E4445A-15

S E R V I C E   N O T E

Supersedes:
NONE

PSA Series Spectrum Analyzers with Options 233 and 110, and Option Driver Assembly p/n E4440-60253

**Serial Numbers: US00000000/US45303154
MY00000000/MY46181862**

Tuned RF Level Range 2 to Range 3 Switching Time Improvement

Parts Required:

P/N	Description	Qty.
NA	Windows PC (see part 2).	1
HW-PC4	Xilinx, Parallel cable IV	1
N/A	Programs/code downloads	3
N/A	PSA Firmware =/> A.11.00	1

ADMINISTRATIVE INFORMATION

SERVICE NOTE CLASSIFICATION:	
MODIFICATION AVAILABLE	
ACTION CATEGORY:: AGREEABLE TIME	X PERFORMANCE ENHANCEMENT [[]] SERVICE / RELIABILITY ENHANCEMENT
LOCATION [[]] CUSTOMER INSTALLABLE CATEGORY: [[]] ON-SITE X SERVICE CENTER	AVAILABILITY: Until June 2010
AUTHOR: BS	PRODUCT LINE: 12
ADDITIONAL INFORMATION:	

∴ Agilent Technologies

Situation:
This situation occurs only on PSA series analyzers that contain Option 233 Measuring Receiver personality, Option 110 Preamp, and Option Driver assembly part number E4440-60253.
When performing Tuned RF Level (TRFL) measurements that transition from Range 2 to Range 3, instrument users can select the Range 3 Switch Delay setting that allows extra time for the preamp used in Range 3 to settle when the measurement switches ranges. The Range 3 Switch Delay time is several minutes. For some applications where thousandths of a dB drift is a concern, the switch delay eliminates drift.
 The default setting for the TRFL measurement is Range 3 Switch Delay Off, therefore only users who select the switch delay will be affected by the longer measurement time.

Solution/Action:
The latest Option Driver assembly (E4440-60459) contains a reprogrammed IC that eliminates preamp drift, and the need for any switch delays, when switching into Range 3. This IC is field programmable on the earlier Option Driver assemblies with the use of a Xilinx Parallel Cable IV (chip programmer), and a PC with the Agilent IO Libraries, two programs available on the Agilent web site, and the Xilinx software from the Xilinx web site. One of the programs updates the Option Driver part number information and this allows updated assemblies to be easily identified at a later date.
The PSA must have covers removed and the Option Driver assembly partially removed in order to connect the Xilinx chip programmer.
Allow about 30 minutes for the complete process of removing covers and reprogramming the CPLD chip. Downloading the PC programs (required one time only) takes about 1.5 hours.
Although reprogramming the IC will not affect the PSA calibration, removing the instrument covers may void the calibration sticker, and there is a chance that partially removing and reinstalling the Option Driver assembly may result in a loose connection or other damage. Therefore, it is highly recommended that a complete instrument calibration (specs verification) be performed.

Procedure:

Part 1- Checking the Option Driver part number

    On the PSA, press System, More, Show Hardware. Under Assembly Name, look at the part number of the Option Driver. If the part number is E444060253, proceeded with this service note. If the part number is E444060459 or greater, this service note does not apply and your instrument already has been upgraded.

Part 2- Loading the programs onto your PC

1. Assure the computer is running Windows XP and has the correct ports available. The Xilinx programmer connects to a PC through the parallel port and receives power from the PS2 keyboard or mouse connector. Some lap tops do not have these connectors available, or only have these connectors available on the laptop docking station. A LAN or GPIB connection is required also. The PC must have 1.5 GB free space on the hard drive.

2. Go to **http://mktwww.soco.agilent.com/field/service/signal/psa/** and look for "**Download software to reprogram Option Driver board CPLD".** Follow the link to download the CPLD code and option driver header code.

3. The Option Driver Header.exe program you down loaded is a Visual basic program. This program requires Agilent I/O libraries to run. If your computer does not have Agilent libraries, you can down load a free copy from: **www.agilent.com/find/iolib**
Click IO Libraries Suite Product Download page. Under Downloads, chose Download the IO Libraries Suite Software

Part 3 - Install the Xilinx software. This software is free

1. Go to **www.xilinx.com** and click on the Downloads tab.
2. For the "select a download type", select Programming tool
3. For the "select an ISE Version", select 10.1
4. For the "select an OS" select Windows and click Search
5. Select Webinstall
6. Enter your User ID and Password. You probably need to click Create Account and follow the directions.
7. When the webPACK download screen appears, click next. The product ID shown does not need to be changed.
8. Fill in the fields as appropriate.
9. Save webinstall.zip to your PC. Press OK
10. Open up zip file and extract files. Select "use folder names".
11. Double click Setup .exe and follow installation instructions
12. At the Enter Registration screen, click on Product Registration and Download button to obtain registration ID. Copy the registration ID and paste into the box. Assure the ISE webPACK 10.1 Free Download box is checked.
13. At the Select Products to Install screen, select Stand Alone Programming Tools, and uncheck ISE Design Tools. Press Next
14. Accept the terms of software on the two screens.
15. At the Select Destination Directory, use the default settings. Press next
16. At the Webinstall Options Page, use the default Internet Explorer proxy setting.
17. At Select Installation Options screen, use Default Programming Tools Common files. Press Next
18. At the second Select Installation Options screen, leave everything selected. Press Next
19. At the third Select Installation Options screen, assure Launch Xilinx update, and install cable Drivers is checked.
20. At the Begin Installation screen, click Install. Installation will take about 10 minutes with a fast internet connection.
21. At the Xilinx update screen, click advanced to check settings. Do not Check for Upgrade. Click Cancel.
22. At the Xilinx Software Setup screen, you should see installation complete. Click OK

Part 4 – Connect the Xilinx Parallel Cable IV to the PC

1. Refer to the parallel cable manual for connections. The parallel cable IV connects to the PC parallel port, and power is provided from the PC mouse or keyboard connector.

Part 5 – Remove instrument covers and connect Xilinx programmer to the Option Driver Assy.

1. Remove the analyzer's outer case and top brace. See the PSA Service Guide for the procedure to remove and replace these covers.

2. With the instrument powered down, locate the Option Driver assembly shown in **Figure 1.** Notice how the ribbon cables connected to the board assembly are routed near the instrument fans. This

routing prevents damage to the cables when the top brace is installed.
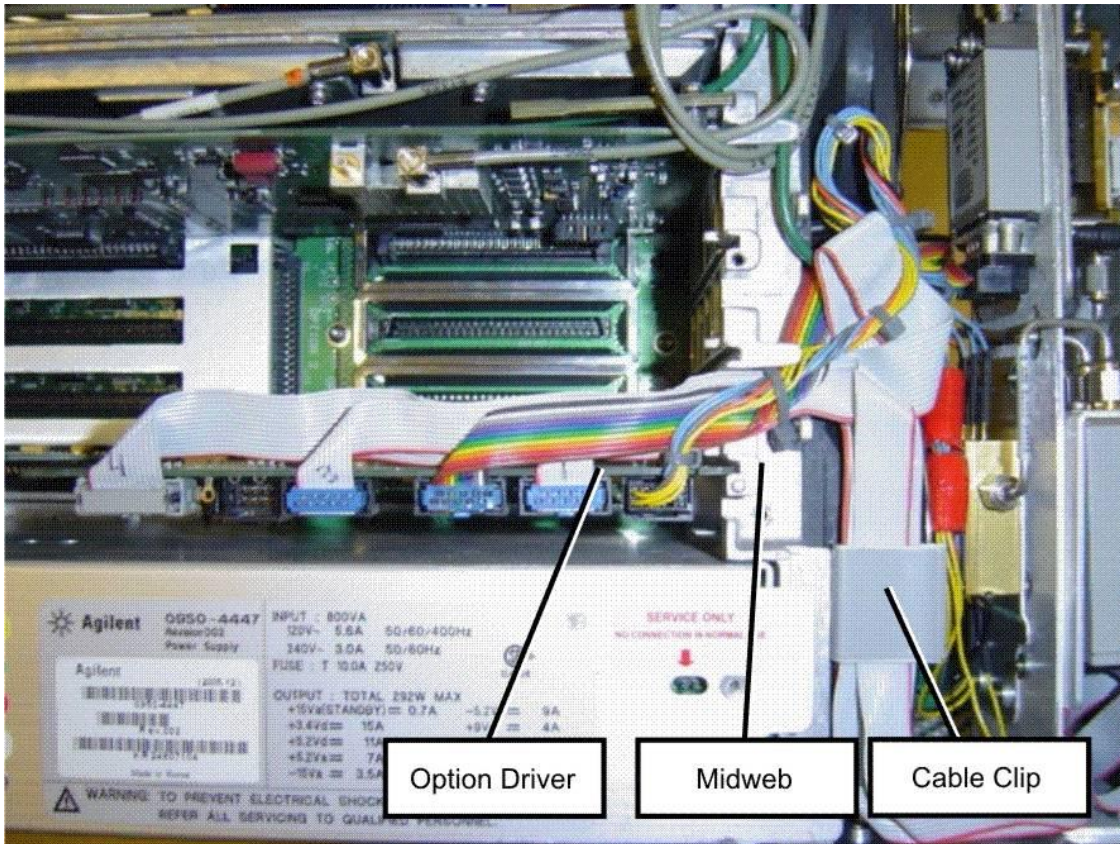
Figure 1. Option Driver assembly location. E4448A shown

3. Without removing any cables from the option driver, carefully unseat the board assembly from the motherboard. You will need to remove the ribbon cables from the cable clip and possibly remove the cable tie near the mid web. Pull the board out of the instrument only far enough to expose connector J2.

4. See Figure 2. Locate J2 near the middle of the board. Connect the ribbon cable from the Parallel Cable's pod to the JTAG connector, J2, on the A38 option Driver Assembly being careful to align the keying tab on the cable with the J2 header slot.
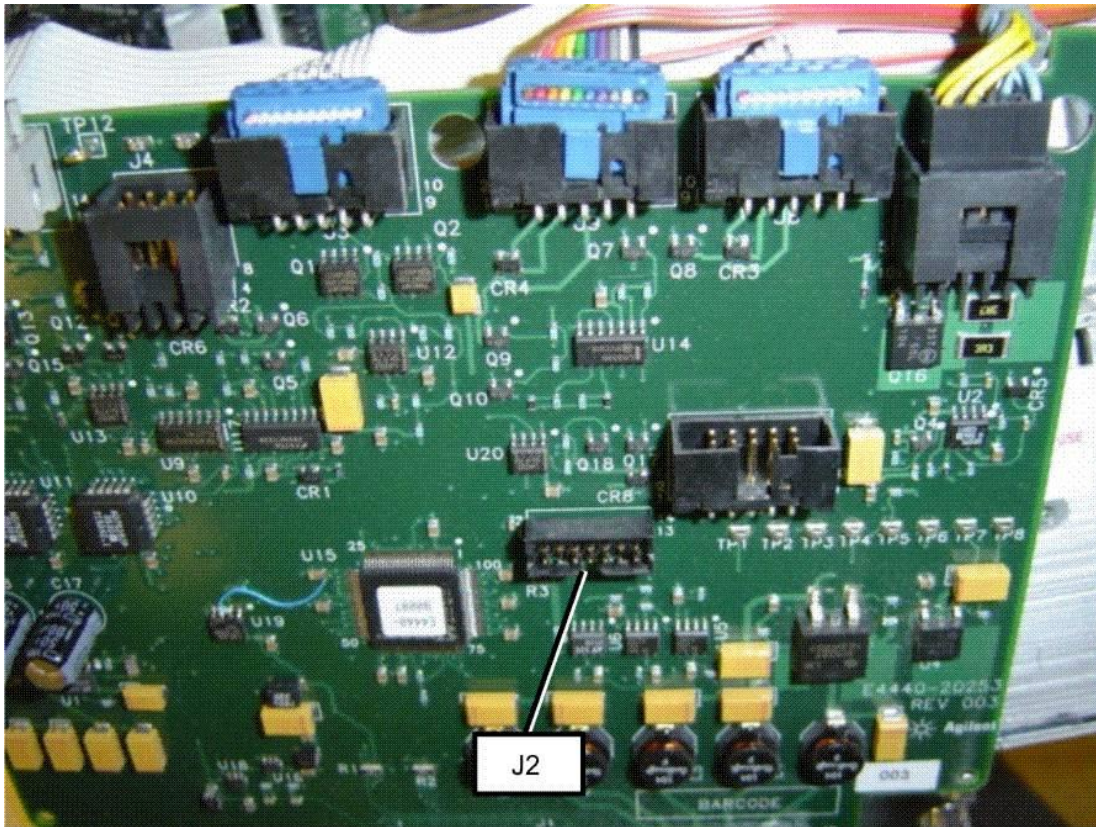
Figure 2. Location of J2 connector

5. Re-install the Option driver into the instrument being careful to avoid pinching or disconnecting the ribbon cables. Assure the board is fully seated in the motherboard.

Part 6 - Reprogram the Option Driver CPLD Chip

1. Power on the PSA. Wait until the instrument boots up and a measurement screen is shown.

2. Launch iMPACT. On the PC press Start, All Programs, locate Xilinx ISE Design Suite, hover over ISE, Accessories, chose Impact.

3. At the Impact Access Permission screen, click OK

4. Select Create New Project [ipf], click browse and name the project something like opt driver.ipf. Press Save, then OK.

5. In the welcome to impact screen, assure only configure devices using boundry scan is checked. Click Finish.

6. In the Assign new configuration file screen, retrieve the option_driver.jed file from the location where you stored it. Click Open. For example if the file is on your desk top, select C://Documents and Settings/your file name/Desktop

7. In the Device Programming Properties screen, assure Verify, and Erase Before Programming are selected. Press OK.

8. The block labeled "xc95144xl" should now be highlighted

9. In the iMPACT screen, right click on the box labeled "xc95144xl". Select Program.

10. The Programming Status dialog box should now appear showing the programming progress. When the programming is done (this takes approximately 4 seconds), the Programming Status dialog box should go away and "Programming Succeeded" will appear for a few seconds on the iMPACT screen. Save the project file so the next time you reprogram the CPLD chip, you can shorten the process slightly. Close the IMPACT program.

11. Power down the PSA and remove the Option Driver assembly from the instrument and remove the ribbon cable from J2. Assure the Option Driver is seated in the motherboard. Assure all cables on the Option Driver are inserted fully and are routed correctly to avoid pinched cables when the top brace is installed.

12. Power up the PSA and assure it boots up normally. If a purple box appears on screen that has message: "EEPROM self test failure for Boards: Option Driver"; reseat the Option Driver in the motherboard.

Part 7 – Reprogramming the board header information on the Option Driver Assembly

Note: This step must be completed since the PSA firmware uses the board header information to determine if the Range 3 Switch Delay choice is required.

1. Connect the LAN or GPIB cable from the PC to the PSA.

2. Locate the **option driver header.exe** file on your computer. Double click on the file to launch the program.

3. After you have read the information in the option driver window, chose OK.

4. Select LAN or GPIB, and provide the information necessary for the connectivity method chosen. For example provide the LAN IP address if LAN is chosen.

5. Click on the "Identify Instrument" button on the PC screen.

6. If the connection cannot be made, a window appears telling you to check your GPIB configuration. Even if you have chosen LAN, this same message appears. The solution is to recheck your addresses and settings, possibly re-enter the LAN settings on the PSA. Also assure the IO libraries are loaded on your PC.

7. Follow the on-screen instructions.

Part 8 –Load PSA Firmware Rev A.11.xx or Greater

1. Check the current Firmware revision by pressing the following buttons on the PSA: System, More, Show System.

2. If the firmware is A.11.xx or greater, cycle instrument power to allow instrument to read the updated board header.

3. If the firmware revision is less than A.11.xx, install the latest PSA firmware. Go to: http://www.agilent.com/find/psa_firmware Click on and review the PSA Firmware Procedure. The firmware update program is PSA A.11.xx.exe. Download the firmware to your PC and follow the on screen directions.

Part 9 –Verify the board header change and CPLD code update

1. On the PSA, press Mode, Measuring Receiver, Measure, Tuned RF Level.

2. Press Measure Setup, More. There should be no softkey marked "Range 3 Switch Delay". The range 3 switch delay is no longer needed and that is why there is no softkey. If the softkey does appear, either the board header was not programmed in part 7 or the PSA firmware was not updated to A.11.xx. or greater

3. To verify operation of the new CPLD code, power down the instrument, locate the preamp behind the front panel LCD display, and connect a voltmeter probe clip to one of the pins on the preamp that has a yellow wire attached. You will need to slide the yellow wire connector away from the body of the preamp so you can attach the voltmeter without the risk of shorting the voltmeter to the preamp body. Assure the wire is still attached to the preamp pin.

4. Power on the PSA and wait until the PSA completes the auto align process. Press Mode, Measuring Receiver.

5. The volt meter should read approximately 7 VDC.

6. Remove the voltmeter probe clip and restore the yellow wire connection.

7. Replace the PSA Top Brace and Outer cover.

Part 10 – Instrument Performance Verification

Since removing the instrument covers may void the calibration sticker, and there is a chance that partially removing and reinstalling the Option Driver assembly may result in a loose connection or other damage, it is recommended that a complete instrument calibration be performed.

End of process.