

Technical Support
Knowledge Center Open

How do I upgrade my ESA-E Series Spectrum Analyzer?

Notices

© Keysight Technologies Incorporated, 2002-2020

1400 Fountaingrove Pkwy., Santa Rosa, CA 95403-1738, United States All rights reserved.

No part of this documentation may be reproduced in any form or by any means (including electronic storage and retrieval or translation into a foreign language) without prior agreement and written consent from Keysight Technologies, Inc. as governed by United States and international copyright laws.

Restricted Rights Legend

If software is for use in the performance of a U.S. Government prime contract or subcontract, Software is delivered and licensed as "Commercial computer software" as defined in DFAR 252.227-7014 (June 1995), or as a "commercial item" as defined in FAR 2.101(a) or as "Restricted computer software" as defined in FAR 52.227-19 (June 1987) or any equivalent agency regulation or contract clause.

Use, duplication or disclosure of Software is subject to Keysight Technologies' standard commercial license terms, and non-DOD Departments and Agencies of the U.S. Government will receive no greater than Restricted Rights as defined in FAR 52.227-19(c)(1-2) (June 1987). U.S. Government users will receive no greater than Limited Rights as defined in FAR 52.227-14 (June 1987) or DFAR 252.227-7015 (b)(2) (November 1995), as applicable in any technical data.

Portions of this software are licensed by third parties including open source terms and conditions.

For detail information on third party licenses, see [Notice](#).

Contents

Please Note: The information provided on this page is for reference only. The upgrades for these products are no longer available. 4

Firmware & Measurement Personalities:..... 15

Available Accessories: 21



Please Note: The information provided on this page is for reference only. The upgrades for these products are no longer available.

Most of the **ESA-E** Series options are available for post-sale retrofit. The upgrades are normally either a **hardware option** or **measurement personality**. Many of the measurement personalities are application specific and require additional hardware options.

Hardware upgrade kits contain installation instructions and the desired assembly. **Adjustments** or **performance verifications** may be required to ensure the instrument meets the published specifications.

- Some performance verification tests can be performed manually as explained in the [calibration guide](#). The [ESA Series Calibration Application Software](#) contains details about each test and the equipment needed to check ESA-E series options. The N7800A Calibration & Adjustment Software can be used to run performance verification tests and make adjustments. All adjustments must be performed using the N7800A Calibration & Adjustment Software.
- More involved upgrades require the instrument be shipped to a Keysight Service Center to have the upgrade installed. Make sure to obtain a quote for the installation before sending the instrument and upgrade kit to a Keysight Service Center to get installed. A full calibration is the only way to guarantee specifications are being met.

The table below provides an **Installation Note** for each upgrade. The installation note includes a list of the performance verification tests and adjustments required as well as the test equipment and test software necessary to complete the upgrade. Customers with a large inventory of instruments may have the equipment available to complete the process, but in most cases the instrument will need to be sent to and Keysight Service Center. Performing the tests listed in the installation note guarantees the newly installed option is functioning, but a full instrument calibration is the only way to guarantee specifications are being met.

Hardware upgrades may require that a **minimum firmware** is already installed. Up-to-date firmware can be downloaded for free from the [ESA-E Firmware Upgrade Center](#).

Some hardware upgrades may also require the redemption and installation of a **license key** before they will be activated. Once a redemption certificate is received, the license key(s) can be redeemed at the [Software License Redemption Web Site](#).

The upgrades listed below do not work on all Spectrum Analyzers. Find the **serial prefix** on the Spectrum Analyzers to determine if it is compatible. The serial prefix is the first six alpha-numeric characters of the serial number.

Below are the upgrade tables for:

1. ESA-E Series Internal Hardware Upgrades (Option 000 - 999)
2. ESA-E Series Internal Hardware Upgrades (Option A00 - ZZZ)
3. ESA Series Available External Hardware Option Upgrades
4. ESA Series Available Firmware & Measurement Personality Upgrades

ESA-E Series Internal Hardware Upgrades (Option 000 - 999)												
Option	Models	Description	Order As	Deliver y	Installation Note	Upgrade Contents	Minimum Firmware	Adjustments Required	Additional Requirements	Incompatible With	Installed By -Installation Time	Option Slots Needed ¹
060	E4402B E4404B E4405B E4407B	Low emissions	E440x BU-060	No	Available	Hardware, License key	A.06.00	No	None	B7B, 1DP	Advanced User - 3.0 Hrs	0
106	E4402B E4404B E4405B E4407B	Bluetooth™ demodulation	E440x BU-106	No	Available	Hardware	A.09.00	No	228, B72	BAA	Advanced User - 1.0 Hrs	1 Analog

How do I upgrade my ESA-E Series Spectrum Analyzer?

120	E4402B E4404B E4405B E4407B	Dynamic range extension	E440x BU-120 or E4402-60064	No	Available	Hardware	None	No	None	None	Service Center Recommended - 1.5 Hrs	1 Analog
1AX	E4402B E4404B E4405B E4407B	RS-232 / parallel interface	E440x BU-1AX or E4401-60370	No	Available	Hardware	None	No	None	A4H	Advanced User - 1.0 Hrs	1 Digital
1D5	E4402B E4404B E4405B E4407B	High stability frequency reference	E440x BU then select E440x BK-1D5	No	Available	Hardware	None	Yes	Serial Prefix < US/MY/SG4421	None	Service Center Only - 5.0 Hrs	0

How do I upgrade my ESA-E Series Spectrum Analyzer?

	E4 40 2B E4 40 4B E4 40 5B E4 40 7B	High stability frequency reference	E440x BU then select E440x BL-1D5	Yes	Available	License key	A.14.00	Yes	Serial Prefix ≥ US/MY/SG4421	None	Service Center Recommended - 1.0 Hrs	0
1 D 6	E4 40 2B E4 40 4B E4 40 5B E4 40 7B	Time gating	E440x BU-1D6	Yes	Available	License key	A.04.00	No	None	None	Advanced User - 1.0 Hrs	0
1 D N	E4 40 2B E4 40 4B E4 40 5B E4 40 7B	3.0 GHz tracking generator	E440x BU-1DN or E4403-60046	No	Available	Hardware	None	No	None	H26	Service Center Only - 3.0 Hrs	0

How do I upgrade my ESA-E Series Spectrum Analyzer?

1 D R	E4 40 2B E4 40 4B E4 40 5B E4 40 7B	Narrow resolut ion bandwi dths	E440x BU-1 DR	Yes	Avai labl e	Licen se key	A.04.0 0 A.08.0 2 for 3 Hz and 1 Hz NRB W's	No	1D5 (If 3 Hz and 1 Hz ban dwidths are needed) .	None	Advance d User - 1.5 Hrs	0	
	1 D S	E4 40 2B E4 40 4B E4 40 5B E4 40 7B	Interna l 3.0 GHz RF pream p	E440x BU-1 DS	Yes	Avai labl e	Licen se key	A.04.0 0	Yes	None	None	Service Center Recomm ended - 1.5 Hrs	0
	21 9	E4 40 2B E4 40 4B E4 40 5B E4 40 7B	Noise figure	E440x BU-21 9	No	Avai labl e	Hard ware, Softw are, Licen se key	A.12.0 0	No	1DS ² , B72	1DP	Advance d User - 1.0 Hrs	1 1 Analo g + Digi tal

ESA-E Series Internal Hardware Upgrades (Option A00 - ZZZ)

O p t i o n	M o d e l s	D e s c r i p t i o n	O r d e r A s	e D e l i v e r y	I n s t a l l a t i o n N o t e	U p g r a d e C o n t e n t s	M i n i m u m F i r m w a r e	A d j u s t m e n t s R e q u i r e d	A d d i t i o n a l R e q u i r e m e n t s	I n c o m p a t i b l e W i t h	I n s t a l l e d B y - I n s t a l l a t i o n T i m e	O p t i o n S l o t s N e e d e d ¹
----------------------------	----------------------------	---	---------------------------------	---	--	---	---	---	--	--	--	--

How do I upgrade my ESA-E Series Spectrum Analyzer?

A 4 H	E4 40 2B E4 40 4B E4 40 5B E4 40 7B	GPIB / parallel interface	E440x BU- A4H or E4401- 6038 2	No	Avai labl e	Hard ware	None	No	None	1AX	Advanc ed User - 1.0 Hrs	1 Digi tal
A 4J	E4 40 2B E4 40 4B E4 40 5B E4 40 7B	IF and sweep ports	E440x BU- A4J or E4401- 6017 9	No	Avai labl e	Hard ware	None	No	None	AYX	Advanc ed User - 1.0 Hrs	1 Analo g
AY Q ¹	E4 40 2B E4 40 4B E4 40 5B E4 40 7B	EMI detectors and FM Demodula tion	E440x BU- AYQ	No	Avai labl e	Hard ware	A.14. 00	No	1DR, B72	BAA	Advanc ed User - 1.0 Hrs	1 1 Analo g + Digi tal

How do I upgrade my ESA-E Series Spectrum Analyzer?

AYX	E4402B E4404B E4405B E4407B	Fast zero Span sweep times	E440x BU-AYX or E4401-60152	No	Available	Hardware	None	No	None	A4J, B7D ³	Advanced User - 2.0 Hrs	11 Analog + Digital
AYZ	E4407B	External mixing	E4407 BU-AYZ	No	Available	Hardware, License key	A.04.00	Yes	Input ⁴	None	Service Center Only - 5.0 Hrs	0
B72	E4402B E4404B E4405B E4407B	Expanded memory Included in Serial Prefix ≥ US/ MY/ SG4144	E440x BU-B72 or E4401-60384	No	Available	Hardware, Software	None	No	None	None	Advanced User - 1.5 Hrs	0
B7B	E4402B E4404B E4405B E4407B	TV trigger / picture	E440x BU-B7B	No	Available	Hardware, License key	A.04.00	No	BAA	060	Advanced User - 2.0 Hrs	0

How do I upgrade my ESA-E Series Spectrum Analyzer?

B 7 D & B 7E	E4 40 2B E4 40 4B E4 40 5B E4 40 7B	Comms hardware - DSP + RF Downconv erter	E440x BU- B7D and E440x BU- B7E or E4402 -6006 7 B7D & B7E must be ordere d togeth er	No	Avai labl e	Hard ware	A.04. 00	Yes	1D5, B72	AYX ³	Service Center Only - 3.0 Hrs	2 1 Analo g, 1 Analo g + Digi tal
B A A	E4 40 2B E4 40 4B E4 40 5B E4 40 7B	FM demodula tion	E440x BU- BAA or E4401 -6033 7	No	Avai labl e	Hard ware	None	No	None	BAA	Advanc ed User - 1.0 Hrs	1 Analo g
B A B	E4 40 7B	3.5 mm APC RF input	E4407 BU- BAB	No	Avai labl e	Hard ware, Licen se key	A.04. 00	Yes	None	H26	Service Center Recom mended - 2.0 Hrs	0

How do I upgrade my ESA-E Series Spectrum Analyzer?

H 70	E4 40 2B E4 40 4B E4 40 5B E4 40 7B	70 MHz IF output	E440x BU- H70	No	Avai labl e	Hard ware	None	Yes	ESA Service Guide (OBW) or ESA CBT (E4401- 90262)	None	Advanc ed User - 4.0 Hrs	1 Analo g
H S B	E4 40 2B E4 40 7B	LO out on rear panel for use with sideband adaptor, tek 1405 or aerodynex	OB SO LETE replac ed wit h H3B	No	Avai labl e	Hard ware	None	No	1DN	None	Advanc ed User - 2.0 Hrs	1 Analo g
H 3 B	E4 40 2B	Provide 1 st LO output on rear panel	E4402 BU- H3B	No	Avai labl e	Hard ware	None	No	None	1DN	Advanc ed User - 2.0 Hrs	1 Cover ed by Outp ut
U K B	E4 40 2B	Low frequency extension	E4402 BU- UKB	No	Avai labl e	Hard ware, Licen se key	A.05. 00	Yes	1DR, Input ⁵	None	Service Center Only - 3.0 Hrs	0
	E4 40 4B E4 40 5B	Low frequency extension	E440x BU- UKB	No	Avai labl e	Hard ware, Licen se key	A.05. 00	Yes	1DR, Input ⁵	None	Service Center Only - 3.0 Hrs	0
	E4 40 7B	Low frequency extension	E4407 BU- UKB	No	Avai labl e	Hard ware, Licen se key	A.06. 00	Yes	1DR, Input ⁵	None	Service Center Only - 3.0 Hrs	0

¹Before upgrading with option AYQ view this [comparison table](#) to see exactly what you get on an ESA-E Series with option AYQ.

ESA-E Series Available External Hardware Option Upgrades											
Option	Models	Description	Order As	Delivery	Installation Note	Upgrade Contents	Minimum Firmware	Adjustments Required	Additional Requirements	Incompatible With	Installed By - Installation Time
1C P	E4402B E4404B E4405B E4407B	Rackmount kit	E440xB-1CP or E4401-60385	No	Available	Hardware	None	No	None	AYT, AYU, AXT, UK9	Advanced User - 0.5 Hrs
1D 7	E4402B E4404B E4405B E4407B	50 to 75Ω minimum loss pad	E440xB-1D7 or 0955-1020	No	None	Hardware	None	No	None	1DP, BAB	User - 0.0 Hrs

How do I upgrade my ESA-E Series Spectrum Analyzer?

A5 D	E4 40 2B E4 40 4B E4 40 5B E4 40 7B	12V DC cable	E440x B-A5D or E4401- 60066	No	Avail able	Hard ware	None	No	None	None	User - 0.5 Hrs
AX T	E4 40 2B E4 40 4B E4 40 5B E4 40 7B	Transit case	E440x B-AXT or E4401- 60386	No	Avail able	Hard ware	None	No	None	1CP	User - 0.0 Hrs
AY T	E4 40 2B E4 40 4B E4 40 5B E4 40 7B	Gray soft case	E440x B-AYT or E4401- 60117	No	Avail able	Hard ware	None	No	None	1CP, AYU	User - 0.5 Hrs

AYU	E4402B	Yellow soft case	E440xB-AYU or E4401-60118	No	Available	Hardware	None	No	None	1CP, AYT	User - 0.5 Hrs
	E4404B										
	E4405B										
	E4407B										
	E4404B										
	E4407B										
	E4407B										
UK9	E4402B	Front panel protective cover	E440xB-UK9 or E4401-60193	No	None	Hardware	None	No	None	1CP	User - 0.0 Hrs
	E4404B										
	E4405B										
	E4407B										
	E4404B										
	E4407B										
	E4407B										

Firmware & Measurement Personalities:

- All Measurement Personality Options have a specific instrument firmware requirement. To view these requirements see: [ESA Software & Firmware Revisions](#)
- All Measurement Personality upgrades require the redemption and installation of a license key to be activated. Once a redemption certificate is received they can be redeemed at the [Keysight Software License Redemption](#) Web Site.
- All Measurement Personality upgrades only require that a license key and software be installed before the personality will function, however, there may also be additional hardware requirements. Since the measurement personality upgrades only require a software installation, these installations are meant to be done by the customer, and no adjustments or performance verification are required.

ESA Series Available Firmware & Measurement Personality Upgrades											
Option	Models	Description	Order As	Delivery	Installation Note	Upgrade Contents	Minimum Firmware	Additional Requirements	Recommended Options	Incompatible With	Installed By - Installation Time

How do I upgrade my ESA-E Series Spectrum Analyzer?

22 5	E4 40 2B E4 40 4B E4 40 5B E4 40 7B	Cable fault location Included in BAH	E44 0xB U-2 25	Yes	None	Softw are, Licen se key	≥ A.07. 01	1DN, B72	1DN, B72, B7K	None	User - 1.0 Hrs
22 6	E4 40 2B E4 40 4B E4 40 5B E4 40 7B	Phase noise	E44 0xB U-2 26	Yes	None	Softw are, Licen se key	≥ A.08. 02	B72	B72, 1D5, 1DR	None	User - 1.0 Hrs
22 7	E4 40 2B E4 40 4B E4 40 5B E4 40 7B	Cable TV	E44 0xB U-2 27	Yes	None	Softw are, Licen se key	≥ A.07. 06	B72	B72, AYX, B7B, BAA	None	User - 1.0 Hrs

<p>228</p>	<p>E4402B E4404B E4405B E4407B</p>	<p>Bluetooth™ measurement personality</p>	<p>E440xB U-228</p>	<p>Yes</p>	<p>None</p>	<p>Software, License key</p>	<p>≥ A.09.00</p>	<p>106, AYX, B72</p>	<p>106, B72, B7D, B7E, 1D5</p>	<p>None</p>	<p>User - 1.0 Hrs</p>
<p>229</p>	<p>E4402B E4404B E4405B E4407B</p>	<p>Modulation Analysis</p>	<p>E440xB U-229</p>	<p>Yes</p>	<p>None</p>	<p>Software, License key</p>	<p>≥ A.08.04</p>	<p>B72, B7D, B7E, 1D5</p>	<p>B72, B7D, B7E, 1D5</p>	<p>None</p>	<p>User - 1.0 Hrs</p>
<p>231</p>	<p>E4402B E4404B E4405B E4407B</p>	<p>ESA to 89601A software link utility Included in 229</p>	<p>E440xB U-231</p>	<p>Yes</p>	<p>None</p>	<p>Software</p>	<p>≥ A.08.04</p>	<p>B7D, B7E, 1D5, A4H, B72</p>	<p>None</p>	<p>None</p>	<p>User - 1.0 Hrs</p>

How do I upgrade my ESA-E Series Spectrum Analyzer?

25 2	E4 40 2B E4 40 4B E4 40 5B E4 40 7B	EDGE upgrade to GSM/ GPRS	E44 0xB U-2 52	Yes	None	Softw are, Licen se key	≥ A.14. 01	BAH, B7D, B7E, 1D5, 1D6, 1D6, B72	BAH, B7D, B7E, 1D5, 1D6, 1DS, B72, 1DR	None	User - 1.5 Hrs
26 6	E4 40 2B E4 40 4B E4 40 5B E4 40 7B	8566/68 B program ming compatib ility	E44 0xB U-2 66	Yes	None	Softw are	≥ A.14. 00	A4H, B72	A4H	290	User - 1.0 Hrs
29 0	E4 40 2B E4 40 4B E4 40 5B E4 40 7B	8590 series program ming compatib ility	E44 0xB U-2 90	Yes	None	Softw are	≥ A.07. 00	A4H	A4H	266	User - 1.0 Hrs

<p>BA C</p>	<p>E4 40 2B E4 40 4B E4 40 5B E4 40 7B</p>	<p>cdmaOne</p>	<p>E44 0xB ⌋ BAG</p>	<p>Yes</p>	<p>None</p>	<p>Software, License key</p>	<p>≥ A.07. 02</p>	<p>B72</p>	<p>B72, B7D, B7E, 1D5</p>	<p>None</p>	<p>User - 1.5 Hrs</p>
<p>BA H</p>	<p>E4 40 2B E4 40 4B E4 40 5B E4 40 7B</p>	<p>GSM/ GPRS</p>	<p>E44 0xB ⌋ BAH</p>	<p>Yes</p>	<p>None</p>	<p>Software, License key</p>	<p>≥ A.14. 01</p>	<p>1D6, B72</p>	<p>1D6, B72, B7D, B7E, 1D5</p>	<p>None</p>	<p>User - 1.5 Hrs</p>
<p>J3 5</p>	<p>E4 40 2B E4 40 4B E4 40 5B E4 40 7B</p>	<p>ESA FM deviation measurements</p>	<p>E44 0xB ⌋ J35</p>	<p>Yes</p>	<p>None</p>	<p>Software, License key</p>	<p>≥ A.07. 05</p>	<p>BAA</p>	<p>BAA</p>	<p>None</p>	<p>User - 1.0 Hrs</p>

How do I upgrade my ESA-E Series Spectrum Analyzer?

J36	E4402B E4404B E4405B E4407B	ESA flexible FM deviation measurements	E440xB U- J36	Yes	None	Software, License key	≥ A.09.00	BAA, B72	BAA	None	User - 1.0 Hrs
UE2	E4402B E4404B E4405B E4407B	Firmware upgrade (A.14.06)	E440xB U- UE2 or E4401-6 0403	Yes	Available	Software	None	B72	B72	Instruments with serial prefix < US/MY/SG4144 and without option B72	User - 1.0 Hrs

- Option Slots 1, 2, 3, & 4 have both analog and digital bus connection, while slots 5 & 6 have only analog. To see what slots are available for a given instrument press [System]{More}{Show System}
- These are recommended options, but not required to install the software option. However, performance may be limited without the recommended option.
- If both options B7D and AYX are present in the unit at the same time, the firmware will give priority to option B7D due to it's higher ADC speed. Upgrade with options B7D and AYX in the unit together only if you want the capability of the sweep ports that option AYX gives.
- AYZ requires "50Ω 3GHz Input" part number E4403-60033 or later. See [System]{More}{Show Hdwr}
- UKB requires "50Ω 3GHz Input" part number E4403-60036 or later. See [System]{More}{Show Hdwr}
- To determine upgrade by Customer or Service Center go to [RF compatibility verification for B7D/B7E upgrade](#)

Connectivity Options:

- [Upgrading your ESA with option 230, Web Remote Control Software](#)
- [E4444A BenchLink Spectrum Analyzer Connectivity Software](#)
- [ESA-E Link to 89601A VSA Software](#)

Available Accessories:

- [RF & Microwave Test Accessories](#)
- [Probe Accessories for Spectrum Analyzers](#)
- [Filters and Limiters](#)
- [EMC Precompliance Test Accessories](#)

