



Agilent Single or Multi-channel Coherent Signal Simulator System Product Overview

BENEFITS

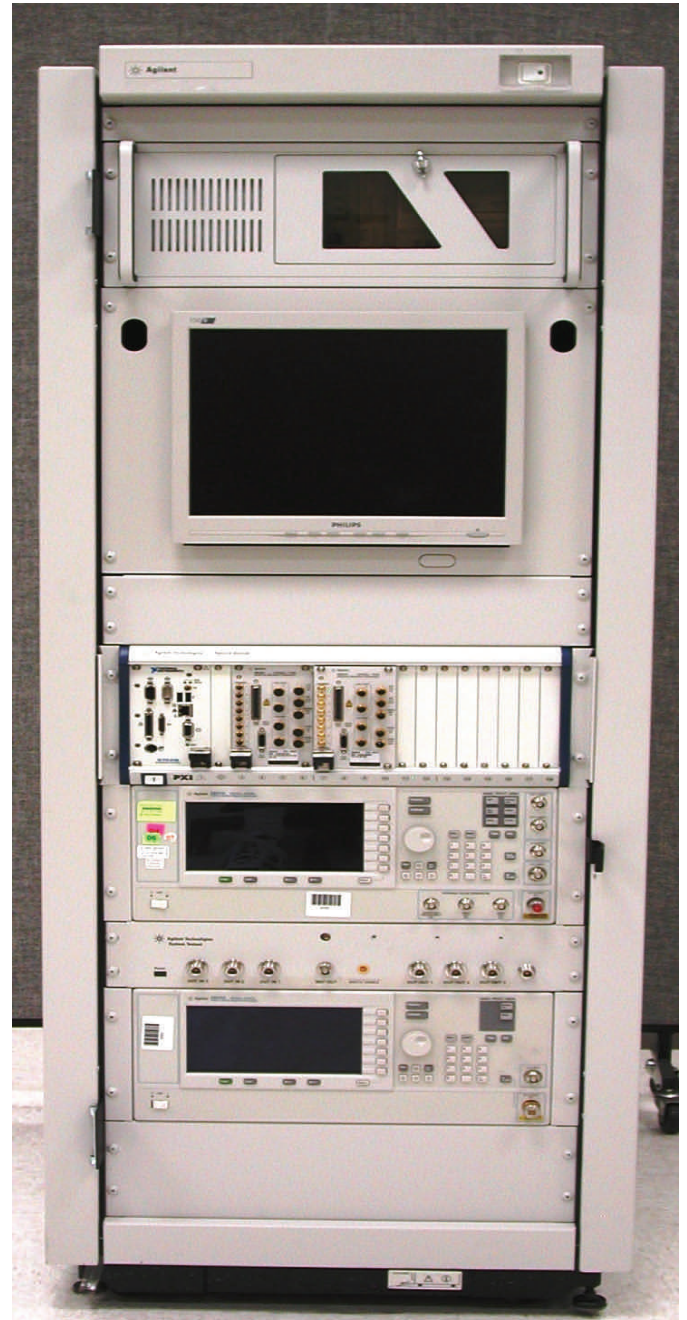
- The Agilent Z2090B-3xx can generate single or multiple coherent outputs to 44 GHz with precise phase and amplitude offsets
- Available as a component bundle or as an integrated system
- 1GHz of modulation bandwidth
- 1 nsec switching within 1 GHz modulation bandwidth
- Scalable from 2 to 8 channels and beyond
- Significant reduction in test system calibration time
- Stable, reliable digital alternative to legacy analog solutions

CORE TEST APPLICATIONS

- Direction Finding & Interferometry
- Create advanced threats and jamming signals using complex modulation
- Test Radar Warning Receivers (RWR), Electronic Counter Measures (ECM), Electronic Support Measures (ESM), SIGINT systems, and EW receivers
- Aircraft/Ground Radar scenario simulation

KEY SPECIFICATIONS

- For multiple channel coherent systems
- < 1.5 degrees phase tracking @ 18 GHz
- 250 KHz to 44GHz multiple outputs
- 15 bit fidelity @ 1 GHz bandwidth
- Multiple software applications supported

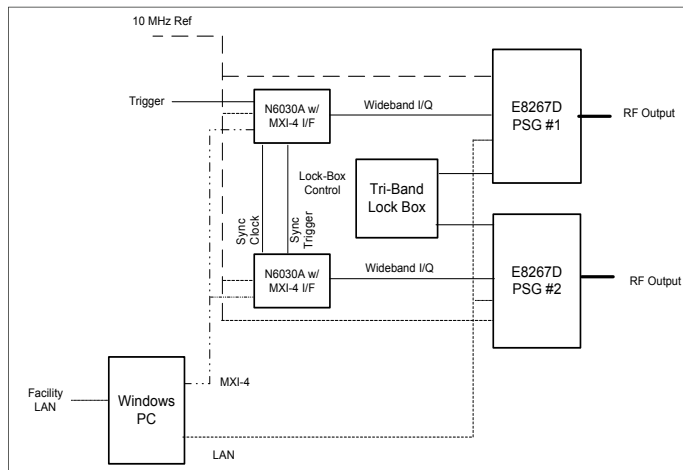


Example of a two channel coherent system



Agilent Technologies

SYSTEM OVERVIEW



Complete system solution, ready to use

Key Specifications

250 kHz to 20, 31.8 or 44GHz Frequency coverage.

Wide bandwidth

- 1GHz for RF signals >3.2 GHz
- 260 MHz for RF signals <3.2 GHz
- 500 MHz IF bandwidth (N6030A)
- 1 GHz I/Q bandwidth (N6030A)

Phase Coherent Tracking

Typical phase tracking at 18 GHz between outputs is < 1.5 degrees. Data measured from 14 degrees C to 27 degrees C temperature range.

Fast Switching Speed

The system can switch frequency in less than 1 ns for signals within the 1 GHz frequency bandwidth.

Wide Dynamic Range

- Broadband noise floor <-135 dBm
- Phase noise: <-109dBc/Hz at 10 kHz offset, CW
- Wide Spurious-free dynamic range

System Software

- Matlab® command-line interface
- LabVIEW® IVI-C style driver
- Waveform Generation Tool
- Signal Studio for pulse building compatibility
- I/Q correction software (future capability)

2 channel coherent system Block Diagram

The waveform data is created in the controller PC, in the appropriate software package (e.g. Agilent Pulse Builder), and then downloaded through a MXI interface into two N6030A Arbitrary waveform generators in the same physical chassis. The resultant output signals from the N6030A's are routed to the two E8267D signal generators, each with the capability of providing a modulated RF carrier from 250 kHz to 20 GHz. The N6030A's have a 1.25 G Sample per second, 15bit 250 MHz Direct Digital Synthesis bandwidth. The Z5623A-K07 Tri band lock box provides necessary circuitry to ensure phase coherence to within 3 degrees.

Hardware and software tools support remote operation using a variety of programming languages.

Single Channel Configuration

A single channel configuration version is available. This version consists of a controller PC with applicable software, a single N6030A AWG and a single E8267D Signal Generator. This is well suited for those applications requiring as single RF signal simulation.

Multi Channel Configurations

Additional channels can be added using additional Arbitrary Waveform Generators (AWG) and Performance Signal Generators (PSG). Phase coherent channels can be established with the ability to measure and control phase relationships.

Forward Looking

As needs change, the Z2091B systems are designed to adapt to meet them. New equipment, new signals, and new capabilities can be added with minimal disruption to work flow.

1GHz Bandwidth up to 44 GHz

Agilent's new Z2091B Signal Simulation System offers 1 GHz bandwidth with unmatched dynamic range up to 44GHz carrier frequencies, allowing you to generate ultra-wide bandwidth signals easily and repeatedly with precision and freedom from spurious output and noise.

SYSTEM OVERVIEW (Continued)

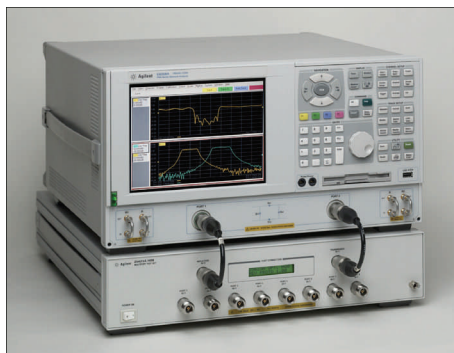
2 to 8 Phase Coherent Output Channels

The Z2091B system augments the wide bandwidth and high performance of the system by providing up to 8 phase coherent outputs.

Each output may be individually controlled or combined to provide precise amplitude and phase control for each of the up to 8 IF (-E02) or microwave (-E03) outputs.

This solution includes the N6030A dual AWG and the Agilent E8267D PSG with optional 1 GHz baseband inputs. Combining these components with the Z5623A series L.O. distribution.

systems and satellite communications, and terrestrial microwave radio for broadband wireless access, the Z2091B provides a path to success.



Lock Box

Local Oscillator Lock Boxes

A variety of lock boxes are available to distribute LO signals from the primary (master) signal generator to all slave signal generators. The different architectures are dependent on the number of signal outputs desired. The LO lock boxes perform signal distribution and switching to allow the signal generators to be calibrated and then re-configured to master/slave operation for coherent applications.

Part of the family

The Agilent Z2090B-3xx Series Signal Simulation and Processing Systems offer the flexibility and performance for addressing today's complex signal environments. In-

Key Building Blocks

Key Building Blocks

The following building blocks can be used as part of the system. Depending on requirements, other building blocks can be used to supplement these capabilities.



**E8267D Performance
Signal Generator**

Key Features of the Performance Signal Generator

Agilent's E8267D PSG vector signal generator is a microwave vector signal generator with direct I/Q modulation up to 44 GHz. It features a built-in wideband I/Q modulator that delivers up to 1 GHz RF modulation bandwidth. It simplifies the generation of complex vector modulated signals for design and manufacturing test applications in aerospace, defense, satellite communications, and broadband wireless.

KEY BUILDING BLOCKS (Continued)

Key Features of the Performance Signal Generator (continued)

The E8267D PSG also includes an advanced wideband (80 MHz) internal baseband generator capable of flexible arbitrary waveform playback and sophisticated real-time signal generation.

The PSG can be customized for baseband, RF, and microwave test applications ranging from simple distortion test and general purpose troubleshooting to baseband coding algorithm development and advanced digital microwave transceiver design verification. Optional performance enhancements and accessories are available in addition to a comprehensive suite of signal creation software.

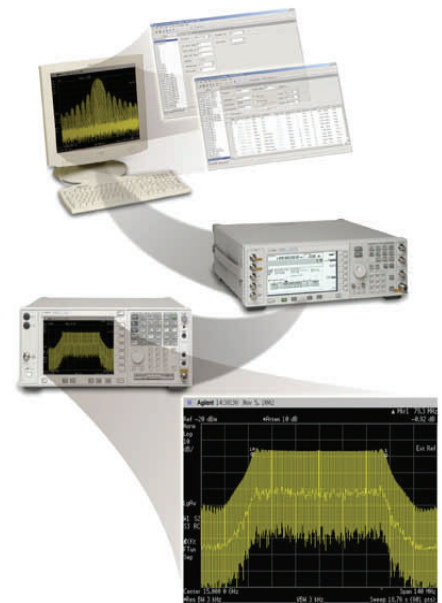
- Frequency range 250 kHz to 20, 31.8 or 44 GHz with .001 Hz resolution

- Output power range +17 to -130 dBm with superior level accuracy
- Industry-leading phase noise performance
- External 160 MHz (standard) RF modulation bandwidth extendable up to 1 GHz

The following features are available on the E8267D with appropriate options:

- Flexible FSK, MSK, PSK, QAM, custom I/Q, AM, FM, ϕ M, & pulse
- Step, list, & ramp sweep frequency and power
- Internal baseband generator (80 MHz RF BW)
- Real-time I/Q symbol generation (up to 50 Msym/s)
- Generate radar test signals, 802.11 WLAN, multi tone, noise power ratio, custom modulation, and more

- Digital I/O and PC HDD waveform streaming with Baseband Studio
- Remote control over LAN and GPIB
- SCPI and IVI-COM drivers



N6030A Arbitrary Waveform Generator



Key Features of the Arbitrary Waveform Generator

The N6030A (in development phase) is a wideband arbitrary waveform generator (AWG) capable of generating high-resolution signal simulations for defense and emerging communication standards.

This 3U high CompactPCI module offers two independent, differential output channels to drive both single-ended and balanced designs.

Each channel operates at 1.25GS/s and offers 15 bits resolution to create the most realistic, wideband signal scenarios from a commercially available AWG.

The wide channel bandwidth also allows users to hop narrow band signals at ns rates.

The N6030A includes the following capabilities to make your signal simulation development tasks simpler:

- 8 to 16 MSa of waveform memory
- Sophisticated sequencing which includes 512k definable packets and 16k sequences for definable playback of waveform memory
- Synchronization of any number of modules for phase-coherent, multi-emitter simulations
- Four trigger inputs for event-based simulations

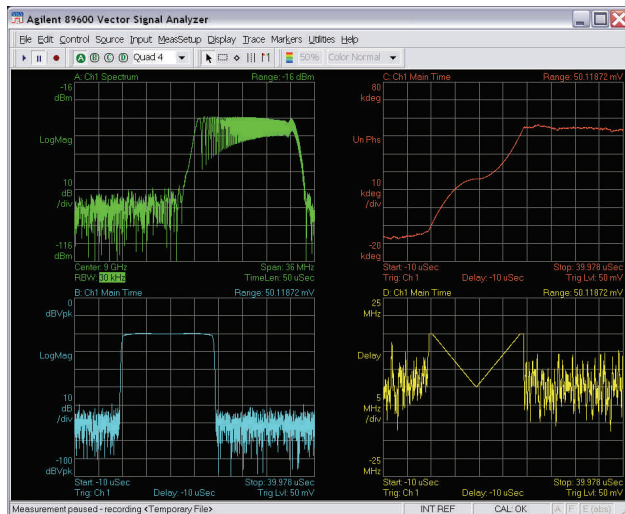
KEY BUILDING BLOCKS (Continued)

- Four marker outputs for system synchronization
- Multiple sequence play and jump modes for event-based simulations
- Repeatable and deterministic latencies
- Low phase-noise sample clock
- External Clock input for operation at arbitrary sample rates
- Intuitive GUI for module setup and control
- Easy file transfers from Matlab®
- Programmatic interfaces for LabVIEW®, IVI-C and .NET
- Windows 2000 and XP device driver
- Plug compatible with Comp

Applications

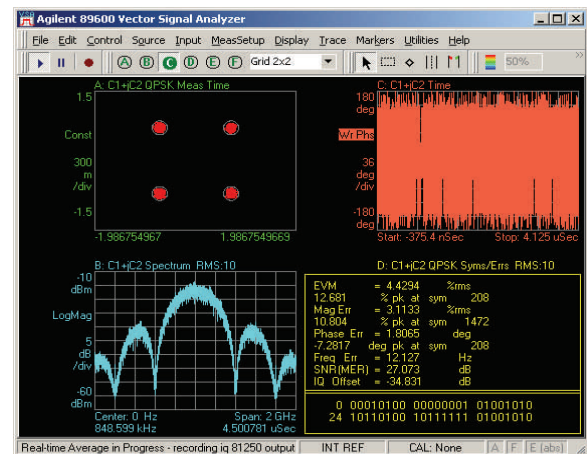
Some possible applications of the N7500A systems are shown in the following screenshots

Chirp Radar signal up to 1 GHz wide

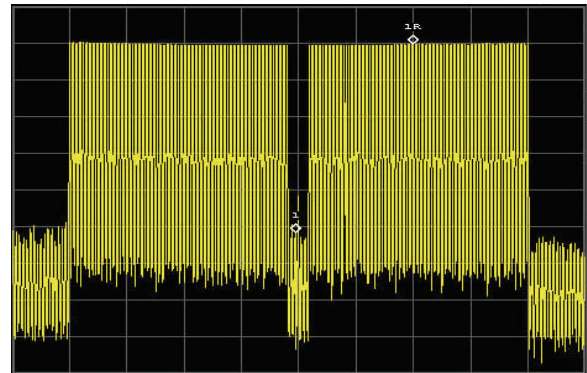


Applications (Continued)

NPR waveform with >50 dB notch



Very Wide Bandwidth Digital Communications



Other Applications

Other applications

Additional applications include Multi-Channel Interferometry, Multiple Radar Signal Return Simulation, Doppler Radar Signals, EW, ELINT, SIGINT, and Ultra Wideband I/Q Modulation. Satellite channel simulation with high channel occupancy can improve system validation. Realistic EW and battlefield scenarios can be generated.

Application Assistance

Agilent's application experts are available to help optimize the system, taking full advantage of the system capability for your unique application. Operator training is also available to help you get the system into service quickly.

If your application goes beyond the standard system offering described above, Agilent program managers and engineering professionals can help define and implement unique functionality. They ensure that your custom requirements are successfully implemented, from initial design through acceptance.

Warranty & Support

Agilent provides a 1-year return-to-Agilent warranty on custom systems. Warranty extensions and custom repair strategies are available to meet your specific requirements.

Agilent Technologies aims to maximize the value you receive, while minimizing your risk and problems. We strive to ensure that you get the test and measurement capabilities you paid for and obtain the support you need. Our extensive support resources and services can help you choose the right Agilent products for your applications and apply them successfully. Every instrument and system we sell has a global warranty. Support is available for at least five years beyond the production life of the product. Two concepts underlie Agilent's overall support policy: "Our Promise" and "Your Advantage."

Our Promise

Our Promise means your Agilent test and measurement equipment will meet its advertised performance and functionality. When you are choosing new equipment, we will help you with product information, including realistic performance specifications and practical recommendations from experienced test engineers. When you use Agilent equipment, we can verify that it works properly, help with product operation, and provide basic measurement assistance for the use of specified capabilities, at no extra cost upon request. Many self-help tools are available.

Your Advantage

Your Advantage means that Agilent offers a wide range of additional expert test and measurement services, which you can purchase according to your unique technical and business needs. Solve problems efficiently and gain a competitive edge by contracting with us for calibration, extra-cost upgrades, out-of-warranty repairs, and onsite education and training, as well as design, system integration, project management, and other professional engineering services. Experienced Agilent engineers and technicians worldwide can help you maximize your productivity, optimize the return on investment of your Agilent instruments and systems, and obtain dependable measurement accuracy for the life of those products.

Get the latest information on the products and applications you select.



For more assistance with your test and measurement needs or to find your local Agilent office go to:

www.agilent.com/find/emailupdates
www.agilent.com/find/assist

Windows is a U.S. registered trademark of Microsoft Corporation.

Product specifications and descriptions in this document subject to change without notice.

Note: Contact your Agilent sales representative for configuration and pricing information.

© Agilent Technologies, Inc. 2007
Printed in USA, May 10, 2007
5989-6850EN



Agilent Technologies