See Through the Complexity

Bring the industry-leading vector signal analysis software into your simulation environments as the trusted golden receiver with flexible signal visualization and troubleshooting tools.
Introduction

The 89600 VSA software is a comprehensive set of tools for demodulation and vector signal analysis. These tools enable you to explore virtually every facet of a signal and optimize your most advanced designs. Now you can accelerate development with a consistent set of analysis tools for simulation and test.

Keysight EEsof EDA is the leading supplier of Electronic Design Automation (EDA) software for communications product designs. SystemVue is an electronic system-level (ESL) design tool for system architects and algorithm developers to innovate the PHY layer design of next-generation communication systems. Advanced Design System (ADS) is EDA software for RF and microwave, Signal Integrity, and Power Integrity applications. Both SystemVue and ADS connect to the 89600 VSA software for analysis of simulated signals.

Key Benefits

- Quickly analyze simulated signals from Keysight SystemVue and ADS using 89600 VSA software as a trusted “golden receiver”
- Produce consistent, comparable analysis results at the simulation, prototype, and design validation stages
- Pinpoint signal problems with powerful troubleshooting tools in multiple traces and analysis that supplement SystemVue and ADS

Apply Vector Signal Analysis Across the Lifecycle

Figure 1: 89600 VSA software can link with Keysight EEsof EDA ADS (Advanced Design System) and SystemVue to make consistent analyses from design to production.
89600 VSA Core and Elements for Simulation

89600 VSA for Keysight EEsof EDA simulation has a simple product structure with a core environment and three optional elements for different applications.

W89600B/E Core and Element Structure

W89601BP VSA Base Core Environment Bundle

The W89601BP VSA Core Environment is a bundle with vector analysis including the connectivity to Keysight EDA SystemVue and ADS simulation tools and Keysight hardware platforms.

Key features:

- Time, frequency, and modulation domain analysis
- Flexible traces and displays with simultaneous and multi-measurements
- Record the acquired signal waveforms to playback for troubleshooting
- Analog and digital modulation including custom IQ and custom OFDM

This bundle includes:

- Basic vector signal analysis and hardware connectivity
- Simulation link with Keysight EDA SystemVue and ADS
- Analog and digital modulation analysis
- Custom IQ and Custom OFDM modulation analysis
- Spectrum analysis with PXIe VSA hardware (M9393A/M9391A)
Prerequisite software:
In order to use this bundle, you must also have one of the following:

- SystemVue ESL W1461 Comms Architect
- Advanced Design System (ADS) Core bundle

Did you know...
Connectivity to over 45 Keysight instrument platforms is a standard feature of Basic VSA (option 200). For a complete list of hardware platforms, visit https://www.keysight.com/find/89600_hardware.

**W89601BP/BT VSA Core Bundle**

Includes Vector, analog demod, digital demod, custom IQ, custom OFDM, and power spectrum

- FM transmitter in Analog Demod
- EDGE in Digital Demod
- FBMC in Custom OFDM
- BOC (satellite) in Custom IQ

Figure 3: Product structure of W89601B VSA Core and Advanced Elements for simulation.
89600 VSA Advanced Elements for Simulation

The 89600 VSA core environment provides fundamental vector signal analysis in time, frequency, and modulation domains of analog and digital modulation along with custom IQ and OFDM to cover most of general purpose applications.

Listed below are optional elements for advanced signal quality and modulation analysis that can be added to 89600 VSA core environment by industrial segments.

Table 1. Key feature summary of optional advanced elements

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Key Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>W89602EP/ET</td>
<td>- Gain deeper insights of FM linear chirp and pulsed radar signals&lt;br&gt;- Automatic synchronization to target FMCW radar or pulsed radar&lt;br&gt;- Modulation analysis in pulses with CW, linear FM, triangular FM and Barker code&lt;br&gt;- Multi-carrier group delay for satellite wideband channel signals</td>
</tr>
<tr>
<td>Advanced Aerospace and Defense (A/D) Element</td>
<td></td>
</tr>
<tr>
<td>W89603EP/ET</td>
<td>- 5G New Radio (NR) modulation analysis for 3GPP Release 15&lt;br&gt;- Pre-5G physical layer measurements based on the Verizon 5G specifications&lt;br&gt;- LTE &amp; LTE-Advanced FDD + TDD with MIMO analysis up to 8 carriers&lt;br&gt;- NB-IoT modulation analysis based on 3GPP Release 13&lt;br&gt;- 3G modulation analysis with EVM, CCDF, spectrum and more (W-CDMA, cdma2000, 1xEV-DO, TD-SCDMA)&lt;br&gt;- Multiple, simultaneous color-coded result views</td>
</tr>
<tr>
<td>Advanced Cellular Element</td>
<td></td>
</tr>
<tr>
<td>W89604EP/ET</td>
<td>- Support OFDM and DSSS modes with presets of IEEE 802.11a/b/g/j/p&lt;br&gt;- Cove all signal bandwidths and modulation modes with IEEE 802.11n/ac/ax including up to 8x8 MIMO and MU-MIMO&lt;br&gt;- Demodulate TEDS and RFID signals for signal quality tests&lt;br&gt;- Analyze DOCSIS 3.1 downstream and upstream with MER/BER</td>
</tr>
<tr>
<td>Advanced Networking Element</td>
<td></td>
</tr>
</tbody>
</table>
Figure 4: W89602E VSA Advanced A/D element provides critical measurements such as pulse analysis, linear FM chirp analysis used in automotive radar, along with multi-carrier group delay for satellite wideband channel signals.

Figure 5: W89603E VSA Advanced Cellular element gives your easier access to EVM measurements of cellular signals based on 5G New Radio (NR), 5GTF, LTE/LTE-Advanced and 3G like W-CDMA.
Using 89600 VSA with Keysight EEsof EDA Simulation

How can we utilize 89600 VSA software with our simulation environments? There are several examples of 89600 VSA links in Keysight EEsof EDA SystemVue and Advanced Design System (ADS) as the starting point.

With the real-time streaming interface between SystemVue, ADS and 89600 VSA software, it is simple to bring generated waveforms from simulation into test instruments for analysis. In addition, the source component is also available to import measurement data into the simulation. This enables easy comparison between simulation results and measured results from hardware. This “virtual hardware” or “golden receiver” enables you to uncover system problems before prototype hardware even exists.
Figure 7: Application-based example in SystemVue with 3GPP LTE downlink transmission including ADS cosim block and 89600 VSA sink to visualize the streamed data.

Figure 8: Example to generate simple single QPSK carrier to output the data and run EVM measurement on 89600 VSA software.
ADS can also connect to and communicate with remote instruments using a data link with 89600 VSA software. In the 14-min video available at http://www.keysight.com/find/eesof-ads-instrument, you can find the example workspaces of ADS with and without Python Anaconda for instrument connectivity to utilize the 89600 VSA software for simulation and actual measurement by instruments with step-by-step instructions. You can find (1) ADS data link and instrument control steps, (2) communicating with an instrument from ADS directly and (3), controlling instruments using ADS-Python Datalink feature to understand how to integrate 89600 VSA software within Keysight EEsof ADS.

PC/System Requirements

Any laptop, desktop or Windows-based instrument can be used to run the 89600 VSA software, as long as it meets or exceeds the following minimum requirements. For a list of the most current requirements, see www.keysight.com/find/89600-pc.

Floating License Server Requirements

The 89601BN floating license requires loading a vendor daemon on a license server. This server can be the same PC running the 89600 VSA software. Full installation instructions and support are provided for compatible server operating systems: Windows 7 Professional, Enterprise, Ultimate (64-bit); Windows Server 2008.

Ordering Information

Protect your software investment.

Check the version number of your software by selecting Help > About in the 89600 VSA software toolbar and comparing that to the current version number found at www.keysight.com/find/89600_updates.

<table>
<thead>
<tr>
<th>Description</th>
<th>License Type: Floating perpetual</th>
<th>License Type: Floating time-based¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>VSA Core Bundle for Keysight EEsof EDA Simulation</td>
<td>W89601BP</td>
<td>W89601BT</td>
</tr>
<tr>
<td>VSA Advanced A/D Element for Simulation</td>
<td>W89602EP</td>
<td>W89602ET</td>
</tr>
<tr>
<td>VSA Advanced Cellular Element for Simulation</td>
<td>W89603EP</td>
<td>W89603ET</td>
</tr>
<tr>
<td>VSA Advanced Networking Element for Simulation</td>
<td>W89604EP</td>
<td>W89604ET</td>
</tr>
</tbody>
</table>

¹ Currently 1-year time-based license is only available.
Additional Resources

Literature
89600 VSA Software, Brochure, 5990-6553EN

Web
Visit www.keysight.com/find/89600vsa and click “Explore Bundles:” to find Pack for Simulation

Learn more at: www.keysight.com

For more information on Keysight Technologies’ products, applications or services, please contact your local Keysight office. The complete list is available at: www.keysight.com/find/contactus