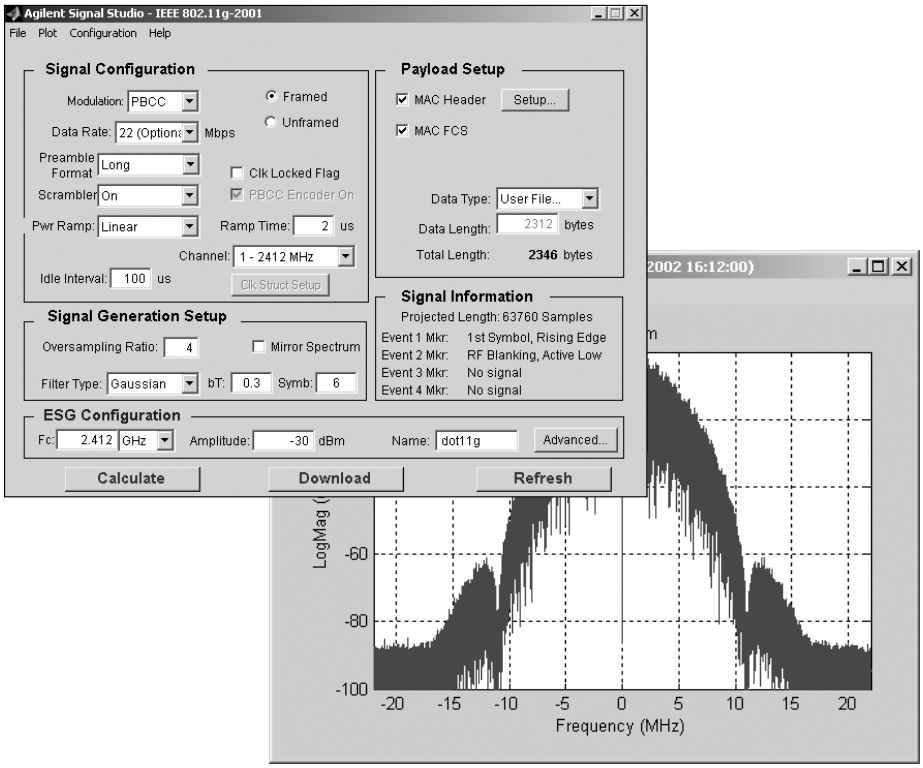
Agilent
802.11g WLAN Signal Studio Software for the E4438C ESG Vector Signal Generator

Option 415
Technical Overview



802.11g WLAN test signals

802.11g WLAN Signal Studio software is a powerful tool for creating various WLAN baseband I/Q waveforms for use with the Agilent E4438C ESG vector signal generator.

Main features

- Easily configure 802.11g waveforms from the intuitive user interface
- Quickly create fully-coded WLAN frames:
  - •IEEE 802.11g PBCC-22 and 33 optional modes (requires option 415)
  - •IEEE 802.11g[1] OFDM and IEEE 802.11a modes (requires option 410)
  - •IEEE 802.11g DSSS and IEEE 802.11b modes (requires option 405)
- Add a user file as the payload data type•
- Selectable framing includes preamble and header
- Activate scrambling, interleaving, and encoding
- Plot I/Q signals, spectrum, and CCDF curve
- Configure ESG settings remotely
- Connect to the ESG with 10B/T LAN or GPIB

Try before you buy!

Go to www.agilent.com/find/signalstudio and download 802.11g WLAN Signal Studio to your PC to evaluate the signal configuration and plotting capabilities of the software. License keys are required to load the waveforms created by the software into the ESG. These license keys can be ordered through your sales engineer or the nearest sales office, which can be found at http://www.agilent.com/find/assist

Benefits

Component test

- Determine performance characteristics of 802.11g WLAN components
- Modify signal parameters to meet customized test needs
- Generate statistically correct signals to properly stress components

Receiver test

- Fully-coded 802.11g WLAN frames enable FER, PER, and BER for testing receiver sensitivity
- Verify demodulation capability of 802.11g WLAN receivers

I/Q waveform generation

802.11g WLAN Signal Studio software is a Windows®-based utility that simplifies the creation of 802.11g WLAN I/Q waveforms. It is intended for use with the E4438C ESG vector signal generator's baseband generator operating in arbitrary mode.

Configure and build 802.11g WLAN I/Q waveforms quickly with Signal Studio's easy-to-use graphical interface. The configured I/Q waveform is computed by the PC with Signal Studio and downloaded to the ESG, which automatically begins generating the modulated RF waveform.

1. CCK-OFDM is not supported at this time in 802.11g WLAN Signal Studio software.

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Recommended configuration*

E4438C ESG with the following options:

E4438C-002**	32 Msample baseband generator
E4438C-415**	802.11g WLAN Signal Studio software
E4438C-410**	802.11a WLAN Signal Studio software
E4438C-405**	802.11b WLAN Signal Studio software
E4438C-506	6-GHz frequency range
E4438C-UNJ	Improved phase noise
E4438C-005	6 GB internal hard drive

* Other configurations possible.

** Indicates required options. All three options (415, 410, and 405) are required to download all three types of 802.11g waveforms from the software into the ESG. If you have previously purchased Option 405 or 410, the license keys remain valid and you only need to install Option 415 to have full functionality. If you do not want or need full 802.11g functionality, each mode can be enabled independently with the appropriate license key. The baseband generator may be either Option E4438C-001 or Option E4438C-002. Option E4438C-001 contains 8 Msamples of memory.

Upgrade kits

If you currently own an E4438C ESG vector signal generator and are interested in obtaining an upgrade kit only (license key), order E4438CK and:

- Option E4438CK-415 for the 802.11g PBCC-22 and 33 optional modes
- Option E4438CK-410 for 802.11a Signal Studio software
- Option E4438CK-405 for 802.11b Signal Studio software

802.11g WLAN Signal Studio software features[2]

Spreading/coding schemes	802.11b, 802.11g DSSS, and 802.11g PBCC-22 and 33 modes Preamble (short and long) and header: DSSS 11-chip Barker sequence Payload: DSSS 11-chip Barker sequence, CCK, or PBCC 802.11a and 802.11g OFDM modes Preamble and header: OFDM Payload: OFDM
Framing	Framed: bursted framed data includes preamble and header fields Non-framed: non-bursted continuous data
Modulation formats	DBPSK, DQPSK, BPSK, QPSK, 8-PSK, 16-QAM, 64-QAM
Data rates	1, 2, 5.5, 6,9, 11, 12, 18, 22, 24, 33, 36, 48, 54, custom
Data source	1s, 0s, 01s, 10s, PN9, PN15, user file
Payload data length FCS)	Maximum: 2346 bytes (with MAC header and MAC Minimum: 0 byte
Encoding rates	1/2, 2/3, 3/4
Idle interval	0-100,000 µs
Oversample ratio	2 to 9
Baseband filtering for 802.11b, 802.11g DSSS, PBCC-22 and 33 modes	Rectangle, Gaussian, and root cosine with adjustable filter coefficient and symbol length
Windowing for 802.11a & 802.11g OFDM modes	Raised-cosine windowing for each OFDM symbol with adjustable symbol length
Power ramping for 802.11b, 802.11g DSSS, PBCC-22 and 33 modes	None, linear, cosine Ramp time: 0-1000 µs
Scrambler	802.11b, 802.11g DSSS, PBCC-22 and 33 modes: On, off, preamble only 802.11a and 802.11g OFDM modes: on, off
Sub-carrier setup for 802.11a and 802.11g OFDM modes	Sub-carriers are individually selectable.
Service field for 802.11a and 802.11g OFDM modes	0-FFFF Hex (16-bits: First 7 LSB are masked to zero)
Scrambler seed initialization value for 802.11a and 802.11g OFDM modes	0-7F Hex

2. Features subject to change

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