

# Agilent N7502A Signal Simulation Systems

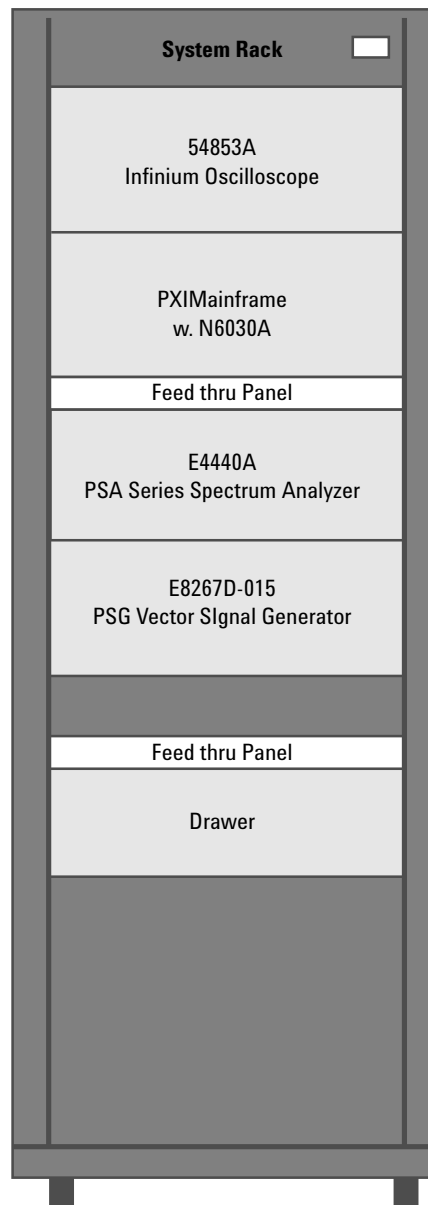
Configuration Guide

250 kHz to 20 GHz

250 kHz to 44 GHz

The N7502A signal simulation system is a complete signal generation and analysis system, with hardware and software combined to increase productivity and reduce setup time. The Agilent goal is to have your system up and running within hours of system delivery. The system incorporates the best of Agilent's expertise – both technical and practical – to ensure your system performance is optimized.

The N7502A configuration has significant flexibility so you can define a system most appropriate for your specific application needs. Use this guide to make the most informed selections and help build the system that gets your high performance signal generation job done right.



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## Configuration overview

Configuration of the N7502A system requires careful selection of the following parts:

1. Arbitrary waveform generator and supporting hardware
2. Microwave signal generator and modulation characteristics
3. Computer platform
4. System software components
5. Microwave spectrum analysis
6. Additional instruments (e.g., oscilloscope)
7. Physical layout, eg. benchtop or pre-configured in a system rack
8. Implementation and support services

The system offers configuration flexibility in each selection area, so that most applications can be addressed with the standard system. This configuration guide assists in identifying the required and optional features for the specific system you require.

In some cases, configurations may require additional unique or custom hardware or software, in addition to engineering services and program management for successful implementation. Please ask your local sales representative for more information.

## Arbitrary waveform generator and supporting hardware

The N7502A includes the N6030A arbitrary waveform generator, with sampling rate of 1.25 GS/s and 15-bit resolution. With this wide bandwidth capability, the N6030A enables direct generation of IF waveforms with up to 500 MHz bandwidth from a single channel. Alternatively, the N6030A dual channels can be used as I/Q inputs of a microwave signal generator for signals with up to 1 GHz bandwidth.

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<i>Included:</i>	○ <b>N6030A</b>	arbitrary waveform generator
	○ <b>N6030A-500</b>	18 slot PXI mainframe

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<i>Recommended Option:</i>	○ <b>N6030A-016</b>	16 megasample memory
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## Microwave signal generator and modulation characteristics

The N7502A supports various sources and options.  
One or more sources can be configured in the system.

### PSG vector signal generator

The E8267D PSG vector signal generator is normally the signal generator of choice, offering frequency coverage from 250 kHz to 20 GHz or 44 GHz. With the addition of the wideband I/Q modulation option, the E8267D offers 1 GHz modulation bandwidth above 3.2 GHz. Below 3.2 GHz, the I/Q modulation bandwidth is 160 MHz.

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<i>Recommended:</i>	○ <b>E8267D</b>	PSG vector signal generator
	○ <b>E8267D-015</b>	1 GHz wide bandwidth I/Q modulation

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<i>Recommended options:</i>	○ <b>E8267D-UNT</b>	AM, FM, phase modulation and LF output
	○ <b>E8267D-UNR</b>	Enhanced phase noise performance
	○ <b>E8267D-UNW</b>	Narrow pulse modulation
	○ <b>E8267D-420</b>	Signal Studio for pulse building – enables advanced definition of pulsed waveform shaping and sequencing

### E6432A VXI synthesizer

The E6432A VXI synthesizer is also a good choice for the N7502A. It covers the frequency range from 10 MHz to 20 GHz and offers I/Q modulation capability with I/Q modulation bandwidth of 40 MHz. The E6432A also offers direct IF upconversion of a 300 MHz IF, which can be generated by the N6030A on a single channel. The combination offers high quality upconversion with RF bandwidth of over 130 MHz from 300 MHz to 20 GHz. In addition, the E6432A offers increased switching speed compared with the PSG. Fully settled tuning between any two arbitrary frequencies across the entire frequency band requires less than 350  $\mu$ s. Frequency switching to within 50 kHz of the desired frequency is typically 150  $\mu$ s or less.

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<i>Optional source:</i>	○ <b>E6432A</b>	VXI microwave synthesizer, 10 MHz to 20 GHz
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<i>Recommended options:</i>	○ <b>E6432A-UNG</b>	add I/Q modulator
	○ <b>E6432A-300</b>	add IF upconversion

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<i>Choose VXI controller:</i>	○ <b>E8491B</b>	IEEE1394 VXI Controller
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<i>Choose mainframe:</i>	○ <b>N7502A-306</b>	E1421B VXI mainframe 6 slot
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## Computer platform

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*Included:*

- **N7502A-500** Tower PC to be used on a separate work surface outside the rack. This computer includes the following, or better: 3.40 GHz XEON processor, 2 GB SDRAM Memory, LAN, USB, and 19 inch flat panel display. The Windows XP® operating system is pre-installed.

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*Choose one:*

- **N7502A-201** PXI embedded PC controller with LAN and GP-IB, for LAN connection to the workstation computer. Same as N6030A-501.
- **N7502A-202** MXI-4 kit for 10 meter (copper) MXI connection to the workstation computer. This includes MXI-4 cards both in the PXI mainframe and in the workstation computer. Same as N6030A-502.
- **N7502A-203** MXI-4 kit for 30 meter (fiber) MXI connection to the workstation computer. This includes MXI-4 cards both in the PXI mainframe and in the workstation computer.

**Note:**

*The N7502A-202 and -203 also include a GP-IB card in the PXI mainframe.*

## System software components

System software is pre-installed.

**Note:** A demo copy of the software can be downloaded from the Agilent web site at [www.agilent.com/find/signalsimulation](http://www.agilent.com/find/signalsimulation).

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*Included:*

- **N7509A**      Waveform Generation Toolbox; powerful easy-to-use way to define and implement signal.

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*Choose one:*

- **N7502A-102**      89601A vector signal analyzer software with 89601A-200, - 300, -AYA – provides vector signal analysis (VSA) capability, including from data taken by the oscilloscope
  
- **Baseband Studio for pulse building (PSG only)**      enables advanced definition of pulsed waveform shaping and sequencing.

## Microwave spectrum analyzer

The PSA Series high-performance spectrum analyzer is recommended as a general-purpose tool for analyzing waveforms.

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<i>Recommended, Choose one:</i>	○ <b>E4440A</b>	PSA Series spectrum analyzer, 3 Hz to 26.5 GHz
	○ <b>E4448A</b>	PSA Series spectrum analyzer, 3 Hz to 50 GHz

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<i>Recommended options:</i>	○ <b>E444XA-123</b>	Switchable MW preselector bypass
	○ <b>E444XA-241</b>	Flexible digital modulation analysis
	○ <b>E444XA-1DS</b>	Internal Preamplifier

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<i>Choose one:</i>	○ <b>E444XA-122</b>	80 MHz bandwidth digitizer
	○ <b>E444XA-H70</b>	70 MHz output

## Additional instruments (e.g., oscilloscope)

Additional instruments can be added to the system as needed.

### Oscilloscopes

The addition of a wide bandwidth oscilloscope enables the direct digitization of high frequency signals. This enables signals to be analyzed with up to 6 or 13 GHz bandwidth. Captured data can be analyzed using the scope or transferred to the computer for analysis by the VSA software.

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<i>Optional, choose one:</i>	○ <b>54855A</b>	Infiniium oscilloscope, 6 GHz, 4 channels, 20 GS/s per channel with 54855A-001 1 M MegaZoom memory/channel upgrade
	○ <b>DSO81304A</b>	Infiniium oscilloscope, 13 GHz, 20/40 GS/s per channel

## System racking

Agilent provides complete integration services for the N7502A, including racking, cabling, software loading, system test, documentation, and system warranty and support. A fully racked system ships to your site in a wooden crate. Users typically open the crate in a shipping area, then roll it on the built-in wheels to the facility where the system will be used, plug it in and begin running it. The instruments are already positioned in the rack for optimized performance, while meeting strict ergonomics and safety requirements. This is the best way to get up and running quickly and ensure that the startup process goes smoothly.

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- Recommended, Choose one:*
- **N7502A-601**      1.2 m rack, 110 V power, display not rack mounted
  - **N7502A-602**      1.2 m rack, 220 V power, display not rack mounted
  - **N7502A-603**      1.6 m rack, 110 V power, display not rack mounted
  - **N7502A-604**      1.6 m rack, 220 V power, display not rack mounted

Alternatively, users can specify the system without racking, eg. for benchtop setups. In this case, the instruments typically arrive together in a single shipment, but each instrument is in an individual box. The user unpacks the instruments one by one, positions them in a suitable location on a benchtop, typically stacking instruments as needed. Users then must follow instructions to ensure proper cabling and interconnections of instruments. Users must then plan for appropriate ergonomics and safety for their specific setup.

## Implementation and support services

### Warranty Information

The N7502A is supported with a one-year return-to-Agilent warranty. Upon request, Agilent can quote extensions to three-year warranty and also three-year calibration. Agilent also offers services to assist in integration, training, consulting, repair, and calibration. Please contact your Agilent sales representative for more information.

### Application Assistance

Agilent's signal generation and analysis experts are available to help you take full advantage of the system for your unique application. User training and consulting can help you get up to speed quickly. If your application has unique requirements, 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.

### Related Agilent Literature

- **N7502A Signal Simulation System**  
Product overview  
5989-1827EN
- **N6030A Arbitrary Waveform Generator**  
Technical overview  
5989-1457EN
- **E8267D PSG Vector Signal Generator**  
Data sheet  
5989-0697EN
- **Infiniium Oscilloscopes and  
89601A Vector Signal Analysis Software**  
Data sheet  
5989-0947EN

### Ordering Information

Contact your Agilent representative.

### Web Resources

For additional product information, visit [www.agilent.com/find/signalsimulation](http://www.agilent.com/find/signalsimulation)



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