

External Boot Drive for Keysight Logic Analysis Systems

Installation
Guide

Notices

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Safety Notices

CAUTION

A CAUTION notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Safety Summary

The following general safety precautions must be observed during all phases of operation of this instrument. Failure to comply with these precautions or with specific warnings or operating instructions in the product manuals violates safety standards of design, manufacture, and intended use of the instrument. Keysight Technologies assumes no liability for the customer's failure to comply with these requirements. Product manuals are provided with your instrument on CD-ROM and/or in printed form. Printed manuals are an option for many products. Manuals may also be available on the Web. Go to www.keysight.com and type in your product number in the Search field at the top of the page.

General	Do not use this product in any manner not specified by the manufacturer. The protective features of this product may be impaired if it is used in a manner not specified in the operation instructions.
Before Applying Power	Verify that all safety precautions are taken. Make all connections to the unit before applying power. Note the instrument's external markings described in "Safety Symbols".
Ground the Instrument	If your product is provided with a grounding type power plug, the instrument chassis and cover must be connected to an electrical ground to minimize shock hazard. The ground pin must be firmly connected to an electrical ground (safety ground) terminal at the power outlet. Any interruption of the protective (grounding) conductor or disconnection of the protective earth terminal will cause a potential shock hazard that could result in personal injury.
Fuses	See the user's guide or operator's manual for information about line-fuse replacement. Some instruments contain an internal fuse, which is not user accessible.
Do Not Operate in an Explosive Atmosphere	Do not operate the instrument in the presence of flammable gases or fumes.
Do Not Remove the Instrument Cover	Only qualified, service-trained personnel who are aware of the hazards involved should remove instrument covers. Always disconnect the power cable and any external circuits before removing the instrument cover.
Cleaning	Clean the outside of the instrument with a soft, lint-free, slightly dampened cloth. Do not use detergent or chemical solvents.
Do Not Modify the Instrument	Do not install substitute parts or perform any unauthorized modification to the product. Return the product to an Keysight Sales and Service Office for service and repair to ensure that safety features are maintained.
In Case of Damage	Instruments that appear damaged or defective should be made inoperative and secured against unintended operation until they can be repaired by qualified service personnel.

CAUTION










A CAUTION notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.













WARNING


A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Safety Symbols

Table 1 Safety Symbol




Symbol	Description
	Direct current
	Alternating current
	Both direct and alternating current
	Three phase alternating current
	Three phase alternating current
	Earth ground terminal
	Protective earth ground terminal
	Frame or chassis ground terminal
	Terminal is at earth potential

Symbol	Description
	Equipotentiality
N	Neutral conductor on permanently installed equipment
L	Line conductor on permanently installed equipment
	On (mains supply)
	Off (mains supply)
	Standby (mains supply). The instrument is not completely disconnected from the mains supply when the power switch is in the standby position
	In position of a bi-stable push switch
	Out position of a bi-stable push switch
	Equipment protected throughout by DOUBLE INSULATION or REINFORCED INSULATION
	Caution, refer to accompanying documentation
	Caution, risk of electric shock
	Do not apply around or remove from HAZARDOUS LIVE conductors
	Application around and removal from HAZARDOUS LIVE conductors is permitted
	Caution, hot surface

Symbol	Description
	Ionizing radiation
CAT I	IEC Measurement Category I
CAT II	Measurement Category II
CAT III	Measurement Category III
CAT IV	Measurement Category IV

Compliance and Environmental Information

Table 2 Compliance and Environmental Information

Safety Symbol	Description
	CSA is the Canadian certification mark to demonstrate compliance with the Safety requirements.
 N10149	The C-tick mark is a registered trademark of the Spectrum Management Agency of Australia. This signifies compliance with the Australia EMC Framework regulations under the terms of the Radio Communication Act of 1992.
	CE compliance marking to the EU Safety and EMC Directives. ISM GRP-1A classification according to the international EMC standard. ICES/NMB-001 compliance marking to the Canadian EMC standard.

Contents

1 Installation on 16900 Series Logic Analysis Systems

Step 1. Prepare the instrument for disassembly	13
To power off the system	13
Step 2. Remove the cover	15
Step 3. Remove the CPU tray	16
16900A and 16902A CPU tray	16
16903A CPU tray	18
Step 4. Remove the internal hard disk drive	20
Step 5. Install the SATA interface adapter	22
Step 6. Replace the CPU tray	24
Step 7. Replace the cover	24
Step 8. Connect and power up the external boot drive	24
Step 9. Power up the logic analysis system	25
Step 10. Recover the operating system and re-install software	26

2 Installation on 16800 Series and 16901A Logic Analysis Systems

Step 1. Prepare the instrument for disassembly	29
To power off the system	29
Step 2. Remove the cover	31
Step 3. Remove the front panel assembly	32
Step 4. Remove the internal hard disk drive	33
Step 5. Install the SATA interface adapter	34

Step 6. Replace the front panel assembly	36
Step 7. Replace the cover	36
Step 8. Connect and power up the external boot drive	36
Step 9. Power up the logic analyzer	37
Step 10. Recover the operating system and re-install software	38

3 Characteristics

1 Installation on 16900 Series Logic Analysis Systems

- Step 1. Prepare the instrument for disassembly / 13
- Step 2. Remove the cover / 15
- Step 3. Remove the CPU tray / 16
- Step 4. Remove the internal hard disk drive / 20
- Step 5. Install the SATA interface adapter / 22
- Step 6. Replace the CPU tray / 24
- Step 7. Replace the cover / 24
- Step 8. Connect and power up the external boot drive / 24
- Step 9. Power up the logic analysis system / 25
- Step 10. Recover the operating system and re-install software / 26

If you had previously ordered the 16900A, 16902A or 16903A legacy logic analysis system with the external boot drive option (Option 009) and have ordered this external boot drive as a replacement or extra additional drive, the frame's internal hard disk drive has already been removed and the SATA interface adapter has been installed at the factory. In this case, the new E5862A external drive must be imaged prior to use to be compatible with the frame hardware by using the recovery software disk that was shipped with your original system. Go to ["Step 10. Recover the operating system and re-install software"](#) on page 26.

If you ordered the E5862A external boot drive conversion kit as an external boot drive for use with a legacy 16900A, 16902A or 16903A logic analysis system that has an internal hard disk drive, you must remove the frame's internal hard disk and image the external drive prior to use to be compatible with the frame hardware the drive will be connected to. You

will need to image the external drive by using the recovery software disk that was shipped with your original system. Begin with [“Step 1. Prepare the instrument for disassembly”](#) on page 13.

CAUTION

Electrostatic discharge can damage electronic components. Use grounded wrist straps and mats when handling electronic components.

Step 1. Prepare the instrument for disassembly

Do this procedure before doing any disassembly procedure on the instrument.

- 1 Close the *Keysight Logic Analyzer* application software.
- 2 Back up any data and license files you want to retain using LAN, USB flash drive, writable CDs, etc.
- 3 Power off the system using one of the methods explained below.
- 4 Remove the power cord.
- 5 Move the instrument to a static safe work environment.

WARNING

Hazardous voltages exist on the power supply. To avoid electrical shock, disconnect the power from the instrument before performing the following procedures. After disconnecting the power, wait at least six minutes for the capacitors on the power supply board to discharge before servicing the instrument.

CAUTION

Damage can occur to electronic components if you remove or replace assemblies when the instrument is on or when the power cable is connected. Never attempt to remove or install any assembly with the instrument on or with the power cable connected.

To power off the system

There are several ways to power off the logic analysis system.

NOTE

When powering off the logic analysis system, wait until the fans stop turning (about 15 seconds) before turning the logic analysis system back on. This ensures that internal circuitry restarts in a known state.

Using the Windows Shutdown

On the logic analysis system desktop click **Start** > **Shut Down** or if you are running remote desktop, click **Start** > **Settings** > **Windows Security** > **Shut Down**. This software power off does the following:

- Closes all programs that are running.

- Writes all data to the disk.
- Turns off the power supply.
- If the system is unplugged while it is off and then plugged back in, the system will not power on until the power button is pressed.

Using a Short Press of the Power Button

Pressing the power button on a frame for a short time (less than 2 seconds or so):

- Closes all programs that are running.
- Writes all data to the disk.
- Turns off the power supply.

If the power button is depressed for a short time (less than 2 seconds or so) while another instrument has an open Remote Desktop connection to this instrument, a message on the logic analysis system screen (not on the remote desktop) will pop up asking if you really want to power down. Clicking the 'yes' button results in the above events. Clicking 'no' will prevent the shutdown and not answering the dialog box (neither clicking "Yes" or "No") will have no effect. Further short presses on the power button will have no effect.

Using a Long Press of the Power Button

Pressing the power button for more than 4 seconds will power the system down abruptly. Use this method only when other methods have not responded:

- Programs that are running will not be shut down. Any data that has not been written to the disk will be lost.
- Turns off the power supply.
- If the system is unplugged while it is off and then plugged back in, the system will not power on until the power button is pressed.
- If the system does not boot, the hard disk drive will need to be re-imaged.

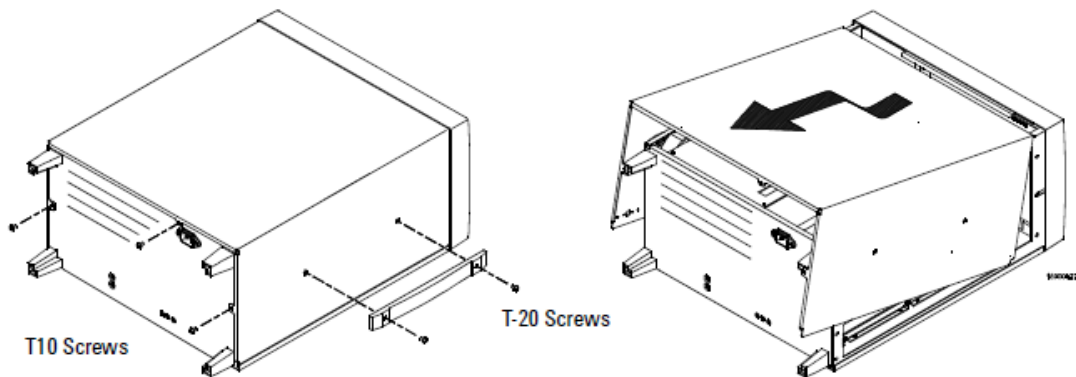
Unplugging the Power Cord or Power Loss

Unplugging power while the instrument is turned on or a power loss is similar to the long press of the power button with one exception:

- When the system is plugged back in, it will power up and boot into Windows.

Step 2. Remove the cover

- 1 Using a Torx T20 screwdriver, remove the handle assembly.
- 2 Using a Torx T10 screwdriver, remove 3 screws that secure the cover to the chassis.
- 3 Slide the cover back and up to remove.



CAUTION

When reinstalling the handle assembly, ensure that the screws are torqued to 2.372 Newton meters (21 inch pounds) so that they do not work themselves loose.

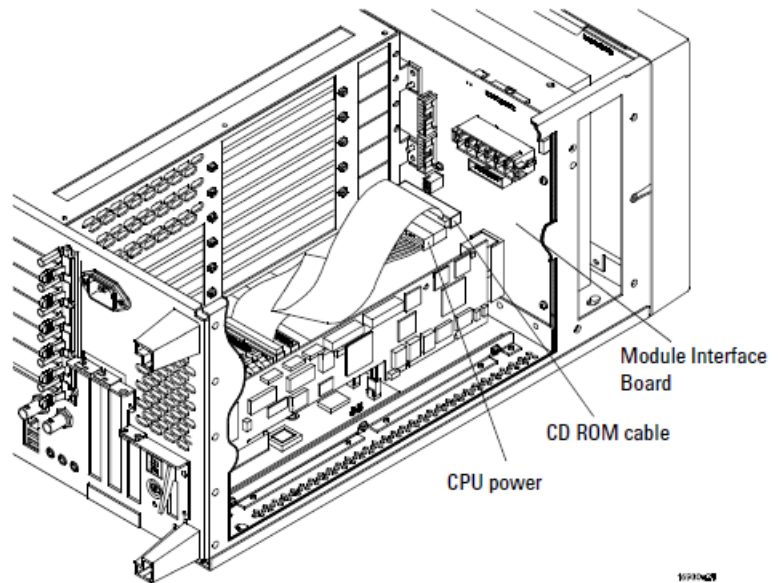
Step 3. Remove the CPU tray

CAUTION

Before removing the CPU tray (after the cover is removed), attach a grounding wrist strap to the chassis.

16900A and 16902A CPU tray

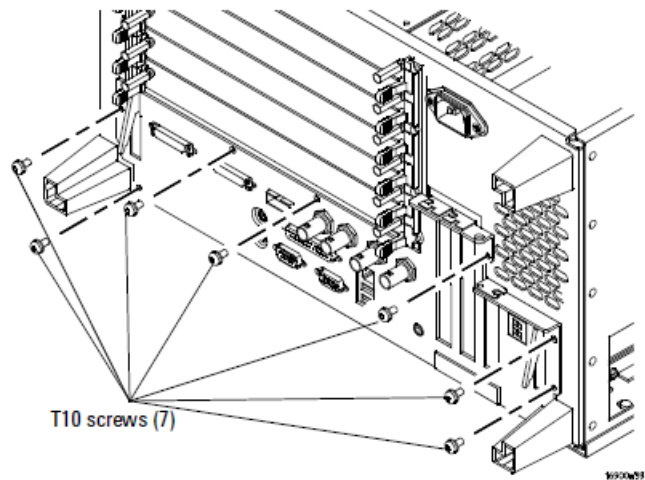
- 1 Disconnect cables from the module interface board.



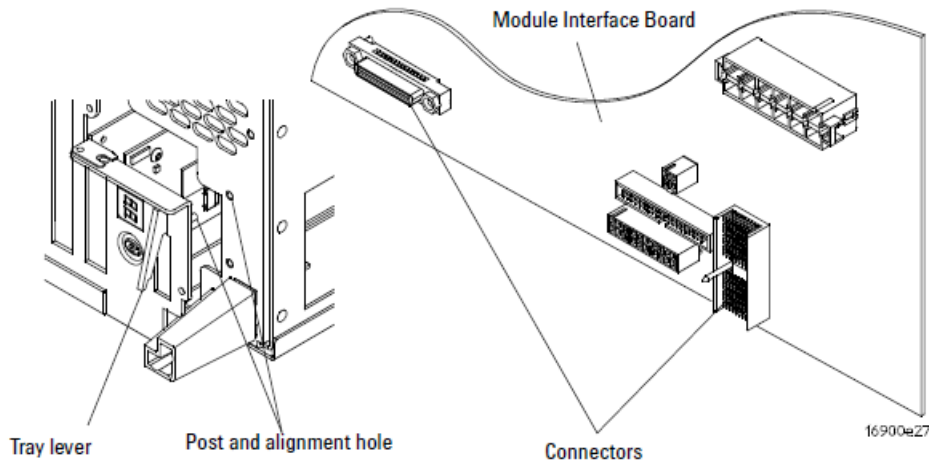
- 2 Remove 7 screws from the back of the CPU tray using a Torx T10 screwdriver.

CAUTION

Do not loosen the other screws on the rear sheet metal; they position the rear sheet metal with respect to the CPU motherboard, and this position should not be shifted. Doing so can make it difficult to make a reliable connection between the PCI cards and the CPU motherboard.

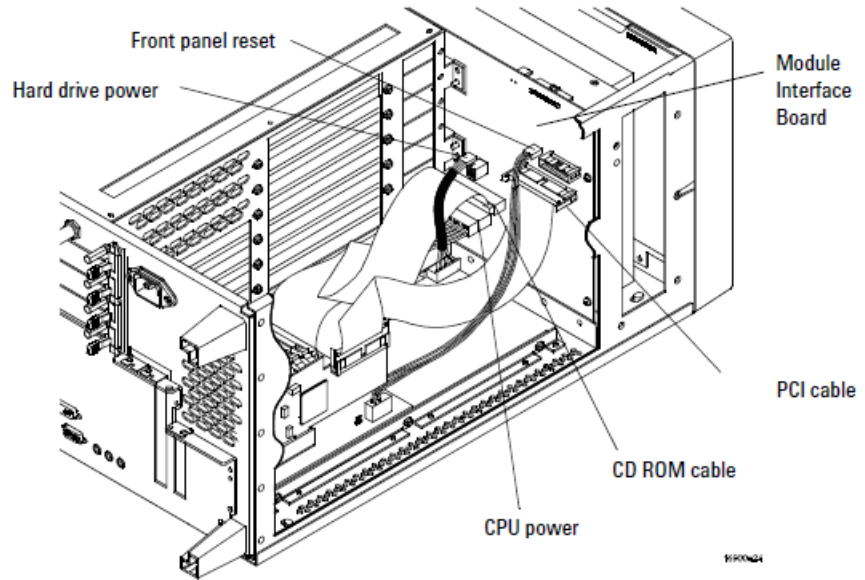


- 3 Use the tray levers to pry and disconnect the CPU board from the module interface board and slide the tray out being careful not to catch the loose cables on anything.



16903A CPU tray

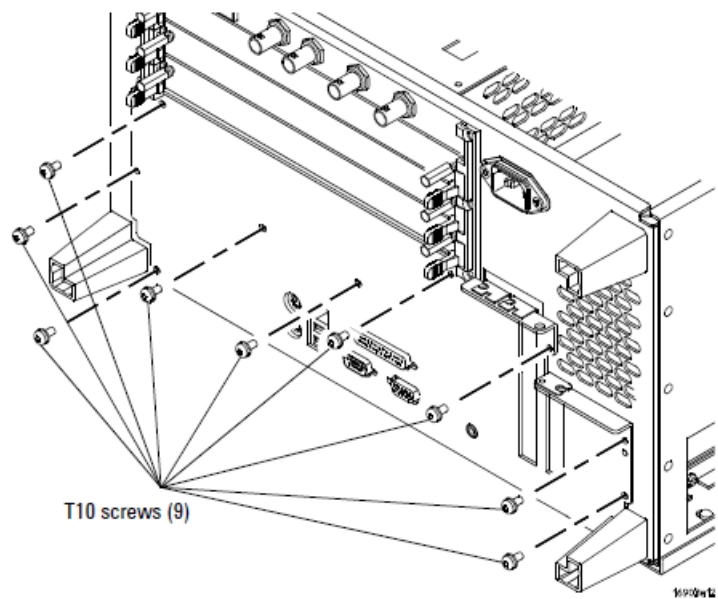
- 1 Disconnect cables from the module interface board.



- 2 Remove 9 screws from the back of the CPU tray using a Torx T10 screwdriver.

CAUTION

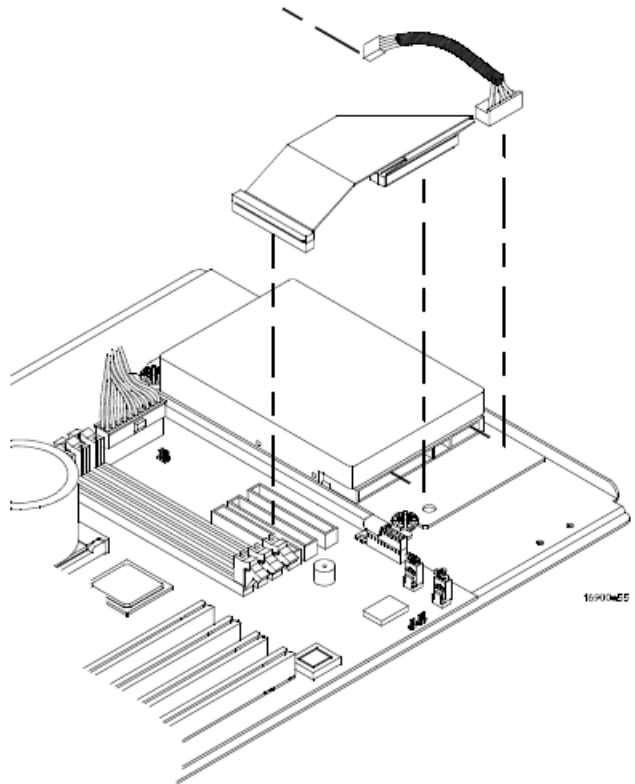
Do not loosen the other screws on the rear sheet metal; they position the rear sheet metal with respect to the CPU motherboard, and this position should not be shifted. Doing so can make it difficult to make a reliable connection between the PCI cards and the CPU motherboard.



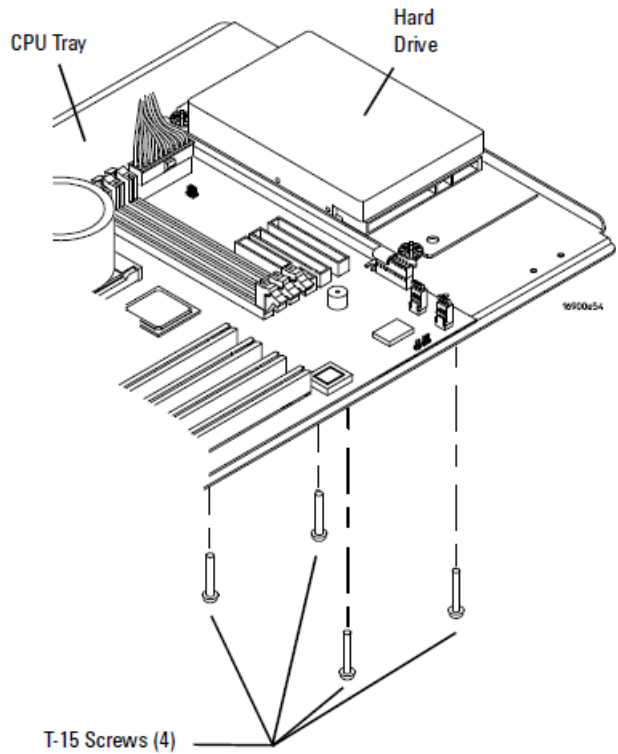
- 3 Slide the tray out being careful not to catch the loose cables on anything.

Step 4. Remove the internal hard disk drive

- 1 Disconnect the IDE (80-wire) cable and the power (4-wire) cable from the internal hard disk drive.
- 2 Remove the internal hard disk drive cables:
 - a Disconnect the IDE cable from the motherboard and remove it.
 - b If you have a 16900A or 16902A frame, disconnect the power cable from the I/O board and remove it. (If you have a 16903A frame, the power cable was already disconnected from the module interface board.)

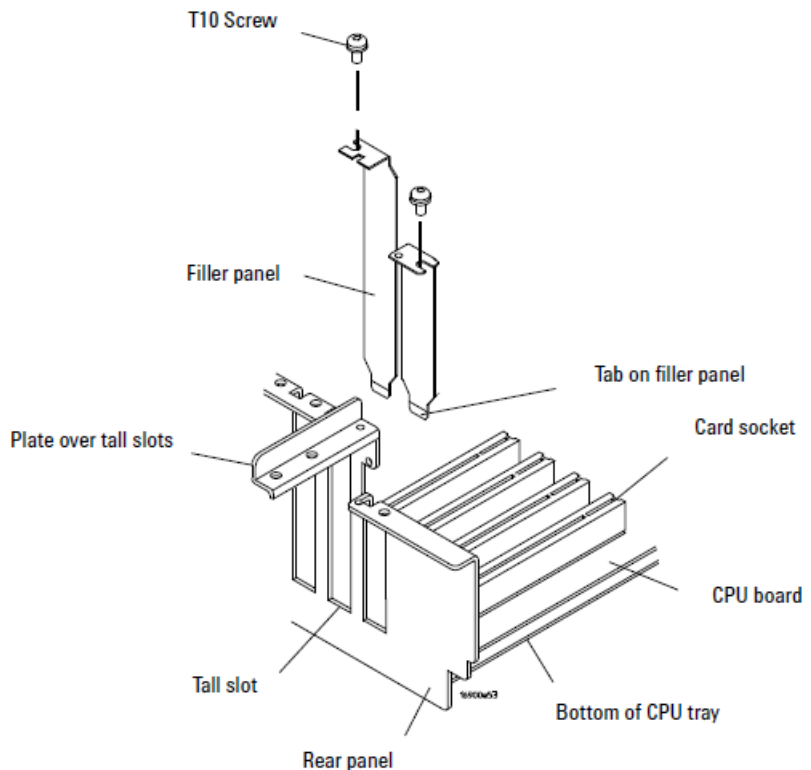


- Using a Torx T15 screwdriver, remove the 4 screws that secure the hard drive to the hard drive plate. These screws are accessible through holes in the bottom of the CPU tray.



Step 5. Install the SATA interface adapter

- 1 Using a T10 screwdriver, remove the screws securing the tall slot filler panel covers to the rear panel of the CPU tray.
- 2 Swing the plate over the tall slot(s) out of the way (as shown in the following figure), and remove the filler panel.

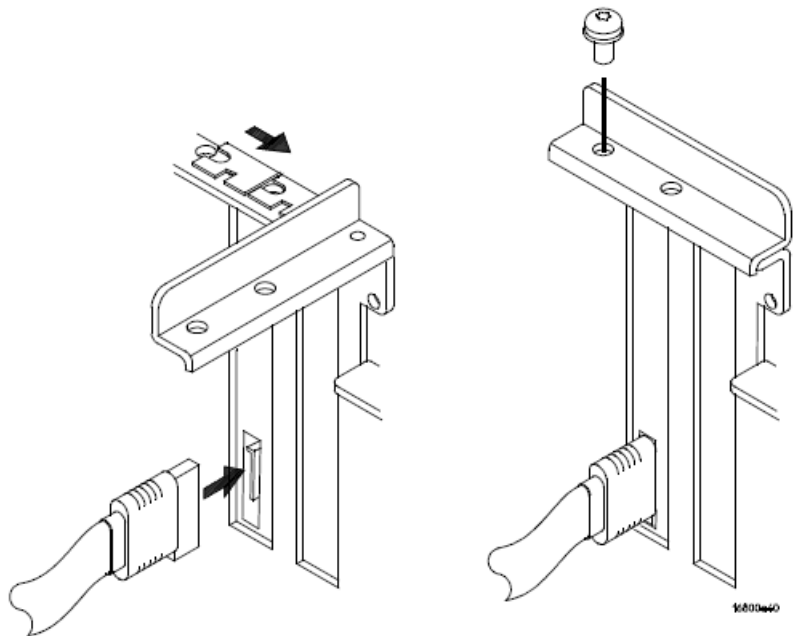


- 3 To install the SATA interface adapter, ensure that the tab at the bottom of the card is aligned with the slot in the bottom of the CPU tray between the motherboard and rear panel.
- 4 If using the SATA-to-eSATA adapter plate, insert the adapter and connect the internal SATA cable to an available SATA connector on the motherboard. If using the eSATA adapter card, press the card securely into the socket on the motherboard.
- 5 Connect the eSATA cable to the external port on the interface card.

This adjusts the interface card's position so there is adequate room to disconnect and reconnect the SATA cable after the installation is complete.

NOTE

If you do not adjust the interface card's position (by connecting the SATA cable to the port), it may be difficult or impossible to connect the cable after the card securing screws are tightened.



- 6 Swing the plate back into place.
- 7 Replace the screw(s).

Step 6. Replace the CPU tray

- 1 To install the CPU tray, reverse the procedure shown in "Step 3. Remove the CPU tray" on page 16.

Step 7. Replace the cover

- 1 To replace the cover, reverse the procedure shown in "Step 2. Remove the cover" on page 15.

CAUTION

When reinstalling the handle assembly, ensure that the screws are torqued to 2.372 Newton meters (21 inch pounds) so that they do not work themselves loose.

Step 8. Connect and power up the external boot drive

- 1 If the eSATA cable is not already connected to the port on the SATA interface adapter in the 16900 series logic analysis system frame, do that now.
- 2 Connect the other end of the eSATA cable to the external boot drive.
- 3 Turn the external boot drive power on by connecting its power cable and setting its power switch to the on position.

Step 9. Power up the logic analysis system

- 1 Turn on the logic analysis system.

If the external boot drive is connected to the port on the SATA interface adapter, the LED on the external drive will light up to show that the drive is recognized and is active.

The new E5862A external drive must be imaged prior to use to be compatible with the legacy 16900A, 16902A or 16903A frame hardware the drive will be connected to. You will need to image the external drive by using the recovery software disk that was shipped with your original system. In this case, continue with the steps in this and the next section.

- 2 Locate the recovery DVD that shipped with your original logic analysis system.

Step 10. Recover the operating system and re-install software

- 1 Using the appropriate recovery DVD, restore the operating system. Follow the instructions that come with the recovery DVD.
- 2 Install the *Keysight Logic Analyzer* application software. Follow the installation/upgrade instructions provided on the web download page (<http://www.keysight.com/find/la-sw-download>) or with the application software CD.
- 3 Install any additional application software.
- 4 Restore the data and license files you backed up in "Step 1. Prepare the instrument for disassembly" on page 13.

2 Installation on 16800 Series and 16901A Logic Analysis Systems

- Step 1. Prepare the instrument for disassembly / 29
- Step 2. Remove the cover / 31
- Step 3. Remove the front panel assembly / 32
- Step 4. Remove the internal hard disk drive / 33
- Step 5. Install the SATA interface adapter / 34
- Step 6. Replace the front panel assembly / 36
- Step 7. Replace the cover / 36
- Step 8. Connect and power up the external boot drive / 36
- Step 9. Power up the logic analyzer / 37
- Step 10. Recover the operating system and re-install software / 38

For a logic analysis system that runs the Windows 7 operating system (system serial numbers of MY51420101 or higher) - If you ordered the E5862A external boot drive conversion kit to use as a secondary external boot drive, you can simply boot to your new external drive and the system will automatically configure itself. Go to ["Step 8. Connect and power up the external boot drive"](#) on page 36.

For an older legacy logic analysis system that runs the Windows XP operating system (system serial numbers prior to MY51420101) - If you ordered the E5862A external boot drive conversion kit to use as a secondary external boot drive, you must image the external drive prior to use to be compatible with the frame hardware the drive will be connected

to. You will need to image the external drive by using the recovery software disk that was shipped with your original system. Begin with "Step 8. Connect and power up the external boot drive" on page 36.

CAUTION

Electrostatic discharge can damage electronic components. Use grounded wrist straps and mats when handling electronic components.

Step 1. Prepare the instrument for disassembly

Do this procedure before doing any disassembly procedure on the instrument.

- 1 Close the *Keysight Logic Analyzer* application software.
- 2 Back up any data and license files you want to retain using LAN, USB flash drive, external USB CD/DVD writer, etc.
- 3 Power off the system using one of the methods explained below.
- 4 Remove the power cord.
- 5 Move the instrument to a static safe work environment.

WARNING

Hazardous voltages exist on the power supply. To avoid electrical shock, disconnect the power from the instrument before performing the following procedures. After disconnecting the power, wait at least six minutes for the capacitors on the power supply board to discharge before servicing the instrument.

CAUTION

Damage can occur to electronic components if you remove or replace assemblies when the instrument is on or when the power cable is connected. Never attempt to remove or install any assembly with the instrument on or with the power cable connected.

To power off the system

There are several ways to power off the logic analyzer.

NOTE

When powering off the logic analyzer, wait until the fans stop turning (about 15 seconds) before turning the logic analyzer back on. This ensures that internal circuitry restarts in a known state.

Using the Windows Shutdown

On the logic analyzer desktop click **Start> Shut Down** or if you are running remote desktop, click **Start> Settings> Windows Security> Shut Down**. This software power off does the following:

- Closes all programs that are running.

- Writes all data to the disk.
- Turns off the power supply.
- If the system is unplugged while it is off and then plugged back in, the system will not power on until the power button is pressed.

Using a Short Press of the Power Button

Pressing the power button on a frame for a short time (less than 2 seconds or so):

- Closes all programs that are running.
- Writes all data to the disk.
- Turns off the power supply.

If the power button is depressed for a short time (less than 2 seconds or so) while another instrument has an open Remote Desktop connection to this instrument, a message on the logic analyzer screen (not on the remote desktop) will pop up asking if you really want to power down. Clicking the 'yes' button results in the above events. Clicking 'no' will prevent the shutdown and not answering the dialog box (neither clicking "Yes" or "No") will have no effect. Further short presses on the power button will have no effect.

Using a Long Press of the Power Button

Pressing the power button for more than 4 seconds will power the system down abruptly. Use this method only when other methods have not responded:

- Programs that are running will not be shut down. Any data that has not been written to the disk will be lost.
- Turns off the power supply.
- If the system is unplugged while it is off and then plugged back in, the system will not power on until the power button is pressed.
- If the system does not boot, the hard disk drive will need to be re-imaged.

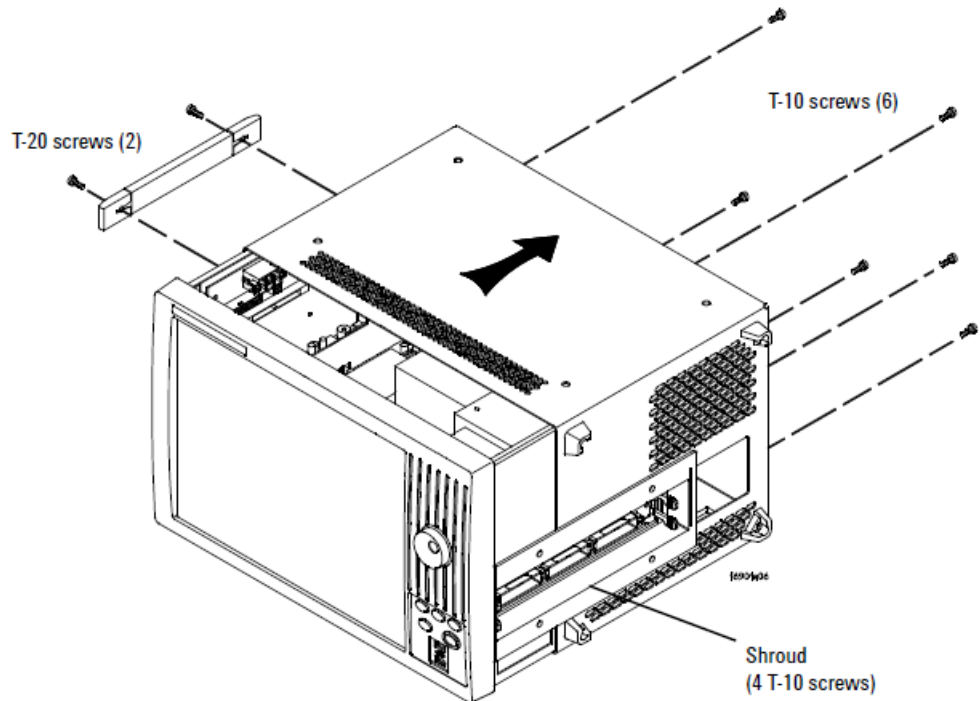
Unplugging the Power Cord or Power Loss

Unplugging power while the instrument is turned on or a power loss is similar to the long press of the power button with one exception:

- When the system is plugged back in, it will power up and boot into Windows.

Step 2. Remove the cover

- 1 Using a Torx T20 screwdriver, remove the handle assembly.
- 2 Using a Torx T10 screwdriver, remove 6 screws that secure the cover to the chassis.
Optional for 16901A: Removing the shroud may make it easier to remove and replace the cover. In this case, remove 4 T10 screws; then, remove the shroud.
- 3 Slide the cover back to remove.

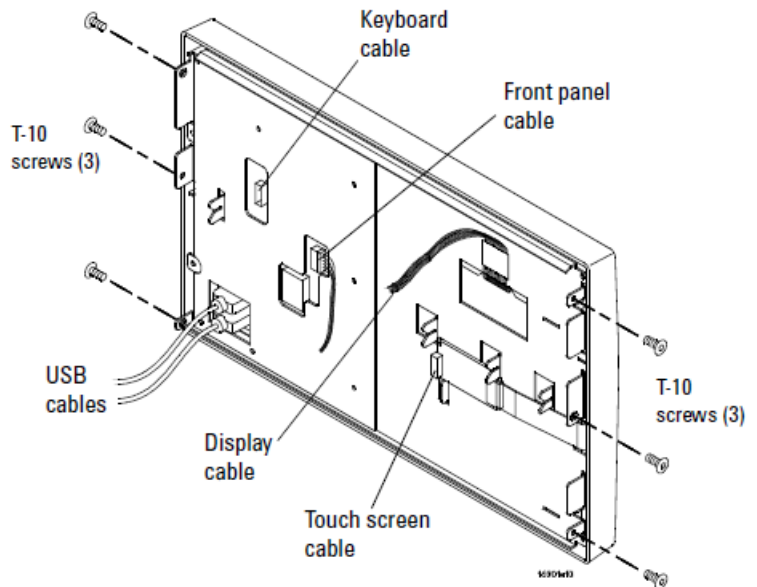


CAUTION

When reinstalling the handle assembly, ensure that the screws are torqued to 2.372 Newton meters (21 inch pounds) so that they do not work themselves loose.

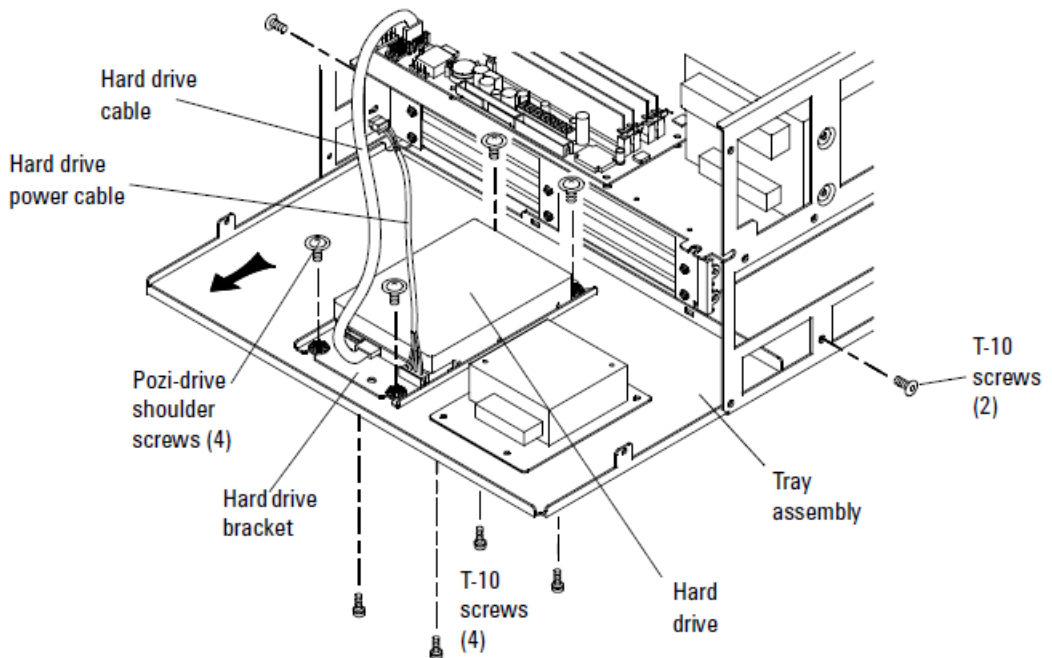
Step 3. Remove the front panel assembly

- 1 Disconnect the following cables:
 - USB cables from the motherboard.
 - Display cable from the display board or from the motherboard if applicable (use care when disconnecting to avoid damage).
 - Touchscreen cable from the touch screen controller board (if the frame model has touchscreen).
 - Keyboard cable from the keypad board.
 - Front panel cable from the back-light inverter board.
- 2 Using a Torx T10 screwdriver, remove 6 screws that secure the front panel to the chassis.
- 3 Remove the front panel assembly.



Step 4. Remove the internal hard disk drive

- 1 Using a Torx T10 screwdriver, remove the 2 side screws that secure the tray assembly to the chassis.
- 2 Slide the tray out just enough to be able to disconnect the 2 hard drive cables from the hard drive.
- 3 Using a Torx T10 screwdriver, remove the 4 screws that secure the hard drive to the hard drive bracket. These screws are accessible through holes in the bottom of the tray assembly. Other hard disk mounting variations will be similar.
- 4 To remove the hard drive bracket, remove the 4 Pozi-drive shoulder screws with washers that secure it to the tray assembly.



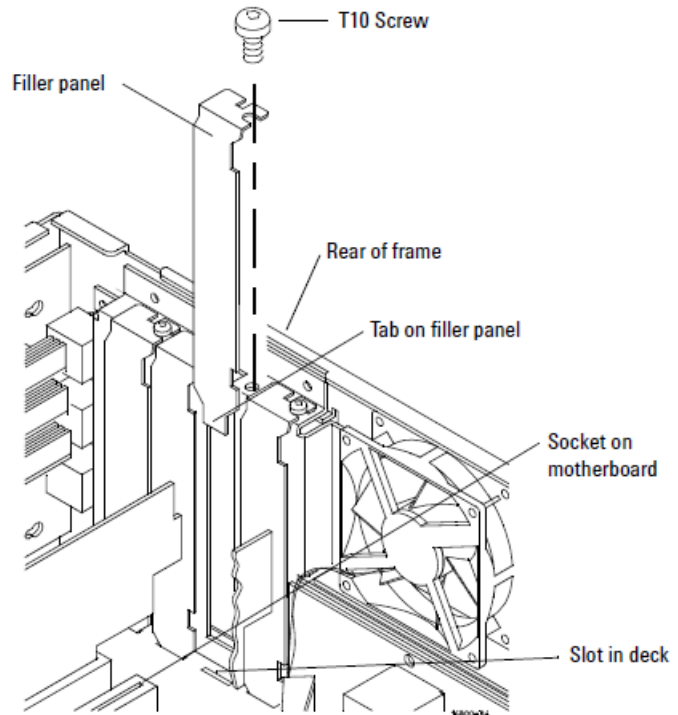
- 5 Remove the internal hard disk drive cables:
 - a Disconnect the SATA cable from the motherboard and remove it.
 - b Disconnect the power cable from the MIB board and remove it.

Step 5. Install the SATA interface adapter

- 1 Using a T10 screwdriver, remove the screws securing the filler panel to the rear of the frame.
- 2 Remove the filler panel.

NOTE

Depending on the motherboard, the PCI slot location for the SATA interface card may be different.



- 3 To install the SATA interface adapter, ensure that the tab at the bottom of the card is aligned with the slot in the bottom of the CPU tray between the motherboard and rear panel.
- 4 If you are using the SATA-to-eSATA adapter plate, insert the adapter and connect the internal SATA cable to an available SATA connector on

the motherboard. If you are using the eSATA adapter card, press the card securely into the socket on the motherboard.

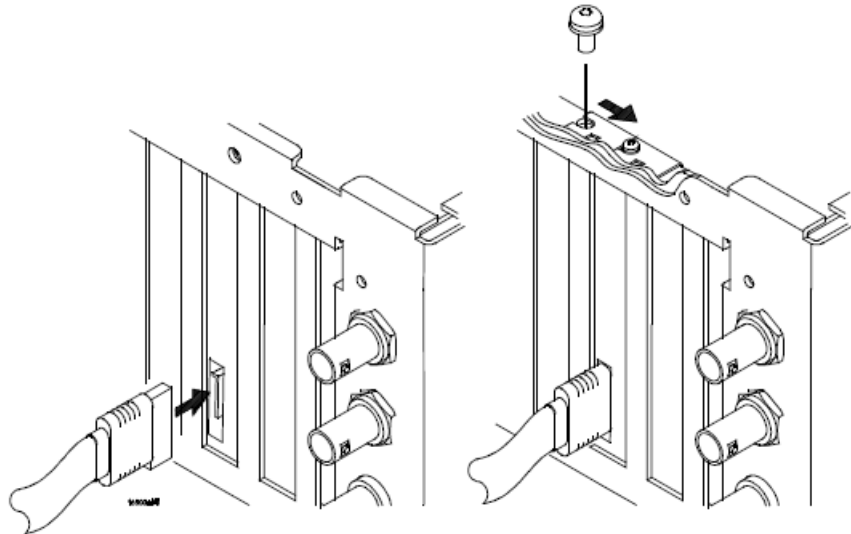
- 5 Connect the eSATA cable to the external port on the interface card.
This adjusts the interface card's position so there is adequate room to disconnect and reconnect the SATA cable after the installation is complete.

NOTE

If you do not adjust the interface card's position (by connecting the SATA cable to the port), it may be difficult or impossible to connect the cable after the screws are tightened.

NOTE

Depending on the motherboard, the PCI slot location for the SATA interface card may be different.



- 6 Replace the screw(s).

Step 6. Replace the front panel assembly

- 1 To install the front panel assembly, reverse the procedure shown in "Step 3. Remove the front panel assembly" on page 32.

Step 7. Replace the cover

- 1 To replace the cover, reverse the procedure shown in "Step 2. Remove the cover" on page 31.

CAUTION

When reinstalling the handle assembly, ensure that the screws are torqued to 2.372 Newton meters (21 inch pounds) so that they do not work themselves loose.

Step 8. Connect and power up the external boot drive

- 1 If the eSATA cable is not already connected to the port on the SATA interface adapter in the 16800 Series or 16901A logic analysis system frame, do that now.
- 2 Connect the other end of the eSATA cable to the external boot drive.
- 3 Turn the external boot drive power on by connecting its power cable and setting its power switch to the on position.

Step 9. Power up the logic analyzer

- 1 Turn on the logic analysis system.

If the external boot drive is connected to the port on the SATA interface adapter, the LED on the external drive will light up to show that the drive is recognized and is active.

If you ordered a 16800 series or 16901A logic analysis system frame with the external boot drive option (Option 109) and have a system Serial Number of MY51420101 and higher, the drive is shipped from the factory with the operating system, frame drivers, and application software installed. In this case, you are done with the external disk installation procedure and should continue with the first-time set up procedures in the logic analyzer Installation Guide.

If you ordered the E5862A external boot drive conversion kit for a legacy logic analysis system which runs Windows XP (system Serial Numbers lower than MY51420101), the new E5862A external drive must be re-imaged prior to use to be compatible with the legacy frame hardware the drive will be connected to. You will need to image the external drive by using the recovery software disk that was shipped with your original system. In this case, continue with the steps in this and the next section.

- 2 Locate the recovery DVD that shipped with your original logic analysis system.

Step 10. Recover the operating system and re-install software

- 1 Connect a keyboard, mouse, and USB DVD-ROM drive to the logic analyzer.
- 2 Using the appropriate recovery DVD, restore the operating system. Follow the instructions that come with the recovery DVD.
- 3 Install the *Keysight Logic Analyzer* application software. Follow the installation/upgrade instructions provided on the web download page (<http://www.keysight.com/find/la-sw-download>) or with the application software CD.
- 4 Install any additional application software.
- 5 Restore the data and license files you backed up in "Step 1. Prepare the instrument for disassembly" on page 29.

3 Characteristics

Operating

Table 3 Operating Environment

Environment	Characteristics
Shock:	80 g, 64 in/sec.
Temperature:	5°C to 55°C (+41°F to 131°F).
Humidity:	5% to 95% relative humidity, non-condensing.
Altitude:	-304.8 to 3,048 m (-1,000 to 10,000 ft).
Vibration:	Linear: 10 to 300 Hz, 3.0 g (0 to peak). Random: 10 to 300 Hz, 0.3 g rms.

CAUTION

While operating, do not expose the drive to more than 5 to 500 Hz at 0.3 g rms.

Non-Operating

Table 4 Non-operating Environment

Environment	Characteristics
Shock:	54 g, 292 in/sec.
Temperature:	-40°C to 65°C (-40°F to 149°F).
Humidity:	5% to 95% relative humidity, non-condensing.
Altitude:	-304.8 to 12,192 m (-1,000 to 40,000 ft).
Vibration:	Low-frequency: 5 to 20 Hz, 0.195 inches (double amplitude). High-frequency: 20 to 300 Hz, 2.41 g rms.

CAUTION

In non-operating conditions or in storage, do not expose the drive to more than 5 to 500 Hz at 3.0 g rms.

