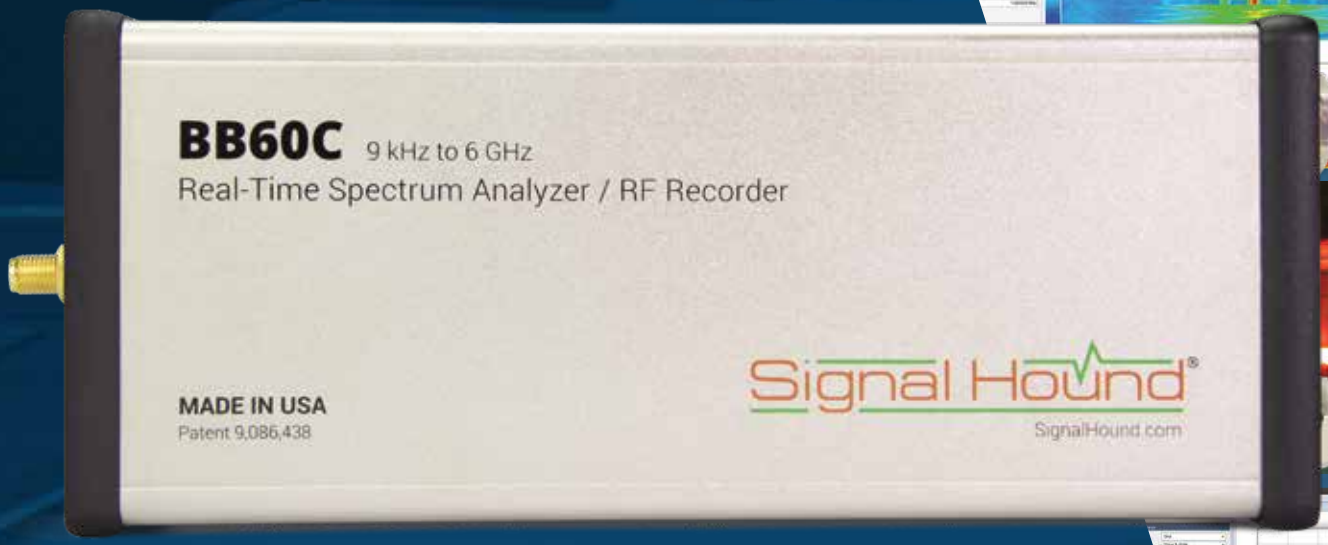
Signal Hound®

BB60C

Spectrum Analyzer

Real-Time Spectrum Analyzer
and Monitoring Receiver

9 kHz to 6 GHz



Unrivaled Value
High Performance

signalhound.com

BB60C

Spectrum Analyzer

Real-Time Spectrum Analyzer and Monitoring Receiver
9 kHz to 6 GHz

Features and Performance You Need Now

Implementing wireless technologies is becoming part of many of our jobs. Having a spectrum analyzer available to test and implement RF designs into your projects is key. The Signal Hound BB600C spectrum analyzer offers an unrivaled value, providing the performance you need at the best price available on the market.

The BB60C is a high-performance spectrum analyzer and monitoring receiver. Tuning from 9 kHz to 6 GHz, the analyzer has 27 MHz of instantaneous bandwith (IBW), 90 dB of dynamic range, and 24 GHz/sec sweep speed at >10 kHz RBW. The price/performance value of the BB60C is making many test engineers wonder why they should be paying so much for their next spectrum analyzer.

Managing and maintaining efficient communication networks requires the best tools you can get. The need for an affordable spectrum analyzer with the performance to monitor, manage, troubleshoot, and protect RF spectrum in the field has become a critical factor for success. The BB60C is meeting the need for many of these applications.

Whether you are in the lab or in production, the BB60C is the spectrum analyzer you need to keep your product supported. Don't wait for your turn to share scarce equipment — now you can have what you need in your own desk drawer!

- **9 kHz to 6 GHz frequency range**
- **+10 dBm to –158 dBm measurement range**
- **90 dB dynamic range**
- **24 GHz/sec sustained sweep speed**
- **27 MHz of instantaneous bandwidth**
- **–158 dBm displayed average noise level (Frequency at 1 GHz)**
- **System noise figure 12 dB typical (20 MHz to 1.8v GHz)**
- **± 2.0 dB absolute amplitude accuracy**
- **10 Hz to 10 MHz resolution bandwidth**
- **Calibrated streaming I/Q 250 kHz to 27 MHz of selectable I/Q bandwidth**
- **Real-time spectrum analysis capabilities up to 27 MHz with a 100 percent probability of intercepting signals as fast as 1 µsec**

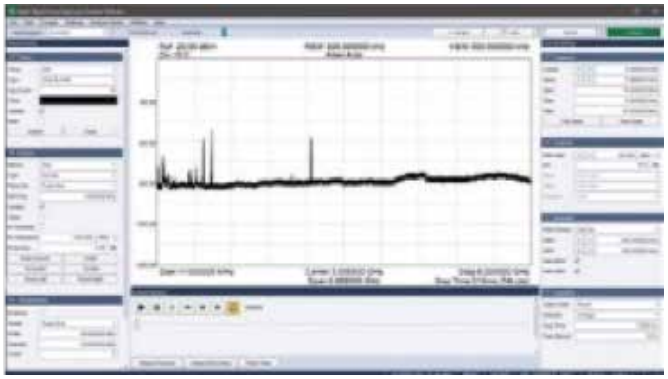
Measurements, Capabilites and Features

Spectrum Analyzer Measurements

Evaluate your signal performance in detail

The BB60C provides a wide range of measurements that let you evaluate your signal performance in detail.

In addition to its many specialized measurements, the BB60C offers all the traditional spectrum analyzer capabilities with features such as adding markers, traces, channel power, adjacent channel power, occupied bandwidth, spectrogram, phase noise, trace export, and sweep recording.



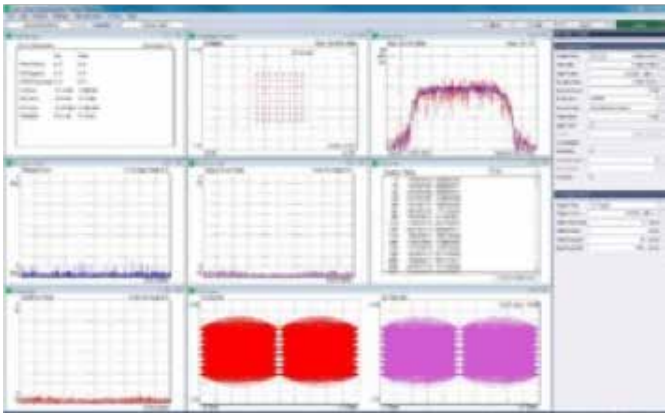
The BB60C offers all of the traditional spectrum analyzer measurement capabilities.

Complex Signal Analysis

Don’t pay extra to analyze your complex signals!

The BB60C includes a full suite of signal analysis capabilities. Our digital modulation analysis capability includes constellation diagrams and symbol tables for modulation formats such as QPSK, BPSK, 8PSK, π/4DQPSK, DQPSK, and QAM16/32/64/256.

Use constellation plots to visualize RF metrics such as I/Q offset, skew, EVM, phase noise, sample timing jitter, and compression.

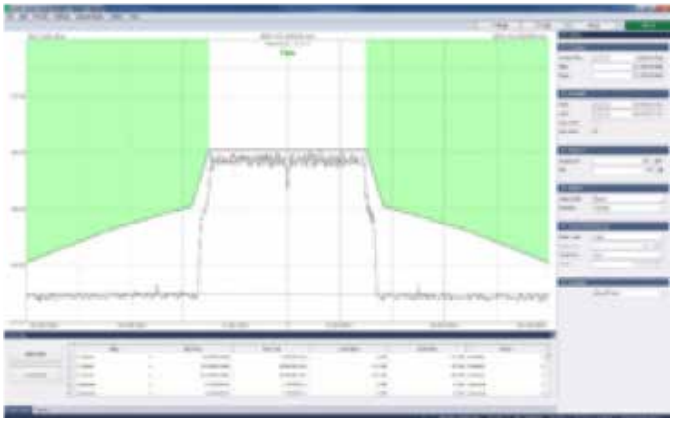


The BB60C includes a full suite of digital modulation analysis capabilities.

Spectrum Emission Mask Measurements

Easily trigger on out-of-band and spurious signals

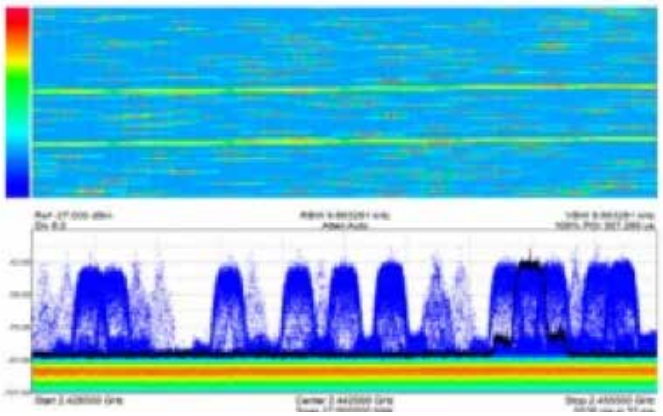
The BB60C software comes with a spectrum emission mask capability. This allows you to easily locate out-of-band or spurious signals. For several wireless standards, such as Wi-Fi, we offer single button presets for all the WLAN 802.11b/a/n/ac standards. This allows you to easily test out-of-channel spurious and adjacent channel power against the standard specified transmission mask.



Define your own spectrum emission mask

Real-Time Spectrum Analyzer Capabilities

For many real-world signals — from complex modulated communications signals, to interference events, to pulsed tactical signals — the signal energy can be sporadic, non-recurring, or even random. With traditional spectrum analysis, these signals could be nearly impossible to “catch” in an analyzer window or to trigger on. Present and future communication modulations are increasing the challenge further with techniques such as frequency-hopping, spread spectrum, pulsed, and cognitive radio low-probability-of-intercept techniques.



The real-time persistence and waterfall analysis show the occupancy of the 2.4 GHz ISM band of a Bluetooth headset and a cell phone searching for a Wi-Fi network.

SWaP+C: Look No Further

Pushing the boundaries of performance

Next-generation defense systems are pushing the boundaries of performance even as they continue to reduce size, weight, power, and cost (SWaP+C). Even in the commercial world, providing test engineers with critical test equipment in their drawer or on-the-go provides a competitive advantage.

BB60C Real-time Spectrum Analyzer	
Size	8.63” x 3.19” x 1.19” (219 mm x 81 mm x 30 mm)
Weight	1.10 lbs. (0.50 kg)
Power	One USB 3.0 port and one adjacent USB 2.0 or USB 3.0 port

The BB60C offers excellent SWaP+C parameters.

USB Powered

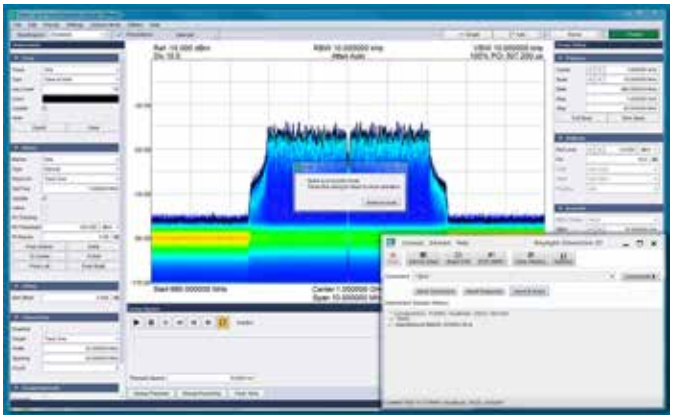
The BB60C is powered by USB and does not contain an internal power supply. This provides the ultimate in portability. Simply plug into a USB 3.0 port and start collecting data.

The BB60C is powered by your PCs USB 3.0 connection.

SCPI Automation

Remote operation via a TCP/IP link

The BB60C offers remote interface and control capabilities using SCPI compatible commands. It can be remotely operated by sending SCPI commands through a TCP/IP link. You can connect and interface the BB60C software through any VISA implementation or any programming language that allows SOCKET programming.



Expand Your Spectrum Monitoring Capability with Affordable Performance

Monitor, manage, troubleshoot and protect your RF spectrum

Wireless technology powers the modern world. From Wi-Fi to Bluetooth, satellites to smart phones, and automobiles to homes, every year it becomes more vital and ubiquitous. When signals interfere with one another, data rates plummet, connections drop, errors multiply, range decreases, pathways become noisy, and information exchange slows. The consequences can range from annoying to catastrophic.

Across this wide range of spectrum monitoring applications, high-end spectrum analysis has become a necessity. The need for affordable spectrum analyzer performance to monitor, manage, troubleshoot, and protect RF spectrum in the field has become a critical factor for success.

The BB60C meets your key requirements of performance and affordability

Sweep speed — the BB60C offers an industry leading 24 GHz/sec sweep speed at any of its resolution bandwidth settings ≥10 kHz. Covering 1 GHz to 6 GHz in just 208 milliseconds allows for a constant sweep of the airwaves.

Dynamic range — over 90 dB of specified dynamic range ensures that your signals can be distinguished from the spectrum analyzer's noise floor.

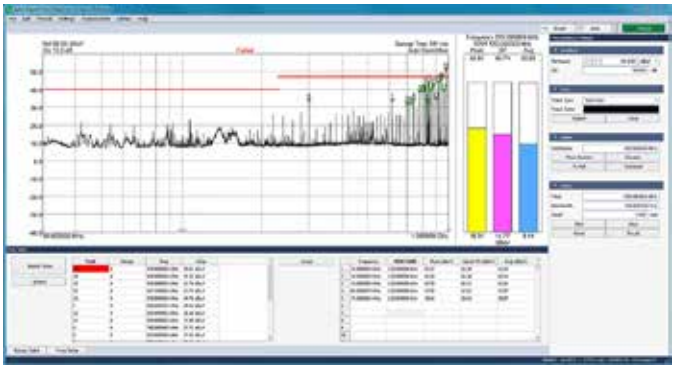
Real-time spectrum analysis capabilities — up to 27 MHz of instantaneous bandwidth with a 100 percent probability of intercepting signals as fast as 1 microsecond.

Affordable EMC Precompliance Testing

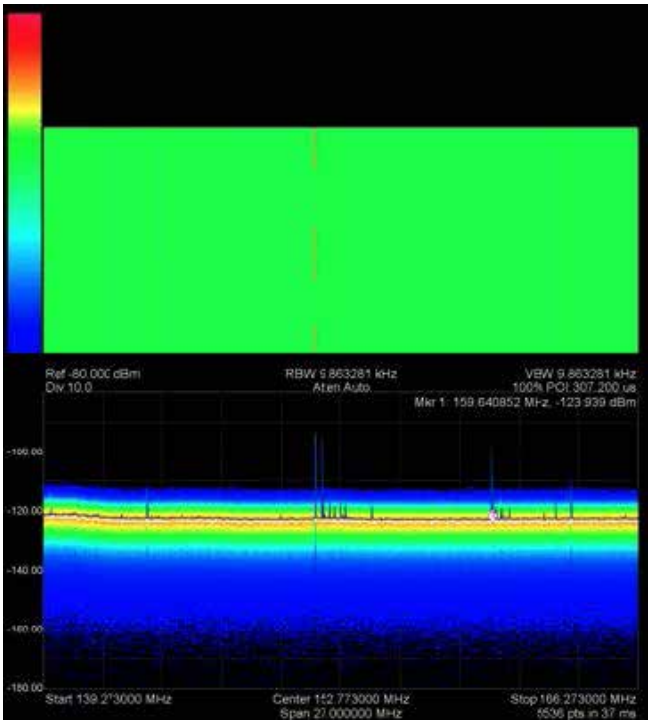
Radiated emissions standards exist for commercial, industrial, military, and aerospace products and systems, and involve formal testing of RF emissions during device operation. For those developing electronic hardware, low-cost alternatives are needed to help guide EMC decisions during the development phase.

The BB60C offers EMC Precompliance analysis for evaluating device behavior during prototyping and pre-production phases. EMC regulations have many frequency ranges and complex level requirements; we provide Limit Line Tables and Range Tables which can be used to generate and simplify the use of complex EMC Plots. The BB60C allows you to add in path loss and add Antenna Factor Correction Tables, which are used to calibrate or compensate for test setup frequency response imperfections.

Using the real-time capabilities allows you to capture very short duration and intermittent signals that traditional spectrum analyzers or EMC receivers aren't capable of measuring reliably. The BB60C provides persistent displays, waterfall displays, max held trace, and frequency mask triggers. It can perform all of these measurements that reveal frequency and time-domain information simultaneously. These measurement methods are particularly useful for capturing and analyzing bursty, modulated, or intermittent signals.



The BB60C offers easily accessible Frequency Scan Displays for common standards, Bar Meter Plots with quasi-peak detector features, and a spur table display, all in one interface.

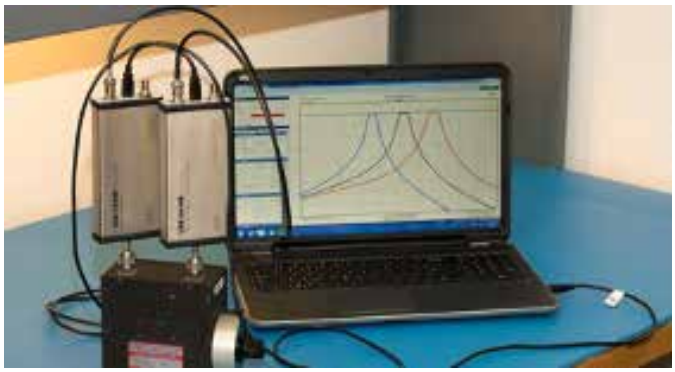


A persistent display with EMC probes can reveal spurious and intermittent spurious activity of a standard USB 2.0 port.

Get a high-performance, low-cost Scalar Network Analyzer (SNA)

If you need to make accurate and efficient cable insertion loss measurements or antenna return loss measurements, and the project you're working on doesn't warrant the cost of a Site Master™ or similar device, then take a look at our discounted scalar network analyzer product combinations.

Signal Hound offers highly-capable and affordable SNA product combinations that measure insertion loss, return loss, and have the spectrum analyzer features you need. We also include an API so that your equipment can do double duty—possibly as automated test equipment—when the need arises. In today's competitive economy you need to leverage your equipment to get the most out of your investment.



Upgrade your BB60C to a Scalar Network Analyzer with the TG124A!

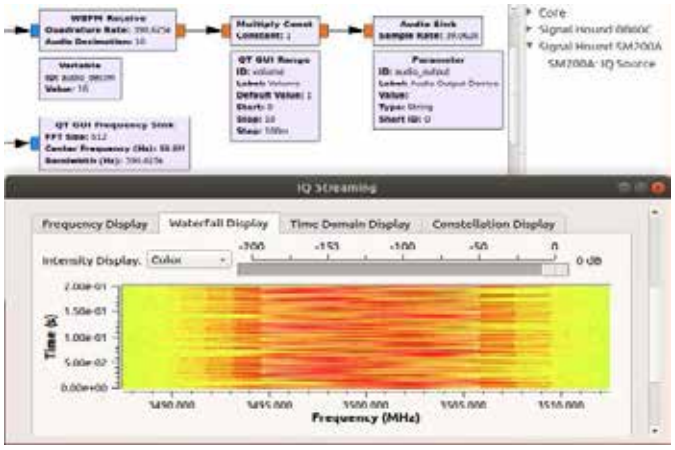
The Signal Hound TG124A is a 100 kHz to 12.4 GHz tracking generator which works with your BB60C to measure filters, attenuators, amplifiers and more! It is compact, simple to use, and an effective troubleshooting and analysis tool in the lab or in the field. Whether you are an amateur radio enthusiast or a microwave communications professional, the TG124A provides fast, accurate results.

GNU Radio
THE FREE & OPEN SOFTWARE RADIO ECOSYSTEM

Modules Accelerate SDR Development

Integrate the BB60C into your SDR

Software-defined radio (SDR) is a radio communication system where components that have been traditionally implemented in hardware (e.g. mixers, filters, amplifiers, modulators/ demodulators, detectors, etc.) are instead implemented by means of software on a personal computer or embedded system. While the concept of SDR is not new, the rapidly evolving capabilities of digital electronics make practical many processes which were once only theoretically possible. Signal Hound offers GNU Radio modules for the BB60C. This allows them to be used as I/Q sources from within GNU Radio, as blocks in a flowgraph, components of a hierarchical block, or called from a script.

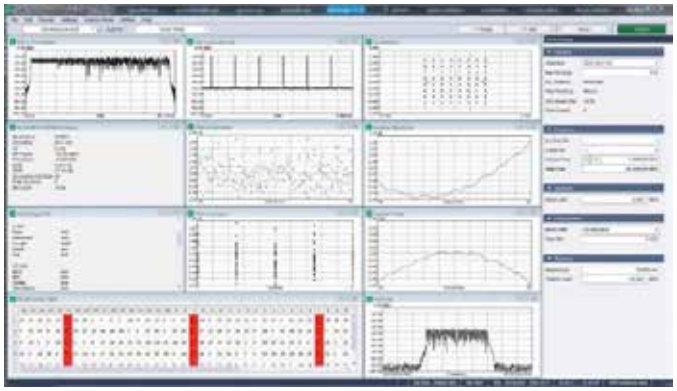


The GNU Radio application running the BB60C analyzer as a flowgraph block.

802.11a/b/g/n/ac WLAN Modulation Analysis

Now you can afford to evaluate transmitted WLAN signals at your desk

The BB60C enables you to accurately evaluate your signal performance and quality for the 802.11a/b/g/n/ac WLAN standards. You can demodulate WLAN signals with bandwidths up to 27 MHz and all QAM formats. Capture signal details with up to 15 different measurement windows so you can analyze modulation quality down to the bit level. The BB60C lets you capture and analyze transient rogue signals, plus troubleshoot spurious and out-of-band emissions.



Accurately evaluate your Wi-Fi signal performance and analyze modulation quality down to the bit level.

Easy Integration into Test Environments

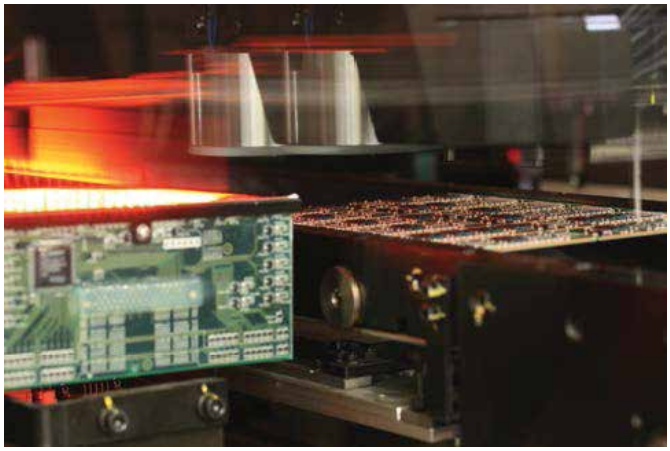
Signal Hound's open-systems approach provides a highly extensible platform for creating custom-tailored applications. Companies with automated test equipment (ATE) applications can easily extend the basic analysis software that comes with the product to address their unique requirements. Since the APIs are fully documented and programmable in C/C++, virtually any set of custom functions can be created, deployed, and maintained by programmers who are familiar with these industry-standard software methods.

Expanding capabilities beyond the box

Extensibility is very important in today's rapidly changing wireless communications environment where you need to remotely deploy solutions or updates that can then be adapted to address new requirements simply by remote updates of the software — without the need for physical interaction.

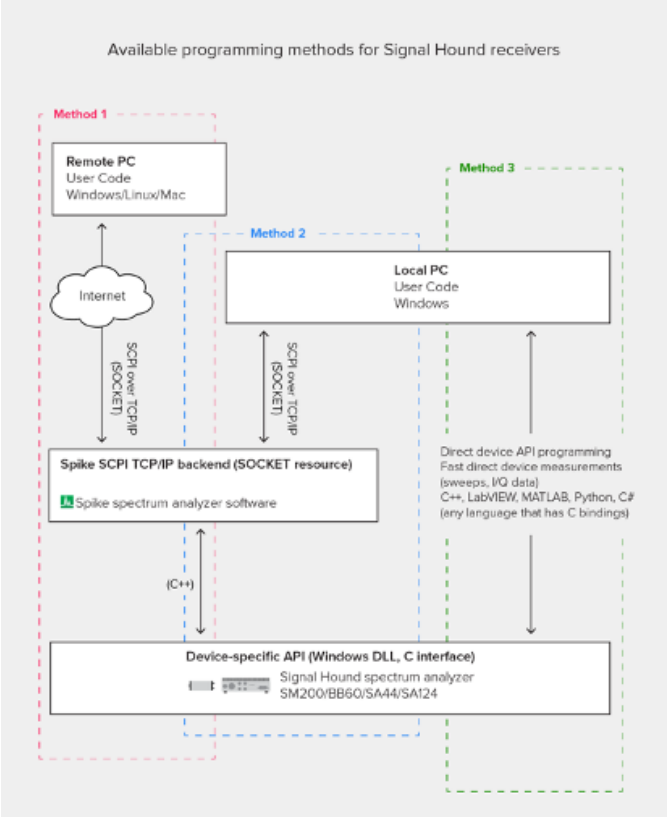
Software customization is also a critical factor for creating specialized spectrum analysis functions. Often, spectrum analysis applications need to incorporate complex algorithms to detect, analyze, and "chase" signals of interest.

The BB60C sends digitized data of the received RF spectrum to the PC where most of the signal processing occurs. This architecture has distinct advantages over sensors that perform all of their signal processing in an FPGA.



Remote control of monitoring nodes

With the reduced expense of setting up a spectrum monitoring node, it follows that it must be able to be reset or rebooted without the need for field personnel visiting each node. The monitoring system is connected to the network and backend resources through the PC's Ethernet interface. The Ethernet interface supports the full range of communications, data uploads, software updates, and other system management tasks. By pairing the BB60C with any Intel vPro-enabled PC, from a high-performance desktop to an ultra-compact NUC, the entire system can be managed remotely, including the ability to cycle the power and initiate operations.



Increase measurement speed with direct device API programming

The BB60C architecture allows for an additional technique to further increase speed performance. In many cases, the instrument software can consume computer processor overhead. The added use of the program may have a small impact on overall test times. In cases where fractions of a second are critical, Signal Hound allows its users to bypass the BB60C software application. This allows for direct device API programming for even faster measurements. The BB60C can be programmed in C++, LabVIEW, MATLAB, Python, C#, or any language that has C bindings.

Technical Specifications

Frequency Range	9 kHz to 6 GHz	
RF Input Impedance (SMA connector)	50 Ω Nominal	
Streaming Digitized I/Q	250 kHz to 27 MHz of selectable IF bandwidth that is amplitude corrected	
Resolution Bandwidths (RBW)	10 Hz to 10 MHz	
Internal Timebase Accuracy	±1 ppm per year	
System Noise Figure (Typical)	12 dB from 20 MHz to 1.8 GHz	
SSB Phase Noise at 1 GHz Center Frequency	**Offset Frequency** 100 Hz 1 kHz 10 kHz 100 kHz 1 MHz	**dBc/Hz** -70 -76 -83 -93 -117
Sweep Speed	**Speed** 24 GHz/sec 24 GHz/sec 24 GHz/sec 24 GHz/sec	**RBW** 1 MHz 100 kHz 30 kHz 10 kHz
Amplitude Accuracy (+10 dBm to Display Average Noise Level (DANL))	**9 kHz to 6 GHz** ± 2.0 dB +2.0 dB/–2.6 dB	**RBW filter shape** Flat-Top windowing Nuttall windowing
Display Average Noise Level (DANL)	**Input Frequency Range** 9 kHz to 500 kHz 500 kHz to 10 MHz 10 MHz to 6 GHz	**DANL** –140 dBm/Hz –154 dBm/Hz –158 dBm/Hz + 1.1dB/GHz

Residual Responses REF Level ≤ –50 dBm, 0 dB Attenuation	**Input Frequency Range** 500 kHz to 6 GHz	**Range Residual Level** –103 dBm
LO Leakage @ RF Input:	≤ –80 dBm	
Spurious Mixer Responses (any ref level (RL) from +10 dBm to –50 dBm, in 5 dB increments, input 10 dB less than RL, RBW ≤30 kHz)	**Input Frequency Range** 9 kHz to 6 GHz	**Spurious Level±** –50 dBc
System Requirements	Windows® 7, 8, or 10 operating system or Ubuntu Linux 18.04, 8 GB of RAM, Intel i7, 3rd generation (Ivy Bridge) or later with a quad core processor, one USB 3.0 port, and one adjacent USB 2.0 or USB 3.0 port. Note: RF recording using streaming I/Q bandwidths > 8 MHz requires the computer's mass storage drive to have at least 250MB/sec of sustained write speed such as an SSD, RAID-0, or RAID-5.	
Connectivity	USB 3.0 serial bus The Cypress FX3 peripheral controller streams the packetized data over a USB 3.0 link to the PC, where 80 million, 14 bit ADC samples per second are processed into a spectrum sweep or I/Q data stream.	
GPIO Port	Used for antenna switching and in/out triggering.	
Synchronization	1 PPS GPS input port enables ± 50ns time-stamping	
Operating Temperature (Ambient)	• **Standard:** 32°F to 149°F (0°C to +65°C) • **Option-1:** –40°F to 149°F (–40°C to +65°C)	
Size and Weight	Net, 1.10 lbs. (0.50 kg) 8.63" x 3.19" x 1.19" (219mm x 81mm x 30mm)	
Power Consumption	(1) USB 3.0 port and (1) adjacent USB 2.0 or USB 3.0 port	

BB60C

Spectrum Analyzer

Real-Time Spectrum Analyzer
and Monitoring Receiver
9 kHz to 6 GHz

Standard: Passive cooling,
32˚F to 149˚F (0˚C to +65˚C)

Option 1: Active cooling & extended temperature,
-40˚F to 149˚F (-40˚C to +65˚C)

Ordering Information

- **Order online: signalhound.com**
- **Most orders ship next day**
- **2-year warranty on all Signal Hound products**
- **30 day money back satisfaction guarantee**

Price includes all software and options – no add-ons needed!

VSG25A

2.5 GHz Vector Signal Generator

- **-40 dBm to +10 dBm output power**
- **Easily generate analog, digital, and arbitrary waveforms**
- **1000+ simultaneous tones, 6 nanosecond pulses**
- **Built-in support for a number of modulation types**

VSG60A

6 GHz Vector Signal Generator

- **Arbitrary I/Q sample rates: 12.5 kSPS to 51.2 MSPS**
- **Stream waveforms of virtually any size**
- **+10 dBm to -55 dBm output power**
- **Agile, low phase noise LO with 200 µs frequency hops**

SA44B

4.4 GHz Spectrum Analyzer

- **RF Frequency Range: 1 Hz to 4.4 GHz**
- **Wide dynamic range: -151 dBm to +10 dBm**
- **Resolution bandwidths (RBW) pf 0.1 Hz to 250 KHz**

SM200B

20 GHz Real-time Spectrum Analyzer

- **100 kHz to 20 GHz frequency range**
- **+20 dBm to -160 dBm measurement range**
- **1 THz sustained sweep speed**
- **160 MHz of instantaneous bandwidth**
- **Phase noise of 132 dBc/Hz, 10 kHz offset, and 1 GHz carrier**