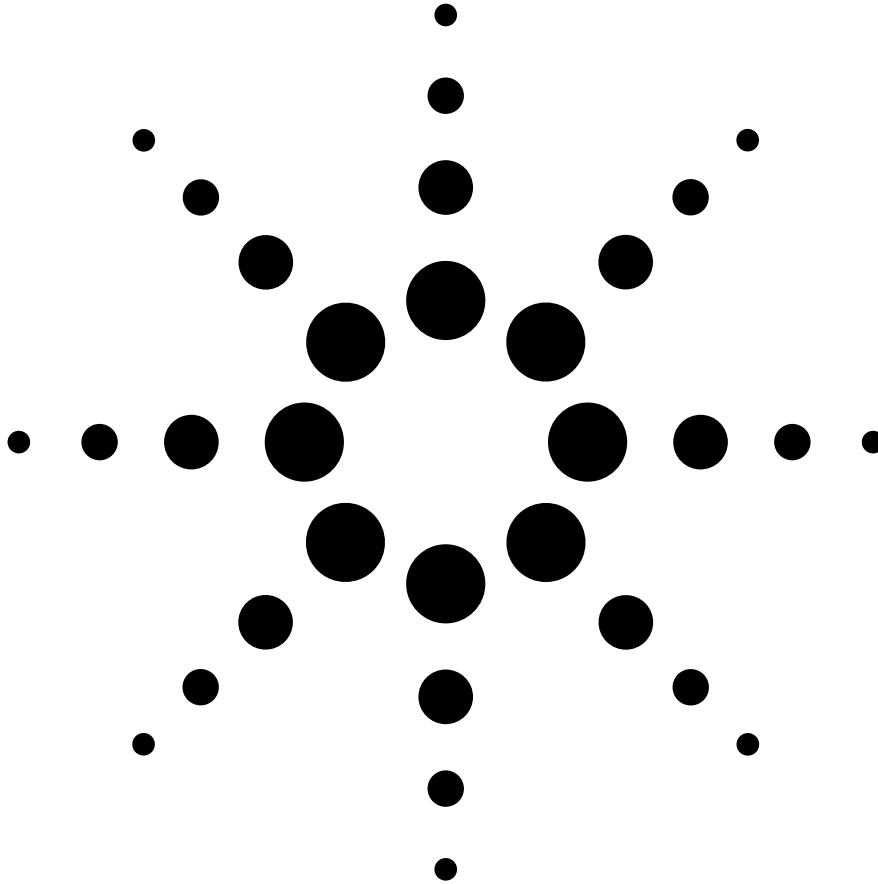


Agilent E4438C ESG Vector Signal Generator

Configuration Guide



E4438C ESG Vector Signal Generator

Configuring your E4438C Vector Signal Generator

The following steps will guide you through configuring your E4438C Vector Signal Generator with the performance you need.

Step 1 Choose a frequency range (Mandatory)

Ordering #	Description	Requires	Not Compatible	For more information go to: www.agilent.com/find/esg
E4438C-501	250 kHz to 1 GHz frequency range			
E4438C-502	250 kHz to 2 GHz frequency range			
E4438C-503	250 kHz to 3 GHz frequency range			
E4438C-504	250 kHz to 4 GHz frequency range			
E4438C-506	250 kHz to 6 GHz frequency range *(Mechanical attenuator only– Option UNB performance is included with option 506)	UNJ	UNB*, 300	

Step 2 Choose phase noise performance

Ordering #	Description	Requires	Not Compatible	For more information go to: www.agilent.com/find/esg
<i>Standard</i>	Standard phase noise performance			Data Sheet: 5988-4039EN
E4438C-UNJ	Enhanced phase noise performance: Up to 20 dB single sideband (SSB) improvement over standard performance. (Option 1E5 performance is included)		300, 1E5	Data Sheet: 5988-4039EN

Step 3 Choose an attenuator

Ordering #	Description	Requires	Not Compatible	For more information go to: www.agilent.com/find/esg
<i>Standard with Options 501,502,503,504</i>	State-of-the-art electronic attenuator: Includes excellent adjacent channel performance (ACP) for CDMA application (previously Option H99). Also provides alternate timeslot power control ideal for GSM receiver and transmitter designs (previously Option UNA).		506	Data Sheet: 5988-4039EN
E4438C-UNB	High output power with <u>mechanical attenuator</u> : Increase the output power up to 6 dB for higher power applications. (Option UNB performance is included with Option 506)		300, 506	Data Sheet: 5988-4039EN

Step 4 Choose baseband generator with memory

Ordering #	Description	Requires	Not Compatible	For more information go to: www.agilent.com/find/esg
<i>Standard</i>	External I/Q inputs only. No built-in digital modulation.			Data Sheet: 5988-4039EN
E4438C-601	Internal baseband generator, 8 MSa memory with digital bus capability; used to produce arbitrary and real-time I/Q waveforms. A variety of standard compliant firmware and software is available.		602	Data Sheet: 5988-4039EN
E4438C-602	Internal baseband generator, 64 MSa memory with digital bus capability; extra memory for when longer waveform playback is desired. Used to produce arbitrary and real-time I/Q waveforms. A variety of standard-compliant firmware and software is available. Option 001 is NOT required.		601	Data Sheet: 5988-4039EN
E4438C-005	6 GB hard drive for non-volatile waveform storage	601 or 602		Data Sheet: 5988-4039EN

Step 5 Choose signal creation software for your internal baseband generator

Ordering #	Description	Requires	Not Compatible	For more information go to: www.agilent.com/find/esg or www.agilent.com/find/signalstudio
Standard with Options 601 & 602	Generates arbitrary waveforms and real-time I/Q symbols. Includes custom modulation, multitone, and the PSG/ESG download assistant for MATLAB®.			
E4438C-400	3GPP W-CDMA FDD Personality	601 or 602		Technical Overview: 5988-4449EN
E4438C-401	cdma2000® and IS-95-A Personality	601 or 602		Technical Overview: 5988-4430EN
E4438C-402	TDMA Personality (GSM, EDGE, GPRS, EGPRS, NADC, PDC, PHS, DECT, TETRA)	601 or 602		Technical Overview: 5988-4431EN
E4438C-403	Calibrated Noise (AWGN) Personality	601 or 602		
E4438C-404	Signal Studio for 1xEV-DO	601 or 602		Technical Overview: 5988-5459EN
E4438C-406	Signal Studio for <i>Bluetooth</i>	601 or 602		Technical Overview: 5988-5417EN
E4438C-407	Signal Studio for S-DMB	601 or 602		Technical Overview: 5989-0861EN
E4438C-408	Signal Studio for enhanced multitone	601 or 602		Technical Overview: 5988-5639EN
E4438C-409	GPS Personality	601 or 602		Technical Overview: 5988-6256EN
E4438C-411	Signal Studio for TD-SCDMA (TSM)	601 or 602		Technical Overview: 5988-6552EN
E4438C-414	Signal Studio for 1xEV-DV and cdma2000	601 or 602		Technical Overview: 5988-9123EN
E4438C-417	Signal Studio for 802.11 WLAN	601 or 602		Technical Overview: 5988-8618EN
E4438C-418	Signal Studio for HSDPA over W-CDMA	601 or 602		Technical Overview: 5988-0390EN
E4438C-420	Signal Studio for pulse building	601 or 602		Technical Overview: 5988-8134EN
E4438C-421	Signal Studio for noise power ratio (NPR)	601 or 602		Technical Overview: 5988-9161EN
E4438C-SP1	Signal Studio for Jitter Injection	601 or 602		
N7600A-101	Signal Studio for 3GPP W-CDMA with HSDP/HSUPA	601 or 602		View online documentation
N7612A-105	Signal Studio for TD-SCDMA (LCR)	N5101A, N5110B-193, and 601 or 602		View online documentation
N7613A-101	Signal Studio for 802.16-2004 (WiMAX)	601 or 602		View online documentation
N7615A-101	Signal Studio for 802.16 OFDMA	601 or 602		View online documentation
N7616A-101	Signal Studio for T-DMB	601 or 602		View online documentation
N7622A	Signal Studio toolkit	601 or 602		Technical Overview: 5989-1606EN
N7623A-101	Signal Studio for DVB	601 or 602		Technical Overview: 5989-2575EN

Step 6 Choose a bit-error-rate (BER) analyzer

Ordering #	Description	Requires	Not Compatible	For more information
E4438C-UN7	Internal bit-error-rate analyzer			
E4438C-300	GSM/EDGE basestation loopback BER test capability	601 or 602, 402, UN7	UNJ, UNB, 506	

Step 7 Choose accessories or instrument connector configuration

Ordering #	Description	Requires	Not Compatible	For more information go to: www.agilent.com/find/esg
E4438C-003	Enables ESG digital <u>output</u> connectivity with N5102A	601 or 602		Technical Overview 5988-9495EN
E4438C-004	Enables ESG digital <u>input</u> connectivity with N5102A Baseband Studio digital signal interface module	601 or 602		Technical Overview: 5988-9495EN
E4438C-1EM	Moves all front panel connectors to rear panel			
E4438C-1CP	Rack mount kit with handles			Catalog: 5980-0450E
E4438C-1CN	Handle kit			Catalog: 5980-0450E

Step 8 Choose a warranty plan

Ordering #	Description	For more information go to: www.agilent.com/find/services_upfront_options
<i>Standard</i>	1-year return-to-Agilent warranty and service	
3 years	Extended return-to-Agilent warranty and service	

Step 9 Choose a calibration plan

There is no calibration plan standard with the E4438C.
For a calibration plan, specify 3 or 5 years for one of the appropriate plans below when ordering.

Plan	For more information go to: www.agilent.com/find/services_upfront_options
Agilent Calibration Upfront Plan	
Agilent Calibration Plus Upfront Plan	
Z540 Calibration Upfront Plan	

Step 10 Choose any documentation

Ordering #	Description	For more information go to: www.agilent.com/find/esg
E4438C-CD1 (Standard)	CD-ROM - English Documentation Set	
E4438C-0BW	Service documentation, assembly level (Hardcopy)	
E4438C-0BV	Service documentation, component level (Hardcopy)	
E4438C-UK6	Commercial calibration certificate with test data (Hardcopy)	
E4438C-ABA	United States - English documentation set (Hardcopy)	
E4438C-AB0	Taiwan - Chinese localization (Hardcopy)	
E4438C-AB1	Korean - Korean localization (Hardcopy)	
E4438C-AB2	China - Chinese localization (Hardcopy)	
E4438C-ABF	French - French localization (Hardcopy)	
E4438C-ABJ	Japanese - Japanese localization (Hardcopy)	

Related Products

Product	Description	For more information go to: www.agilent.com/find/basebandstudio
N5115A	Baseband Studio for fading. Provides channel simulation of signals generated from the E4438C ESG vector signal generator or the E5515C wireless communications test set.	
N5110B	Baseband Studio for waveform capture and playback. Allows capture of digital IQ waveforms directly from a device or playback of IQ waveforms as digital or RF stimulus	
N5102A	Baseband Studio digital signal interface module. Enables digital outputs from, and digital inputs to, the E4438C ESG and E8267D PSG vector signal generators. Also works with N5110B Baseband Studio for waveform capture and playback.	
N5101A	Baseband Studio PCI card. Required to operate N5115A Baseband Studio for fading, N5110B Baseband Studio for waveform capture and playback, or N5120A Baseband Studio for CPRI RE Test software.	
N5103A	High speed serial interface card. Required for the N5120A Baseband Studio for CPRI RE Test software.	
N5120A	Baseband Studio for CPRI RE test. Emulate a radio equipment controller to test radio equipment downlink and uplink paths using the CPRI interface.	

Upgradeable Options 1, 2, 3

Ordering #	Upgrade description	Information required with order
E4438CK-601	Complete upgrade kit with installation guide ⁴	Serial # and host ID of instrument. Customer's email address.
E4438CK-602	Complete upgrade kit with installation guide ⁴	Serial # and host ID of instrument. Customer's email address.
E4438CK-005	Complete upgrade kit with installation guide	Serial # and host ID of instrument. Customer's email address.
E4438CK-1E5	Complete upgrade kit with installation guide	Serial # and host ID of instrument. Customer's email address.
E4438CK-UN7	Complete upgrade kit with installation guide	Serial # and host ID of instrument. Customer's email address.
E4438CK-003	License key (alphanumeric code)	Serial # and host ID of instrument. Customer's email address.
E4438CK-004	License key (alphanumeric code)	Serial # and host ID of instrument. Customer's email address.
E4438CK-400	License key (alphanumeric code)	Serial # and host ID of instrument. Customer's email address.
E4438CK-401	License key (alphanumeric code)	Serial # and host ID of instrument. Customer's email address.
E4438CK-402	License key (alphanumeric code)	Serial # and host ID of instrument. Customer's email address.
E4438CK-403	License key (alphanumeric code)	Serial # and host ID of instrument. Customer's email address.
E4438CK-404	License key (alphanumeric code)	Serial # and host ID of instrument. Customer's email address.
E4438CK-406	License key (alphanumeric code)	Serial # and host ID of instrument. Customer's email address.
E4438CK-408	License key (alphanumeric code)	Serial # and host ID of instrument. Customer's email address.
E4438CK-409	License key (alphanumeric code)	Serial # and host ID of instrument. Customer's email address.
E4438CK-411	License key (alphanumeric code)	Serial # and host ID of instrument. Customer's email address.
E4438CK-414	License key (alphanumeric code)	Serial # and host ID of instrument. Customer's email address.
E4438CK-417	License key (alphanumeric code)	Serial # and host ID of instrument. Customer's email address.
E4438CK-418	License key (alphanumeric code)	Serial # and host ID of instrument. Customer's email address.
E4438CK-421	License key (alphanumeric code)	Serial # and host ID of instrument. Customer's email address.

- Option UNB, 1EM, and 300 must be returned to the Agilent factory for an upgrade. These can not be upgraded by the customer.
- Latest firmware is recommended for upgrades. Firmware can be found at www.agilent.com/find/upgradeassistant.
- License key options require Option 001, 002, 601, or 602.
- Upgrade kit is not compatible for instruments with Option 1EM installed.

List of available options

E4438C ESG Custom ****Call for details****	E4438C ESG custom enhancements for the following applications: polar modulation, multiple input multiple output (MIMO), 802.11n, phase coherency, radar simulation
E4438C-003	Enables ESG digital outputs with N5102A
E4438C-004	Enables ESG digital inputs with N5102A
E4438C-005	6 GB internal hard drive
E4438C-1CM	Rackmount flange kit
E4438C-1CN	Front handle kit
E4438C-1CP	Rackmount flange and front handle kit
E4438C-1E5	High-stability time-base - <i>Now free!</i>
E4438C-1EM	Moves all front panel connectors to the rear panel
E4438C-400	3GPP W-CDMA FDD Personality
E4438C-401	cdma2000® and IS-95-A Personality
E4438C-402	TDMA Personality (GSM, EDGE, GPRS, EGPRS, NADC, PDC, PHS, DECT, TETRA)
E4438C-403	Calibrated Noise (AWGN) Personality
E4438C-404	Signal Studio for 1xEV-DO
E4438C-406	Signal Studio for <i>Bluetooth</i>
E4438C-407	Signal Studio for S-DMB
E4438C-408	Signal Studio for enhanced multitone
E4438C-409	GPS Personality
E4438C-411	Signal Studio for TD-SCDMA (TSM)
E4438C-414	Signal Studio for 1xEV-DV and cdma2000
E4438C-417	Signal Studio for 802.11 WLAN
E4438C-418	Signal Studio for HSDPA over W-CDMA
E4438C-420	Signal Studio for pulse building
E4438C-421	Signal Studio for noise power ratio (NPR)
E4438C-501	Frequency range from 250 kHz to 1 GHz
E4438C-502	Frequency range from 250 kHz to 2 GHz
E4438C-503	Frequency range from 250 kHz to 3 GHz
E4438C-504	Frequency range from 250 kHz to 4 GHz
E4438C-506	Frequency range from 250 kHz to 6 GHz
E4438C-601	Internal baseband generator, 8 MSa memory with digital bus capability
E4438C-602	Internal baseband generator, 64 MSa memory with digital bus capability
E4438C-SP1	Signal Studio for Jitter Injection
E4438C-UN7	Internal bit error rate (BER) analyzer
E4438C-UNB	High output power with mechanical attenuator
E4438C-UNJ	Enhanced phase noise performance
N7600A	Signal Studio for 3GPP W-CDMA with HSDPA/HSUPA
N7612A	Signal Studio for TD-SCDMA (LCR)
N7613A	Signal Studio for 802.16-2004 (WiMAX)
N7615A	Signal Studio for 802.16 OFDMA
N7616A	Signal Studio for T-DMB
N7622A	Signal Studio Toolkit
N7623A	Signal Studio for DVB

Manuals and printed options

E4438C-UK6	Hardcopy of the commercial calibration certificate and calibration test data
E4438C-0BV	Hardcopy of the component level service manual
E4438C-0BW	Hardcopy of the assembly level service manual
E4438C-AB0	Hardcopy of the Chinese (Taiwan) user's guide
E4438C-AB1	Hardcopy of the Korean user's guide
E4438C-AB2	Hardcopy of the Chinese (China) user's guide
E4438C-ABA	Hardcopy of the English documentation set
E4438C-ABF	Hardcopy of the French user's guide
E4438C-ABJ	Hardcopy of the Japanese user's guide
E4438C-CD1	CD-ROM containing the English documentation set

Additional Agilent Literature

Application notes

RF Source Basics, a self-paced tutorial (CD-ROM),
literature number 5980-2060E.

*Digital Modulation in Communications Systems –
An Introduction,*
Application Note 1298, literature number 5965-7160E.

*Using Vector Modulation Analysis in
the Integration, Troubleshooting, and Design
of Digital RF Communications Systems,*
Application Note 89400-8, literature number 5091-8687E.

Testing CDMA Base Station Amplifiers,
Application Note 1307, literature number 5967-5486E.

*Understanding GSM/EDGE Transmitter and Receiver
Measurements for Base Transceiver Stations and
Their Components,*
Application Note 1312, literature number 5968-2320E.

*Understanding CDMA Measurements for
Base Stations and Their Components,*
Application Note 1311, literature number 5968-0953E.

*Testing and Troubleshooting Digital RF
Communications Receiver Designs,*
Application Note 1314, literature number 5968-3579E.

Bluetooth® RF Measurements Fundamentals,
Application Note 1333-1, literature number 5988-
3760EN.

*Designing and Testing 3GPP W-CDMA Base
Transceiver Stations,* Application Note 1355,
literature number 5980-1239E.

*Designing and Testing 3GPP W-CDMA
User Equipment,*
Application Note 1356, literature number 5980-1238E.

Designing and Testing cdma2000 Base Stations,
Application Note 1357, literature number 5980-1303E.

Designing and Testing cdma2000 Mobile Stations,
Application Note 1358, literature number 5980-1237E.

Product literature

E4438C ESG Vector Signal Generator,
Brochure, literature number 5988-3935EN.

E4438C ESG Vector Signal Generator,
Data Sheet, literature number 5988-4039EN.

IntuiLink Software,
Data Sheet, literature number 5980-3115EN.

Additional Resources

See the ESG Web page

Get the latest news, product and support information, application literature and more. The Agilent Technologies Internet address for the ESG family is: <http://www.agilent.com/find/esg>

See the Signal Creation Software Web page

Simplifying complex signal simulation, Signal Studio software runs on a PC and embedded software runs directly on the signal generator. The Agilent Technologies Internet address for the Signal Creation Software is: <http://www.agilent.com/find/signalstudio>

See the Baseband Studio Web page

Baseband Studio is a suite of baseband signal applications and accessories that simplify the creation and verification of cellular, wireless networking, and aerospace/defense component and subsystem designs. The Agilent Technologies Internet address for Baseband Studio is: <http://www.agilent.com/find/basebandstudio>

New trade-up program

Ask your local sales representative about instrument trade-up opportunities for all ESG models.

IntuiLink PC software

Transfer screen data and images easily into Microsoft® Excel and Microsoft® Word. Save and restore instrument states. Download arbitrary waveform files. For more information visit our website at: <http://www.agilent.com/find/IntuiLink>

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Agilent Technologies' Test and Measurement Support, Services, and Assistance

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. 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 receive your new Agilent equipment, we can help verify that it works properly and help with initial product operation.

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.



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Printed in USA, February 2, 2006

5988-4085EN

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