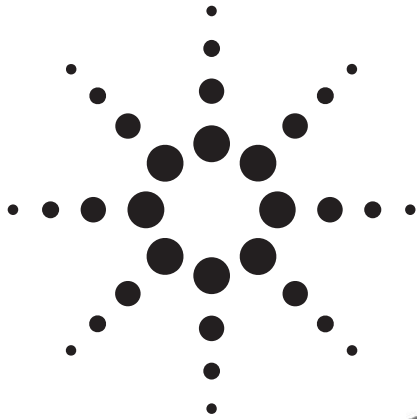


# Agilent E6432A VXI Microwave Synthesizer

## Product Overview



Agilent E6432A  
VXI Microwave  
Synthesizer

### High performance microwave capability in VXI

- 10 MHz to 20 GHz
- -90 dBm to +20 dBm
- <400  $\mu$ s frequency switching time
- 1 Hz frequency resolution
- AM, FM, pulse and I/Q modulators
- VXI *Plug&Play* driver

Working together, we can anticipate—and apply—the latest advances in electronic technology, accelerating your progress toward new successes.

As a test engineer you are the one who ensures that your product will work reliably when it reaches the market, and will continue to work in your customer's hands. Due to increasing market pressures and the need to compete effectively, you need to design and manufacture your products faster and at a lower cost.

From high volume manufacturing to the field environment, you need the tools to quickly design and configure solutions that will maximize test throughput, address the measurement challenges your team faces in advanced microwave applications and easily integrate with other products to develop complete, flexible test solutions.

With the emergence of broadband digital communications, you need a source that can deliver digital modulation in wide bandwidths as well as analog modulation for flexibility and complete solutions.



**Agilent Technologies**

Innovating the HP Way

Agilent understands these needs and has created a fast, flexible, rugged system optimized signal source with high-performance microwave capability in the VXI format.

With the ability to address these measurement challenges, which require fast switching speeds, low phase noise, high spectral purity and synthesizer accuracy for the generation of high quality digital modulation microwave signals, the E6432A VXI Microwave Synthesizer provides a level of performance never before available from Agilent

The E6432A VXI Microwave Synthesizer is a C-size, 3 slot, register-based VXI module. It covers the frequency range of 10 MHz to 20 GHz with 1 Hz resolution. Its amplitude range is from -90 dBm to +20 dBm. This module delivers CW signals with low phase noise and excellent spectral purity. When combined with external arbitrary waveform generators, this module can deliver AM, FM, I/Q and pulse signals with state-of-the-art performance. Its high-speed architecture and register-based design supports switching between any two arbitrary carrier frequencies in typically less than 220  $\mu$ s or any two amplitudes within its vernier range in less than 50  $\mu$ s. This switching speed makes the E6432A ideal for automated testing in applications requiring a large number of test frequencies, including antenna testing, satellite payload testing and defense radar, EW and avionics testing. A deep list mode and comprehensive triggering allow the host computer to offload source management to the measurement system, shortening development time and achieving maximum measurement throughput.

**Optimized for automated test systems**

Designed for demanding performance in automated test systems, the E6432A VXI Microwave Synthesizer utilizes VXI compliant *plug&play* drivers running on a Windows NT<sup>®</sup>



System configuration

platform and register-based processing to simplify access to the system and deliver its promised switching speeds.

**Fast response to VXI host interface**

Based on a drift canceling circuit employing a fast tuning microwave VCO, the E6432A delivers frequency-switching times of a few hundred microseconds or less. In addition, through circuit optimization, the instrument's assist processor and phase locked loops provide fast data throughput and fast settling.

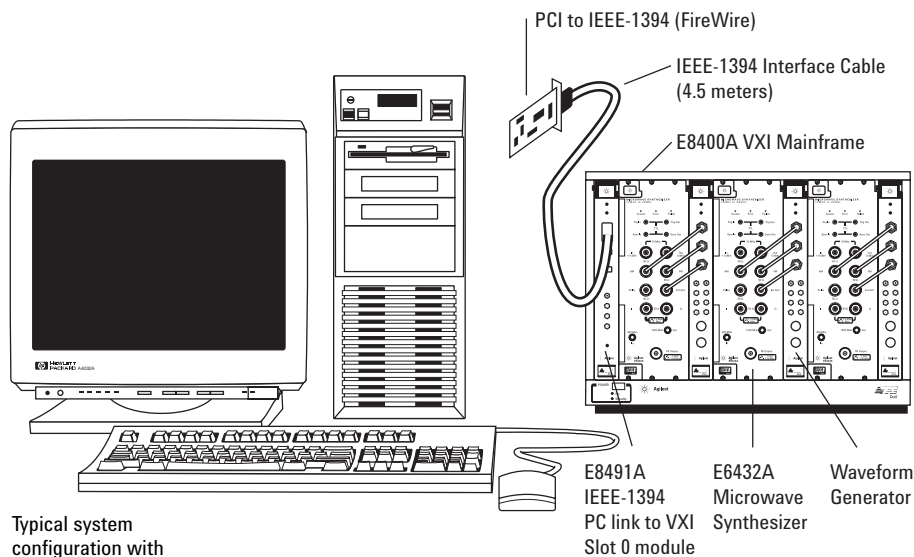
**Easy programming**

Communication with the E6432A is simplified with its *plug&play* driver. This driver is an integral part of the E6432A and should be thought of as an extension of the instrument firmware. Examples and programming tips for C, Visual Basic, VEE, Lab View and Lab Windows are available in the web-based help program provided with the *plug&play* driver.

An optional SCPI client allows the use of ASCII strings using the SCPI language to command and control the instrument.

**Fast frequency and amplitude switching**

Fully settled tuning between any two arbitrary frequencies across the entire frequency band requires less than 400  $\mu$ s. Frequency switching to within 50 kHz of the desired frequency or 1 degree of settled phase is typically 220  $\mu$ s or less. Amplitude-only switching between any two power levels without an attenuator step change to .05 dB of the desired power is typically less than 80  $\mu$ s. Power level changes utilizing the optional step attenuator

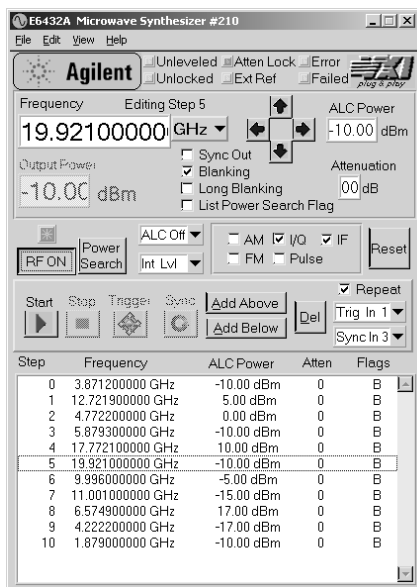


Typical system configuration with multiple sources and firewire interface

are less than 20 ms. The fast frequency switching results in decreased measurement time in scenarios where throughput is currently limited by the time it takes to retune the signal source. Examples of such scenarios include antenna testing, TR module, RFIC and MMIC testing.

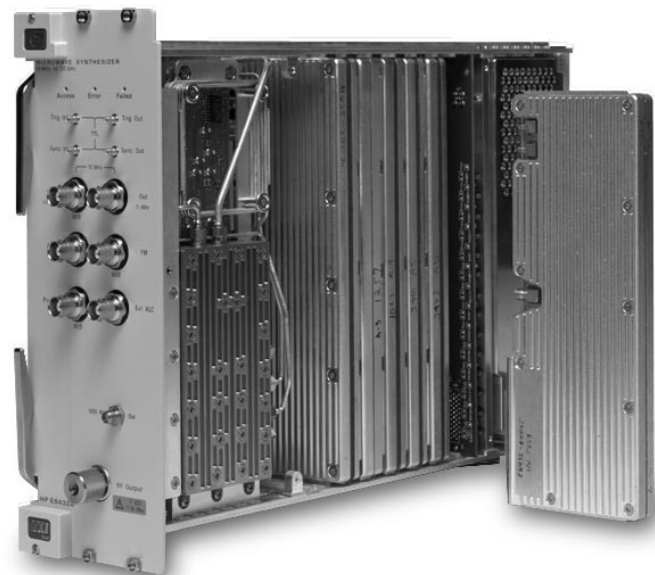
### Virtual front panel

A virtual front panel, provided as a part of the *plug&play* driver and installed automatically with the driver software, allows the synthesizer to be controlled as if it is a standalone product. The panel allows direct control of the RF output, leveling, ALC and modulation. Additionally, the virtual front panel provides access to configuration, list mode, self-test and calibration panels. All of the features of the virtual front panel are directly accessible through the programmatic interface.



Virtual front panel with list mode activated

Internal shielded construction of the Agilent E6432A



### List and triggering modes

A deep list mode of up to 128k entries provides sequence memory for very long test scenarios. Each entry may hold settings for frequency, amplitude, attenuator setting, settling and blanking modes, and a marker. The host computer constructs the list array and downloads the array into the E6432A VXI Microwave Synthesizer hardware prior to execution.

The synthesizer provides three ways to execute a sequence, free-run, sync and triggered. A sequence repeat feature is available for any trigger mode. All events available on the front panel are also available on the TTL trigger bus. Interrupts in the sequence may also be enabled when test needs require dwelling at a specific point for longer periods of time.

### Optional Broadband I/Q Modulation

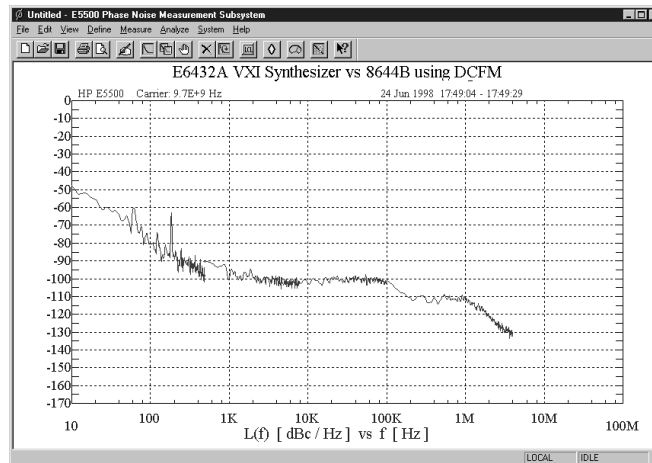
For the first time in a commercial microwave source, a broadband I/Q modulator, available as Option UNG, is integrated into the E6432A. This

modulator accepts I and Q baseband vector signals and modulates the microwave carrier up to 20 GHz. This modulator can be calibrated to give accurate amplitude response at any RF frequency. With a bandwidth of >40 MHz and a dynamic range of >40 dB, Option UNG is ideal for emerging broadband communications that require more bandwidth than the common wireless cellular formats. The E6432A Option UNG serves such applications as wireless LAN (IEEE 802.11), Ka band satellite digital transparent and digital regenerative payloads, NPR measurements, radar/EW, and LMDS with the help of external banded upconverters. Arbitrary waveform generators in VXI with wide bandwidths are available to generate the I and Q vectors. Additional adjustments of the I/Q circuitry inside the E6432A compensate for imbalances in the baseband source to provide the lowest error vector magnitude and the highest overall modulation quality for the most demanding vector signal applications.

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

Typical phase noise graph of the Agilent E6432A



### Spectrally pure, free of harmonics and spurious

The E6432A uses patented assembly shielding to reduce cross talk between modules and limit problems caused by ingress. Critical circuitry is contained within two hybrid thin and thick film microcircuits. DC to DC converters inside the module carefully filter and re-regulate the VXI mainframe power supplies. These features combine to give the E6432A its high level of technical performance in most commercially available VXI mainframes.

### Ordering Information

<b>Agilent E6432A</b>	VXI Microwave Synthesizer
<b>Option 002</b>	Add enhanced frequency modulation
<b>Option 1E1</b>	Add 70 dB step attenuator
<b>Option UNF</b>	Add high power (+20 dBm) 2–20 GHz
<b>Option UNG</b>	Add I/Q modulator
<b>Option UNH</b>	Add improved spectral purity (10 MHz to 2 GHz)

Contact your Agilent sales representative for more information.

### Warranty Information

All Agilent products described in this document are warranted against defects in material and workmanship for a period of one year from date of shipment.

### Related Agilent Literature

*An Introduction to the Agilent E6432A plug&play Driver*  
Product Note  
literature number 5968-3660E

*Creating Frequency Lists Using a Spreadsheet and ActiveX* Product Note  
literature number 5968-8434E

*E6432A Configuration Guide*  
literature number 5967-6272E

*E6432A Technical Specifications*  
literature number 5968-1242E

*High Performance Microwave Capability in VXI* Brochure  
literature number 5967-6313E

*Test Systems and VXI Products Catalog*  
literature number 5980-0307E

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