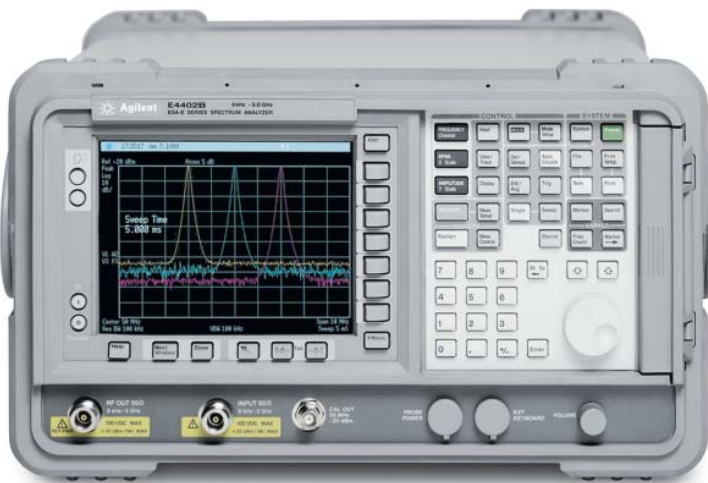


Agilent ESA-E Series Spectrum Analyzer

Configuration Guide



This ESA configuration guide will help you determine which performance options, measurement personalities, accessories, and services to include in your new ESA-E, or to add as upgrades to an existing ESA-E.

Options for the new EXA signal analyzer are shown alongside the ESA to help customers who wish to migrate to the latest technology. Customers looking for increased speed, more application options, or modern connectivity will benefit by moving to the new EXA signal analyzer.

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Agilent Technologies

Agilent ESA-E Spectrum Analyzer

This step-by-step guide will help you configure your ESA-E. Capabilities that are listed as standard come with the instrument at no additional charge. Tailor the performance, exterior, and service packages to meet your requirements.

The ESA-E spectrum analyzer is available in three express configurations: standard (STD/STG) or communications test (COM). The express analyzers offer faster delivery by limiting the number of options that can be ordered together. The custom configuration allows for maximum flexibility in ordering the analyzer that best meets your needs by offering all of the ESA-E options; however, it increases the delivery timeframe.

For detailed specifications, refer to the ESA-E Spectrum Analyzer specification guide (E4401-90490). For a summary of specifications, refer to the ESA-E data sheet, literature number 5989-9815EN.

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ESA-E Custom Configuration

Step 1. Select your frequency range

| Description | ESA-E model number ¹ | EXA option number |
|------------------------------------|---------------------------------|--|
| Frequency range, 9 kHz to 3.0 GHz | E4402B | N9010A-503 EXA Option 503 maximum frequency range is 3.6 GHz |
| Frequency range, 9 kHz to 6.7 GHz | E4404B | N9010A-507 EXA Option 507 maximum frequency range is 7.0 GHz |
| Frequency range, 9 kHz to 13.2 GHz | E4405B | N9010A-513 EXA Option 513 maximum frequency range is 13.6 GHz |
| Frequency range, 9 kHz to 26.5 GHz | E4407B | N9010A-526 |

Step 2. Included options at no additional charge

| Description | ESA-E spectrum analyzer | EXA signal analyzer |
|------------------------------------|---------------------------------------|---|
| GPIO connection | Option A4H ² | Standard on all EXA signal analyzers; in addition, the EXA offers seven USB ports and LAN connectivity as standard. |
| IntuiLink PC connectivity software | Connects to Microsoft® Word and Excel | The PC-based EXA requires no additional software to connect to Microsoft applications |

Step 3. Choose frequency reference

| Description | ESA-E spectrum analyzer | EXA signal analyzer |
|--|---|---|
| Frequency reference (standard aging rate) | $\pm 2 \times 10^{-6}$ / year | $\pm 1 \times 10^{-6}$ / year |
| High-stability frequency reference (reduces frequency drift resulting in more accurate measurements; recommended option) | Option 1D5 Aging rate: $\pm 1 \times 10^{-7}$ / year | N9010A-PFR Aging rate: $\pm 1 \times 10^{-7}$ / year |

Step 4. Choose an attenuator

| Description | ESA-E spectrum analyzer | EXA signal analyzer |
|-------------------------------------|-------------------------|---|
| Mechanical attenuator (standard) | 5 dB steps, 0 to 60 dB | 10 dB steps, 0 to 60 dB |
| Fine-step mechanical attenuator | Not available | N9010A-FSA Allows 2 dB steps for the full 60 dB range of the mechanical attenuator |
| Electronic attenuator up to 3.6 GHz | Not available | N9010A-EA3 Add to the mechanical attenuator; 1 dB steps, 0 to 24 dB |

Step 5. Add a preamplifier

| Description | ESA-E spectrum analyzer | EXA signal analyzer |
|--------------|------------------------------|----------------------------------|
| Preamplifier | Option 1DS 1 MHz to 3 GHz | N9010A-P03 100 kHz to 3.6 GHz |

1. The E4402B has six available expansion slots for additional hardware options; the E4404/05/07B has five available expansion slots
2. Requires one expansion slot

ESA-E Custom Configuration – continued

Step 6. Add extra options¹

| Description | ESA-E spectrum analyzer | EXA signal analyzer |
|--|-----------------------------|---|
| Narrow resolution bandwidths (recommended option) | Option 1DR | Standard |
| Low-emissions shielding | Option 060 ² | Not available |
| Wide-offset phase noise improvement and ACPR dynamic range extension | Option 120 ³ | Similar performance standard |
| Replace GPIB with serial port | Option 1AX ^{3,4} | Serial port unavailable; USB is standard |
| Time-gated spectrum analysis | Options 1D6 | Standard |
| 50 ohm tracking generator | Option 1DN, 9 kHz to 3 GHz | Not available |
| Fast time domain sweep; IF, sweep, and video output ports | Option AYX ³ | Fast time domain sweep is standard |
| External mixing | Option AYZ ⁵ | Not available |
| Digital demodulation hardware | Option B7D/B7E ⁶ | Standard |
| APC 3.5 mm input connector | Option BAB ⁵ | Not available |
| Low frequency extension to 100 Hz | Option UKB ⁷ | Not available |
| EMI detectors and FM Demodulation | Option AYQ ^{3,7} | Most EMC adds quasi-peak deletion and basic FM demodulation |

1. If two or more ESA-E options are ordered, memory size may limit the number of options that may be loaded at any one time; for detailed information about memory size limitations, please see the Web site: <http://sa.tm.agilent.com/ESA/memory>
2. Not compatible with Option B7B
3. Requires one expansion slot
4. Not compatible with Option A4H
5. E4407B only
6. Requires Option 1D5; occupies two expansion slots, must be ordered jointly
7. Requires Option 1DR

ESA-E Custom Configuration – continued

Step 7. Choose measurement software

| Description | ESA-E spectrum analyzer | EXA signal analyzer |
|---|------------------------------|---|
| AM demodulation | Standard | N9063A |
| FM demodulation/ deviation | Option BAA ^{1,2} | N9063A |
| Phase noise measurement | Option 226 ³ | N9068A |
| Noise figure measurement | Option 219 ^{4,2} | N9069A |
| GSM/GPRS measurement | Option BAH ^{5,6} | N9071A |
| Edge upgrade to option BAH | Option 252 ⁷ | N9071A |
| Cable fault location measurement | Option 225 ⁸ | Not available |
| TV trigger on screen measurement | Option B7B ⁹ | Not available |
| Cable TV field service and analog broadcast measurement | Option 227 | Not available |
| Modulation analysis measurement | Option 229 ¹⁰ | 89601X |
| Benchlink Web remote software | Option 230 ¹¹ | Remote desktop comes standard with the PC-based EXA |
| ESA to 89601A VSA software link | Option 231 ¹² | Standard |
| 89601A vector signal analysis (VSA) software | 89601A – runs on external PC | 89601A – runs internal to the instrument |
| 8566/68 programming code compatibility | Option 266 ¹³ | Not available |
| 8590 series programming code compatibility | Option 290 ¹³ | Not available |
| 856xE/EC programming code compatibility | Not available | N9061A |
| Bluetooth® measurement analyzer bundle | Option 304 ¹⁴ | Not available |
| cdmaOne measurement | Option BAC ¹⁵ | Not available |
| cdma2000 measurement | Not available | N9072A |
| W-CDMA measurement | Not available | N9073A-1FP |
| HSDPA / HSUPA measurement | Not available | N9073A-2FP |
| 802.16 OFDMA measurement | Not available | N9075A |
| TD-SCDMA measurement | Not available | N9079A-1FP |
| HSDPA/8PSK measurement | Not available | N9079A-2FP |

Step 8. Add special options

| Description | ESA-E spectrum analyzer | EXA signal analyzer |
|---|-----------------------------|---------------------|
| 26.5 GHz uncalibrated built in preamplifier | Option H26 ¹⁸ | Not available |
| 70 MHz IF output | Options H70 ^{2,16} | Not available |
| FM deviation personality enhancement | Option J36 ¹⁷ | Not available |

- Not compatible with Option 304 or 106
- Occupies one expansion slot
- If two or more ESA-E options are ordered, memory size may limit the number of options that may be loaded at any one time; for detailed information about memory size limitations, please see the Web site: <http://sa.tm.agilent.com/ESA/memory>
- See *ESA Noise Figure Measurement Personality Technical Overview*, literature number 5989-0215EN, for recommended options
- Requires Option B7D/B7E
- Requires Option 1D5 and 1D6; includes capability of Option 225
- Requires Option BAH
- Requires Option 1DN; not compatible with Option BAH; recommended accessory Option B7K
- Requires BAA; not compatible with Option 060
- Requires Options B7D/B7E, A4H, and 1D5; includes capability of Option 231
- Requires Option A4H
- Requires Options B7D/B7E, A4H, and 1D5
- Free download on the Web, no license required: <http://www.agilent.com/find/esa>
- Includes Options 228, 106, B7D/B7E, 1DS, and 1D5; occupies three expansion slots
- Requires Options B7D/B7E and 1D5
- Recommended for use with 89601A VSA software
- Requires Option BAA
- Available at time of purchase only. Not upgradable.

ESA-E Standard Express Spectrum Analyzer (STD/STG)

The ESA-E express analyzers offer configurations that are typically ordered together to help speed instrument delivery. The EXA signal analyzer is not offered in an express configuration, however, the newer technology allows for faster delivery times, regardless of the configuration. If you wish to order an EXA configuration equivalent to the ESA-E express analyzer, please select the individual EXA options shown in the table below.

Step 1. Select your frequency range

| Description | ESA-E model number ¹ | EXA option number |
|------------------------------------|--|--|
| Frequency range, 9 kHz to 3.0 GHz | E4402B E4402B-STD or E4402B-STG (adds tracking generator) | N9010A-503 EXA Option 503 maximum frequency is 3.6 GHz |
| Frequency range, 9 kHz to 6.7 GHz | E4404B E4404B-STD or E4404B-STG (adds tracking generator) | N9010A-507 EXA Option 507 maximum frequency range is 7.0 GHz |
| Frequency range, 9 kHz to 13.2 GHz | E4405B E4405B-STD or E4405B-STG (adds tracking generator) | N9010A-513 EXA Option 513 maximum frequency range is 13.6 GHz |
| Frequency range, 9 kHz to 26.5 GHz | E4407B E4407B-STD or E4407B-STG (adds tracking generator) | N9010A-526 |

Step 2. Included ESA-E options at no additional charge

| Description | ESA-E spectrum analyzer | EXA signal analyzer |
|---|---------------------------------------|---|
| GPIB connection | Option A4H ² | Standard on all EXA signal analyzers; in addition, the EXA offers seven USB ports and LAN connectivity standard |
| FM demodulation/deviation | Option BAA ^{2,3} | N9063A |
| Fast time domain sweep; IF, sweep, and video output ports | Option AYW ² | Fast time domain sweep is standard |
| IntuiLink PC connectivity software | Connects to Microsoft® Word and Excel | The PC-based EXA requires no additional software to connect to Microsoft applications |

Step 3. Choose frequency reference

| Description | ESA-E spectrum analyzer | EXA signal analyzer |
|--|---|---|
| Frequency reference (standard aging rate) | $\pm 2 \times 10^{-6}$ / year | $\pm 1 \times 10^{-6}$ / year |
| High-stability frequency reference (reduces frequency drift resulting in more accurate measurements; recommended option) | Option 1D5 Aging rate: $\pm 1 \times 10^{-7}$ / year | N9010A-PFR Aging rate: $\pm 1 \times 10^{-7}$ / year |

1. The E4402B has three expansion slots for additional options; the E4404/5/7B have two expansion slots
2. Requires one expansion slot
3. Not compatible with Options 304 or 106

ESA-E Standard Express Spectrum Analyzer (STD/STG) – continued

Step 4. Add a preamplifier (preamplifiers are not standard)

| Description | ESA-E spectrum analyzer | EXA signal analyzer |
|--------------|------------------------------|----------------------------------|
| Preamplifier | Option 1DS 1 MHz to 3 GHz | N9010A-P03 100 kHz to 3.6 GHz |

Step 5. Add extra options¹

| Description | ESA-E spectrum analyzer | EXA signal analyzer |
|---|----------------------------|---|
| Narrow resolution bandwidths (recommended option) | Option 1DR | Standard |
| Time-gated spectrum analysis | Options 1D6 | Standard |
| Performance bundle | Option B75 ² | For equivalency, order N9010A-PFR |
| Replace GPIB with serial port | Option 1AX ^{3,4} | Serial port unavailable; USB comes standard |
| 50 ohm tracking generator | Option 1DN, 9 kHz to 3 GHz | Not available |

Step 6. Choose measurement software

| Description | ESA-E spectrum analyzer | EXA signal analyzer |
|---|------------------------------|--|
| Phase noise measurement | Option 226 ¹ | N9068A |
| Noise figure measurement | Option 219 ^{5,6} | N9069A |
| Cable fault location measurement | Option 225 ⁷ | Not available |
| Cable TV field service and analog broadcast measurement | Option 227 | Not available |
| Benchlink Web remote software | Option 230 ⁸ | Remote desktop come standard with the PC-based EXA |
| 89601A vector signal analysis (VSA) software | 89601A – runs on external PC | 89601A – runs internal to the instrument |
| 8566/68 programming code compatibility | Option 266 ⁹ | Not available |
| 8590 Series programming code compatibility | Option 290 ⁹ | Not available |
| 856xE/EC programming code compatibility | Not available | N9061A |

Future upgrades for the ESA-E standard express spectrum analyzer (STD/SG)

Available future expansion slots

E4402B – Three additional expansion slots
E4404/5/7B – Two additional expansion slots

1. If more than two ESA-E options are ordered, memory size may limit the number of options that can be loaded at any one time; for detailed information about memory size limitations, please see the Web site: <http://sa.tm.agilent.com/ESA/memory>
2. Includes Options 1D5, 1DR and 1DS
3. Requires one expansion slot
4. Not compatible with Option A4H
5. See *ESA Noise Figure Measurement Personality Technical Overview*, literature number 5989-0215EN, for recommended options
6. Requires one expansion slot
7. Requires Option 1DN; not compatible with Option BAH; recommended accessory Option B7K
8. Requires Option A4H
9. Free download on the Web, no license required: <http://www.agilent.com/find/esa>

ESA-E Communications Test Express Spectrum Analyzer (COM)

Step 1. Select your frequency range

| Description | ESA-E model number ¹ | EXA option number |
|------------------------------------|---------------------------------|--|
| Frequency range, 9 kHz to 3.0 GHz | E4402B E4402B-COM | N9010A-503 EXA Option 503 maximum frequency is 3.6 GHz |
| Frequency range, 9 kHz to 6.7 GHz | E4404B E4404B-COM | N9010A-507 EXA Option 507 maximum frequency range is 7.0 GHz |
| Frequency range, 9 kHz to 13.2 GHz | E4405B E4405B-COM | N9010A-513 EXA Option 513 maximum frequency range is 13.6 GHz |
| Frequency range, 9 kHz to 26.5 GHz | E4407B E4407B-COM | N9010A-526 |

Step 2. Included ESA-E options at no additional charge

| Description | ESA-E spectrum analyzer | EXA signal analyzer |
|--|---|---|
| GPIB connection | Option A4H ² | Standard on all EXA signal analyzers; in addition, the EXA offers seven USB ports and LAN connectivity standard |
| High-stability frequency reference (reduces frequency drift resulting in more accurate measurements; recommended option) | Option 1D5 Aging rate: $\pm 1 \times 10^{-7}$ / year | N9010A-PFR Aging rate: $\pm 1 \times 10^{-7}$ / year |
| Narrow resolution bandwidths (recommended option) | Option 1DR | Standard |
| ESA to 89601A VSA software link | Option 231 ^{3, 6} | Standard |
| FM demodulation/ deviation | Option BAA ^{2, 3, 4} | N9063A |
| Digital demodulation hardware | Option B7D/B7E ⁵ | Standard |
| IntuiLink PC connectivity software | Connects to Microsoft® Word and Excel | The PC-based EXA requires no additional software to connect to Microsoft applications |

Step 3. Add a preamplifier (preamplifiers are not standard)

| Description | ESA-E spectrum analyzer | EXA signal analyzer |
|--------------|------------------------------|----------------------------------|
| Preamplifier | Option 1DS 1 MHz to 3 GHz | N9010A-P03 100 kHz to 3.6 GHz |

Step 4. Add additional options

| Description | ESA-E spectrum analyzer | EXA signal analyzer |
|-------------------------------|----------------------------|--|
| Replace GPIB with serial port | Option 1AX ^{2, 7} | Serial port unavailable; USB is standard |
| Time-gated spectrum analysis | Options 1D6 | Standard |

1. The E4402B has two expansion slots for additional hardware options; the E4404/05/07B has one expansion slot
2. Requires one expansion slot
3. Requires Options B7D/B7E, A4H, and 1D5
4. Not compatible with Option 304 or 106
5. Occupies two expansion slots
6. If more than two or three ESA-E options are ordered, memory size may limit the number of options that can be loaded at any one time; for detailed information about memory size limitations, please see the Web site: <http://sa.tm.agilent.com/ESA/memory>
7. Not compatible with Option A4H

ESA-E Communications Test Express Spectrum Analyzer (COM) – continued

Step 5. Choose measurement software¹

| Description | ESA-E spectrum analyzer | EXA signal analyzer |
|---|------------------------------|--|
| Phase noise measurement | Option 226 | N9068A |
| Noise figure measurement | Option 219 ² | N9069A |
| GSM/GPRS measurement | Option BAH ^{3,4} | N9071A |
| EDGE upgrade to Option BAH | Option 252 ⁵ | N9071A |
| Cable TV field service and analog broadcast measurement | Option 227 | Not available |
| Modulation analysis measurement | Option 229 ⁶ | 89601X |
| 89601A vector signal analysis (VSA) software | 89601A – runs on external PC | 89601A – runs internal to the instrument |
| 8566/68 programming code compatibility | Option 266 ⁷ | Not available |
| 8590 Series programming code compatibility | Option 290 ⁷ | Not available |
| cdmaOne measurement | Option BAC ⁸ | Not available |

Future upgrades for the ESA-E standard express spectrum analyzer (STD/SG)

Available future expansion slots

E4402B – Three additional expansion slots
 E4404/5/7B – Two additional expansion slots

1. If more than two or three ESA-E options are ordered, memory size may limit the number of options that can be loaded at any one time; for detailed information about memory size limitations, please see the Web site: <http://sa.tm.agilent.com/ESA/memory>
2. See *ESA Noise Figure Measurement Personality Technical Overview*, literature number 5989-0215EN, for recommended options
3. Requires Option B7D/B7E
4. Requires Options 1D5 and 1D6; includes capability of Option 225
5. Requires Option BAH
6. Requires Options B7D/B7E, A4H, and 1D5; includes capability of Option 231
7. Free download on the Web, no license required: <http://www.agilent.com/find/esa>
8. Requires Options B7D/B7E and 1D5

Express Analyzer and Bundle Equivalent Options

The table below shows equivalent options in each bundle offered for ESA-E spectrum analyzers.

| ESA-E express option or bundle | ESA-E equivalent option(s) | Additional information |
|--|-----------------------------|---|
| STD- Standard analyzer | AYX, BAA | |
| STG- Standard analyzer with tracking generator | AYX, BAA, 1DN | |
| COM- Communication test analyzer | B7D/B7E, 1D5, 1DR, BAA, 231 | |
| B75- Performance bundle | 1DR, 1DS, 1D5 | Only available with express analyzer STD or STG |
| 304- Bluetooth® premium bundle | 228,106, B7D/B7E, 1DS, 1D5 | Options 106 and 228 are not available outside the option bundle 304 |

ESA-E Accessory, Calibration, and Warranty Options

Step 6. Select accessories and calibration options

| Description | ESA-E spectrum analyzer option | ESA-E notes | ESA-E part number | EXA signal analyzer option |
|--|--------------------------------|--|-------------------|---|
| 12 VDC power cable | A5D | DC power connection available on every ESA | E4401-60066 | Not available |
| Hard transit case | AXT | | E4401-60101 | N9010A-HTC |
| Gray soft carrying/operation case | AYT | | E4401-60117 | Not available |
| Yellow soft carrying/operation case | AYU | | E4401-60118 | Not available |
| Cable fault measurement kit (50 ohm) | B7K | Requires Option 1DN or STG and Option 225 or BAH | | Not available |
| Gray backpack carrying case | 042 | | 9300-2465 | Not available |
| Yellow backpack carrying case | 044 | | 9300-2470 | Not available |
| Rack mount kit with handles | 1CP | This kit is designed to fit into Agilent racks only; for non-Agilent racks, additional end brackets are required and are available by ordering part number 1494-0061 | E4401-60057 | N9010A-1CP |
| 50 to 75 ohm minimum loss pad | 1D7 | | 0955-1020 | N9010A-MLP |
| Rechargeable snap-on battery and charger | E1779A/B | Order as separate model number, not option number. European Union customers must order E1779B. | | Not available |
| Front panel cover | UK9 | | E4401-60193 | Standard |
| Benchlink spectrum analyzer, PC software | B70 | Also orderable as E4444A; requires Option A4H or 1AX | | Remote desktop is a standard feature on EXA |
| Benchlink Web remote control software | 230 | Requires Option A4H | | Remote desktop is a standard feature on EXA |
| IntuiLink software (shipped with every instrument) | *** | Available on Web site for download | | Remote desktop is a standard feature on EXA |
| Harmonic mixer series (26.5, 40, 50, 60, 75, 110 GHz) | 11970 | For use in E4407B Option AYZ | | |
| Preselected millimeter mixer series (40, 50, 60, 75 GHz) | 11974 | For use in E4407B Option AYZ | | |
| Low noise amplifier to 1 GHz | 11909A | | | |
| Firmware upgrade | UE2 | Firmware updates also available on Web site for free download http://www.agilent.com/find/esa_firmware/ | | See http://www.agilent.com/find/esa |
| Add extra manual set | OB1 | Available for Web download | | Available for Web download |
| Commercial calibration certificate with test data | UK6 | | | N9010A-UK6 |
| Delete manual set (retains CD-ROM version) | OBO | | | |
| Service documentation, component level CLIP | OBV | Component level information package | | |
| Service documentation, assembly level | OBW | Performance verification and adjustment software included | | N9010-90002 |

For more information visit www.agilent.com/find/accessories

Step 7. Choose warranty length

| Description | ESA-E spectrum analyzer | EXA signal analyzer |
|---|--|------------------------|
| 1-year return-to-Agilent warranty and service | Standard (R-51B-001-C) | Standard (R-51B-001-C) |
| 3-year return-to-Agilent warranty and service | R-51B-001-3C Default configuration option | Recommended upgrade |

ESA-E Upgrade Options

Add additional options or upgrade your existing ESA-E spectrum analyzer

Available models:

E4401BU (9 kHz to 1.5 GHz)
 E4402BU (30 Hz to 3.0 GHz)
 E4404BU (30 Hz to 6.7 GHz)
 E4405BU (30 Hz to 13.2 GHz)
 E4407BU (30 Hz to 26.5 GHz)

Ordering instructions

To upgrade an existing ESA-E Series spectrum analyzer, order the corresponding model number followed by a 'U' and the desired option number. (E440xBU-xxx)

For more information see:
http://www.agilent.com/find/esa-e_upgrades/

| | | | | |
|---------------------|----------------------------|---|--------------------------|-------------------|
| Customer upgradable | Customer upgradable w/test | Self-maintainers with Option 0BW & N7811A software ⁴ | Return to service center | Return to factory |
|---------------------|----------------------------|---|--------------------------|-------------------|

Hardware capabilities and performance

| | | | | | | |
|--|-------------|--|---|---|---|---|
| Replace GPIB connection (A4H) with serial port | 1AX | Not compatible with Option A4H; occupies one expansion slot | | X | | X |
| GPIB connection | A4H | Not compatible with Option 1AX; occupies one expansion slot | | X | | X |
| Wide offset phase noise improvement and ACPR dynamic range extension | 120 | Occupies one expansion slot | | X | | X |
| Time-gated spectrum analysis | 1D6 | | | X | | X |
| 50 ohm tracking generator (9 kHz to 3.0 GHz) | 1DN | Operates to 1.5 GHz on E4401B | | X | | X |
| Narrow resolution BW | 1DR | | | X | | X |
| TV trigger and picture on screen | B7B | Requires BAA; not compatible with Option 060 | | X | | X |
| Cable fault location accessory kit (50 ohm) | B7K | Requires Option 1DN and Option 225 or BAH | X | | | |
| FM demodulation/deviation | BAA | Not compatible with Options 304, or 106; occupies one expansion slot | | X | | X |
| Fast time domain sweep; IF, sweep, and video output ports | AYX | Not compatible with Options B7D, 304; occupies one expansion slot. Includes capability of Option A4J | | X | | X |
| Low emissions shielding | 060 | Not compatible with B7B | | X | | X |
| Preamplifier built-in for enhanced sensitivity | 1DS | Operates to 3 GHz | | | X | X |
| 100 Hz (30 Hz usable) frequency range extension | UKB | Requires Option 1DR | | | X | X |
| Digital demodulation hardware | B7D/ B7E | Requires Option 1D5; not compatible with Option AYX; occupies two expansion slots, must be ordered jointly | | | X | X |
| APC 3.5 mm input connector | BAB | Available on the E4407B only | | | X | X |
| Bluetooth FSK demodulator | 106 | Requires Options B7D, 228; occupies one expansion slot | | X | | X |
| External mixing | AYZ | Available on E4407B only | | | X | X |
| EMI detectors quasi-peak and FM demodulation | AYQ | Occupies one expansion slot; requires Option 1DR | | X | | X |
| 70 MHz IF out | H70 | Occupies one expansion slot | | X | | X |
| Memory extension to 10 MB X | B72 | Included on all new instruments starting with SN US4144 or MY4144; required for firmware version A.08.00 or higher | X | | | X |
| High stability frequency reference | 1D5 | E4401B X X | | | X | X |
| | | E4402B/04B/05B/07B (SN prefix before 4421) ² | | | | X |
| | | SN prefixes US4421, MY4421, SG4421 or later ³ | | | X | X |
| IF sweep, video output ports | A4J | Not compatible with AYX; occupies one expansion slot | | X | | X |

Applications and firmware

| | | | | | | |
|--|------------------|--|---|---|--|---|
| Noise figure measurement personality and hardware | 219 ¹ | See Option 219 Technical Overview for recommended options | | X | | X |
| Cable fault location measurement personality | 225 ¹ | Requires Option 1DN; recommended accessory Option B7K; firmware available on Web, requires license key | X | | | |
| Phase noise measurement personality | 226 ¹ | Firmware available on Web, requires license key | X | | | |
| Cable TV service and installation personality | 227 ¹ | Firmware available on Web, requires license key | X | | | |
| Bluetooth measurement personality | 228 ¹ | Requires Option 106, AYX requires Option 106 for full functionality | X | | | |
| Modulation analysis personality | 229 ¹ | Requires Options B7D/B7E, 1D5; includes capability of Option 231; firmware available on Web, requires license key | X | | | |
| ESA to 89601A vector signal analysis software link utility | 231 ¹ | Requires Options B7D/B7E, A4H, 1D5; Option 229 included capability of Option 231; free download from Web; www.agilent.com/find/esa | X | | | |
| EDGE upgrade on GSM | 252 ¹ | Requires Options BAH, B7D/B7E, A4H, 1D5; requires Option 1DN for cable fault test | X | | | |
| HP 8566/68 programming code compatibility | 266 ¹ | Free download from Web; www.agilent.com/find/esa | X | | | |
| 8590 Series programming code compatibility | 290 ¹ | Free download from Web; www.agilent.com/find/esa | X | | | |
| GSM/GPRS measurement personality | BAH ¹ | Requires Options 1D6 firmware available on Web, requires license key | X | | | |
| cdmaOne measurement personality | BAC ¹ | Firmware available on Web, requires license key | | | | |
| FM deviation personality enhancement | J36 ¹ | Requires Option BAA | X | | | |

1. If more than two or three measurement personalities are ordered, memory size limitations may limit the number that may be loaded into the ESA at any one time. For detailed information about memory size limits, please see the Web site: <http://sa.tm.agilent.com/ESA/memory/>
2. For serial number prefixes less than US4421, MY4421, or SG4421, order E440xBK-1D5
3. For serial number prefixes US4421, MY4421, or SG4421 and later, order E440xBL-1D5
4. Self-maintainers are customers who service and calibrate their own instruments. Information about the N7811A software can be found at: <http://calsw.tm.agilent.com/>

Related Literature

- Agilent ESA-E Series Spectrum Analyzer, Configuration Guide*, literature number 5989-9953EN
- Modulation Analysis Measurement Personality, Product Overview*, literature number 5988-2116EN
- Bluetooth RF Measurement Solution, Product Overview*, literature number 5980-2786EN
- Cable Fault Location Measurement Personality, Product Overview*, literature number 5980-1915E
- Cable TV Service and Installation Analyzer, Product Overview*, literature number 5980-0845E
- cdmaOne Measurement Solutions for ESA-E Series Spectrum Analyzers, Product Overview*, literature number 5968-6869E
- 8560-EC Series, Brochure*, literature number 5968-9571E
- 8560-EL Series, Technical Specifications*, literature number 5966-1496E
- 8560-EC Series, Technical Specifications*, literature number 5968-8156E
- ESA BenchLink Spectrum Analyzer Software, Product Overview*, literature number 5966-0676E
- BenchLink Web Remote Control Software, Product Overview*, literature number 5988-2610EN
- ESA Snap-On Battery Pack, Flyer*, literature number 5966-1851E
- ESA-E Series Spectrum Analyzer, Brochure*, literature number 5968-3278E
- ESA-E Series Self-Guided Demo, Product Note*, literature number 5968-3658E
- ESA-E Series TV Transmission Quality Measurements, Product Overview*, literature number 5968-6874E
- ESA-E Series Measuring Signals Above 26.5 GHz, Product Overview*, literature number 5968-6873E
- Select the Right Spectrum Analyzer for Your Needs, Selection Guide*, literature number 5968-3413E
- GSM Measurement Solutions for ESA-E Series Spectrum Analyzers, Product Overview*, literature number 5968-6871E
- Performance Verification and Adjustment Software*, (See Option OBW)
- Phase Noise Measurement Personality Product, Product Overview*, literature number 5988-4348E



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