Design Automation

With Signal Hound

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Application
NOTE

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Signal Hound's mission to provide unrivaled value in test and measurement applies directly to automated test. Two key components of production line testing are scalability and automation. If your test solution can't scale, your throughput will be limited. If you can't automate, repeatability, traceability, and throughput decrease while labor increases. The added costs come in the form of reduced quality, increased labor, and time. Balancing this with the tremendous costs of tooling up a production line is challenging. Signal Hounds SM, SP, and BB family spectrum analyzers, VSG family vector signal generators, and RFS family RF switches provide a powerful solution for design automation.

## Scalability With RFS Family Switches

The RFS44 (44 GHz four port RF switch) and RFS8 (8 GHz eight port RF switch) are two new RF switching products from Signal Hound. Both can be controlled directly from your SM435, SM200, SP145, or BB60D real time spectrum analyzers. Direct connect control provides a tremendous advantage, allowing for automated switching during sweeps. Configuring sweeps across multiple antennas allows for several antenna configurations in your automated test platform. In addition to automated sweeps, the RFS switches can be remote controlled, allowing multiple DUTs to be connected and tested using a single RTSA or VSG.

Automation With SCPI

Signal Hound offers remote interface and control capabilities using SCPI compatibility commands for its spectrum analyzers via our Spike™ software. Our Spike software provides control of all Signal Hound spectrum analyzers using a common Graphical User Interface (GUI) to offer advanced signal analysis measurements and display. They can be remotely operated by sending SCPI commands to Spike through a TCP/IP link. You can connect and interface the Spike software through any VISA implementation or any programming language that allows SOCKET programming.

Figure 1

The Spike software will accept a single network connection in which it can receive SCPI commands and send responses. Instrument control is performed by connecting to the Spike software on a TCP/IP port. On this port, a user can send and receive raw SCPI commands. It is not necessary to use an I/O library like VISA to communicate with the Spike software, but it can simplify several operations. It is possible to communicate directly over the socket with socket programming. The computer that is communicating with the Spike software does not have to be the same computer running the Spike software and does not have to be a Windows platform. It is recommended to use a VISA library if available. Several implementations of VISA exist. Commonly used options include Keysight's I/O libraries and NI's VISA libraries. You can also use VISA implementations that exist in other languages/ environments such as MATLAB, LabVIEW, and Python.
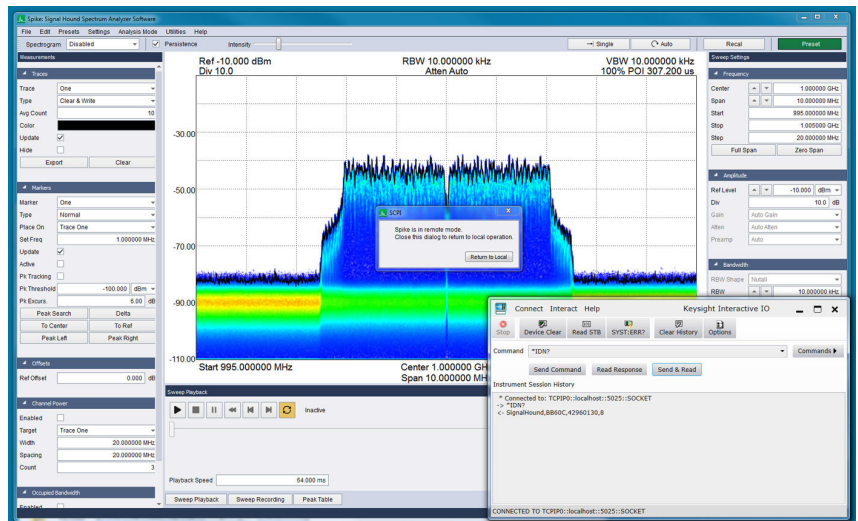
Automation With the Signal Hound API

Alternatively, direct API programming using a device-specific local API can be employed, providing the fastest and most complete control over your Signal Hound devices. Device APIs provide complete control over the Signal Hound device and are the foundation upon which Signal Hound's Spike Software, VSG60 Software and VSG25 Software are built. APIs are available at no cost for all Signal Hound spectrum analyzers providing both Windows and Linux support. Application examples in C/C++, C#, Python, and MATLAB are provided to get you going quickly.

Case Study: Mixed Standards Control In Volume Production Test

A production test for a commercial spectrum monitoring product includes environmental chamber testing every device from -40C to 60C. The solution tests multiple devices at a time, logging hundreds of thousands of data points. Several measurement standards from various vendors (including Signal Hound) are controlled using a single PC running a custom application. The environmental chambers are loaded manually, then the production test software is launched.

The custom application is written in C++ and incorporates the Signal Hound SDK, a VISA library, and SCPI to drive the signal generators, read the power meters, and take measurements from the devices under test (DUT). At the end of each run, a simple PASS / FAIL quickly separates units. Detailed performance data from every DUT for each measurement taken at each frequency and each temperature can be analyzed, allowing for problem troubleshooting, lot tracking, and characterization over large sample sets.

By utilizing a custom C++ application, the Signal Hound SDK, and VISA libraries, performance gains are maximized, decreasing test time without compromising the number of test points or individual measurements. Coordination across multiple vendor's devices is accomplished using a standard VISA driver and SCPI, allowing the ability to incorporate any standard that supports SCPI.

This automated test environment is currently running 7 days a week and has tested tens of thousands of products.

Further Reading

About Signal Hound

Signal Hound designs and builds powerful, affordable spectrum analyzers and signal generators for engineers and RF professionals around the globe. Whether you're needing EMC precompliance capabilities in a small two-person shop or spectrum monitoring on a national scale, our test equipment is designed with you in mind. Accurate and powerful enough for mission-critical RF analysis, priced at a point accessible to most, and supported by a talented group of engineers committed to what they do – we truly believe that our devices offer unrivaled value in the test equipment industry.

In business since 1996 and selling our own line of Signal Hound test equipment since 2010, we've built the foundation of our company on years of test equipment repair, service, hardware and software development, and manufacturing experience. Signal Hound is a small company with big goals – and an even bigger commitment to providing our customers with an outstanding experience when purchasing and using our products.