

Installation Guide

Agilent 4072A Advanced Parametric Tester

Agilent 4073A Ultra Advanced Parametric Tester

Edition 6



Agilent Technologies

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Product maintenance agreements and other customer assistance agreements are available for Agilent Technologies products.

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Agilent Technologies certifies that this product met its published specifications at the time of shipment [from the factory]. Agilent Technologies further certifies that its calibration measurements are traceable to the **National Institute of Standards and Technology (NIST)**, to the extent allowed by the Institute's calibration facility, and to the calibration facilities of other International Standards Organization members.

Printing History

New editions are complete revisions of the manual. Update packages, which are issued between editions, contain additional and replacement pages to be merged into the manual by the customer. The dates on the title page change only when a new edition is published. No information is incorporated into a reprinting unless it appears as a prior update; the edition does not change when an update is incorporated.

The software revision code printed before the date indicates the version level of the software product at the time the manual or update was issued. Many product updates and fixes do not require manual changes and, conversely, manual corrections may be done without accompanying product changes. Therefore, do not expect a one to one correspondence between product updates and manual updates.

Edition 1	For Agilent 4070 System Software Revision B.02.00, June 1999
Edition 2	For Agilent 4070 System Software Revision B.02.10, June 2000
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Safety Summary

The following general safety precautions must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions or with specific warnings elsewhere in this manual may impair the protections provided by the equipment. In addition, it violates safety standards of design, manufacture, and intended use of the instrument. Agilent Technologies, Inc. assumes no liability for customer's failure to comply with these requirements.

NOTE Agilent 4072A/4073A complies with INSTALLATION CATEGORY II for main input and INSTALLATION CATEGORY I for measurement input terminals, and POLLUTION DEGREE 2 defined in IEC 1010-1.

The 4072A/4073A is INDOOR USE product.

The 4072A/4073A is CLASS 1 LASER product based on IEC 825-1 for optical wave:

AEL power is less than 0.2 mW.

Wavelength is 650 nm of continuous wave.

GROUND THE INSTRUMENT

To minimize shock hazard, the instrument chassis and cabinet must be connected to an electrical ground. The power terminal and the power cable must meet International Electrotechnical Commission (IEC) safety standards.

DO NOT OPERATE IN AN EXPLOSIVE ATMOSPHERE

Do not operate the instrument in the presence of flammable gases or fumes. Operation of any electrical instrument in such an environment constitutes a definite safety hazard.

KEEP AWAY FROM LIVE CIRCUITS

Operation personnel must not remove instrument covers. Component replacement and internal adjustments must be made by qualified maintenance personnel. Do not replace components with power cable connected. Under certain conditions, dangerous voltages may exist even with the power cable removed. To avoid injuries, always disconnect power and discharge circuits before touching them.

DO NOT SERVICE OR ADJUST ALONE

Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

DO NOT SUBSTITUTE PARTS OR MODIFY INSTRUMENT

Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification to the instrument. Return the instrument to a Agilent Technologies Sales and Service Office for services and repair to ensure that safety features are maintained.

DANGEROUS PROCEDURE WARNINGS

Warnings, such as in the example below, precede potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed.

WARNING Dangerous voltages, capable of causing death, are present in this instrument. Use extreme caution when handling, testing, and adjusting.

Safety Symbols

The general definitions of safety symbols used on equipment or in manuals are listed below.



Instruction manual symbol: the product will be marked with this symbol when it is necessary for the user to refer to the instruction manual in order to protect against damage to the instrument.



Indicates dangerous voltage and potential for electrical shock. Do not touch terminals that have this symbol when instrument is on.



Protective conductor terminal.

It is intended for connection to an external protective conductor for protection against electric shock in case of a fault or the terminal of a protective earth electrode.



Frame or chassis terminal. A connection to the frame (chassis) of the equipment which normally includes all exposed metal structures.



Alternating current.



Direct current.



Electrical shock.



ON (Supply).



OFF (Supply).

CAT1

Means INSTALLATION CATEGORY I. Measurement terminals on the testheads comply with INSTALLATION CATEGORY I.

WARNING

The warning sign denotes a hazard. It calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in injury or death to personnel.

CAUTION

The caution sign denotes a hazard. It calls attention to an operating procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product.

NOTE

The note sign denotes important information. It calls attention to a procedure, practice, condition or the like, which is essential to highlight.

Electrical Work Types

The definitions of electrical work types are as follows.

Work Type 3 Energized circuits are exposed and inadvertent contact with uninsulated energized parts is possible. Potential exposure does not exceed 30 Vrms, 42.4 Vpeak, 60 Vdc, and 240 VA.

Work Type 4 Energized circuits are exposed and inadvertent contact with uninsulated energized parts is possible. Potential exposure can exceed 30 Vrms, 42.4 Vpeak, 60 Vdc, 240 VA, or hazardous RF current.

In This Manual

Purpose

CAUTION The information in this manual is provided for use by trained service personnel only. To avoid electrical shock, do not perform any procedures in this manual unless qualified to do so.

This manual contains installation information for the Agilent 4072A and 4073A tester.

For information about site preparations that the customer must perform, see the *Pre-Installation Guide*.

For information about service information used to repair the 4072A/4073A, refer to the *Service Guide*.

For information regarding calibrating the 4072A/4073A, refer to the *System Calibration Guide*.

Audience

This manual is intended for Agilent customer engineers who perform the 4072A/4073A tester installation or service personal who maintain the 4072A/4073A.

Contents

This manual provides procedures and information necessary to install and verify the 4072A/4073A tester.

Chapter 1 , “General Information,” describes what to do before installation, equipment required to install the 4072A/4073A, and the installation sequence.

Chapter 2 , “Installing System Cabinet,” describes how to install the system cabinet.

Chapter 3 , “Rack-Mounting Instruments, System Controller, and Peripherals,” describes how to mount the system controller, peripherals, Agilent 4284A, Agilent 3458A, Agilent 81110A, Agilent 8110A, and Agilent 8114A into the system cabinet.

Chapter 4 , “Connecting Testhead to the Cabinet,” describes how to install the testhead.

Chapter 5 , “Setting Up Agilent E3172A/AJ/B and Agilent E3173A,” describes how to set up the Agilent E3172A/AJ/B and E3173A system controller.

Chapter 6 , “Installing Software (for C.03.01),” describes how to install and customize the system software. This chapter also provides installation information for the GPIB interface cards and the optical interface card.

Chapter 7 , “Verifying Tester Operation,” describes how to confirm the 4072A/4073A configuration and operation.

Appendix A , “Agilent E3171A/AJ, E3172A/AJ/B, and E3173A Factory Settings,” describes software revisions, customization, and other settings for the E3171A/AJ, E3172A/AJ/B, or E3173A system controller.

Appendix B , “Miscellaneous Operations,” provides information that may be used after the initial installation.

Appendix C , “Installing Software (for B.03.01 or Earlier),” describes how to install and customize the system software. This chapter also provides installation information for the GPIB interface cards and the optical interface card.

Appendix D , “Error Messages,” describes the error messages that may be returned when an error occurs during the 4072A/4073A operation.

Other Manuals

The following manuals are available for servicing the 4072A/4073A.

Agilent 4072A/4073A Service Guide (Agilent part number E3102-90500)

Agilent 4072A/4073A System Calibration Guide (Agilent part number E3102-90510)

Agilent 4072A/4073A Pre-Installation Guide (Agilent publication number 5968-4911E)

For information on user operation and programming of the 4072A/4073A, see the following manuals.

Agilent 4070 User's Guide (Agilent part number E3102-90000)

Agilent 4070 Programming Guide for BASIC Users (Agilent part number E3102-90010)

Agilent 4070 Programming Reference for BASIC Users (Agilent part number E3102-90110)

Agilent 4070 Programming Guide for C Users (Agilent part number E3102-90020)

Agilent 4070 Programming Reference for C Users (Agilent part number E3102-90120)

Agilent 4070 Maintenance Guide (Agilent part number E3102-90200)

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1 General Information

This manual provides procedures and information necessary to install and verify the Agilent 4072A/4073A parametric tester.

This chapter provides an overview of the preparation, requirements, and installation sequence. It consists of the following sections:

- “Before Installation”
- “Requirements for Installation”
- “Installation Sequence”
- “Serial Number Prefixes”

Chapter 2 provides the system cabinet installation procedure. Chapter 3 provides procedures for mounting the system controller, peripherals, Agilent 4284A precision LCR meter, Agilent 3458A digital multimeter, Agilent 81110A pulse generator, Agilent 8110A pulse generator, Agilent 8114A pulse generator, and Agilent E4411B spectrum analyzer into the system cabinet. Chapter 4 provides procedures for connecting the system cabinet and the testhead. Chapter 5 and chapter 6 provide software installation procedures. Chapter 5 describes how to set up the Agilent E3172A/AJ/B and E3173A system controller. Chapter 6 describes how to install and customize HP-UX, BASIC/UX, SICL, and the Agilent 4070 system software. Chapter 7 provides instructions for verifying proper tester operation.

NOTE

The software installation process depends on which system controller is being used. Before installation, identify which system controller is being used. If using the E3172A/AJ/B or E3173A system controller, see chapter 5. If a system controller other than E3172A/AJ/B or E3173A is being used, see chapter 6.

To check which system controller is being used, find the label on the rear panel of the system controller. If the E3171A/AJ, E3172A/AJ/B, or E3173A is used, the label will read “Agilent E3171A(or AJ)”, “Agilent E3172A(, AJ, or B)”, or “Agilent E3173A”.

Appendix A provide the information on software revisions, customization, and other settings for the E3171A/AJ, E3172A/AJ/B, or E3173A. Appendix B provides information that you may use after installation is completed. Appendix C describes how to install and customize HP-UX, BASIC/UX, SICL, and the Agilent 4070 system software for the Agilent 4070 software revision B.03.01 or earlier. Appendix D describes the error messages that may be returned when an error occurs during 4072A/4073A operation.

Before Installation

Before installing the 4072A/4073A, the following procedures must be performed, as described in the *Agilent 4072A/4073A Pre-Installation Guide*.

- Site Preparation:

Before the 4072A/4073A arrives at the installation site, an Agilent customer engineer *must call the customer or visit the site*, and make sure that the site preparation has been performed as described in the *Agilent 4072A/4073A Pre-Installation Guide*.

- Unpacking:

After receiving the 4072A/4073A, the following must be done by the customer.

1. Unpack the system cabinet.
2. Move the 4072A/4073A to the installation location.

For more information, see the *Agilent 4072A/4073A Pre-Installation Guide*.

Requirements for Installation

The following is required for installing the 4072A/4073A:

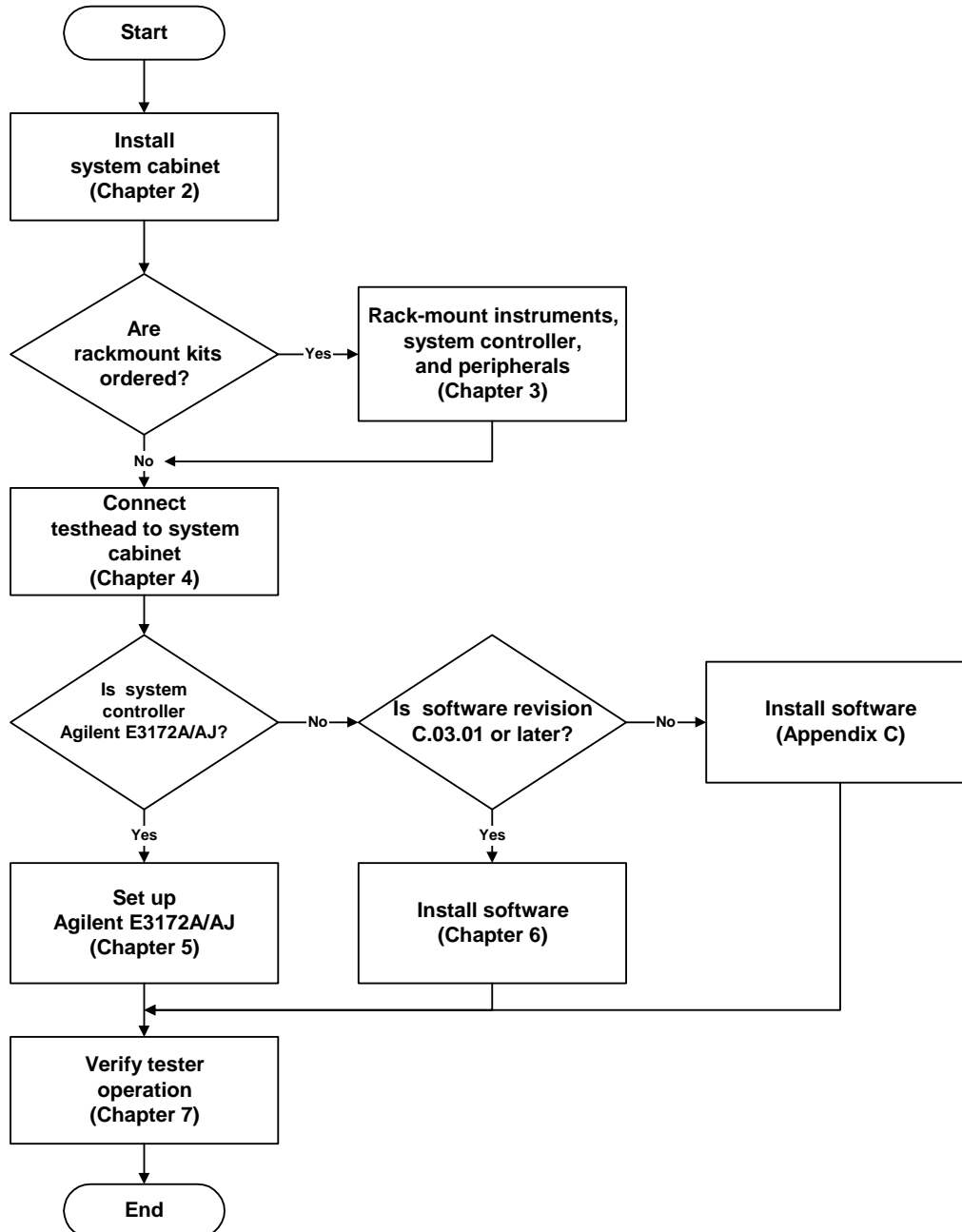
- cross slot screwdrivers (pozidrive or phillips screwdrivers)
- cross slot screwdriver (ISO No.1; The shaft must be longer than 25 cm.)
- flat-blade screwdriver
- nut driver (H8)
- spanner (H8)
- hex L screwdrivers (H3 and H5)
- Torx® screwdriver (T-25)
- wire strippers
- 3/8-inch wrench
- 5/16-inch wrench
- slip-joint pliers
- hand-held multimeter
- tape measure
- *Agilent 4072A/4073A Pre-Installation Guide*
- *Agilent 4072A/4073A Installation Guide*
- *Agilent 4072A/4073A Service Guide*

Installation Sequence

Figure 1-1 shows the installation sequence and the chapter numbers that describe the related installation steps in detail.

Install the 4072A/4073A according to the following installation sequence. For further details, refer to the appropriate chapter.

Figure 1-1 Agilent 4072A/4073A Tester Installation Sequence



Serial Number Prefixes

Agilent Technologies uses a two-part serial number which is stamped on the serial number plate attached to the product. The first five letters and digits are the serial number prefix and the last five digits are the suffix. The first two letters indicate the country where the product was manufactured. The prefix changes when a significant change is made to the product. The suffix is assigned sequentially and is unique to each product.

Some sections, paragraphs, tables, and figures in this manual have the serial number prefix information as follows:

Table 1-1 Abbreviations

Abbreviations	Description
JP10G-	Agilent E3102A (4072A) with a serial number prefix of JP10G
JP20G-	Agilent E3102A (4072A) with a serial number prefix of JP20G
JP30G-	Agilent E3102A (4072A) with a serial number prefix of JP30G
JP10H-	Agilent E3103A (4073A) with a serial number prefix of JP10H or Agilent E3172A/AJ (C3600) with a serial number prefix of JP10H
JP20H-	Agilent E3103A (4073A) with a serial number prefix of JP20H or Agilent E3172A/AJ (C3600) with a serial number prefix of JP20H
JP10F-	Agilent E3171A/AJ (745/132L) with a serial number prefix of JP10F
JP20F-	Agilent E3171A/AJ (745/132L) with a serial number prefix of JP20F
JP10J-	Agilent E3172B (C3600) with a serial number prefix of JP10J- or Agilent E3173A (C3700) with a serial number prefix of JP10J-

The following shows the changes of each serial number prefix.

Table 1-2 Serial Number Prefixes

Agilent Product No.	Serial No. Prefix	Changes
E3102A (4072A)	JP10G	Initial release (No shelter plate)
	JP20G	81110A support ^a
	JP30G	<ul style="list-style-type: none"> Agilent E3172A (C3600 workstation) support^b PDU modification (power outlet protector and fan protectors)
E3103A (4073A)	JP10H	Initial release ^a
	JP20H	<ul style="list-style-type: none"> Agilent E3172A (C3600 workstation) support^b PDU modification (power outlet protector and fan protectors)
E3171A/AJ (745/132L)	JP10F	Initial release
	JP20F	PCI bus support
E3172A/AJ (C3600)	JP10H	Initial release
	JP20H	FDD deletion
E3172B (C3600)	JP10J	Initial release
E3173A (C3700)	JP10J	Initial release

a. The system cabinet includes the E3153A option 100.

b. The system cabinet includes the E3153A option 101.

2 Installing System Cabinet

This chapter provides information for installing the system cabinet. This part of the installation process consists of the following main steps:

1. unpacking and moving the Agilent 4072A/4073A to its final location
2. connecting the power distribution unit (PDU) to the site power line
3. confirming operation of the PDU and emergency off (EMO) circuit

This chapter describes these main steps:

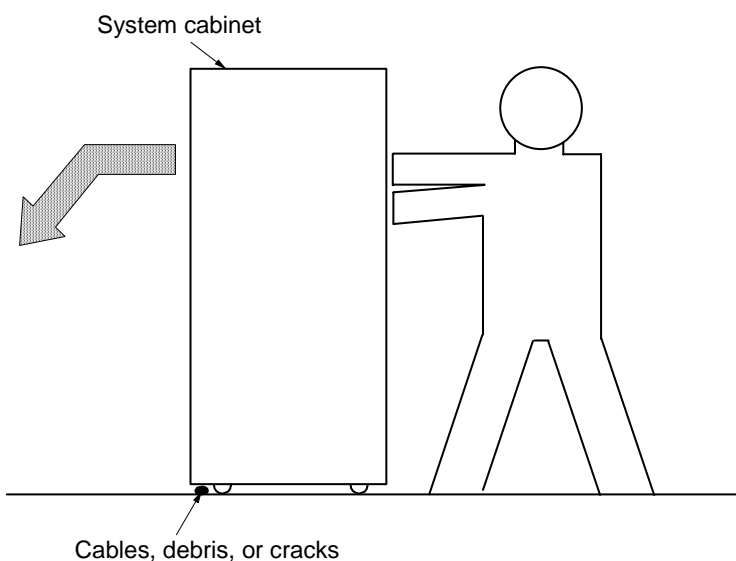
- “To Unpack and Move Agilent 4072A/4073A”
- “To Connect PDU to Site Power Line”
- “To Confirm PDU and EMO Operation”
- “Power Outlet and Power Cord Specifications”

To Unpack and Move Agilent 4072A/4073A

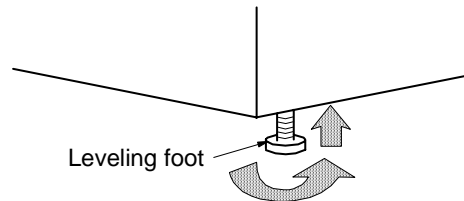
To unpack the 4072A/4073A, see the *Agilent 4072A/4073A Pre-Installation Guide*.

The system cabinet and its accessories (vinyl cover intact) must be moved close to the installation location, such as the entrance of the clean room. The system cabinet is equipped with casters to allow movement of the cabinet to its final location.

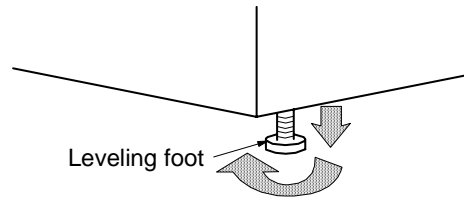
WARNING When moving the system cabinet on its casters, do not allow the casters to become caught on cables or debris, or in cracks in the floor. The cabinet has a high center of gravity, and momentum caused by pushing or pulling can cause the cabinet to tip over, resulting in serious injury to personnel and damage to the equipment.



CAUTION Fully raise the leveling feet when the cabinet is moved. If not, the leveling feet may be damaged. Confirm the leveling position before moving the system cabinet.



WARNING After the system cabinet is moved to its final location and before performing any other installation steps, stabilize the cabinet by lowering the leveling feet until they are in contact with the floor. Failure to observe this warning can result in serious injury to personnel and damage to the equipment.



To Connect PDU to Site Power Line

The power distribution unit (PDU) is the primary unit for controlling and distributing ac power. The PDU must be connected to the correct power line (source) using the main power cable. This section describes the power requirements for the PDU and how to make this connection.

CAUTION Before connecting the main power cable to the site power line, check if the correct line voltage is applied to the site power line using a hand-held multimeter.

If you are going to connect the main power cable to the site power line directly, check with the site power line administrator first.

Power Source Requirements

The power source requirements for the installation site depend on the Agilent E3102A/E3103A line voltage option selected.

Table 2-1 shows the applicable line voltage, maximum input current of the PDU, and allowable diameters for the main power cable for each line voltage option.

Table 2-1 Agilent 4072A/4073A Line Voltage Option and Power Cable

Option No.	Applicable Line Voltage	Agilent Part No. of PDU	Maximum Current	Allowable Diameter of Main Power Cable (in mm)
E3102A/E3103A option 200 ^a	200 Vac	E3160-60265 ^b E3160-60065 ^c	20 A	16.5 to 18.5
E3102A/E3103A option 208 ^a	208 Vac	E3160-60266 ^b E3160-60066 ^c	24 A	16.5 to 18.5
E3102A/E3103A option 220 ^d	220 Vac	E3160-60267 ^b E3160-60067 ^c	20 A	6.5 to 10.0
E3102A/E3103A option 240 ^d	240 Vac	E3160-60268 ^b E3160-60068 ^c	20 A	6.5 to 10.0

- A 4-meter main power cable is furnished with the 4072A/4073A. The cable has a 30 A rating with a NEMA L6-30P plug.
- If the serial number of the 4072A/4073A is JP30G- or JP20H-, these PDUs are included.
- These PDUs are the old type, which has a different to that of the new type. For details, refer to the section “To Confirm PDU and EMO Operation” on page 34.
- The customer needs to prepare a main power cable and plug that satisfy the local installation code safety requirements, and that provide a means for earth grounding. For Japan, the customer needs to prepare a main power cable and plug that satisfy the Electrical Appliance and Material Control Law. The power cable must have a 20 A rating.

Connecting Main Power Cable

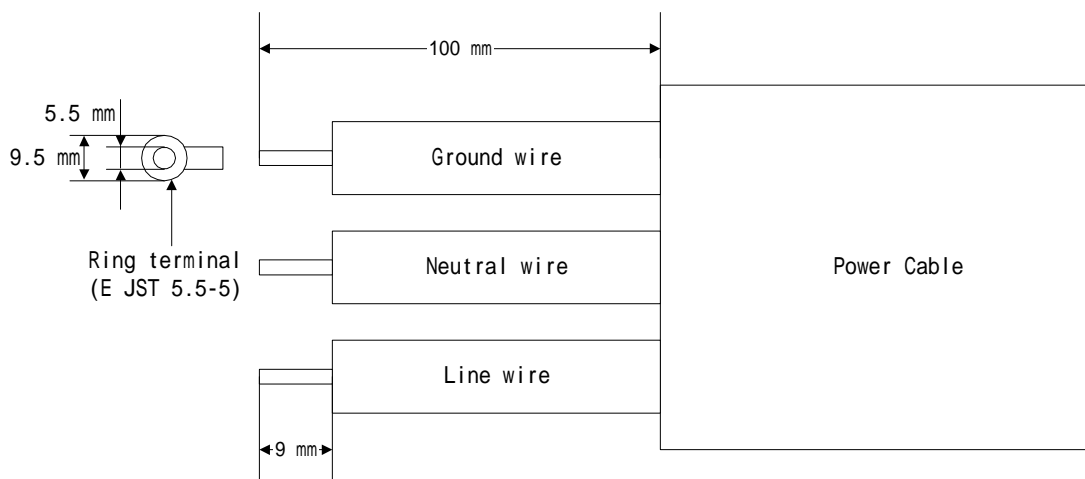
WARNING Main power cable installation must be performed by trained service personnel only. Incorrect installation will result in serious injury to operating personnel and damage to the equipment.

Connect the ground wire for the main power cable to the earth ground terminal at the installation site.

NOTE Before starting the following procedure, prepare a main power cable that satisfies the requirements shown in table 2-1.

Then, the PDU side of the main power cable must be prepared as follows:

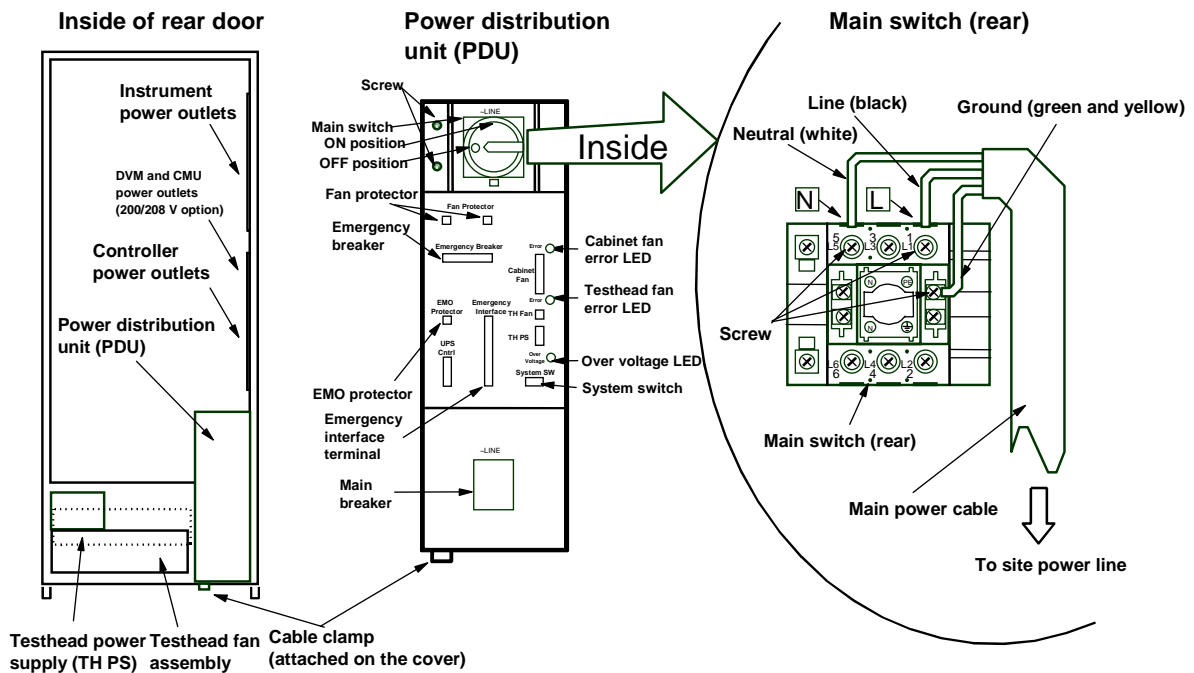
1. Cut the wires of the main power as shown in the following figure.
2. Attach a ring terminal to the ground wire of the main power cable.



Use the following procedure to connect the power distribution unit (PDU) to the power line (source) at the installation site.

1. Set the breaker for the switch board to OFF.
2. Open the rear door of the system cabinet with the key provided.
3. Set the main switch, main breaker and emergency breaker to OFF.
4. Remove the two screws at the left of the main switch, and remove the main switch.
5. Remove the PDU side panel.
6. Loosen the cable clamp.
7. Pass the main power cable through the cable clamp opening.
8. Connect the wires to the main switch as shown in figure 2-1.
9. Fasten the cable clamp securely.
10. Reinstall the PDU side panel (removed in step 5).
11. Reinstall the main switch (removed in step 4).
12. Connect the main power cable to the power line (source) at the installation site.
13. Connect the ground wire of the rear door to the ground point at the installation site.

Figure 2-1 PDU Locations and Power Cable Connection



To Confirm PDU and EMO Operation

Electrical Work Type 3:

WARNING 24 V is forced to the uninsulated parts of the EMO rear panel. Do not touch these parts.

After connecting the power distribution unit (PDU) to the power line (source) at the installation site, you must confirm the operation of the PDU and emergency off (EMO) circuit, as described in this section.

The EMO circuit places the 4072A/4073A in a safe shutdown condition when the circuit is activated. This circuit is activated automatically when certain conditions occur or when you manually press the EMO button, which is the *large red button* at the top front of the system cabinet.

There are two type of PDU. Before you confirm the operation of the PDU, check the part number. The part number is displayed on the panel of the main switch.

Figure 2-2 PDU Panel of the main switch

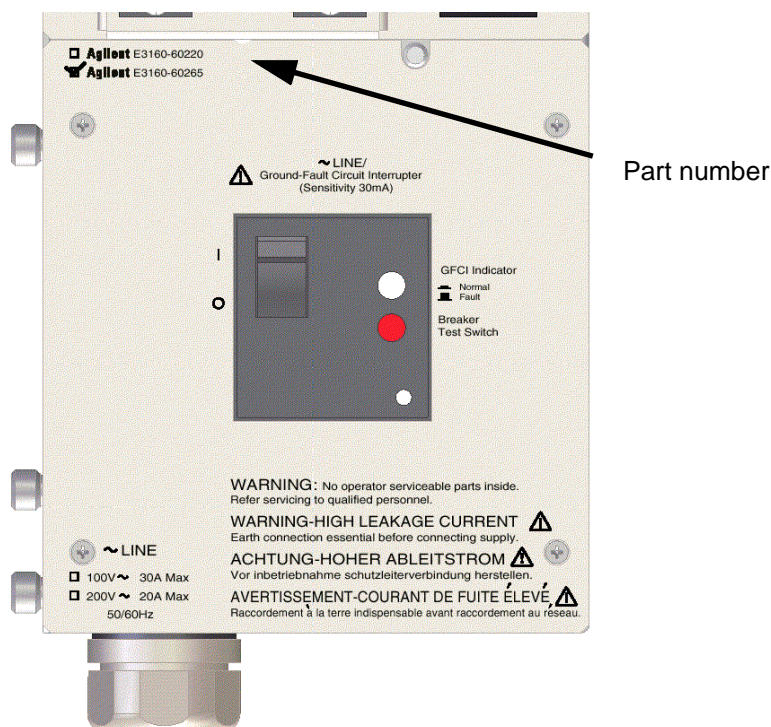
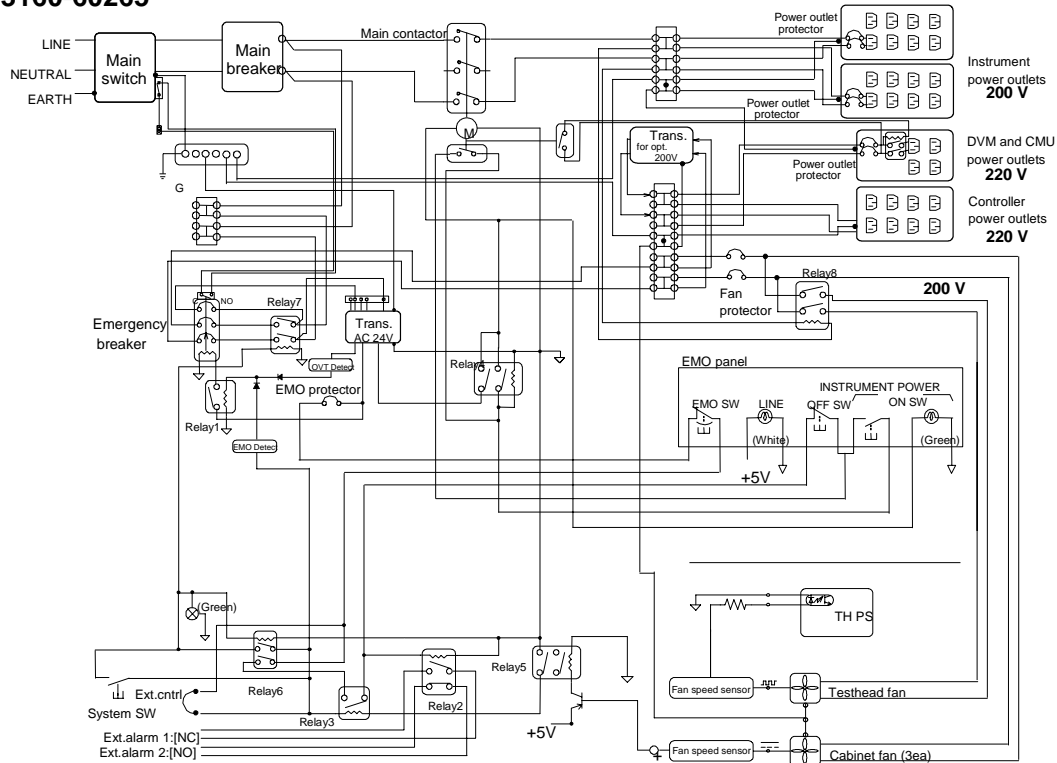


Figure 2-3 through figure 2-5 are overall circuit diagrams of the PDU and EMO circuits for 200 V, 208 V, and 220/240 V options.

Figure 2-3 PDU and EMO Circuit Diagram (200 V option)

E3160-60265



E3160-60065

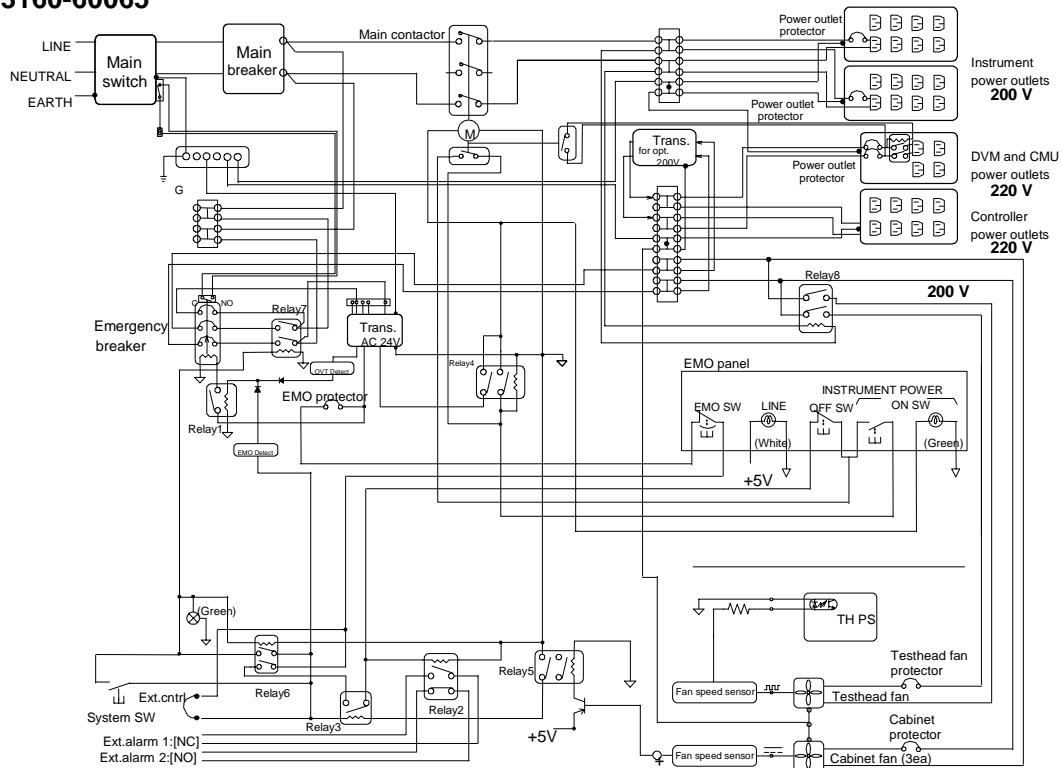
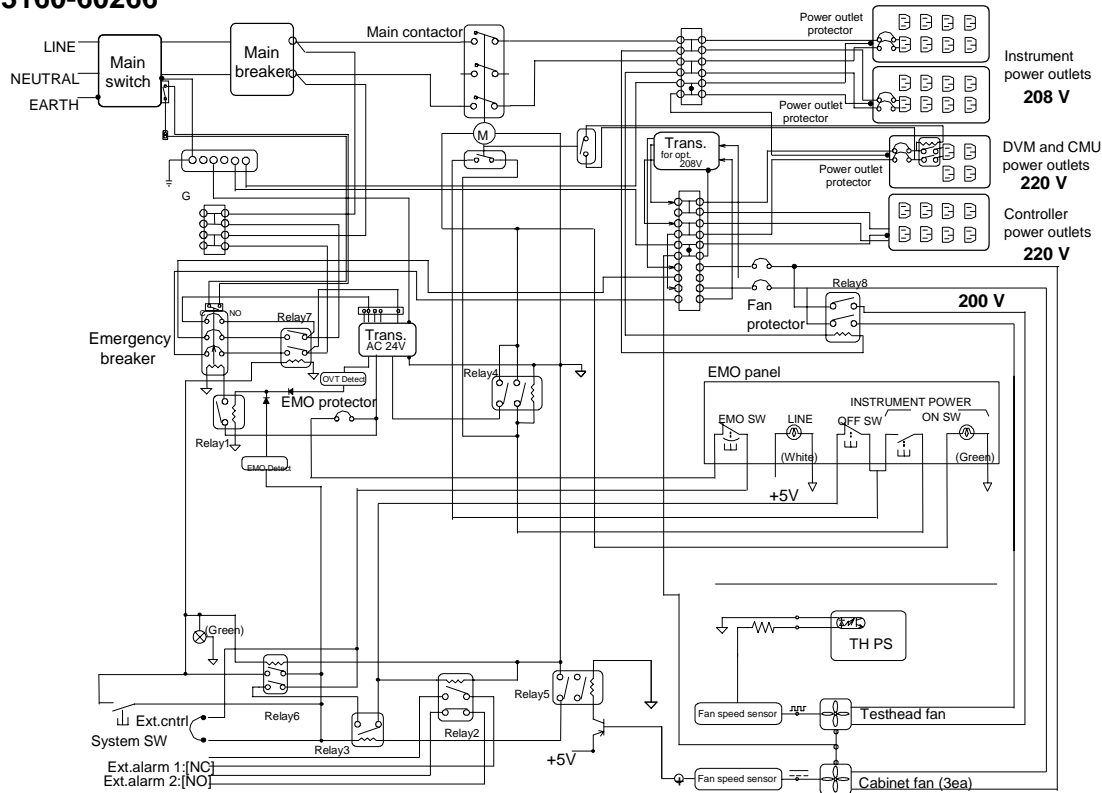


Figure 2-4 PDU and EMO Circuit Diagram (208 V option)
E3160-60266



E3160-60066

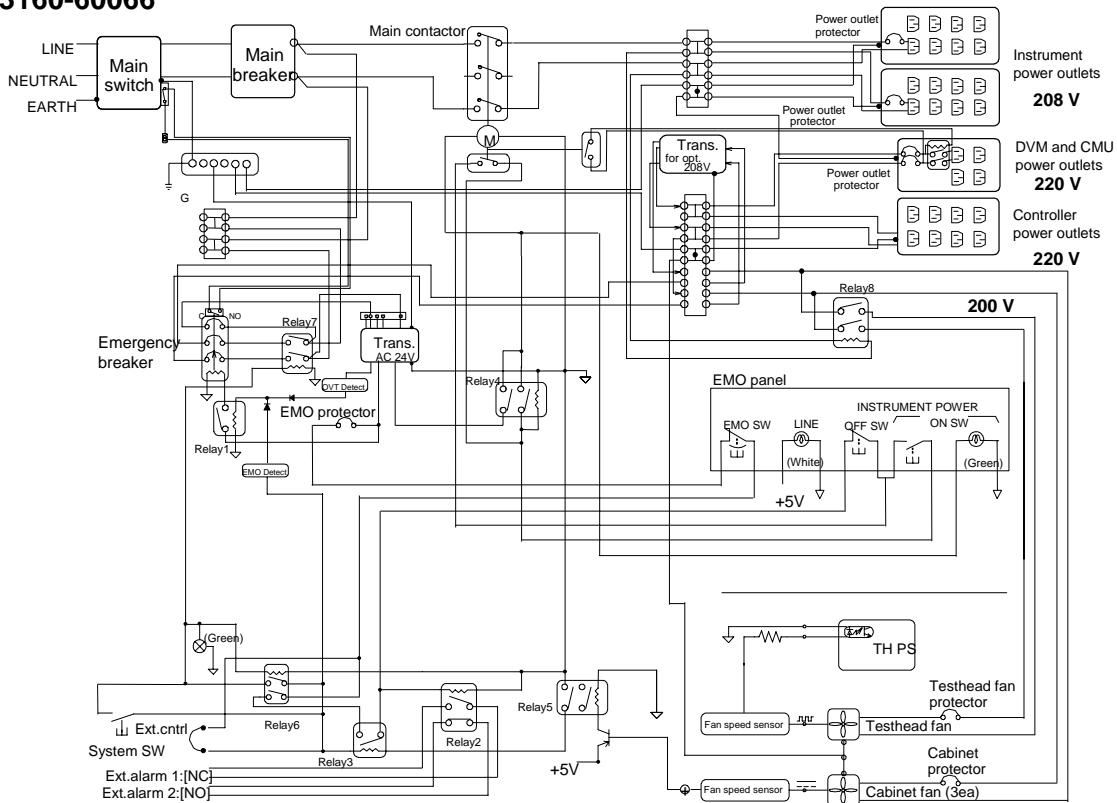
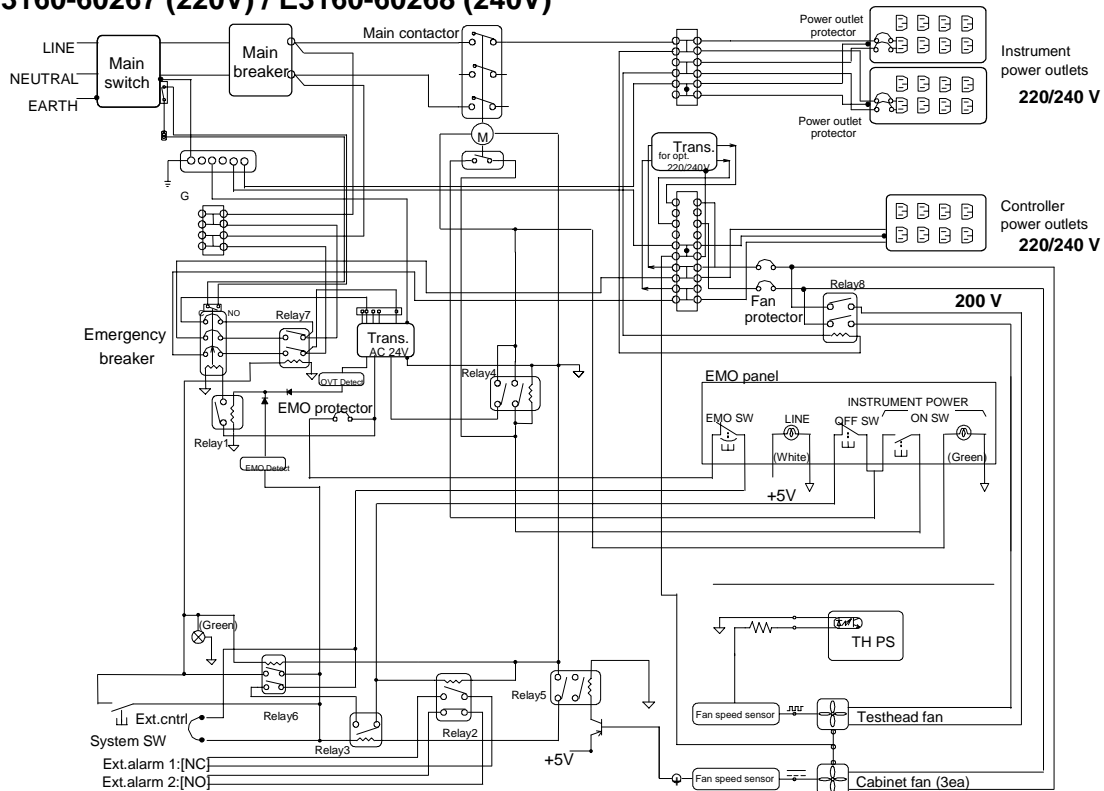
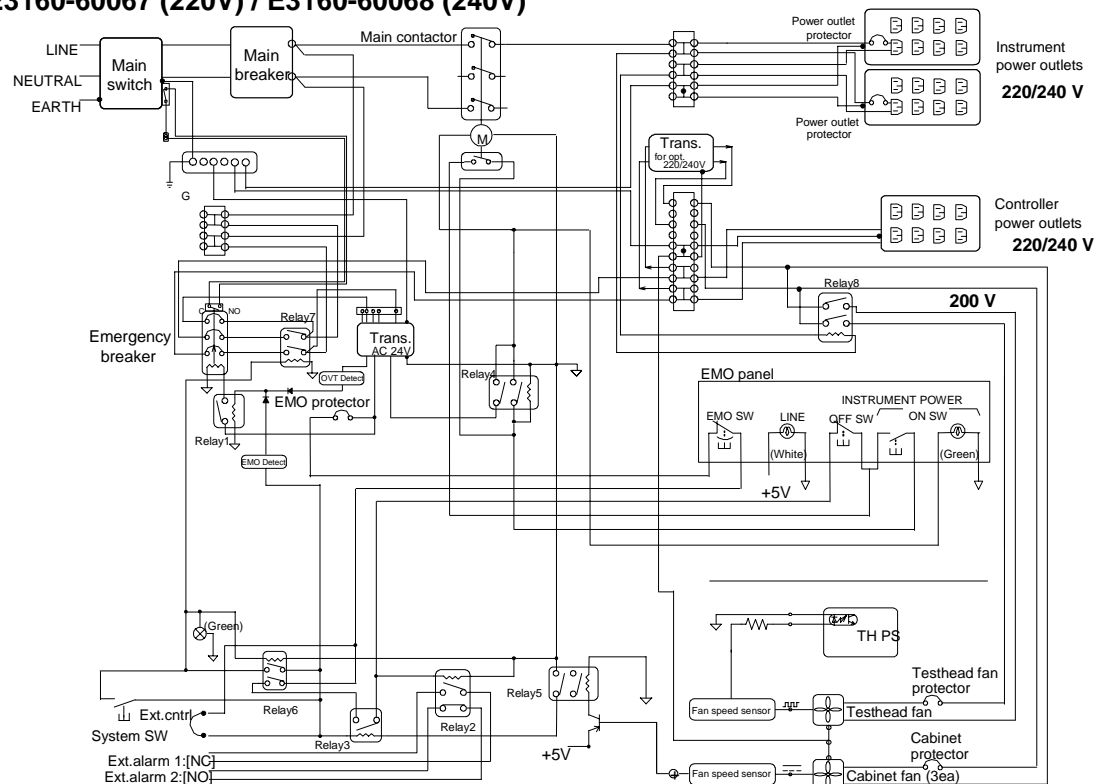


Figure 2-5 PDU and EMO Circuit Diagram (220/240 V option)
E3160-60267 (220V) / E3160-60268 (240V)



E3160-60067 (220V) / E3160-60068 (240V)



Installing System Cabinet

To Confirm PDU and EMO Operation

The procedures in this section confirm the operation of the following:

- ground-fault circuit interrupter (for option 200 only)
- main breaker
- emergency breaker
- main switch
- system switch
- LINE indicator
- INSTRUMENT POWER ON/OFF switches
- controller power outlets
- instrument power outlets
- DVM and CMU power outlets (for option 200 and 208 only)
- EMO button
- ext alarm 1 and 2 terminals
- ext control terminals
- EMO protector
- fan protector
- power outlet protector

For the location of the components shown in this procedure, see figure 2-6 and figure 2-7.

Figure 2-6 Power Outlet Locations

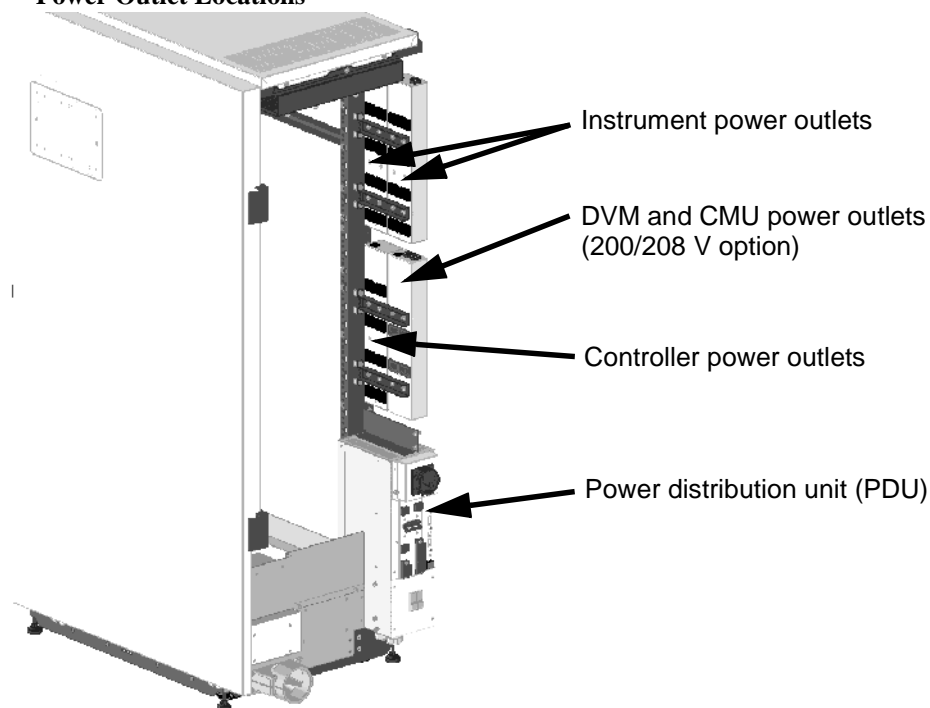
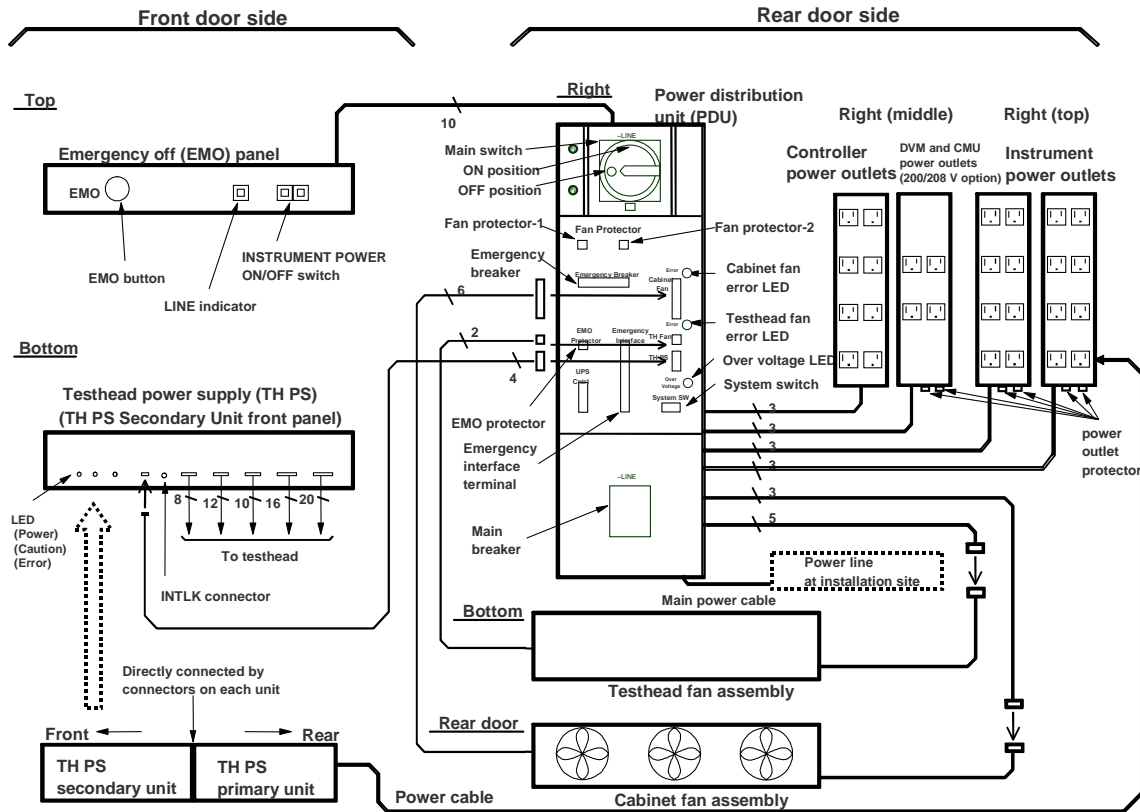


Figure 2-7 Component Locations for PDU and EMO Check



If the part number of PDU is E3160-60065, E3160-60066, E3160-60067, or E3160-60068, the fan protector switches are separated by function for the TH fan and the cabinet fan like figure 2-8.

Figure 2-8 Fan protector switch for E3160-60065, E3160-60066, E3160-60067, and E3160-60068



Performing PDU and EMO Operation Check

NOTE When all steps of the following procedure are completed, the PDU is ready for use.

If you have any problems performing this operation check, see the *Agilent 4072A/4073A Service Guide* to troubleshoot the PDU.

NOTE The PDU has two type. Before you check the function of PDU and EMO operation, confirm the part number of PDU.

To check PDU that is E3160-60265, E3160-60266, E3160-60267, or E3160-60268.

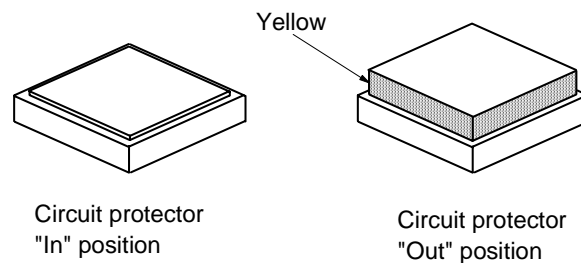
1. Disconnect all power cords from the power outlets in the system cabinet, and turn off all the instruments, controller, and peripherals.
2. Set the following:

Switch board breaker	OFF position
Main breaker	OFF position
Emergency breaker	OFF position
Main switch	OFF position
EMO button	Normal ("Out") position
EMO protector	"In" position
Fan protector-1	"In" position
Fan protector-2	"In" position
Power outlet protector	"In" position

To set the EMO button on the EMO panel to the "Out" position, rotate the switch in a clockwise direction.

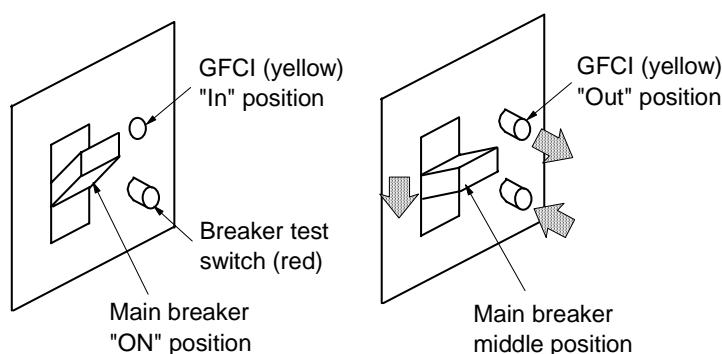
The position of the EMO, cabinet fan, and testhead fan protectors are exchanged by pressing the protector button.

Figure 2-9 Positions of EMO, Cabinet Fan, and Testhead Fan Protectors



3. For the E3102A/E3103A option 200 only, check the ground-fault circuit interrupter (GFCI) as follows:
 - a. Set the main breaker to the ON position. Confirm that the yellow push-button, labeled “GFCI Indicator”, is in its normal position (“In” position).
 - b. Press the red push-button, labeled “Breaker Test Switch”, to force earth leakage current. Confirm that the main breaker turns off (moved to middle position), and the GFCI indicator has moved to the “Out” position to indicate the earth leakage condition.
 - c. Set the main breaker to the ON position (reset the GFCI indicator) as follows:
 - i. Set the main breaker lever to the OFF position. The GFCI indicator moves to the “In” position.
 - ii. Set the main breaker lever to the ON position.

Figure 2-10 GFCI Indicator



4. Check the main breaker, emergency breaker, main switch, LINE indicator, system switch, and controller power outlets as follows:
 - a. Set the power board breaker to the ON position.
 - b. Set the main breaker to the ON position.
 - c. Set the emergency breaker to the ON position.
 - d. Set the main switch to the ON position.
 - e. Confirm if the over voltage LED turns on. If so, check the source power line.
 - f. Confirm that the LINE indicator on the EMO panel turns on.
 - g. Press the system switch, and confirm that the green LED in the system switch turns on.

NOTE Do steps d through g within 20 seconds. After 20 seconds, the cabinet fan error LED turns on. Set the main switch to the OFF position and repeat steps d through g.

- h. Confirm that the proper voltage is applied to the controller power outlets, using a hand-held multimeter.
 - i. Confirm that no voltage is being applied to the instrument power outlets.
 - j. (For options 200 and 208 only) Confirm that no voltage is being applied to the DVM and CMU power outlets.

5. Check the INSTRUMENT POWER ON/OFF switches, instrument power outlets, DVM and CMU power outlets, and power outlet protector as follows:
 - a. Press the INSTRUMENT POWER ON switch on the EMO panel.
 - b. Confirm that the green LED in the INSTRUMENT POWER ON switch turns on.
 - c. Confirm that the proper voltage is applied to the instrument power outlets using a hand-held multimeter.
 - d. (For options 200 and 208 only) Confirm that the proper voltage is applied to the DVM and CMU power outlets using a hand-held multimeter.
 - e. Press the power outlet protector to set it to the “Out” position. See figure 2-9.
 - f. Confirm that no voltage is applied to the instrument power outlets.
 - g. (For options 200 and 208 only) Confirm that no voltage is applied to the DVM and CMU power outlets.
 - h. Press the power outlet protector to set it to the “In” position. See figure 2-9.
 - i. Press the INSTRUMENT POWER OFF switch on the EMO panel.
 - j. Confirm that the green LED in the INSTRUMENT POWER ON switch turns off.
 - k. Confirm that no voltage is applied to the instrument power outlets.
 - l. (For options 200 and 208 only) Confirm that no voltage is applied to the DVM and CMU power outlets.
 - m. Press the INSTRUMENT POWER ON switch.
6. Check the EMO button and ext alarm 1 and 2 terminals as follows:
 - a. Check the conductivity of the ext alarm 1 and 2 terminals on the PDU using a hand-held multimeter. The resistance between the ext alarm 1 terminals must be set at approximately $0\ \Omega$, and the resistance between the ext alarm 2 terminals must be set very high.
 - b. Press the EMO button.
 - c. Confirm that the emergency breaker is set to the OFF position, and confirm that the LINE indicator and the green LED in the INSTRUMENT POWER ON switch is turned off.
 - d. Check the conductivity of the ext alarm 1 and 2 terminals in the emergency off condition. The resistance between the ext alarm 1 terminals must be set very high, and the resistance between the ext alarm 2 terminals must be set at approximately $0\ \Omega$.
 - e. Press the INSTRUMENT POWER ON switch, and confirm that the green LED in the INSTRUMENT POWER ON switch does not turn on.
 - f. Rotate the EMO button in a clockwise direction to set it to the “Out” position (normal position).
7. Check the ext control terminals as follows:
 - a. Confirm that the LINE indicator is turned off.
 - b. Remove the shorting bar connected between the ext control terminals.
 - c. Confirm that you cannot set the emergency breaker to the ON position.
 - d. Reinstall the shorting bar on the ext control terminals.
 - e. Set the emergency breaker to the ON position, and confirm that the LINE indicator turns on.
 - f. Press the system switch, and confirm that the green LED in the system switch turns on.

NOTE Do steps e through f within 20 seconds. After 20 seconds, the cabinet fan error LED turns on. Set the emergency breaker to the OFF position and repeat steps e through f.

- g. Press the INSTRUMENT POWER ON switch, and confirm that the green LED in the INSTRUMENT POWER ON switch turns on.
8. Check the EMO protector as follows:
- a. Press the EMO protector to set it to the “Out” position. See figure 2-9.
 - b. Confirm that the emergency breaker is set to the OFF position, and also confirm that the LINE indicator and the green LED in the INSTRUMENT POWER ON switch turn off.
 - c. Press the EMO protector to set it to the “In” position.
 - d. Set the emergency breaker to the ON position, and confirm that the LINE indicator turns on.
 - e. Press the system switch, and confirm that the green LED in the system switch turns on.

NOTE Do steps d through e within 20 seconds. After 20 seconds, the cabinet fan error LED turns on. Set the emergency breaker to the OFF position and repeat steps d through e.

- f. Press the INSTRUMENT POWER ON switch, and confirm that the green LED in the INSTRUMENT POWER ON switch turns on.
9. Check the fan protector as follows:
- a. Press the fan protector-1 to set it to the “Out” position. See figure 2-9.
 - b. Confirm the conditions of the following in a few minutes:

LINE indicator	On
Green LED in the INSTRUMENT POWER ON switch	Off
Cabinet fan	Stopped
Cabinet fan error LED (red)	Lit
Testhead fan	Stopped
Testhead fan error LED (red)	Lit
 - c. Press the fan protector -1 to set it to the “In” position.
 - d. Set the emergency breaker to the OFF position, and wait at least 3 seconds; then set it to the ON position. Confirm that the LINE indicator turns on.
 - e. Press the system switch, and confirm that the green LED in the system switch turns on.

NOTE Do steps d through e within 20 seconds. After 20 seconds, the cabinet fan error LED turns on. Repeat steps d through e.

- f. Press the INSTRUMENT POWER ON switch, and confirm that the green LED in the INSTRUMENT POWER ON switch turns on.
- g. Confirm that the cabinet fan and the testhead fan operate.

- h. Repeat steps a through g to check the fan protector -2 switch.
10. Set the main switch, emergency breaker, and main breaker to the OFF position.

To check PDU that is E3160-60065, E3160-60066, E3160-60067, or E3160-60068.

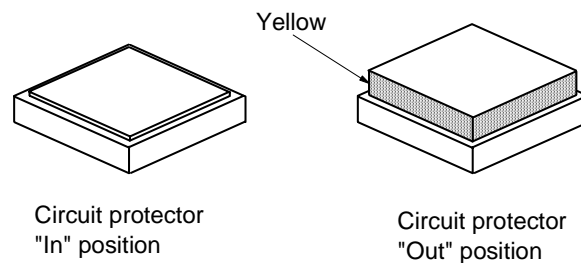
1. Disconnect all power cords from the power outlets in the system cabinet, and turn off all the instruments, controller, and peripherals.
2. Set the following:

Switch board breaker	OFF position
Main breaker	OFF position
Emergency breaker	OFF position
Main switch	OFF position
EMO button	Normal (“Out”) position
EMO protector	“In” position
Cabinet fan protector	“In” position
Testhead fan protector	“In” position
Power outlet protector	“In” position

To set the EMO button on the EMO panel to the “Out” position, rotate the switch in a clockwise direction.

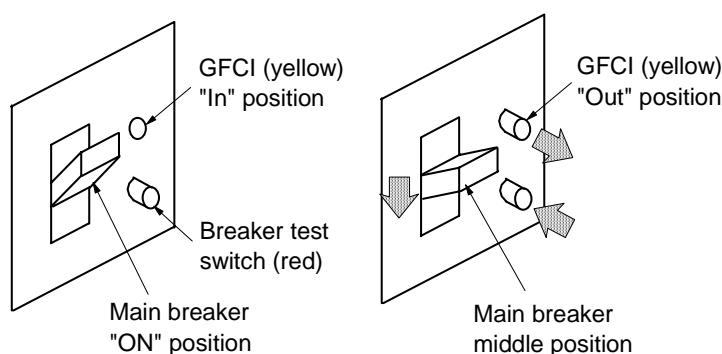
The position of the EMO, cabinet fan, and testhead fan protectors are exchanged by pressing the protector button.

Figure 2-11 Positions of EMO, Cabinet Fan, and Testhead Fan Protectors



3. For the E3102A/E3103A option 200 only, check the ground-fault circuit interrupter (GFCI) as follows:
 - a. Set the main breaker to the ON position. Confirm that the yellow push-button, labeled “GFCI Indicator”, is in its normal position (“In” position).
 - b. Press the red push-button, labeled “Breaker Test Switch”, to force earth leakage current. Confirm that the main breaker turns off (moved to middle position), and the GFCI indicator has moved to the “Out” position to indicate the earth leakage condition.
 - c. Set the main breaker to the ON position (reset the GFCI indicator) as follows:
 - i. Set the main breaker lever to the OFF position. The GFCI indicator moves to the “In” position.
 - ii. Set the main breaker lever to the ON position.

Figure 2-12 GFCI Indicator



4. Check the main breaker, emergency breaker, main switch, LINE indicator, system switch, and controller power outlets as follows:
 - a. Set the power board breaker to the ON position.
 - b. Set the main breaker to the ON position.
 - c. Set the emergency breaker to the ON position.
 - d. Set the main switch to the ON position.
 - e. Confirm if the over voltage LED turns on. If so, check the source power line.
 - f. Confirm that the LINE indicator on the EMO panel turns on.
 - g. Press the system switch, and confirm that the green LED in the system switch turns on.

NOTE Do steps d through g within 20 seconds. After 20 seconds, the cabinet fan error LED turns on. Set the main switch to the OFF position and repeat steps d through g.

- h. Confirm that the proper voltage is applied to the controller power outlets, using a hand-held multimeter.
 - i. Confirm that no voltage is being applied to the instrument power outlets.
 - j. (For options 200 and 208 only) Confirm that no voltage is being applied to the DVM and CMU power outlets.

5. Check the INSTRUMENT POWER ON/OFF switches, instrument power outlets, DVM and CMU power outlets, and power outlet protector as follows:
 - a. Press the INSTRUMENT POWER ON switch on the EMO panel.
 - b. Confirm that the green LED in the INSTRUMENT POWER ON switch turns on.
 - c. Confirm that the proper voltage is applied to the instrument power outlets using a hand-held multimeter.
 - d. (For options 200 and 208 only) Confirm that the proper voltage is applied to the DVM and CMU power outlets using a hand-held multimeter.
 - e. Press the power outlet protector to set it to the “Out” position. See figure 2-9.
 - f. Confirm that no voltage is applied to the instrument power outlets.
 - g. (For options 200 and 208 only) Confirm that no voltage is applied to the DVM and CMU power outlets.
 - h. Press the power outlet protector to set it to the “In” position. See figure 2-9.
 - i. Press the INSTRUMENT POWER OFF switch on the EMO panel.
 - j. Confirm that the green LED in the INSTRUMENT POWER ON switch turns off.
 - k. Confirm that no voltage is applied to the instrument power outlets.
 - l. (For options 200 and 208 only) Confirm that no voltage is applied to the DVM and CMU power outlets.
 - m. Press the INSTRUMENT POWER ON switch.
6. Check the EMO button and ext alarm 1 and 2 terminals as follows:
 - a. Check the conductivity of the ext alarm 1 and 2 terminals on the PDU using a hand-held multimeter. The resistance between the ext alarm 1 terminals must be set at approximately $0\ \Omega$, and the resistance between the ext alarm 2 terminals must be set very high.
 - b. Press the EMO button.
 - c. Confirm that the emergency breaker is set to the OFF position, and confirm that the LINE indicator and the green LED in the INSTRUMENT POWER ON switch is turned off.
 - d. Check the conductivity of the ext alarm 1 and 2 terminals in the emergency off condition. The resistance between the ext alarm 1 terminals must be set very high, and the resistance between the ext alarm 2 terminals must be set at approximately $0\ \Omega$.
 - e. Press the INSTRUMENT POWER ON switch, and confirm that the green LED in the INSTRUMENT POWER ON switch does not turn on.
 - f. Rotate the EMO button in a clockwise direction to set it to the “Out” position (normal position).
7. Check the ext control terminals as follows:
 - a. Confirm that the LINE indicator is turned off.
 - b. Remove the shorting bar connected between the ext control terminals.
 - c. Confirm that you cannot set the emergency breaker to the ON position.
 - d. Reinstall the shorting bar on the ext control terminals.
 - e. Set the emergency breaker to the ON position, and confirm that the LINE indicator turns on.
 - f. Press the system switch, and confirm that the green LED in the system switch turns on.

NOTE Do steps e through f within 20 seconds. After 20 seconds, the cabinet fan error LED turns on. Set the emergency breaker to the OFF position and repeat steps e through f.

- g. Press the INSTRUMENT POWER ON switch, and confirm that the green LED in the INSTRUMENT POWER ON switch turns on.
8. Check the EMO protector as follows:
- a. Press the EMO protector to set it to the “Out” position. See figure 2-9.
 - b. Confirm that the emergency breaker is set to the OFF position, and also confirm that the LINE indicator and the green LED in the INSTRUMENT POWER ON switch turn off.
 - c. Press the EMO protector to set it to the “In” position.
 - d. Set the emergency breaker to the ON position, and confirm that the LINE indicator turns on.
 - e. Press the system switch, and confirm that the green LED in the system switch turns on.

NOTE Do steps d through e within 20 seconds. After 20 seconds, the cabinet fan error LED turns on. Set the emergency breaker to the OFF position and repeat steps d through e.

- f. Press the INSTRUMENT POWER ON switch, and confirm that the green LED in the INSTRUMENT POWER ON switch turns on.
9. Check the cabinet fan protector as follows:
- a. Press the cabinet fan protector to set it to the “Out” position. See figure 2-11.
 - b. Confirm the conditions of the following in a few minutes:

LINE indicator	On
green LED in the INSTRUMENT POWER ON switch	Off
cabinet fan	Stopped
cabinet fan error LED (red)	Lit
 - c. Press the cabinet fan protector to set it to the “In” position.
 - d. Set the emergency breaker to the OFF position, and wait at least 3 seconds; then set it to the ON position. Confirm that the LINE indicator turns on.
 - e. Press the system switch, and confirm that the green LED in the system switch turns on.

NOTE Do steps d through e within 20 seconds. After 20 seconds, the cabinet fan error LED turns on. Repeat steps d through e.

- f. Press the INSTRUMENT POWER ON switch, and confirm that the green LED in the INSTRUMENT POWER ON switch turns on.

10. Check the testhead fan protector as follows:
 - a. Press the testhead fan protector to set it to the “Out” position. See figure 2-9.
 - b. Confirm the condition of the following:

testhead fan	Stopped
testhead fan error LED (red)	Lit
 - c. Press the testhead fan protector to set it to the “In” position.
 - d. Press the INSTRUMENT POWER OFF switch.
 - e. Press the INSTRUMENT POWER ON switch and confirm that the green LED in the INSTRUMENT POWER ON switch turns on.
 - f. Confirm that the testhead fan operates.
11. Set the main switch, emergency breaker, and main breaker to the OFF position.

Power Outlet and Power Cord Specifications

The 4072A/4073A has three types of power outlets:

- instrument power outlets (eight power outlets)
- controller power outlets (eight power outlets)
- (For options 200 and 208 only) DVM and CMU power outlets (four power outlets)

The power outlets are used to supply ac power to the instruments, controller, and peripherals installed in the system cabinet. The maximum current for the power outlets depends on the line voltage selection options (E3102A/E3103A options 200, 208, 220, and 240) as shown in table 2-2 and table 2-3.

Check the current consumption for instruments and peripherals installed in the system cabinet to make sure the maximum current for each outlet is sufficient. Also, check the total current consumed by all the instruments, controller, and peripherals connected to the power outlets. Total current must be less than the total current shown in table 2-2 and table 2-3.

Table 2-2 Maximum Current of Power Outlets (1)

Option No.	Instrument Power Outlets		Controller Power Outlets	
	Total Current	Maximum Current for Each Outlet	Total Current	Maximum Current for Each Outlet
E3102A/E3103A option 200	8 A	6 A	6 A	6 A
E3102A/E3103A option 208	8 A	6 A	6 A	6 A
E3102A/E3103A option 220	8 A	6 A	6 A	6 A
E3102A/E3103A option 240	8 A	6 A	6 A	6 A

Table 2-3 Maximum Current of Power Outlets (2)

Option No.	DVM and CMU Power Outlets	
	Total Current	Maximum Current for Each Outlet
E3102A/E3103A option 200	2 A	2 A
E3102A/E3103A option 208	2 A	2 A
E3102A/E3103A option 220	—	—
E3102A/E3103A option 240	—	—

CAUTION Before you turn on the 4072A/4073A, make sure that the line voltage selector switch for each instrument is set correctly. See the *Operation Manual* for each instrument for instructions on how to set these switches.

Also, make sure that the power cords, for instruments, controller, and peripherals installed in the system cabinet, are completely connected to the power outlets.

The following table lists the power cords used to connect the instruments, controller, testhead power supply (TH PS), and peripherals to the system cabinet power outlets.

Table 2-4 Power Cords for Instruments, Controller, TH PS, and Peripherals

Line Voltage (in Vac)	Agilent Part Number	Type of Plug
200/208/220/240	8120-1625	IEC 320 C14

NOTE If you need to enable the emergency off capability of the 4072A/4073A for the system controller, connect the power cord for the controller to a controller power outlet.

3 Rack-Mounting Instruments, System Controller, and Peripherals

This chapter describes how to mount the system controller, 17-inch color monitor, flat panel display, CD-ROM drive, DDS drive, Agilent 3458A digital multimeter, Agilent 4284A precision LCR meter, Agilent 8110A, Agilent 81110A, and Agilent 8114A pulse generator, and Agilent E4411B spectrum analyzer into the system cabinet.

This chapter contains the following sections:

- “Rack Mount Kits”
- “To Mount System Instruments (Agilent 4284A/Agilent 3458A)”
- “To Mount Pulse Generator (Agilent 8110A/81110A/8114A)”
- “To Mount 17-inch Color Monitor and Keyboard Shelf”
- “To Mount Flat Panel Display”
- “To Mount System Controller”
- “To Mount CD-ROM Drive (For JP10G-)”
- “To Mount DDS Drive (For JP30G-, JP20H-)”
- “To Mount Spectrum Analyzer (Agilent E4411B)”

Rack Mount Kits

This section describes three cabinet configurations as follows:

- cabinet configuration 1 (with monitor rack mount)
- cabinet configuration 2 (without the E4411B spectrum analyzer)
- cabinet configuration 3 (with the E4411B spectrum analyzer)

Figure 3-1 through figure 3-8 shows the front view of the system cabinet, and the position of the system controller, 17-inch color monitor, CD-ROM drive, DDS drive, the 3458A digital multimeter, and the 4284A precision LCR meter without the 8110A, 81110A, 8114A pulse generator, and the E4411B spectrum analyzer.

Cabinet Configuration 1 (with Monitor Rack Mount)

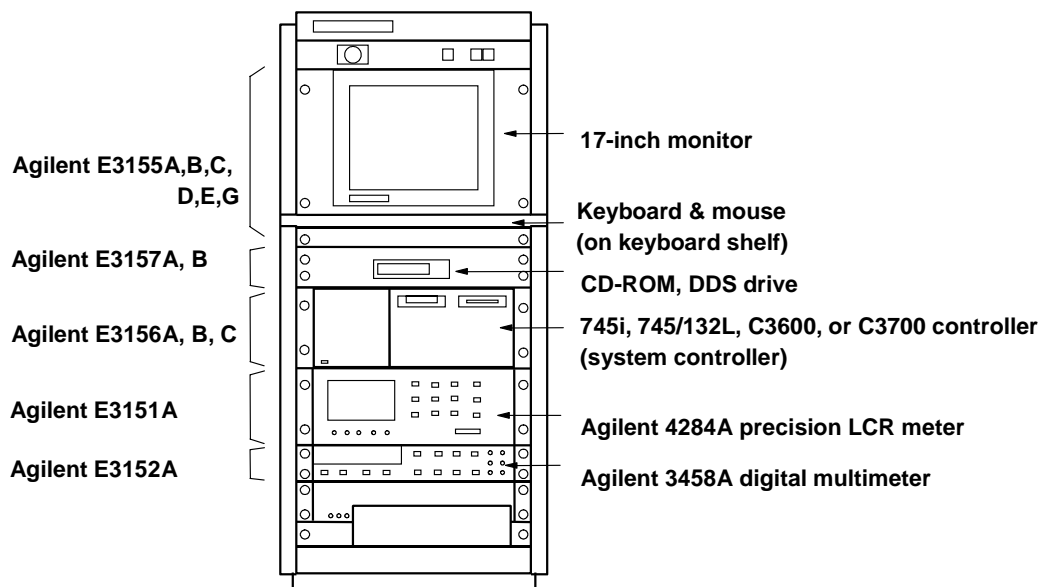
Figure 3-1 shows the position where the system controller, 17-inch color monitor, CD-ROM drive, DDS drive, the 3458A, 4284A are to be installed when the 17-inch monitor is mounted in the system cabinet.

NOTE If the 17-inch color monitor is mounted in the system cabinet, the pulse generator and spectrum analyzer cannot be mounted in the system cabinet.

NOTE The external CD-ROM drive cannot be mounted into the system cabinet of the 4072A (JP20G-) and 4073A (JP10H-) but can be mounted into the system cabinet of the 4072A (JP10G-).

NOTE The external DDS drive only can be mounted into the system cabinet of the 4072A (JP30G-) and 4073A (JP20H-).

Figure 3-1 Rack Mount Positions in the System Cabinet (No Pulse Generator Installed)



Cabinet Configuration 2 (without E4411B)

Figure 3-2 through figure 3-5 shows the position where the 8110A or 81110A and 8114A pulse generators are to be installed. Up to five 8110As or 81110As can be installed without the 8114A. Up to four 8110As or 81110As can be installed with one 8114A, and up to two 8110As or 81110As with two 8114As.

NOTE You cannot install the 8110As and 81110As simultaneously into the same 4072A/4073A system cabinet.

If the E3102A/E3103A option 025 and 026 rack mount option, for the C3600/C3700 system controller and the DDS drive, are ordered, up to four 8110As or 81110As can be installed without the 8114A. For details about PGU configuration, refer to the Table 3-1.

Table 3-1 Maximum Number of Installed Pulse Generators

Number of Agilent 8114A	Number of Agilent 8110A or Agilent 81110A (When 745/132L or C3600/C3700 is mounted.)	Number of Agilent 8110A or Agilent 81110A (When C3600/C3700 with DDS drive is mounted.)
0	5	4
1	4	3
2	2	1

The 8110As, 81110A, or 8114As are installed in the upper part of the cabinet, and named PG 1, PG 2, PG 3, PG 4, and PG 5, starting from the bottom PG. With one 8114A, the 8114A is installed in the bottom position, and named PG 1. With two 8114As, the first 8114A is installed in the bottom position, and named PG 1, the second is installed in the top position, and named PG # (# is the largest number of the PGs). For example, when one 8110A or 81110A and two 8114As are installed, the first 8114A is PG 1, the 8110A or 81110A is PG 2, and the second 8114A is PG 3 from the bottom PG.

The 81110As are mounted opposite with the system cabinet for air cooling. You cannot install the 8110As and 81110As simultaneously into the same 4072A/4073A system cabinet. If the serial number of the 4072A/4073A prefixed with JP20G-, JP30G-, JP10H-, or JP20H-, the 81110A can be mounted into the system cabinet. If the serial number of the 4072A prefixed with JP10G-, the E3153A option 100 or 101 cabinet upgrade kit is needed to install the 81110A.

If the serial number of 4072A/4073A prefixed with JP30G- or JP20H-, the C3600/C3700 system controller can be mounted into the system cabinet. If the serial number of 4072A/4073A prefixed with JP10G-, JP20G-, or JP10H-, the E3153A option 101 cabinet upgrade kit and the E3156C rack mount kit are needed to install the C3600/C3700 system controller.

Table 3-2 shows the relations between the configuration and required options. Choose appropriate options by using this support matrix, and refer to the chapters corresponding to installing them.

Table 3-2 Configuration vs. Required Options

Configuration			Required Options					
Model Number/ Serial Number	Mounted System Controller	Installed Pulse Generator	E3153A PG Integration Kit					
			001 ^a	002 ^a	003 ^a	004 ^a	100 ^b	101 ^c
4072A/JP10G	745i 745/132L	No PG						
		8114A only				√		
		8110A only	√	√				
		8110A and 8114A	√	√		√		
		81110A only	√		√		√	
		81110A and 8114A	√		√	√	√	
	C3600 C3700	No PG						
		8114A only				√		
		8110A only	√	√				
		8110A and 8114A	√	√		√		
		81110A only	√		√			√
		81110A and 8114A	√		√	√		√
4072A/JP20G 4073A/JP10H	745i 745/132L	No PG						
		8114A only				√		
		8110A only	√	√				
		8110A and 8114A	√	√		√		
		81110A only	√		√			
		81110A and 8114A	√		√	√		
	C3600 C3700	No PG						√
		8114A only				√		√
		8110A only	√	√				√
		8110A and 8114A	√	√		√		√
		81110A only	√		√			√
		81110A and 8114A	√		√	√		√
4072A/JP30G 4073A/JP20H	745i 745/132L	No PG					√	
		8114A only				√	√	
		8110A only	√	√			√	
		8110A and 8114A	√	√		√	√	
		81110A only	√		√		√	
		81110A and 8114A	√		√	√	√	
	C3600 C3700	No PG						
		8114A only				√		
		8110A only	√	√				
		8110A and 8114A	√	√		√		
		81110A only	√		√			
		81110A and 8114A	√		√	√		

- To install the option 001/002/003/004, See “To Mount Pulse Generator (Agilent 8110A/81110A/8114A)” on page 82.
- To install the option 100, See “To Install Upgrade Kit for Agilent 81110A Rack Mount Kit (E3153A option 100).” on page 85.
- To install the option 101, See “To Install Upgrade Kit for Agilent 81110A Rack Mount Kit (E3153A option 101).” on page 88.

Figure 3-2 Rack Mount Positions (Agilent 8110A/8114A + 745i or 745/132L)

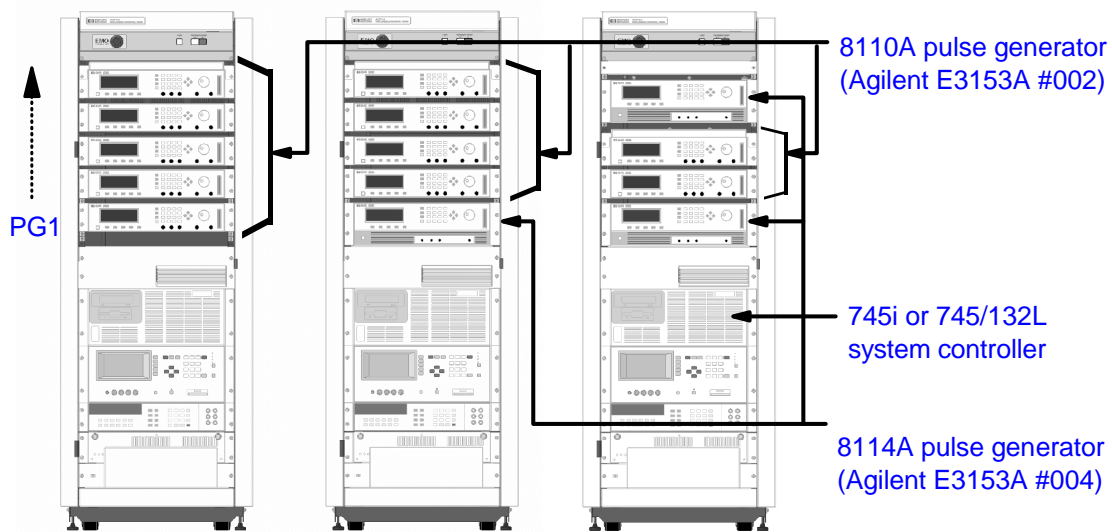


Figure 3-3 Rack Mount Positions (Agilent 81110A/8114A + 745i or 745/132L)

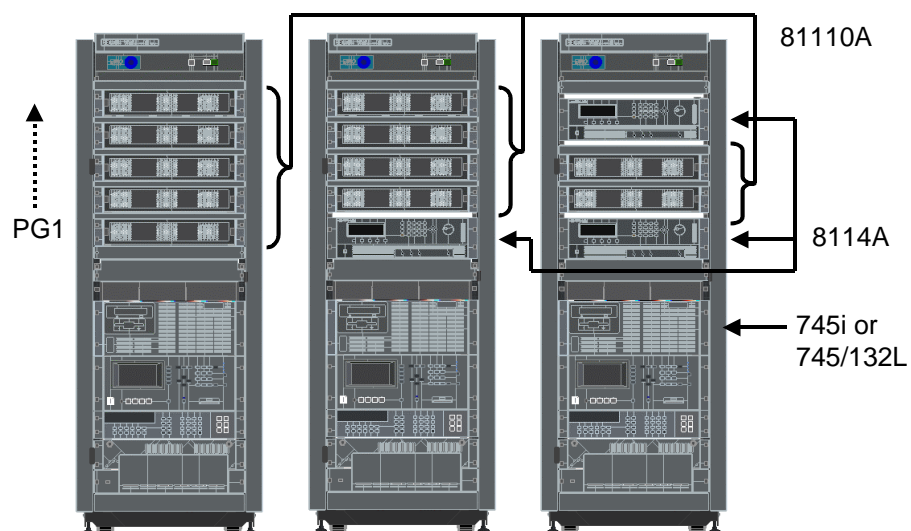


Figure 3-4 Rack Mount Positions (Agilent 81110A/8114A + C3600/C3700 without DDS drive)

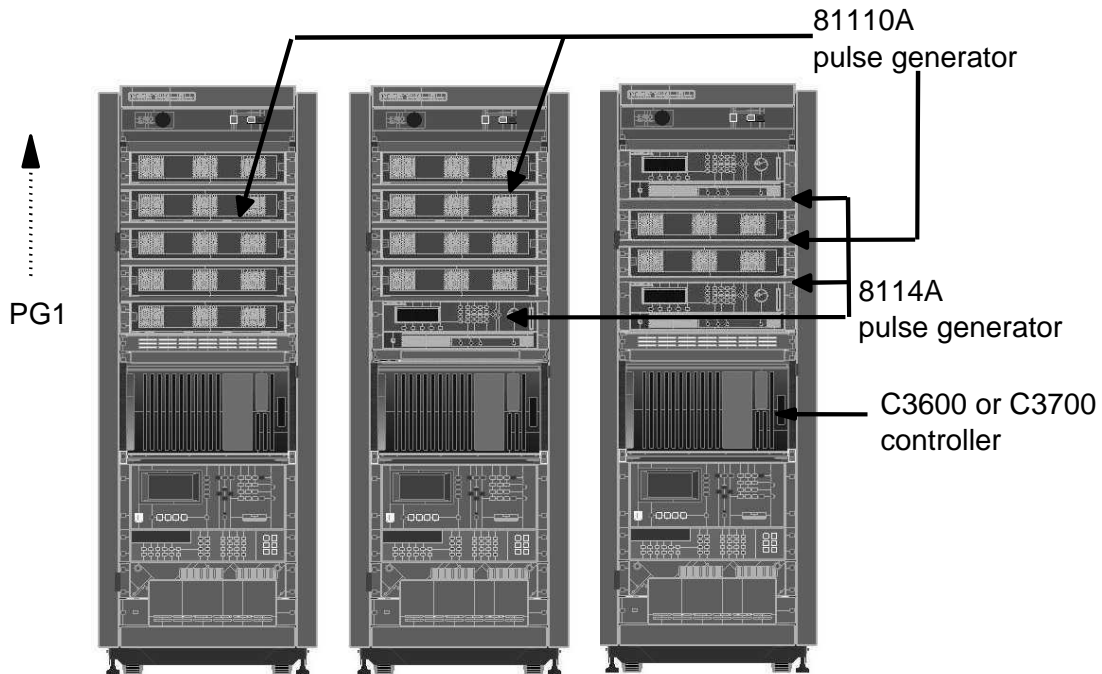
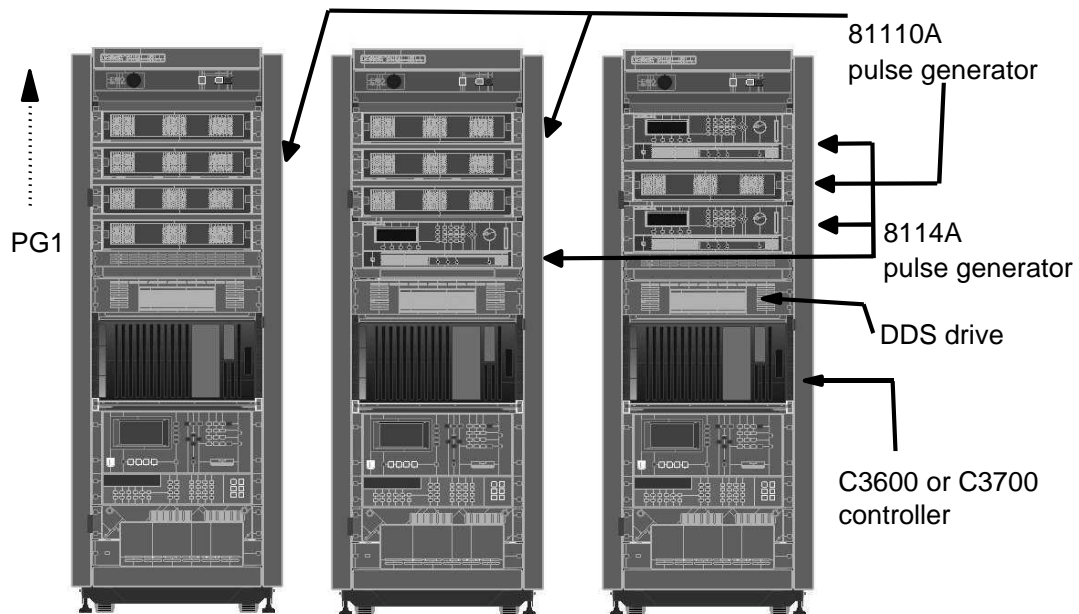


Figure 3-5 Rack Mount Positions (Agilent 81110A/8114A + C3600/C3700 with DDS drive)



Cabinet Configuration 3 (with E4411B)

There are two configuration when installing the E4411B spectrum analyzer into the system cabinet as follows:

- without the system controller rack mount
- with the system controller rack mount

In the each configuration, the number of pulse generator to be installed into the system cabinet is different.

Without System Controller Rack Mount

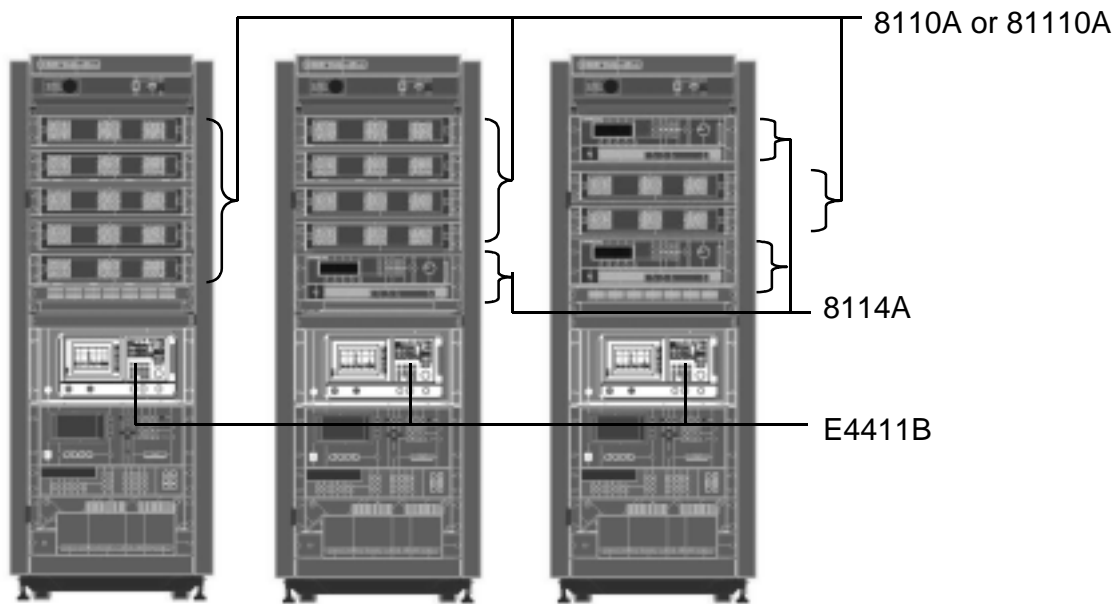
Figure 3-6 shows the position where the E4411B spectrum analyzer and pulse generators are to be installed when the system controller is not mounted in the system cabinet. Table 3-3 shows the maximum number of installed pulse generators in the system cabinet.

NOTE You cannot install the 8110As and 81110As simultaneously into the same 4072A/4073A system cabinet.

Table 3-3 Maximum Number of Installed Pulse Generators (with E4411B + 8110A/81110A/8114A without System Controller)

Number of Agilent 8114A	Number of Agilent 8110A or Agilent 81110A
0	5
1	4
2	2

Figure 3-6 Rack Mount Positions (E4411B + 81110A/8114A without System Controller)



With System Controller Rack Mount

Figure 3-7 and figure 3-8 shows the position where the E4411B spectrum analyzer and pulse generators are to be installed when the system controller is rackmounted in the system cabinet. The Table 3-4 shows the maximum number of installed pulse generators in the system cabinet.

NOTE You cannot install the 8110As and 81110As simultaneously into the same 4072A/4073A system cabinet.

If the E3102A/E3103A option 025 and 026 rack mount option, for the C3600/C3700 system controller and the DDS drive, are ordered, only one 8110A, 81110A, or 8114A can be installed in the system cabinet. For details about PGU configuration, refer to the Table 3-4.

Table 3-4 Maximum Number of Installed Pulse Generators (with E4411B + 8110A/81110A/8114A with System Controller)

Number of Agilent 8114A	Number of Agilent 8110A or Agilent 81110A (When 745i, 745/132L, or C3600/C3700 without DDS is mounted)	Number of Agilent 8110A or Agilent 81110A (When C3600/C3700 with DDS is mounted)
0	2	1
1	1	0
2	0	—

Figure 3-7 Rack Mount Positions (E4411B + 8110A/8114A with System Controller)

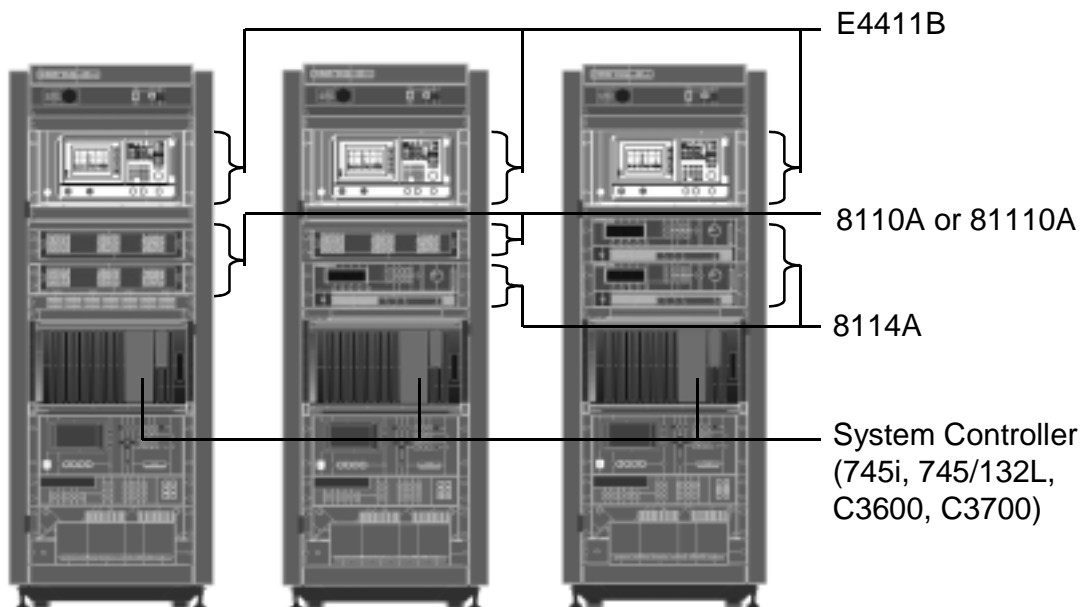
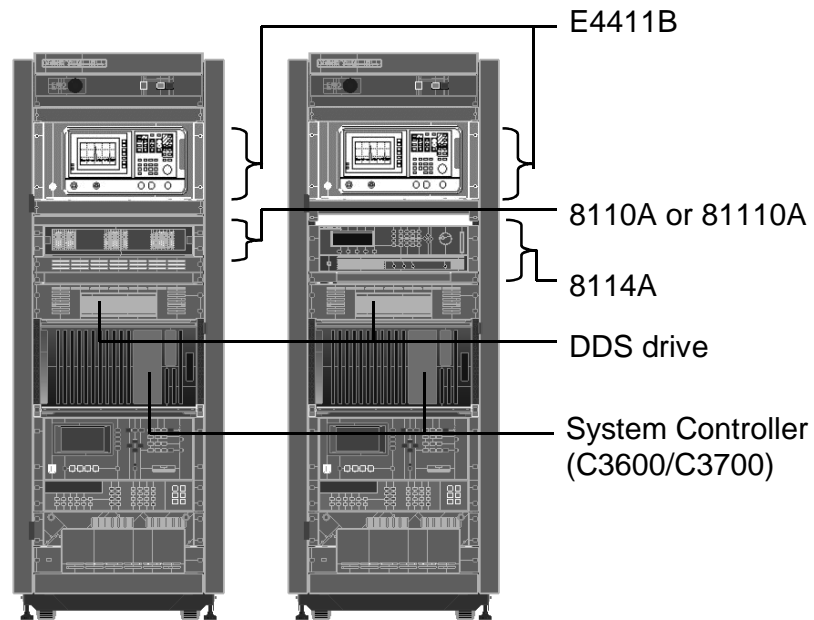


Figure 3-8 Rack Mount Positions (E4411B + 81110A/8114A with C3600/C3700 + DDS)



Contents of Rack Mount Kit

Rack mount kits for mounting the system instruments, system controller, and peripherals into the system cabinet are shown below. For the contents of each rack mount kit, see table 3-5 through table 3-26.

- Agilent E3151A rack mount kit for the Agilent 4284A LCR meter
- Agilent E3152A rack mount kit for the Agilent 3458A multimeter
- Agilent E3153A rack mount kit for the Agilent 8110A/81110A/8114A pulse generator
- Agilent E3155A rack mount kit for the HP A2287A 17-inch monitor
- Agilent E3155B rack mount kit for the HP A4330A 17-inch monitor
- Agilent E3155C rack mount kit for the HP A4490A 17-inch monitor
- Agilent E3155D rack mount kit for the HP D2838W 17-inch monitor
- Agilent E3155E rack mount kit for the HP D8900A 17-inch monitor
- Agilent E3155F rack mount kit for the flat panel display
- rack mount accessories for the HP D8906A 17-inch monitor
- Agilent E3156A rack mount kit for the 745i controller
- Agilent E3156B rack mount kit for the 745/132L controller
- Agilent E3156C rack mount kit for the C3600/C3700 controller
- Agilent E3157A rack mount kit for the CD-ROM drive (For JP10G-)
- Agilent E3157B rack mount kit for the DDS drive (For JP30G-, JP20H-)
- rack mount accessories for the Agilent E4411B spectrum analyzer

Rack Mount Kit for Agilent 4284A

Table 3-5 lists the accessories furnished with the E3151A rack mount kit. They are used to mount the 4284A into the system cabinet.

Table 3-5 Contents of Rack Mount Kit for Agilent 4284A (Agilent E3151A)

Description	Part Number	Quantity
Screw M4×12	0515-1718	4
BNC-T (m-f-f) type adapter	1250-2405C	3
Agilent 16048E test leads	16048-60002	1
Screw 10-32	2680-0278C	8
Power cord, universal	8120-1625	1
GPIB cable, 1 m	8120-3445	1
Flange	E3160-01215	2
Support rail extension adapter ^a	E3160-01258	2
Support rail	E3160-01261	2

a. This part is used for the 4071A (JP10D-).

Rack Mount Kit for Agilent 3458A

Table 3-6 lists the accessories furnished with the E3152A rack mount kit. They are used to mount the 3458A into the system cabinet.

Table 3-6 Contents of Rack Mount Kit for Agilent 3458A (Agilent E3152A)

Description	Part Number	Quantity
Screw M4×12	0515-1718	4
Screw 10-32	2680-0278C	8
Power cord, universal	8120-1625	1
GPIB cable, 1 m	8120-3445	1
Test leads (BNC-banana-plug cable)	E3120-61683	1
Flange	E3160-01216	2
Support rail extension adapter ^a	E3160-01258	2
Support rail	E3160-01261	2

a. This part is used for the 4071A (JP10D-).

Rack Mount Kit for Pulse Generator

Table 3-7 lists the contents of the E3153A pulse generator integration kit. The E3153A option 001 is used to install the first pulse generator. Option 002, 003, and 004 are used to mount the 8110A, 81110A, or 8114A into the system cabinet. Option 100 is used to upgrade the system cabinet to install the 81110A into the system cabinet. Option 101 is used to upgrade the system cabinet to install the 81110A and the C3600 system controller into the system cabinet.

Table 3-7 Contents of Pulse Generator Integration Kit (Agilent E3153A)

Product No.	Option No.	Description
E3153A	001	first pulse generator integration kit
	002	Rack mount kit for the 8110A
	003	Rack mount kit for the 81110A
	004	Rack mount kit for the 8114A
	100	Upgrade kit for the 81110A rack mount kit
	101	Upgrade kit for the 81110A with the C3600

First Pulse Generator Integration Kit (Agilent E3153A option 001)

Table 3-8 lists the accessories furnished with the integration kit for the first pulse generator. They are used to mount the first pulse generator into the system cabinet.

Table 3-8 Contents of first Pulse Generator Integration Kit (Agilent E3153A option 001)

Description	Part Number	Quantity
BNC-triaxial adapter	1250-0595	2
Cable tie	1400-0493C	4
Zipper tube, 3m	1400-2242	1
Screw 10-32	2680-0278C	5
GPIB cable, 2 m	8120-3446	1
zip lock sealing	8710-1576	1
1-to-2 adapter	E3125-61042	3
BNC cable for pulse switch	E3125-61607	7
Trigger distributor	E3150-61021	1
BNC(f)-to-BNC(m) cable assembly, 115 cm, white	E3150-61602	2
Cover ^a	E3160-04063	1

a. This part is installed on the top of the pulse generator which is the 8110A.

Contents of Rack Mount Kit**Rack Mount Kit for Agilent 8110A (Agilent E3153A option 002)**

Table 3-9 lists the accessories furnished with the rack mount kit for the 8110A. They are used to mount the 8110A into the system cabinet.

Table 3-9 Contents of Rack Mount Kit for Agilent 8110A (Agilent E3153A option 002)

Description	Part Number	Quantity
BNC(f)-to-BNC(m) cable assembly, 115 cm, yellow	04062-61604	1
BNC(f)-to-BNC(m) cable assembly, 115 cm, blue	04062-61608	1
Screw M4×12	0515-1718	4
Screw 10-32	2680-0278C	4
Power cord	8120-1763	1
GPIB cable, 50 cm	8120-3444	1
PG cable, 4.6 m	E3150-61601	2
Label	E3150-89101	1
Flange	E3160-01251	2
Support rail	E3160-01263	2

Rack Mount Kit for Agilent 81110A (Agilent E3153A option 003)

Table 3-10 lists the accessories furnished with the rack mount kit for the 81110A. They are used to mount the 81110A into the system cabinet.

Table 3-10 Contents of Rack Mount Kit for Agilent 81110A (Agilent E3153A option 003)

Description	Part Number	Quantity
BNC(f)-to-BNC(m) cable assembly, 115 cm, yellow	04062-61604	1
BNC(f)-to-BNC(m) cable assembly, 115 cm, blue	04062-61608	1
Screw M4×12	0515-1718	4
Screw 10-32	2680-0278C	8
Screw 10-32×.75	2680-0320	4
Power cord	8120-1763	1
GPIB cable, 50 cm	8120-3444	1
PG cable, 4.6 m	E3150-61601	2
Label	E3150-89101	1
Support rail	E3160-01267	2
Cover	E3160-04102	1
Flange, right	E3160-60100	1
Flange, left	E3160-60101	1

Rack Mount Kit for Agilent 8114A (Agilent E3153A option 004)

Table 3-11 lists the accessories furnished with the rack mount kit for the 8114A. They are used to mount the 8114A into the system cabinet.

Table 3-11 Contents of Rack Mount Kit for Agilent 8114A (Agilent E3153A option 004)

Description	Part Number	Quantity
BNC(f)-to-BNC(m) cable assembly, 115 cm, yellow	04062-61604	1
BNC(f)-to-BNC(m) cable assembly, 115 cm, blue	04062-61608	1
Feed through, 50Ω	04192-61002	1
Screw M4×12	0515-1718	6
Nut 10-32	0590-0804	8
Screw 10-32	2680-0278C	10
Power cord	8120-1763	1
GPIB cable, 1 m	8120-3445	1
Transition time converter	E3150-61022	1
PG cable, 4.6 m	E3150-61601	1
BNC cable for transition time converter, 50 cm	E3150-61603	1
Label	E3150-89101	1
Support rail	E3160-01263	2
Flange, right	E3160-01298	1
Flange, left	E3160-01299	1

Upgrade Kit for Agilent 81110A Rack Mount Kit (Agilent E3153A option 100)

Table 3-12 lists the accessories furnished with the upgrade kit for the 81110A rack mount kit. They are used to upgrade the system cabinet for mounting the first 81110A into the system cabinet.

Table 3-12 Contents of Upgrade Kit for Agilent 81110A Rack Mount Kit (Agilent E3153A option 100)

Description	Part Number	Quantity
Screw M4 L8	0515-1012	4
Nut M5×0.8	0535-0081	8
Nut 10-32	0590-0804	14
Screw 10-32	2680-0278C	41
Screw 10-32×.75	2680-0320	4
Chassis for mounting shelter plate, right	E3160-00150	1
Chassis for mounting shelter plate, left	E3160-00151	1
Front panel for TH PS	E3160-00208	1
Front panel	E3160-00257	1
Blank panel ^a	E3160-00258	1
Shelter plate	E3160-00606	1
Cover for the DVM airflow	E3160-00607	2
Angle for mounting shelter plate, right	E3160-00608	1
Angle for mounting shelter plate, left	E3160-00609	1
Rear plate for TH PS	E3160-00610	1
Rear plate for system controller ^b	E3160-00611	1
Rear plate for CMU ^b	E3160-00612	1
Rear plate for DVM ^b	E3160-00613	1
Flange	E3160-01219	2
Hinge, right	E3160-01265	1
Hinge, left	E3160-01266	1
Cover for the top of the 81110A	E3160-04065	1
Blank panel	E3160-04066	1
Fan cover for the system controller	E3160-04101	1

a. This part is used at the top position installed pulse generator in the system cabinet.

b. These parts are used when each instrument is not installed in the system cabinet.

Upgrade Kit for Agilent 81110A and C3600 controller Rack Mount Kit (Agilent E3153A option 101)

Table 3-13 lists the accessories furnished with the upgrade kit for the 81110A rack mount kit. They are used to upgrade the system cabinet for mounting the first 81110A into the system cabinet.

Table 3-13 Contents of Upgrade Kit for Agilent 81110A Rack Mount Kit (Agilent E3153A option 101)

Description	Part Number	Quantity
Screw M4 L8	0515-1012	4
Nut M5×0.8	0535-0081	8
Nut 10-32	0590-0804	14
Screw 10-32	2680-0278C	36
Screw 10-32×.75	2680-0320	4
Chassis for mounting shelter plate, right	E3160-00152	1
Chassis for mounting shelter plate, left	E3160-00153	1
Front panel for TH PS	E3160-00208	1
Blank panel ^a	E3160-00258	1
Cover for the DVM airflow	E3160-00607	2
Rear plate for TH PS	E3160-00610	1
Rear plate for DVM ^b	E3160-00613	1
Angle for mounting shelter plate, left	E3160-00618	1
Angle for mounting shelter plate, right	E3160-00619	1
Shelter plate	E3160-00620	1
Rear plate for C3600 ^b	E3160-00621	1
Rear plate for CMU ^b	E3160-00622	1
Hinge, right	E3160-01265	1
Hinge, left	E3160-01266	1
Cover for the top of the 81110A	E3160-04065	1
Front panel	E3160-04068	1

a. This part is used at the top position installed pulse generator in the system cabinet.

b. These parts are used when each instrument is not installed in the system cabinet.

Rack Mount Kits for 17-inch Monitors

There are six types of rack mount kits for use with four different types of 17-inch monitors, as shown in the tables below. Table 3-14 lists the accessories furnished with the E3155A rack mount kit. They are used to mount the HPA2287A 17-inch monitor into the system cabinet.

Table 3-14 Contents of Rack Mount Kit for HP A2287A (Agilent E3155A)

Description	Part Number	Quantity
Screw 10-32	2680-0278C	12
Power cord, universal	8120-1625	1
Support shelf	E3160-00161	1
Keyboard shelf	E3160-00166	1
Front panel	E3160-00261	1
Support rail extension adapter ^a	E3160-01258	2
Support rail	E3160-01262	2
Cover	E3160-04061	1
Front door, small	E3160-65035	1

a. This part is used for the 4071A (JP10D-).

Table 3-15 lists the accessories furnished with the E3155B rack mount kit. They are used to mount the HP A4330A 17-inch monitor into the system cabinet.

Table 3-15 Contents of Rack Mount Kit for HP A4330A (Agilent E3155B)

Description	Part Number	Quantity
Screw 10-32	2680-0278C	12
Power cord, universal	8120-1625	1
Belt	9223-0678	1
Installation guide	E3155-90002	1
Support shelf	E3160-00165	1
Keyboard shelf	E3160-00166	1
Front panel	E3160-00263	1
Support rail extension adapter ^a	E3160-01258	2
Support rail	E3160-01262	2
Front door, small	E3160-65035	1

a. This part is used for the 4071A (JP10D-).

Table 3-16 lists the accessories furnished with the E3155C rack mount kit. They are used to mount the HP A4490A 17-inch monitor into the system cabinet.

Table 3-16 Contents of Rack Mount Kit for HP A4490A (Agilent E3155C)

Description	Part Number	Quantity
Screw 10-32	2680-0278C	6
Power cord, universal	8120-1625	1
Belt	9223-0678	1
Installation guide	E3155-90012	1
Keyboard shelf	E3160-00166	1
Support shelf	E3160-00170	1
Front panel, right side	E3160-00264	1
Front panel, left side	E3160-00265	1
Support rail	E3160-01218	2
Front door, small	E3160-65035	1

Table 3-17 lists the accessories furnished with the E3155D rack mount kit. They are used to mount the HP D2838W 17-inch monitor into the system cabinet.

Table 3-17 Contents of Rack Mount Kit for HP D2838W (Agilent E3155D)

Description	Part Number	Quantity
Screw 10-32	2680-0278C	8
Power cord, universal	8120-1625	1
Belt	9223-0678	1
Installation guide	E3155-90022	1
Support shelf	E3160-00174	1
Keyboard shelf	E3160-00177	1
Front panel, right side	E3160-00268	1
Front panel, left side	E3160-00269	1
Support rail extension adapter ^a	E3160-01258	2
Support rail	E3160-01261	2
Front door, small	E3160-65035	1

a. This part is used for the 4071A (JP10D-).

Table 3-18 lists the accessories furnished with the E3155E rack mount kit. They are used to mount the HP D8900A 17-inch monitor into the system cabinet.

Table 3-18 Contents of Rack Mount Kit for HP D8900A (Agilent E3155E)

Description	Part Number	Quantity
Screw 10-32×.5	2680-0278C	8
Screw 10-32×.75	2680-0320	4
Power cord, universal	8120-1625	1
Belt	9223-0678	1
Installation guide	E3155-90030	1
Keyboard shelf	E3160-00179	1
Support shelf	E3160-00185	1
Front panel	E3160-00275	1
Support rail	E3160-01264	2
Front door, small	E3160-65035	1

Table 3-19 lists the rack mount accessories. They are used to mount the HP D8906A 17-inch monitor into the system cabinet.

Table 3-19 Rack Mount Accessories for HP D8906A

Description	Part Number	Quantity
Screw 10-32×.5	2680-0278C	8
Screw 10-32×.75	2680-0320	4
Power cord, universal	8120-1625	1
Belt	9223-0678	1
Installation guide	E3155-90030	1
Keyboard shelf	E3160-00179	1
Support shelf	E3160-00195	1
Front panel	E3160-00295	1
Support rail	E3160-01264	2
Front door, small	E3160-65035	1

Rack Mount Kits for Flat Panel Display

Table 3-20 lists the accessories furnished with the E3155F rack mount kit. They are used to mount the flat panel display to the system cabinet.

Table 3-20 Contents of Rack Mount Kit for Flat Panel Display (Agilent E3155F)

Description	Part Number	Quantity
Screw M4×8	0515-2079	8
Cable tie	1400-0249	10
Screw bolt, 10-32	2680-0607	4
Washer	3050-0893	8
Washer ^a	3050-1013	8
Washer	3050-0226	4
Monitor extension cable (3m)	E3120-61687	1
Installation guide	E3155-90042	1
USB extension cable (16ft)	E3160-61691	2
Side panel (large)	E3160-65021	1
Side panel (small)	E3160-65022	1
Long arm with four bolts	E3160-65023	1
Short arm	E3160-65024	1
Fixing set	E3160-65025	2
FPD attachment set	E3160-65026	1
Keyboard tray assembly	E3160-65027	1
Cover	E3160-65028	1

a. These parts are used when the flat panel display leans.

Rack Mount Kit for System Controller

There are three types of rack mount kits for use with different types of system controllers, as shown in the table below.

Table 3-21 lists the accessories furnished with the E3156A rack mount kit. It is used to mount the 745i controller into the system cabinet.

Table 3-21 Contents of Rack Mount Kit for 745i Controller (Agilent E3156A)

Description	Model/Part Number	Quantity
Screw M4×12	0515-1718	4
Screw 10-32	2680-0278C	8
ITF buffer/speaker module	HP 46081A	1
Power cord, universal	8120-1625	1
Monitor extension cable	E3120-61687	1
Flange	E3160-01215	2
Support rail extension adapter ^a	E3160-01258	2
Support rail	E3160-01262	2

a. This part is used for the 4071A (JP10D-).

Table 3-22 lists the accessories furnished with the E3156B rack mount kit. They are used to mount the 745/132L controller into the system cabinet.

Table 3-22 Contents of Rack Mount Kit for 745/132L Controller (Agilent E3156B)

Description	Part Number	Quantity
Screw M4×12	0515-1718	4
Screw 10-32	2680-0278C	8
Power cord, universal	8120-1625	1
Monitor extension cable	E3120-61687	1
4-meter RS12-PS12 cable	E3120-61685	2
Flange ^a	E3160-01215	2
Flange ^b	E3160-01219	2
Support rail extension adapter ^c	E3160-01258	2
Support rail	E3160-01262	2

a. This part is used for the 4071A and 4072A (JP10G-).

b. This part is used for the 4072A (JP20G-) and 4073A(JP10H-).

c. This part is used for the 4071A (JP10D-).

Table 3-23 lists the accessories furnished with the E3156C rack mount kit. They are used to mount the C3600/C3700 controller into the system cabinet.

NOTE If the serial number of 4072A/4073A is JP30G- or JP20H-, the E3156C rack mount kit can be mounted into the system cabinet. If the serial number of 4072A/4073A is JP10G-, JP20G-, or JP10H-, the E3153A option 101 cabinet upgrade kit is needed before installing the E3156C rack mount kit.

Table 3-23 Contents of Rack Mount Kit for C3600/C3700 Controller (Agilent E3156C)

Description	Part Number	Quantity
Screw M3×0.5	0515-0914	6
Screw 8-32	2510-0120	2
Screw 10-32	2680-0278C	6
Power cord, universal	8120-1625	1
Monitor extension cable (3m)	E3120-61687	1
Installation guide	E3156-90001	1
Support rail	E3160-01269	2
Cover	E3160-04099	1
Frame	E3160-60103	1
USB extension cable	E3160-61691	2

Rack Mount Kit for CD-ROM Drive (For JP10G-) and DDS Drive (For JP30G-, JP20H-)

Table 3-24 lists the accessories furnished with the E3157A rack mount kit. It is used to mount the CD-ROM drive into the system cabinet. If you mount the HP C2944D, HP C2948A, or HP C4310A CD-ROM drive into the system cabinet, use the following parts.

NOTE The E3157A was discontinued in April 2000. The external CD-ROM drive cannot be mounted into the system cabinet of 4072A (JP20G- and JP30G-) and 4073A (JP10H- and JP20H-) but into the system cabinet of 4072A (JP10G-).

Table 3-24 Rack Mount Accessories for HP C2944D, HP C2948A, or HP C4310A (Agilent E3157A)

Description	Part Number	Quantity
Screw 10-32	2680-0278C	8
Power cord, universal	8120-1625	1
Support shelf	E3160-00164	1
Support shelf ^a	E3160-00171	1
Front panel ^b	E3160-00262	1
Front panel ^a	E3160-00266	1
Support rail extension adapter ^c	E3160-01258	2
Support rail ^a	E3160-01261	2
Support rail	E3160-01262	2
Cover	E3160-04062	1

- a. This part is for rack mounting the HP C4310A.
- b. This part is for rack mounting the HP C2944D or HP C2948A.
- c. This part is used for the 4071A (JP10D-).

Table 3-25 lists the accessories furnished with the E3157B rack mount kit. It is used to mount the DDS drive into the system cabinet. If you rack-mount the HP C6364A DDS drive into the system cabinet, use the following parts.

NOTE If the serial number of 4072A/4073A is JP30G- or JP20H-, the E3157B rack mount kit can be mounted into the system cabinet. If the serial number of 4072A/4073A is JP10G-, JP20G-, or JP10H-, the E3153A option 101 cabinet upgrade kit is needed before installing the E3157B rack mount kit.

Table 3-25 Rack Mount Accessories for HP C6364A (Agilent E3157B)

Description	Part Number	Quantity
Nut hex M5×0.8	0535-0081	2
Sheet nut ^a	0590-0804	12
Screw 10-32	2680-0278C	8
Support shelf	E3160-00190	1
Chassis ^b	E3160-00193	1
Front panel	E3160-00286	1
Rear panel ^b	E3160-00623	1
Support rail	E3160-01263	2
Bracket, left ^b	E3160-01288	1
Bracket, right ^b	E3160-01289	1
Flange ^c	E3160-01298	1
Flange ^c	E3160-01299	1
Bracket ^c	E3160-09003	1

- a. Four sheet nuts are used for fixing the shelter plate (E3160-00620).
- b. These parts are not used when you install the rack mount kit into the system cabinet which has serial number prefix JP10G.
- c. These parts are used for the 8114A pulse generator.

Rack Mount Accessories for Agilent E4411B

Table 3-26 lists the rack mount accessories for the E4411B spectrum analyzer. They are used to mount the E4411B into the system cabinet.

Table 3-26 **Contents of Rack Mount Accessories for Agilent E4411B**

Description	Part Number	Quantity
Screw M4×8	0515-2079	1
Sheet nut	0590-0804	10
Screw 10-32	2680-0278C	10
Power cord, universal	8120-1625	1
Stopper	E3150-06001	1
Support shelf	E3150-20001	1
BNC cable, 4.6 m	E3150-61601	1
Support rail	E3160-01263	2

To Mount System Instruments (Agilent 4284A/Agilent 3458A)

This section describes how to mount the 4284A or 3458A into the system cabinet.

NOTE To mount the *customer's* 4284A or 3458A into the system cabinet, perform all the procedures in this section.

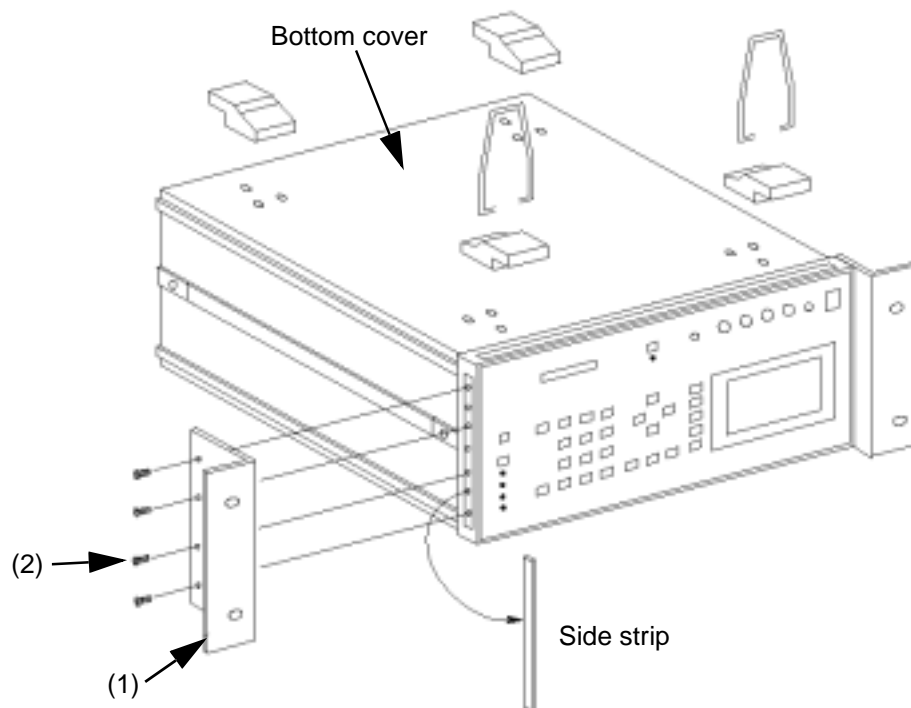
If the E3102A/E3103A option 011 or 012 rack mount option, for the 4284A and 3458A, is ordered, the system instruments are mounted into the system cabinet at the factory. To connect the system instruments with the system controller, use step 4 of the following procedure.

NOTE When used with the 4072A/4073A, the 4284A must be equipped with options 001 and 006.

To install the 4284A or 3458A, use the following procedures:

1. Attach the rack flanges.
 - a. Remove the side strips from both sides of the instrument.
 - b. Attach a rack flange (1) to each side of the instrument using four screws (2). The rack flanges and screws are included in the rack mount kit.
 - c. Remove the four feet and two tilt stands from the bottom cover of the instrument.

Figure 3-9 Attaching Rack Flanges



2. Install the system instruments into the system cabinet.
 - a. Remove the blank panel from the location where you will install the instrument. For the location of system instruments, see figure 3-1. Keep the torx screws; these will be used to attach the instrument rack flanges.
 - b. Install the support rails into the system cabinet. At the factory, clip-on nuts are attached to the front and rear columns of the system cabinet for installing the rails.
 - c. Position and slide the instrument on the support rails.
 - d. Secure the instrument rack flanges to the system cabinet. At the factory, clip-on nuts are attached to the front columns of the system cabinet for attaching the rack flanges.
 - e. If you are installing the 4284A (CMU), confirm the fuse. If it is for 100 V/120 V (3 A/250 V/time delay, Agilent part number 2110-0381), change it to 220/240 V fuse (2 A/250 V/time delay, Agilent part number 2110-0303).
 - f. If you are installing the 3458A (DVM), confirm the fuse. If it is for 100 V/120 V (1.5 A/no time delay, Agilent part number 2110-0043), change it to 220 V/240 V fuse (500 mA, slow blow, Agilent part number 2110-0202).
 - g. Connect the power cord between the system instrument and an instrument power outlet.

NOTE When using the E3102A/E3103A option 200 or 208, connect the power cord to the DVM and CMU power outlet.

3. Check the system instrument GPIB address. The 4072A/4073A system software assigns the GPIB addresses as shown in table 3-27.

Table 3-27 GPIB Address of Instruments

Instrument	GPIB Address
4284A (CMU)	17
3458A (DVM)	22

NOTE If you need to set an additional GPIB address for an instrument, *first install the Agilent 4070 system software*, then edit the configuration file (/etc/opt/hp4070/config/1) to change the GPIB address value. See chapter 6.

4. Connect the GPIB cables between the system controller and the system instruments.

Table 3-28 lists the connections for the GPIB interface cards installed in the system controller, and the logical unit number initially assigned for each interface by the 4070 system software.

- If the system controller is installed in the system cabinet:
 - ☐ Use 1-meter GPIB cables to connect the system controller to an instrument, and to interconnect the system instruments.
 - ☐ Use a 4-meter GPIB cable to connect the system controller to the wafer prober.
- If the system controller is *not* installed in the system cabinet:
 - ☐ Use 4-meter GPIB cables to connect the system controller to an instrument in the cabinet, and to connect the system controller to the wafer prober.
 - ☐ Use 1-meter GPIB cables to interconnect the system instruments in the system cabinet.

Table 3-28 GPIB Interface Connection

GPIB Interface	Connected Devices	Logical Unit No.
Agilent E2071D (EISA) Agilent E2078A (PCI)	system controller, 4284A (CMU), 3458A (DVM), 8110A, 81110A, 8114A, E4411B, and other instruments	7
Agilent E2071D (EISA) Agilent E2078A (PCI)	Automatic wafer prober	25

To Mount Pulse Generator (Agilent 8110A/81110A/8114A)

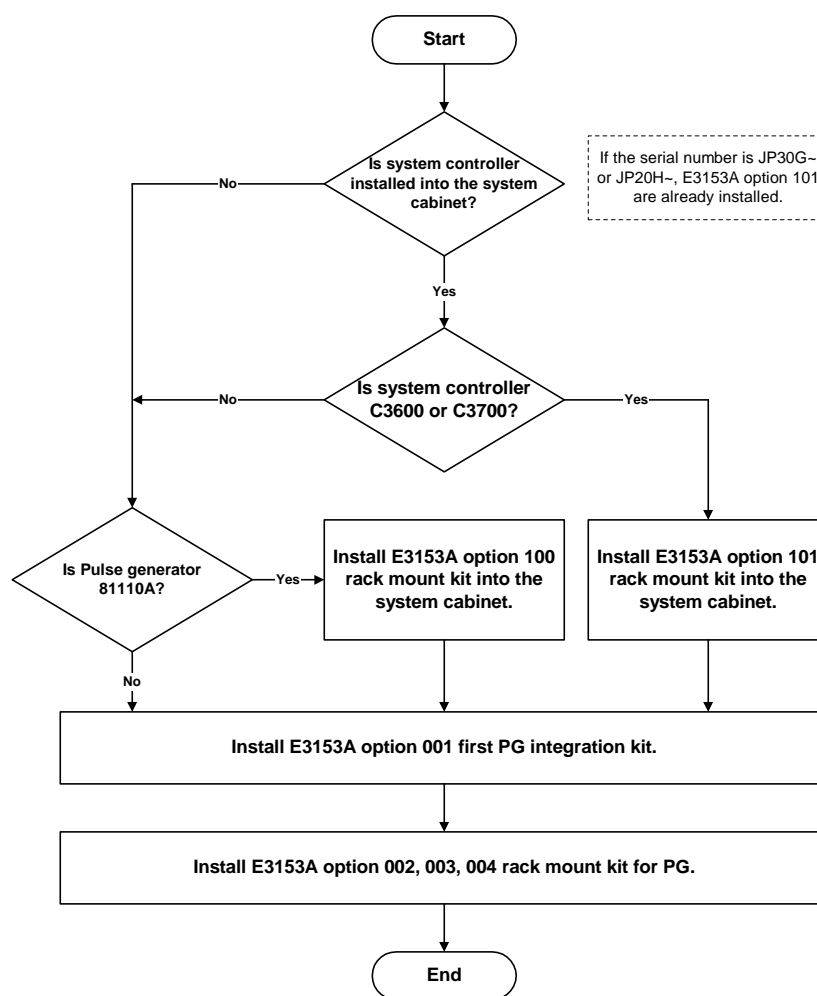
This section describes how to mount the 8110A, 81110A, or 8114A into the system cabinet. Before mounting the pulse generators, installing the first pulse generator integration kit is required. Update kit for the 81110A rack mount kit must also be installed before mounting the 81110A.

NOTE To mount the *customer's* 8110A, 81110A, or 8114A into the system cabinet, perform the following procedures in this section.

If the E3102A option 500 and 550, 551, or 552 are ordered, the integration kit, pulse generators, and upgrade kit for the 81110A rack mount kit are mounted into the system cabinet at the factory. To connect the system instruments with the system controller, see “[GPIB Address and Cables](#)”.

Figure 3-10 shows the installation sequence of rack mount kit for pulse generators. Install the rack mount kit according to the following installation sequence.

Figure 3-10 PGU rack mount kit Installation Sequence

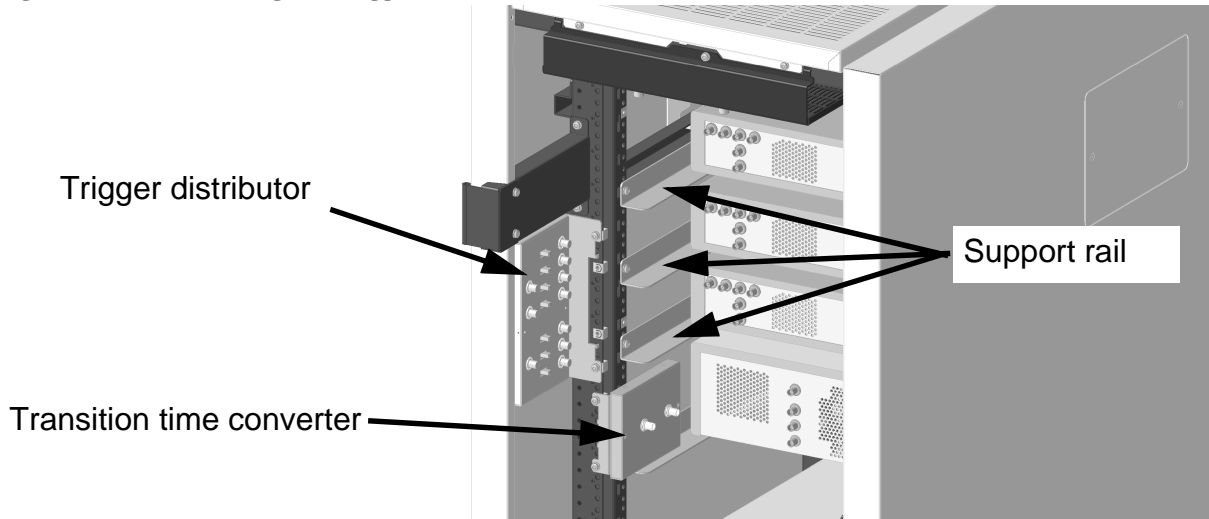


To Install First Pulse Generator Integration Kit (E3153A option 001)

This section describes how to install the first pulse generator integration kit.

Attach the trigger distributor using screws. Figure 3-11 shows the installation location for the trigger distributor.

Figure 3-11 Attaching the Trigger Distributor

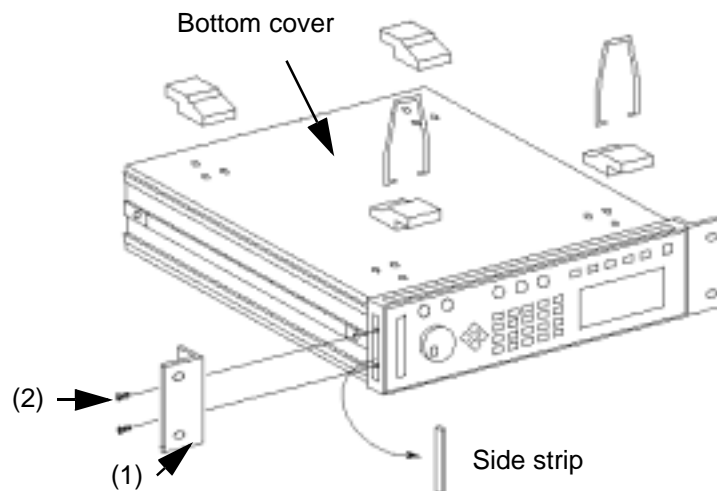


To Mount Agilent 8110A and Agilent 8114A (E3153A option 002/004)

To install the 8110A or 8114A, use the following procedures:

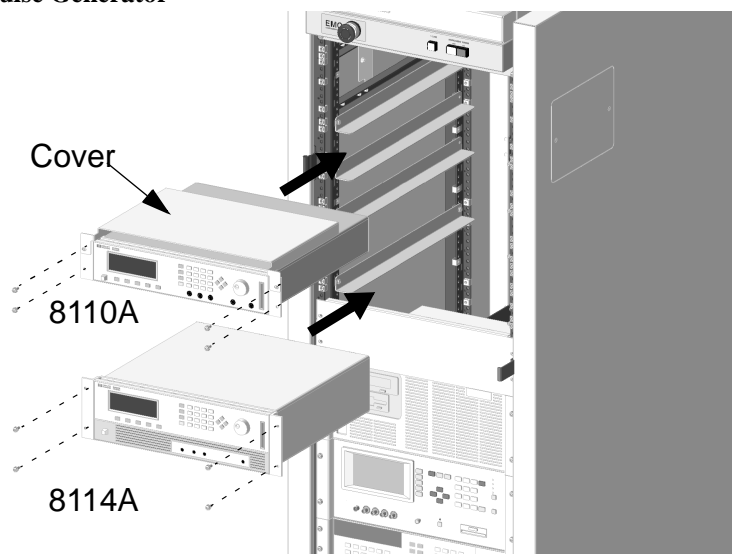
1. Attach the rack flanges.
 - a. Remove the side strips from both sides of the instrument.
 - b. Attach a rack flange (1) to each side of the instrument using two screws (2). The rack flanges and screws are included in the rack mount kit.
 - c. Remove the four feet and two tilt stands from the bottom cover of the instrument.

Figure 3-12 Attaching the Rack Flanges



2. Install the pulse generators into the system cabinet.
 - a. Remove the blank panel from the location where you will install the pulse generator. For the location of the pulse generators, see figure 3-2. Keep the torx screws; these will be used to attach the instrument rack flanges.
 - b. Install the support rails into the system cabinet. At the factory, clip-on nuts are attached to the front and rear columns of the system cabinet for installing the rails.
 - c. Position and slide the pulse generator on the support rails. Attach the cover furnished in the integration kit with the pulse generator 8110A and installed on the top of the pulse generators.
 - d. Secure the pulse generator rack flanges to the system cabinet. At the factory, clip-on nuts are attached to the front columns of the system cabinet for attaching the rack flanges.
 - e. (8114A only) If you install two 8110As, attach the blank panel (E3160-04065) upside second 8114A.
 - f. Connect the power cord between the pulse generator and an instrument power outlet. See figure 3-21.
 - g. (8114A only) Attach the transition time converter behind the 8114A. Figure 3-11 shows the position of the transition time converter.

Figure 3-13 Installing Pulse Generator




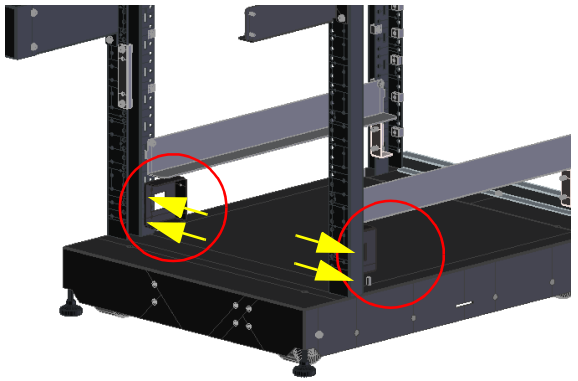
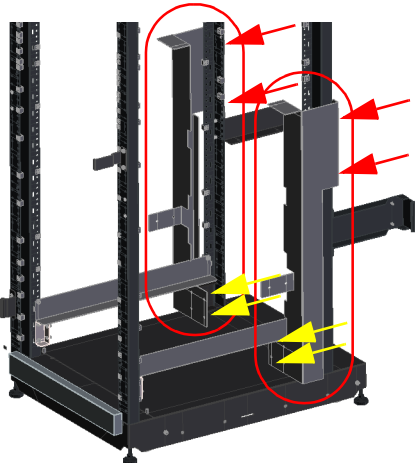
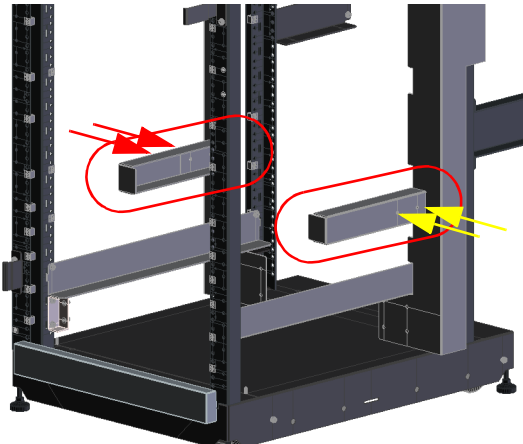
To Install Upgrade Kit for Agilent 81110A Rack Mount Kit (E3153A option 100).

This section describes how to install the upgrade kit for the 81110A rack mount kit and the 745i or 745/132L system controller. The upgrade kit must be installed before mounting the 81110A.

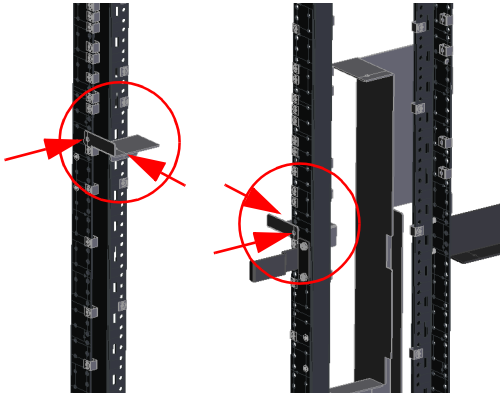
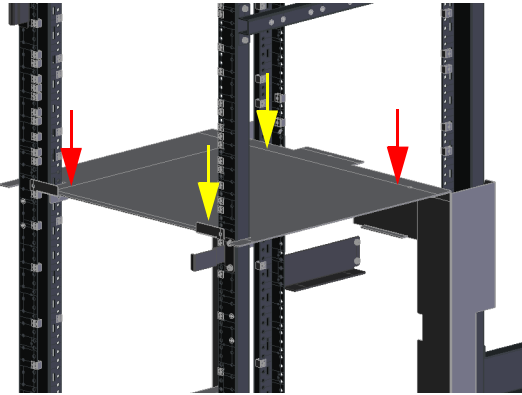
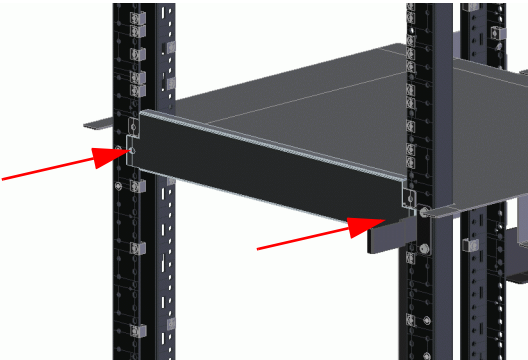
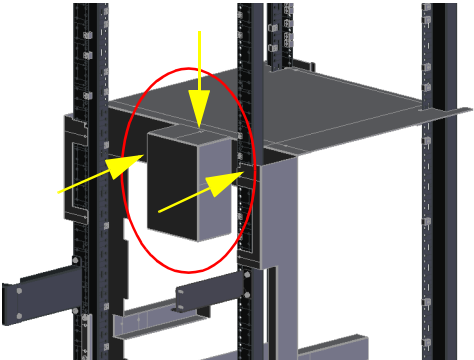
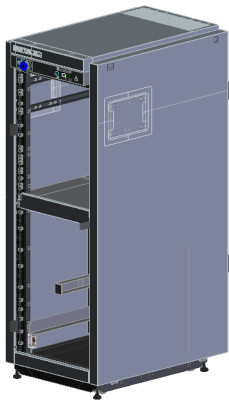
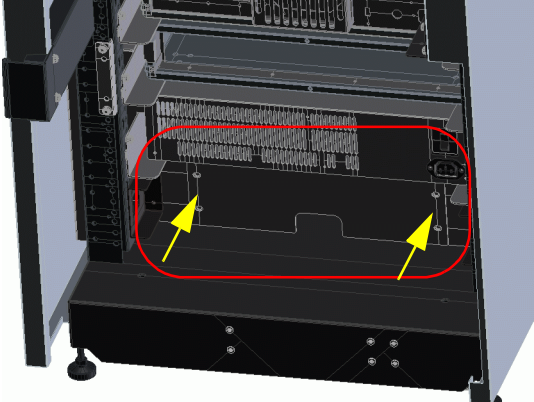
NOTE To mount the *customer's* 81110A and the 745i or 745/132L controller into the system cabinet, perform all the procedures in this section.

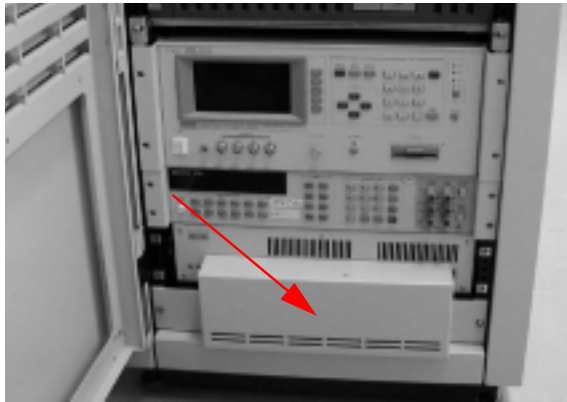
If the E3102A/E3103A is ordered, the upgrade kit for the 81110A rack mount kit is installed into the system cabinet at the factory. To connect the system instruments with the system controller, see “GPIB Address and Cables”.

To install the upgrade kit for the 81110A rack mount kit, use the following procedures:

	
<ol style="list-style-type: none"> 1. Remove the right and left side panels of the cabinet. 2. Remove the PDU assembly, testhead fan assembly, and all instruments. 	<ol style="list-style-type: none"> 3. Install two hinges to attach the chassis for mounting the shelter plate at the rear of the system cabinet. (Four screws and nuts)
	
<ol style="list-style-type: none"> 4. Install two chassis for mounting the shelter plate. (Eight screws and four nuts) 	<ol style="list-style-type: none"> 5. Install two covers for the DVM airflow. (Four screws)

Rack-Mounting Instruments, System Controller, and Peripherals
To Mount Pulse Generator (Agilent 8110A/81110A/8114A)

	
<p>6. Install two angles for mounting the shelter plate. (Four screws and nuts)</p>	<p>7. Install the shelter plate. (Four screws)</p>
	
<p>8. Install the front panel. (Two screws and nuts)</p>	<p>9. Install the fan cover for the system controller. (Three screws) If the system controller is 745i, you do <i>not</i> need to install this cover.</p>
	
<p>10. Install the right and left side panels.</p>	<p>11. Install the rear plate for the TH PS. (Two nuts M5)</p>



12. Replace the front panel for the TH PS.
13. If the controller, DVM, or CMU is not mounted, install the rear panel for each instrument. (Two nuts M5)

To Install Upgrade Kit for Agilent 81110A Rack Mount Kit (E3153A option 101).

This section describes how to install the upgrade kit for the 81110A rack mount kit and the C3600/C3700 system controller. The upgrade kit must be installed before mounting the 81110A.

This section has two procedures. The installation procedure depends on the DDS rack mount kit.

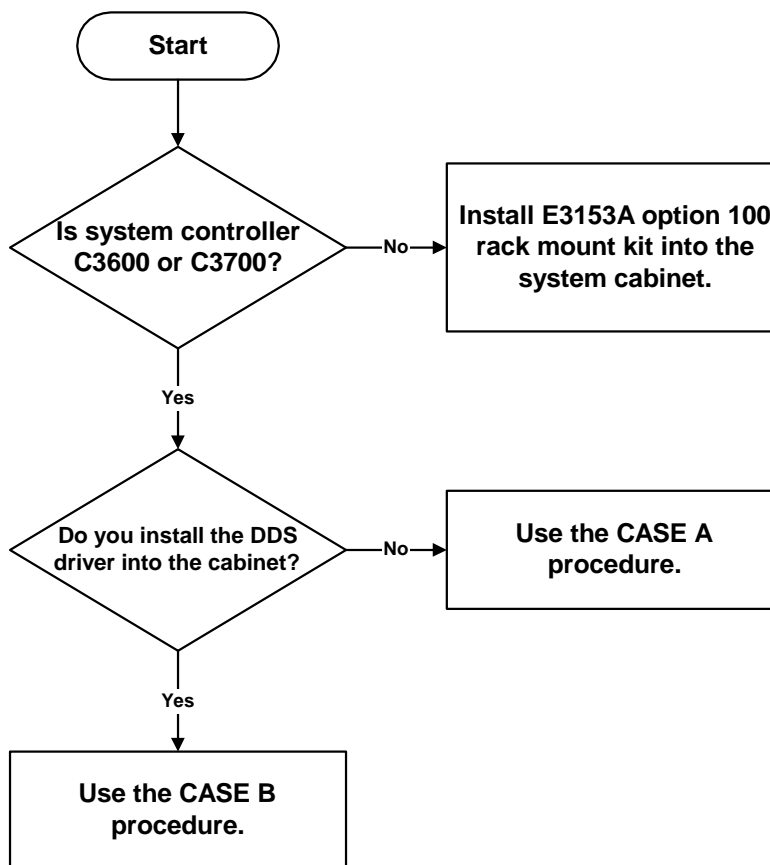
If you do not need to install the DDS rack mount kit, use the CASE A procedure.

If you are going to install the DDS rack mount kit with the C3600/C3700 rack mount kit, some parts of the E3157B rack mount kit must be installed at the same time. To install the upgrade kit for the 81110A rack mount kit with E3157B, use the CASE B procedure.

NOTE To mount the *customer's* 81110A and the C3600/C3700 controller into the system cabinet, perform all the procedures in this section.


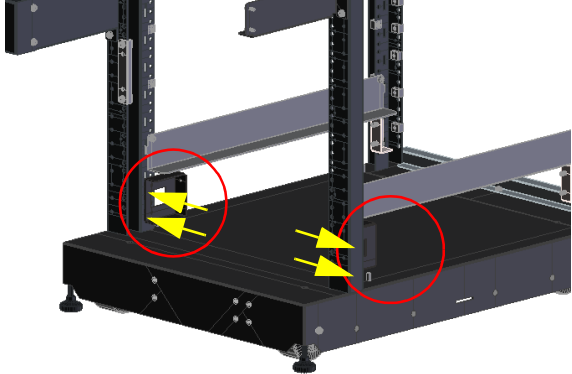
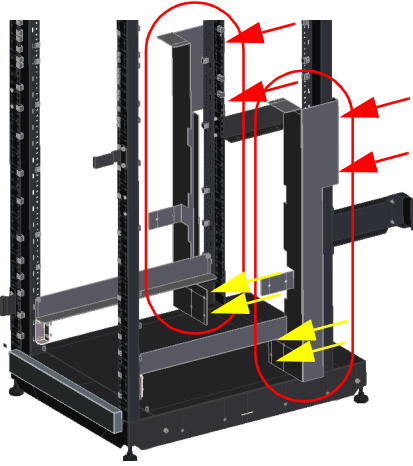
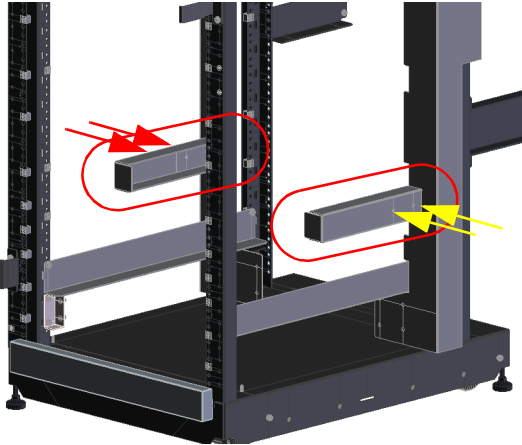
If the E3102A/E3103A is ordered, the upgrade kit for the 81110A rack mount kit is installed into the system cabinet at the factory. To connect the system instruments with the system controller, see “GPIB Address and Cables”.

Figure 3-14 E3153A option 101 Upgrade Kit Installation Sequence

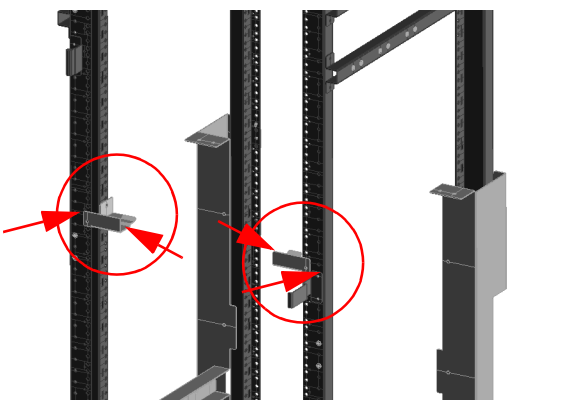
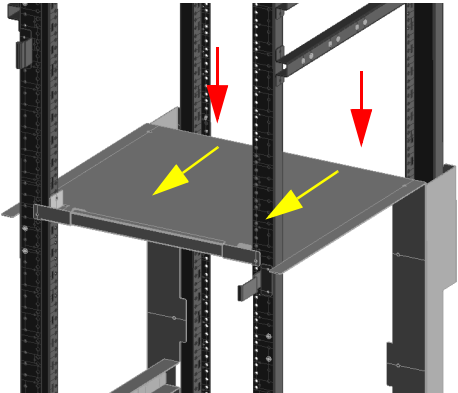
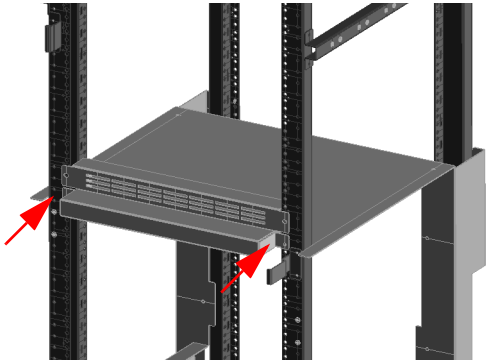
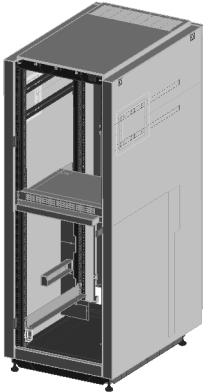
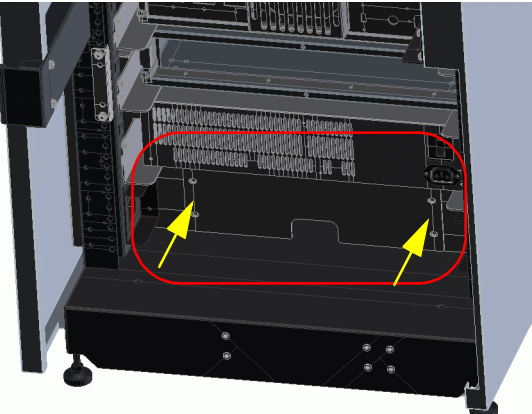
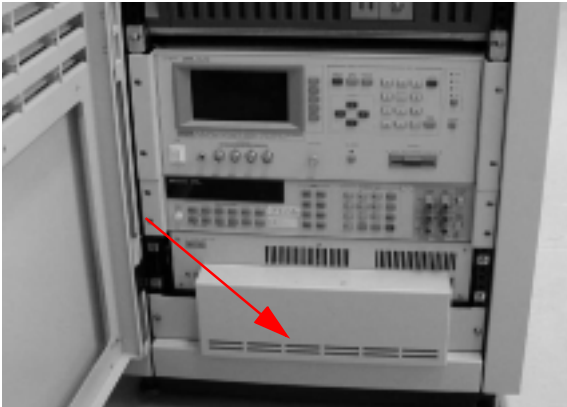


CASE A

To install Upgrade kit for the 81110A and C3600/C3700 rack mount kit.


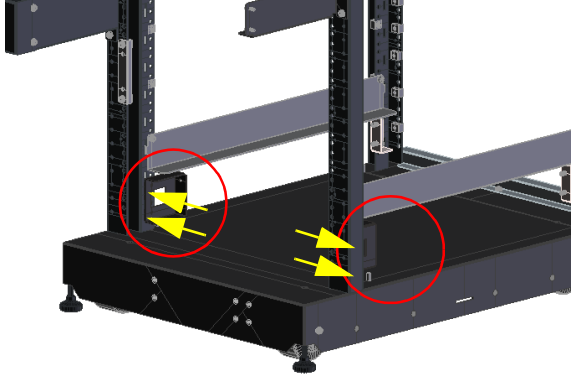
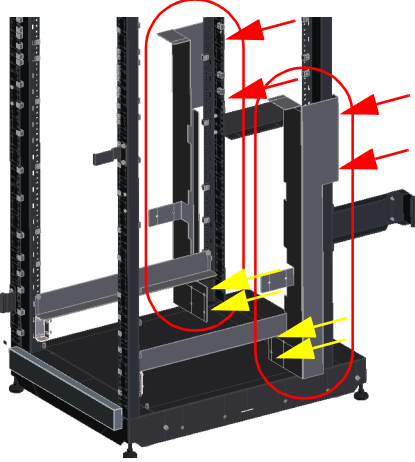
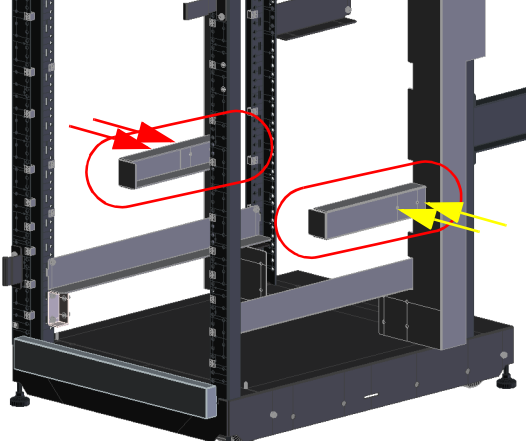
	
<ol style="list-style-type: none"> 1. Remove the right and left side panels of the cabinet. 2. Remove the PDU assembly, testhead fan assembly, and all instruments. 	<ol style="list-style-type: none"> 3. Install two hinges to attach the chassis for mounting the shelter plate at the rear of the system cabinet. (Four screws and nuts)
	
<ol style="list-style-type: none"> 4. Install two chassis for mounting the shelter plate. (Eight screws and four nuts) 	<ol style="list-style-type: none"> 5. Install two covers for the DVM airflow. (Four screws)

Rack-Mounting Instruments, System Controller, and Peripherals
To Mount Pulse Generator (Agilent 8110A/81110A/8114A)

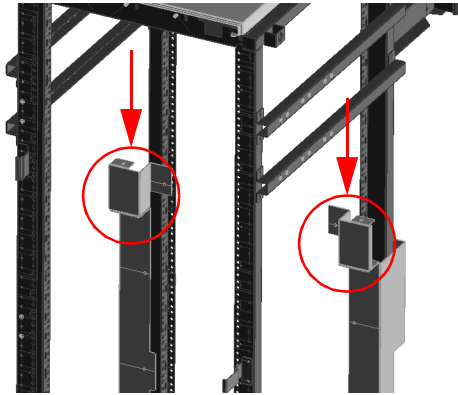
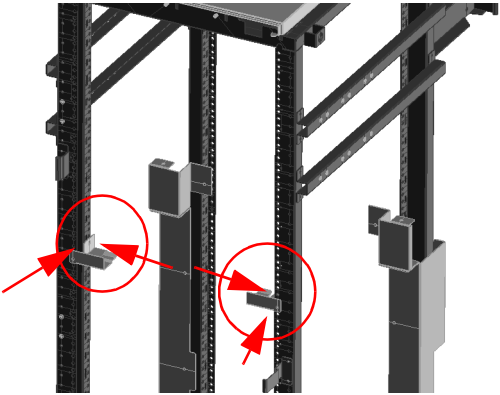
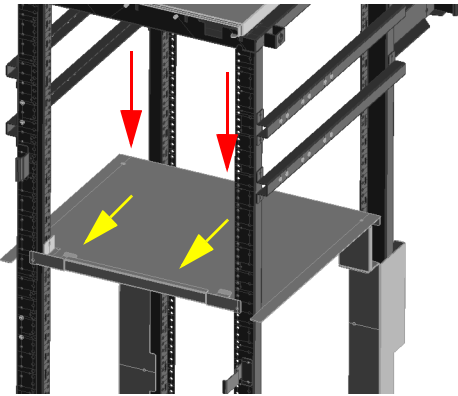
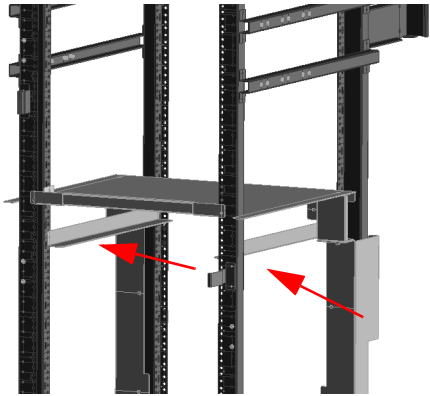
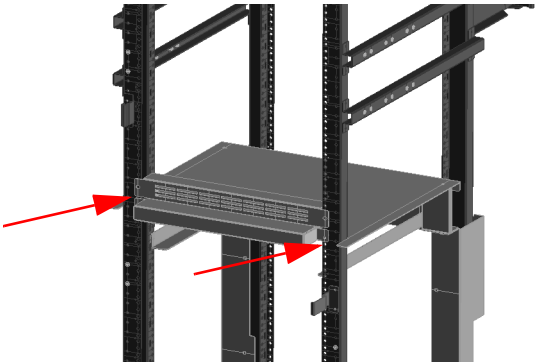

	
<p>6. Install two angles for mounting the shelter plate. (Four screws and nuts)</p>	<p>7. Install the shelter plate. (Four screws)</p>
	
<p>8. Install the front panel. (Two screws and nuts)</p>	<p>9. Install the right and left side panels.</p>
	
<p>10. Install the rear plate for the TH PS. (Two nuts M5)</p>	<p>11. Replace the front panel for the TH PS. 12. If the controller, DVM, or CMU is not mounted, install the rear panel for each instrument. (Two nuts M5)</p>

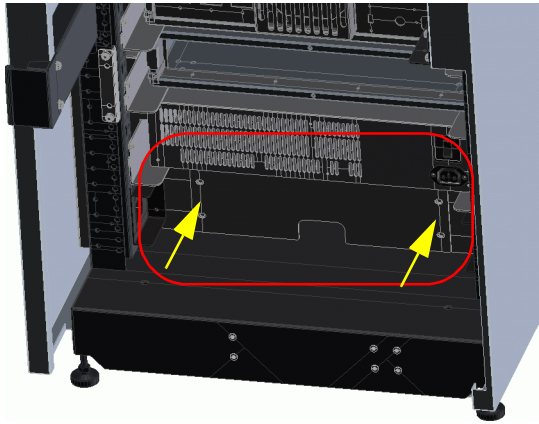
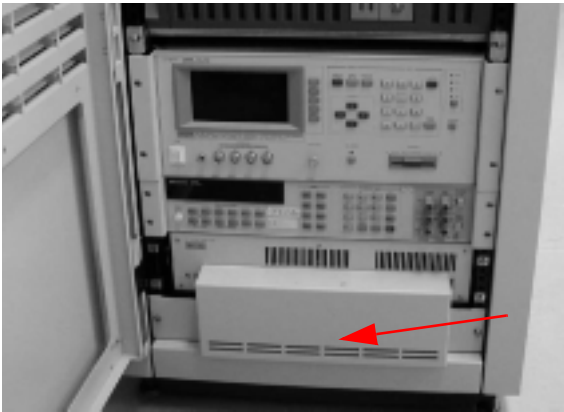
CASE B

To install Upgrade kit for the 81110A,C3600/C3700, and DDS rack mount kit.

	
<ol style="list-style-type: none"> 1. Remove the right and left side panels of the cabinet. 2. Remove the PDU assembly, testhead fan assembly, and all instruments. 	<ol style="list-style-type: none"> 3. Install two hinges to attach the chassis for mounting the shelter plate at the rear of the system cabinet. (Four screws and nuts)
	
<ol style="list-style-type: none"> 4. Install two chassis for mounting the shelter plate. (Eight screws and four nuts) 	<ol style="list-style-type: none"> 5. Install two covers for the DVM airflow. (Four screws)

Rack-Mounting Instruments, System Controller, and Peripherals
To Mount Pulse Generator (Agilent 8110A/81110A/8114A)

	
<p>6. Install two brackets to the chassis. These parts are furnished with the E3157B DDS rack mount kit.</p>	<p>7. Install two angles for mounting the shelter plate. (Four screws and nuts)</p>
	
<p>8. Install the shelter plate. (Two screws)</p>	<p>9. Install the support rails into the system cabinet. These parts are furnished with the E3157B DDS rack mount kit.</p>
	
<p>10. Install the front panel. (Two screws and nuts)</p>	<p>11. Install the right and left side panels.</p>

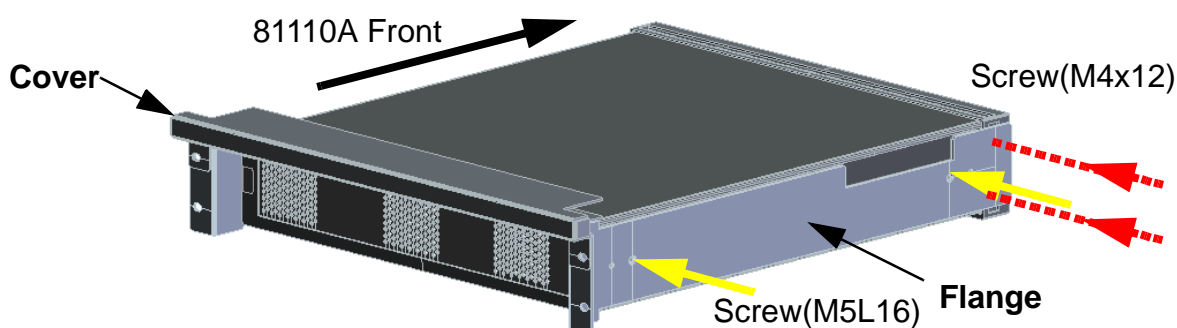
	
<p>12. Install the rear plate for the TH PS. (Two nuts M5)</p> <p>13. If the controller, DVM, or CMU is not mounted, install the rear panel for each instrument. (Two nuts M5)</p>	<p>14. Replace the front panel for the TH PS.</p>

To Mount Agilent 81110A (E3153A option 003)

To install the 81110A, use the following procedures:

1. Attach the rack flanges and side cover to the 81110A.
 - a. Remove the side strips from both sides of the 81110A.
 - b. Attach a rack flange to each side of the 81110A using four screws. The rack flanges and screws are included in the rack mount kit.
 - c. Remove the four feet and two tilt stands from the bottom cover of the 81110A.
 - d. Attach a side cover to each side of the 81110A using two screws.

Figure 3-15 Attaching Rack Flanges



2. Install the 81110A into the system cabinet.
 - a. Remove the blank panel from the location where you will install the 81110A. For the location of 81110As, see figure 3-2. Keep the torx screws; these will be used to attach the 81110A rack flanges.
 - b. Install the support rails into the system cabinet. At the factory, clip-on nuts are attached to the front and rear columns of the system cabinet for installing the rails.
 - c. Connect the power cord, clock trigger cable (yellow), and GPIB cable at the rear of the 81110A.
 - d. Pass these cables, connected at the rear of the 81110A, to the front of the 81110A.
 - e. Position and slide the 81110A on the support rails so that the rear of the 81110A comes to the front of the system cabinet.
 - f. Remove the small plate on the front cover with two screws to pass the 2m GPIB connecting cable between the bottom of the 81110A and the other instruments.
 - g. Attach the front cover furnished in the rack mount kit.
 - h. Secure the 81110A rack flanges to the system cabinet using four screws. At the factory, clip-on nuts are attached to the front columns of the system cabinet for attaching the rack flanges.
 - i. Connect the power cable to the instrument power outlets. See figure 3-21.

Figure 3-16 Installing Agilent 81110A Pulse Generator (1)

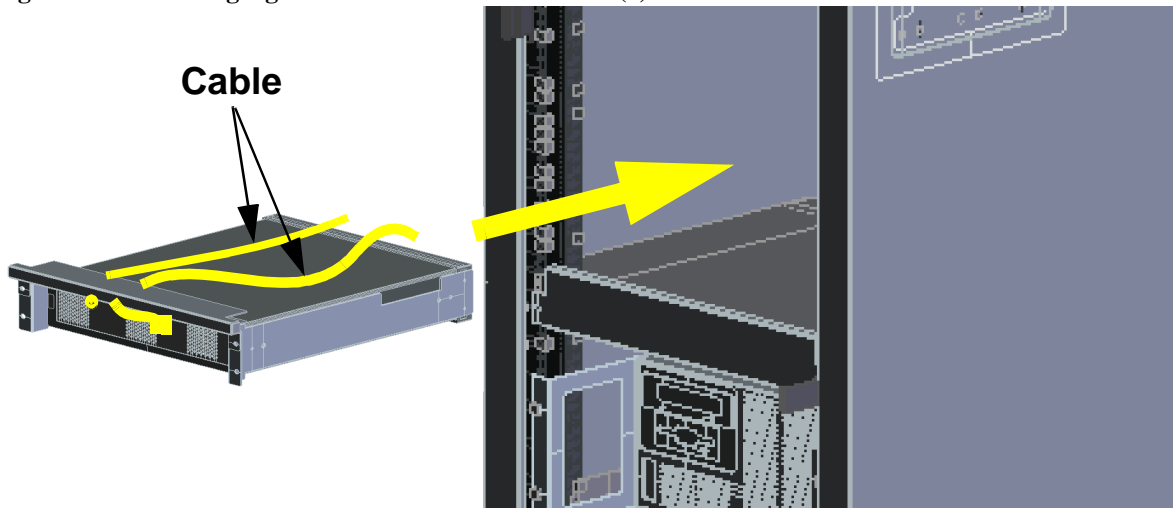


Figure 3-17 Installing Agilent 81110A (Front View)



Figure 3-18 Installing Agilent 81110A (Rear View)



GPIB Address and Cables

1. Check the pulse generator GPIB address. The 4070 system software assigns the GPIB addresses as shown in table 3-29.

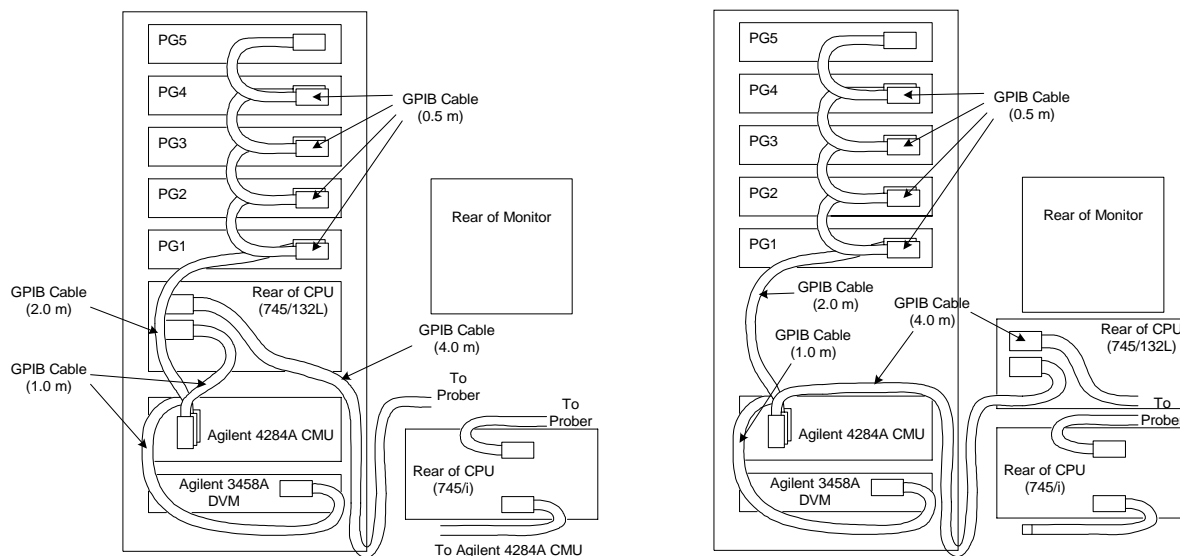
Table 3-29 GPIB Address of Pulse Generators

Pulse Generator	GPIB Address
PG 1 (Master PG)	10
PG 2	11
PG 3	12
PG 4	13
PG 5	14

NOTE If you need to set an additional GPIB address for an instrument, *first install the Agilent 4070 system software*, then edit the configuration file (`/etc/opt/hp4070/config/1`) to change the GPIB address value. See chapter 6.

2. Connect the GPIB cables between the system controller and the pulse generators.
If the installed pulse generators are the 8110A and 8114A, connect the GPIB cables as shown in figure 3-19.

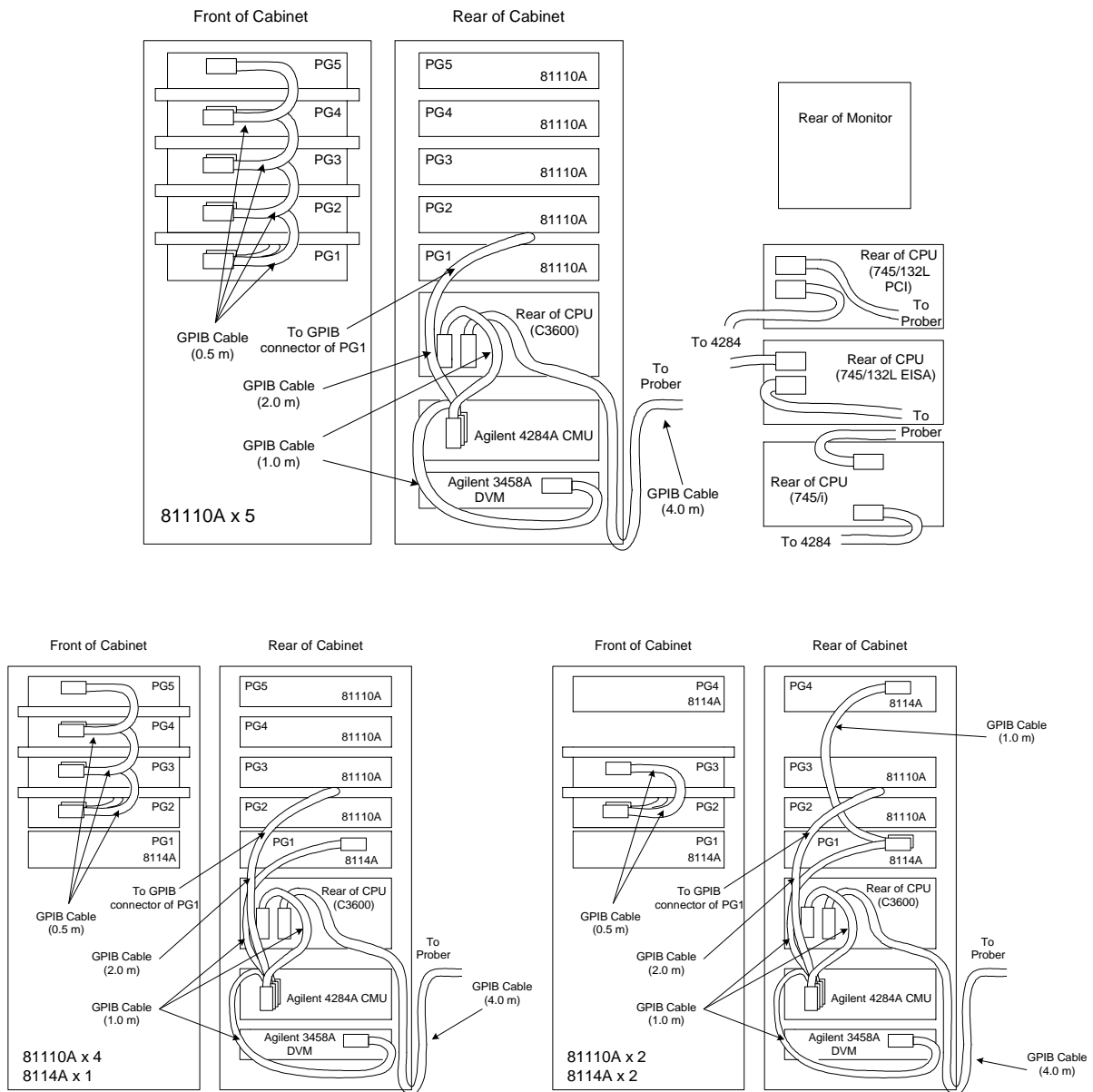
Figure 3-19 GPIB Cable Connection (Agilent 8110A and Agilent 8114A)



If the installed pulse generators are the 81110A and 8114A, connect the GPIB cables as shown in figure 3-20.

NOTE Pass the GPIB cable between the bottom of the 81110A and 4284A through the right hole of the cover.

Figure 3-20 GPIB Cable Connection (Agilent 81110A and Agilent 8114A)

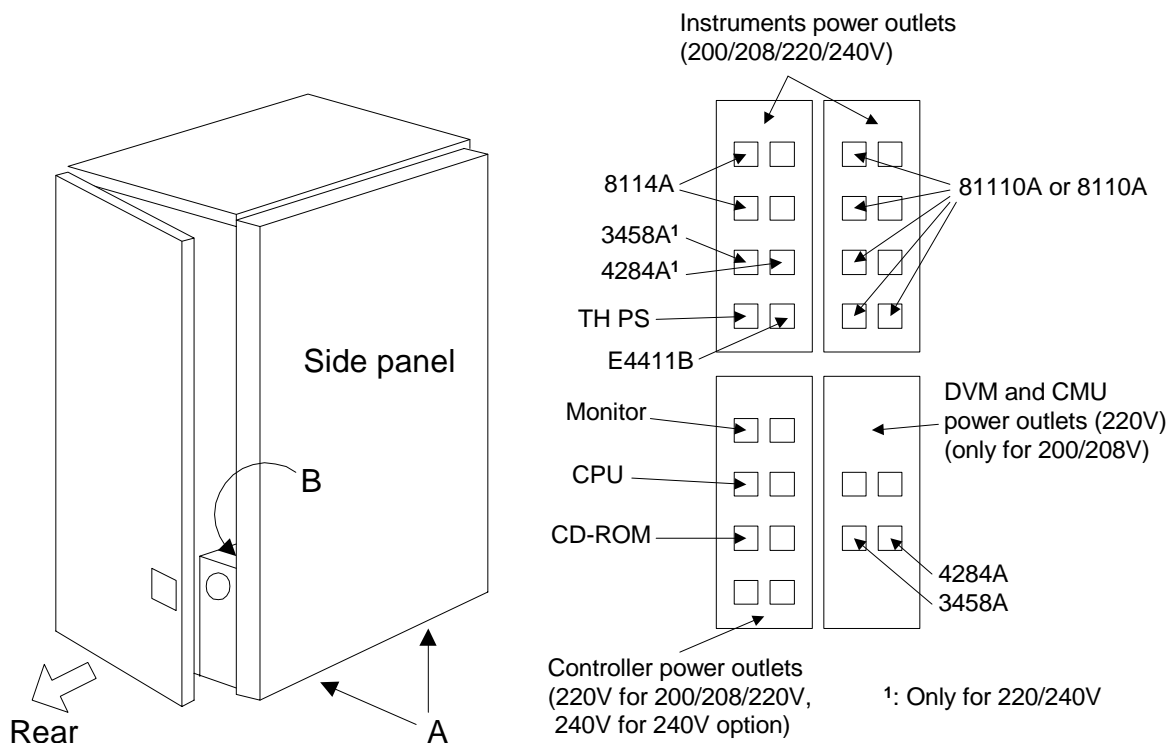


Connecting Power Cords

This section describes how to connect the power cords between instruments and power outlets.

1. Connect the power cords between instruments and power outlets inside the system cabinet. The positions of the power cords are shown in figure 3-21.
2. Secure the power cables to the pillar with the furnished cable ties in the system cabinet.

Figure 3-21 Connecting Positions of the Power Cords



To Mount 17-inch Color Monitor and Keyboard Shelf

This section describes how to mount the 17-inch color monitor, keyboard, and mouse.

Removing Front Panel and Support Shelf

This procedure is for the E3102A/E3103A option 020 only.

NOTE	If the E3102A/E3103A option 020 is ordered, the rack mount kit is already installed into the system cabinet at the factory. However, the 17-inch monitor is not mounted into the system cabinet at the factory, and must be installed at the installation site. Before mounting the 17-inch monitor, you must remove the front panel and support shelf.
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1. Remove the front panels, which are installed at the monitor rack mount position, from the system cabinet using a torx screwdriver. Keep the four torx screws. These are used to reattach the front panel to the system cabinet.
2. Remove the support shelf from the system cabinet. See figure 3-23.

Removing Front Door and Setting Up the Rack Mount Kit

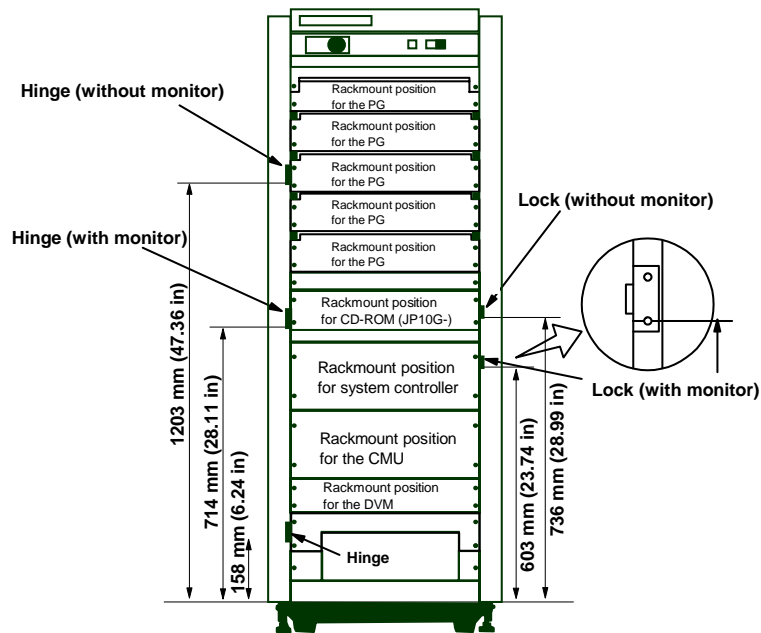
This procedure is for the E3155A/B/C/D/E/G only.

NOTE	The rack mount kit and the 17-inch monitor must be installed at the installation site. Even if the E3155A/B/C/D/E/G rack mount kit is ordered with the E3102A/E3103A, the rack mount kit is not installed in the 4072A/4073A system cabinet at the factory.
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Before mounting the 17-inch monitor, mount the 17-inch monitor rack mount kit using the following procedures:

1. Remove the left side panel by removing the screws at the bottom of the side panel and at the top of the PDU, then lift up the left side panel.
2. Remove the ground wire by removing the nut at the bottom of the front door.
3. Remove the center poles of the front door hinges, and remove the front door.
4. Remove the four blank panels at the monitor and keyboard shelf location using a torx screwdriver.
Keep the torx screws. These are used to attach the monitor front panel and keyboard shelf to the system cabinet.
5. Remove the hinge at the “without monitor” location shown in figure 3-22.

Figure 3-22 System Cabinet Part Location



6. Attach the hinge at the “with monitor” location.
7. Remove the right side panel by removing the two screws at the bottom of the side panel, then lift up the side panel.
8. Remove the front door lock at the “without monitor” location shown in Figure 3-22.
9. Attach the front door lock at the “with monitor” location.
10. Install the support rails into the system cabinet using screws. At the factory, clip-on nuts are attached to the front and rear columns of the system cabinet for installing the support rails.
11. Install the small front door included in the rack mount kit.
12. Attach the ground wire at the bottom of the front door.
13. Reinstall the right side panel.
14. Reinstall the left side panel.

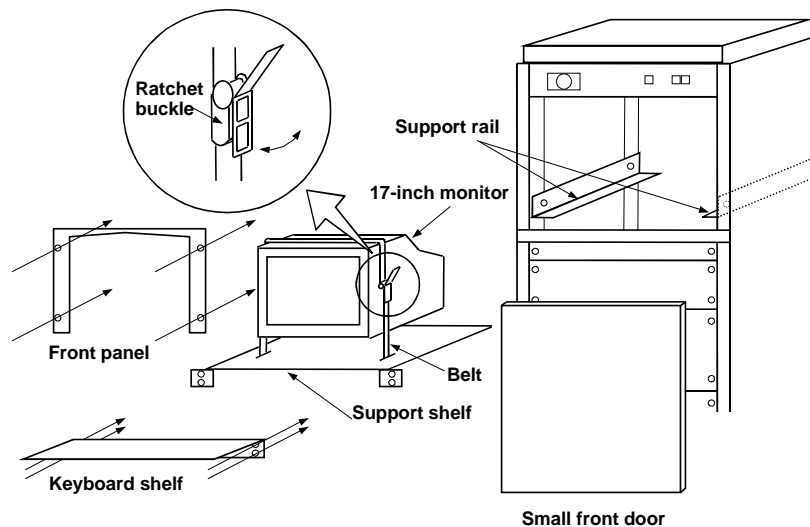
Installing 17-Inch Monitor

1. Place the support shelf on the floor.
2. (HP A4330A, HP A4490A, HP D2838W, HP D8900A, or HPD8906A) Pass the belt through the opening on the support shelf.
3. (HP A2287A, HP A4330A, or HP A4490A) Remove the foot of the 17-inch monitor.
4. Put the 17-inch monitor on the support shelf.
5. (HP A4330A, HP A4490A, HP D2838W, HP D8900A, or HP D8906A) Secure the monitor on the support shelf using the belt as shown in figure 3-23.

(HP A2287A) Secure the monitor on the support shelf using the cover.

6. Hold the support shelf up, place it on the support rails, and slide it into the cabinet.
7. When using the E3155C rack mount kit, fix the support shelf to the support rails using torx screws.
8. Attach the front panel using the four torx screws removed earlier.
9. Connect the video cable. If the system controller is installed outside of the cabinet, use an extension cable.
10. Connect the power cord between the monitor and a controller power outlet.

Figure 3-23 Installing 17-inch Color Monitor and Keyboard Shelf



Installing Keyboard Shelf

1. Place the keyboard shelf in the location shown in figure 3-23.
2. Attach the keyboard shelf to the system cabinet using four torx screws. At the factory, clip-on nuts are attached to the front columns of the system cabinet for installing the keyboard shelf.

Setting Up Keyboard and Mouse

1. Place the keyboard and mouse on the keyboard shelf.
2. Pass the keyboard and mouse cables through the opening under the keyboard shelf.
3. Connect the keyboard and mouse cables to the system controller. If the system controller is installed outside of the cabinet, use an extension cable.

To Mount Flat Panel Display

This section describes how to mount the flat panel display, keyboard, and mouse.

NOTE The rack mount kit and the flat panel display must be installed at the installation site. Even if the E3155F rack mount kit is ordered with the E3102A/E3103A, the rack mount kit is not installed in the 4072A/4073A system cabinet at the factory.

To mount the flat panel display, use the following procedures:

Installing Rack mount kit

This section describes how to mount the rack mount kit with FPD to the side of the system cabinet.



1. Remove the side panel of cabinet.



2. Attach the large panel to the cabinet.

NOTE You can install the panel to the both side of system cabinet.



3. (Optional) If you mount the arm at the left side of cabinet, assemble the long arm and small panel by four bolts.



4. Attach the long arm to the cabinet.

Rack-Mounting Instruments, System Controller, and Peripherals
To Mount Flat Panel Display



5. Fix the long arm to the large plate using hex wrench.



6. Attach the short arm from underneath.



7. Attach the inner ring by the short screw.



8. Attach the two support rings by long screws.



9. Attach the lever at the suitable position not to interfering with the arm.



10. Attach the keyboard tray assembly.



11. Attach the inner ring by short screw.



12. Attach the two support rings by long screws.



13. Attach the lever.



14. Pass the keyboard cable through.



15. Pass the keyboard cable through behind the keyboard tray.

Rack-Mounting Instruments, System Controller, and Peripherals
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16. Pass through the mouse cable.



17. Fasten the cables by the cable tie to the keyboard tray.



18. Put the FPD on the keyboard tray.



19. Attach the two attachment by four screws (0515-2079) and washers (3050-0893) to fix the FPD.



20. Connect the power cable and display cable to the FPD.



21. Fix the cables to the keyboard tray by cable tie.



22. Fix the cables to the long arm by three cable ties.



23. Tie the cables by two cable ties.



24. Pass the cables to the hole of side panel.



25. Attach the side cover.



26. Fix the side cover by the four screws (0515-2079) and washers (3050-0893).



27. Final.

To Mount System Controller

This section describes how to mount the system controller into the system cabinet.

NOTE If the E3102A/E3103A option 023 *and* E3171A/AJ are ordered at the same time or the E3102/E3103A option 025 *and* E3172A/AJ/B or E3173A are ordered at the same time, the system controller is installed into the system cabinet at the factory. In this case, the following installation is *not* required.

If the E3156A/B/C is ordered, the rack mount kit and system controller are *not* installed into the system cabinet. You must install the rack mount kit and system controller.

To mount the system controller, use the following procedures:

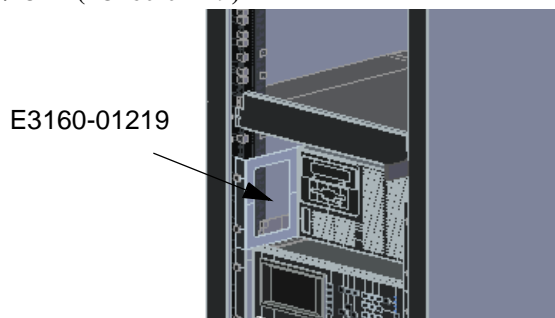
To Install E3156A/B Rack Mount Kit

This section describes how to mount the rack mount kit for the 745i or 745/132L system controller into the system cabinet. The E3156A is used for the 745i system controller. The E3156B is used for the 745/132L system controller.

1. Remove the side strips from both sides of the system controller.
2. Screw a rack flange to each side of the system controller.

NOTE If the system cabinet has the 81110A pulse generator integration kit, use E3160-01219 flange. If the cabinet don't include the above integration kit, use E3160-01215 flange.

Figure 3-24 Flange for 745/132L (E3160-01219)

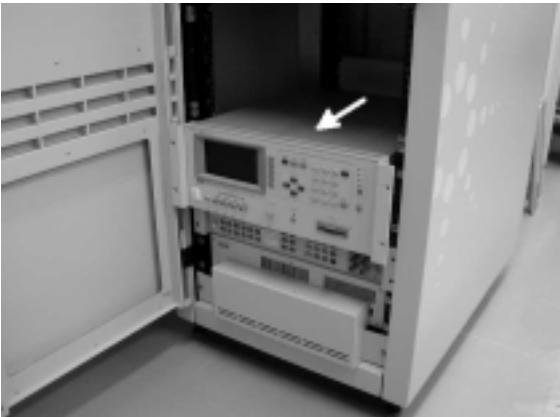


3. Remove the blank panel from the system controller location. Keep the four torx screws; these are used to attach the system controller to the system cabinet.
4. Install the rails into the system cabinet. At the factory, clip-on nuts are attached to the front and rear columns of the system cabinet for installing the rails.
5. Slide the system controller on the rails.
6. Attach the system controller rack flanges to the system cabinet using torx screws. At the factory, clip-on nuts are attached to the front columns of the system cabinet for attaching the system controller.
7. Connect the video cable. If the monitor is installed outside of the system cabinet, use an extension cable.

8. Connect the keyboard cable. If the monitor is installed outside of the system cabinet, use an extension cable.
9. Connect the power cord between the system controller and a controller power outlet.

To Install E3156C Rack Mount Kit

This section describes how to mount the rack mount kit for the C3600/C3700 system controller into the system cabinet.



1. Remove the Agilent 4280A from system cabinet.



2. Attach the support rail to the system cabinet.

NOTE

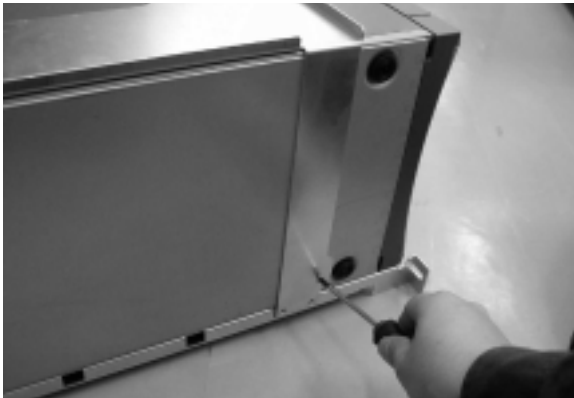
These support rails for the controller are set in the opposite direction.



3. Put the HP C3600/C3700 system controller on the frame. Place the bottom of the C3600/C3700 to the left side.



4. Attach the cover to the HP C3600/C3700 system controller.



5. Screw in the controller using the two screws (8-32).



6. Screw in Fix the cover using the six screws (M3).

NOTE

Do not raise the controller with the frame vertically after fixing the frame. The flange of the frame may bend.



7. After installing the 4284A, install the system controller along with the notch of the frame into the system cabinet.



8. Attach the system controller flange to the system cabinet using torx screws.

To Mount CD-ROM Drive (For JP10G-)

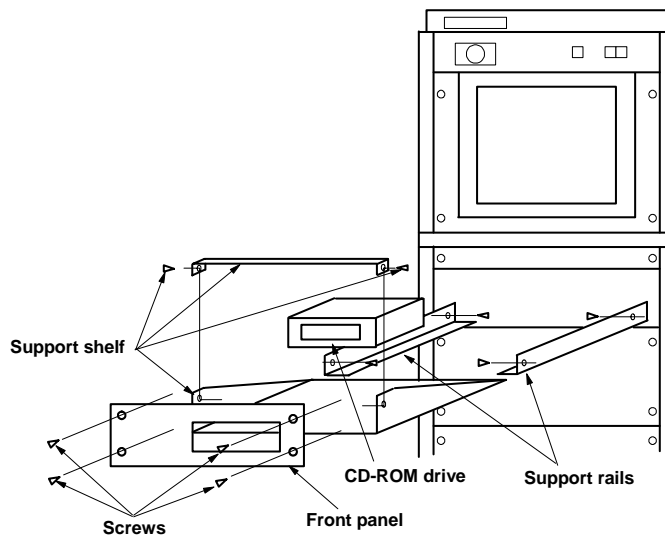
This section describes how to mount the CD-ROM drive into the system cabinet.

NOTE The external CD-ROM drive cannot be mounted into the system cabinet of the 4072A (JP20G-) and 4073A (JP10H-) but can be mounted into the system cabinet of the 4072A (JP10G-).

To mount the CD-ROM drive, use the following procedures:

1. Attach the CD-ROM drive on the support shelf, as shown in figure 3-25.
2. Remove the blank panel from the location for the CD-ROM drive. Keep the four torx screws; these are used to attach the panel to the system cabinet.
3. Install the support rails in the system cabinet. At the factory, clip-on nuts are attached to the front and rear columns of the system cabinet for installing the rails.
4. Slide the CD-ROM drive (with the support shelf) on the support rails. The groove at the rear corners of the support shelf must slide on the rails.
5. Attach the front panel to the system cabinet using the torx screws. At the factory, clip-on nuts are attached to the front columns for installing the front panel.
6. Connect the SCSI cable between the SCSI connector on the system controller and the CD-ROM drive.
7. Connect the power cord between the CD-ROM drive and a controller power outlet.

Figure 3-25 Installing CD-ROM Drive



To Mount DDS Drive (For JP30G-, JP20H-)

This section describes how to mount the DDS drive into the system cabinet.

NOTE The external DDS drive can be mounted into the system cabinet of the 4072A (JP30G-) and 4073A (JP20H-). If the serial numbers do not match, the E3153A option 101 Upgrade kit for the Agilent 81110A Pulse Generator must be installed into the system cabinet to install this DDS rack mount kit.

Mount the DDS drive as follows:

1. Before installing the DDS rack mount kit, two brackets must be installed into the cabinet. To install these brackets, see “To Install Upgrade Kit for Agilent 81110A Rack Mount Kit (E3153A option 101).” on page 88.
2. Connect the SCSI cable to the SCSI connector on the DDS drive.
3. Connect the power cord to the DDS drive.
4. Attach the DDS drive on the support shelf, as shown in figure 3-26.
5. Install the attachment and the support rail for the DDS rack mount kit into the system cabinet. For details, see “To Install Upgrade Kit for Agilent 81110A Rack Mount Kit (E3153A option 101).” on page 88.
6. Slide the DDS drive (with the support shelf) on the support rails.
7. Attach the front panel to the system cabinet using the torx screws. At the factory, clip-on nuts are attached to the front columns for installing the front panel.
8. Attach the Chassis (Cover) on the support shelf, as shown in figure 3-27.
9. Attach the rear panel into the system cabinet, as shown in figure 3-28.

Figure 3-26 Installing DDS Drive

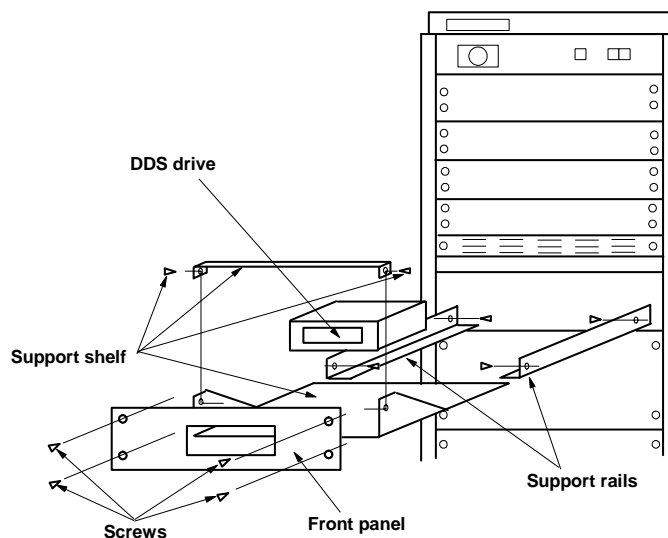


Figure 3-27 Installing DDS Cover

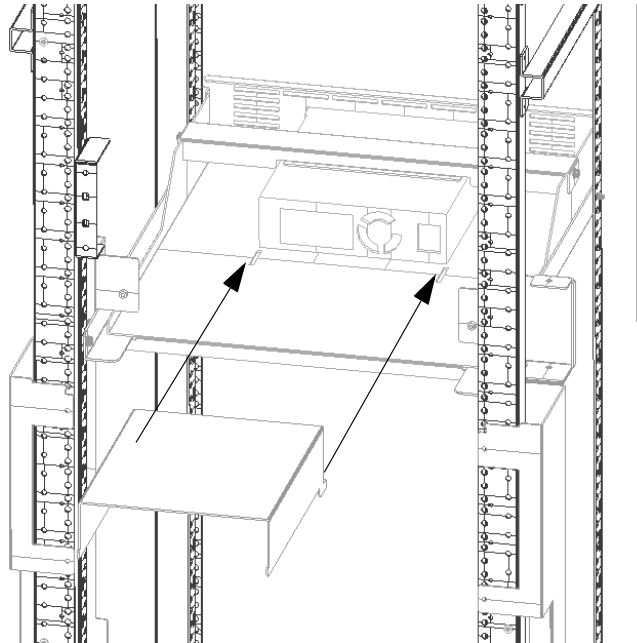
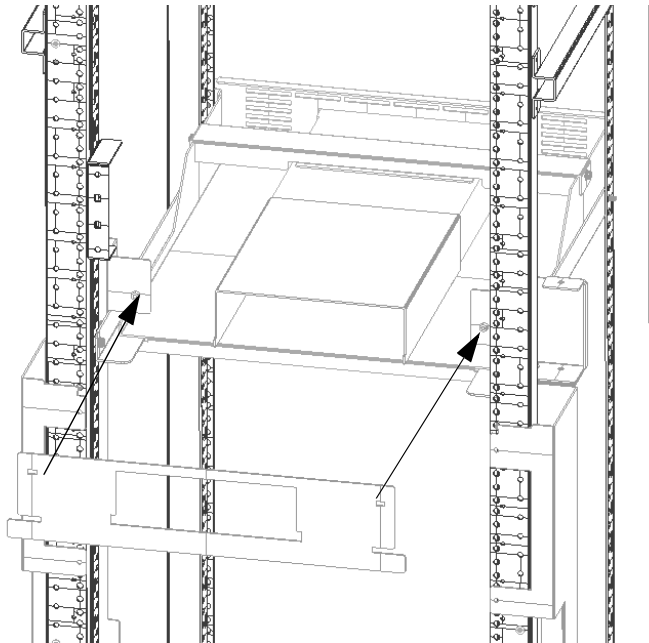


Figure 3-28 Installing Rear Panel for DDS Drive



To Mount Spectrum Analyzer (Agilent E4411B)

This section describes how to mount the spectrum analyzer into the system cabinet.

NOTE To mount the *customer's* E4411B into the system cabinet, perform all the procedures in this section.

If the E3102A option SP1 rack mount option for the E4411B, is ordered, the spectrum analyzer is mounted into the system cabinet at the factory.

To mount the system controller, use the following procedures:



1. Remove the arm of E4411B following the procedures as shown in the above figure.



2. Put the E4411B on the frame.



3. Attach the stopper by one screw (M4×8).



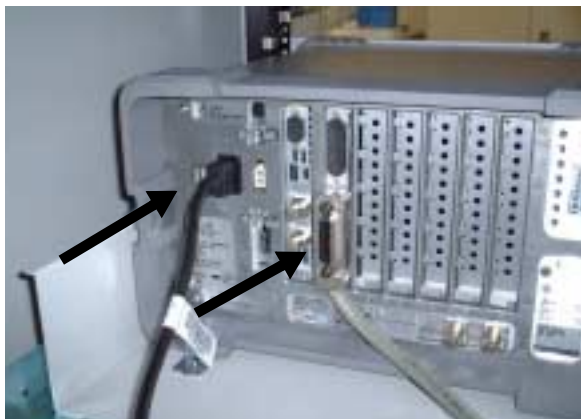
4. Attach the support rail by four screws and sheet nuts.



5. Install the frame with the E4411B into the system cabinet.



6. Screw four screws and sheet nuts to fix the frame with the E4411B.



7. Connect the power cable and GPIB cable.

4 Connecting Testhead to the Cabinet

This chapter describes how to connect the testhead to the system cabinet. This part of the installation process consists of the following main steps:

1. connecting the air duct, optical fiber cables, and ground wire
2. connecting the testhead power cable
3. connecting the measurement cables (test leads)
4. checking the operation of the testhead power supply (TH PS)

This chapter also contains the following sections:

- “Required Parts”
- “To Connect Air Duct, Optical Fiber Cables, and Ground Wire”
- “To Connect Testhead Power Cable”
- “To Connect CMU (Agilent 4284A) Test Leads”
- “To Connect DVM (Agilent 3458A) Test Leads”
- “To Connect Pulse Generator (Agilent 8110A/81110A/8114A) Test Leads”
- “To Connect Agilent E4411B Spectrum Analyzer Test Leads”
- “To Check the Testhead Power Supply and Instrument Operation”

CAUTION Before performing the procedures described in this section, turn OFF the testhead power switch, and remove the power cord from the testhead power supply.

Required Parts

Table 4-1 lists the parts required to connect the testhead to the system cabinet. Verify that the parts are furnished with the Agilent 4072A/4073A.

Table 4-1 Parts for Connecting Testhead to the System Cabinet

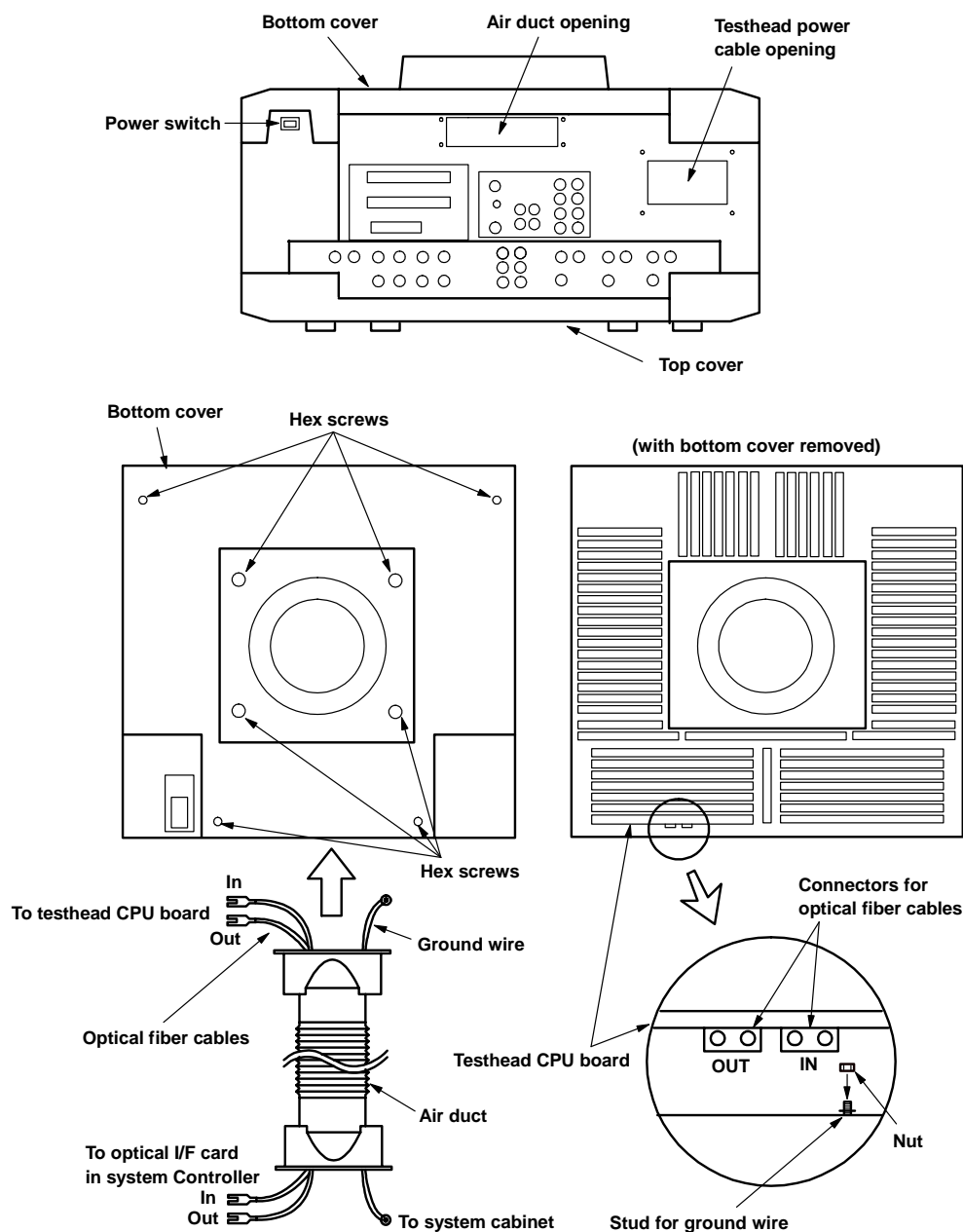
Description	Part Number	Quantity
Fitting for air duct ^a	E3120-60008	2
Air duct ^a	E3120-40005	1
Optical fiber cable assembly ^a (pair)	E3120-61602	1
Ground wire ^a	E3120-61678	1
Testhead power cable ^b	E3160-60007	1
For Agilent 4284A		
BNC-T (m-f-f) type adapter ^c	1250-2405C	2
Agilent 16048E test leads ^c	16048-60002	1
For Agilent 3458A		
Test leads (BNC-banana-plug cable) ^d	E3120-61683	1
For Agilent 8110A, Agilent 81110A, or Agilent 8114A		
BNC-triaxial adapter ^e	1250-0595	up to 2 ^f
1-to-2 adapter	E3125-61042	up to 3 ^f
BNC cable for pulse switch ^e	E3125-61607	up to 7 ^f
BNC(f)-to-BNC(m) cable assembly, 115 cm, yellow ^g	04062-61604	1 ^h
BNC(f)-to-BNC(m) cable assembly, 115 cm, blue ⁱ	04062-61608	1 ^h
PG cable, BNC cable 4.6 m ⁱ	E3150-61601	1 or 2 ^j
BNC(f)-to-BNC(m) cable assembly, 115 cm, white ^e	E3150-61602	up to 2
feed through, 50 Ω ^k	04192-61002	1 ^h
BNC cable for transition time converter, 50 cm ^k	E3150-61603	1 ^h
For Agilent E4411B		
Test leads (BNC cable, 4.6 m) ^l	E350-61601	1
Type N(m)-to-BNC(f) adapter ^l	1250-0780	1

- The air duct assembly includes the air duct and fittings. The optical fiber cables and the ground wire are passed through the air duct assembly.
- The testhead power cable is connected to the testhead power supply at the factory.
- The 16048E and a BNC-T-type adapter are included with the Agilent E3102A/E3103A option 011.
- The test leads (BNC-banana-plug cable) are included with the Agilent E3102A/E3103A option 012.
- These parts are included with the Agilent E3102A/E3103A option 500.
- The required quantity depends on the number of pulse generators and connections with the testhead.
- These parts are included with the Agilent E3102A/E3103A option 550.
- For each 8110A, 81110A, or 8114A. This quantity depends on the number of 8110As, 81110As, or 8114As.
- These parts are included with the Agilent E3102A/E3103A option 550, 551, and 552.
- Two parts are required for each 8110A or 81110A. One part is required for each 8114A.
- These parts are included with the Agilent E3102A/E3103A option 552.
- These parts are included with the Agilent E3102A/E3103A option SP1.

To Connect Air Duct, Optical Fiber Cables, and Ground Wire

This section describes how to connect the air duct (and the optical fiber and ground cables that run through the air duct) between the testhead and system cabinet. Figure 4-1 and figure 4-2 show the part locations for the testhead and system cabinet, respectively.

Figure 4-1 Part Locations for the Testhead



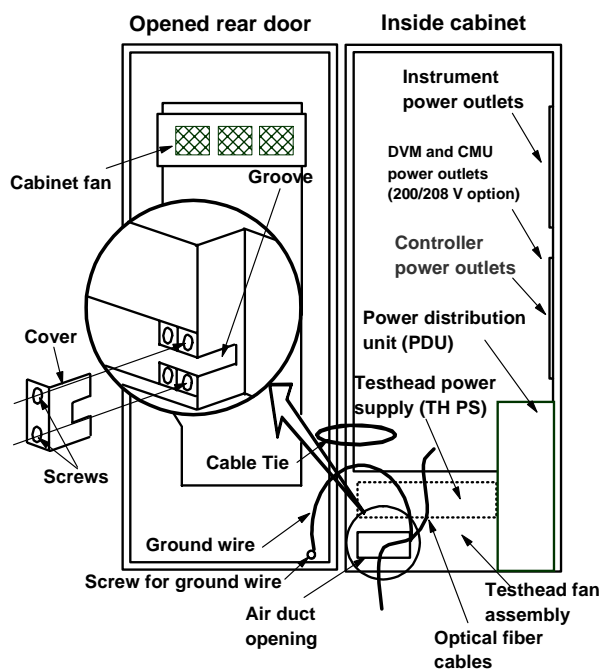
To connect the testhead to the system cabinet, use the following procedure.

1. Connect the ground wire and optical fiber cables to the system cabinet.
 - a. Open the rear door of the system cabinet.
 - b. Remove the groove cover, as shown in figure 4-2.
 - c. Put the ground wire and the optical fiber cables into the groove at the bottom of the system cabinet, as shown in figure 4-2.
 - d. Reinstall the cover.

The optical fiber cables are now ready to be connected to the system controller, as described in chapter 5 or chapter 6.

- e. Pull the ground wire so that it can be connected to the rear door.
- f. Remove the nut from the screw located in the lower-right corner of the opened rear door.
- g. Connect the ground wire to the rear door using the nut.

Figure 4-2 System Cabinet Part Locations



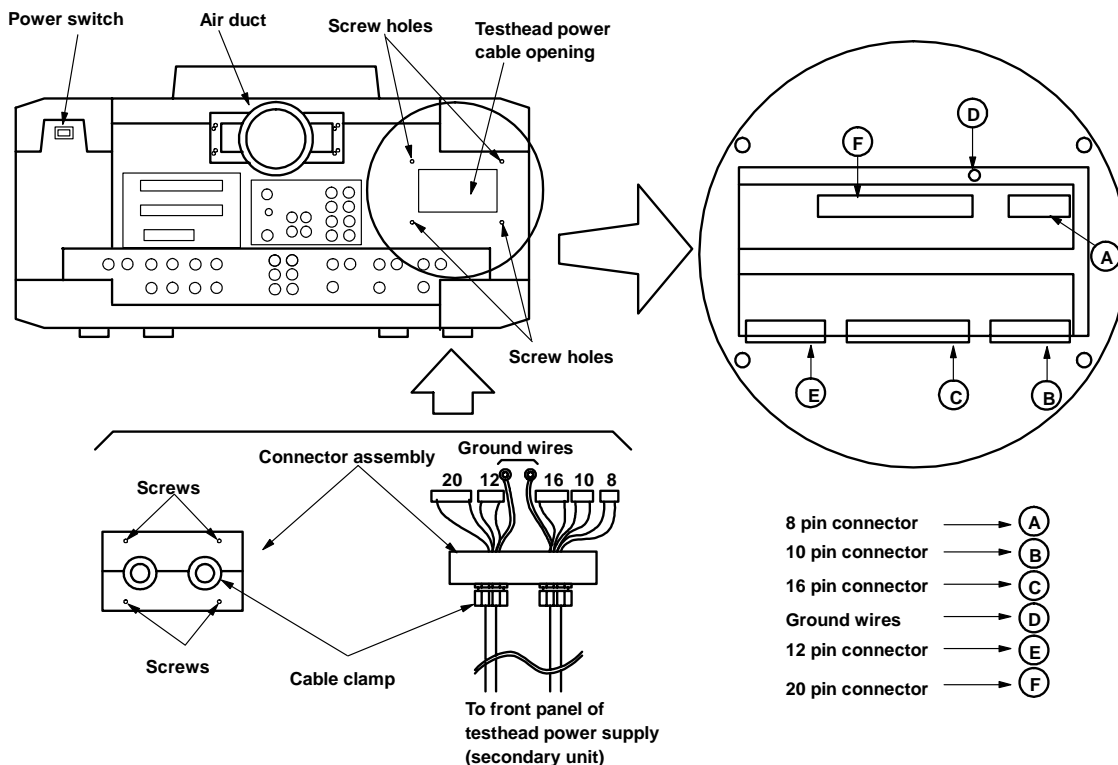
2. Connect the air duct to the system cabinet.
 - a. Place the end of the air duct on the air duct opening.
 - b. Attach the air duct using the four screws provided with the air duct fitting.
3. Close the rear door and reinstall the inner plate and bottom cover of the testhead.
 - a. Close the rear door of the system cabinet.
 - b. Reinstall the testhead inner plate using eight hex screws (M6).
 - c. Reinstall the testhead bottom cover using eight hex screws (M4).

To Connect Testhead Power Cable

This section describes how to connect the testhead power cable between the testhead and the system cabinet. Figure 4-3 shows the part locations for the testhead.

1. Open the rear door of the system cabinet.
2. Pull out the testhead power cable connector assembly from the system cabinet. The other side of the cable is connected to the testhead power supply at the factory.
3. Using a cable tie, secure the testhead power cable, as shown in figure 4-2.
4. Pull the cable out near the bottom of the system cabinet, then close the system cabinet rear door.
5. Connect the connectors as shown in figure 4-3:
 - 12-pin connector to “E” connector.
 - 16-pin connector to “C” connector.
 - 10-pin connector to “B” connector.
 - 8-pin connector to “A” connector.
 - 20-pin connector to “F” connector.
 - Attach the two ground wires at screw hole “D”, using the screw provided with the testhead.
6. Screw the four screws on the connector assembly.

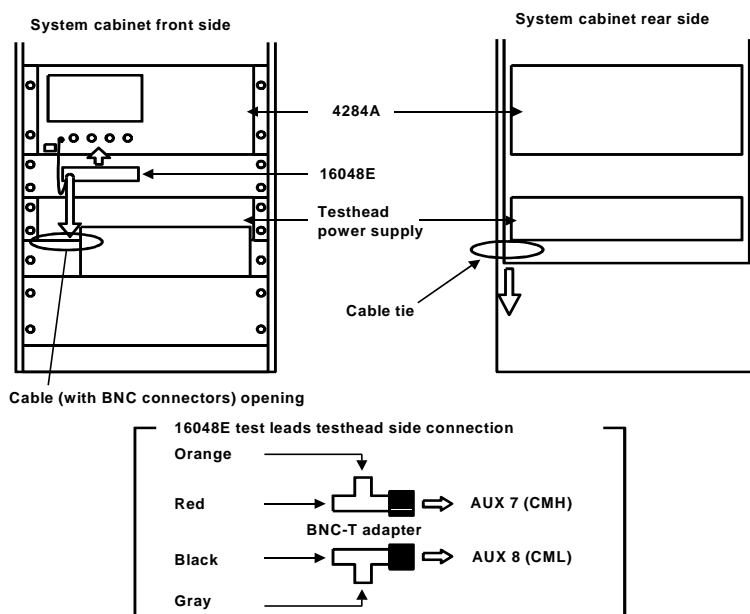
Figure 4-3 Testhead Power Cable Connection



To Connect CMU (Agilent 4284A) Test Leads

This section describes how to connect the capacitance measurement unit (CMU) test leads between the testhead and system cabinet. Figure 4-4 shows the system cabinet part locations.

Figure 4-4 Connecting Agilent 4284A to Testhead

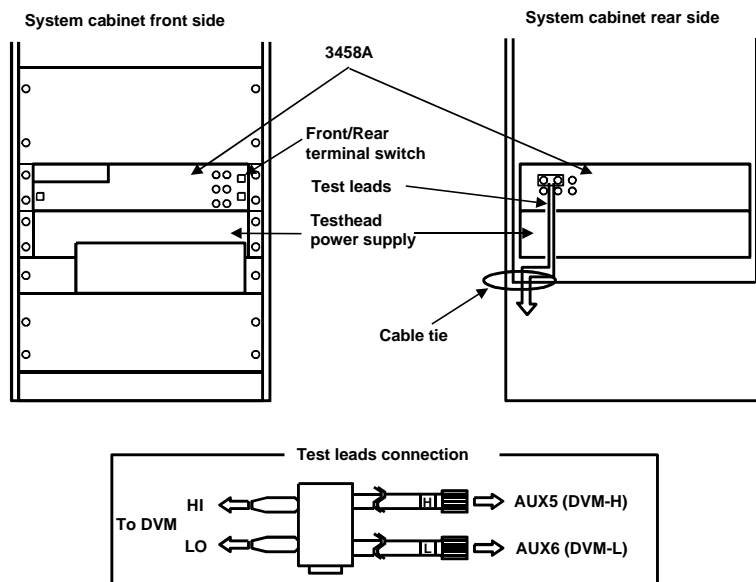


1. Open the front door of the system cabinet.
2. Remove the front panel, which is installed under the TH PS.
3. Connect the 16048E test leads to the UNKNOWN terminals on the 4284A (CMU) front panel.
4. Insert the banana terminal test lead into the ground terminal (\perp), on the left side of the UNKNOWN terminal.
5. Pull the cable through the opening, as shown in figure 4-4.
6. Reinstall the front panel.
7. Close the front door of the system cabinet.
8. Open the rear door of the system cabinet.
9. Pull the cable out near the bottom rear of the system cabinet.
10. Using a cable tie, secure the cable, as shown in figure 4-4.
11. Close the rear door of the system cabinet.
12. Connect the red and orange test leads to the female connectors of a BNC-T (m-f-f) adapter.
13. Connect the male connector of the BNC-T (m-f-f) adapter to the AUX7 (CMH) connector on the testhead side panel.
14. Connect the gray and black leads to the female connectors of a BNC-T (m-f-f) adapter.
15. Connect the male connector of the BNC-T (m-f-f) adapter to the AUX8 (CML) connector on the testhead side panel. Do *not* connect the ring terminal lead.

To Connect DVM (Agilent 3458A) Test Leads

This section describes how to connect the digital voltmeter (DVM) test leads between the testhead and the system cabinet. Figure 4-5 shows the system cabinet part locations.

Figure 4-5 Connecting Agilent 3458A to Testhead



1. Open the rear door of the system cabinet.
2. Connect the test leads (dual-banana plug side) to the Input (2 Wire) HI and LO terminals on the 3458A (DVM) rear panel.
3. Pull the test lead "H"-labeled cable and "L"-labeled cable out near the bottom rear of the system cabinet.
4. Using a cable tie, secure the cables, as shown in figure 4-5.
5. Close the rear door of the system cabinet.
6. Connect the test lead "H"-labeled cable to the AUX5 (DVM-H) connector on the testhead side panel.
7. Connect the test lead "L"-labeled cable to the AUX6 (DVM-L) connector on the testhead side panel.
8. Set the Front/Rear Terminal switch to the "In" (retracted) position. The switch is located in the upper-right corner of the 3458A (DVM) front panel.

To Connect Pulse Generator (Agilent 8110A/81110A/8114A) Test Leads

This section describes how to connect the pulse generator test leads between the testhead and the system cabinet.

To Connect Trigger Cables

This section describes how to connect the trigger cable between the pulse generators and the trigger distributor. Figure 4-6 shows an overview of the trigger distributor. Figure 4-7 through figure 4-9 show the pulse generator configuration.

Figure 4-6 Trigger Distributor Overview

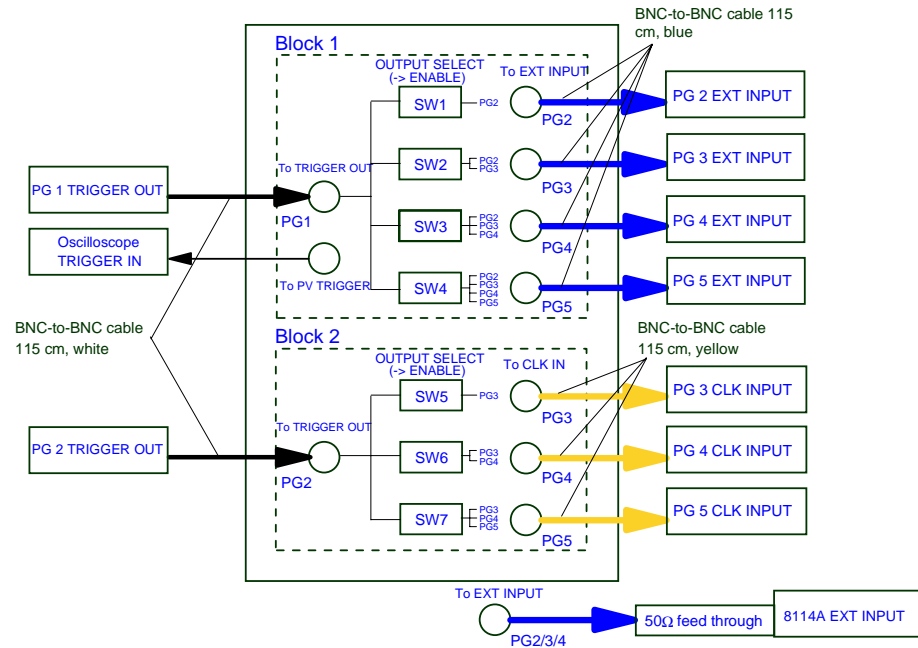


Figure 4-7 Pulse Generator Configuration (with no Agilent 8114A)

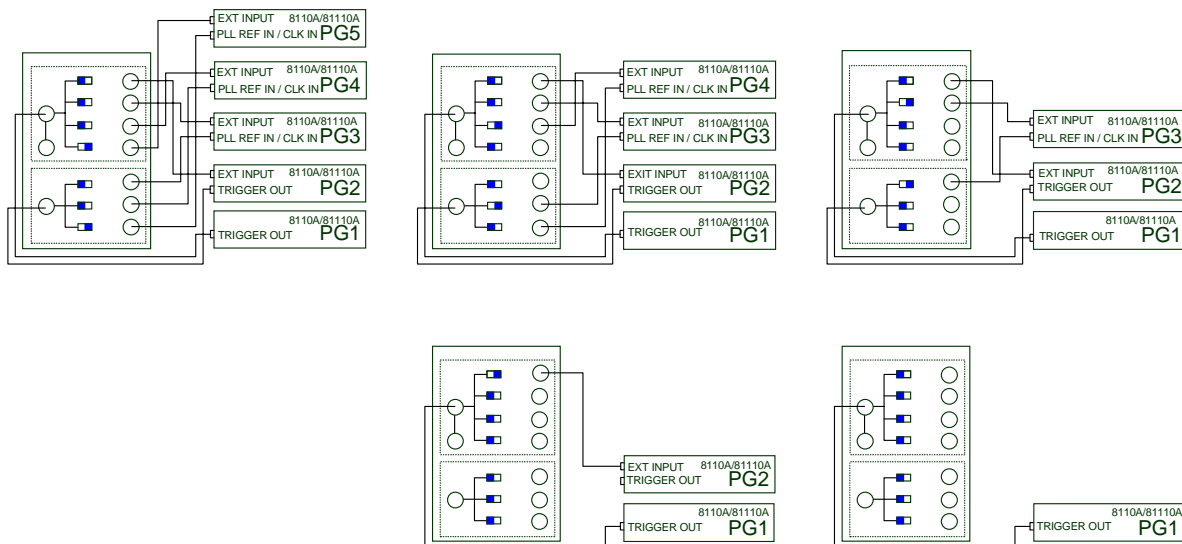
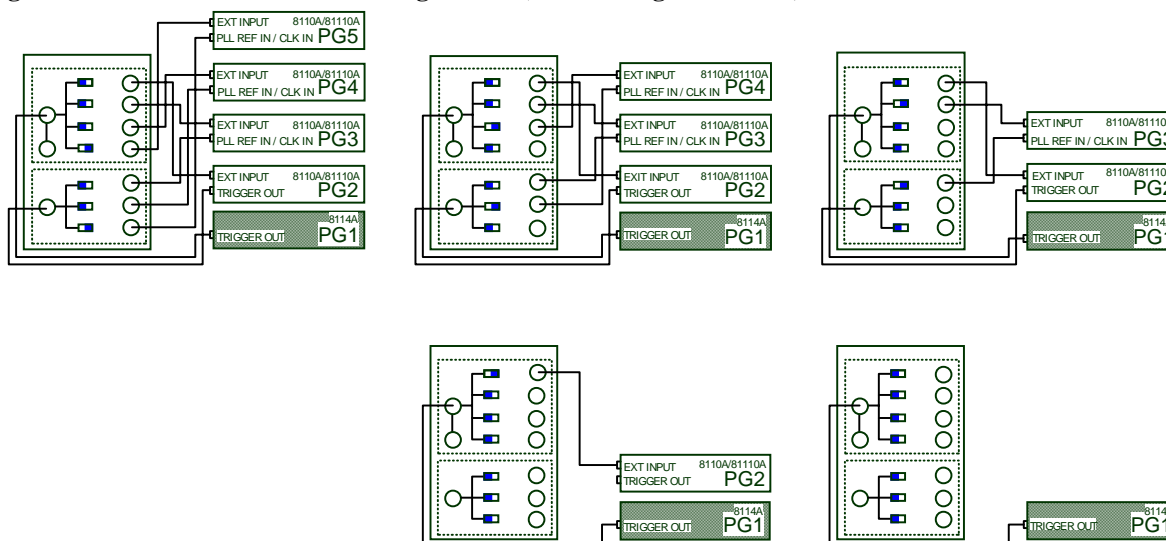
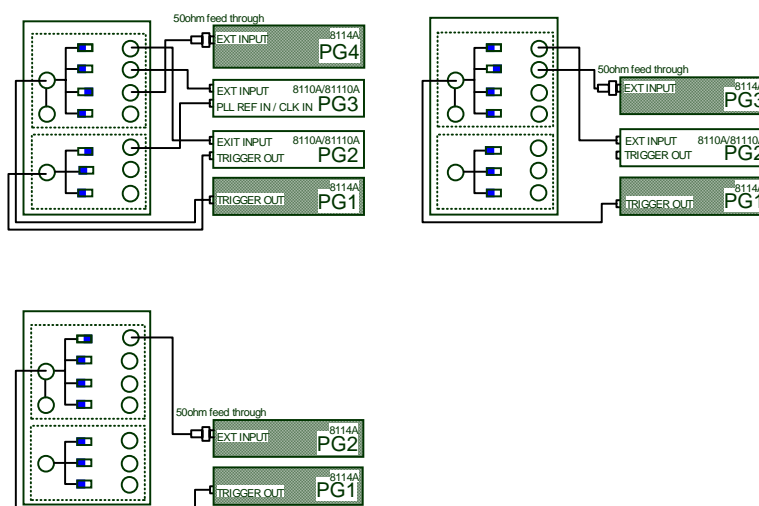


Figure 4-8 Pulse Generator Configuration (with one Agilent 8114A)**Figure 4-9 Pulse Generator Configuration (with two Agilent 8114As)**

1. Open the rear door of the system cabinet.
2. Connect the trigger cable (BNC-to-BNC cable, 115 cm, white) between PG 1 TRIGGER OUT and the terminal (To TRIGGER OUT PG1) on the trigger distributor.
3. (If connecting more than three PGs and the PG 3 is the 8110A or 81110A) Connect the trigger cable (BNC-to-BNC cable, 115 cm, white) between PG 2 TRIGGER OUT and the terminal (To TRIGGER OUT PG2) on the trigger distributor.
4. Connect the trigger cable (BNC-to-BNC cable, 115 cm, blue) between PG 2/3/4/5 EXT INPUT and the terminal (To EXT INPUT PG2/3/4/5) on the trigger distributor.
(For the 8114A) Connect the 50 Ω feed through between the To EXT INPUT terminal and the PG EXT INPUT.
5. (For the 8110A or 81110A) Connect the trigger cable (BNC-to-BNC cable, 115 cm, yellow) between PG 3/4/5 PLL REF IN/CLK IN and the terminal (To CLK IN PG3/4/5) on the trigger distributor.

NOTE Do not connect the trigger cables to the To EXT INPUT PG2/3/4/5 and To CLK IN PG3/4/5 terminals discontinuously. Connect to the terminals in consecutive order.

6. Set the trigger distributor switches. The trigger distributor switch settings depend on the number of pulse generators connected to the output terminal on the trigger distributor. The settings of the trigger distributor switches are shown in table 4-2.

Table 4-2 Trigger Distributor Switch Settings

Number for 8110A or 81110A	Number for 8114A	Block 1				Block 2		
		SW 1	SW 2	SW 3	SW 4	SW 5	SW 6	SW 7
1	0	OFF	OFF	OFF	OFF	OFF	OFF	OFF
2		<i>ON</i>	OFF	OFF	OFF	OFF	OFF	OFF
3		OFF	<i>ON</i>	OFF	OFF	<i>ON</i>	OFF	OFF
4		OFF	OFF	<i>ON</i>	OFF	OFF	<i>ON</i>	OFF
5		OFF	OFF	OFF	<i>ON</i>	OFF	OFF	<i>ON</i>
0	1	OFF	OFF	OFF	OFF	OFF	OFF	OFF
1		<i>ON</i>	OFF	OFF	OFF	OFF	OFF	OFF
2		OFF	<i>ON</i>	OFF	OFF	<i>ON</i>	OFF	OFF
3		OFF	OFF	<i>ON</i>	OFF	OFF	<i>ON</i>	OFF
4		OFF	OFF	OFF	<i>ON</i>	OFF	OFF	<i>ON</i>
0	2	<i>ON</i>	OFF	OFF	OFF	OFF	OFF	OFF
1		OFF	<i>ON</i>	OFF	OFF	OFF	OFF	OFF
2		OFF	OFF	<i>ON</i>	OFF	<i>ON</i>	OFF	OFF

To Connect Signal Cables

This section describes how to connect the signal cables between the pulse generators and the testhead.

1. Open the rear door of the system cabinet.
2. Tie the PG cables with the cable ties and fix them to the frame of the system cabinet at a point 50 cm from the end of the PG cables.
3. Connect the PG cables, as shown in table 4-3, to the output terminals of the pulse generators.

(For the 8110A) Connect the two PG cables (BNC-to-BNC cable, 4.6 m) to the OUTPUT 1 and OUTPUT 2 terminals on the 8110A rear panel.

(For the 81110A) Connect the two PG cables (BNC-to-BNC cable, 4.6 m) to the OUTPUT 1 and OUTPUT 2 terminals on the 81110A front panel.

(For the 8114A) Connect the 8114A-transition time converter cable (50 cm) to the OUTPUT terminal on the 8114A rear panel, and connect to the transition time converter. Then connect the PG cable (BNC-to-BNC cable, 4.6 m) to the transition time converter.

Table 4-3 Pulse Generator Channel Name

Pulse Generator	PG channel 1 (OUTPUT 1)	PG channel 2 ^a (OUTPUT 2)
PG 1	PG11	PG12
PG 2	PG21	PG22
PG 3	PG31	PG32
PG 4	PG41	PG42
PG 5	PG51	PG52

a. The 8114A has only one output channel. These labels are not used for the 8114A.

Figure 4-10 Connecting PG Cables (For 8110A and 8114A)

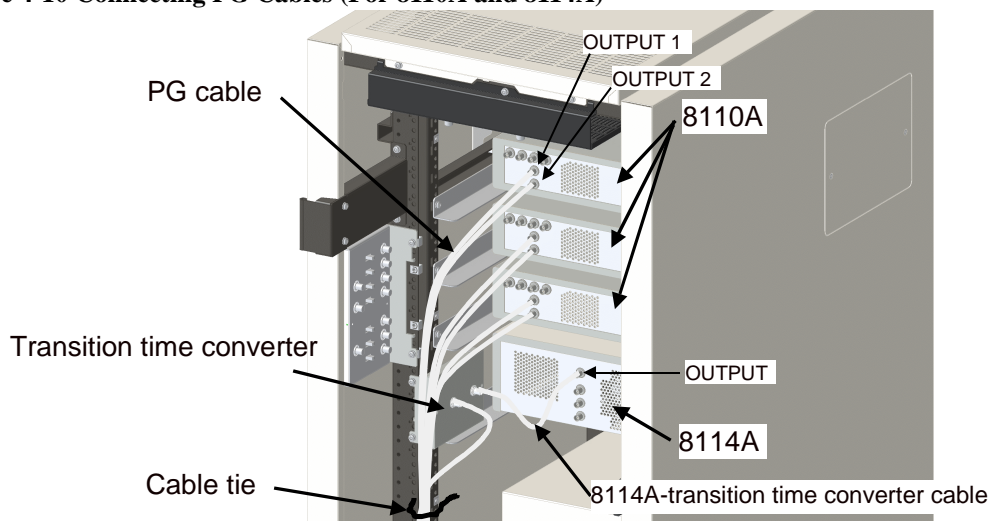
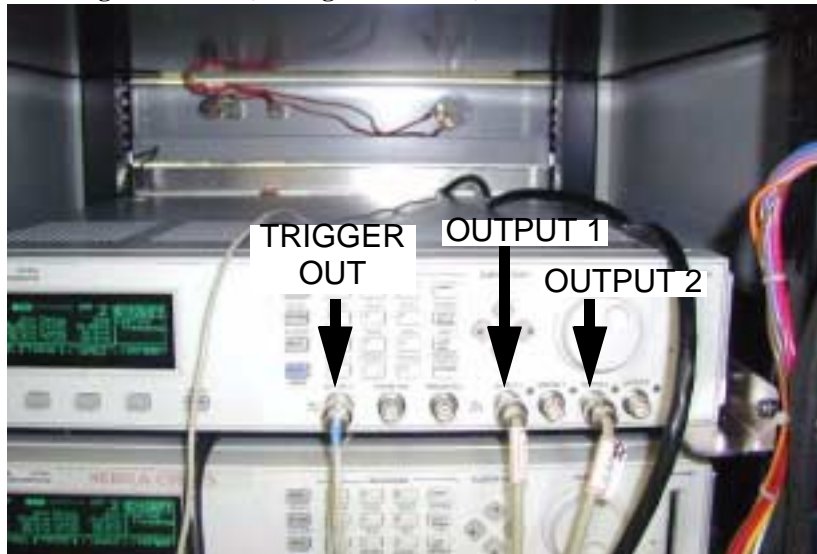


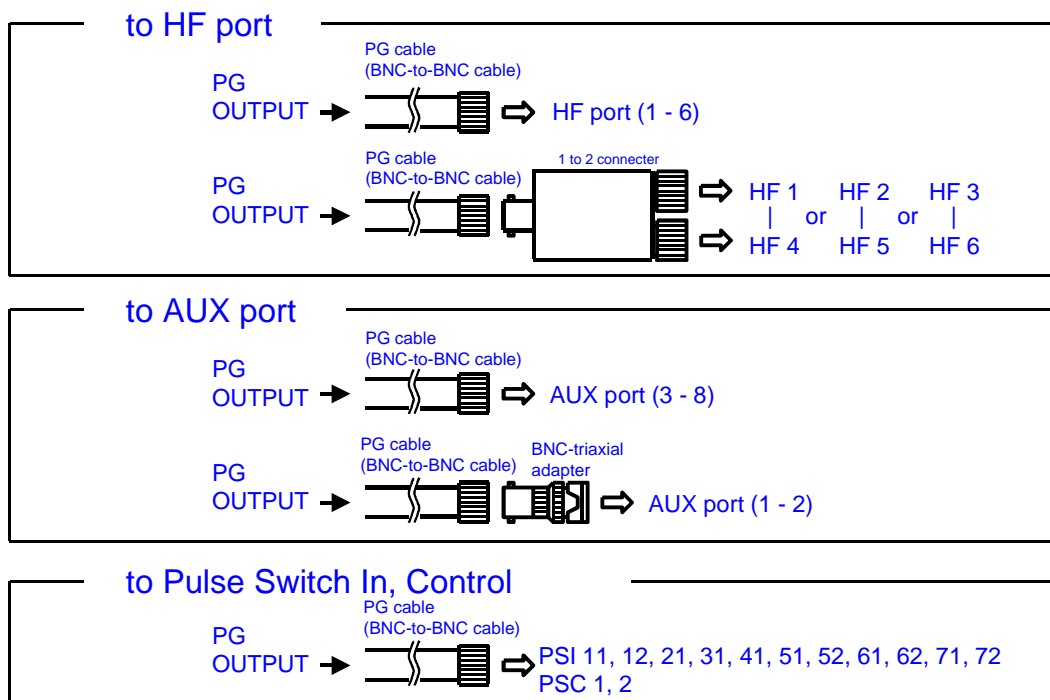
Figure 4-11 Connecting PG Cables (For Agilent 81110A)



4. Pass the PG cables through the opening of the rear door of the system cabinet.
5. Wrap the PG cables in a zipper tube using the zip lock sealing tool and attach to the cabinet.
6. Close the rear door of the system cabinet.
7. Connect the PG cables to the HF ports, AUX ports, pulse switch in ports, or pulse switch control ports on the testhead side using the PG cables, 1 to 2 connector, or BNC-triaxial adapter. See figure 4-12.

Use the pulse switch cable (BNC-to-BNC cable), which is included in the integration kit for the first pulse generator, to connect from the pulse switch out port (PSO 1-7) to the HF port or AUX port.

Figure 4-12 Connecting Signal Cables to Testhead Port



NOTE When installing the 4072A/4073A tester, Agilent Technologies recommends connecting the PG cables to the HF ports using the default setting, shown in table 4-4 through table 4-6.

Table 4-4 Default Setting of PG Cable Connections (with no Agilent 8114A)

PG name	Output Terminal	PG Cable	HF Port
PG 1 (8110A or 81110A)	OUTPUT 1	PG11	HF1
	OUTPUT 2	PG12	HF2
PG 2 (8110A or 81110A)	OUTPUT 1	PG21	HF3
	OUTPUT 2	PG22	HF4
PG 3 (8110A or 81110A)	OUTPUT 1	PG31	HF5
	OUTPUT 2	PG32	HF6
PG 4 (8110A or 81110A)	OUTPUT 1	PG41	not connected
	OUTPUT 2	PG42	not connected
PG 5 (8110A or 81110A)	OUTPUT 1	PG51	not connected
	OUTPUT 2	PG52	not connected

Table 4-5 Default Setting for PG Cable Connections (with one Agilent 8114A)

PG name	Output Terminal	PG Cable	HF Port
PG 1 (8114A)	OUTPUT	PG11	HF1
PG 2 (8110A or 81110A)	OUTPUT 1	PG21	HF2
	OUTPUT 2	PG22	HF3
PG 3 (8110A or 81110A)	OUTPUT 1	PG31	HF4
	OUTPUT 2	PG32	HF5
PG 4 (8110A or 81110A)	OUTPUT 1	PG41	HF6
	OUTPUT 2	PG42	not connected
PG 5 (8110A or 81110A)	OUTPUT 1	PG51	not connected
	OUTPUT 2	PG52	not connected

Table 4-6 Default Setting for PG Cable Connections (with two Agilent 8114As)

PG name	Output Terminal	PG Cable	HF Port
PG 1 (8114A)	OUTPUT	PG11	HF1
PG 2 (8114A)	OUTPUT	PG21	HF2

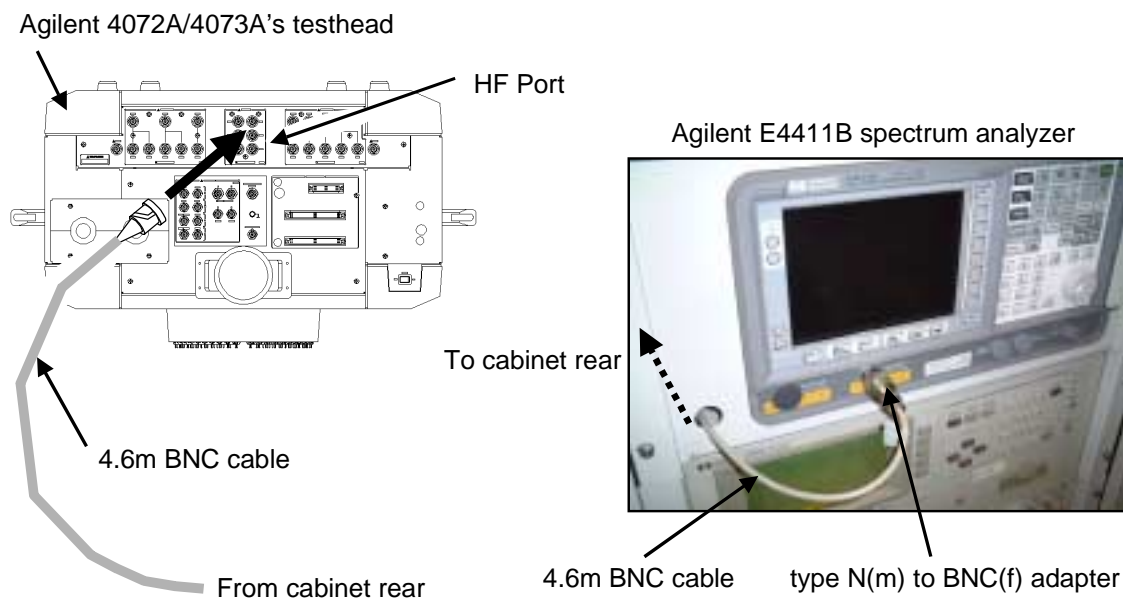
PG 1 (8114A)	OUTPUT	PG11	HF1
PG 2 (8110A or 81110A)	OUTPUT 1	PG21	HF2
	OUTPUT 2	PG22	HF3
PG 3 (8114A)	OUTPUT	PG31	HF4

PG 1 (8114A)	OUTPUT	PG11	HF1
PG 2 (8110A or 81110A)	OUTPUT 1	PG21	HF2
	OUTPUT 2	PG22	HF3
PG 3 (8110A or 81110A)	OUTPUT 1	PG31	HF4
	OUTPUT 2	PG32	HF5
PG 4 (HP 8114A)	OUTPUT	PG41	HF6

To Connect Agilent E4411B Spectrum Analyzer Test Leads

This section describes how to connect the spectrum analyzer test leads between the testhead and the system cabinet. Figure 4-13 shows the system cabinet part locations.

Figure 4-13 Connecting Agilent E4411B to Testhead



1. Open the rear door of the system cabinet.
2. Connect the test leads cable (4.6 m BNC cable) to the 50 Ω input terminals (type N) on the E4411B front panel with the type N(m)-to-BNC(f) adapter.
3. Pull the test lead cable out near the bottom rear of the system cabinet.
4. Using a cable tie, secure the cables.
5. Close the rear door of the system cabinet.
6. Connect the test lead cable to the HF port connector on the testhead side panel.

To Check the Testhead Power Supply and Instrument Operation

Electrical Work Type 3:

WARNING 24 V is forced to the uninsulated parts of the EMO rear panel. Do not touch these parts.

1. Open the rear door of the system cabinet.
2. Verify that the testhead fan protector and the cabinet fan protector are set to the “In” position.
These protectors are located in the front panel of the power distribution unit.
3. Verify that the power outlet protectors are set to the “In” position.
These protectors are located at the instrument power outlets and DVM and CMU power outlets.
4. Connect the power cord between the testhead power supply and an instrument power outlet.
5. Set the main breaker to the ON position.
6. Set the emergency breaker to the ON position.
7. Set the main switch to the ON position. The LINE indicator on the top of the system cabinet turns on.
8. Verify that the over voltage LED turns on. If so, check the source power line.
9. Press the system switch. The green LED in the system switch turns on.

NOTE Complete steps 7 through 9 within 20 seconds. After 20 seconds, the cabinet fan error LED turns on. Set the main switch to the OFF position and repeat steps 7 through 9.

10. Press the INSTRUMENT POWER ON switch on the top front of the system cabinet. The green LED in the INSTRUMENT POWER ON switch turns on.
11. Turn on the testhead power supply LINE switch and the testhead power switch.
12. Open the front door of the system cabinet.
13. Check the three LEDs (Power, Caution, Error) on the front panel of the testhead power supply. The LEDs are described in table 4-7.

Table 4-7 LEDs for the Testhead Power Supply

LEDs			Description
Power [Green]	Caution [Yellow]	Error [Red]	
ON	OFF	OFF	Normal condition.
OFF	ON	ON	Testhead power supply output is over current.
OFF	OFF	ON	Testhead power supply output is over voltage. Testhead power supply output has insufficient voltage. Temperature in the testhead power supply is too high.
OFF	ON	OFF	Testhead fan has stopped. Testhead fan has slowed down. Fan protector is open. Overheating has occurred inside the testhead.

NOTE The power (green) LED must be lit for normal 4072A/4073A operation. If the power LED is not lit, see the *Agilent 4072A/4073A Service Guide*, and troubleshoot the testhead power supply.

CAUTION Before turning on the 4072A/4073A, verify that the line voltage selector switch for each instrument is set correctly. For instructions on how to set these switches, see the *Operation Manual* for each instrument.

Make sure that the power cords for the instruments, controller, and peripherals installed in the system cabinet are completely connected to the power outlets.

14. Turn on the instruments (3458A, 4284A, 8110A or 81110A, 8114A, and E4411B).

15. Wait until the power-on self-test execution is completed.

16. Check the power-on self-test results.

NOTE If you have a self-test failure, see the service manual for the related equipment, and troubleshoot the equipment.

5 Setting Up Agilent E3172A/AJ/B and Agilent E3173A

This chapter describes how to set up the Agilent E3172A/AJ/B and Agilent E3173A system controller for use with the Agilent 4072A/4073A.

HP-UX, SICL, BASIC/UX, 4070 system software, and Agilent SPECS are installed in the E3172A/AJ/B and E3173A at the factory.

NOTE To install the system software in a system controller other than the E3172A/AJ/B and E3173A, see chapter 6 or appendix C.

This chapter contains the following sections:

- “To Set Up Hardware”
- “To Check System Controller and Peripheral Operation”
- “To Set Up Software”

To Set Up Hardware

This section describes how to set up the E3172A/AJ/B and E3173A system controller on a table.

NOTE If you rack-mount the system controller or monitor into the system cabinet, see chapter 3.

To set up the E3172A/AJ/B and E3173A on a table, use the following procedure.

1. Place the system controller on the table.
2. Place the monitor on the system controller.
3. Place the keyboard and mouse in front of the system controller.
4. Connect the power cord between the system controller and a controller power outlet.
5. Connect the video cable between the monitor and the system controller.
6. Connect the power cord between the monitor and a controller power outlet.
7. Connect the keyboard and mouse cables to the system controller.
8. Connect the installation site network cable to the LAN connector.

NOTE Before connecting the LAN cable, you must get an IP address and hostname for the system controller. Contact the installation site's system and network administrator.

9. If there are any SCSI devices outside of the system controller, connect the SCSI cable between the system controller and the SCSI devices. Connect the power cords between the SCSI devices and controller power outlets.

To Check System Controller and Peripheral Operation

Electrical Work Type 3:

WARNING 24 V is forced to the uninsulated parts of the EMO rear panel. Do not touch these parts.

To check the E3172A/AJ/B and E3173A system controller and peripherals, use the following procedure.

1. Set the main breaker to the ON position.
2. Set the emergency breaker to the ON position.
3. Set the main switch to the ON position.
4. Press the system switch.

NOTE Complete the step 3 through 4 within 20 seconds. If it exceeds 20 seconds, the cabinet fan error LED turns on. Set the main switch to the OFF position and repeat step 3 through 4.

5. Turn on the system controller and peripherals.
6. Wait until the power-on self-test execution is completed.
7. Check the self-test results.

NOTE If you have a self-test failure, see the service manual for the related equipment, and troubleshoot the equipment.

To Set Up Software

This section describes how to set up the software for the E3172A/AJ/B and E3173A system controller. HP-UX, SICL, BASIC/UX, 4070 system software, and SPECS are installed in the E3172A/AJ/B and E3173A system controller at the factory. A common environment is also customized at the factory. For more information regarding customization, see appendix A.

1. Turn on the monitor.
2. Turn on the SCSI devices, if applicable.
3. Turn on the system controller. HP-UX starts up automatically.
4. During start up, the `/sbin/set_parms` command runs automatically. Select the time zone settings and then enter the network information, font server setting, and so on, according to the displayed instructions.
5. This setting is optional.
If an automatic wafer prober is used with the 4072A/4073A tester, and the wafer prober address does not match the `/etc/opt/hp4070/config/PCONFIG` file, edit the `PCONFIG` file.
6. This setting is optional.
If SPECS is used, execute the `/home/hpsrvc/config/config.specs` command to customize the SPECS environment. For further details, refer to the *Agilent SPECS Installation Guide*.
7. This setting is optional.
If the Agilent E4411B control software is used, install the E4411B control software and customize the E4411B control software environment. For further details, refer to the “Installing E4411B Control Software (Optional)” in chapter 6.

6 Installing Software (for C.03.01)

This chapter describes how to install the Agilent 4070 system software, and includes software customization and other relevant software installation information.

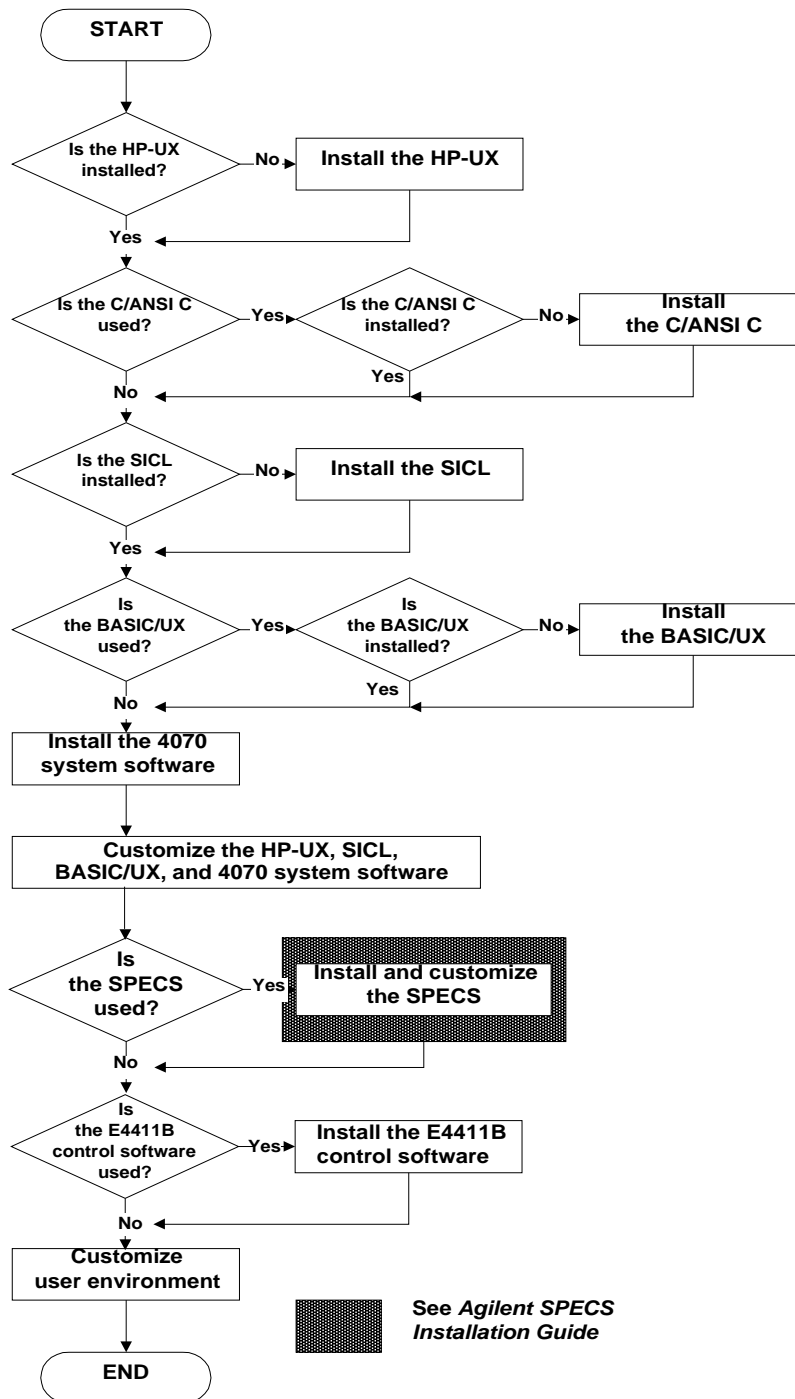
This chapter contains the following sections:

- “Software Installation Overview”
- “System Software Configuration”
- “Before Software Installation”
- “Installing HP-UX and Other Application Software”
- “Customizing for Agilent 4072A/4073A”
- “Creating New User Account”

Software Installation Overview

Figure 6-1 shows the overall sequence for installing the 4070 system software.

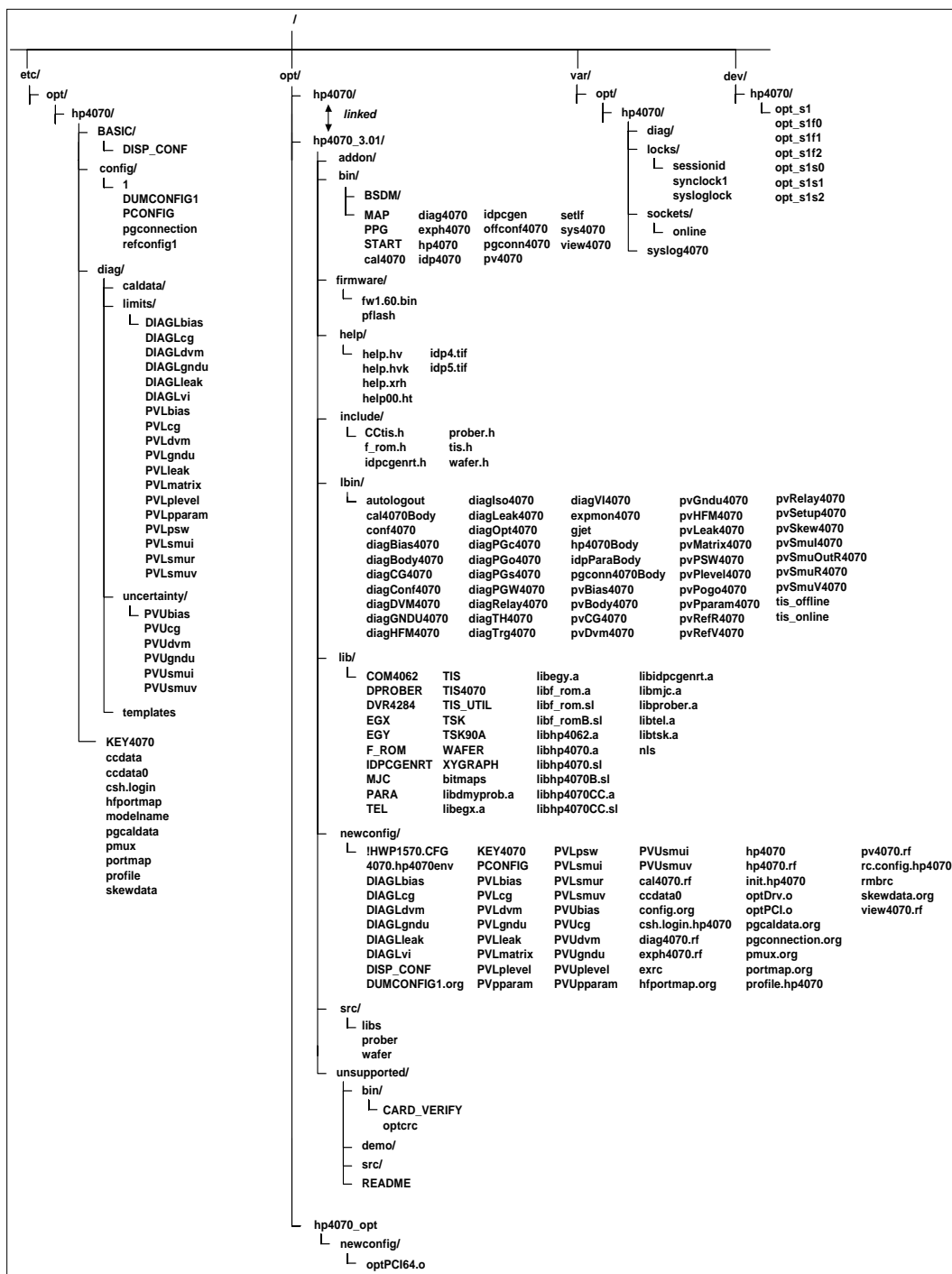
Figure 6-1 4070 Software Installation Sequence



System Software Configuration

Figure 6-2 shows the directory structure for the 4070 system software.

Figure 6-2 System Software Directory Structure



- /opt/hp4070 directory

This directory contains the 4070 system core software, and is configured with the following directories.

- ☐ bin

This directory contains the executable files that you most commonly execute.

- ☐ lbin

This directory contains the executable files that are executed by the front end programs. For example, the programs used by the TIS server, diagnostics, and performance verification are stored in this directory.

- ☐ lib

This directory contains the library files that are linked to C and BASIC programs.

- ☐ include

This directory contains the header files (include files) that are used by C programs and algorithms.

- ☐ newconfig

This directory contains the default files. These include not only the system software files but also HP-UX files related to the 4070 system software. The installation tool copies the files from this directory to the appropriate directory when the installation tool is executed.

- ☐ addon

The user-made files that control the additional instruments are stored in this directory. When the system software is installed, there are no files in this directory.

- ☐ install

This directory contains the installation tools to install the 4070 system software.

- /opt/hp4070_opt directory

- ☐ newconfig

This directory contains the optical interface driver for 64-bits.

- /var/opt/hp4070 directory

This directory contains the temporary data files and log files used for the 4070 system software, and is configured with the following directories.

- ☐ sockets

This directory contains the socket file that is used for communicating between the TIS server and clients.

- ☐ diag

This directory contains the log files and data files that are made during the diagnostics and performance verification.

- ☐ locks

This directory contains the lock file that is used for making and managing the test session.

The 4072/4073A system files are explained below:

<code>/opt/hp4070/bin/hp4070</code>	Executed when you run the TIS server, and also executed when you log into the tester environment.
<code>/opt/hp4070/bin/diag4070</code>	Diagnostics file.
<code>/opt/hp4070/bin/pv4070</code>	Performance verification file.
<code>/etc/opt/hp4070/config/1</code>	Information on the system configuration, such as the optical interface slot number, GPIB address for the system instruments, and so on.
<code>/etc/opt/hp4070/config/pgconnection</code>	Connection information between the pulse generator and the testhead.
<code>/etc/opt/hp4070/config/refconfig1</code>	System configuration.
<code>/etc/opt/hp4070/config/PCONFIG</code>	Information on the GPIB address for the automatic wafer probers.
<code>/var/opt/hp4070/syslog4070</code>	TIS server logs are added to this file.
<code>/var/opt/hp4070/diag/log</code>	Diagnostics logs are added to this file.
<code>/var/opt/hp4070/diag/DIAGdata</code>	Diagnostics data is overwritten on this file.
<code>/var/opt/hp4070/diag/PVdata</code>	The latest performance verification data is stored in this file; old data files are copied to PVdata_XX.

Before Software Installation

Before installing the 4070 system software, Agilent Technologies recommends that the following procedures are performed.

- equipment preparation
Before installing the system software, you must prepare the equipment, such as the CD-ROM drive and software media. If you install all of the software, you will need to prepare all of the media for the HP-UX, C/ANSI C, HP BASIC, SICL, and 4070 system software.
- file backup
If you install the system software on a hard disk that already has data, Agilent Technologies recommends that you back up all existing programs and data.
- contents check
If you install the system software on a hard disk that already has data, you must check the contents of the hard disk. The 4070 system software and the Agilent 4062 system software *cannot* be executed on the same computer (system controller) because the execution environments are different. If the 4062 system software is installed, uninstall it now.

Installing HP-UX and Other Application Software

Minimum and Recommended Requirements

The minimum and recommended requirements for 4072A/4073A operation are as follows. If the system controller does not meet the following conditions, modify the hardware or software conditions.

- hardware requirements

Table 6-1 Hardware requirements

System controller	Model C3600 or C3700
Memory	512 MB
HDD	9 GB
Display	1024 × 768 1280 × 1024

- software requirements

swap size:	512 Mbyte
system configuration:	Standard LVM
software selection:	CDE runtime environment
file name length:	Long
logical volume size:	<div> <div>/stand</div> <div>112 Mbyte</div> </div> <div> <div>/</div> <div>140 Mbyte</div> </div> <div> <div>/tmp</div> <div>64 Mbyte</div> </div> <div> <div>/home</div> <div>20 Mbyte</div> </div> <div> <div>/opt</div> <div>1536 Mbyte</div> </div> <div> <div>/usr</div> <div>1544 Mbyte</div> </div> <div> <div>/var</div> <div>1024 Mbyte</div> </div>

```
Kernel parameter:      create_fastlinks 1
                        dnrc_hash_locks 512
                        fs_async 1
                        maxdsiz 0xC0000000
                        maxdsiz_64bit 0x400000000
                        maxfiles 200
                        maxfiles_lim 2048
                        maxssiz 0x04FB3000
                        maxssiz_64bit 0x100000000
                        maxswapchunks 4096
                        maxtsiz 0x400000000
                        maxtsiz_64bit 0x100000000
                        maxuprc 256
                        maxusers 128
                        ninode 4000
                        shmmax 0x400000000
                        stape
                        msgtql 256
```

Compatible OS revisions and application software

The following table shows OS revision and application software compatibility for the Agilent 4072A/4073A. The checked (✓) box indicates the latest 4070 software revision.

Table 6-2 Software Revision for C3700

	HP-UX C/ANSI C	SICL	BASIC/UX	4070 System Software	Testhead firmware	Configuration Tool	Agilent SPECS	E4411B Control Software
✓	B.11.11 (Sep 2001)	11i-2.1	C.08.04	C.03.01	1.41 1.57	C.01.03	C.02.51	Y.01.22

Table 6-3 Software Revision for C3600

	HP-UX C/ANSI C	SICL	BASIC/UX	4070 System Software	Testhead firmware	Configuration Tool	Agilent SPECS	E4411B Control Software
✓	B.11.11 (Jun 2000 or Sep 2000)	11i-1.0 11i-2.1	C.08.04	C.03.01	1.41 1.57	C.01.03	C.02.51	Y.01.22

NOTE When you install these software, use the software media provided by the Agilent technologies.

Installing HP-UX 11i

Start up from the HP-UX install and core OS CD-ROM, and install the HP-UX 11i. For further details, refer to the *HP-UX 11i Installation and Updating Guide*.

The following CD-ROMs are used for installing the HP-UX 11i.

- hp-ux 11i technical computing operating environment 1 of 2
- hp-ux 11i technical computing operating environment 2 of 2

To install the HP-UX 11i, use the following procedures:

1. Insert the HP-UX 11i CD-ROM 1 into the drive.
2. Stop the autoboot by pressing the space key.

You will see the boot console menu.

3. Search for bootable devices, using the choices displayed (for example, enter `search` or `sea`). The bootable devices are displayed as below.

Path Number	Device Path	Device Type
-----	-----	-----
P0	IDE	LTN485S
P1	SCSI.6.0	SEAGATE ST34572N

4. Boot from the CD-ROM drive using the command as below. Press `n` for the interact with IPL.

```
Main Menu: Enter command > bo IDE
Interact with IPL (Y, N, Q)?> n
```

5. The install kernel will be loaded (takes 3-5 minutes), after which the screen prompts you to enter the keyboard language of your console. Enter 26 and press **Return** and again to confirm.

```
Enter the number of the language you want: 26 Return
```

```
You have selected the keyboard language USB_PS2_DIN_US_English.
Please confirm your choice by pressing RETURN or enter a new number: Return
```

6. Choose `Install HP-UX` in the welcome screen.
7. Choose the following source location and user interface options in the user interface and media options screen and press **OK**.

```
Source Location Options:          Media only installation
```

```
User Interface Options:          Advanced installation
```

8. Proceed through each screen to configure the system in the `/opt/ignite/bin/itool` screen by using the following procedures:

- a. Set the swap size, language, locale, and keyboard in the `Basic` screen as below:

```
swap size:      512 MB
language:       English or Japanese
locale:         C or ja_JP.SJIS
keyboard:       USB_PS2_DIN_US_English
```

- b. Set the following item in the Software screen.

Ignite-UX-11-11 Yes

- c. Set the following items in the System screen.

- hostname
- IP address
- timezone
- date and time
- root password
- subnet mask and default gateway (if needed)
- domain name server (DNS) (if needed)
- network information service (NIS) (if needed)

- d. Set the logical volume size as below:

/stand	112 Mbyte
/	140 Mbyte
/tmp	64 Mbyte
/home	20 Mbyte
/opt	1536 Mbyte
/usr	1544 Mbyte
/var	1024 Mbyte

9. Choose Go!.

10. Choose Go! in the confirmation screen.

HP-UX 11i installation starts.

11. About 20 minutes later, the instruction appears to change the media to the HP-UX 11i CD-ROM 2. Change the media and press **Return**.

12. The system automatically reboots after all software has been loaded.

Installing C/ANSI C

If C/ANSI C is used for measurement program development, also install all C/ANSI C filesets. The following CD-ROM is used for installing the C/ANSI C.

- hp-ux 11i application software 2 of 3

To install the C/ANSI C, use the `/usr/sbin/swinstall` command:

1. Insert the software media (CD-ROM) into the CD-ROM drive.
2. Log in as a superuser (root).
3. Open a dtterm window.
4. Mount the CD-ROM drive on the controller by using the `/sbin/mount` command. Before mounting, use the `mkdir` command to make `/SD_CDROM` directory if the `/SD_CDROM` directory does not exist.

```
# mkdir /SD_CDROM
```

```
# /sbin/mount /dev/dsk/c0t0d0 /SD_CDROM
```

5. Load the C/ANSI C filesets using the `/usr/sbin/swinstall` command as follows:

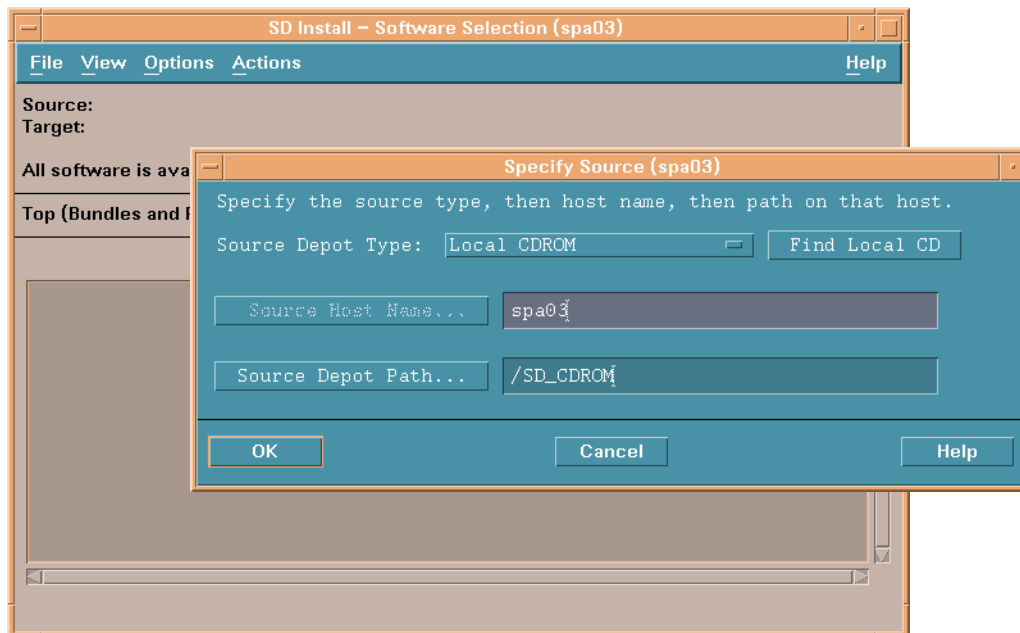
- a. Type the `/usr/sbin/swinstall` command.

```
# /usr/sbin/swinstall
```

The SD install and specify source window appear as shown in figure 6-3.

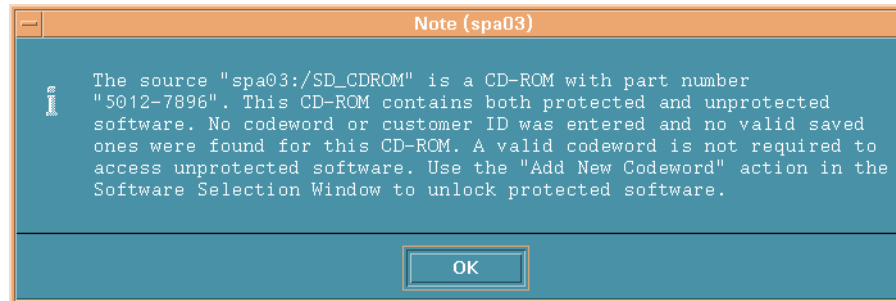
CAUTION The environment variable `LANG` must be `C` when you execute the `swinstall` command. Otherwise, core dump may occur.

Figure 6-3 SD Install and Specify Source Window



- b. Press **OK** in the specify source window. The specify source window disappears, and the following window is displayed.

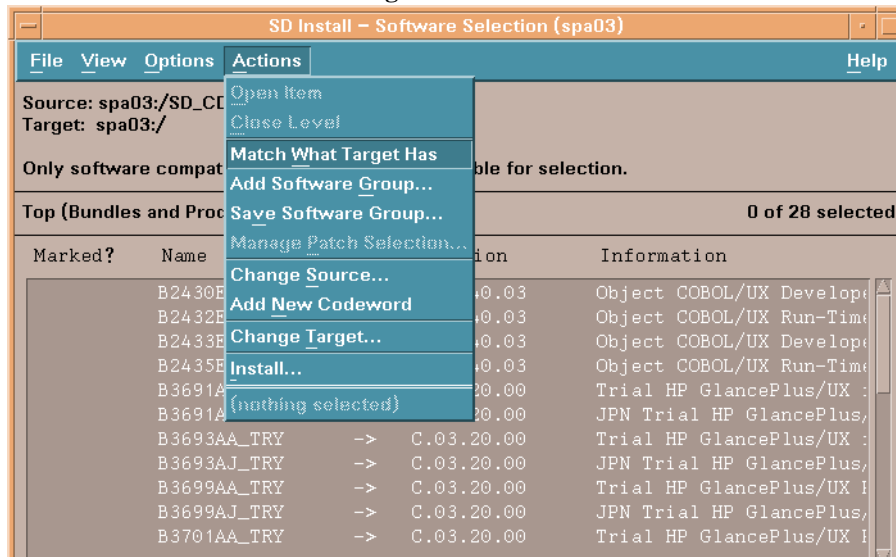
Figure 6-4 Note Window



Press **OK**. Then the C/ANSI C software is displayed in the SD install window.

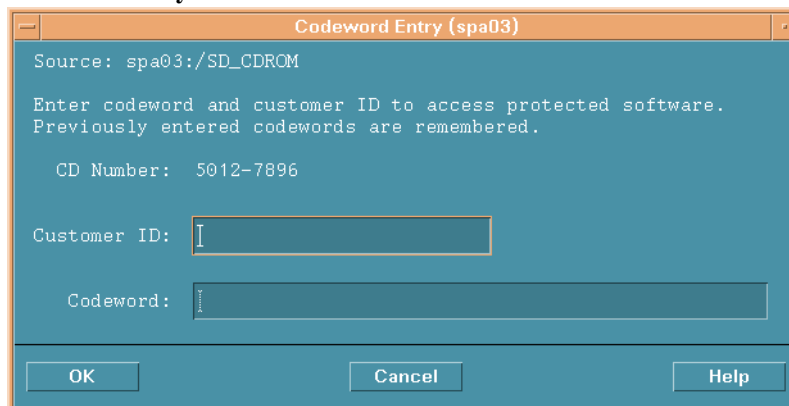
- c. Choose Actions: Add codeword... to enter the codeword for C/ANSI C as shown in figure 6-5.

Figure 6-5 SD Install Window for Adding New Codeword



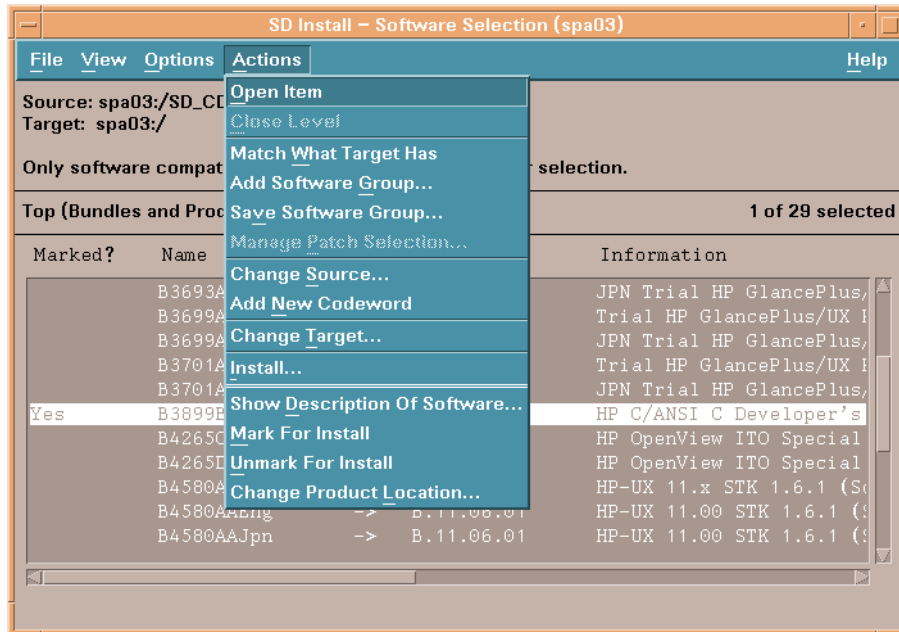
- d. Enter the codeword in the following window as shown in figure 6-6. Click **OK**.

Figure 6-6 Codeword Entry Window



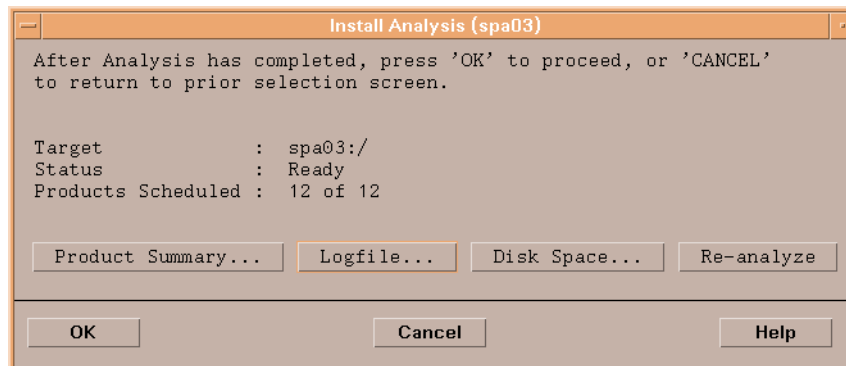
- e. Choose B3899BA.
- f. Choose Actions: Install (analysis)... as shown in figure 6-30.

Figure 6-7 SD Install Window with Install Menu



The install analysis window appears as shown in figure 6-31.

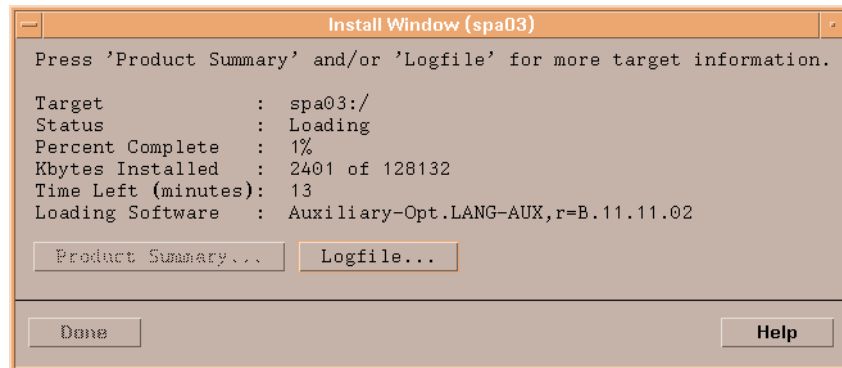
Figure 6-8 Install Analysis Window



- g. Click **Logfile...** in the install analysis window. The logfile window appears.
- h. Check for errors in the logfile. If there is an error, stop the installation and troubleshoot.
- i. Click **OK** in the logfile window. The logfile window disappears.

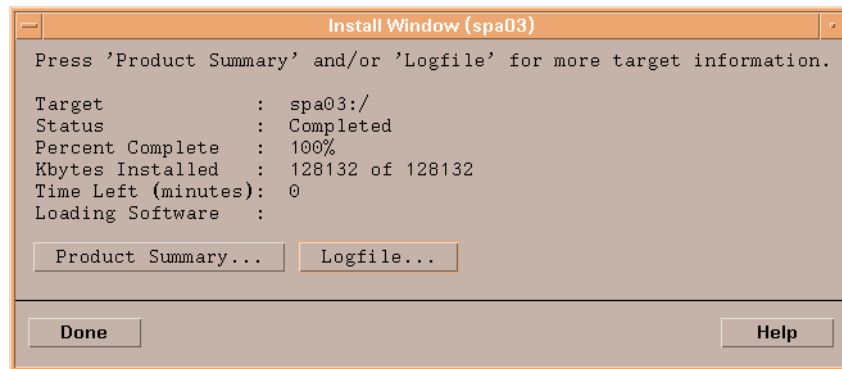
- j. Click **OK** on the install analysis window. The software installation begins. This takes about 10 minutes.

Figure 6-9 Install Window for Loading Filesets



- k. After the software installation is complete, check for errors in the `/var/adm/sw/swagent.log` file. To check for errors, click **Logfile...** on the install window as shown in figure 6-10.

Figure 6-10 Install Window for Loading Completed



- l. Click **OK** in the logfile window. The logfile window disappears.
 - m. Click **Done** in the install window. The install window disappears.
 - n. Choose File: Exit in the swinstall window.
6. Unmount the CD-ROM drive, if necessary, using the `/sbin/umount` command.

```
# /sbin/umount /SD_CDROM
```
 7. Remove the software media (CD-ROM) from the CD-ROM drive, and put it in a safe place.

Installing Patches for HP-UX

After loading HP-UX, install the recommended patches.

The following CD-ROM is used for installing the HP-UX 11i.

- Agilent 4070/SPECS S/W configuration tool

To install these patches, use the `/usr/sbin/swinstall` command.

1. Insert the software media (CD-ROM) into the CD-ROM drive.
2. Log in as a superuser (`root`).
3. Open a `dtterm` window.
4. Mount the CD-ROM drive on the controller by using the `/sbin/mount` command.

```
# /sbin/mount /dev/dsk/c0t0d0 /SD_CDROM
```

5. Load the patch filesets using the `/usr/sbin/swinstall` command, as follows.

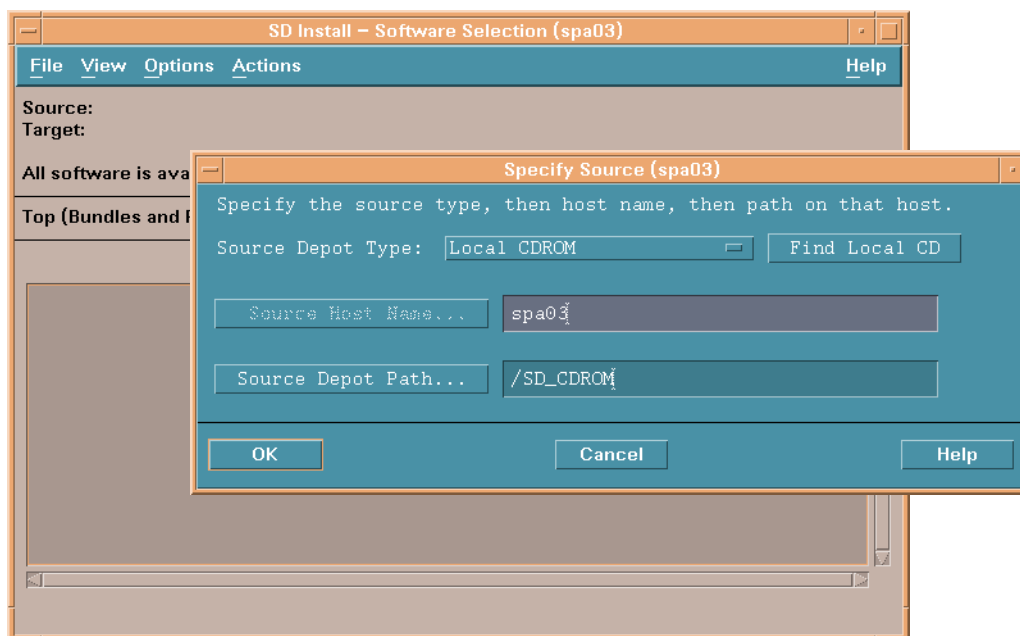
- a. Type the `/usr/sbin/swinstall` command.

```
# /usr/sbin/swinstall
```

The SD install and specify source window appear as shown in figure 6-11.

CAUTION The environment variable `LANG` must be `C` when you execute the `swinstall` command. Otherwise, core dump may occur.

Figure 6-11 SD Install and Specify Source Window

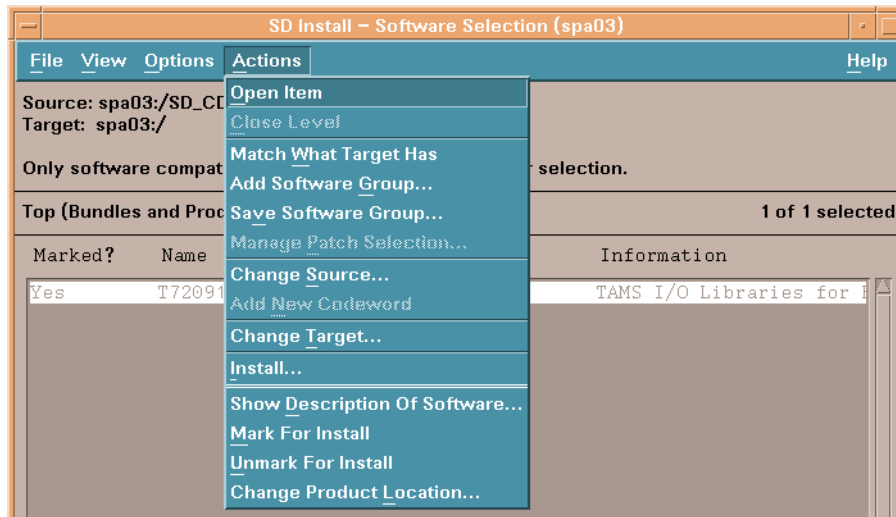


Press **OK**. Then the patches are displayed in the SD install window.

- b. Choose **Local CD-ROM** in the specify source window.

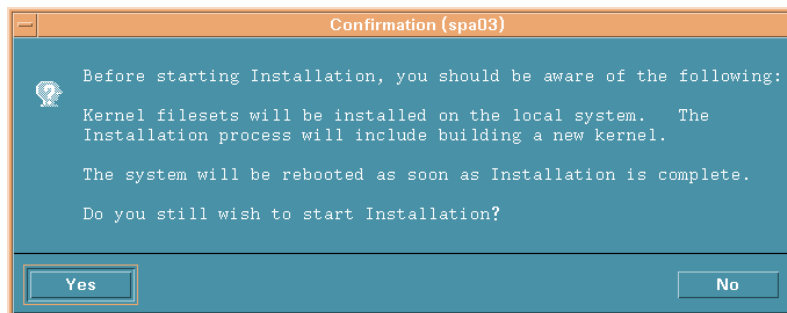
- c. Type the source path name in the **Source Depot Path...** For example, if the CD-ROM drive is mounted in SD_CDROM, type the name as follows:
`/SD_CDROM/PATCH11I.UPD;1`
- d. Choose all patches.
- e. Choose Actions: Install (analysis)... as shown in figure 6-12.

Figure 6-12 SD Install Window with Install Menu



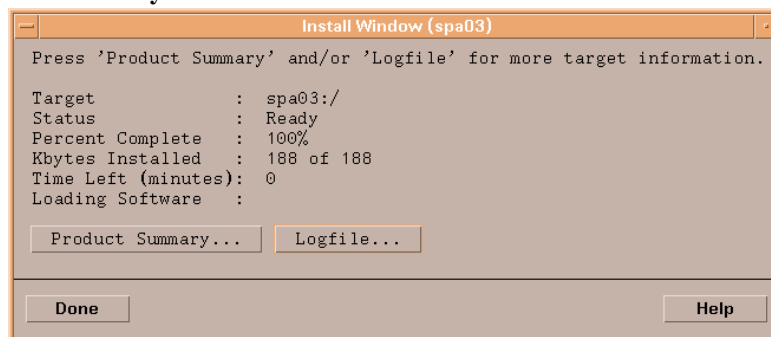
- f. Click **OK** in the confirmation window as shown in

Figure 6-13 Confirmation Window



The install analysis window appears as shown in figure 6-14.

Figure 6-14 Install Analysis Window



- g. Click **Logfile...** in the install analysis window. The logfile window appears.
 - h. Verify that there are no errors in the logfile. If there is an error, stop the installation and troubleshoot.
 - i. Click **OK** in the logfile window. The logfile window disappears.
 - j. Click **OK** in the install analysis window. The software installation begins. This takes about 5 minutes.
- 6. After the software installation is complete, the new kernel is automatically rebuilt. This takes about 10 minutes.
 - 7. After rebuilding the new kernel, the controller boot-up automatically.

Installing 4070/SPECS Software Configuration Tool

The following CD-ROM is used for installing the 4070/SPECS software configuration tool.

- Agilent 4070/SPECS S/W configuration tool

To install these patches, use the `/usr/sbin/swinstall` command.

1. Insert the software media (CD-ROM) into the CD-ROM drive.
2. Log in as a superuser (`root`).
3. Open a `dtterm` window.
4. Mount the CD-ROM drive on the controller by using the `/sbin/mount` command.

```
# /sbin/mount /dev/dsk/c0t0d0 /SD_CDROM
```

5. Load the configuration tool filesets using the `/usr/sbin/swinstall` command, as follows.

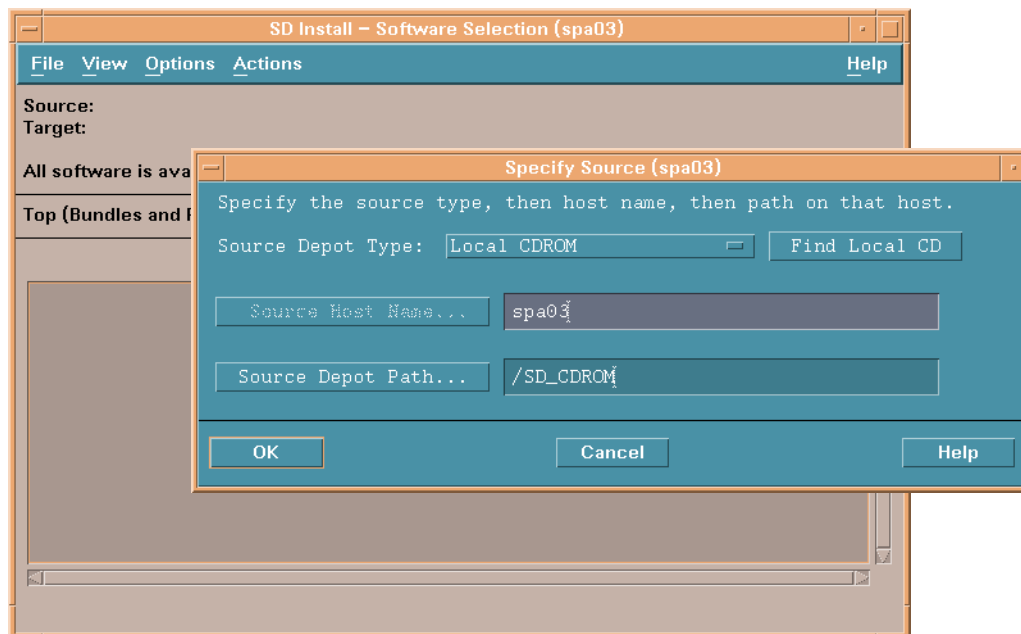
- a. Type the `/usr/sbin/swinstall` command.

```
# /usr/sbin/swinstall
```

The SD install and specify source window appear as shown in figure 6-20.

CAUTION The environment variable `LANG` must be `C` when you execute the `swinstall` command. Otherwise, core dump may occur.

Figure 6-15 SD Install and Specify Source Window

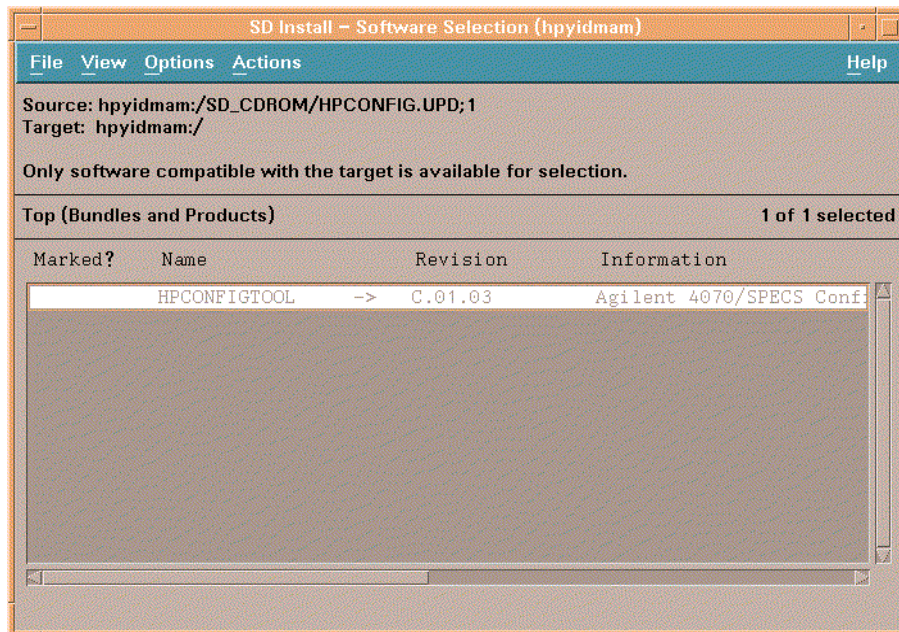


- b. Choose **Local CD-ROM** in the specify source window.
- c. Type the source path name in the **Source Depot Path....** For example, if the CD-ROM drive is mounted in `SD_CDROM`, type the name as follows:

```
/SD_CDROM/HPCONFIG.UPD;1
```

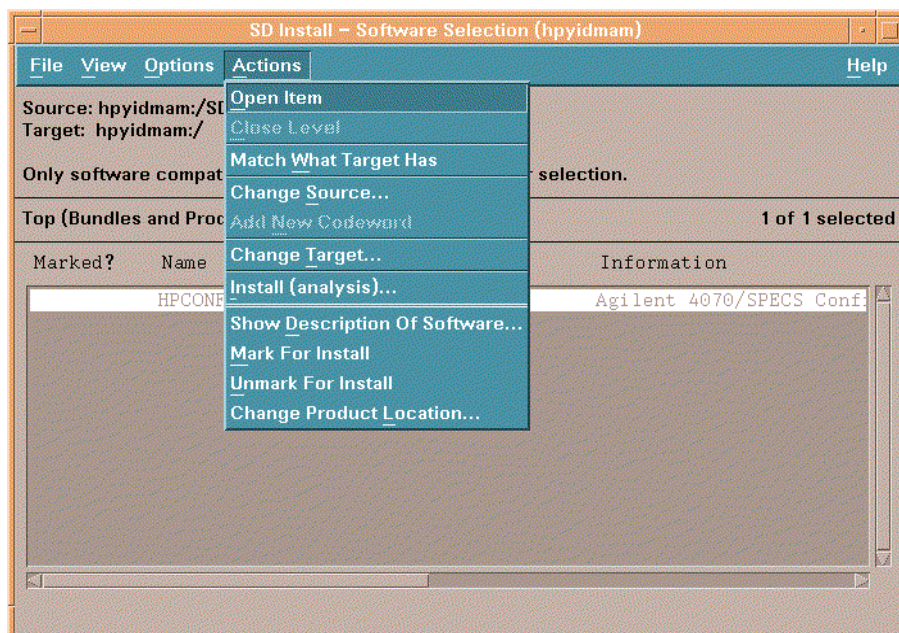
- d. Press **OK** in the specify source window. The specify source window disappears, and the configuration tool software is displayed in the SD install window as shown in figure 6-16.

Figure 6-16 SD Install Window with Configuration Tool Software



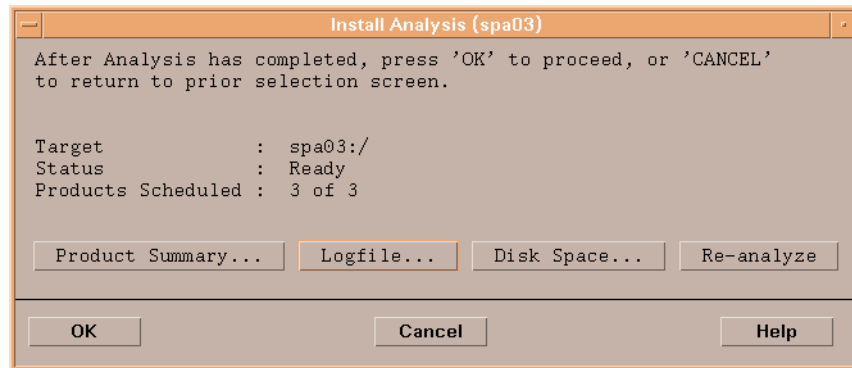
- e. Choose HPCONFIGTOOL.
- f. Choose Actions: Install (analysis)... as shown in figure 6-17.

Figure 6-17 SD Install Window with Install Menu



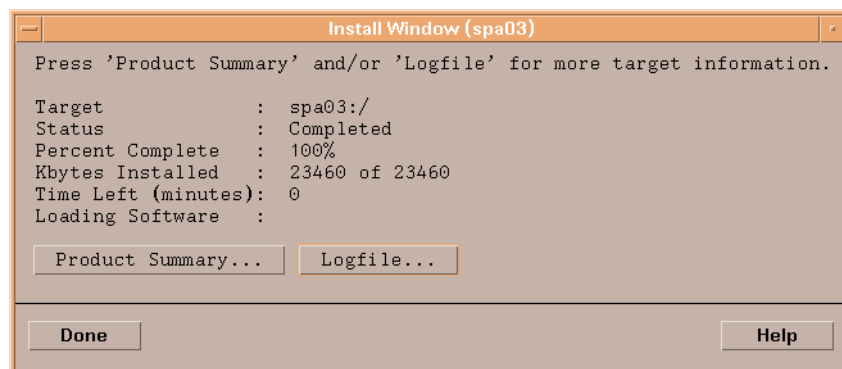
The install analysis window appears as shown in figure 6-18.

Figure 6-18 Install Analysis Window



- g. Click **Logfile...** in the install analysis window. The logfile window appears.
- h. Verify that there are no errors in the logfile. If there is an error, stop the installation and troubleshoot.
- i. Click **OK** in the logfile window. The logfile window disappears.
- j. Click **OK** in the install analysis window. The software installation begins. This takes about 5 minutes.
- k. After the software installation is complete, verify that there are no errors in the `/var/adm/sw/swagent.log` file. To check for errors, click **Logfile...** in the install window as shown in figure 6-23.

Figure 6-19 Install Window for Loading Completed



- l. Click **OK** in the logfile window. The logfile window disappears.
 - m. Click **Done** in the install window. The install window disappears.
 - n. Choose **File: Exit** in the swinstall window.
6. Unmount the CD-ROM drive, if necessary, using the `/sbin/umount` command.
- ```
/sbin/umount /SD_CDROM
```
7. Remove the software media (CD-ROM) from the CD-ROM drive, and put it in a safe place.

## Installing SICL

The following CD-ROM is used for installing the SICL.

- TAMS I/O Libraries For HP-UX 11i

To install SICL, use the `/usr/sbin/swinstall` command:

1. Insert the software media (CD-ROM) into the CD-ROM drive.
2. Log in as a superuser (root).
3. Open a dtterm window.
4. Mount the CD-ROM drive on the controller by using the `/sbin/mount` command.

```
/sbin/mount /dev/dsk/c0t0d0 /SD_CDROM
```

5. Load the SICL filesets using the `/usr/sbin/swinstall` command, as follows.

- a. Type the `/usr/sbin/swinstall` command.

```
/usr/sbin/swinstall
```

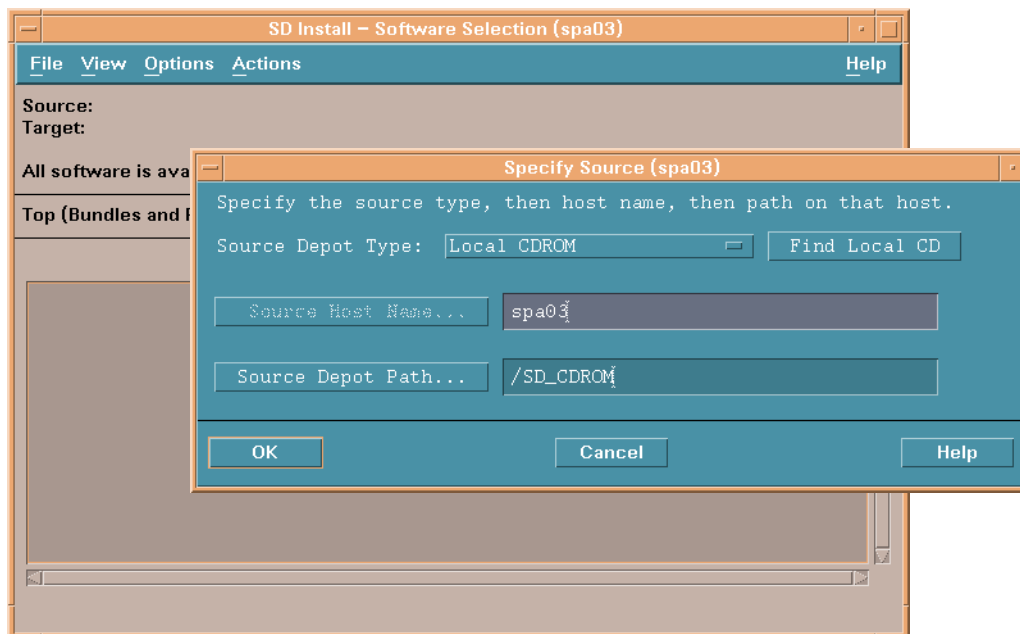
The SD install and specify source window appear as shown in figure 6-20.

---

**CAUTION** The environment variable `LANG` must be `C` when you execute the `swinstall` command. Otherwise, core dump may occur.

---

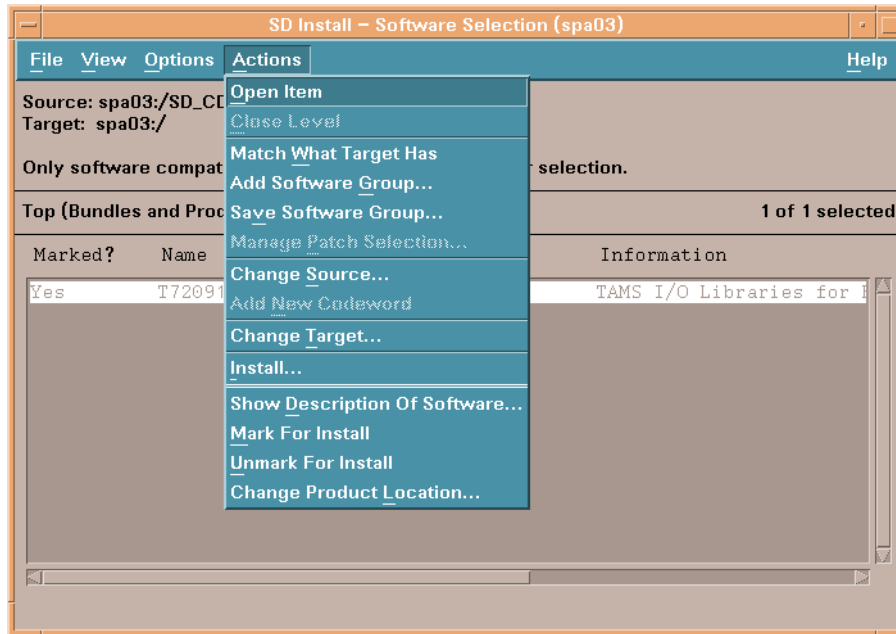
**Figure 6-20 SD Install and Specify Source Window**



Press **OK**. Then the SICL software is displayed in the SD install window.

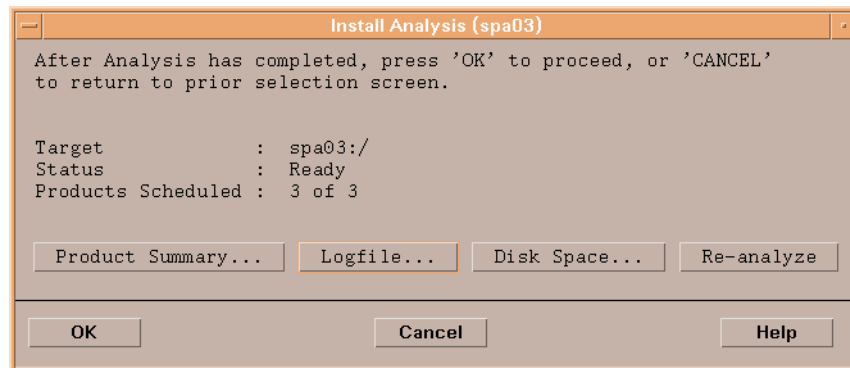
- b. Choose T72091-32-64.
- c. Choose Actions: Install (analysis)... as shown in figure 6-21.

**Figure 6-21 SD Install Window with Install Menu**



The install analysis window appears as shown in figure 6-22.

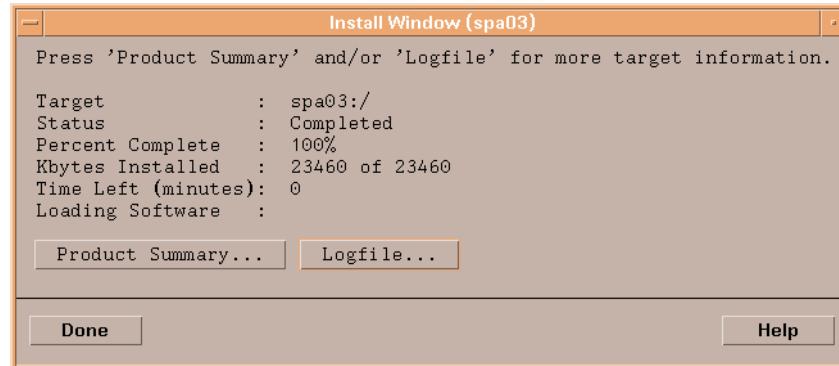
**Figure 6-22 Install Analysis Window**



- d. Click **Logfile...** in the install analysis window. The logfile window appears.
- e. Verify that there are no errors in the logfile. If there is an error, stop the installation and troubleshoot.
- f. Click **OK** in the logfile window. The logfile window disappears.
- g. Click **OK** in the install analysis window. The software installation begins. This takes about 15 minutes.

- h. After the software installation is complete, verify that there are no errors in the `/var/adm/sw/swagent.log` file. To check for errors, click **Logfile...** in the install window as shown in figure 6-23.

**Figure 6-23 Install Window for Loading Completed**



- i. Click **OK** in the logfile window. The logfile window disappears.
  - j. Click **Done** in the install window. The install window disappears.
  - k. Choose **File: Exit** in the swinstall window.
6. Unmount the CD-ROM drive, if necessary, using the `/sbin/umount` command.  

```
/sbin/umount /SD_CDROM
```
  7. Remove the software media (CD-ROM) from the CD-ROM drive, and put it in a safe place.

## Installing BASIC/UX

The following CD-ROM is used for installing the BASIC/UX.

- RMB/UX v.8.04

To install BASIC/UX software, use the `/usr/sbin/swinstall` command.

---

**NOTE** Before installing BASIC/UX, go to the *Read Me Before Installing BASIC/UX* manual, which contains some important information for the currently released BASIC/UX.

---

1. Insert the software media (CD-ROM) into the CD-ROM drive.
2. Log in as a superuser (root).
3. Open a dtterm window.
4. Mount the CD-ROM drive on the controller by using the `/sbin/mount` command.

```
/sbin/mount /dev/dsk/c0t0d0 /SD_CDROM
```
5. Load the HP BASIC/UX filesets using the `/usr/sbin/swinstall` command, as follows.
  - a. Type the `/usr/sbin/swinstall` command.

```
/usr/sbin/swinstall
```

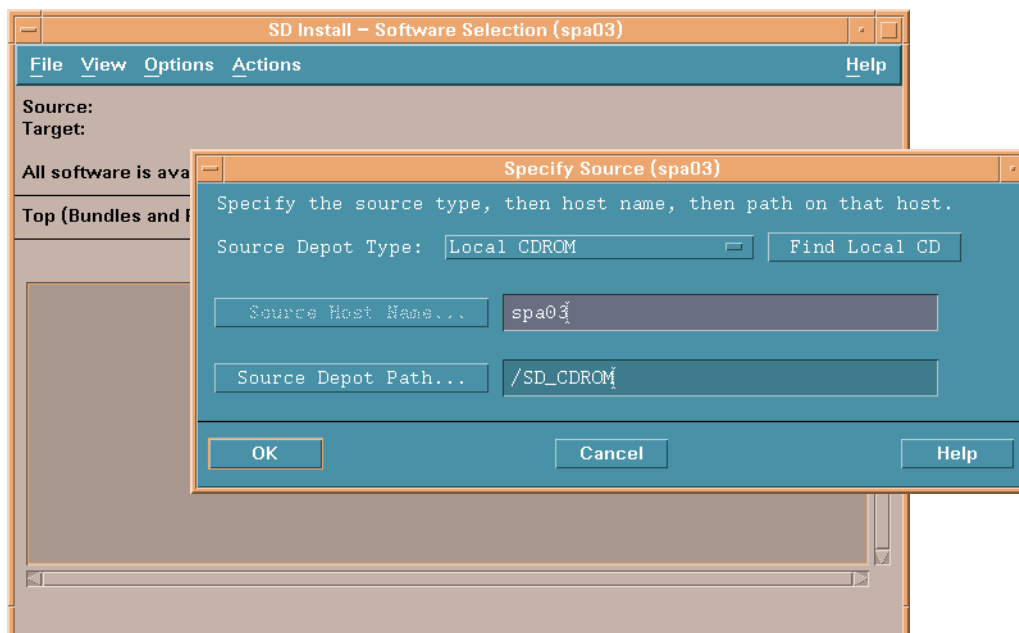
The SD install and specify source window appear as shown in figure 6-24.

---

**CAUTION** The environment variable `LANG` must be `C` when you execute the `swinstall` command. Otherwise, core dump may occur.

---

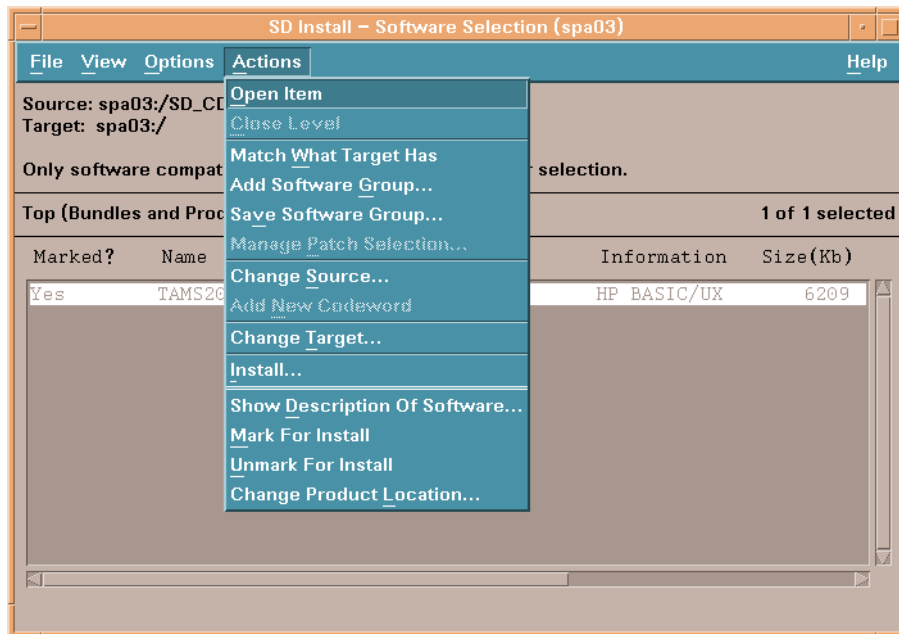
**Figure 6-24 SD Install and Specify Source Window**



Press **OK**. Then the HP BASIC/UX software is displayed in the SD install window.

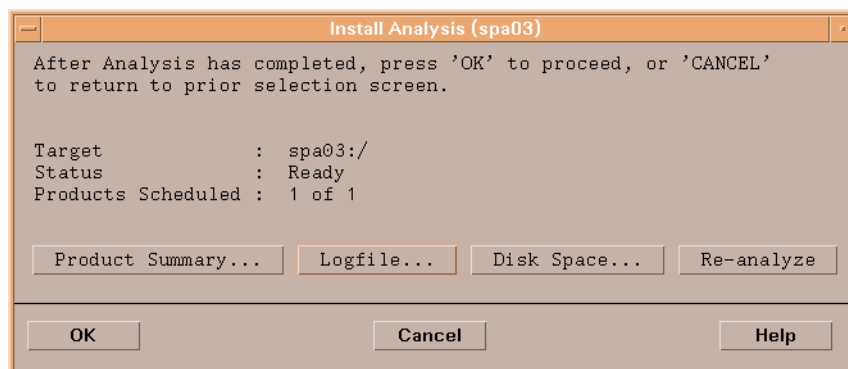
- b. Choose TAMS2047.
- c. Choose Action: Install (analysis)... as shown in figure 6-25.

Figure 6-25 SD Install Window with Install Menu



The install analysis window appears as shown in figure 6-26.

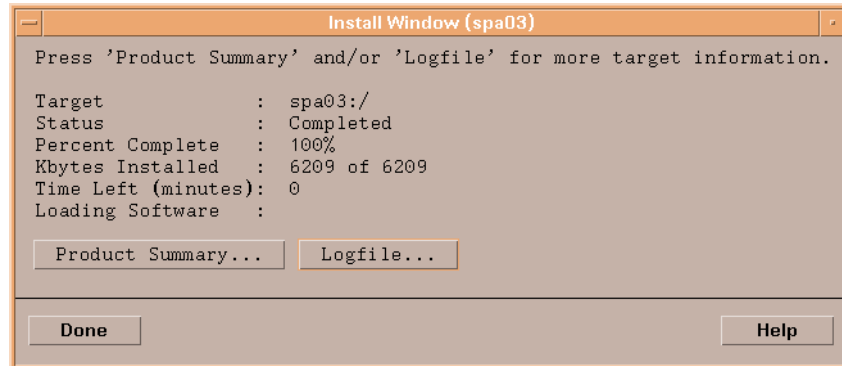
Figure 6-26 Install Analysis Window



- d. Click **Logfile...** in the install analysis window. The logfile window appears.
- e. Verify that there are no errors in the logfile. If there is an error, stop the installation and troubleshoot.
- f. Click **OK** in the logfile window. The logfile window disappears.
- g. Click **OK** in the install analysis window. The software installation begins. This takes about 5 minutes.

- h. After the software installation is complete, verify that there are no errors in the `/var/adm/sw/swagent.log` file. To check for errors, click **Logfile...** in the install window as shown in figure 6-27.

**Figure 6-27 Install Window for Loading Completed**



- i. Click **OK** in the logfile window. The logfile window disappears.
  - j. Click **Done** in the install window. The install window disappears.
  - k. Choose File: Exit in the swinstall window.
6. Unmount the CD-ROM drive, if necessary, using the `/sbin/umount` command.  

```
/sbin/umount /SD_CDROM
```
  7. Remove the software media (CD-ROM) from the CD-ROM drive, and put it in a safe place.

## Installing 4070 System Software

The following CD-ROM is used for installing the Agilent 4070 system software and optical interface card driver.

- Agilent 4070 system software

To install the 4070 system software, use the `/usr/sbin/swinstall` command:

1. Insert the software media (CD-ROM) into the CD-ROM drive.
2. Log in as a superuser (`root`).
3. Open a `dtterm` window.
4. Mount the CD-ROM drive on the 4070 system controller using the `/sbin/mount` command.

```
/sbin/mount /dev/dsk/c0t0d0 /SD_CDROM
```

5. Load the 4070 system software filesets using the `/usr/sbin/swinstall` command, as follows.

- a. Type the `/usr/sbin/swinstall` command as a superuser.

```
/usr/sbin/swinstall
```

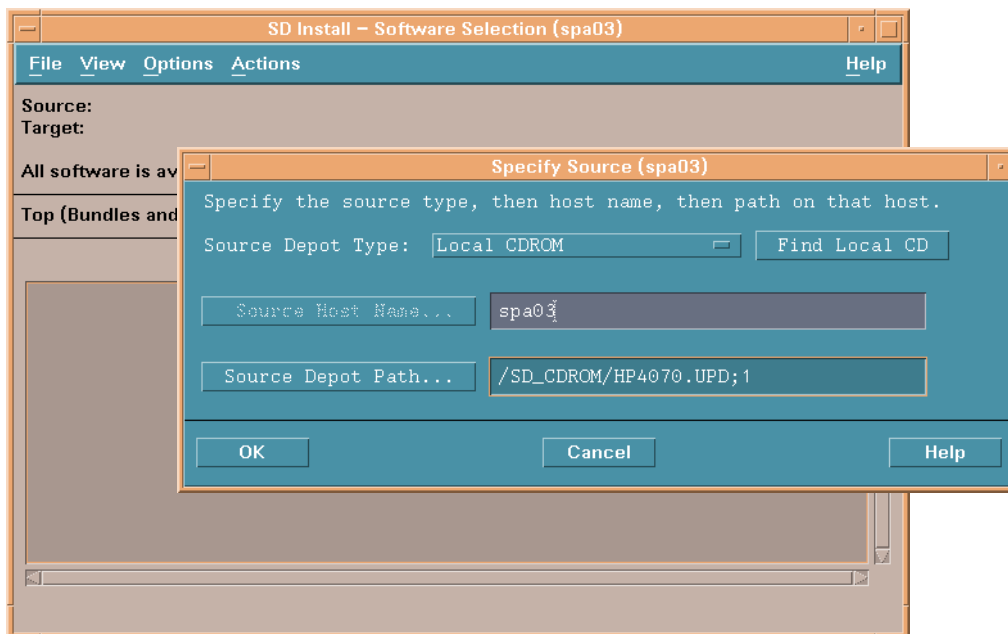
The SD install and specify source window appear as shown in figure 6-28.

---

**CAUTION** The environment variable `LANG` must be `C` when you execute the `swinstall` command. Otherwise, core dump may occur.

---

**Figure 6-28 SD Install and Specify Source Window**

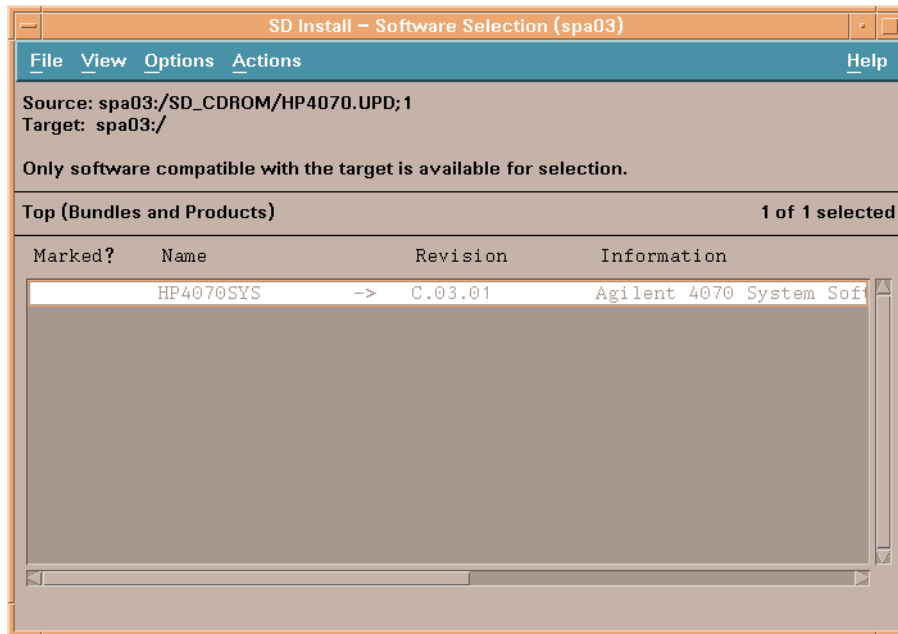


- b. Choose **Local CD-ROM** in the specify source window.
- c. Type the source path name in the **Source Depot Path....** For example, if the CD-ROM drive is mounted in `SD_CDROM`, type the name as follows:

```
/SD_CDROM/HP4070.UPD;1
```

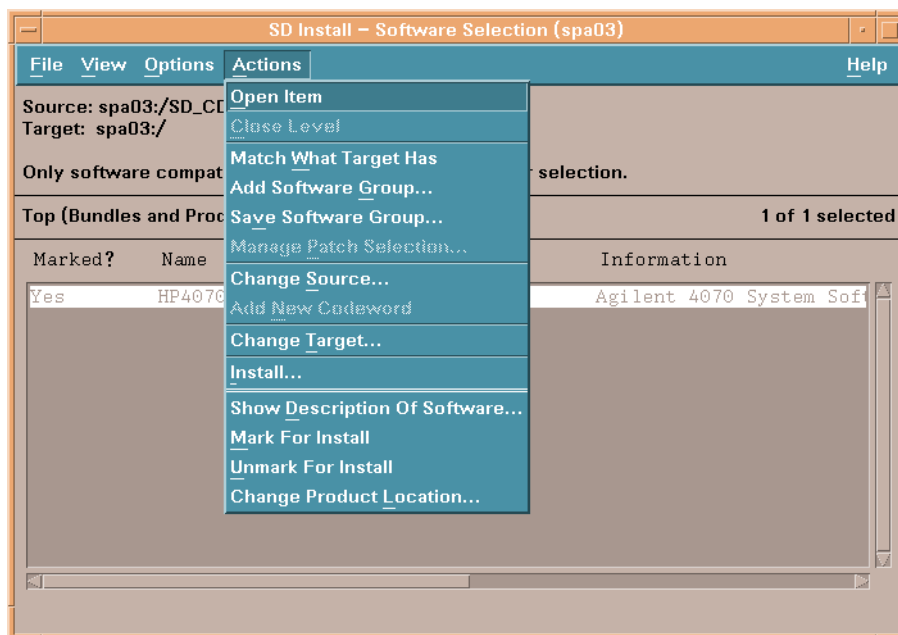
- d. Press **OK** in the specify source window. The specify source window disappears, and the 4070 system software is displayed in the SD install window as shown in figure 6-29.

**Figure 6-29 SD Install Window with 4070 System Software**

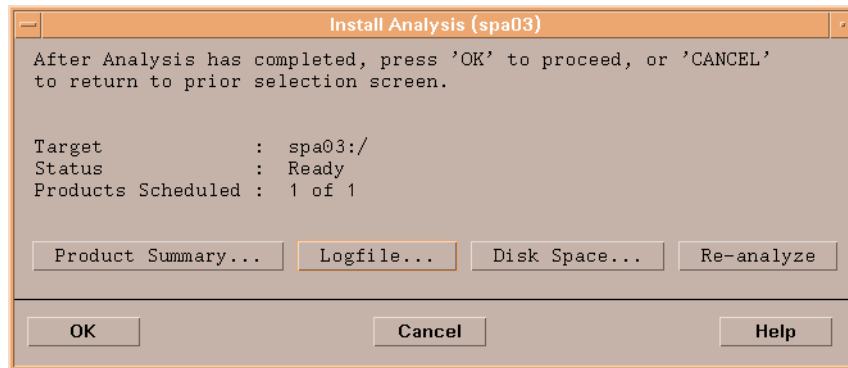


- e. Choose HP4070SYS.  
f. Choose Actions: Install (analysis) ... as shown in figure 6-30.

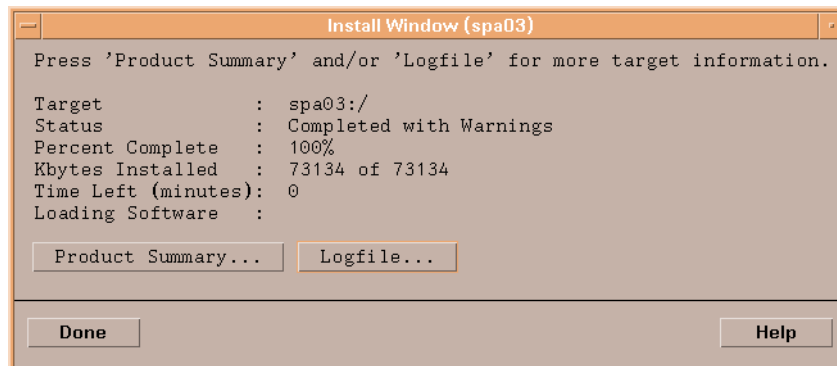
**Figure 6-30 SD Install Window with Install Menu**



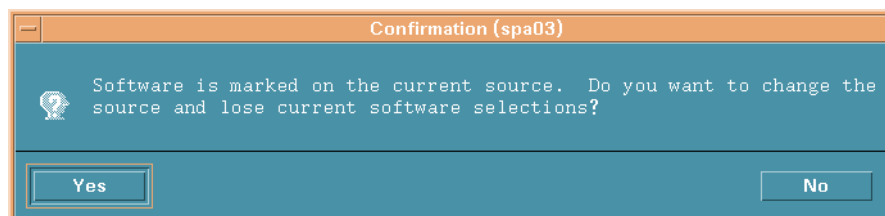
The install analysis window appears as shown in figure 6-31.

**Figure 6-31 Install Analysis Window**

- g. Click **Logfile...** in the install analysis window. The logfile window appears.
- h. Verify that there are no errors in the logfile. If there is an error, stop the installation and troubleshoot.
- i. Click **OK** in the logfile window. The logfile window disappears.
- j. Click **OK** in the install analysis window. The software installation begins. This takes about 5 minutes.
- k. After the software installation is complete, Verify that there are no errors in the `/var/adm/sw/swagent.log` file. To check for errors, click **Logfile...** in the install window as shown in figure 6-32.

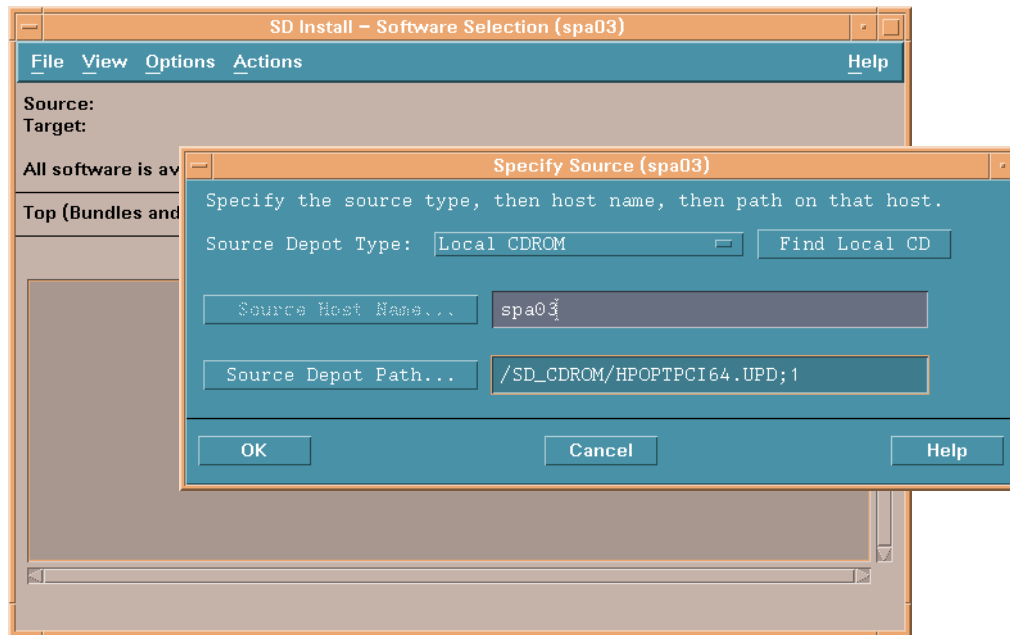
**Figure 6-32 Install Window for Loading Completed**

- l. Click **OK** in the logfile window. The logfile window disappears.
- m. Click **Done** in the install window. The install window disappears.
- n. Choose Action: Change Source... The confirmation window appears as shown in figure 6-33.

**Figure 6-33 Confirmation Window**

- o. Click **Yes**. The SD install and specify source window appear as shown in figure 6-34.

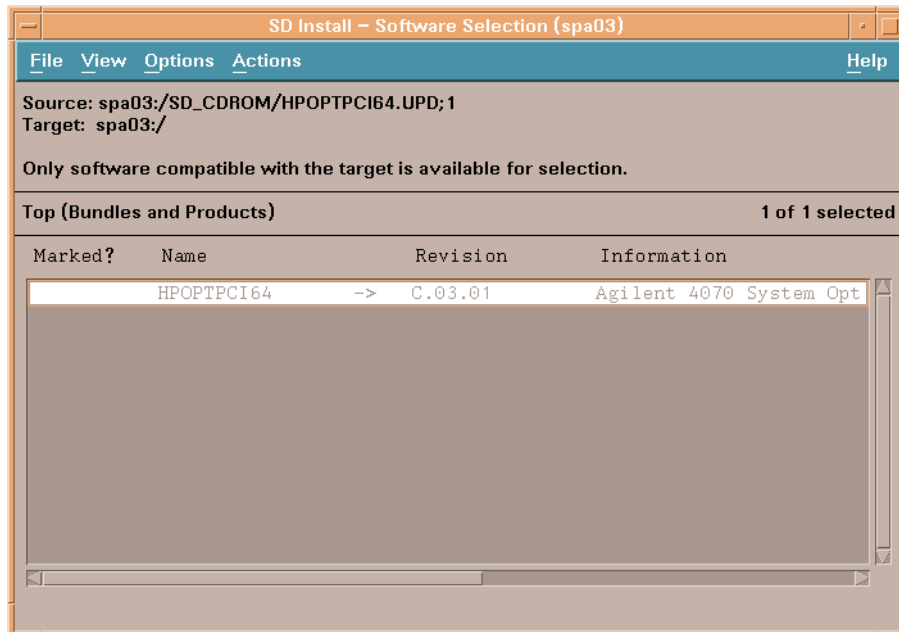
**Figure 6-34 SD Install and Specify Source Window**



- p. Choose **Local CD-ROM** in the specify source window.
- q. Type the source path name in the **Source Depot Path....** For example, if the CD-ROM drive is mounted in SD\_CDROM, type the name as follows:
- ```
/SD_CDROM/HPOPTPCI64.UPD;1
```

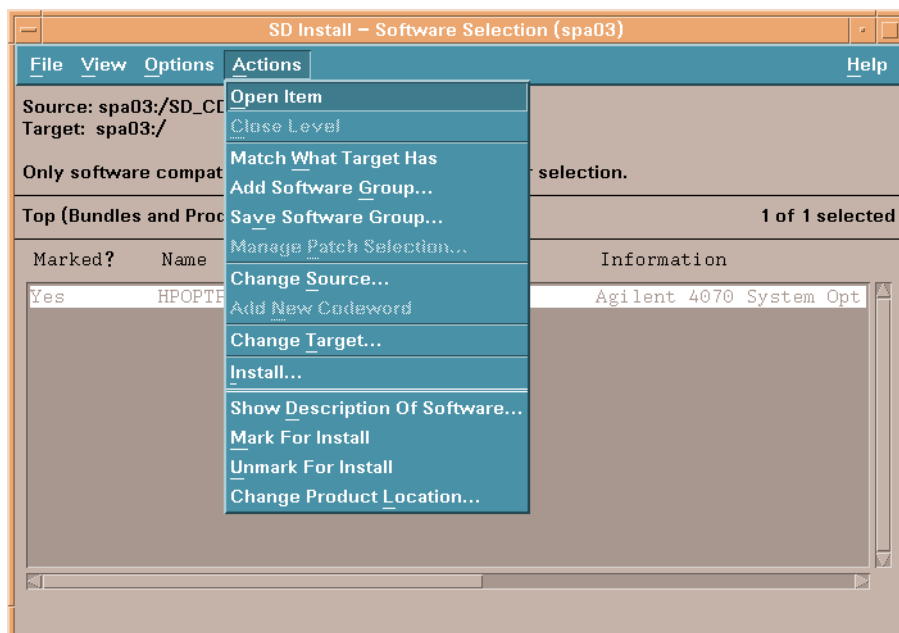
- r. Press **OK** in the specify source window. The specify source window disappears, and the 4070 system software is displayed in the SD install window as shown in figure 6-35.

Figure 6-35 SD Install Window with 4070 System Software



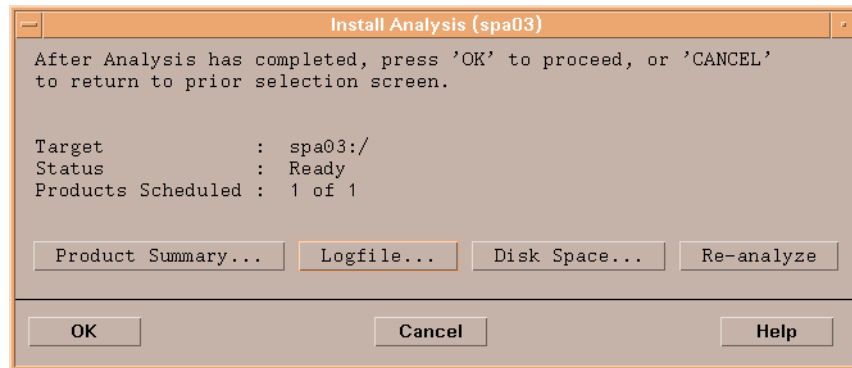
- s. Choose HPOPTPCI64.
t. Choose Action: Install (analysis)... as shown in figure 6-36.

Figure 6-36 SD Install Window with Install Menu



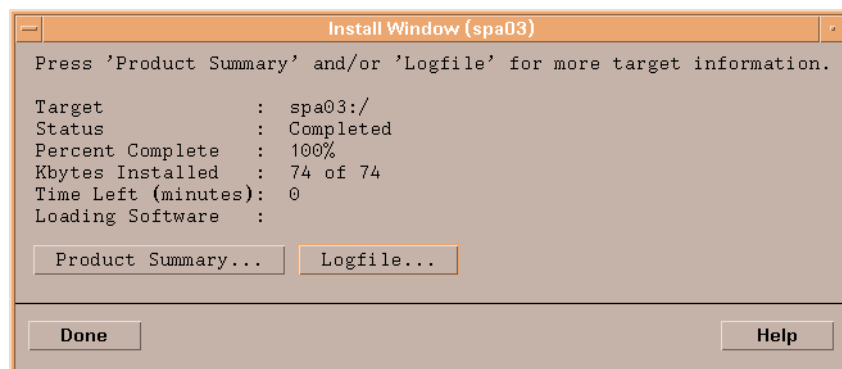
The install analysis window appears as shown in figure 6-31.

Figure 6-37 Install Analysis Window



- u. Click **Logfile...** in the install analysis window. The logfile window appears.
- v. Verify that there are no errors in the logfile. If there is an error, stop the installation and troubleshoot.
- w. Click **OK** in the logfile window. The logfile window disappears.
- x. Click **OK** in the install analysis window. The software installation begins. This takes about 5 minutes.
- y. After the software installation is complete, Verify that there are no errors in the `/var/adm/sw/swagent.log` file. To check for errors, click **Logfile...** in the install window as shown in figure 6-38.

Figure 6-38 Install Window for Loading Completed

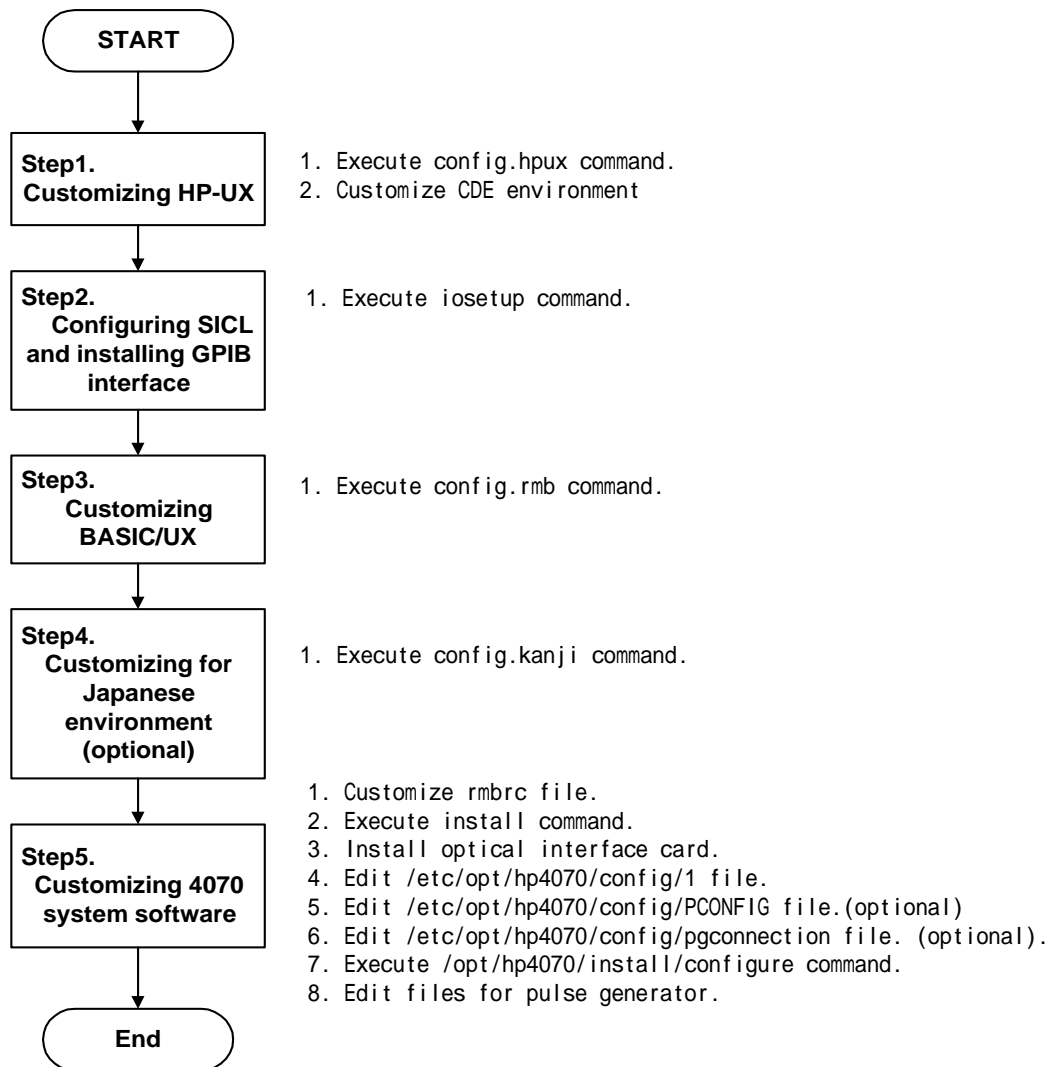


- z. Click **OK** in the logfile window. The logfile window disappears.
 - aa. Click **Done** in the install window. The install window disappears.
 - ab. Choose File: Exit in the swinstall window.
6. Unmount the CD-ROM drive, if necessary, using the `/sbin/umount` command.
 7. Remove the software media (CD-ROM) from the CD-ROM drive, and put it in a safe place.

Customizing for Agilent 4072A/4073A

Figure 6-39 shows the customization flow for the Agilent 4072A/4073A.

Figure 6-39 Agilent 4072A/4073A Customization Flow



Step 1. Customizing HP-UX

Executing config.hpux Command

To customize HP-UX for the 4072A/4073A, execute the `/home/hpsrvc/config/config.hpux` command. This command executes the following:

- Drivers are added to kernel as follows.
stape
- Kernel parameters are modified as follows.

```
create_fastlinks 1
dnlc_hash_locks 512
fs_async 1
maxdsiz 0xC0000000
maxdsiz_64bit 0x400000000
maxfiles 200
maxfiles_lim 2048
maxssiz 0x04FB3000
maxssiz_64bit 0x100000000
maxswapchunks 4096
maxtsiz 0x400000000
maxtsiz_64bit 0x100000000
maxuprc 256
maxusers 128
ninode 4000
shmmax 0x400000000
msgtql 256
```
- The HP-UX kernel is rebuilt and placed in `/stand/system` after the previous kernel is backed up as `/stand/vmunix.prev`.
- The HP-UX system configuration information is placed in `/stand/system` after the previous information is backed up as `/stand/vmunix.prev`.

NOTE A reboot is required to make the new kernel effective.

Customizing the Common Desktop Environment (CDE)

Agilent Technologies recommends that you customize the `/usr/dt/config/C/sys.resources` (for English) or `/usr/dt/config/ja_JP.SJIS/sys.resources` (for Japanese) command as follows:

```
:
dtsession*lockTimeout: 0      ⇐ Change "30" to "0"
:
```

NOTE If you do not customize this setting, the display is automatically locked by the CDE with the password.

Step 2. Configuring SICL and Installing GPIB Interface

To configure the SICL and install the GPIB interface for the 4072A/4073A, use the following procedure. If you configure another interface, refer to *HP I/O Libraries Installation and Configuration Guide for HP-UX*, *Installing and Using HP BASIC/UX 8.0*, or the *Installation Guide* for each interface.

NOTE When using the C3600/C3700 system controller, use one Agilent E2078A for the 4072A/4073A control and one E2078A for wafer prober control.

Executing the iosetup Command

1. Execute the `/opt/sicl/bin/iosetup` command as follows.

```
# /opt/sicl/bin/iosetup
```

The I/O setup for the HP-UX window appears as shown in figure 6-40.

Figure 6-40 I/O Setup for HP-UX Window



2. When using the C3600/C3700 system controller, set up the GPIB interface using the following procedure.
 - a. Double-click E2078 High Speed HP-IB (PCI). The E2078 high speed HP-IB configuration window appears as shown in figure 6-41.

Figure 6-41 Agilent E2078 High Speed HP-IB Configuration Window

HP e2078 High Speed HP-IB configuration

E2078 HP-IB

The current configuration is shown. Make changes as desired, and click on OK to accept.

Identifiers

Logical Unit #: 7

Symbolic Name: hpib7

Hardware Settings
(Must match installed hardware)

PCI Slot: 4

Serial Number: A1300169

Other Settings

HPIB Bus Addr: 21

System Controller: yes

OK

Cancel

Defaults

Help

- b. Set each parameter as shown in the following example.

The following table shows the example for the E2078 GPIB card.

Table 6-4 Example of parameter for PCI GPIB card

Controller	Model C3600/C3700
Logical unit number	7
Symbolic name	hpib7
PCI slot	4
Serial number	This number is printed on the interface card.
GPIB bus address	21
System controller	Yes

- c. Click **OK**.
- d. Repeat steps a through c to set up the secondary GPIB interface, and use suitable parameters as shown in the following example.

Table 6-5 Example of parameter for 2nd PCI GPIB card

Controller	Model C3600/C3700
Logical unit number	25
Symbolic name	hpib25
PCI slot	6
Serial number	This number is printed on the interface card.
GPIB bus address	21
System controller	Yes

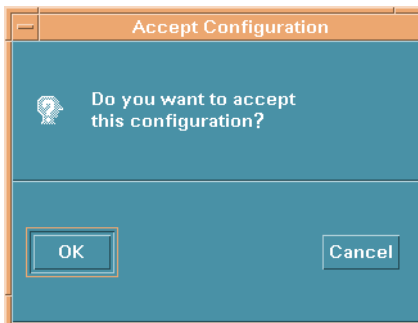
3. Choose File: Build... to rebuild the kernel as shown in figure 6-42.

Figure 6-42 I/O Setup for HP-UX Window with File Menu



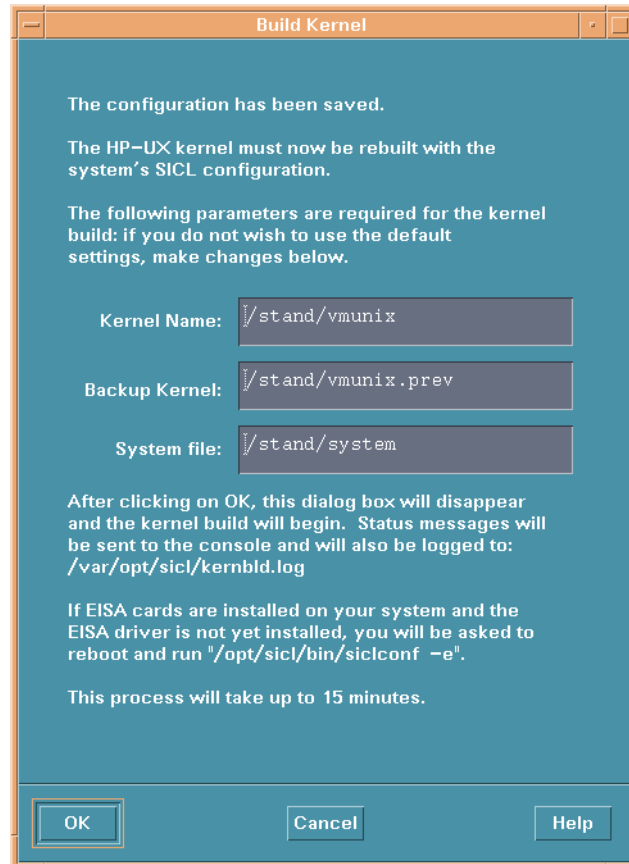
The accept configuration window appears as shown in figure 6-43.

Figure 6-43 Accept Configuration Window



4. Click **OK** in the accept configuration window. The accept configuration window disappears, and the build kernel window appears as shown in figure 6-44.

Figure 6-44 Build Kernel Window



5. Click **OK**. The new kernel is automatically rebuilt. This takes about 15 minutes.
6. After creating the new kernel, shut down HP-UX using the `/sbin/shutdown` command.
7. Turn off the system controller after the shutdown process is completed.
8. Install the GPIB interface card(s) into the system controller PCI slot.
9. Turn on the system controller and boot-up the HP-UX operating system.

NOTE Ignore the following message appears during the kernel is rebuilt.

```
sed: Function s/^[ ]*/char
HPUX_Support_../../etc/opt/sicl/libsicldrvr.a[.="@(#) / cannot be
parsed.
```

Step 3. Customizing BASIC/UX

To customize BASIC/UX for the 4072A/4073A, execute the `/home/hpsrvr/config/config.rmb` command. This command executes the following:

- The `/etc/dt/config/Xsession.d/0000.rmb` file is created for the CDE. The colormap and xmodmap information is described in this file.
- The `/etc/X11/rgb.txt` file is modified to include colors predefined by BASIC/UX. Also, the `/usr/bin/X11/rgb` command is executed using the `/etc/X11/rgb.txt` file.
- The `/usr/bin/X11/xmodmap` is executed to recognize the combinations between the computer and keyboard.
- The `/opt/rmb/rmb8_04/newconfig/Rmb` file (for revision C.08.04) is copied to `/usr/lib/X11/app-defaults/Rmb`.

Step 4. Customizing for Japanese Environment (Optional)

To customize for a Japanese environment, execute the `/home/hpsrvr/config/config.kanji` command. This command executes the following:

The `/etc/dt/config/Xsession.d/9000.kanji` file has been created for the CDE.

```
#!/usr/bin/ksh
if [ $LANG = 'ja_JP.SJIS' ] || [ $LANG = 'ja_JP.eucJP' ]; then
    /usr/bin/X11/xmodmap -e 'keycode 34 = Meta_L'
fi
```

Step 5. Customizing 4070 System Software

To customize the 4070 system software, execute the `/home/hpsrvr/config/config.4070` command. This command customizes the `/etc/opt/rmb/rmb8_04rc` (for revision C.08.04) and executes the `/opt/hp4070/install/install` command. For further details, see “Customizing rmbrc File” and “Executing install Command”.

Customizing rmbrc File

The `/etc/opt/rmb/rmb8_04` (for revision C.08.04) is automatically customized by the `/home/hpsrvr/config/config.4070` command.

```
:
770 ! WORKSPACE = 4M                               ← This line is automatically modified by config.4070.
:
1520 ! SHL_SEARCH /opt/hp4070/lib ← This line is automatically modified by config.4070.
:
```

Executing `install` Command

The `/opt/hp4070/install/install` command is executed using the `/home/hpsrvr/config/config.4070` command. The `install` command integrates the optical interface driver into the HP-UX kernel.

NOTE Before executing the `install` command, remove all of the `opt_s3*` files from `/dev/hp4070` directory, because these files are not re-created. However these files are automatically created in the above directory when you execute the `install` command.

1. When using the C3600/C3700 system controller, the following messages is displayed.

```
bus type: PCI
```

2. The following message is displayed:

```
The new kernel is now ready.  
Is it ok to reconfigure the HP-UX kernel [y or n] ?
```

3. To reconfigure the kernel, type `y`, then press **Return**.

4. When the kernel reconfiguration is completed, the following message is displayed:

```
Is it ok to update the content of /stand/system according  
to the present kernel configuration [y or n; default y] ?
```

5. To update the `/stand/system` file, type `y`, then press **Return**.

6. When the update is complete, the following message is displayed:

```
Do you want to shutdown the system now [y or n] ?
```

7. To shut down the system controller, type `y`, then press **Return**.

8. After the shutdown process is complete, turn off the system controller.

NOTE After executing the install process, the `install` command updates the `/tmp/hp4070.log` file. Check this file for any errors that may have occurred.

NOTE Ignore the following message appears during the kernel is rebuilt.

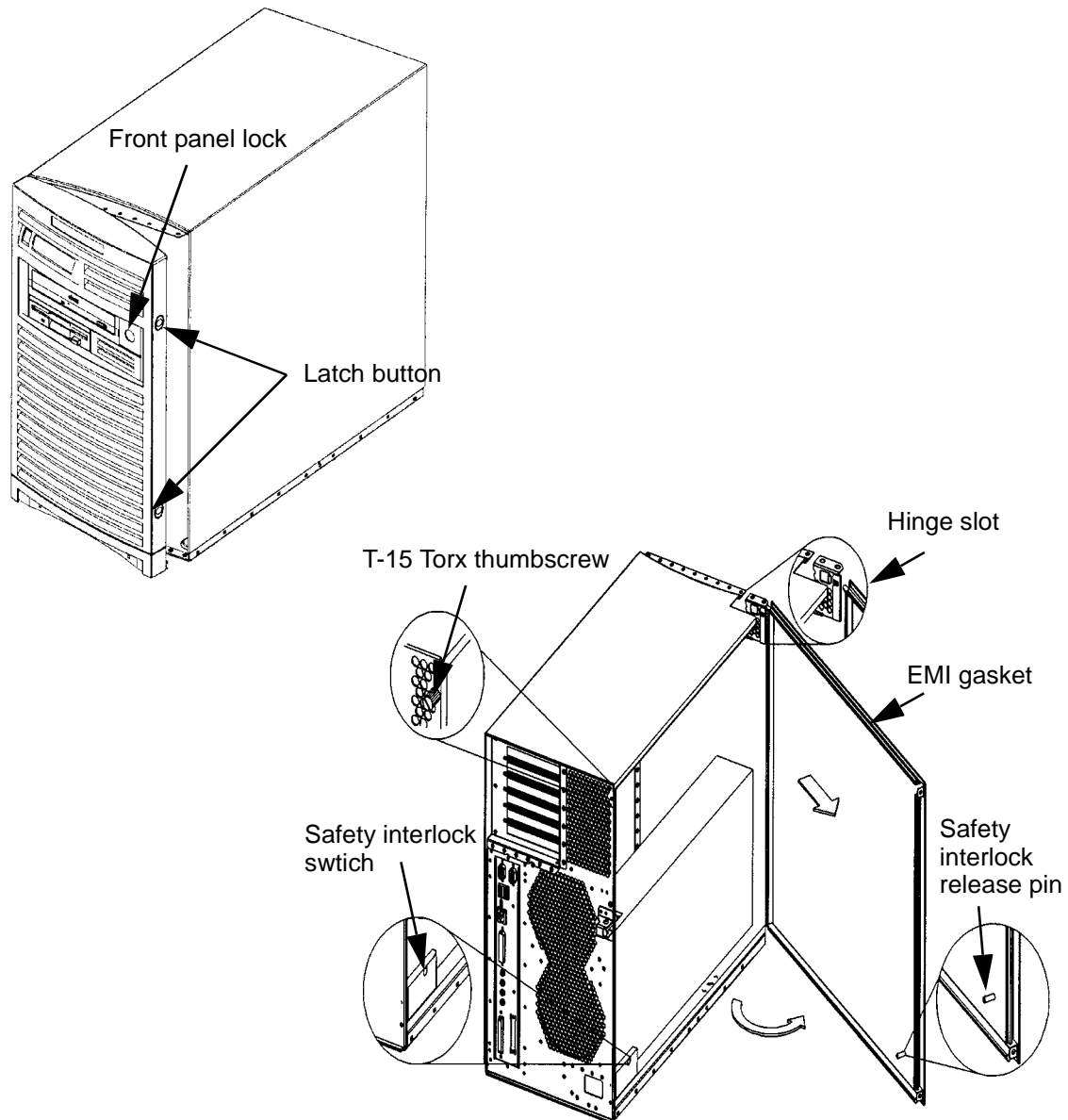
```
sed: Function s/^[ ]*/char  
HPUX_Support_.../etc/opt/sicl/libsicldrvr.a[]="@(#) / cannot be  
parsed.
```

Installing Optical Interface Card

This section describes how to install the optical interface card. If you install the optical interface card in the C3600/C3700 system controller, use the following procedure.

1. Make sure that the shutdown process was complete, then turn off the system controller.
2. Remove the cables and power cord from the rear panel of the system controller.
3. If the system controller is mounted in the system cabinet, unmount it from the system cabinet.
4. Remove the front panel and side cover as shown in figure 6-45.

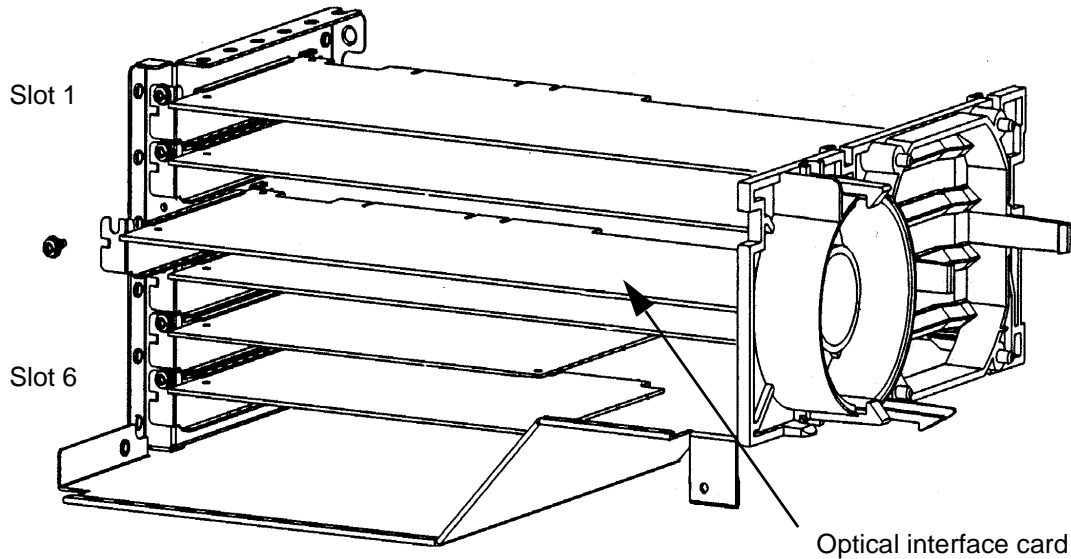
Figure 6-45 Removing Front Panel and Side Cover (C3600/C3700)



5. Remove the blank panel from the PCI slot position where you will install the optical interface card. This should be the same slot used to execute the `install` command.
6. Insert the optical interface card into the PCI slot 3 as shown in figure 6-46.

NOTE The graphical interface card is already installed into PCI slot 2. Don't move or remove this card. This card only works correctly in PCI slot 2.

Figure 6-46 Optical Interface Card Installation (C3600/C3700)



7. Reinstall the side cover and front panel.
8. If the system controller is mounted in the system cabinet, slide and secure the system controller with the rack flanges, using torx screws.
9. Connect the cables and power cord to the system controller.
10. Connect the optical fiber cables from the testhead to the optical interface board as follows.
 - a. Connect the "In" cable to the "IN" connector.
 - b. Connect the "Out" cable to the "OUT" connector.
11. Turn on and start up the system controller.

Editing /etc/opt/hp4070/config/1 File

This customization is optional.

If the system configuration does not match the standard configuration, you must edit the /etc/opt/hp4070/config/1 file. Change the file to match the system configuration.

Figure 6-47 shows the default setting for the /etc/opt/hp4070/config/1 file.

Figure 6-47 The /etc/opt/hp4070/config/1 File

```
# Agilent 4070 configuration file
# lines beginnign with '#' is comment line

# version: this file format version
version:2

# testhead.slot: Opt I/F card slot number of HOST computer
# testhead.timeout: Opt I/F interrupt time value (DO NOT CHANGE)
testhead.slot:3
testhead.timeout:100000

# hpibif.total: number of GPIB I/F card
# hpibif.NO.address: GPIB IF address of NO-th card
# hpibif.timeout: GPIB timeout value (DO NOT CHANGE)
hpibif.total:1
hpibif.1.address:7
hpibif.timeout:5000000

# cmu84.exist: 4284A existence (1: exist, 0: not-exist)
# cmu84.hpibif.address: GPIB IF address connected to 4284A
# cmu84.busaddress: 4284A GPIB bus address
# cmu84.cable: cable length of 4284A (1 or 4)
cmu84.exist:1
cmu84.hpibif.address:7
cmu84.busaddress:17
cmu84.cable:4

# dvm3458.1.exist: 3458A existence (1: exist, 0: not-exist)
# dvm3458.1.hpibif.address: GPIB IF address connected to 3458A
# dvm3458.1.busaddress: 3458A GPIB bus address
dvm3458.1.exist:1
dvm3458.1.hpibif.address:7
dvm3458.1.busaddress:22

# hfmatrix: HF Matrix existence (1: exist, 0: not-exist)
hfmatrix:1
# pulsemux: Pulse Switch #1/#2 existence (1: exist, 0: not-exist)
pulsemux:1

# pgName.pgNo.hpibIFaddr.hpibBusaddr:existence
#   pgName = pg8110 or pg8114 or pg81110
#   pgNo = PG logical number (1, 2, 3, 4, 5, 6, 7)
#   PG of PGNo=1 is always needed.
#   hpibIFaddr = GPIB IF address connected to the PG
#   hpibBusaddr = the PG GPIB bus address
#   existence = the PG existence (1: exist, 0: not-exist)

pg8110.1.7.10:1
pg8110.2.7.11:1
pg8110.3.7.12:1
pg8110.4.7.13:1
pg8110.5.7.14:1
```

Editing /etc/opt/hp4070/config/PCONFIG File

This customization is optional.

If an automatic wafer prober is used with the 4072A/4073A, the GPIB address for the automatic wafer prober must be set. Agilent Technologies recommends that the GPIB address be set to the default address included in the /etc/opt/hp4070/config/PCONFIG file. Figure 6-48 shows the default setting for the /etc/opt/hp4070/config/PCONFIG file.

To change the GPIB address setting in the system software, edit the file.

The GPIB address is expressed by a 4-digit number, *xxyy*, where:

- *xx*: logical unit number
- *yy*: GPIB address of wafer prober

Figure 6-48 The /etc/opt/hp4070/config/PCONFIG File

```
1000 !! RE-SAVE "/etc/opt/hp4070/config/PCONFIG"
1010 !!
1020 !
1030 ! WPS EG1034X 2501
1040 ! WPS EG2001X 2502
1050 ! WPS TEL4000A 2503
1060 ! WPS TEL4400A 2503
1070 ! WPS TEL19S 2503
1080 ! WPS TEL20S 2503
1090 ! WPS APM3000A 2505
1100 ! WPS APM6000A 2505
1110 ! WPS APM7000A 2505
1120 ! WPS SP900B 2508
1130 ! WPS SP1000B 2508
1140 ! WPS SP1100B 2508
```

Editing /etc/opt/hp4070/config/pgconnection File

This customization is optional.

The /etc/opt/hp4070/config/pgconnection file includes the information of the cable connections between the pulse generators and testhead ports. To change the file to match the connection configuration, use the /opt/hp4070/bin/pgconn4070 command.

NOTE To execute the /opt/hp4070/bin/pgconn4070, the TIS online session must be running.

Figure 6-49 shows the sample of /etc/opt/hp4070/config/pgconnection file.

Figure 6-49 The /etc/opt/hp4070/config/pgconnection File

```
# Agilent 4070 Pulse Generator Connection File
# Format Revision 1.0
# lines beginning with '#' are comment lines
# DVM or CMU are not handled in this file
# DO NOT CHANGE ABOVE LINES

THF1:
THF2:
THF3:

HF1:
HF2:
HF3:
HF4:
HF5:
HF6:

AUX1:
AUX2:
AUX3:
AUX4:
AUX5:
AUX6:
AUX7:
AUX8:

PSI11:
PSI12:
PSI21:
PSI31:
PSI41:
PSI51:
PSI61:
PSI62:
PSI71:
PSI72:

PSC1:
PSC2:
```

Executing /opt/hp4070/install/configure Command

Execute the `configure` command after installing the optical interface card into the system controller and customizing the `/etc/rc` file, `/etc/opt/hp4070/config/1` file (optional), and `/etc/opt/hp4070/config/PCONFIG` file (optional).

To execute the `configure` command, use the following procedure.

This command confirms the 4072A/4073A tester configuration, measures the capacitance compensation data, and sets the line frequency.

NOTE

Before executing the `configure` command, the testhead conditions must be as follows:

- The TIS server must be worked.
 - The wafer prober sense switch must be pushed.
 - The interlock pins on the testhead must be shorted.
 - The measurement pins must be open.
-

1. Turn on the 4072A/4073A and all system instruments. Do not forget to turn on the testhead power supply and testhead.
2. If an 4284A is configured with the 4072A/4073A, connect the Agilent 16048E test lead between the 4284A and the testhead.
3. Log in as a superuser (`root`).
4. Open a `dtterm` window.

5. Type the `configure` command as follows:

```
# /opt/hp4070/install/configure
```

6. The 4072A/4073A tester configuration and the following message are displayed:

```
Please check the system configuration recognized by the system software.  
Is the above configuration correct [y or n] ?
```

If the configuration is correct, type `y`, then press **Return**.

If the configuration is *not* correct, type `n`, press **Return**, then check the following:

- Is the 4072A/4073A (testhead and all system instruments) turned on?
- Are the optical fiber cables connected between the optical interface card and the testhead?
- Are the GPIB cables connected between the system controller and the system instruments?

If any mistakes are found, correct them, then re-execute the `configure` command.

7. The line frequency set for the testhead and the following message are displayed:

```
Is the above line frequency (Power Line Cycle) correct [y or n] ?
```

- If the line frequency is correct, type `y`, then press **Return**.
- If the line frequency is incorrect, type `n`, press **Return**, and then type the correct line frequency.

8. The following message is displayed:

```
Do you want to perform capacitance compensation parameter
measurement right now [y or n] ?
```

- If an 4284A is configured with the 4072A/4073A, type y, then press **Return** to execute the capacitance compensation parameter measurement.
- If an 4284A is not configured, or the 4284A does not need the capacitance compensation parameter measurement, type n, then press **Return**.

9. After finishing the configure command execution, the following message is displayed:

```
*****
*
* Agilent 4070 system software configuration completed. *
* Now the system is ready to use.                      *
*
*****
```

Customizing for Pulse Generator

If the pulse generator is to be installed newly or reconfigured, perform the following:

1. Edit the `/etc/opt/hp4070/config/1` file
2. Execute the `/opt/hp4070/install/configure` command
3. Perform the pulse level calibration
To perform the pulse level calibration, use the `/opt/hp4070/bin/cal4070` command. For more information, see the *Agilent 4072A/4073A Calibration Guide*.

Installing E4411B Control Software (Optional)

The following CD-ROM is used for installing the E4411B control software.

- Agilent 4070 series spectrum analyzer control software

To install the E4411B control software, use the `/usr/sbin/swinstall` command:

Loading E4411B Control Software

1. Insert the software media (CD-ROM) into the CD-ROM drive.
2. Log in as a superuser (`root`).
3. Open a `dtterm` window.
4. Mount the CD-ROM drive on the controller by using the `/sbin/mount` command.

```
# /sbin/mount /dev/dsk/c0t0d0 /SD_CDROM
```

5. Load the E4411B control software filesets using the `/usr/sbin/swinstall` command, as follows.

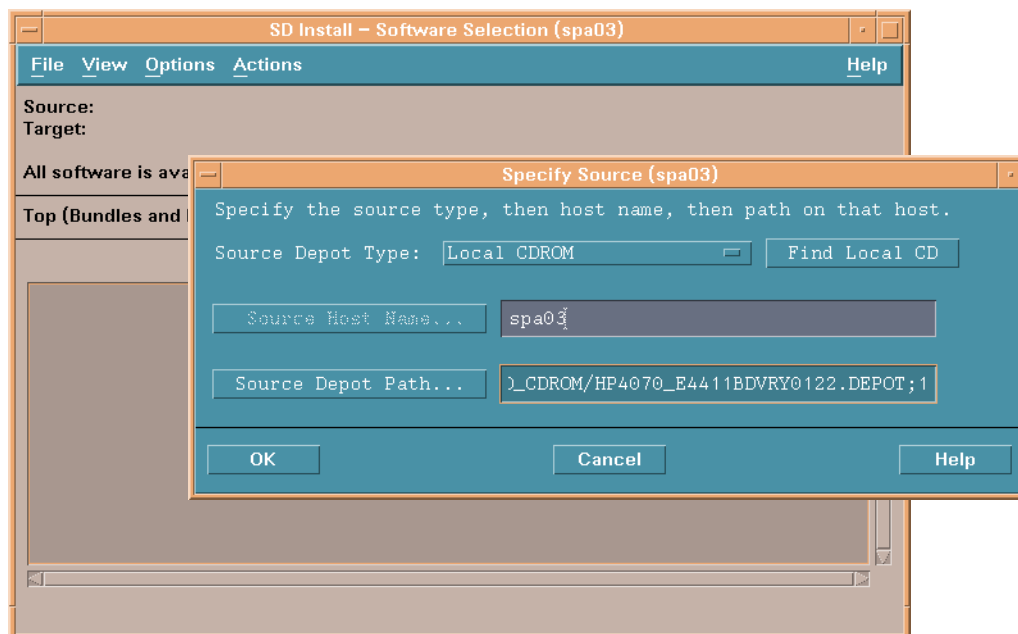
- a. Type the `/usr/sbin/swinstall` command.

```
# /usr/sbin/swinstall
```

The SD install and specify source window appear as shown in figure 6-50.

CAUTION The environment variable `LANG` must be `C` when you execute the `swinstall` command. Otherwise, core dump may occur.

Figure 6-50 SD Install and Specify Source Window



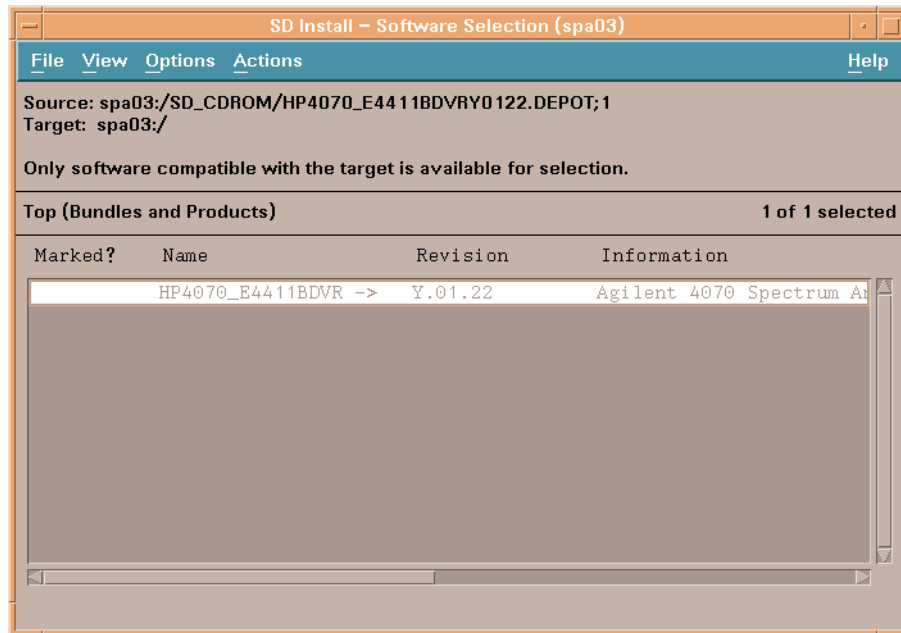
- b. Choose **Local CD-ROM** on the specify source window.

- c. Type the source path name in the **Source Depot Path....** For example, if the CD-ROM drive is mounted in SD_CDROM, type the name as follows:

```
/SD_CDROM/HP4070_E4411BDVRY0122.DEPOT;1
```

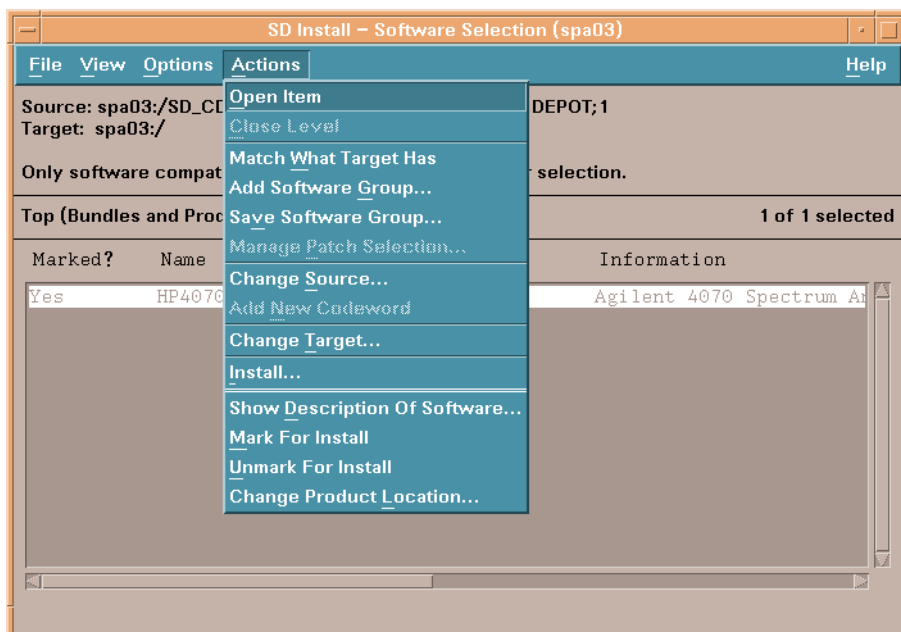
- d. Press **OK** in the specify source window. The specify source window disappears, and the E4411B control software is displayed in the SD install window as shown in figure 6-51.

Figure 6-51 SD Install Window with 4070 System Software



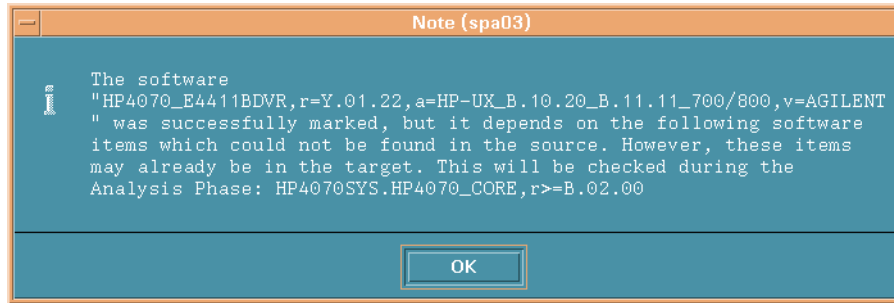
- e. Choose HP4070_E4411BDVR.
- f. Choose Actions: Install (analysis)... as shown in figure 6-52.

Figure 6-52 SD Install Window with Install Menu



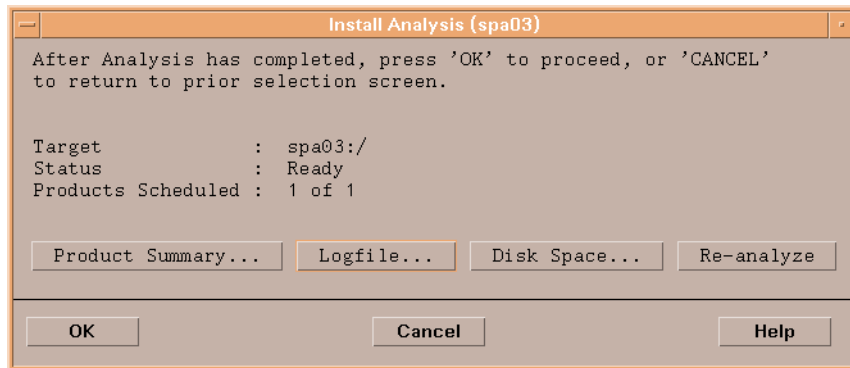
- g. Click **OK** in the confirmation window as shown in figure 6-53.

Figure 6-53 Confirmation Window



The install analysis window appears as shown in figure 6-54.

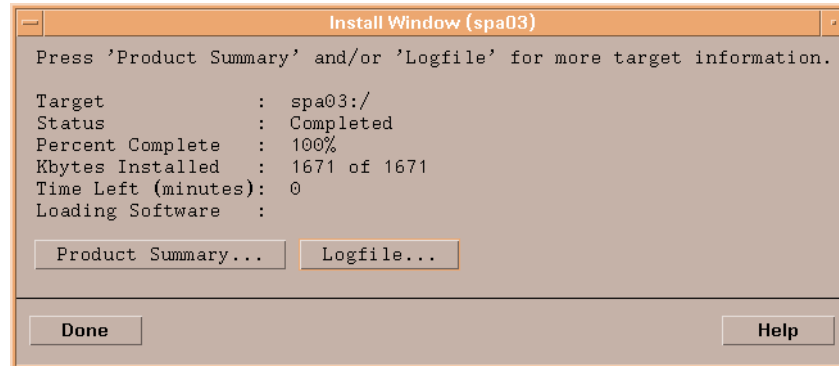
Figure 6-54 Install Analysis Window



- h. Click **Logfile...** in the install analysis window. The logfile window appears.
- i. Verify that there are no errors in the logfile. If there is an error, stop the installation and troubleshoot.
- j. Click **OK** in the logfile window. The logfile window disappears.
- k. Click **OK** in the install analysis window. The software installation begins. This takes about 10 minutes.

- l. After the software installation is complete, verify that there are no errors in the `/var/adm/sw/swagent.log` file. To check for errors, click **Logfile...** in the install window as shown in figure 6-55.

Figure 6-55 Install Window for Loading Completed



- m. Click **OK** in the logfile window. The logfile window disappears.
 - n. Click **Done** in the install window. The install window disappears.
 - o. Choose File: Exit in the swinstall window.
6. Unmount the CD-ROM drive, if necessary, using the `/sbin/umount` command.


```
# /sbin/umount /SD_CDRROM
```
 7. Remove the software media (CD-ROM) from the CD-ROM drive, and put it in a safe place.

Customizing E4411B Control Software

1. Set up the E4411B spectrum analyzer GPIB address file with the command:

```
# /opt/ringosc/setup_e4411b_hpib
```

This script requires to enter the GPIB address of the E4411B. The default GPIB address of the spectrum analyzer is 718.

The script creates the `/opt/ringosc/config` file, which is referred to by the start program calibration script.

2. Edit each user's profile to change the `PCS_ADDON_TIMEOUT` value.

Add the following line in the `$HOME/.dtprofile`.

```
export PCS_ADDON_TIMEOUT=60
```

If the `DTSOURCEPROFILE` parameter in `.dtprofile` is defined as true, add the above line to the user's `.profile` or `.login`, depending on the shell type of the user.

Note that it must be set to 60. Otherwise, the `/opt/hp4070/addon/start` script does not run correctly.

If you load the spectrum analyzer control software before installing Agilent SPECS, simply re-install the spectrum analyzer control software.

3. Log out and log in the user environment to active the `PCS_ADDON_TIMEOUT` value.

Verifying E4411B Control Software Installation

1. Start TIS server with the command:

```
# /opt/hp4070/bin/hp4070 -start
```

When the TIS server starts, the /opt/hp4070/addon/start program is executed. The /opt/hp4070/addon/start program verifies the existence of the E4411B, and then calibrates it. The start log is recorded in the /opt/ringosc/syslogE4411BDVR file.

2. Check that there is no error in the /opt/ringosc/syslogE4411BDVR file.

Further Customization Required for Agilent SPECS Users

1. Create a framework using the Plug Framework (RO_PLUG.fwk) and the standard framework. If you don't use the standard framework, INIT_SPEANA must be manually added to your framework after TESTER_START.
 - a. Configuration file can be found in the /opt/SPECS/usr/fwk directory with the name consists of framework name followed by a suffix (.cf.) The GPIB address is written in the configuration file with SPANA_ADDR parameter.
2. The created framework retrieves the E4411B and GPIB addresses from a framework configuration file. (The framework configuration file can be found in the /opt/SPECS/usr/fwk directory. The filename consists of a framework name followed by an extension (.cf). The GPIB address is written in the configuration file with the SPANA_ADDR parameter.) Set the correct GPIB address in the framework configuration file.

The E4411B drivers can be called from any algorithm, just like TIS commands. The drivers cannot be called from a test plan.

Creating New User Account

The `hp4070`, `specs`, and `hpsrvr` users are automatically created by loading the software configuration tool. If you need to create additional user accounts, use the following procedure.

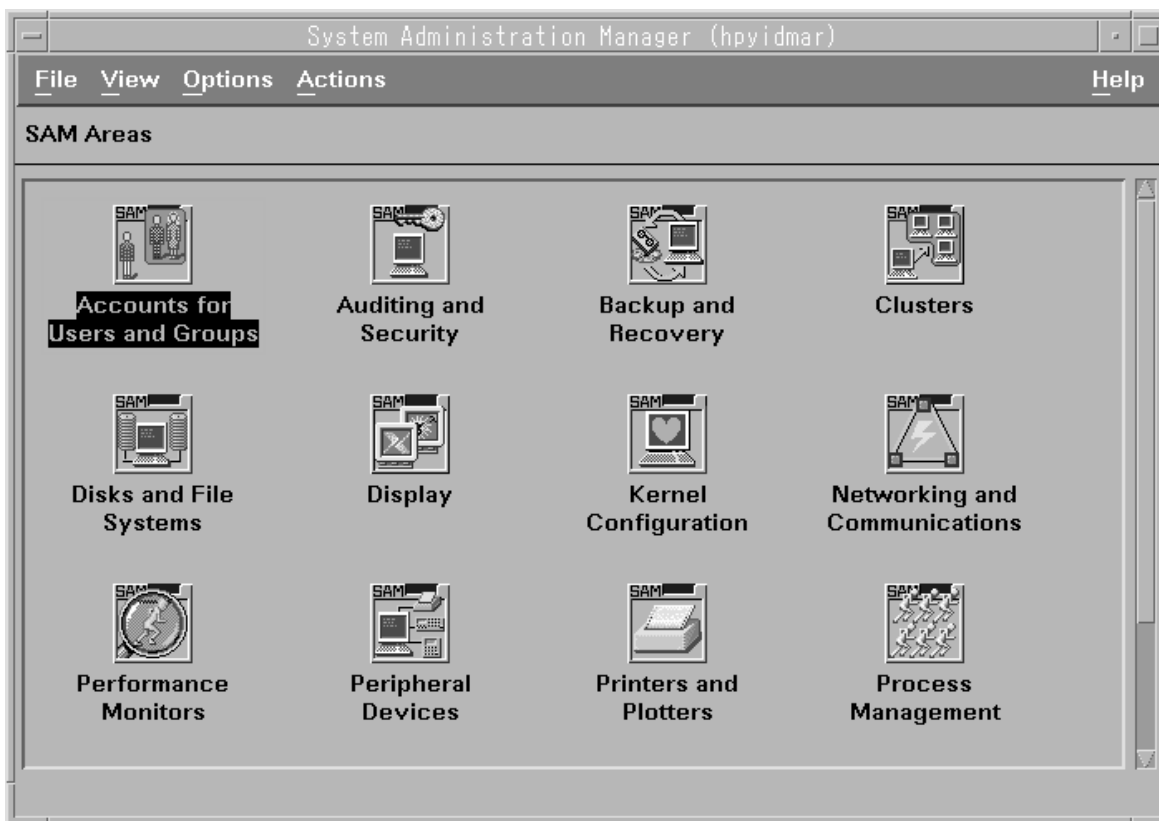
To create a new user account, use the system administration manager (SAM). The following briefly explains how to create a new user account.

1. Log in as a superuser by typing `root`, and type the root password for the system controller.
2. Open a `dtterm` window.
3. To start the SAM (1M) utility, type:

```
# sam
```

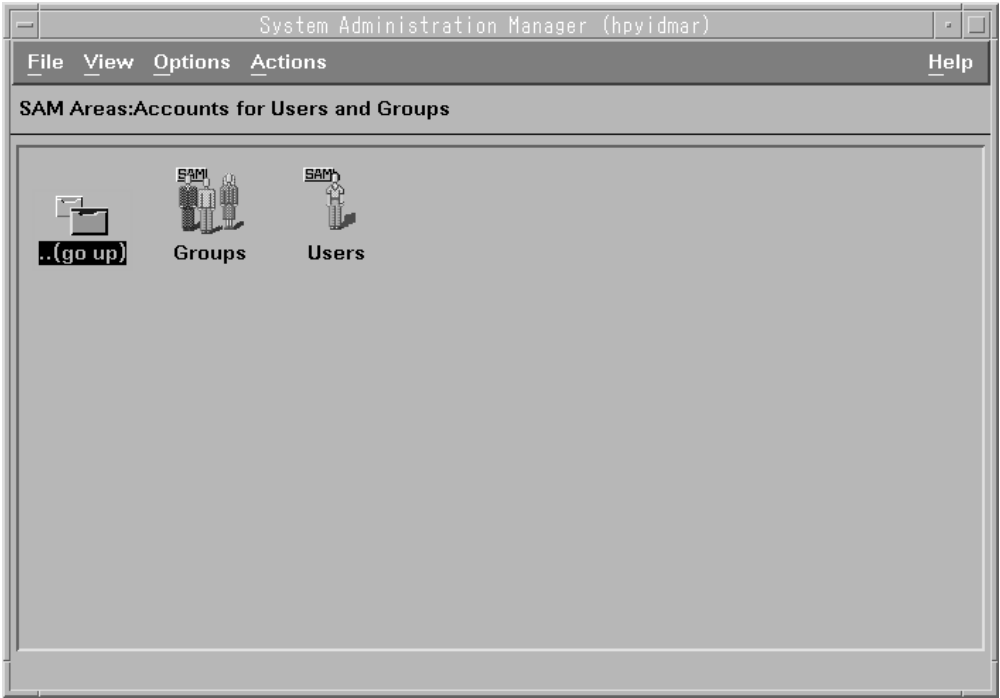
The SAM window appears as shown in figure 6-56.

Figure 6-56 System Administration Manager (SAM) Window



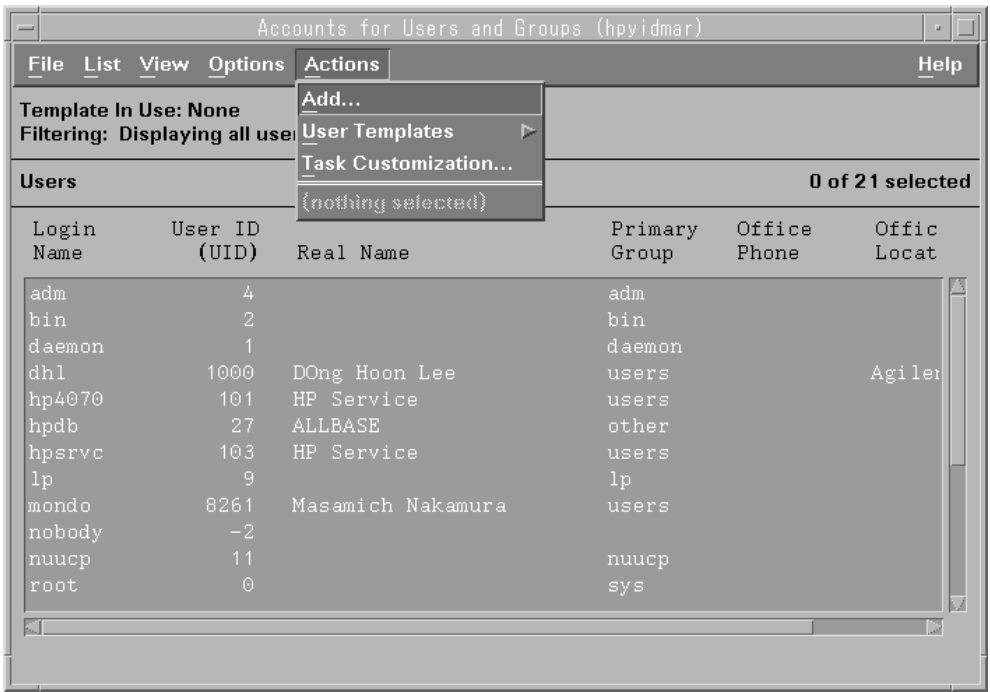
4. Double-click the Accounts for Users and Groups icon.

Figure 6-57 Accounts for Users and Group Screen of SAM Window



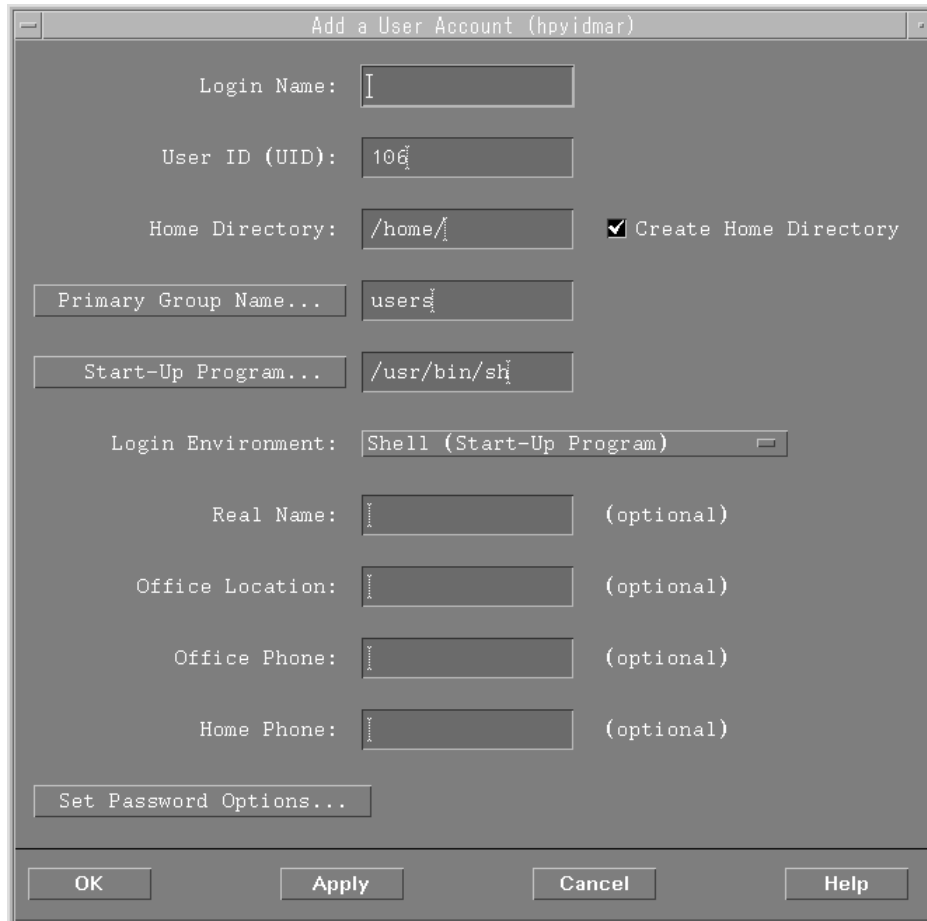
5. Double-click the Users icon. The accounts for users and groups window appears as shown in figure 6-58.

Figure 6-58 Accounts for Users and Group Window



6. Choose Action: Add... in the accounts for users and group window. The add a user account window appears as shown in figure 6-59.

Figure 6-59 Add a User Account Window

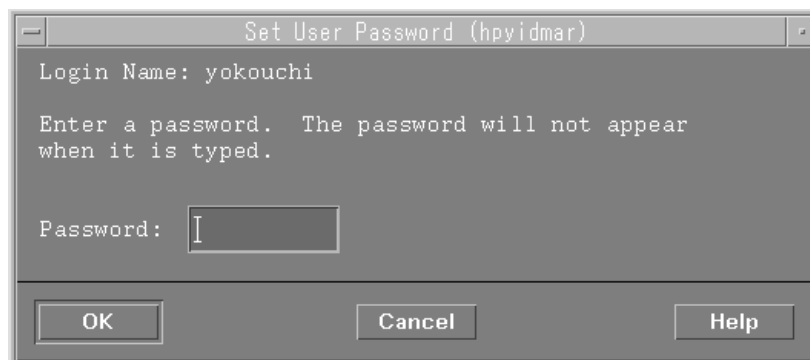


The 'Add a User Account (hpyidmar)' window contains the following fields and controls:

- Login Name: []
- User ID (UID): [1001]
- Home Directory: [/home/] ☒ Create Home Directory
- Primary Group Name...: [users]
- Start-Up Program...: [/usr/bin/sh]
- Login Environment: [Shell (Start-Up Program)]
- Real Name: [] (optional)
- Office Location: [] (optional)
- Office Phone: [] (optional)
- Home Phone: [] (optional)
- Set Password Options... []
- Buttons: OK, Apply, Cancel, Help

7. Fill in the required information, then click **OK** in the add a user account window. The set user password window appears as shown in figure 6-60.

Figure 6-60 Set User Password Window



The 'Set User Password (hpyidmar)' window contains the following fields and controls:

- Login Name: yokouchi
- Enter a password. The password will not appear when it is typed.
- Password: []
- Buttons: OK, Cancel, Help

8. Set the temporary password, and click **OK** in the set user password window.

NOTE You must set the password for the system security. Then, the password must be reported to system administrator after installation.

After the new user has been created, the note window appears as shown in figure 6-61.

Figure 6-61 Note Window



9. Click **OK** in the note window. The note window disappears.
10. Choose **File: Exit** in the SAM window. The SAM window disappears.
11. Log off from the superuser environment.

7 Verifying Tester Operation

After installation, you must verify the tester operation, and confirm that the installation process was completed. This chapter provides instructions for verifying correct Agilent 4072A/4073A operation.

This chapter consists of the following sections:

- “To Turn On Agilent 4072A/4073A”
- “To Confirm Agilent 4072A/4073A Configuration”
- “To Confirm the Agilent 4072A/4073A Operation”

To Turn On Agilent 4072A/4073A

Electrical Work Type 3:

WARNING 24 V is forced to the uninsulated parts of the EMO rear panel. Do not touch these parts.

To turn on the 4072A/4073A, use the following procedure.

1. Set the following components:

EMO button	Normal (“Out”) position
EMO protector	“In” position
Fan protector -1	“In” position
Fan protector -2	“In” position
Power outlet protector	“In” position
Ext control terminal	Short condition

Figure 7-1 shows the component locations.

2. Set the main breaker to the ON position.
3. Set the emergency breaker to the ON position.
4. Set the main switch to the ON position. The LINE indicator, on the top front of the system cabinet, turns on.
5. Verify that the over voltage LED turns on. If so, check the source power line.
6. Press the system switch. The green LED in the system switch turns on.

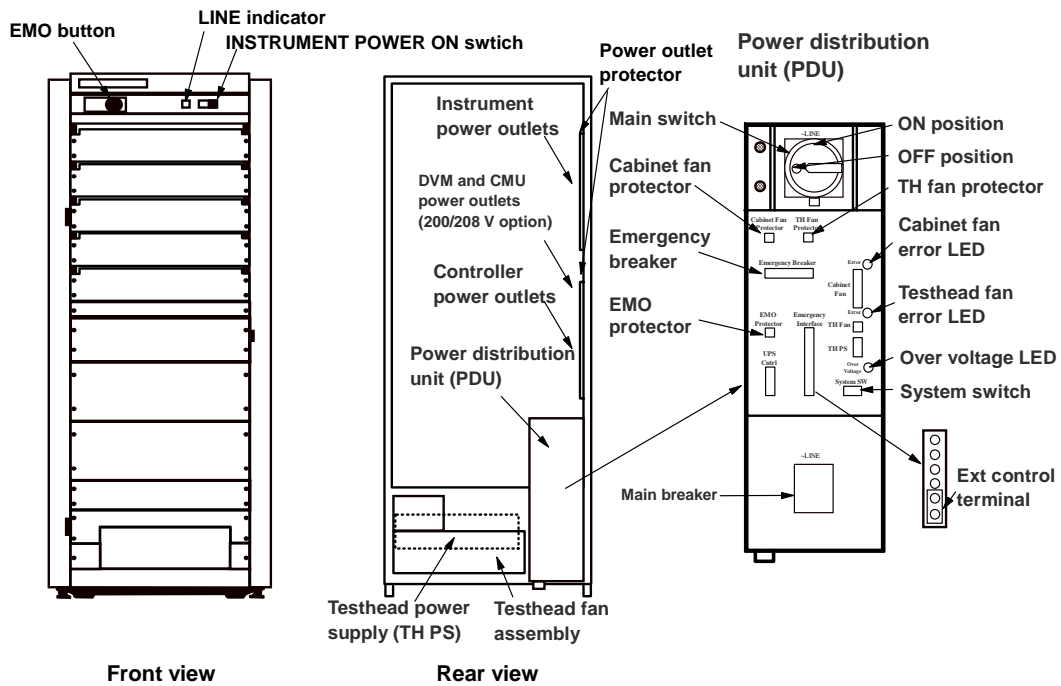
NOTE Complete steps 4 through 6 within 20 seconds. After 20 seconds, the cabinet fan error LED turns on. Set the main switch to the OFF position and repeat steps 4 through 6.

7. Press the INSTRUMENT POWER ON switch on the top front of the system cabinet. The green LED in the INSTRUMENT POWER ON switch turns on.
8. Turn on all the system instruments installed in the system cabinet.

NOTE You can press the EMO button to safely shut down the 4072A/4073A. This shuts down ac power to *all* the power outlets inside the system cabinet, which includes the system instruments and testhead power supply. It also turns off power to the system controller and peripherals connected to these power outlets. In this case, it turns off the controller without the normal shutdown sequence.

If an emergency occurs, press the EMO button to shut down the 4072A/4073A. For more information regarding the EMO circuit, see chapter 2.

Figure 7-1 Component Locations



To Confirm Agilent 4072A/4073A Configuration

This section describes how to check the 4072A/4073A configuration. To confirm the configuration, use the `/opt/hp4070/bin/hp4070` command, which is included in the Agilent 4070 system software.

To execute the `hp4070` command, use the following procedure.

1. Turn the 4072A/4073A on.
2. Enable the testhead by placing any fixture on the testhead, or by placing the testhead on the prober.
3. Turn the system controller on, and start the HP-UX system.
4. Log in as any user.
5. Verify that the TIS server is running. To check it, type:

```
$ ps -ef | grep tis
```

If the TIS server is running, the `tis_online` daemon appears.

```
user 20049      1  0  Mar  3  ?        2:04 tis_online -ioff -e -a
```

If the TIS server is not running, run the TIS server using the following command:

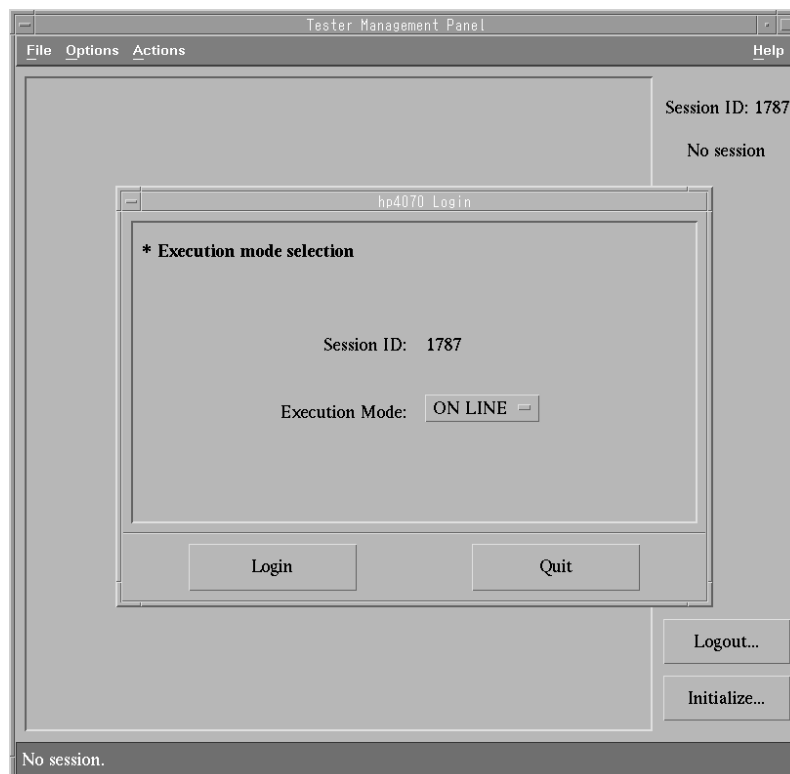
```
$ hp4070 -start
```

6. To verify the configuration and to display it on the window, execute `hp4070`:

```
$ hp4070
```

The tester management panel and `hp4070` login window appear.

Figure 7-2 Tester Management Panel with `hp4070` Login



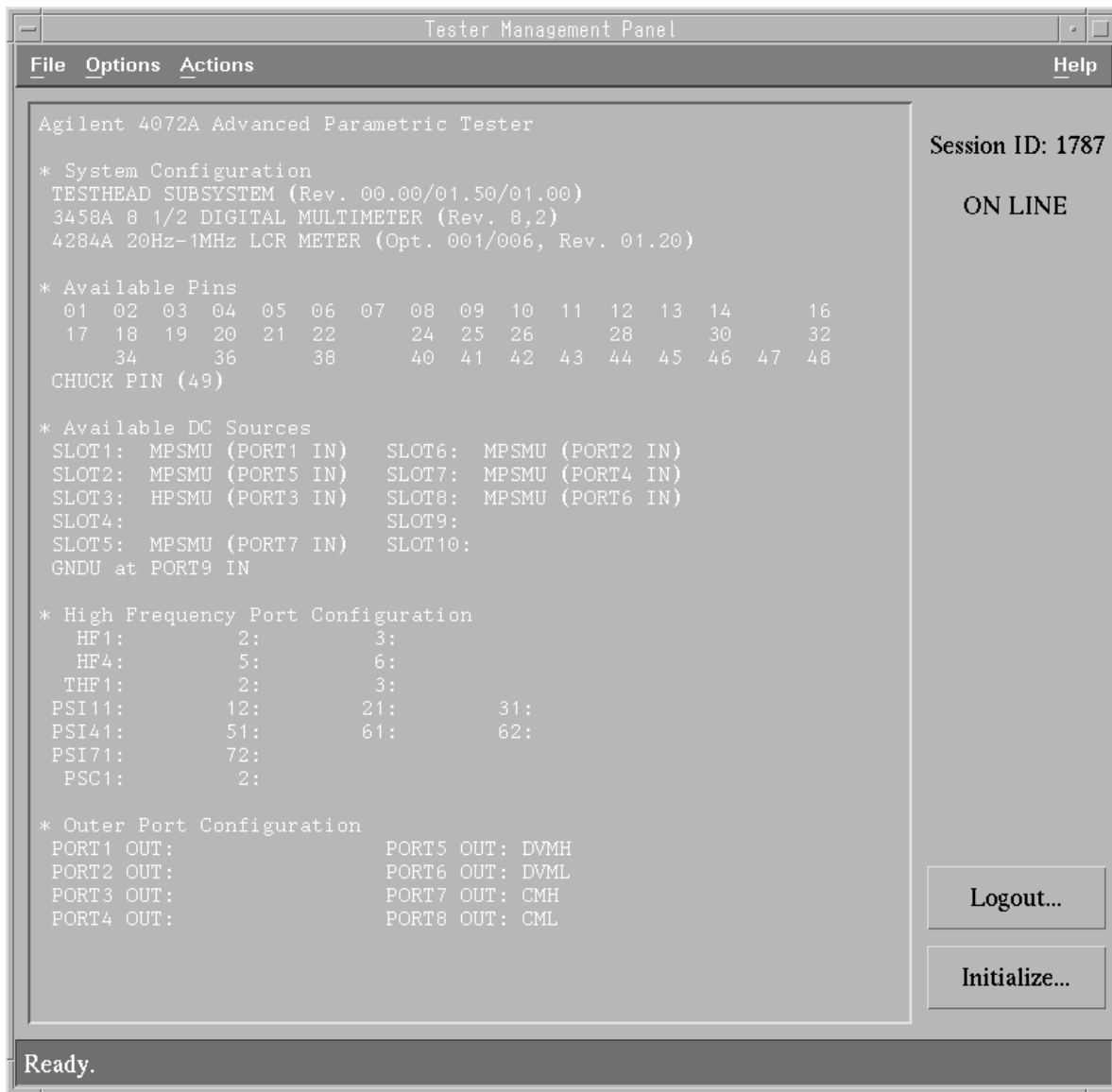
Verifying Tester Operation

To Confirm Agilent 4072A/4073A Configuration

- Choose the **ON LINE** execution mode, and click **Login**.

The configuration appears on the tester management panel.

Figure 7-3 Tester Management Panel Login Screen



If the configuration is not correct, or the `hp4070` command does not run correctly, see the Troubleshooting section of the *Agilent 4072A/4073A Service Guide*.

To Confirm the Agilent 4072A/4073A Operation

This section describes how to check the operation of the 4072A/4073A. To confirm the operation, use the diagnostics program (/opt/hp4070/bin/diag4070) included in the 4070 system software.

For further details of the diagnostics program execution, see the *Agilent 4072A/4073A Service Guide*. If the 4072A/4073A fails the diagnostics, see the Troubleshooting section of the *Agilent 4072A/4073A Service Guide*.

Procedure

To execute the diagnostics program, use the following procedure.

1. The wafer prober sense switch must be pushed, and the interlock pins on the testhead must be shorted. To do this, do one of following:
 - a. If an automatic wafer prober is used:
 - i. Set the personality board on the wafer prober.
 - ii. Set the testhead on the wafer prober. If the personality board is already wired to the probe card/probe card adapter, do not contact the probe card to anything. The probe card needles must be open.
 - b. If the Agilent E3140A test fixture adapter and the Agilent E3141A universal test fixture are used:
 - i. Set the test fixture on the test fixture adapter, then open the test fixture measurement pins.
 - ii. Set the test fixture adapter on the testhead.
 - iii. Close the top cover of the test fixture adapter.

Verifying Tester Operation

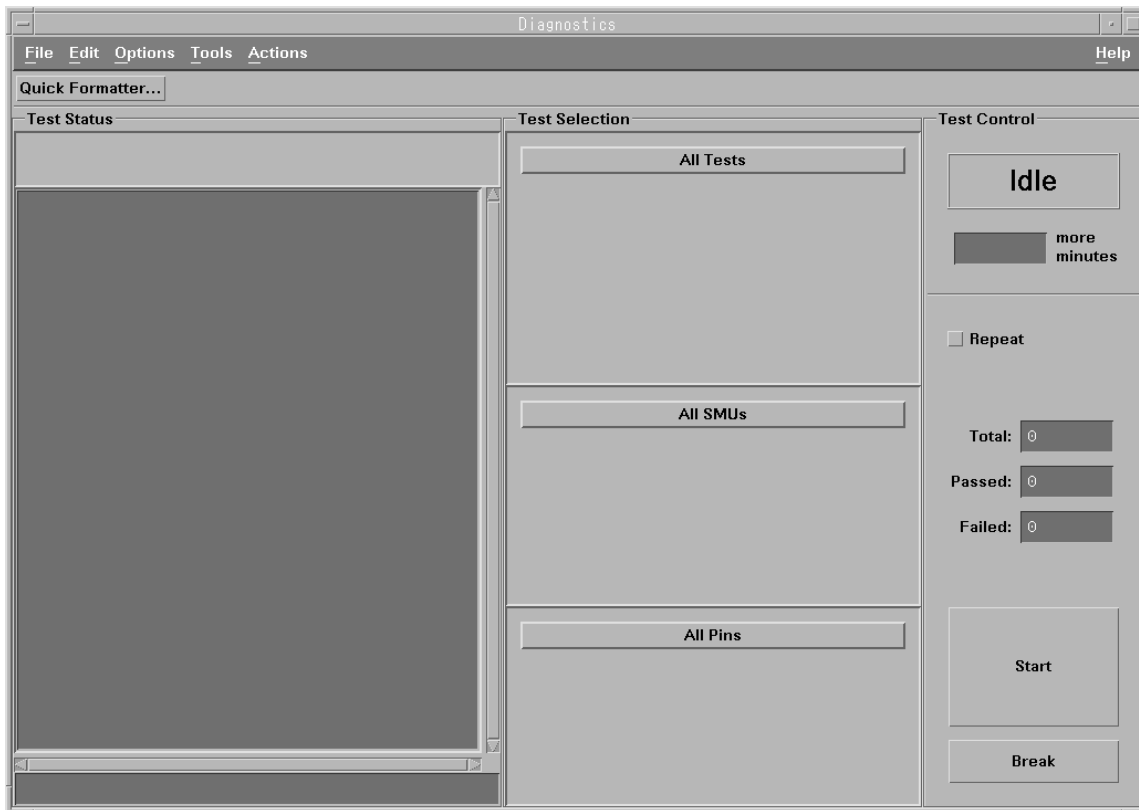
To Confirm the Agilent 4072A/4073A Operation

2. Execute the diagnostics program.

```
$ diag4070
```

The diagnostics window appears.

Figure 7-4 Diagnostics Window



3. Click **Start** to execute the diagnostics. The total time required to complete all the diagnostics tests depends on the tester configuration. For a fully configured tester, the diagnostics take about 15 minutes.

Confirmation

While the diagnostics program is executing, you can see the diagnostics results on the diagnostics window. The results will be written to the `/var/opt/hp4070/diag/log` file in ASCII format.

The `/var/opt/hp4070/diag/log` file includes the:

- time when diagnostics started
- results of diagnostics
- messages for troubleshooting
- time when diagnostics finished

NOTE The diagnostics results are added to the `/var/opt/hp4070/diag/log` file, with the latest results are at the end of the file. To see the latest results, open the file with a text editor, and go to the end of the file.

Displaying and Printing the Test Results

After diagnostics, the test data is stored in the `/var/opt/hp4070/diag/DIAGdata` file. If you need to report the test results, you can use the quick formatter, which is included in the 4070 system software, to display and print out test results. The following describes how to display and print test results using the quick formatter.

1. Click **Quick Formatter...** in the diagnostics window, or execute the `view4070` command in the terminal window.

Figure 7-5 Quick Formatter Window

The screenshot shows a window titled "Quick Formatter" with a menu bar (File, Edit, View) and a toolbar (PV Data, Save..., Diskette..., Print..., Search...). Below the toolbar is a table with the following columns: Description, Nominal, Minimum, Results, Maximum, and Uncertain. The table contains data for a test labeled "(232) SMU Current Force and Measurement Test" and "SMU3:Pin Bd 8/GNDU:Pin Bd 16". The data is organized into groups of four rows each, representing different current ranges and measurement methods.

Description	Nominal	Minimum	Results	Maximum	Uncertain
(232) SMU Current Force and Measurement Test					
SMU3:Pin Bd 8/GNDU:Pin Bd 16					
100nA Range (G-F)	0.000E+00 V	-2.000000E-03 V	-4.362944E-05 V	2.000000E-03 V	0.000E
100nA Range (G-F)	0.000E+00 V	-2.000000E-03 V	-4.347832E-05 V	2.000000E-03 V	0.000E
100nA Range (G-F)	0.000E+00 V	-2.000000E-03 V	-4.340119E-05 V	2.000000E-03 V	0.000E
100nA Range (G-F)	0.000E+00 V	-2.000000E-03 V	-4.326675E-05 V	2.000000E-03 V	0.000E
1uA Range (G-F)	0.000E+00 V	-2.000000E-03 V	-4.277095E-05 V	2.000000E-03 V	0.000E
1uA Range (G-F)	0.000E+00 V	-2.000000E-03 V	-4.265214E-05 V	2.000000E-03 V	0.000E
1uA Range (G-F)	0.000E+00 V	-2.000000E-03 V	-4.297031E-05 V	2.000000E-03 V	0.000E
1uA Range (G-F)	0.000E+00 V	-2.000000E-03 V	-4.298028E-05 V	2.000000E-03 V	0.000E
100nA Range (DVM)	-1.000E-07 A	-1.006000E-07 A	-9.998996E-08 A	-9.940000E-08 A	1.690E
100nA Range (Per Ch AD)	-1.000E-07 A	-1.005490E-07 A	-1.000100E-07 A	-9.944897E-08 A	1.690E
100nA Range (Ref AD)	-1.000E-07 A	-1.005490E-07 A	-1.000012E-07 A	-9.944897E-08 A	1.690E
100nA Range (DVM)	-1.000E-08 A	-1.042000E-08 A	-9.995849E-09 A	-9.580000E-09 A	1.180E
100nA Range (Per Ch AD)	-1.000E-08 A	-1.036584E-08 A	-1.000000E-08 A	-9.625857E-09 A	1.190E
100nA Range (Ref AD)	-1.000E-08 A	-1.036584E-08 A	-9.996100E-09 A	-9.625857E-09 A	1.190E
100nA Range (DVM)	1.000E-08 A	9.580000E-09 A	9.996921E-09 A	1.042000E-08 A	1.180E
100nA Range (Per Ch AD)	1.000E-08 A	9.626927E-09 A	9.995000E-09 A	1.036691E-08 A	1.190E

2. Select the File: Load: File... menu in the quick formatter window, and choose the data file. The diagnostics data file is stored in the `/var/opt/hp4070/diag` directory.
3. To print out the diagnostics data displayed in the quick formatter window:
 - a. Click **Print...** in the quick formatter window. The print window appears.
 - b. Type the printer name.
 - c. Click **OK**.
4. To store formatted data in a text file:
 - a. Click **Print...** in the quick formatter window. The print window appears.
 - b. In the print window, type:

```
cat > file_name
```

Verifying Tester Operation
To Confirm the Agilent 4072A/4073A Operation

A Agilent E3171A/AJ, E3172A/AJ/B, and E3173A Factory Settings

This appendix describes the factory settings for the Agilent E3171A/AJ, Agilent E3172A/AJ/B, and Agilent E3173A controller. The information in this section may help you if the E3171A/AJ, E3172A/AJ/B, or E3173A system controller software encounters a problem.

Software Revision

The latest software revision is installed in the E3171A/AJ, E3172A/AJ/B, and E3173A at the factory. The following table shows the corresponding revisions for the operating system and the Agilent 4070 system software. The checked (✓) box indicates the latest 4070 software revision.

Table A-1 Software Revision for Agilent E3171A/AJ

	HP-UX C/ANSI C	SICL	BASIC/UX	4070 System Software	Testhead F/W	Configuration Tool	Agilent SPECS	E4411B Control Software
	B.10.20 ACE3 (Jun 1998)	G.01.02	C.08.02	B.02.00	1.24	B.01.00	B.02.40	X.01.20
				B.02.10	1.25 1.26	B.01.01	B.02.41	X.01.20
		G.03.00	C.08.03	B.03.00	1.40 1.41	B.01.02 B.01.03	B.02.50 B.02.51	X.01.22
✓				B.03.01	1.41	C.01.03	B.02.51	Y.01.22

Table A-2 Software Revision for Agilent E3172A/AJ/B Option 102

	HP-UX C/ANSI C	SICL	BASIC/UX	4070 System Software	Testhead F/W	Configuration Tool	Agilent SPECS	E4411B Control Software
	B.10.20 ACE5 (Sep 2000)	G.03.00	C.08.03	B.03.00	1.40 1.41	B.01.02 B.01.03	B.02.50 B.02.51	X.01.22
✓				B.03.01	1.41 1.57	C.01.03	B.02.51	Y.01.22

Table A-3 Software Revision for Agilent E3172A/AJ/B Option 110

	HP-UX C/ANSI C	SICL	BASIC/UX	4070 System Software	Testhead F/W	Configuration Tool	Agilent SPECS	E4411B Control Software
✓	B.11.11 (Jun 2001 or Sep 2001)	11i-1.0 11i-2.1	C.08.04	C.03.01	1.41 1.57	C.01.03	C.02.51	Y.01.22

Table A-4 Software Revision for Agilent E3173A

	HP-UX C/ANSI C	SICL	BASIC/UX	4070 System Software	Testhead F/W	Configuration Tool	Agilent SPECS	E4411B Control Software
✓	B.11.11 (Sep 2001)	11i-2.1	C.08.04	C.03.01	1.41 1.57	C.01.03	C.02.51	Y.01.22

Installed Software

The following software has been installed at the factory.

- HP-UX
- HP-UX recommended patches
 - (For HP-UX B.11.11)
 - ☐ PHKL_23504
 - (For HP-UX B.10.20)
 - ☐ quality pack (XSW700QPK1020)
 - ☐ extension software patch bundle (XSW700HW1020)
 - ☐ HP-UX extension software general release patch bundle (XSW700GR1020)
 - ☐ additional HP-UX patch bundle (NET21020S700)
 - ☐ HP-UX core OS year-2000 patch bundle (Y2K-1020S700)
- C/ANSI C
- SICL
- BASIC/UX
- Agilent 4070 system software
- Agilent 4070/SPECS software configuration tool
- Agilent SPECS

NOTE There are some type for the Agilent software configuration tool. When you install this configuration tool, use the media of the latest revision.

NOTE Agilent E4411B spectrum analyzer control software is not installed in the factory.

Customizing HP-UX

Basic Configuration

When HP-UX was installed at the factory on the E3171A/AJ, E3172A/AJ/B and E3173A, its basic configuration was set as follows:

Primary swap size	512 Mbyte (for the E3172A/AJ/B option 110 and E3173A) 400 Mbyte (for the E3171A/AJ and E3172A/AJ option 102)
Secondary swap size	None
Software selection	CDE runtime environment
Software language	English (for the E3171A, E3172A, and E3172B/E3173A option ABA) Japanese (for the E3171AJ, E3172AJ, and E3172B/E3173A option ABJ)
Locale setting	C (for the E3171A, E3172A, and E3172B/E3173A option ABA) ja_JP.SJIS (for the E3171AJ, E3172AJ, and E3172B/E3173A option ABJ)
keyboard:	USB_PS2_DIN_US_English (for the E3171A/AJ/B option 110 and E3173A)
File system file name length	Long
/home configuration	Minimal
Make volatile dirs separate	True
Create /export volume	False

Logical Volumes

When HP-UX was installed at the factory, the logical volumes were set as follows:

Table A-5 Logical Volumes

Logical Volume Name	Size	
	E3172A/AJ/B option 110 and E3173A	E3171A/AJ and E3172A/AJ/B option 102
/stand	112 Mbyte	84 Mbyte
/	140 Mbyte	48 Mbyte
/tmp	64 Mbyte	32 Mbyte
/home	20 Mbyte	20 Mbyte
/opt	1536 Mbyte	1024 Mbyte
/usr	1544 Mbyte	640 Mbyte
/var	1024 Mbyte	1024 Mbyte

Drivers and Kernel Parameters

Drivers and kernel parameters are modified by executing the `/home/hpsrvc/config/config.4070` command.

Table A-6 Drivers and Kernel Parameters

E3172A/AJ/B option 110 and E3173A		E3171A/AJ or E3172A/AJ/B option 102	
<code>create_fastlinks</code>	1	<code>sflop</code>	
<code>dnlc_hash_locks</code>	512	<code>stape</code>	
<code>fs_async</code>	1	<code>maxdsiz</code>	0x08000000
<code>maxdsiz</code>	0xC0000000	<code>maxuprc</code>	200
<code>maxdsiz_64bit</code>	0x400000000	<code>msgtql</code>	256
<code>maxfiles</code>	200	<code>shmmax</code>	0x08000000
<code>maxfiles_lim</code>	2048		
<code>maxssiz</code>	0x04FB3000		
<code>maxssiz_64bit</code>	0x10000000		
<code>maxswapchunks</code>	4096		
<code>maxtsiz</code>	0x40000000		
<code>maxtsiz_64bit</code>	0x100000000		
<code>maxuprc</code>	256		
<code>maxusers</code>	128		
<code>ninode</code>	4000		
<code>shmmax</code>	0x40000000		
<code>stape</code>			
<code>msgtql</code>	256		

NOTE If you install the Agilent SPECS B.02.50 or later revision, the `maxuprc` kernel parameter must be set 256. For details about the SPECS, refer to the SPECS installation Guide.

Common Desktop Environment (CDE)

The `/usr/dt/config/C/sys.resources` file (for English) or the `/usr/dt/config/ja_JP.SJIS/sys.resources` file (for Japanese) has been modified for disabling that the display lock function operated by the CDE with the password.

```
:  
dtsession*lockTimeout: 0  ← Changed "30" to "0"  
:
```

Installing Driver and Customizing SICL

Installing Drivers (for E3171A/AJ Only)

If the system controller is the E3171A/AJ, the following drivers are installed before customizing the SICL.

- timi
- vme
- vme2

Customizing SICL

The `/opt/sicl/bin/iosetup` command has been executed, and the GPIB and serial port have been set as follows:

Table A-7 GPIB Setting

	GPIB Interface 1	GPIB Interface 2
Logical unit number	7	27
Symbolic name	hpib7	hpib27
Slot number	PCI slot 4 (for E3172A/AJ/B and E3173A) PCI slot 2 (for E3171A/AJ JP20F-) EISA slot 2 for (E3171A/AJ JP10F-)	PCI slot 6 (for E3172A/AJ/B and E3173A) PCI slot 4 (for E3171A/AJ JP20F-) EISA slot 4 for (E3171A/AJ JP10F-)
Serial number	Printed number on interface card	Printed number on interface card
Interrupt request line	3 (for E3171A/AJ JP10F-)	5 (for E3171A/AJ JP10F-)
GPIB bus address	21	21
System controller	Yes	Yes

The following lines in the `/etc/opt/sicl/hwconfig.cf` file have been added by the `iosetup` command.

```

:
# E2078 High Speed HP-IB (PCI)                               ⇐ Added
7 hpib7 e2078 4 21 0x10B5 0x9050 0x10B0103C 0x99813094 1    ⇐ Added
# E2078 High Speed HP-IB (PCI)                               ⇐ Added
25 hpib25 e2078 6 21 0x10B5 0x9050 0x10B0103C 0x99813095 1 ⇐ Added

```

Customizing BASIC/UX

The `/home/hpsrvc/config/config.rmb` command has been executed for customizing BASIC/UX. This command customizes the `/etc/dt/config/Xsession.d/0000.rmb` file, the `/usr/lib/X11/app-defaults/Rmb` file, and the `/etc/X11/rgb.txt` file.

The `/etc/dt/config/Xsession.d/0000.rmb` File

The `/etc/dt/config/Xsession.d/0000.rmb` file has been created for the CDE.

- for E3172A/AJ/B option 110 and E3173A

```
#!/usr/bin/sh

/usr/bin/X11/xinitcolormap -c 16 -f /opt/rmb/rmb8_04/newconfig/xrmbcolormap

/usr/bin/X11/xmodmap /opt/rmb/rmb8_04/newconfig/xmodmap.PC
```

- for the E3171A/AJ and E3172A/AJ/B option 102

```
#!/usr/bin/sh

/usr/bin/X11/xinitcolormap -c 16 -f /opt/rmb/rmb8_03/newconfig/xrmbcolormap

/usr/bin/X11/xmodmap /opt/rmb/rmb8_03/newconfig/xmodmap.PC
```

The `/usr/lib/X11/app-defaults/Rmb` File

The `/usr/lib/X11/app-defaults/Rmb` file has been copied from the `/opt/rmb/rmb8_04/newconfig/Rmb` (for the E3172A/AJ/B option 110 and E3173A) or `/opt/rmb/rmb8_03/newconfig/Rmb` (for the E3171A/AJ and E3172A/AJ/B option 102) file.

The `/etc/X11/rgb.txt` File

The `/opt/rmb/rmb8_04/newconfig/rgb.rmb` (for the E3172A/AJ/B option 110 and E3173A) or `/opt/rmb/rmb8_03/newconfig/rgb.rmb` (for the E3171A/AJ and E3172A/AJ/B option 102) file has been added to the `/etc/X11/rgb.txt` file.

```
      :
0 0 0      rmb_black      ⇐ Added
255 255 255 rmb_white     ⇐ Added
255 0 0     rmb_red       ⇐ Added
255 255 0   rmb_yellow    ⇐ Added
0 255 0     rmb_green     ⇐ Added
0 255 255   rmb_cyan      ⇐ Added
0 0 255     rmb_blue      ⇐ Added
255 0 255   rmb_magenta   ⇐ Added
204 187 51  rmb_olive_green ⇐ Added
51 170 119  rmb_aqua      ⇐ Added
136 102 170 rmb_royal_blue ⇐ Added
204 68 102  rmb_maroon    ⇐ Added
255 119 0   rmb_orange    ⇐ Added
221 136 68  rmb_brown     ⇐ Added
```

The `/usr/bin/X11/rgb` command is then executed as follows:

```
# /usr/bin/X11/rgb < /etc/X11/rgb.txt
```

The /etc/opt/rmb/rmb8_03rc File

The following line in the /etc/opt/rmb/rmb8_03rc file has been modified for the E3171A/AJ.

```
1235  !   DISK 1502 = /dev/rfloppy/c0t0d0    ← Added if E3171A/AJ has FDD
```

The /etc/dt/config/Xsession.d/9000.kanji File

The /home/hpsrvc/config/config.kanji command has been executed for customizing BASIC/UX for the E3171AJ, E3172AJ, and E3172B/E3173A option ABJ. The /etc/dt/config/Xsession.d/9000.kanji file has been created for the CDE.

```
#!/usr/bin/ksh
if [ $LANG = 'ja_JP.SJIS' ] || [ $LANG = 'ja_JP.eucJP' ]; then
    /usr/bin/X11/xmodmap -e 'keycode 34 = Meta_L'
fi
```

Customizing 4070 System Software

The `/home/hpsrvc/config/config.4070` command has been executed for customizing the 4070 system software. This command customizes the `/etc/opt/rmb/rmb8_04rc` (for the E3172A/AJ/B option 110 and E3173A) or `/etc/opt/rmb/rmb8_03rc` (for the E3171A/AJ and E3172A/AJ/B option 102) file, and executes the `/opt/hp4070/install/install` command.

The `/etc/opt/rmb/rmb8_04rc` and `/etc/opt/rmb/rmb8_03rc` File

The following line in the `/etc/opt/rmb/rmb8_04rc` (for the E3172A/AJ/B option 110 and E3173A) or `/etc/opt/rmb/rmb8_03rc` (for the E3171A/AJ and E3172A/AJ/B option 102) file has been modified.

```
      :  
770   !   WORKSPACE = 4M                               ← Modified for BASIC/UX  
      :  
1520  !   SHL_SEARCH /opt/hp4070/lib                   ← Modified for the 4070
```

The `/etc/rc.config.d/hp4070` File

The `config.4070` command makes the `/etc/rc.config.d/hp4070` file, which is executed in the controller boot up process and starts the TIS server.

NOTE If you do not need to start the TIS server, modify the `/etc/rc.config.d/hp4070` file as follows:

```
      :  
      HP4070SYS=0                                       ← Change "1" to "0"  
      :
```

The `/opt/hp4070/install/install` Command

The `/opt/hp4070/install/install` command has been executed at the factory. The installation of the optical interface card has also been completed.

The `/etc/opt/hp4070/config/1` File

The `/etc/opt/hp4070/config/1` file has been edited for the 4072A/4073A configuration.

NOTE	If the E3171A/AJ, E3172A/AJ/B, or E3173A is not ordered with the Agilent E3102A/E3103A, this customization has <i>not</i> been done.
-------------	--------------------------------------------------------------------------------------------------------------------------------------

The `/opt/hp4070/install/configure` Command

The `/opt/hp4070/install/configure` command has been executed with the 4072A/4073A. The `/etc/opt/hp4070/config/refconfig1` file has been created by the `configure` command.

If the Agilent 4284A (CMU) exists, the switching matrix compensation parameter has been measured at the factory.

NOTE	If the E3171A/AJ, E3172A/AJ/B, or E3173A is not ordered with the E3102A/E3103A, this customization has <i>not</i> been done.
-------------	------------------------------------------------------------------------------------------------------------------------------

Sample User Setting

The following three users have been created at the factory. Each user has also been customized for its function.

The hp4070 User Environment

The following action icons have been added to the hp4070 icon that is located at the right side of the CDE front panel.

Table A-8 hp4070 Action Item

Action Name	Executed Command
Tester manager	/opt/hp4070/bin/hp4070
IDP	/opt/hp4070/bin/idp4070
BASIC/UX	/opt/rmb/rmb8_04/rmb (for the E3172A/AJ/B option 110 and E3173A) /opt/rmb/rmb8_03/rmb (for the E3171A/AJ and E3172A/AJ/B option 102)
TIS server monitor	tail -f /var/opt/hp4070/syslog4070

The specs User Environment

The /opt/SPECS/install/bin/setup_user command has been executed for this user.

The hpsrvc User Environment

The following action icons have been added to the hpsrvc icon that is located at the right side of the CDE front panel.

Table A-9 hpsrvc Action Item

Action Name	Executed Command
Tester manager	/opt/hp4070/bin/hp4070
IDP	/opt/hp4070/bin/idp4070
BASIC/UX	/opt/rmb/rmb8_04/rmb (for the E3172A/AJ/B option 110 and E3173A) /opt/rmb/rmb8_03/rmb (for the E3171A/AJ and E3172A/AJ/B option 102)
DIAG	/opt/hp4070/bin/diag4070
PV	/opt/hp4070/bin/pv4070
TIS server monitor	tail -f /var/opt/hp4070/syslog4070

B Miscellaneous Operations

This appendix provides information that may be used after the initial installation.

This appendix consists of the following sections:

- “To Mount Testhead on Wafer Prober”
- “To Connect External Instrument Interlock Connectors”
- “To Change Line Voltage”
- “To Change Line Frequency”
- “To Update Testhead Firmware”
- “To Back Up and Recover System Software Using Ignite-UX”

To Mount Testhead on Wafer Prober

The prober manufacturer is responsible for mounting the Agilent 4072A/4073A testhead onto the wafer prober, as well as subsequent adjustments and service. Agilent Technologies will, however, provide technical assistance regarding testhead installation upon request.

Fully Automatic Wafer Prober

Before installing the testhead, the probe card, and the personality board (Agilent E3145A,B) on the wafer prober, the mounting hardware—hinge, head plate, and so on—must be fabricated.

See the *Agilent 4072A/4073A Pre-Installation Guide* and the *Agilent E3145A/B Installation and Maintenance Guide*, which provide dimensions and other mechanical specifications for the testhead and the personality boards.

WARNING Keep hands clear of the testhead, hinge, and wafer prober when lowering the testhead into position on the wafer prober.

CAUTION Do not touch the testhead measurement pins or the personality board printed patterns. Maintain optimal electrical contact between the testhead measurement pins and the personality board pin contacts.

Oil, perspiration, and dirt can prevent optimal electrical contact, deteriorate insulation, and degrade measurement accuracy.

Manual and Semi-Automatic Wafer Prober

The testhead *cannot* be installed directly on a manual or semi-automatic wafer prober (small size). To connect the testhead to the probe card for the prober, use a cable extension fixture (Agilent E3146A).

The cable extension fixture installs onto the testhead. Wires from the manipulator or probe card for the prober can then be soldered to the cable extension fixture measurement pins.

To enable testhead output, an interlock cable must be connected between the interlock connector on the cable extension fixture and the interlock connector on the wafer prober.

For more information on the E3146A cable extension fixture, see the *Agilent E3146A Installation and Maintenance Guide*.

WARNING When the output enabled lamp on the testhead is lit, potentially hazardous voltages may be present at the cable extension fixture measurement pins. Make sure that the protective cover plate for the cable extension fixture is installed before operating the 4072A/4073A.

CAUTION Do not touch the testhead measurement pins or the cable extension fixture. Oil, perspiration, and dirt can prevent optimal electrical contact, and degrade measurement accuracy.

Connecting Chuck Connection Output Connector

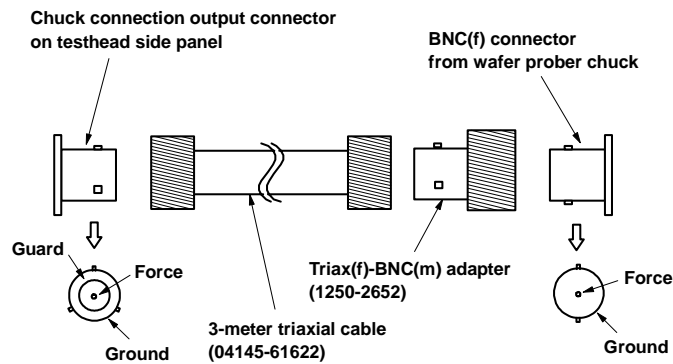
The chuck connection output connector, on the side panel of the testhead, is used to apply bias to the wafer prober chuck terminal.

If the connector is used to apply a bias to the wafer prober chuck, connect the connector and wafer prober chuck terminal using a triaxial cable, as shown in figure B-1. If the wafer prober chuck terminal is a BNC connector, use a triaxial cable with a triaxial(f)-to-BNC(m) adapter.

Figure B-1 shows an example for connecting the chuck connection output connector and a wafer prober chuck terminal, using a BNC(f) connector.

The triaxial cable and triaxial(f)-to-BNC(m) adapter are furnished with the 4072A/4073A.

Figure B-1 Chuck Connection Output Connector



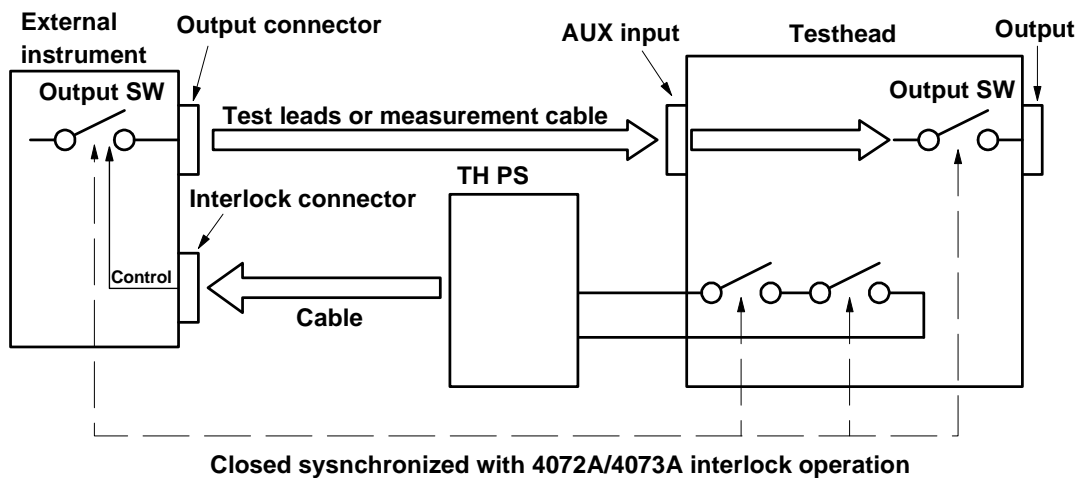
To Connect External Instrument Interlock Connectors

The 4072A/4073A provides a BNC-type interlock connector on the testhead power supply (TH PS) front panel. To locate the connector, remove the blank panel on the TH PS.

The interlock connector is used to control the interlock operation of an external instrument that is connected to the testhead AUX input. The external instrument must have interlock capabilities similar to the Agilent 4142B modular dc source/monitor, that is, the bias force for the instrument is enabled when the interlock terminals are connected (shorted), and disabled when open.

To synchronize the interlock operation of an external instrument with the 4072A/4073A, connect a cable between the Intlk connector (for the TH PS) and the interlock connector (for the external instrument), as shown in figure B-2.

Figure B-2 Intlk Connector Connection Example



To Change Line Voltage

To change the 4072A/4073A operation voltage, replace the main power cable and the parts listed in table B-1.

Parts replacement must be done by Agilent service personnel.

For main power cable requirements, see table 2-1.

Table B-1 Replacement Parts

Replacement Part	200 V	208 V	220 V	240 V
Power distribution unit with power outlets	E3160-60265	E3160-60266	E3160-60267	E3160-60268

To Change Line Frequency

If you move the 4072A/4073A to an area with a different line frequency, the line frequency setting must be changed. You can easily change the 4072A/4073A line frequency setting using the `configure` command.

To execute the `configure` command, see “Executing `/opt/hp4070/install/configure` Command” in chapter 6.

NOTE	The power line frequency affects the SMU integration time, because the SMU integration time is synchronized with power line cycle (PLC).
-------------	------------------------------------------------------------------------------------------------------------------------------------------

To Update Testhead Firmware

If you update the 4070 testhead firmware, use the following procedure.

1. Turn on the 4072A/4073A, all system instruments, and the system controller.
2. Log in as superuser (root).
3. Check if the TIS server is running. To check it, type:

```
# ps -ef | grep tis
```

If the TIS server is running, the `tis_online` daemon appears.

```
user 20049      1  0  May  3  ?        2:04 tis_online -ioff -e -a
```

If the TIS server is not running, run the TIS server using the following command:

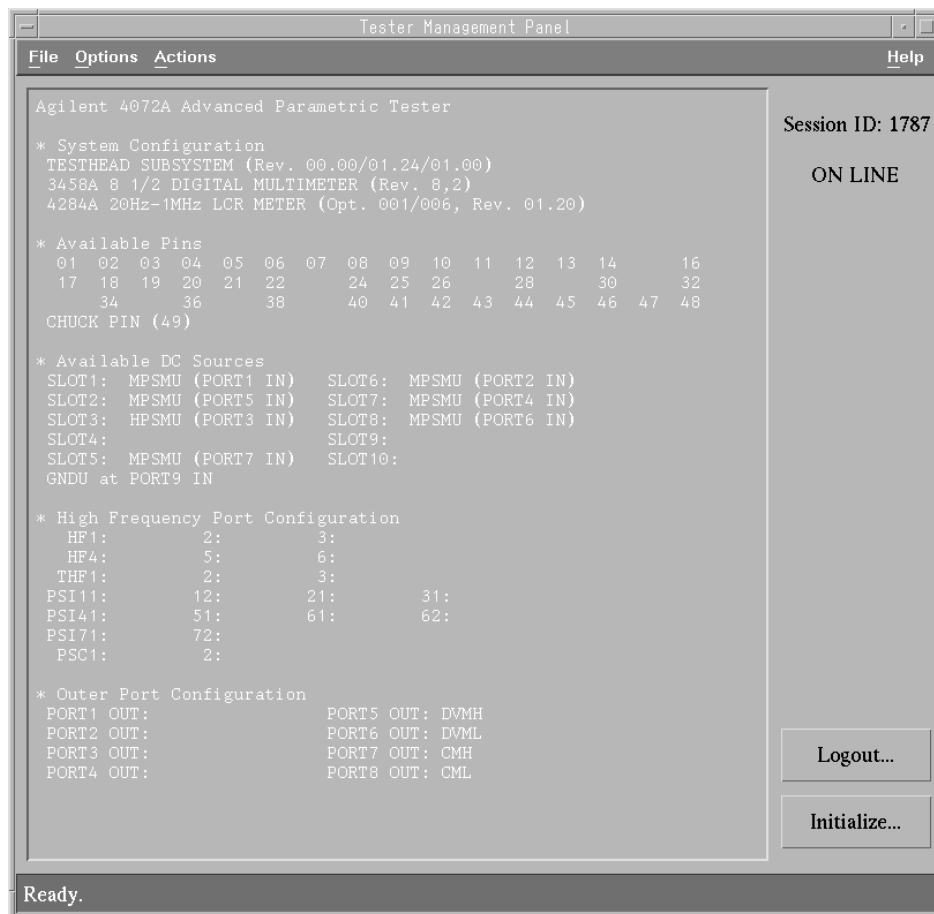
```
# /opt/hp4070/bin/hp4070 -start
```

4. Execute the `hp4070` command. This command displays the testhead firmware revision in the window.

```
# /opt/hp4070/bin/hp4070
```

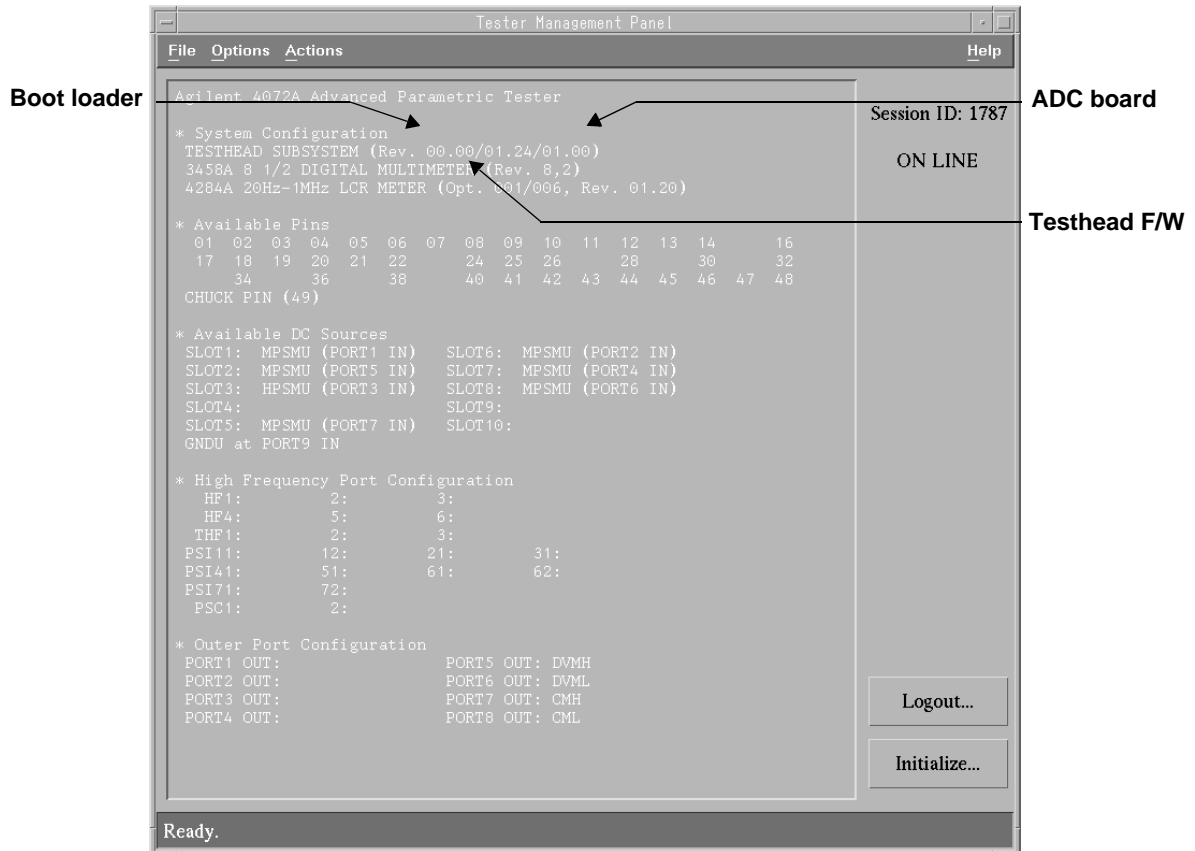
The tester management panel and `hp4070` login window appear.

Figure B-3 Tester Management Panel with `hp4070` Login



- Choose **ON LINE**, and click **Login**. The testhead firmware revision is displayed on the tester management panel.

Figure B-4 Testhead Firmware Revision on Tester Management Panel



- Click **Logout...** in the tester management panel, then click **Quit** in the hp4070 login window.
- Stop the TIS server using the following command:
- Confirm the firmware revision installed in the system controller.

```
# /opt/hp4070/bin/hp4070 -shutdown
```

```
# ll /opt/hp4070/firmware
```

The firmware that is installed in the system controller is listed.

```
-r--r--r-- 1 bin bin 941444 Sep 13 15:00 fw1.41.bin
-r-xr-xr-x 1 bin bin 359528 Sep 13 15:00 pflash
```

9. Update the testhead firmware as follows:

```
# cd /opt/hp4070/firmware
# ./pflash fw1.41.bin

Agilent 4070 firmware maintenance utility

current flash revision: 01.40
switching to flash update mode.....done.

boot ROM 01.00 started.

read 903245 bytes from fw1.40.bin
total data size = 903245 bytes

sent 100% of data
CRC check passed.

rebooting .....done.

flash update completed.
new flash revision: 01.41
#
```

It will take approximately 1 minute and 30 seconds to finish the `pflash` command.

NOTE Use the latest firmware to execute this command.

10. After updating, reconfirm the testhead firmware revision. To confirm it, see step 4 and 5 above.

To Back Up and Recover System Software Using Ignite-UX

This section provides the information for backing up and recovering the system software.

Backing Up System Software

If you back up the system software using Ignite-UX, use the following procedure.

1. Log in the console mode as a superuser (root).
 - a. Choose the Options: Command Line Login in the CDE login screen.
 - b. Type root on the prompt.
 - c. Enter the root password.
2. Execute the `/usr/sbin/swlist` to confirm that the Ignite-UX is installed. If the Ignite-UX is installed, the following is displayed.

```
:  
Ignite-UX-11-11 B.3.4.115 HP-UX Installation Utilities....  
:
```

3. Insert DDS tape into the DDS drive.
4. Execute the following command to make the clone tape. After executing the command, the Ignite-UX clone tape is made. This takes about 1 hour.

```
# /opt/ignite/bin/make_recovery -Av -d /dev/rmt/0m
```

Recovering System Software

If you recover the system software using a Ignite-UX clone tape, use the following procedure.

1. Insert the Ignite-UX clone tape into the DDS drive.
2. Stop the autoboot by pressing the space key. You will see the boot console menu.
3. Search for bootable devices, using the choices displayed (for example, enter search or sea). The bootable devices are displayed as below.

Path Number	Device Path	Device Type
-----	-----	-----
P0	IDE	LTN485S
P1	SCSI.3.0	HP35470A
P2	SCSI.6.0	SEAGATE ST34572N

4. Boot from the DDS drive using the following command as below. Press n for the interact with IPL.

```
Main Menu: Enter command > bo P1
Interact with IPL (Y, N, Q)?> N
```

After you type N, the recovery starts, and this takes about 1 hour.

NOTE

If you recover the clone tape that is made by another system controller; the error message "FATAL ERROR 1-10028, Cannot open optical interface device fail." may be displayed when you execute the hp4070 -start command, and TIS daemon cannot start.

In this case, remove the /dev/hp4070 directory and execute /opt/hp4070/install/install command to remake the device file. For the details, see "Executing install Command".

C Installing Software (for B.03.01 or Earlier)

This chapter describes how to install the Agilent 4070 system software, and includes software customization and other relevant software installation information.

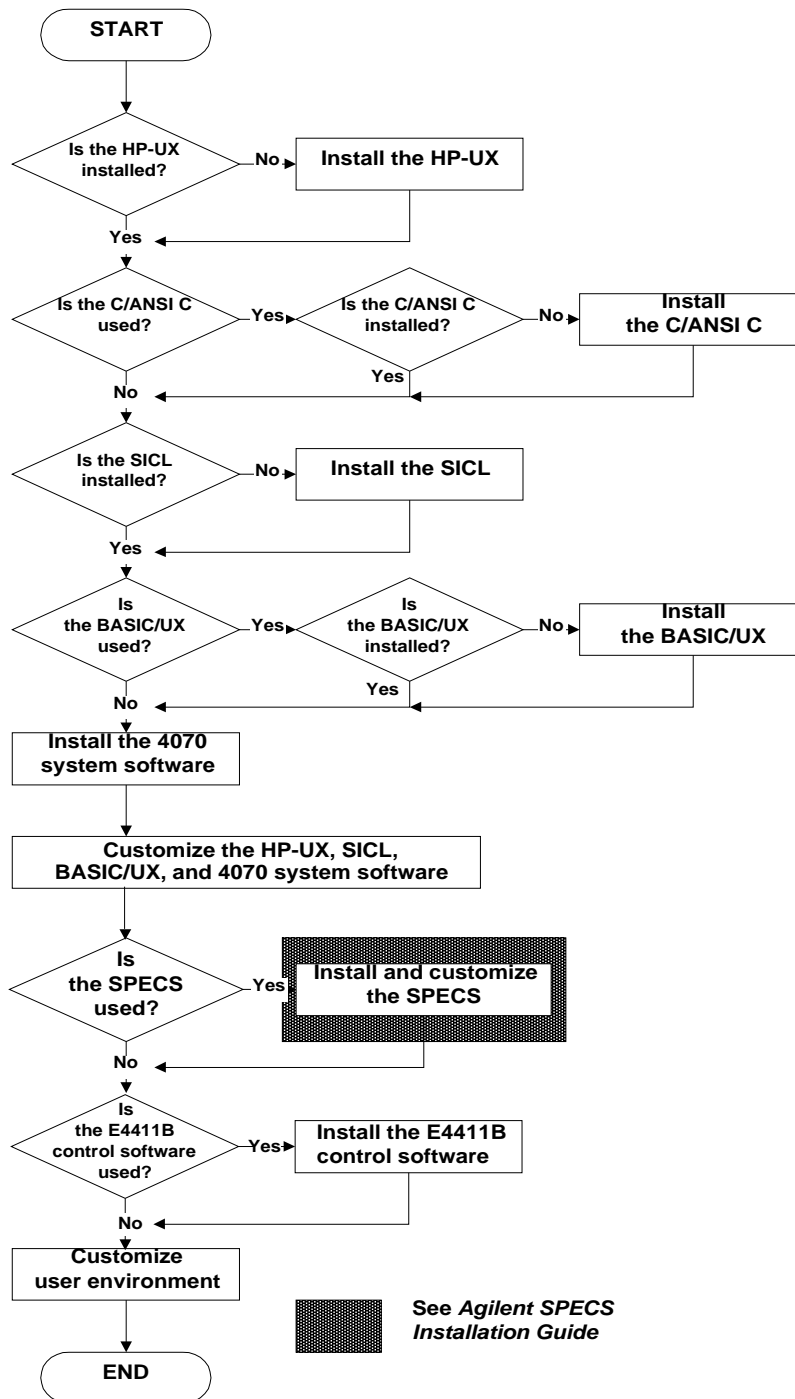
This chapter contains the following sections:

- “Software Installation Overview”
- “System Software Configuration”
- “Before Software Installation”
- “Installing HP-UX and Other Application Software”
- “Customizing for Agilent 4072A/4073A”

Software Installation Overview

Figure C-1 shows the overall sequence for installing the 4070 system software.

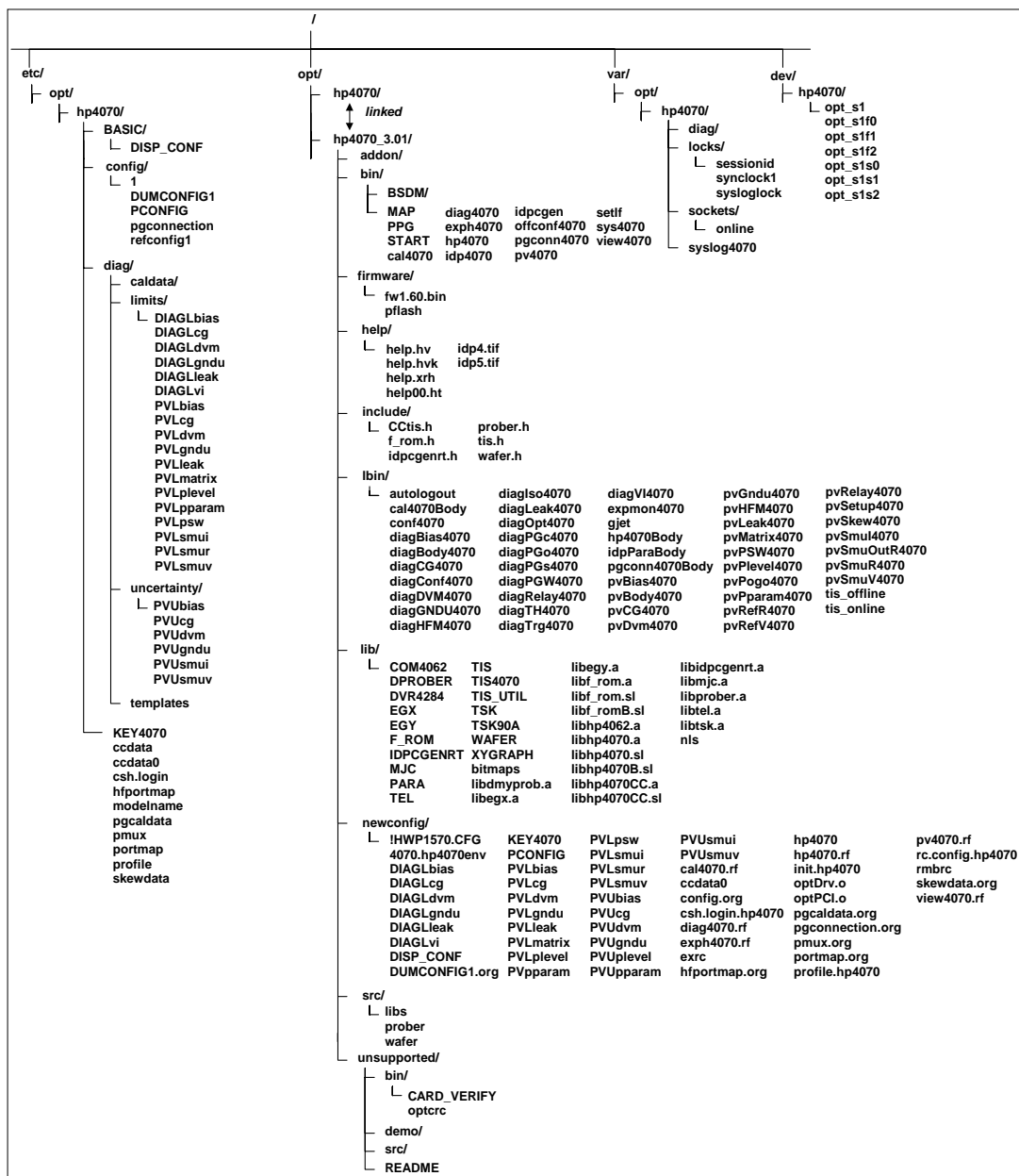
Figure C-1 4070 Software Installation Sequence



System Software Configuration

Figure C-2 shows the directory structure for the 4070 system software.

Figure C-2 System Software Directory Structure



- /opt/hp4070 directory

This directory contains the 4070 system core software, and is configured with the following directories.

- ☐ bin

This directory contains the executable files that you most commonly execute.

- ☐ lbin

This directory contains the executable files that are executed by the front end programs. For example, the programs used by the TIS server, diagnostics, and performance verification are stored in this directory.

- ☐ lib

This directory contains the library files that are linked to C and BASIC programs.

- ☐ include

This directory contains the header files (include files) that are used by C programs and algorithms.

- ☐ newconfig

This directory contains the default files. These include not only the system software files but also HP-UX files related to the 4070 system software. The installation tool copies the files from this directory to the appropriate directory when the installation tool is executed.

- ☐ addon

The user-made files that control the additional instruments are stored in this directory. When the system software is installed, there are no files in this directory.

- ☐ install

This directory contains the installation tools to install the 4070 system software.

- /var/opt/hp4070 directory

This directory contains the temporary data files and log files used for the 4070 system software, and is configured with the following directories.

- ☐ sockets

This directory contains the socket file that is used for communicating between the TIS server and clients.

- ☐ diag

This directory contains the log files and data files that are made during the diagnostics and performance verification.

- ☐ locks

This directory contains the lock file that is used for making and managing the test session.

The 4072/4073A system files are explained below:

<code>/opt/hp4070/bin/hp4070</code>	Executed when you run the TIS server, and also executed when you log into the tester environment.
<code>/opt/hp4070/bin/diag4070</code>	Diagnostics file.
<code>/opt/hp4070/bin/pv4070</code>	Performance verification file.
<code>/etc/opt/hp4070/config/1</code>	Information on the system configuration, such as the optical interface slot number, GPIB address for the system instruments, and so on.
<code>/etc/opt/hp4070/config/pgconnection</code>	Connection information between the pulse generator and the testhead.
<code>/etc/opt/hp4070/config/refconfig1</code>	System configuration.
<code>/etc/opt/hp4070/config/PCONFIG</code>	Information on the GPIB address for the automatic wafer probers.
<code>/var/opt/hp4070/syslog4070</code>	TIS server logs are added to this file.
<code>/var/opt/hp4070/diag/log</code>	Diagnostics logs are added to this file.
<code>/var/opt/hp4070/diag/DIAGdata</code>	Diagnostics data is overwritten on this file.
<code>/var/opt/hp4070/diag/PVdata</code>	The latest performance verification data is stored in this file; old data files are copied to PVdata_XX.

Before Software Installation

Before installing the 4070 system software, Agilent Technologies recommends that the following procedures are performed.

- equipment preparation
Before installing the system software, you must prepare the equipment, such as the CD-ROM drive and software media. If you install all of the software, you will need to prepare all of the media for the HP-UX, C/ANSI C, HP BASIC, SICL, and 4070 system software.
- file backup
If you install the system software on a hard disk that already has data, Agilent Technologies recommends that you back up all existing programs and data.
- contents check
If you install the system software on a hard disk that already has data, you must check the contents of the hard disk. The 4070 system software and the Agilent 4062 system software *cannot* be executed on the same computer (system controller) because the execution environments are different. If the 4062 system software is installed, uninstall it now.

Installing HP-UX and Other Application Software

Minimum and Recommended Requirements

The minimum and recommended requirements for 4072A/4073A operation are as follows. If the system controller does not meet the following conditions, modify the hardware or software conditions.

- Hardware requirements

Table C-1 Hardware requirements

System controller	Model 745i/100 (minimum)	Model 745/132L	Model C3600 (recommended)
Memory	64 MB	128 MB	512 MB
HDD	2 GB	4 GB	9 GB
Display	1024 × 768 1280 × 1024		

- Software requirements

Swap size:	400 Mbyte
System configuration:	Standard LVM
Software selection:	CDE runtime environment
File name length:	Long
Logical volume size:	/opt 400 Mbyte (minimum), 1024 Mbyte (recommended) /usr 400 Mbyte (minimum), 640 Mbyte (recommended) /var 400 Mbyte (minimum), 1024 Mbyte (recommended)
Kernel parameter:	shmmax 0x08000000 maxdsiz 0x08000000 maxuprc 200 msgtql 256

NOTE If you install the Agilent SPECS B.02.50 or later revision, the `maxuprc` kernel parameter must be set to 256. For details about the SPECS, refer to the SPECS installation Guide.

Compatible OS revisions and application software

The following table shows OS revision and application software compatibility for the Agilent 4072A/4073A. The checked (✓) box indicates the latest 4070 software revision.

Table C-2 Software Revision for 745/132L and 745i

	HP-UX C/ANSIC	SICL	BASIC/UX	4070 System Software	Testhead firmware	Configuration Tool	Agilent SPECS	E4411B Control Software
	B.10.20 ACE3 (Jun 1998)	G.01.02	C.08.02	B.02.00	1.24	B.01.00	B.02.40	X.01.00
				B.02.10	1.25 1.26	B.01.01	B.02.41	X.01.20
		G.03.00	C.08.03	B.03.00	1.40 1.41	B.01.02 B.01.03	B.02.50 B.02.51	X.01.22
✓				B.03.01	1.41 1.57	C.01.03	B.02.51	Y.01.22

Table C-3 Software Revision for C3600

	HP-UX C/ANSIC	SICL	BASIC/UX	4070 System Software	Testhead firmware	Configuration Tool	Agilent SPECS	E4411B Control Software
	B.10.20 ACE5	G.03.00	C.08.03	B.03.00	1.40 1.41	B.01.02 B.01.03	B.02.50 B.02.51	X.01.22
✓				B.03.01	1.41 1.57	C.01.03	B.02.51	Y.01.22

NOTE When you install these software, use the software media provided by the Agilent technologies.

Installing HP-UX

Start up from the HP-UX install and core OS CD-ROM, and install HP-UX. For further details, refer to *Installing and Updating Additional Core Enhancements (ACE) for HP-UX 10.20*.

If C/ANSI C is used for measurement program development, also install all C/ANSI C filesets.

Installing Patches and Software Configuration Tools

After loading HP-UX, install the patches and software configuration tool. The following filesets are required for the 4070 system software.

- Quality pack (XSW700QPK1020) included in the HP-UX diagnostics/IPR CD-ROM
- Extension software patch bundle (XSW700HW1020) included in the HP-UX diagnostics/IPR CD-ROM
- HP-UX extension software general release patch bundle (XSW700GR1020) included in the software configuration tool CD-ROM
- Additional HP-UX patch bundle (NET-1020S700) included in the software configuration tool CD-ROM
- HP-UX core OS year 2000 patch bundle (Y2K-1020S700) included in the software configuration tool CD-ROM
- Agilent software configuration tool (HPCONFIG.UPD) included in the software configuration tool CD-ROM

To install these patches and software configuration tool, use the `/usr/sbin/swinstall` command.

Installing SICL

To install SICL, use the `/usr/sbin/swinstall` command. For further details, refer to *HP I/O Libraries Installation and Configuration Guide for HP-UX* or *Installing and Using HP BASIC/UX 8.0*.

Installing HP BASIC/UX

To install HP BASIC/UX software, use the `/usr/sbin/swinstall` command. For further details, refer to *Installing and Using HP BASIC/UX 8.0*.

NOTE	Before installing HP BASIC/UX, go to the <i>Read Me Before Installing HP BASIC/UX</i> manual, which contains some important information for the currently released HP BASIC/UX.
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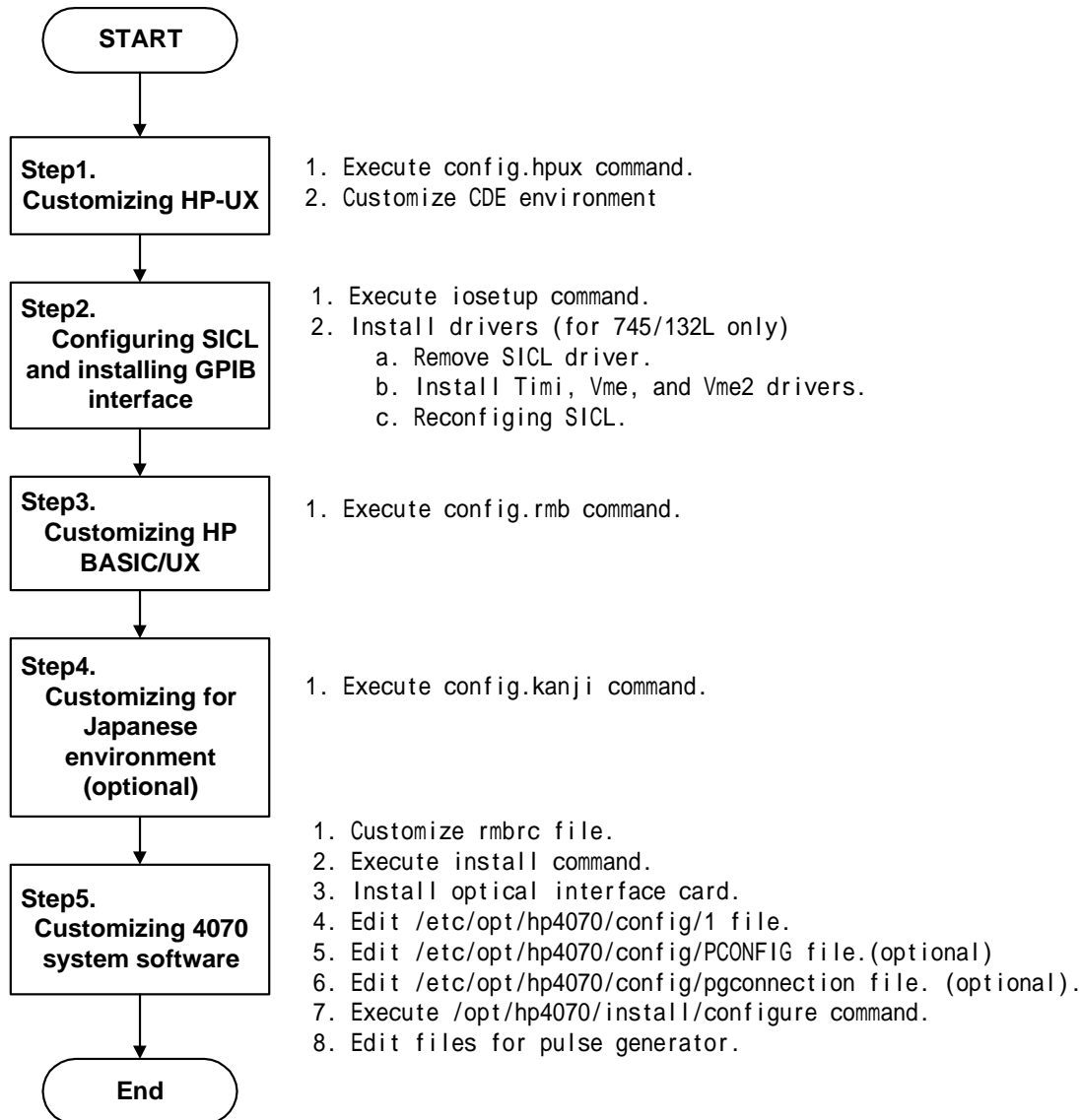
Installing the 4070 System Software

To install the 4070 system software, use the `/usr/sbin/swinstall` command. For further details, refer to the “Installing the 4070 System Software” in the chapter 6.

Customizing for Agilent 4072A/4073A

Figure C-3 shows the customization flow for the Agilent 4072A/4073A.

Figure C-3 Agilent 4072A/4073A Customization Flow



Step 1. Customizing HP-UX

Executing config.hpux Command

To customize HP-UX for the 4072A/4073A, execute the `/home/hpsrvc/config/config.hpux` command. For the detailed information, refer to the “Drivers and Kernel Parameters” in the appendix A.

NOTE A reboot is required to make the new kernel effective.

Customizing Common Desktop Environment (CDE)

Agilent Technologies recommends that you customize the `/usr/dt/config/C/sys.resources` (for English) or `/usr/dt/config/ja_JP.SJIS/sys.resources` (for Japanese) command as follows:

```
      :  
dtsession*lockTimeout:    0      ← Change "30" to "0"  
      :
```

NOTE If you do not customize this setting, the display is automatically locked by the CDE with the password.

Step 2. Configuring SICL and Installing GPIB Interface

To configure the SICL and install the GPIB interface for the 4072A/4073A, use the following procedure. If you configure another interface, refer to *HP I/O Libraries Installation and Configuration Guide for HP-UX, Installing and Using HP BASIC/UX 8.0*, or the *Installation Guide* for each interface.

NOTE When using the C3600 system controller or the 745/132L system controller with PCI slots, use one Agilent E2078A for the 4072A/4073A control and one E2078A for wafer prober control.

When using the 745/132L with EISA slots, use one Agilent E2071D for the 4072A/4073A control and one E2071D for wafer prober control.

When using the 745i system controller, use one Agilent E2071 for the 4072A/4073A control, and one E2071 for wafer prober control.

Executing the iosetup Command

1. Execute the `/opt/sicl/bin/iosetup` command as follows.

```
# /opt/sicl/bin/iosetup
```

The I/O setup for the HP-UX window appears as shown in figure C-4.

Figure C-4 I/O Setup for HP-UX Window



2. When using the C3600 system controller or the 745/132L system controller with the PCI slot, set up the GPIB interface using the following procedure.
 - a. Double-click E2078 High Speed HP-IB (PCI). The E2078 high speed HP-IB configuration window appears as shown in figure C-6.

Figure C-5 Agilent E2078 High Speed HP-IB Configuration Window

HP e2078 High Speed HP-IB configuration

E2078 HP-IB

The current configuration is shown. Make changes as desired, and click on OK to accept.

Identifiers

Logical Unit #: 7

Symbolic Name: hpi7

Hardware Settings
(Must match installed hardware)

PCI Slot: 2

Serial Number: 12345678

Other Settings

HP-IB Bus Addr: 21

System Controller: yes

OK

Cancel

Defaults

Help

- b. Set each parameter as shown in the following example.

The following table shows the example for the E2078 GPIB card.

Table C-4 Example of parameter for PCI GPIB card

Controller	Model 745/132L (PCI model)	Model C3600
Logical unit number	7	
Symbolic name	hpib7	
PCI slot	2	4
Serial number	This number is printed on the interface card.	
GPIB bus address	21	
System controller	Yes	

- c. Click **OK**.
- d. Repeat steps a through c to set up the secondary GPIB interface, and use suitable parameters as shown in the following example.

Table C-5 Example of parameter for 2nd PCI GPIB card

Controller	Model 745/132L (PCI model)	Model C3600
Logical unit number	25	
Symbolic name	hpib25	
PCI slot	4	6
Serial number	This number is printed on the interface card.	
GPIB bus address	21	
System controller	Yes	

3. When using the 745/132L system controller with the EISA slot, set up the GPIB interface using the following procedure.
 - a. Double-click E2071D Plug and Play HP-IB. The E2071D high speed HP-IB configuration window appears as shown in figure C-6.

Figure C-6 Agilent E2071D High Speed HP-IB Configuration Window

HP E2071D High Speed HP-IB configuration

E2071D HP-IB

The current configuration is shown. Make changes as desired, and click on OK to accept.

Identifiers

Logical Unit #: 7

Symbolic Name: hpib7

Hardware Settings
(Must match installed hardware)

EISA Slot: 2

Base I/O Address: 0x350

Plug and Play Settings
(Must match installed hardware)

Plug and Play Id: PNP 3643

Other Settings

IRQ line: 3

HP-IB Bus Addr: 21

System Controller: yes

OK

Cancel

Defaults

Help

- b. Set each parameter as shown in the following example.

Example (installing the E2071D into slot 2)

Logical unit number:	7
Symbolic name:	hpib7
EISA slot:	2
Base address:	350
Plug and play ID (PNP):	This number is printed on a sticker on the exterior connector plate of the interface card.
IRQ line:	3
HP-IB bus address:	21
System controller:	Yes

- c. Click **OK**.

- d. Repeat steps a through c to set up the secondary GPIB interface, and use suitable parameters as shown in the following example.

Example (installing the E2071D into slot 4)

Logical unit number:	25
Symbolic name:	hpib25
EISA slot:	4
Base address:	370
Plug and play id (PNP):	This number is printed on a sticker on the exterior connector plate of the interface card.
IRQ line:	5
HP-IB bus address:	21
System controller:	Yes

4. When using the 745i system controller, set up the GPIB interface using the following procedure.
 - a. Double-click E2071 High Speed HP-IB. The HP E2071 high speed HP-IB configuration window appears as shown in figure C-7.

Figure C-7 Agilent E2071 High Speed HP-IB Configuration Window

HP E2071 High Speed HP-IB configuration

E2071 HP-IB

Default settings for this interface are shown. Make changes if desired, and click on OK to accept.

Identifiers

Logical Unit #: 8

Symbolic Name: hpib

Hardware Settings
(Must match installed hardware)

EISA Slot: 1

DIP switches:
(OPEN = 1) 0 0 0 0

Base I/O Addr: 0x250

Other Settings

IRQ line: 7

HPIB Bus Addr: 21

System Controller: yes

OK

Cancel

Defaults

Help

- b. Use suitable parameters as shown in the following example.

Example (installing the E2071 into slot 2)

Logical unit number:	7
Symbolic name:	hpib7
EISA slot:	2
DIP switches:	0100
IRQ line:	7
HP-IB bus address:	21
System controller:	Yes

- c. Click **OK**.

- d. Repeat steps a through c to set up the secondary GPIB interface, and use suitable parameters as shown in the following example.

Example (installing the E2071 into slot 4)

Logical unit number:	25
Symbolic name:	hpib25
EISA slot:	4
DIP switches:	1100
IRQ line:	7
HP-IB bus address:	21
System controller:	Yes

5. Choose File: Build... to rebuild the kernel as shown in figure C-8.

Figure C-8 I/O Setup for HP-UX Window with File Menu



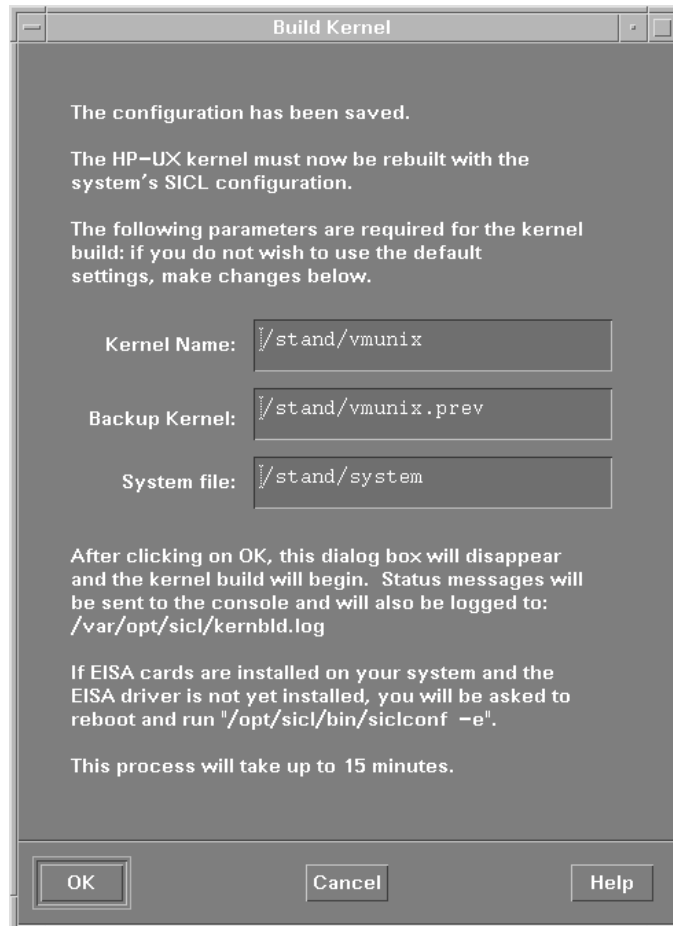
The accept configuration window appears as shown in figure C-9.

Figure C-9 Accept Configuration Window



- Click **OK** in the accept configuration window. The accept configuration window disappears, and the build kernel window appears as shown in figure C-10.

Figure C-10 Build Kernel Window



- Click **OK**. The new kernel is automatically rebuilt. This takes about 15 minutes.
- After creating the new kernel, shut down HP-UX using the `/sbin/shutdown` command.
- Turn off the system controller after the shutdown process is completed.
- Install the GPIB interface card(s) into the system controller PCI or EISA slot.
- Turn on the system controller and boot-up the HP-UX operating system.

NOTE If you remove the GPIB interface cards from the EISA slots, you need to execute the `/sbin/eisa_config` command to reconfigure the kernel. See *HP Standard Instrument Control Library Installation and User's Guide for HP-UX*.

Installing Drivers

When using the 745/132L system controller, you need to install the following drivers to the kernel and rebuild the kernel. When using the C3600 system controller or the 745i system controller, skip this section and go to “Step 3. Customizing HP BASIC/UX”.

- timi
- vme
- vme2

NOTE

If you do not add the timi, vme, and vme2 drivers, the HP 9000 model 745/132L computer will not address the following problem:

- Serial B port cannot be used.
 - SYSTEM FAIL indicator lights in the rear panel of the computer.
-

Removing SICL Driver

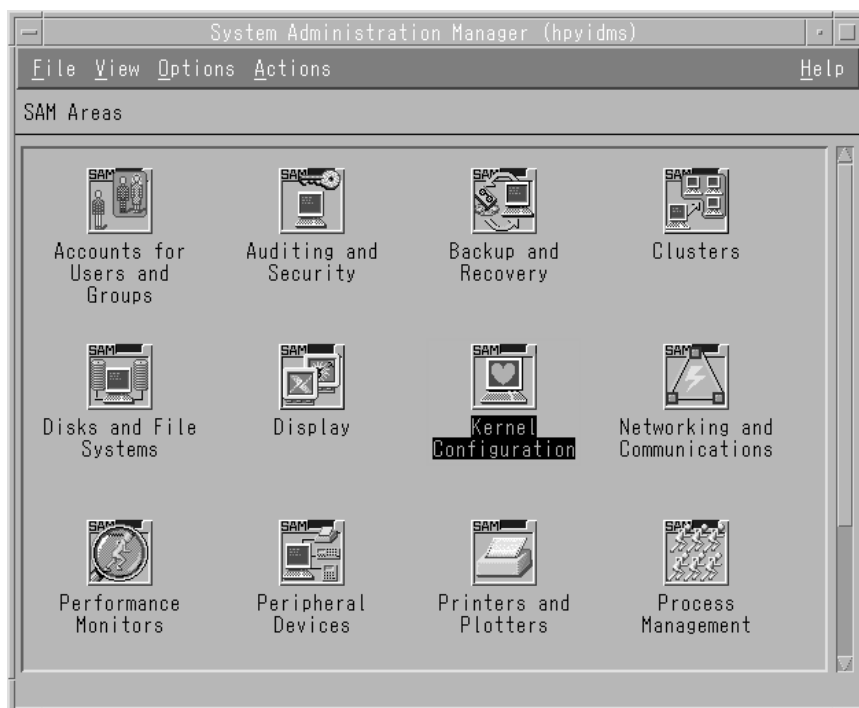
Before installing the drivers, you need to remove the sicil driver from the kernel. Use the following procedures.

1. Log in as a superuser.
2. Open a dtterm window.
3. To start the SAM (1M) utility, type:

```
# sam
```

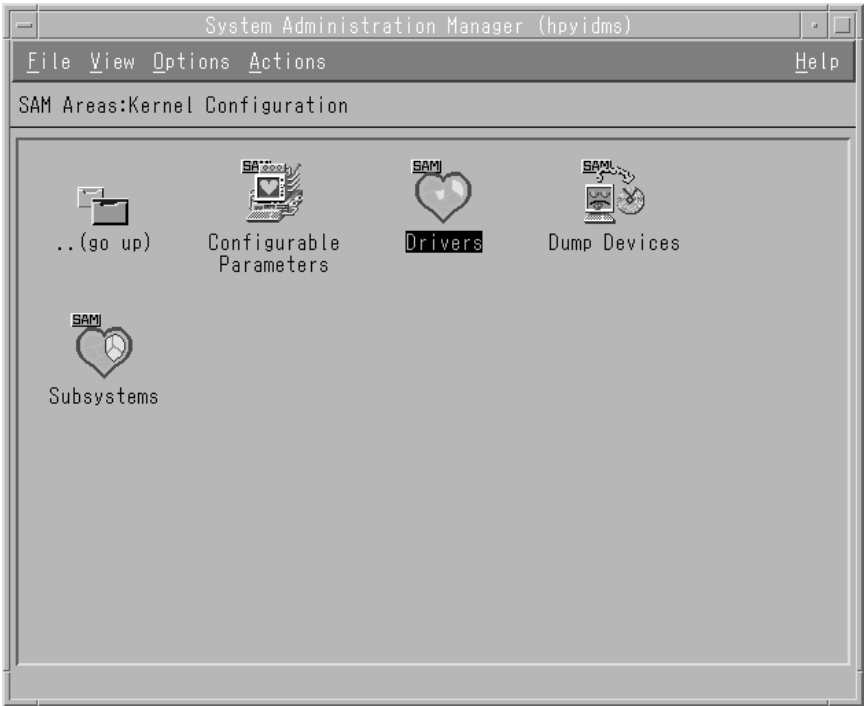
The SAM window appears as shown in figure C-11.

Figure C-11 System Administration Manager (SAM) Window



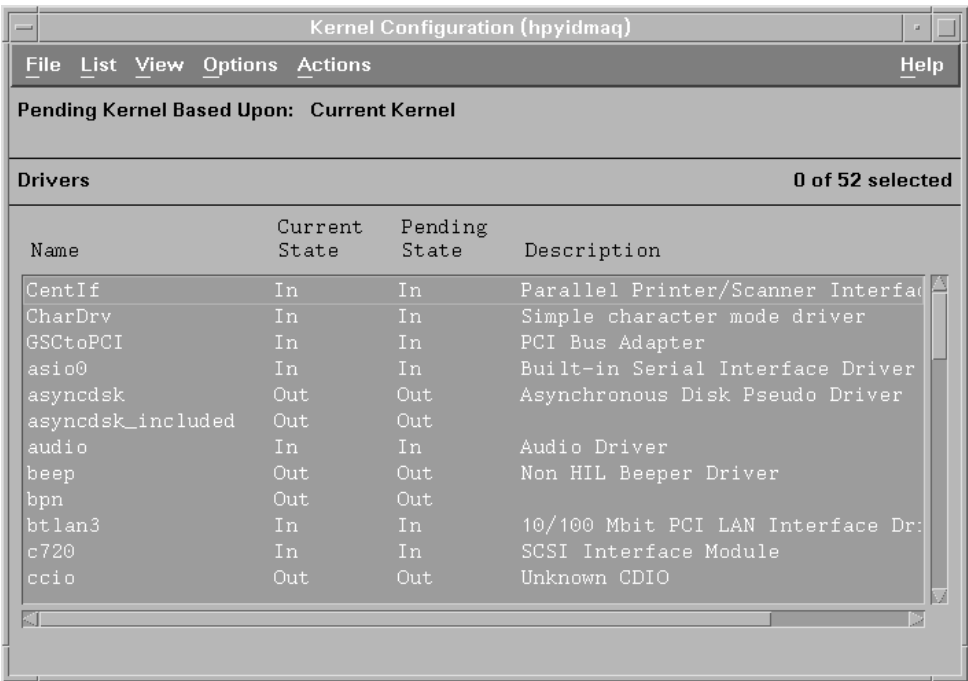
4. Double-click the Kernel Configuration icon.

Figure C-12 Kernel Configuration Screen for SAM Window



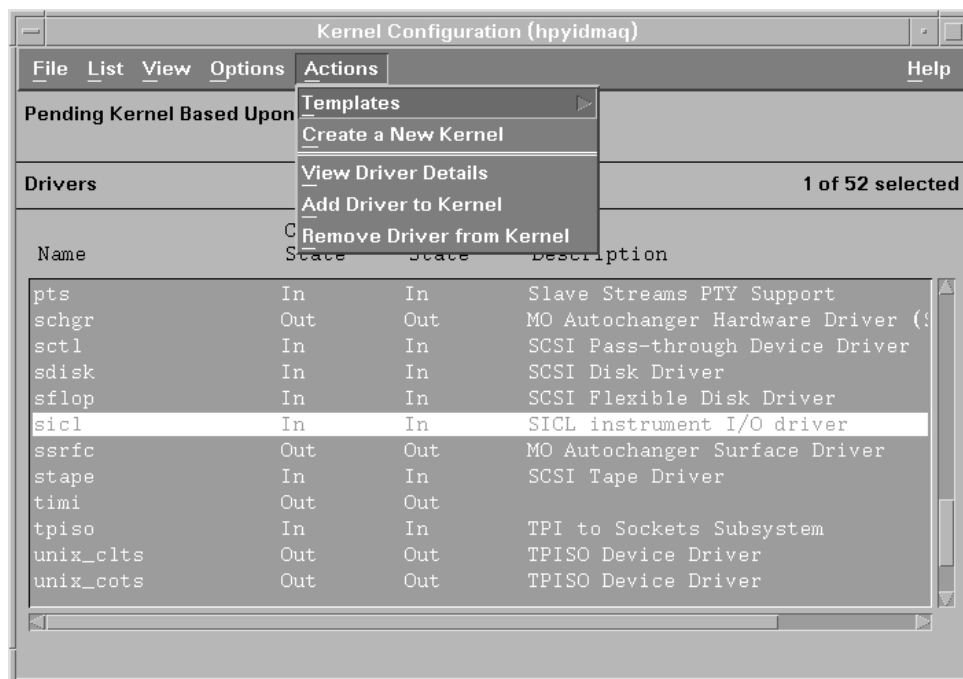
5. Double-click the Driver icon. The kernel configuration window appears as shown in figure C-13.

Figure C-13 Kernel Configuration Window



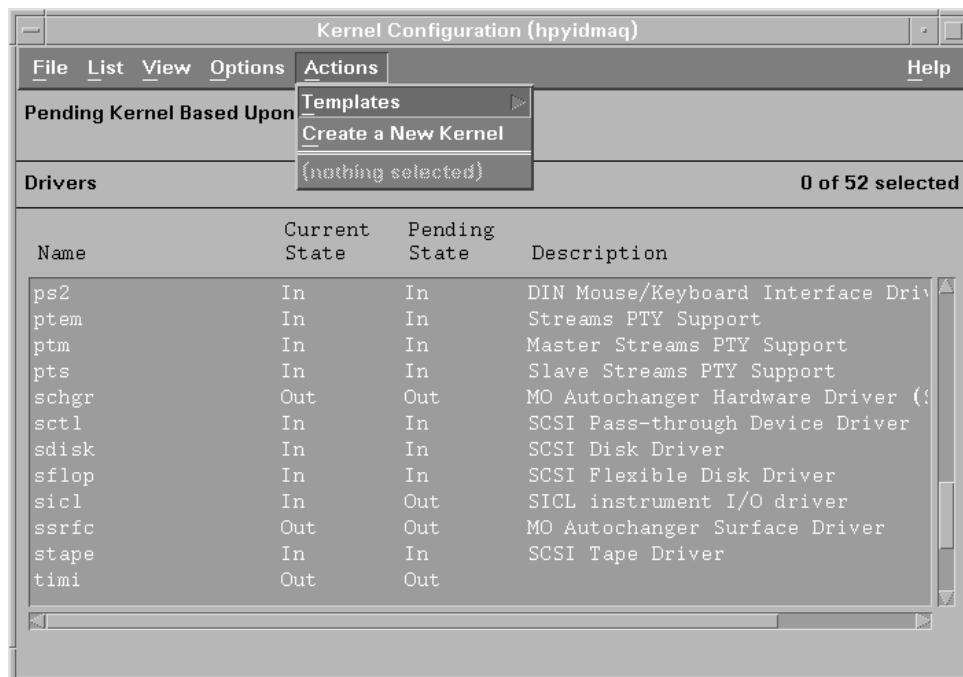
6. Select the “sicl” driver. Then choose Action: Remove Driver from Kernel in the kernel configuration window.

Figure C-14 Removing Driver from Kernel



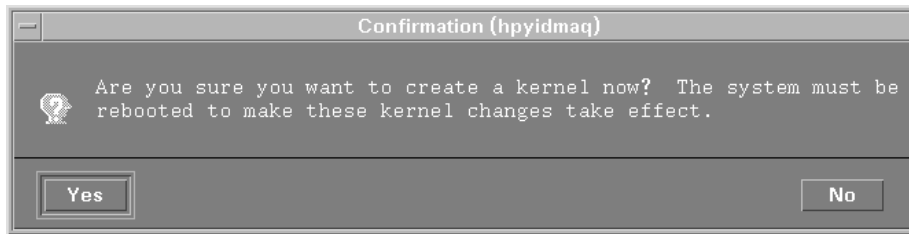
7. Choose Action: Create a New Kernel in the kernel configuration window.

Figure C-15 Creating New Kernel



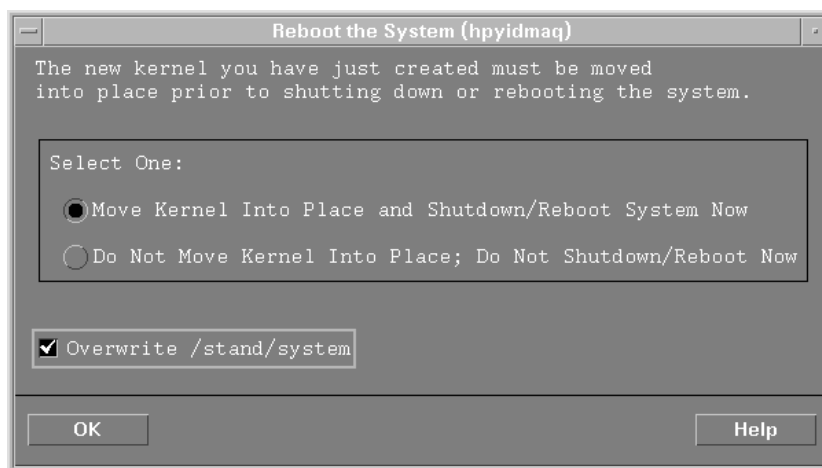
- Click **Yes** in the Confirmation Window.

Figure C-16 Confirmation Window



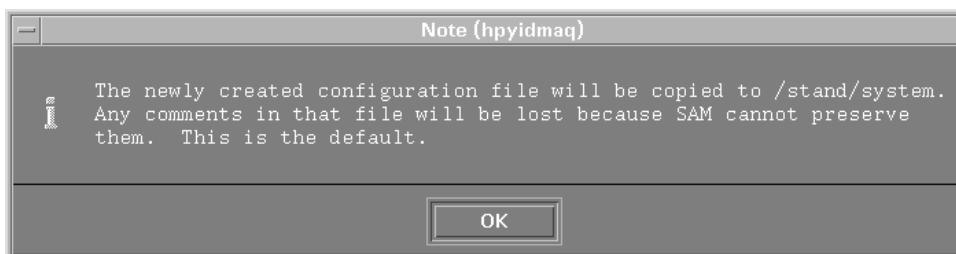
- Click **OK** in the reboot the system window.

Figure C-17 Reboot the System Window



- Click **OK** in the following window. The new kernel is automatically rebuilt and HP-UX is rebooted.

Figure C-18 Note Window



Installing Timi, Vme, and Vme2 Drivers

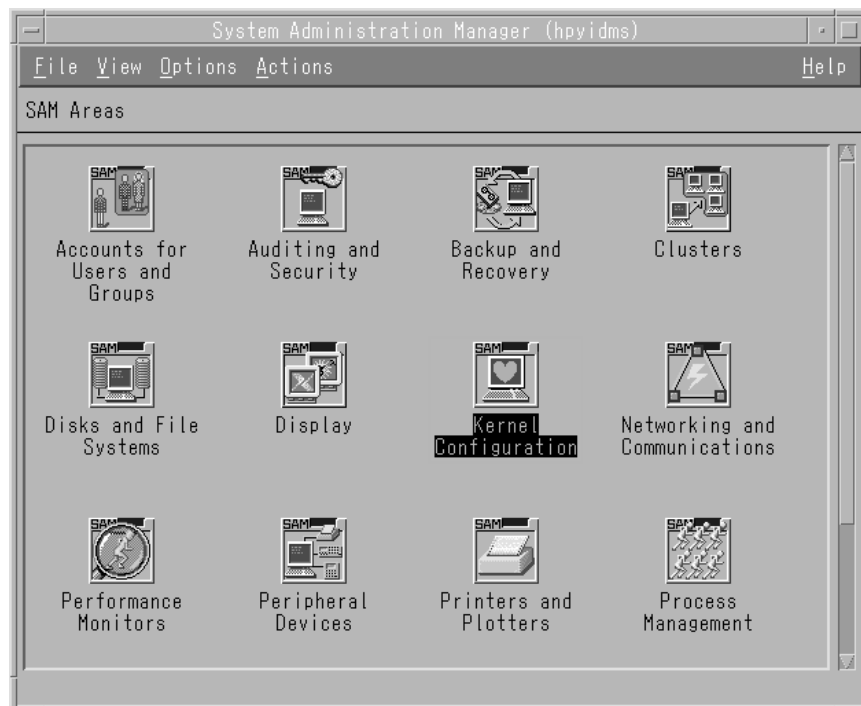
To install the drivers, use the following procedures.

1. Log in as a superuser.
2. Open a dtterm window.
3. To start the SAM (1M) utility, type:

```
# sam
```

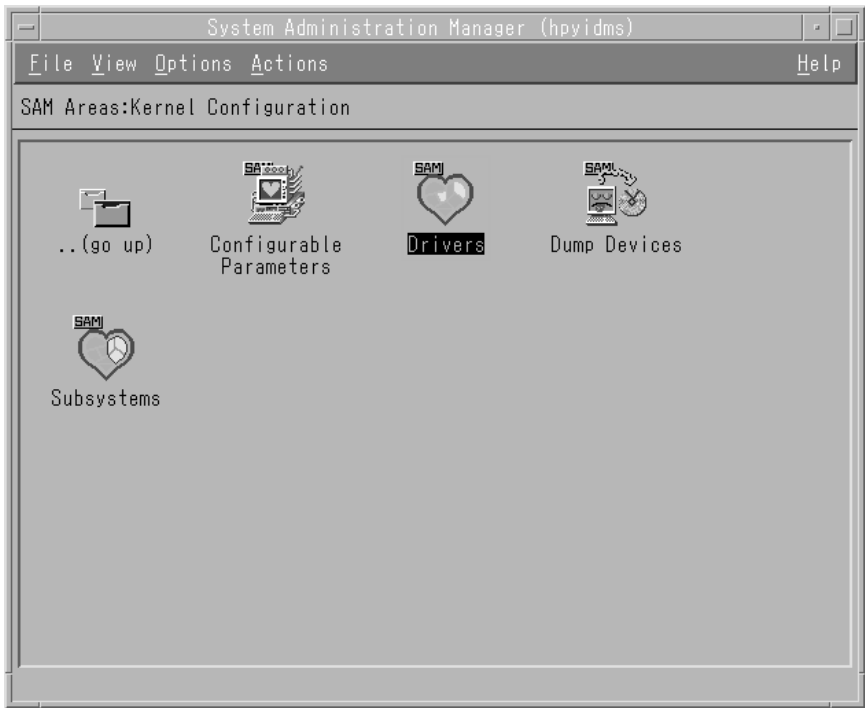
The SAM window appears as shown in figure C-11.

Figure C-19 System Administration Manager (SAM) Window



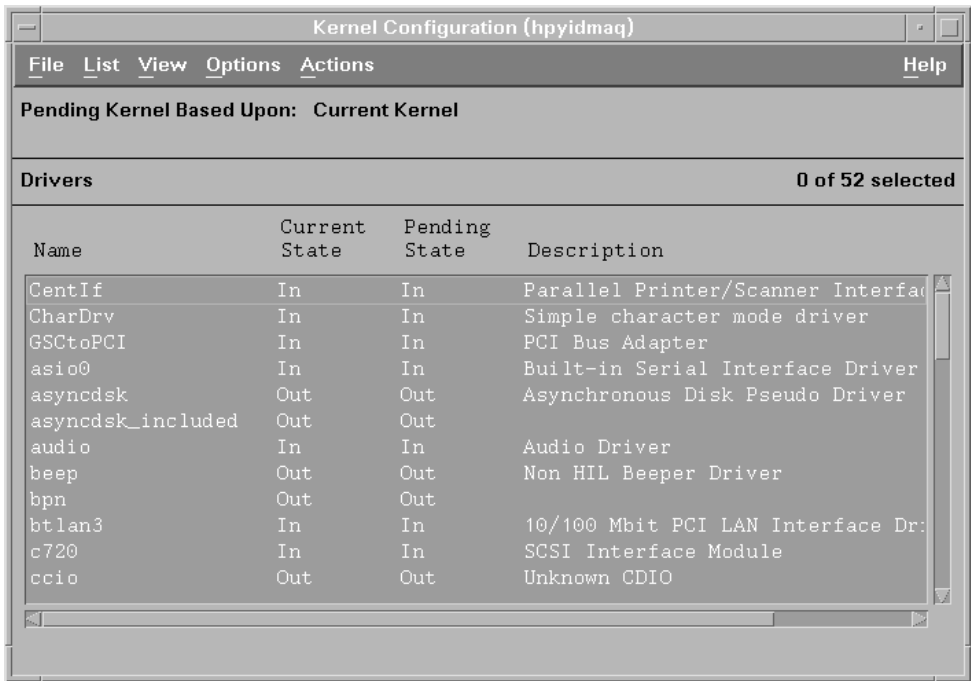
4. Double-click the Kernel Configuration icon.

Figure C-20 Kernel Configuration Screen of SAM Window



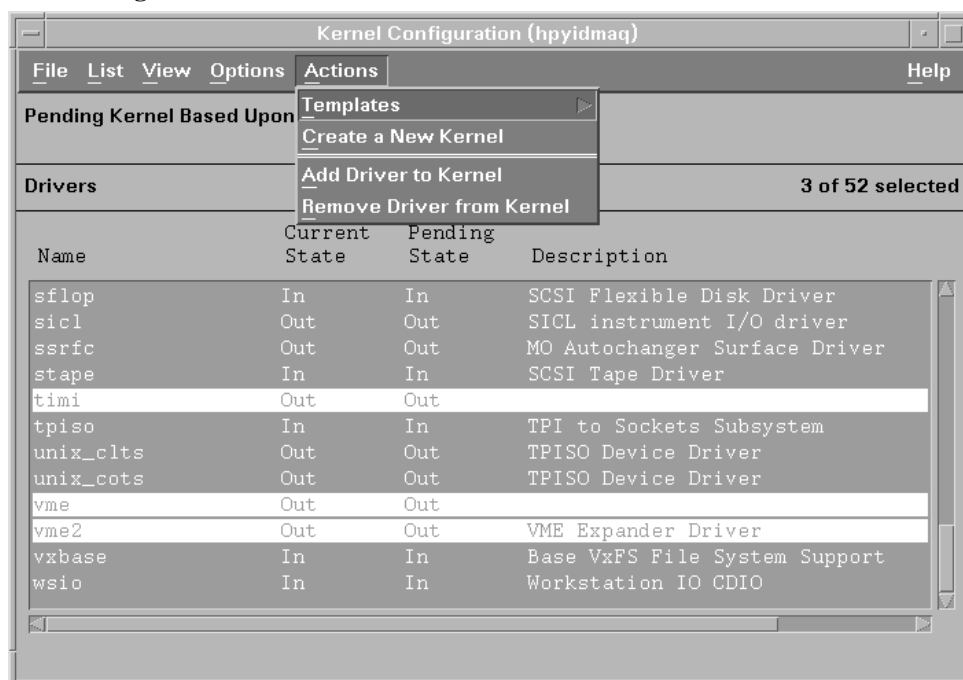
5. Double-click the Driver icon. The kernel configuration window appears as shown in figure C-13.

Figure C-21 Kernel Configuration Window



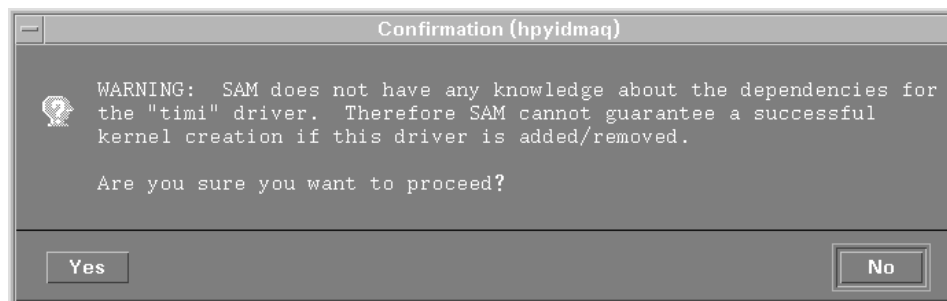
6. Select the “timi”, “vme”, and “vme2” drivers. Then choose Action: Add Driver to Kernel in the kernel configuration window.

Figure C-22 Adding Driver to Kernel



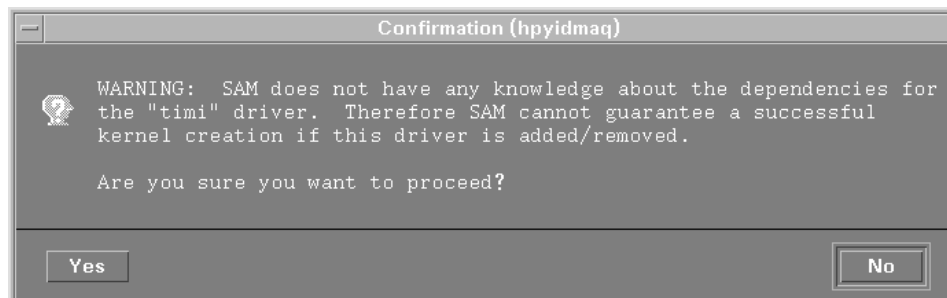
7. Click **Yes** in the confirmation window as shown in figure C-23.

Figure C-23 Confirmation Window



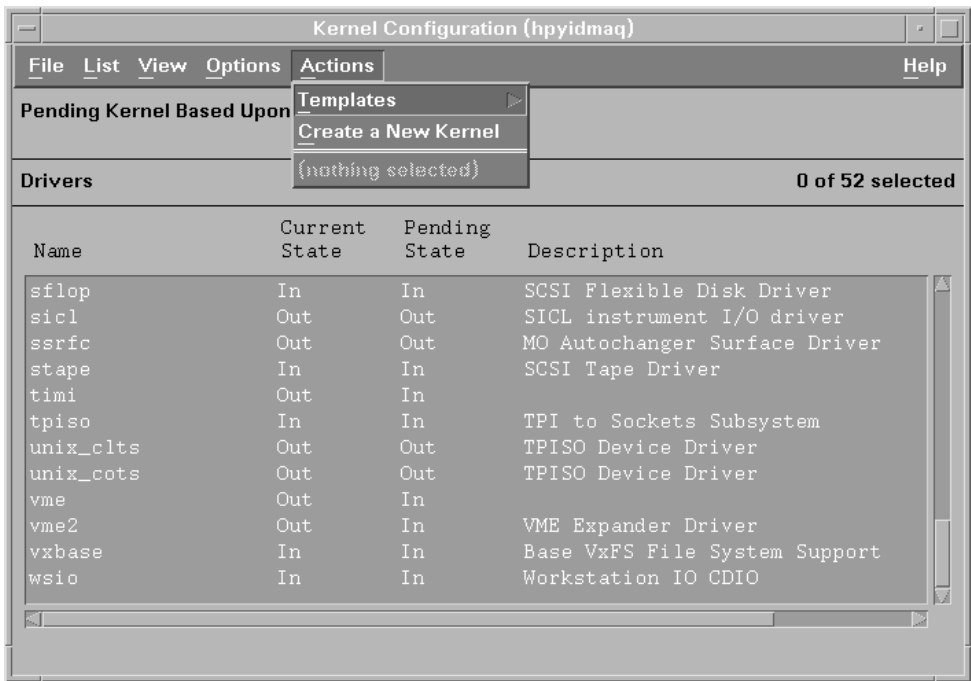
8. Click **Yes** in the confirmation window as shown in figure C-24.

Figure C-24 Confirmation Window



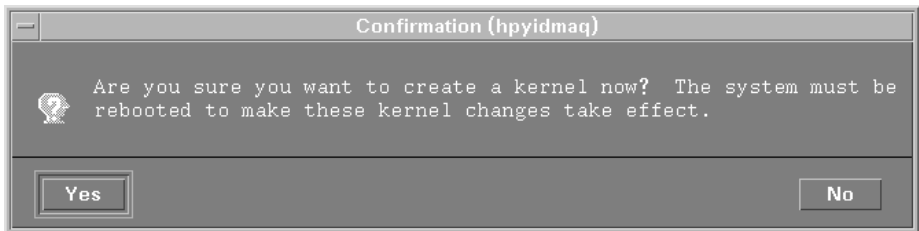
9. Choose Action: Create a New Kernel in the kernel configuration window.

Figure C-25 Creating New Kernel



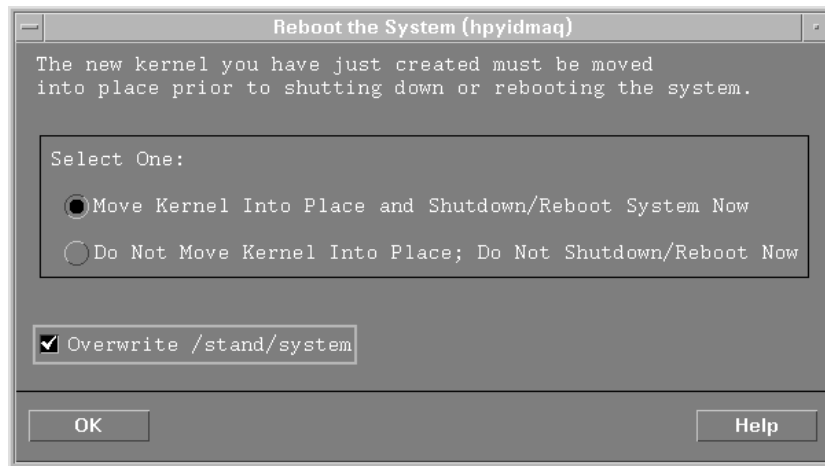
10. Click **Yes** in the confirmation window.

Figure C-26 Confirmation Window



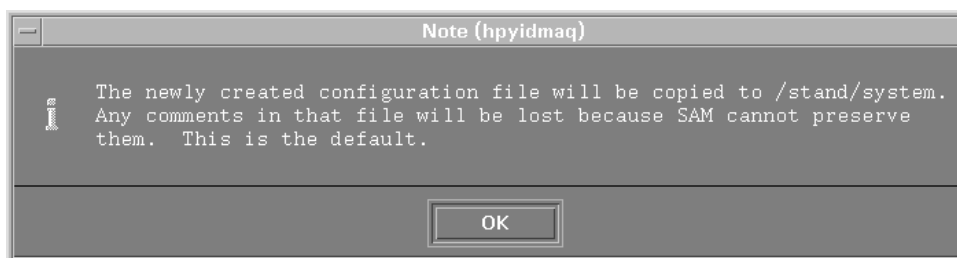
11. Click **OK** in the reboot the system window.

Figure C-27 Reboot the System Window



12. Click **OK** in the following window. The new kernel is automatically rebuilt and HP-UX is rebooted.

Figure C-28 Note Window



Reconfiguring SICL

To reconfigure the SICL, use the following procedures.

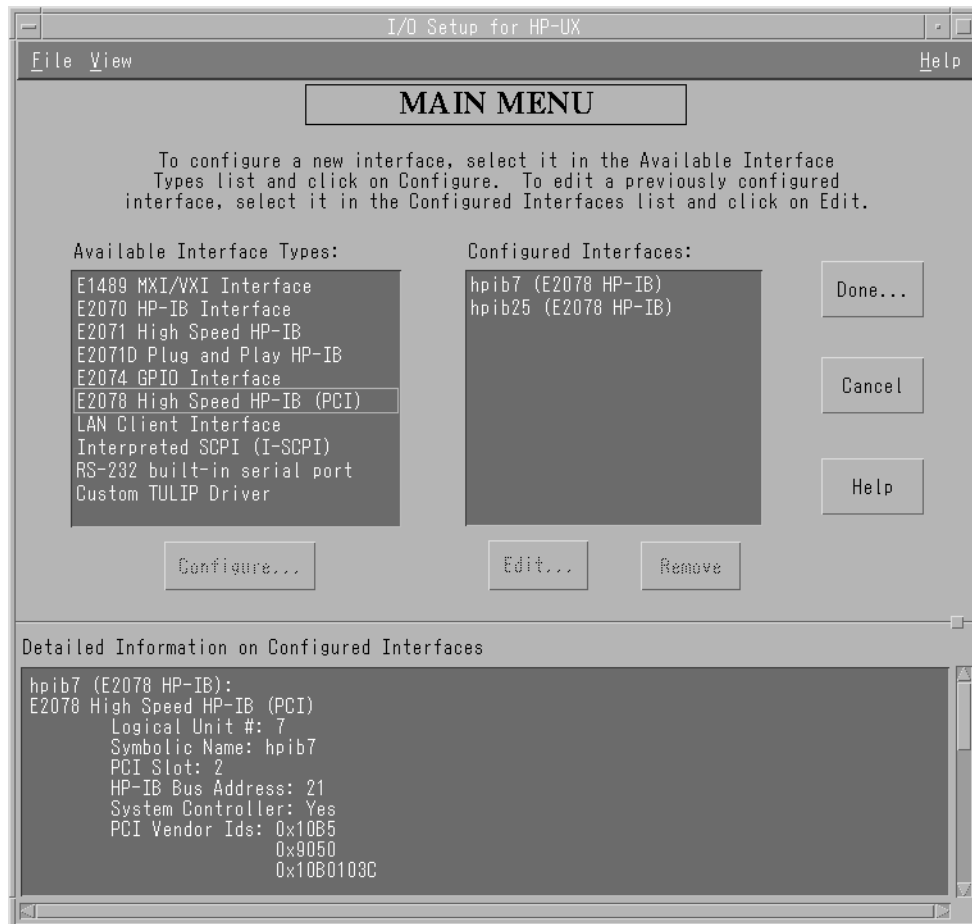
1. Log in as a superuser.
2. Open a dtterm window.
3. Execute the `/opt/sicl/bin/iosetup` command with `-V2` option as follows.

```
# /opt/sicl/bin/iosetup -V2
```

The I/O setup for HP-UX window then appears.

4. Choose **File: Build...** to rebuild the kernel as shown in figure C-29.

Figure C-29 I/O Setup for HP-UX Window



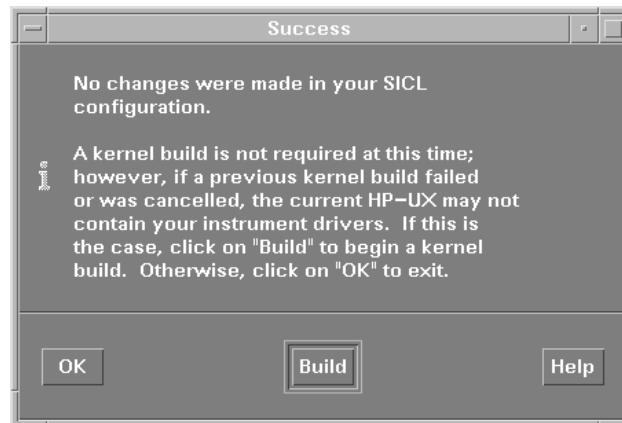
The accept configuration window appears as shown in figure C-30.

Figure C-30 Accept Configuration Window



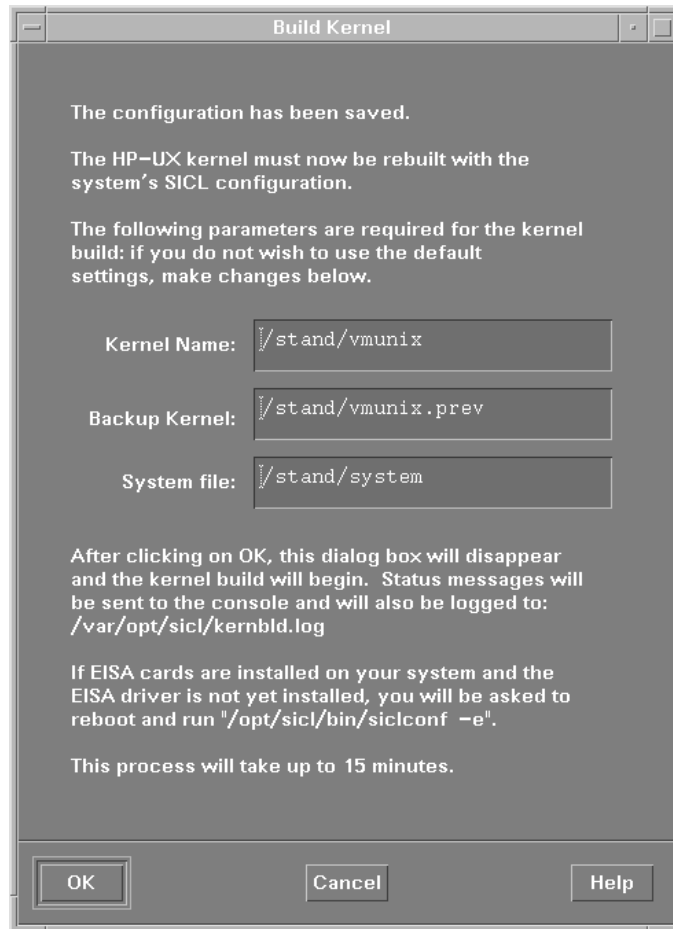
5. Click **OK** in the accept configuration window. The success window appears as shown in figure C-31.

Figure C-31 Success Window



6. Click **Build** in the success window. The build kernel window appears as shown in figure C-32.

Figure C-32 Build Kernel Window



7. Click **OK**. The new kernel is automatically rebuilt. This takes about 15 minutes.
8. After creating the new kernel, reboot the HP-UX using the `/sbin/shutdown -r` command.

Step 3. Customizing HP BASIC/UX

To customize HP BASIC/UX for the 4072A/4073A, execute the `/home/hpsrvr/config/config.rmb` command. For the detailed information, refer to the “Customizing BASIC/UX” in the appendix A.

Step 4. Customizing for Japanese Environment (Optional)

To customize for a Japanese environment, execute the `/home/hpsrvr/config/config.kanji` command. For the detailed information, refer to the “The `/etc/dt/config/Xsession.d/9000.kanji` File” in the appendix A.

Step 5. Customizing 4070 System Software

To customize the 4070 system software, execute the `/home/hpsrvr/config/config.4070` command. For further details, refer to the “Customizing 4070 System Software” in the appendix A.

Executing install Command

The `/opt/hp4070/install/install` command is executed using the `/home/hpsrvr/config/config.4070` command. The `install` command integrates the optical interface driver into the HP-UX kernel.

NOTE	The optical interface card must be removed before executing the <code>install</code> command. Verify that the optical interface card is not installed in the EISA or PCI slot of the system controller. If it is, remove it before proceeding with this procedure.
-------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

NOTE	Before executing the <code>install</code> command, remove all of the <code>opt_sl*</code> files from <code>/dev/hp4070</code> directory, because these files are not re-created. However these files are automatically created in the above directory when you execute the <code>install</code> command.
-------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

1. When using the C3600 system controller or the 745/132L system controller with the PCI slot, the following messages is displayed. In this case, skip step 2 and proceed to step 3.

```
bus type: PCI
```

2. When using the 745/132L system controller with the EISA slot or 745i, perform the following procedures:

- a. the following message is displayed:

```
bus type: EISA
```

```
Enter the optical interface EISA slot number [1-4; default 1]: 1
```

- b. Type the EISA slot number where the optical interface card will be inserted. If you press **Return**, slot number 1 is selected automatically.

Make note of the number used, as the optical interface card must be installed in the EISA slot with the same number.

- c. To see the setup information for the DIP switches and jumper switches on the optical interface card, press the space bar to scroll the display.

Figure C-34 shows an example of the setup information displayed on the screen. This example sets DIP switches “ID1” and “ID2” to off, “ID3” through “D8” to on, and connects jumper switch “IRQ15”.

- d. Set the DIP switches and jumper switches on the optical interface card as shown in the setup information displayed on the screen.

Figure C-33 shows the component locations on the optical interface card.

Figure C-33 Optical Interface Card Component Locations

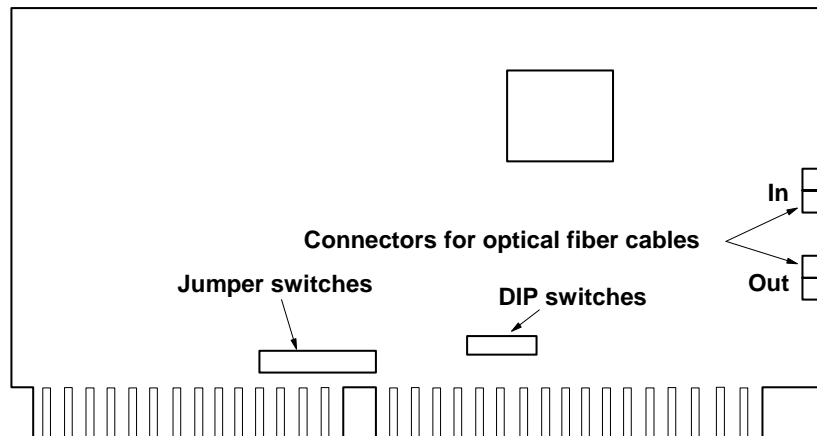


Figure C-34 Optical Interface Card Setup Information

Slot1
 Optical Interface Board for Agilent 4070
 Switch Name: DIP Switch (S1)

This switch selects both the Interface address (addr) and Card ID.

Required setting

0	0	1	1	1	1	1	1
+---+---+x---+x---+x---+x---+x---+x---+on							
+x---+x---+---+---+---+---+---+---+off							
1	2	3	4	5	6	7	8

Labels

I	I	I	I	D	D	D	D
D	D	D	D	5	6	7	8
1	2	3	4				

Slot 1
 Optical Interface Board for Agilent 4070
 Jumper Switches Name: Jumper Switches Switch (JP1)

This switch selects the Interrupt Request line (IRQ).

Required setting

1	0	0	0	0	0	0	0	0	0
+-----+									
	o	o	o	o	o	o	o	o	o
	o	o	o	o	o	o	o	o	o
+-----+									

Labels

I	I	I	I	I	I	I	I	I	I
R	R	R	R	R	R	R	R	R	R
Q	Q	Q	Q	Q	Q	Q	Q	Q	Q
1	1	1	1	9	7	6	5	4	3
5	4	2	1						

3. Press the space bar to scroll until the following message is displayed:

```
The new kernel is now ready.  
Is it ok to reconfigure the HP-UX kernel [y or n] ?
```

4. To reconfigure the kernel, type `y`, then press **Return**.
5. When the kernel reconfiguration is completed, the following message is displayed:

```
Is it ok to update the content of /stand/system according  
to the present kernel configuration [y or n; default y] ?
```

6. To update the `/stand/system` file, type `y`, then press **Return**.
7. When the update is complete, the following message is displayed:

```
Do you want to shutdown the system now [y or n] ?
```
8. To shut down the system controller, type `y`, then press **Return**.
9. After the shutdown process is complete, turn off the system controller.

NOTE	After executing the install process, the <code>install</code> command updates the <code>/tmp/hp4070.log</code> file. Check this file for any errors that may have occurred.
-------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Installing Optical Interface Card

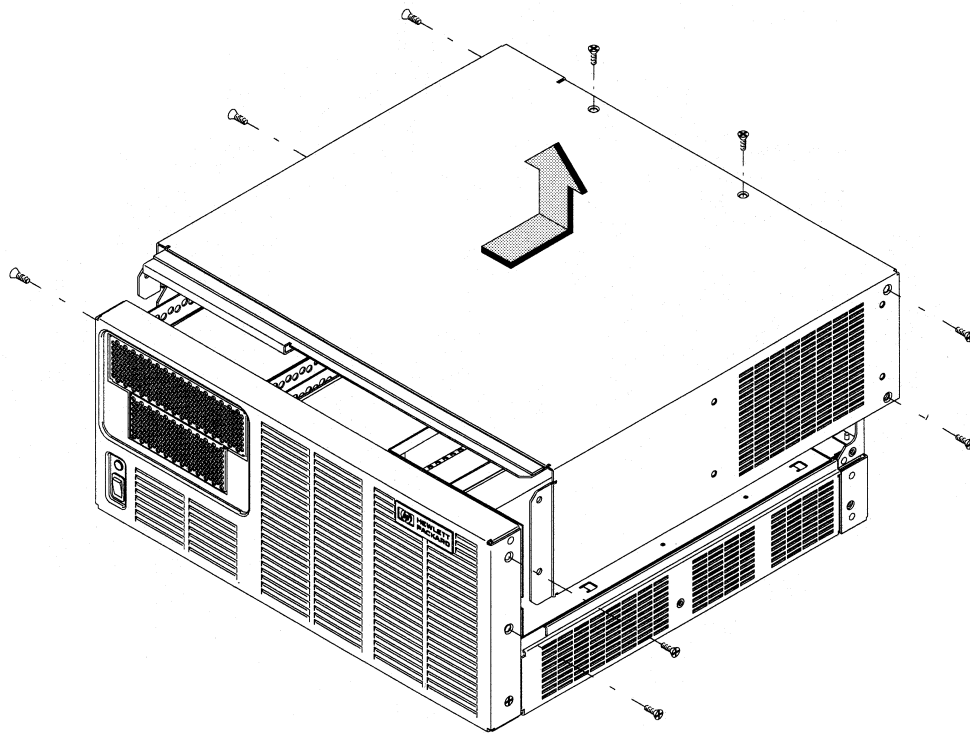
This section describes how to install the optical interface card.

If you install the optical interface card in the C3600 system controller, use the procedure described in the “Installing Optical Interface Card” in the chapter 6.

If you install the optical interface card in the 745/132L, use the following procedure.

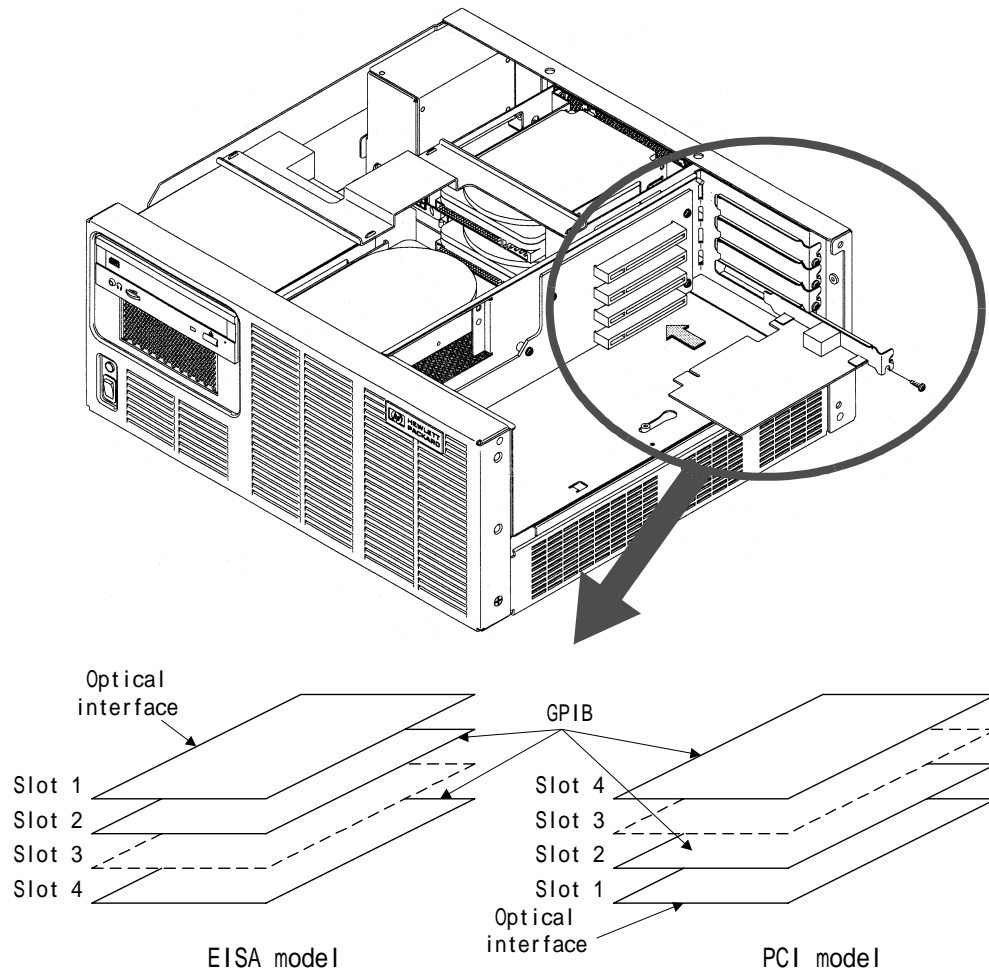
1. Make sure that the shutdown process was complete, then turn off the system controller.
2. Remove the cables and power cord from the rear panel of the system controller.
3. If the system controller is mounted in the system cabinet, unmount it from the system cabinet.
4. Remove the front panel and cover as shown in figure C-35.

Figure C-35 Removing Front Panel and Top Cover (745/132L)



5. Remove the blank panel from the EISA or PCI slot position where you will install the optical interface card. This should be the same slot used to execute the `install` command.
6. Insert the optical interface card into the EISA or PCI slot as shown in figure C-36.

Figure C-36 Optical Interface Card Installation (745/132L)

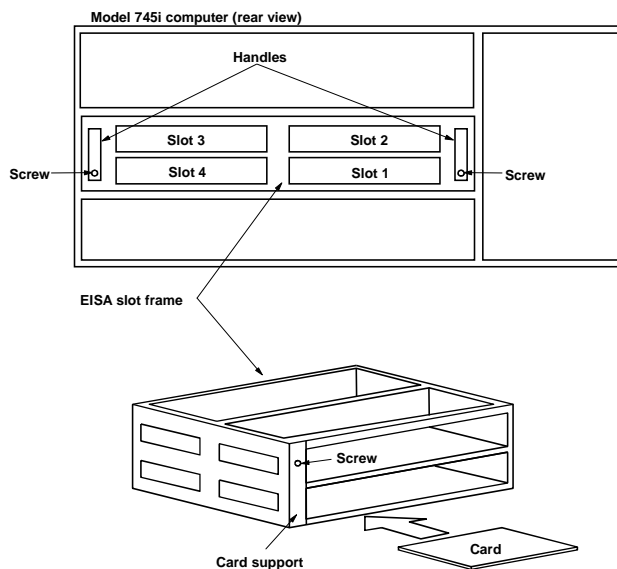


7. Reinstall the front panel and cover.
8. If the system controller is mounted in the system cabinet, slide and secure the system controller with the rack flanges, using torx screws.
9. Connect the cables and power cord to the system controller.
10. Connect the optical fiber cables from the testhead to the optical interface board as follows.
 - a. Connect the “In” cable to the “IN” connector.
 - b. Connect the “Out” cable to the “OUT” connector.
11. Turn on and start up the system controller.

If you install the optical interface card in the 745i, use the following procedure.

1. Make sure that the shutdown process was complete, then turn off the system controller.
2. Remove the cables and power cord from the rear panel of the system controller.
3. If the system controller is mounted in the system cabinet, remove the four torx screws that secure the rack flanges of the system controller using a torx screwdriver. Then slide the system controller about 150 millimeters toward the front.
4. Remove the EISA slot frame from the rear panel of the system controller as follows. See figure C-37
 - a. Remove the screws from the handles of the EISA slot frame.
 - b. Pull the handles to remove the EISA slot frame from the system controller.
5. Install the optical interface card into the EISA slot, as follows.
 - a. Remove the card support from the EISA slot frame by removing the screw.
 - b. Remove the blank panel from the EISA slot position where you will install the optical interface card. This should be the same slot used to execute the `install` command.
 - c. Insert the optical interface card into the EISA slot.
 - d. Reinstall the card support on the EISA slot frame.
6. Reinstall the system controller EISA slot frame.
7. If the system controller is mounted in the system cabinet, slide and secure the system controller with the rack flanges, using torx screws.
8. Connect the cables and power cord to the system controller.
9. Connect the optical fiber cables from the testhead to the optical interface board as follows.
 - a. Connect the “In” cable to the “IN” connector.
 - b. Connect the “Out” cable to the “OUT” connector.
10. Turn on and start up the system controller.

Figure C-37 Optical Interface Card Installation (745i)



Editing /etc/opt/hp4070/config/1 File

This customization is optional.

If the system configuration does not match the standard configuration, you must edit the /etc/opt/hp4070/config/1 file. Change the file to match the system configuration.

For the default setting for the /etc/opt/hp4070/config/1 file, refer to the “Editing /etc/opt/hp4070/config/1 File” in the chapter 6.

Editing /etc/opt/hp4070/config/PCONFIG File

This customization is optional.

If an automatic wafer probe is used with the 4072A/4073A, the GPIB address for the automatic wafer probe must be set. Agilent Technologies recommends that the GPIB address be set to the default address included in the /etc/opt/hp4070/config/PCONFIG file. For the default setting for the /etc/opt/hp4070/config/PCONFIG file, refer to the “Editing /etc/opt/hp4070/config/PCONFIG File” in the chapter 6.

To change the GPIB address setting in the system software, edit the file.

Editing /etc/opt/hp4070/config/pgconnection File

This customization is optional.

The /etc/opt/hp4070/config/pgconnection file includes the information of the cable connections between the pulse generators and testhead ports. To change the file to match the connection configuration, use the /opt/hp4070/bin/pgconn4070 command.

NOTE To execute the /opt/hp4070/bin/pgconn4070, the TIS online session must be running.

For the sample of /etc/opt/hp4070/config/pgconnection file, refer to the “Editing /etc/opt/hp4070/config/pgconnection File” in the chapter 6.

Executing /opt/hp4070/install/configure Command

Execute the configure command after installing the optical interface card into the system controller and customizing the /etc/rc file, /etc/opt/hp4070/config/1 file (optional), and /etc/opt/hp4070/config/PCONFIG file (optional).

To execute the configure command, use the procedure described in the “Executing /opt/hp4070/install/configure Command” in the chapter 6.

This command confirms the 4072A/4073A tester configuration, measures the capacitance compensation data, and sets the line frequency.

NOTE Before executing the configure command, the testhead conditions must be as follows:

- The TIS server must be worked.
 - The wafer probe sense switch must be pushed.
 - The interlock pins on the testhead must be shorted.
 - The measurement pins must be open.
-

Customizing for Pulse Generator

If the pulse generator is to be installed newly or reconfigured, perform the following:

1. Edit the `/etc/opt/hp4070/config/1` file
2. Execute the `/opt/hp4070/install/configure` command
3. Perform the pulse level calibration
To perform the pulse level calibration, use the `/opt/hp4070/bin/cal4070` command. For more information, see the *Agilent 4072A/4073A Calibration Guide*.

D Error Messages

1-xxxxx

- **1-10001 System software inconsistency discovered.**
- **1-10002 System software inconsistency discovered in session login mechanism.**
- **1-10003 System software inconsistency discovered in session logout mechanism.**

Unknown error occurred during the 4070 system software execution, or login/logout session. Cannot continue the session. Execute hp4070 -logout, then execute hp4070 -login again.

- **1-10004 Cannot allocate memory.**

Could not allocate enough memory. Execute hp4070 -logout, then execute hp4070 -login again.

- **1-10006 Cannot set socket buffer size.**
- **1-10007 Failed to call socket().**
- **1-10008 Failed to call bind().**
- **1-10009 Failed to call listen().**
- **1-10010 Failed to call symlink().**
- **1-10011 Failed to call accept().**
- **1-10012 Failed to call connect().**
- **1-10013 Failed to call shmget().**
- **1-10014 Failed to call shmat().**

Unknown error occurred in the 4070 system software. Execute hp4070 -logout, then execute hp4070 -login again. Or reboot HP-UX.

- **1-10015 Cannot open hardware configuration file(in /etc/opt/hp4070/config/).**
- **1-10016 Cannot fstat() hardware configuration file(in /etc/opt/hp4070/config/).**
- **1-10017 Cannot mmap() hardware configuration file(in /etc/opt/hp4070/config/).**
- **1-10018 Cannot read() hardware configuration file(in /etc/opt/hp4070/config/).**
- **1-10019 Cannot unmmap() hardware configuration file(in /etc/opt/hp4070/config/).**

Could not open the configuration file (/etc/opt/hp4070/config/1). Check the configuration file. If problem is not found in the data, permission and so on, re-install the 4070 system software.

- **1-10020 Cannot allocate event handler table.**

Too many test programs are running. Or too many events are registered by the Wait_event command. Stop unnecessary test programs.

- **1-10021 Cannot read Optical Interface Special Data Register 0.**
- **1-10022 Cannot ioctl() Optical Interface Card.**
- **1-10023 Cannot ioctl() Optical Interface Card.**
- **1-10024 Cannot ioctl() Optical Interface Card.**
- **1-10025 Cannot read Optical Interface Special Data Register N.**
- **1-10029 Cannot ioctl() Optical Interface Card N.**

Error occurred when accessing the optical interface card. Execute hp4070 -logout, then execute hp4070 -login again. Or the optical interface card may be defective.

- **1-10026 Power Fail occurred. TIS Daemon process is going to die.**

Testhead was turned off. Turn the testhead on. And execute hp4070 -login.

- **1-10027 Another online TIS Daemon is running.**

Another online TIS daemon is already running. Only one online TIS daemon can be running.

- **1-10028 Cannot open optical interface device file.**

Could not open the optical interface device file. Check the following device files. If problem is not found in the data, permission and so on, execute the configure command after removing the /dev/hp4070 directory. The permission of the file must be crw-rw-rw-.

- ❑ /dev/hp4070/opt_sN
- ❑ /dev/hp4070/opt_sNf0
- ❑ /dev/hp4070/opt_sNf1
- ❑ /dev/hp4070/opt_sNf2
- ❑ /dev/hp4070/opt_sNs0
- ❑ /dev/hp4070/opt_sNs1
- ❑ /dev/hp4070/opt_sNs2

where, N is the ISA slot number (1, 2, 3, or 4) where the optical interface card is installed.

- **1-10031 Cannot fork expmon4070 (errno=N).**

Could not execute expmon4070. Check /opt/hp4070/sbin/expmon4070. The permission must be -r-xr-xr-x. If too many processes are running, kill unnecessary processes.

where, N is the error number returned by the HP-UX kernel or system call.

- **1-10032 OptCard selftest(register r/w test) error.**
- **1-10033 OptCard selftest(FIFO memory r/w test) error.**
- **1-10034 OptCard selftest(communication test) error.**

Failed on the self-test of the optical interface card installed in the system controller. Replace the optical interface card.

- **1-10035 Test Head is not in normal mode. Cannot continue TIS Daemon.**

Unknown problem occurred in the testhead. Turn off the power of the testhead and on again. Then restart the TIS server again.

- **1-20001 Client Table full. Please quit some applications that use TIS library.**

Too many test programs or test algorithms are running. Stop unnecessary programs or algorithms.

- **1-20003 Error in iclear() on accessing GPIB device.**
- **1-20004 Error in itimeout() on accessing GPIB device.**
- **1-20005 Error in igpibllo() on accessing GPIB device.**
- **1-20006 Error in iprintf() on accessing GPIB device.**
- **1-20007 Error in iopen() on accessing GPIB device.**
- **1-20008 Error in iwrite() on accessing GPIB device.**
- **1-20009 Error in iread() on accessing GPIB device.**
- **1-20022 Error in igpibbusstatus().**

Error occurred in accessing GPIB interface. Check the GPIB interface card or the system instruments.

- **1-20010 Error in ioctl() on accessing optical interface.**
- **1-20011 Error in write() on accessing optical interface.**
- **1-20012 Error in read() on accessing optical interface.**
- **1-20014 Error in select() on accessing optical interface (errno=N).**
- **1-20015 Error in select() on accessing optical interface.**

Error occurred in accessing the optical interface. Check the optical interface card or direction of optical interface cables.

where, *N* is the error number returned by the HP-UX kernel or system call.

- **1-20013 Optical Interface Timeout.**

Time out occurred when accessing the testhead. Check the test program. Or turn off the testhead.

- **1-20016 Error in read() on accessing socket.**
- **1-20018 Error in close() of socket.**
- **1-20019 Error in write() on accessing socket.**

Error occurred in accessing the testhead CPU.

- **1-20020 Cannot load C compensation data file.**

Could not read the capacitance compensation data. Check the data and permission of the /etc/opt/hp4070/ccdata file and /etc/opt/hp4070/ccdata0 file.

- **1-20021 C compensation data is not loaded.**

TIS command needs the capacitance compensation data. Related to error No. 1-20020. Solve error No. 1-20020.

- **1-20085 CMU GPIB error occurred.**

GPIB error occurred during communication with the 4284A. Check the GPIB interface card, GPIB cable, and 4284A.

- **1-20086 DVM GPIB error occurred.**

GPIB error occurred during communication with the 3458A. Check the GPIB interface card, GPIB cable, and 3458A.

- **1-30001 Cannot make connection because no session is logged in now.**

No session is logged in now. Execute hp4070 -login.

- **1-30002 Cannot make connection because of wrong session id.**

Wrong session ID was specified. Use correct session ID, or log out of unnecessary session.

- **1-30003 Request was refused because the TIS Daemon is not in the normal state. Current state is *N*.**

where, *N* (=1 to 6) means the following status.

- ☐ 1: Testhead power fail occurred.
- ☐ 2: Testhead emergency (Over Current or Over voltage) occurred.
- ☐ 3: Test fixture is open.
- ☐ 4: Interlock is open.
- ☐ 5: Testhead firmware is abnormal. Replace Testhead CPU board.
- ☐ 6: Another client program (test algorithm, etc.) is in abort process.

This error message appears because of the above status. Solve the problem corresponding to the status.

- **1-30004 Optical Interface timeout.**
Time out occurred during communication with the testhead. Check the optical interface card and the optical fiber cables.
- **1-30005 GPIB timeout.**
Time out occurred during communication with the system instruments. Check the GPIB interface card, GPIB cable, and the system instruments.
- **1-30006 Hardware Exception occurred and cannot accept any request.**
Sub-message for error No. 1-30003.
- **1-30007 A client is in aborting sequence.**
Sub-message for error No. 1-30003.
- **1-30008 SICL error occurred: *N*.**
Error occurred during communication with the system instruments. Check the GPIB interface card, GPIB cable, and the system instruments.
- **1-30009 Cannot make connection. Only one Debugging Panel may run at a time.**
Tried to open a second Interactive Debugging Panel in same session. You can open only one debugging panel at a time in same session.
- **1-30010 Cannot make connection. Another Diagnostics is running.**
Only one Diagnostics program can run at a time. Use the Diagnostics program that is already running. Or stop the program that is already running to newly run the Diagnostics program.
- **1-30011 Cannot make connection. Another Performance Verification is running.**
Only one performance verification (PV) program can run at a time. Use the program that is already running. Or stop the program that is already running to newly run the PV program.
- **1-30012 Request was refused because Diagnostics or PV is running.**
Test program using TIS cannot be executed when the Diagnostics program or the performance verification (PV) program is running. Stop the Diagnostics program or the PV program to run the test program using TIS.
- **1-30013 TIS command cannot be executed because the testhead is in power failure.**
TIS command cannot be executed because a power failure was detected in the testhead. Turn on the power to the testhead again, then restart the TIS server.
- **1-30014 TIS command cannot be executed because over voltage or current is forced to SMUs.**
The TIS command cannot be executed because over voltage or over current is being forced to the SMUs from external instruments or SMUs.
- **1-30015 TIS command cannot be executed because the fixture is open.**
The TIS command cannot be executed because the test fixture lid is open. Close the lid of test fixture.
- **1-30016 TIS command cannot be executed because the interlock is open.**
The TIS command cannot be executed because the interlock circuit is open. Close the interlock circuit.
- **1-30017 TIS command cannot be executed because the testhead cannot work properly.**
The TIS command cannot be executed because the testhead cannot work properly. There is something wrong with the optical interface communication, or something wrong with the testhead. Contact the nearest Agilent Technologies Sales and Service office if the system cannot be restarted.

- **1-30018 TIS command cannot be executed because the system is running an internal process.**

The TIS command cannot be executed because the system is running an internal process.

- **1-30019 TIS command cannot be executed because an abnormal condition exists.**

The TIS command cannot be executed because an abnormal condition in the system. Remove the abnormal condition before executing the TIS command again.

- **1-30021 Detected wrong (*Type1*) pin board(s). Exchange pin(s) marked with “*” for the *Type2* pin board(s).**

1-30022 Detected wrong (*Type1*) chuck connection pin board. Exchange for the *Type2* chuck connection pin board.

1-30023 Detected wrong (*Type1*) low current input board(s). Exchange for the *Type2* low current input board(s).

1-30024 Detected wrong (*Type1*) kelvin input board(s). Exchange for the *Type2* kelvin input board(s).

1-30025 Detected wrong type of kelvin input board or low current input board(s). Exchange for the correct type of kelvin or low current input board(s).

- ☐ If *Type1* is HR type and *Type2* is standard type: The high-resolution type board is installed in the 4072A. Exchange the high-resolution type board for the standard type board.
- ☐ If *Type1* is standard type and *Type2* is HR type: The standard type board is installed in the 4073A. Exchange the standard type board for the high-resolution type board.

2-xxxxxx

- **2-10002 Cannot open file. filename: *File***
Could not open the file specified by *File*. Confirm the file name and permission of the file.
- **2-10004 An illegal format data exists. filename: *File*, data: *Data***
Tried to open file with invalid data format. Change the data format of the data *Data* in the file *File*.
- **2-10008 An improper option is specified. option: *Option***
Improper value (*Option*) was specified for the option. Specify the option properly.
- **2-10009 An improper argument is specified. option: *Option*, argument: *Argument***
Argument value (*Argument*) invalid for the option (*Option*) was specified. Specify the argument properly.
- **2-10014 Cannot execute command. command path: *Path***
Could not execute the command path *Path*. Re-install the 4070 system software.
- **2-10019 Cannot get character input.**
Could not read the character input. Maximum 1024 characters.
- **2-11001 Failed to write the test selection file. Check permission.**
Un-specifiable error occurred in write operation of the test selection file. Check the permission of the file.
- **2-13002 An error occurred in TIS.**
Error occurred in TIS. Refer to the additional messages.
- **2-14001 Cannot open Optical Interface Card device file.**
Could not open the device file for the optical interface card. Check the configuration file (/etc/opt/hp4070/config/1) and specify the proper slot number for the optical interface card. Or kill the unnecessary process that opened the optical interface card device file.
- **2-14003 An error occurred in Optical Interface Card Loopback test.**
Optical interface card failed the loopback test. Check the optical fiber cables or the optical interface card.
- **2-21001 No test is selected. Please select at least one test.**
No test is selected in the "Test Selection" field. Select at least one test.
- **2-21002 No SMU is selected. Please select at least one SMU.**
No SMU is selected in the "Test Selection" field. Select at least one SMU.
- **2-21003 No Pin is selected. Please select at least one pin, chuck or input board.**
No pin is selected in the "Test Selection" field. Select at least one pin, chuck pin, or input board.
- **2-21004 Only a numeric value is allowed here.**
Invalid character (non-numeric) is entered in the input field for numeric character. Enter a numeric value.
- **2-21005 Only an integer value is allowed here.**
Invalid character (non-integer) is entered in the input field for integer. Enter an integer value.

- **2-21006 Invalid repeat count. Must be 1 to 999999 (integer).**
Wrong value is specified for how many times to repeat the test. The value must be 1 to 999999.
- **2-21007 Invalid margin ratio. Must be 0.0 to 1.0 (float).**
Wrong value is specified for the marginal ratio used to define the marginal test limit. The value must be 0.0 to 1.0.
- **2-21008 Can't read the file. The file does not exist or no read permission.**
The file could not be read. The file does not exist or does not have read permission. Check if the file exists or check the permission of the file.
- **2-21009 Can't write the file. The file or directory has no write permission, or the directory does not exist.**
The file could not be written. The file or directory for the file does not have write permission. Or the directory does not exist. Check that the directory exists, and check the permission of the directory and the file.
- **2-21012 Failed to start diagnostics (errno = N).**
HP-UX kernel error No. *N* occurred in starting diagnostics. Check if the `/opt/hp4070/sbin/diagBody4070` program exists and check the permission of the program. If the program does not exist, re-install the 4070 system software. Or check the number of processes in progress, and kill unnecessary process.
- **2-21013 Can't preserve the result data file (errno = N). Check permission or maybe diagnostics was not executed yet.**
HP-UX kernel error No. *N* occurred in preserving the result data file by File: Preserve data... menu on the Diagnostics window. Execute diagnostics once at least. Or check the permission of the file and `/var/opt/hp4070/diag` directory.
- **2-21014 Failed to write the result data (errno = N). Check permission.**
HP-UX kernel error No. *N* occurred in writing the result data. Check the permission of the file and `/var/opt/hp4070/diag` directory.
- **2-21015 Failed to read result data file (errno = N). Check permission.**
HP-UX kernel error No. *N* occurred in reading the result data. Check the permission of the file and `/var/opt/hp4070/diag` directory.
- **2-21016 Failed to write to result data file (errno = N). Check permission or free disk space.**
HP-UX kernel error No. *N* occurred in writing the result data file. Check the permission of the file and `/var/opt/hp4070/diag` directory. Or check the free disk space. File system full may cause this error.
- **2-23001 ADC Board is defective or not installed.**
The high-resolution ADC board is not installed or may be defective. Install or replace the board.
- **2-23002 GNDU is defective or not installed.**
The GNDU board is not installed or may be defective. Install or replace the board.
- **2-23003 Chuck Connection Board is defective or not installed.**
The chuck connection pin board is not installed or may be defective. Install or replace the board.
- **2-23004 LC Input Board (Port *Port_No.*) is defective or not installed.**
The low current input board is not installed or may be defective. Install or replace the board.

- **2-23005 Kelvin Input Board is defective or not installed.**
The kelvin input board is not installed or may be defective. Install or replace the board.
- **2-23006 CMU Input Board is defective or not installed.**
The CMU input board is not installed or may be defective. Install or replace the board.
- **2-23007 Relay Test Board (Block *Block_No.*) is defective or not installed.**
The relay test board is not installed or may be defective. Install or replace the board.
- **2-23011 ADC Board attenuation factor measurement failed. port: *Port*, expected: *Data1*, measured: *Data2***
High-resolution ADC board failed the attenuation factor measurement test. If all ports failed this test, replace the high-resolution ADC board, otherwise follow the diagnostics execution results.
- **2-23012 ADC Board guard amp offset measurement failed. port: *Port*, measured: *Data***
High-resolution ADC board failed the guard amplifier offset measurement test. Follow the diagnostics execution results. If all ports failed this test, replace the high-resolution ADC board.
- **2-23021 Status error occurred in SMU. port: *Port*, status: *Status***
Status error occurred in the SMU specified by *Port*. Check the SMU if the 4070 failed the diagnostics.
- **2-23022 Status error occurred in CMU. status: *Status***
Status error occurred in the CMU. Check the CMU if the 4070 failed the diagnostics.
- **2-23023 Status error occurred in DVM. status: *Status***
Status error occurred in the DVM. Check the DVM if the 4070 failed the diagnostics.
- **2-23031 HF Matrix Board N is defective or not installed.**
Reference configuration file (/etc/opt/hp4070/config/refconfig1) shows the existence of HF matrix board N, but it is not detected by the testhead firmware. HF matrix board may not be installed or may be defective. Install or replace the board.
- **2-23032 HF Matrix Addressing Board is defective or not installed.**
Reference configuration file (/etc/opt/hp4070/config/refconfig1) shows the existence of HF matrix addressing board, but it is not detected by the testhead firmware. HF matrix addressing board is not installed or may be defective. Install or replace the board.
- **2-23033 Pulse Switch N Board is defective or not installed.**
Reference configuration file (/etc/opt/hp4070/config/refconfig1) shows the existence of pulse switch board N, but it is not detected by the testhead firmware. Pulse switch board N is not installed or may be defective. Install or replace the board.
- **2-23041 SMU (port: *N*) is defective or not installed.**
The SMU board is not installed in port *N* or may be defective. Confirm that the SMU configuration. hp4070 -login command displays the 4070 system configuration.
- **2-44343 Low Current Input Board *N* inner port test was skipped.**
The low current input board relay test was skipped because of an SMU error. Repair the SMU connected to the low current input board *N*.
- **2-31001 File already exists. Do you want to replace it?**
If you want to replace the data, select **OK** button. Or else, select **Cancel** button.

- **2-31002 The test(s) requested on non-existent resources will be ignored.**

Invalid test item, SMU, or pin number is selected. The selection is ignored.

- **2-33001 Cannot identify Pin Board. pin: *Pin***

Actual pin board configuration did not match the configuration file (/etc/opt/hp4070/config/refconfig1). Check the configuration file and define the actual configuration.

- **2-33002 Cannot identify SMU Board. port: *Port***

Actual SMU configuration did not match the configuration file (/etc/opt/hp4070/config/refconfig1). Check the configuration file and define the actual configuration.

- **2-33003 Cannot identify CMU.**

Actual CMU configuration did not match the configuration file (/etc/opt/hp4070/config/refconfig1). Check the configuration file and define the actual configuration.

- **2-33004 Cannot identify DVM.**

Actual DVM configuration did not match the configuration file (/etc/opt/hp4070/config/refconfig1). Check the configuration file and define the actual configuration.

- **2-33005 Testhead Power Line Cycle is mismatching. reference: *Ref* [Hz], actual: *Act* [Hz]**

Actual line frequency did not match the configuration file (/etc/opt/hp4070/config/refconfig1). Check the configuration file and define the actual frequency.

- **2-33006 Cannot identify HF Matrix.**

The command attempts to control the HF matrix, even though the reference configuration file (/etc/opt/hp4070/config/refconfig1) has the information of no MF matrix installed. Check the following items:

- ☐ If the command that you execute is correct.
- ☐ If the reference configuration file includes the correct system configuration information.

- **2-33007 Cannot identify Pulse Switch.**

The command attempts to control the pulse switch, even though the reference configuration file (/etc/opt/hp4070/config/refconfig1) has the information of no pulse switch installed. Check the following items:

- ☐ If the command that you execute is correct.
- ☐ If the reference configuration file includes the correct system configuration information.

- **2-33008 Cannot identify *PGn*.**

The command attempts to control the *PGn*, even though the reference configuration file (/etc/opt/hp4070/config/refconfig1) has the information of no *PGn* installed. Check the following items:

- ☐ If the command that you execute is correct.
- ☐ If the reference configuration file includes the correct system configuration information.

- **2-33009 PGn type or GPIB address mismatch.**

The *PGn* definition in the reference configuration file (/etc/opt/hp4070/config/refconfig1) is not correct. Check if the reference configuration file includes the correct system configuration information.

- **2-33011 Cannot find pin for connection test. Port:Port.**

Cannot execute the connection test. At least one pin board must be installed in:

- ☐ Slot 1 to 24 for the HF ports 1, 2, and 3.
- ☐ Slot 25 to 48 for the HF ports 4, 5, and 6.
- ☐ Slot 1 to 48 for the AUX ports 1 to 8.

- **2-41001 Margin detection disabled.**

Detection mode for the marginal limit was disabled.

- **2-45001 Relay contact check failed.**

description: *Testcase*

measured: *Data1*, **offset:** *Offset*, **Rmeas:** *Data2*

Rlimit: *Limit*

Failed in the contact check of the HF Matrix Relay Test. Check the connection of the short adapter. Or do troubleshooting and replace defective part.

- **2-45002 Relay stuck check failed.**

description: *Testcase*

board: *board*, **relay:** *relay*, **measured:** *Data1*, **expected:** *Data2*

Failed in the open check of the HF matrix relay test. Do troubleshooting and replace defective part.

- **2-45101 PG selftest failed.**

description: *PGn Status code: Code*

Message: *PG_Error_Message*

Failed in the selftest of the PG. Do troubleshooting and replace defective part.

- **2-45201 PG connection test failed.**

description: *PGn*

port: *Port*, **expected:** *Data1*, **measured:** *Data2*

Failed in the PG connection test. Check the cable connection and connect properly. Or do troubleshooting and replace defective part.

- **2-45202 PG connection test marginally passed.**

description: *PGn*

port: *Port*, **expected:** *Data1*, **measured:** *Data2*

Passed in the PG connection test but the result is nearly test limit. Check the cable connection and connect properly. Or do troubleshooting and replace defective part.

- **2-45301 Pulse switch test failed.**

description: *PGn*

port: *Port*, **control:** *TH*, **expected:** *Data1*, **measured:** *Data2*

Failed in the testhead controlled pulse switch test. Check the cable connection and connect properly. Or do troubleshooting and replace defective part.

- **2-45302 Pulse switch test marginally passed.**

description: *PGn*

port: *Port*, **control:** *TH*, **expected:** *Data1*, **measured:** *Data2*

Passed in the testhead controlled pulse switch test but the result is nearly test limit. Check the cable connection and connect properly. Or do troubleshooting and replace defective part.

- **2-45303 Pulse switch test failed.**

description: *PGn*

port: *Port*, **control:** *N*, **switch:** *Switch*, **expected:** *Data1*, **measured:** *Data2*

Failed in the PG controlled pulse switch test (multiplexer switch). Check the cable connection and connect properly. Or do troubleshooting and replace defective part.

- **2-45304 Pulse switch test marginally passed.**

description: *PGn*

port: *Port*, **control:** *N*, **switch:** *Switch*, **expected:** *Data1*, **measured:** *Data2*

Passed in the PG controlled pulse switch test (multiplexer switch) but the result is nearly test limit. Check the cable connection and connect properly. Or do troubleshooting and replace defective part.

- **2-45305 Pulse switch test failed.**

description: *PGn*

port: *Port*, **control:** *N*, **switch:** *Switch*, **expected:** *Data1*, **measured:** *Data2*

Failed in the PG controlled pulse switch test (open/close switch). Check the cable connection and connect properly. Or do troubleshooting and replace defective part.

- **2-45306 Pulse switch test marginally passed.**

description: *PGn*

port: *Port*, **control:** *N*, **switch:** *Switch*, **expected:** *Data1*, **measured:** *Data2*

Passed in the PG controlled pulse switch test (open/close switch) but the result is nearly test limit. Check the cable connection and connect properly. Or do troubleshooting and replace defective part.

- **2-45401 PG output level test failed.**

description: *PGn*

port: *Port*, **expected:** *Data1*, **measured:** *Data2*

Failed in the PG output level test. Check the cable connection and connect properly. Or do troubleshooting and replace defective part.

- **2-45402 PG output level test marginally passed.**

description: *PGn*

port: *Port*, **expected:** *Data1*, **measured:** *Data2*

Passed in the PG output level test but the result is nearly test limit. Check the cable connection and connect properly. Or do troubleshooting and replace defective part.

- **2-45501 PG trigger test failed.**

description: *PGn*

port: *Port*, **expected:** *Data1*, **measured:** *Data2*

Failed in the PG trigger test. Check the cable connection and connect properly. Or do troubleshooting and replace defective part.

- **2-45502 PG trigger test marginally passed.**
description: *PGn*
port: *Port*, **expected:** *Data1*, **measured:** *Data2*

Passed in the PG trigger test but the result is nearly test limit. Check the cable connection and connect properly.
Or do troubleshooting and replace defective part.

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- **3-10001 System software inconsistency discovered.**
Unknown error occurred during the Agilent 4070 system software execution. Cannot continue the session.
- **3-10002 Cannot open file. filename: *File***
Could not open the file specified by *File*. Check the file name and permission of the file.
- **3-10004 An illegal format data exists. filename: *File*, data: *Data***
Tried to open file with invalid data format. Change the data format of the data *Data* in the file *File* or remake dataflow.
- **3-10006 Cannot write data to file. filename: *Filename***
Could not write data to *Filename*. Check the permission of file or directory. Or check the free disk space. File system full may cause this error.
- **3-10015 Cannot execute command. command path: *Path***
Check the *Path* command. The command may not have execute permission. If problem is not found, re-install Agilent 4070 system software.
- **3-10023 Failed to open Standard Set calibration data directory.**
Could not open `/etc/opt/hp4070/diag/caldata` directory. Check the data directory. If problem is not found in the directory, permission and so on, re-install the Agilent 4070 system software.
- **3-10024 Cannot rename file. filename: *Filename***
Could not rename the file. Check the permission of file or directory. If problem is not found, re-install the Agilent 4070 system software.
- **3-11001 Failed to write the test selection file.**
Un-specifiable error occurred during write operation of the test selection file. Check the permission of file.
- **3-11002 Failed to open temporary PVheader file.**
Could not open `/var/opt/hp4070/diag/PVheader` file. Check the free disk space. File system full may cause this error. If problem is not found, re-install the Agilent 4070 system software.
- **3-11003 pvBody4070 process is already running. Something is wrong.**
The pvBody4070 process has been started. Check the pvBody process.
- **3-11004 Failed to open pipe (errno = *N*).**
HP-UX kernel error No. *N* occurred during communication with diagnostics program. Exit from the Agilent 4070 system software environment, then log into it again. Then execute diagnostics program.
- **3-11005 Failed to invoke diagBody4070 program (errno = *N*).**
HP-UX kernel error No. *N* occurred when starting diagnostics. Check if the diagBody4070 program exists and check the permission of the program. If the program does not exist, re-install the Agilent 4070 system software. Or check the number of processes in progress, and kill unnecessary process.
- **3-13002 An error occurred in TIS.**
Error occurred in TIS. Refer to the additional messages.

- **3-16001 Memory exhausted.**

The measurement data could not be loaded because of small free memory space. Stop unnecessary applications and close windows to increase free memory.

- **3-16010 Failed to open the file. Check permission or diskette.**

The file was not loaded/saved because error occurred during load/save of file. Check the permission of the file. Or check the diskette.

- **3-16011 Failed to read the file. Check permission or diskette.**

The file was not loaded because error occurred during load of file. Check the permission of the file. Or check the diskette.

- **3-16012 Failed to write the file. Check permission or diskette.**

The file was not saved because error occurred during save of file. Check the permission of the file. Or check the diskette.

- **3-16013 Failed to end printing (errno = N).**

Error No. *N* occurred at end of printing. Cannot close the pipe for LP command.

- **3-20001 Failed to read Standard Set calibration data.**

Could not read the data file in /etc/opt/hp4070/diag/caldata directory. Check the permission of the data file and directory.

- **3-20002 Failed to write Standard Set calibration data.**

Could not write the data file in /etc/opt/hp4070/diag/caldata directory. Check the permission of the data file and directory.

- **3-20003 Failed to remove Standard Set calibration data.**

Could not remove the data file in /etc/opt/hp4070/diag/caldata directory. Check the permission of the data file and directory.

- **3-21001 No test is selected. Please select at least one test.**

No test is selected in the "Test Selection" field. Select at least one test.

- **3-21002 No SMU is selected. Please select at least one SMU.**

No SMU is selected in the "SMU Selection" field. Select at least one SMU.

- **3-21003 No Pin is selected. Please select at least one pin, chuck or input board.**

No pin is selected in the "Pin Selection" field. Select at least one pin or chuck pin.

- **3-21004 Failed to open the profile data file.**

Could not open the profile data file. Check if the file exists and permission of file or directory. If this message is displayed when you open the system default file, check the /etc/opt/hp4070/diag/PVprofile file.

- **3-21005 Failed to read the profile data file.**

Could not read the profile data file. Check if the file exists and permission of file or directory.

- **3-21006 Failed to write to the profile data file.**

Could not write the profile data file. Check if the file exists and permission of file or directory. If this message is displayed when you write the system default file, check the /etc/opt/hp4070/diag/PVprofile file.

- **3-21008 Can't read the file. The file does not exist or no read permission, or the directory does not exist.**

The file could not be read. The file or directory for the file does not have read permission. Or the directory does not exist. Check that the directory exists, and check the permission of the directory and the file.

- **3-21009 Can't write the file. The file or directory does not have write permission, or the directory does not exist.**

The file could not be written. The file or directory for the file does not have write permission. Or the directory does not exist. Check that the directory exists, and check the permission of the directory and the file.

- **3-21010 The DMM address for PV is not specified. Specify GPIB address in Configuration Window.**

- **3-21011 Standard C/R set to be used is not specified. Specify their serial numbers in Configuration Window.**

- **3-21012 Specified value for *Equipment_Name* exceeds the $\pm 5\%$ range limit against the nominal value. Set the correct value.**

- **3-21013 GPIB address must be integer value. Specify an integer value for DMM address.**

A non-integer value is specified for GPIB address. Specify an integer value.

- **3-21022 The Oscilloscope address for PV is not specified. Specify GPIB address in Configuration Window.**

No GPIB address for the 54750A or 86100A oscilloscope is specified in the Standard Selection window. Specify the GPIB address of the oscilloscope.

- **3-21023 Specified Oscilloscope GPIB address is an integer. Specify an integer value.**

Specified GPIB address value for the 54750A or 86100A oscilloscope is not integer. Specify a proper integer value for the GPIB address of the oscilloscope.

- **3-23001 ADC Board is defective or not installed.**

The high-resolution ADC board is not installed or may be defective. Install or replace the board.

- **3-23002 GNDU Board is defective or not installed.**

The GNDU board is not installed or may be defective. Install or replace the board.

- **3-23003 Chuck Connection Pin Board is defective or not installed.**

The chuck connection pin board is not installed or may be defective. Install or replace the board.

- **3-23004 LC Input Board (Port *Port_No.*) is defective or not installed.**

The low current input board is not installed or may be defective. Install or replace the board.

- **3-23005 Kelvin Input Board is defective or not installed.**

The Kelvin input board is not installed or may be defective. Install or replace the board.

- **3-23006 CMU Input Board is defective or not installed.**

The CMU input board is not installed or may be defective. Install or replace the board.

- **3-23007 Relay Test Board (Block *Block_No.*) is defective or not installed.**

The relay test board is not installed or may be defective. Install or replace the board.

- **3-23011 ADC Board attenuation factor measurement failed.**
port: *Port*, **expected:** *Data1*, **measured:** *Data2*

The high-resolution ADC board failed the attenuation factor measurement test. Follow the performance verification execution results. If all ports failed this test, replace the high-resolution ADC board.
- **3-23012 ADC Board guard amp offset measurement failed.**
port: *port*, **measured:** *Data*

The high-resolution ADC board failed the guard amplifier offset measurement test. Follow the diagnostics execution results. If all ports failed this test, replace the high-resolution ADC board.
- **3-23021 Status error occurred in SMU. port:** *port*, **status:** *Data*

Status error occurred in the SMU specified by *Port*. Check the SMU if the Agilent 4071A/4072A failed the performance verification.
- **3-23022 Status error occurred in CMU. status:** *Status*

Status error occurred in the CMU. Check the CMU if the Agilent 4071A/4072A failed the performance verification.
- **3-23023 Status error occurred in DVM. status:** *Status*

Status error occurred in the DVM. Check the DVM if the Agilent 4071A/4072A failed the performance verification.
- **3-23030 Error in iopen() on GPIB device (DMM for PV).**

An error in iopen() occurred when the PV4070 program tries to communicate the DMM (3458A). Confirm if the specified logical unit of the DMM is correct or if the SICL configuration has the specified logical unit entry.
- **3-23031 DMM for PV is not found.**

The DMM (3458A) for PV is not responded by the serial polling on the specified logical unit+GPIB address. Check the following items:
 - ☐ If the GPIB address setting of the DMM is correct.
 - ☐ If another GPIB device other than the DMM is on the specified GPIB address.
 - ☐ If the GPIB cable is not broken.
- **3-23032 The DMM address must specify both logical unit and GPIB address.**

Logical unit or GPIB address of the DMM is not specified in the Standard Selection window. Specify both the logical unit and GPIB address of the DMM.
- **3-23034 Error in iread()/iwrite() on GPIB device (DMM for PV).**

An error occurred during the HP-UX communication between the computer and the DMM (3458A). Check the following items:
 - ☐ If the GPIB cable is not broken.
 - ☐ If the GPIB interface of the computer is not broken.
 - ☐ If the GPIB interface of the DMM (3458A) is not broken.
- **3-23036 Each test pin must be connected to different connector pin.**

Multiple test pins are connected to the same connector. Change the pin assignment.

- **3-23051 HF Matrix Board *N* is defective or not installed.**

Reference configuration file (/etc/opt/hp4070/config/refconfig1) shows the existence of HF matrix board *N*, but it is not detected by the testhead firmware. HF matrix board may not be installed or may be defective. Install or replace the board.

- **3-23052 HF Matrix Addressing Board is defective or not installed.**

Reference configuration file (/etc/opt/hp4070/config/refconfig1) shows the existence of HF matrix addressing board, but it is not detected by the testhead firmware. HF matrix addressing board is not installed or may be defective. Install or replace the board.

- **3-23053 Pulse Switch *N* Board is defective or not installed.**

Reference configuration file (/etc/opt/hp4070/config/refconfig1) shows the existence of pulse switch board *N*, but it is not detected by the testhead firmware. Pulse switch board *N* is not installed or may be defective. Install or replace the board.

- **3-23054 Error in iopen() on GPIB device (Oscilloscope for PV).**

An error in iopen() occurred when the PV4070 program tried to communicate the 54750A or 86100A oscilloscope. Confirm if the specified logical unit of the 54750A or 86100A is correct or if the SICL configuration has the specified logical unit entry.

- **3-23055 Oscilloscope for PV is not found.**

The oscilloscope (54750A or 86100A) for PV is not responded by the serial polling on the specified logical unit+GPIB address. Check the following items:

- ☐ If the GPIB address setting of the oscilloscope is correct.
- ☐ If another GPIB device other than the oscilloscope is on the specified GPIB address.
- ☐ If the GPIB cable is not broken.

- **3-23056 The Oscilloscope address must specify both logical unit and GPIB address.**

Logical unit or GPIB address of the oscilloscope is not specified in the Standard Selection window. Specify both the logical unit and GPIB address of the oscilloscope.

- **3-23057 Error in iread()/iwrite() on GPIB device (Oscilloscope for PV).**

An error occurred during the HP-UX communication between the computer and the oscilloscope (54750A or 86100A). Check the following items:

- ☐ If the GPIB cable is not broken.
- ☐ If the GPIB interface of the computer is not broken.
- ☐ If the GPIB interface of the oscilloscope is not broken.

- **3-23070 Error in itimeout() on GPIB device (DMM for PV).**

- 3-23071 Error in iclear() on GPIB device (DMM for PV).**

- 3-23072 Error in itermchr() on GPIB device (DMM for PV).**

An error occurred when the computer tried to initialize the DMM (3458A). Check the following items:

- ☐ If the GPIB cable is not broken.
- ☐ If the GPIB interface of the computer is not broken.
- ☐ If the GPIB interface of the DMM is not broken.
- ☐ If the DMM is working correctly.

- **3-23080 Error in itimeout() on GPIB device (Oscilloscope for PV).**
3-23081 Error in iclear() on GPIB device (Oscilloscope for PV).
3-23082 Error in itemchr() on GPIB device (Oscilloscope for PV).

An error occurred when the computer tried to initialize the oscilloscope (54750A or 86100A). Check the following items:

- ☐ If the GPIB cable is not broken.
- ☐ If the GPIB interface of the computer is not broken.
- ☐ If the oscilloscope is working correctly.
- ☐ If the GPIB interface of the oscilloscope is not broken.

- **3-24302 Cannot find available SMU. Please check using DIAG4070.**

Could not find available SMU for calibrating the relay test board. Check the testhead configuration by using DIAG4070.

- **3-24303 Failed to calibrate a relay test board. Please check using DIAG4070.**

Could not calibrate a relay test board and could not check of measurement pin position is correct. Check the relay test board by using DIAG4070.

- **3-24501 Each test pin must be connected to different connector pin.**

Multiple test pins are connected to the same connector. Change the pin assignment.

- **3-24801 Cannot specify chuck connection pin for test pin.**

Chuck connection pin was specified to be CMU bias test pin. Set CMU bias test pin to other pin.

- **3-24901 One of 1/2/3/4/48 pin should be available for SMU Output Resistance Test.**

Check the pin board 1, 2, 3, 4 and 48 by using DIAG4070.

- **3-24902 Pin *N* is defective or not installed. SMU Output Resistance Test needs this pin board.**

The pin *N* is not installed or may be defective. Check the pin *N* by using DIAG4070.

- **3-24903 The SMU Output Resistance Test requires at least two SMUs.**

SMU is defective or at least two SMUs are not installed. Check the SMU function and configuration by using DIAG4070.

- **3-24951 Each test pin must be in different block.**

Pulse level test and pulse parameter test require that at least one pin board is installed in each matrix block of the testhead. One pin board must be installed in the slot numbers 1 to 24, and another pin board must be in the numbers 25 to 48.

- **3-24952 Each test pin must be a multiple of 4.**

Test pins specified for the pulse parameter test must be multiples of 4. That is, they are 4, 8, 12, 16, ..., 48. Check the pin configuration.

- **3-25001 Calibration Bus(block: *N*) does not have enough performance. Please check using DIAG4070.**

The calibration is discontinued because calibration bus does not have enough performance. Check the calibration bus by using DIAG4070 and calibrate again.

- **3-25002 SMU *N* does not have enough performance. Please check using DIAG4070. (*V* [V]: *I* [A], *V* [V]: *I* [A])**

The calibration is discontinued because SMU *N* does not have enough performance. Check the SMU *N* by using DIAG4070 and calibrate again.

- **3-25003 Failed to measure Reference Resistor.**
(measured: *Measured_R* [ohm], expected: *Expected_R* [ohm])

3-25004 Failed to measure Reference Resistor.
(expected: *R1* [ohm], min: *R2* [ohm], max: *R3* [ohm])

Could not measure the reference resistor. Check the cable connections, DMM for PV, and high-resolution ADC board.

- **3-25011 ADC Reference Volt measurement failed. (measured: *Measured_V* [V], expected: *Expected_V* [V]).**
3-25012 ADC B-COM Volt measurement failed.(B-COM: *V* [V])

Check the high-resolution ADC board by using DIAG4070. Or check the cable connections.

- **3-25021 ADC R Ref Calibration must be executed before SMU R Calibration.**

The R Ref Calibration was not executed before SMU Ref Calibration. Re-calibrate SMU reference by using **Cal SMU**.

- **3-25031 Vtop/Vbase measurement for skew calibration was failed. Check *PGn-HFm* connection.**

Failed to measure Vtop or Vbase value for the skew calibration. Check the cable connections between the *PGn* and *HFm*. If the skew calibration still fails with this error, check the cable connections between the PV pulse fixture and signal input connector of the oscilloscope.

- **3-25032 *PGn* delay time measurement for skew calibration was failed.**

Failed to measure delay times for the skew calibration. Check the cable connections between the *PGn* and *HFm*. If the skew calibration still fails with this error, check the cable connections between the PV pulse fixture and signal input connector of the oscilloscope.

- **3-26001 Can't read the file. The file does not exist or no read permission or illegal path name is specified. Check the path name.**
- **3-26002 Can't write the file. The file or directory has no write permission, or an illegal path name is specified. Check the path name.**
- **3-26003 Failed to initiate spooler command. Check the specified command.**
- **3-26004 Failed to print (errno = *Error*).**

Could not send the data to spooler command. Check the spooler setting.

- **3-26006 Failed to open diskette directory. Check the following:**
DOS format diskette is inserted into the disk drive.
The specified disk drive path name is correct.
The scsifloppy device driver is present in the HP-UX kernel.
The DOS-UTIL fileset is installed.
- **3-26010 File format error. Specified field delimiter is not found. Check the file format and delimiter specification.**
- **3-26011 File format error. Specified string quotation mark is not found. Check the file format and quotation specification.**
- **3-26012 File format error. Numerical value is not found in a numeric field.**

- **3-26013 File format error. No valid data.**
- **3-27001 An error occurred in Testhead. status: *Status***

Testhead timeout occurred when ADC board was calibrated. Check the ADC board, testhead CPU board and so on.
- **3-31001 File already exists. Do you want to overwrite it?**

If you want to overwrite the data, select **OK** button. If not, select **Cancel** button.
- **3-31002 The test(s) requested on non-existent resources will be ignored.**

Invalid test item, SMU, or pin number is selected. The selection is ignored.
- **3-33001 Cannot identify Pin Board. pin: *Pin***

Actual pin board configuration did not match the configuration file (/etc/opt/hp4070/config/refconfig1). Check the configuration file and define the actual configuration.
- **3-33002 Cannot identify SMU Board. port: *Port***

Actual SMU configuration did not match the configuration file (/etc/opt/hp4070/config/refconfig1). Check the configuration file and define the actual configuration.
- **3-33003 Cannot identify CMU.**

Actual CMU configuration did not match the configuration file (/etc/opt/hp4070/config/refconfig1). Check the configuration file and define the actual configuration.
- **3-33004 Cannot identify DVM.**

Actual DVM configuration did not match the configuration file (/etc/opt/hp4070/config/refconfig1). Check the configuration file and define the actual configuration.
- **3-33005 Testhead Power Line Cycle in config file does not match actual line frequency. reference: *Ref* [Hz], actual: *Act* [Hz]**

Actual line frequency did not match the configuration file (/etc/opt/hp4070/config/refconfig1). Check the configuration file and define the actual frequency.
- **3-33006 Cannot identify HF Matrix.**

The command attempts to control the HF matrix, even though the reference configuration file (/etc/opt/hp4070/config/refconfig1) has the information of no MF matrix installed. Check the following items:

 - ☐ If the command that you execute is correct.
 - ☐ If the reference configuration file includes the correct system configuration information.
- **3-33007 Cannot identify Pulse Switch.**

The command attempts to control the pulse switch, even though the reference configuration file (/etc/opt/hp4070/config/refconfig1) has the information of no pulse switch installed. Check the following items:

 - ☐ If the command that you execute is correct.
 - ☐ If the reference configuration file includes the correct system configuration information.

- **3-33088 Cannot identify PGn.**

The command attempts to control the *PGn*, even though the reference configuration file (/etc/opt/hp4070/config/refconfig1) has the information of no *PGn* installed. Check the following items:

- ☐ If the command that you execute is correct.
- ☐ If the reference configuration file includes the correct system configuration information.

- **3-36001 File already exists. Do you want to overwrite it?**

If you want to overwrite the data, click **OK** button. If not, click **Cancel** button.

- **3-41001 Is it ok to remove the Standard Set calibration data? Note that this operation is not recoverable.**

If you want to remove the data, select **OK** button. If not, select **Cancel** button.

- **3-41002 Do you want to discard all unsaved changes? Note that this operation is not recoverable.**

If you want to discard all unsaved changes, select **OK** button. If not, select **Cancel** button.

- **3-41003 The currently modified data will be lost. Do you want to save them before loading the new Standard Set data?**

If you want to save the data, select **OK** button. If not, select **Cancel** button.

- **3-45701 Relay contact check failed.**

description: *Testcase*

measured: *Data1*, **offset:** *Offset*, **Rmeas:** *Data1*, **Rlimit:** *Limit*

Failed in the contact check of the HF Matrix Relay Test. Check the connection of the short adapter. Or do troubleshooting and replace defective part.

- **3-45702 Relay stuck check failed.**

description: *Testcase*

measured: *Data1*, **offset:** *Offset*, **Rmeas:** *Data1*, **Rlimit:** *Limit*

Failed in the open check of the HF Matrix Relay Test. Do troubleshooting and replace defective part.

- **3-45801 Pulse switch test failed.**

description: *Testcase*

measured: *Data*

Failed in the pulse switch test (on/off test). Check the test lead connections and connect properly. Or do troubleshooting and replace defective part.

- **3-45901 Pulse level test failed.**

description: *Testcase*

measured: *Data*

Failed in the pulse level test. Check the connection from PGU and HF port to the signal input port of the oscilloscope. And connect properly. Or do troubleshooting and replace defective part.

- **3-45921 Pulse parameter test failed.**

description: *Testcase*

measured: *Data*

Failed in the pulse parameter test (except for overshooting). Check the connection from PGU and HF port to the signal input port of the oscilloscope. And connect properly. Or do troubleshooting and replace defective part.

- **3-45922 Pulse parameter test failed due to overshoot.**

description: *Testcase*

measured: *Data*

Failed in the pulse parameter test due to overshoot. Check the connection from PGU, HF port to 54751A. And connect properly. Or do troubleshooting and replace defective part.

4-xxxxxx

- **4-110001 Cannot make connection because no session is logged in now.**

Before starting up the IDP, you need to log in to the 4070 operating environment. Execute `hp4070 -login` command before executing `idp4070` command.

- **4-110004 Break connection because TIS Daemon process was down.**

TIS daemon was down during IDP operation. Log in to the 4070 again, and execute `idp4070` command.

- **4-110005 Cannot send event data to idp4070.**

IDP was down abnormally. Exit IDP by choosing File: Exit menu on the IDP window.

- **4-120001 Cannot allocate memory for reading last measurement data.**

The measurement data could not be loaded when choosing File: Open Last Test menu on the Graph window of IDP because of small free memory space. Stop unnecessary applications and close windows to increase free memory size.

- **4-202004 Allocation size is too large. Ignored.**

Tried to load data file that was edited or broken. Internal error. Number of vector data is larger than the allocated size. Excess data is not set.

- **4-202005 Data size is larger than allocated size. The data is ignored.**

Tried to load data file that was edited or broken. Internal error. Tried to set number of vector data that was negative number. No action.

- **4-202006 Invalid block number is selected. Ignored.**

Internal error. Block number of the data block to be cleared is a negative number or over the maximum number. No action.

- **4-202007 Selected block size is too large. Last selected block is ignored.**

Tried to load data file that was edited or broken. Internal error. Too large block size was specified for block selection. The block is not selected.

- **4-202009 Measurement vector number is invalid. The vector is ignored.**

Tried to load data file that was edited or broken. Internal error. Tried to set number of the vector data that is negative number, zero, or over the number of registered data. The vector data is not set.

- **4-205011 Warning: Illegal data format in data file. Ignored. Too long line. Line = *Line_No.***

Data file to be loaded was edited or broken. Number of characters in line *Line_No.* of data file to be loaded was over 128 characters. The line is ignored. Delete the line or edit the line so that it is 128 or less characters.

- **4-205012 Warning: Too many data in one data block: <= 2002 data per data block. Used only the first 2002 data.**

Data file to be loaded was edited or broken. Number of data in a vector data is over 2002. Only the first 2002 data are loaded. Delete the excess data so that number of data is 2002 or less.

- **4-205013 Warning: Bad data Tag found in data file. Ignored. Line = *Line_No.***

Data file to be loaded was edited or broken. Invalid specifier was used in line *Line_No.* of the data file. The line is ignored. Delete the line. Or edit the data file. Use ":" (colon)", for example, "BX:", "BY:" and so on, to indicate the specifiers.

- **4-205014 Warning: Cannot use Attributes Tag in data block portion. Ignored. Use this Tag in header portion of data file. Line = *Line_No.***
Data file to be loaded was edited or broken. Attribute tag is inserted in line *Line_No.* of the data file to be loaded. The line is ignored. Delete the line.
- **4-205015 Warning: Illegal data format in data file. Ignored. Line = *Line_No.***
Data file to be loaded was edited or broken. Non-numeric data is included in line *Line_No.*. The line is ignored. Delete the non-numeric data, or exchange it with the numeric data.
- **4-205016 Warning: Illegal range format in data file for *Data*. Ignored. Line = *Line_No.***
Data file to be loaded was edited or broken. Could not get the data from the lines #XI, #X and #Y for graph in the data file. The line *Line_No.* is ignored. Delete the line. Or edit the file and insert the proper value.
- **4-205018 Warning: Illegal Character in data file for *Data*. Used NULL String. Line = *Line_No.***
Data file to be loaded was edited or broken. Invalid character was used in line *Line_No.*. The line is ignored. Edit the file. Numeric characters, and '-' (minus), '+' (plus), '_' (underscore), ' ' (space), '.' (period) and ',' (comma) are allowed for the data.
- **4-205019 Warning: Illegal string description in data file. Ignored. Line = *Line_No.***
Data file to be loaded was edited or broken. Strings are not enclosed by double quotations ("). The line *Line_No.* is ignored. Edit the file and properly enclose the strings by double quotations.
- **4-205101 Warning: Bad data range for Log scale;Axis. Turned off log scale mode.**
Tried to set minimum value or maximum value of X axis or Y axis in log scale to 0 or negative value. Graph scale is set to linear scale automatically. The data must be positive value for log scale.
- **4-205102 Warning: Bad data for Log scale. Turned off log scale mode.**
Tried to set X-axis data or Y-axis data in log scale to negative value. Graph scale is set to linear scale automatically. The data must be positive value for log scale.
- **4-205103 Warning: Bad range for scale. Set previous value.**
Difference between maximum value and minimum value of the graph is almost 0. Minimum value and maximum value are set to the previous values automatically. Specify a bigger difference.
- **4-205112 Warning: No Y data. Cannot plot any data.**
Data file to be loaded was edited or broken. Internal error. Y vector data does not exist although X vector data exists. Graph does not plot any data. Create one Y vector data at least.
- **4-211000 Can't open file.**
Error occurred during loading/saving the IDP data file. The data file is not loaded/saved. Confirm that the directory for the data file exists, and the permission of the directory and the data file.
- **4-211001 Can't write file.**
Error occurred while saving the IDP data file. The data file is not saved. Confirm that there is sufficient free disk space. Prepare approximately 10 KByte for one IDP data file.
- **4-211002 Can't read file.**
Size of the data file is less than the size of IDP data file. The data file is not loaded. Specify the IDP data file name properly. If the file was edited, the file cannot be loaded.

- **4-211003 Saving to a file is not allowed when some resource fields are modified.**

Tried to save the IDP data file before setup was completed (clicking **Set** button) on the IDP window. The data file is not saved. Close the Save Dialog and click **Set** button. Then save the data file.

- **4-211004 File format revision mismatch. Can't read the file.**

Tried to load data file, but did not match the IDP data format. The data file is not loaded. Specify the file name of the IDP data. If the IDP data file was edited and changes made, the data file cannot be loaded.

- **4-211005 Can't close the resource display when some resource fields are modified.**

Tried to delete a resource from the Resource Selection dialog before setup for the resource was completed (clicking **Set** button) on the IDP window. The resource is not deleted from the Resource Selection dialog. Close the Resource Selection dialog, click **Set** button. Then delete the resource from the Resource Selection dialog.

- **4-211006 Can't open last measurement data. *Test_name* doesn't create array data.**

4-211007 Can't open last measurement data. No measurement has been performed.

4-211008 Can't open last measurement data. There is no measurement data. The measurement might have been executed on offline system.

Data on the Graph window does not change. Before choosing File: Open Last Test menu, you must execute measurement that makes array data.

File: Open Last Test menu on the Graph window is used to display array data that was measured in the On-line mode.

- **4-212001 Cannot create measurement blocks.**

Number of measurement data exceeds the maximum number. Measurement block is not created. Clear the data loaded on the Graph.

- **4-212002 Cannot create vector data blocks.**

Tried to load data file that was edited or broken. Internal error. Number of data for vector data is zero, negative number, or exceeds the maximum number. No action.

- **4-212003 Cannot allocate data.**

Tried to load data file that was edited or broken. Internal error. Tried to create data with negative number or over the maximum number.

- **4-215100 Error: Data block index value must be 1 to 7.**

Tried to load data file that was edited or broken. Internal error. Data block index value must be 1 to 7.

- **4-215150 Error: Bad file name: May be too long file name or no suffix;*File_name*.**

Name of file to load is too long or no suffix. The file is not loaded. Enter the proper name for the file on the Load dialog, and try to load the file again.

- **4-215151 Error: Bad file suffix.**

Suffix of the file name entered is not '.dpg' or '.dps'. The file is not loaded. Enter the proper name for the file in the Load Dialog, and try to load the file again.

- **4-215152 Error: Bad file type; not an ordinary file.**

File is not ASCII file. The file is not loaded. Enter the proper name for the file in the Load Dialog, and try to load the file again.

- **4-215155 Error: Too long file path name. Maximum 1018 characters.**

File name over 1018 characters was entered. The file is not saved. Use file name with 1018 or less characters and try to save the file again.

- **4-215156 Error: Specified path name is too long. Only the leading 1023 characters are used.**
Path name over 1023 characters was entered. The file is not saved. Use path name with 1023 or less characters and try to save the file again.
- **4-215301 Error: Syntax error in dump command; *Command*.**
Syntax error occurred in dump command. Enter the proper command for dump/print.
- **4-215303 Error: Cannot generate PostScript code.**
Temporary PostScript file could not be created. Secure enough free disk space for temporary file.
- **4-225001 System Error: Cannot open data file; *File_name*.**
Specified data file does not exist, improper directory is specified, or temporary file for dump cannot be created. Check the name of data file, or permission of the file and directory. Or secure enough free disk space for temporary file.

5-xxxxx

- **5-10001 Cannot make connection with TIS Daemon. No session or environment variable PCS_SESSION_ID is not properly set.**

Execute hp4070 -login command. Or confirm the setting of the environmental variable PCS_SESSION_ID.

- **5-10002 Cannot allocate memory. Please quit and try again.**

To allocate memory, stop the action and try it again.

- **5-10003 Environmental variable: PCS_SESSION_ID is not set.**

Quit from the 4070 operating environment, set PCS_SESSION_ID, and then log in again.

6-xxxxx

- **6-20001 Cannot translate 4062 port address into 4070 port address.**
Specified port address for the 4062 could not be translated to the 4070 port address. Check the port address, and specify the correct port address.
- **6-20002 Invalid port is assigned.**
Specified port address is not correct. Confirm the port address.
- **6-20003 Invalid pin is assigned.**
Specified pin number is not correct. Confirm the pin number.
- **6-20004 [F_ROM] Pin number must be 0 to 48.**
Pin number must be 0 to 48. Enter a valid value.
- **6-20005 Specified pin board is defective or not installed.**
Pin board for the specified pin number is not installed or defective. Confirm the pin board configuration. hp4070 -login command displays the 4070 system configuration.
- **6-20006 From_pin is out of range.**
Pin number assigned for the *first pin* parameter of the Connect_th command is not correct. Confirm the pin number.
- **6-20007 To_pin is out of range.**
Pin number assigned for the *last pin* parameter of the Connect_th command is not correct. Confirm the pin number.
- **6-20008 1st parameter must be 1 (connect) or 0 (disconnect).**
Wrong value was specified for the first parameter of Tap_port command. The value must be 0 (disconnect) or 1 (connect). Check the value and specify the proper value.
- **6-20009 2nd parameter must be port address of SMU/AUX port 1 or 2.**
Wrong value was specified for the second parameter of Tap_port command. The value must be the port address of SMU port 1 or 2, or AUX port 1 or 2. Check the value and specify the proper value.
- **6-20010 3rd parameter must be port address of SMU/AUX port 1 or 2.**
Wrong value was specified for the third parameter of Tap_port command. The value must be the port address of SMU port 1 or 2, or AUX port 1 or 2. Check the value and specify the proper value.
- **6-20011 Improper SMU voltage range specified.**
Voltage range setting for SMU is not correct. Check the value of the output voltage and the voltage range, and specify the proper value.
- **6-20012 Improper SMU voltage source, voltage output range, or compliance specified.**
Output voltage value, voltage output range, or current compliance value are not correct. Verify the values of output voltage, voltage output range, and current compliance and then specify the correct value.
- **6-20013 Improper SMU current range specified.**
Current range setting of SMU is not correct. Check the value of the output current and the current range, and specify the proper value.

- **6-20014 Improper SMU current source or compliance specified.**

Value of output current or voltage compliance is not correct. Check the value of output current and voltage compliance, and specify the proper value.

- **6-20015 Specified SMU is defective or not installed.**

Specified SMU board is not installed or defective. Confirm the SMU configuration. `hp4070 -login` command displays the 4070 system configuration.

- **6-20016 Source pin must be connected to an SMU.**

Specified pin board is not connected to SMU. Check the measurement program. The program must have a program line that connects the SMU to the pin board *before* the program line that forces the output of the SMU specified by the pin number.

- **6-20017 Source port must be an SMU or a pin connected to an SMU.**

Source port address used in the `Force_meas` command is not correct. Source port address must be SMU port address or the pin number of the pin board connected to the SMU. Check the port address and specify the proper value.

- **6-20018 Measure pin must be connected to an SMU.**

Specified pin board is not connected to SMU. Check the measurement program. The program must have a program line that connects the SMU to the pin board *before* the program line that performs measurement using the SMU specified by the pin number.

- **6-20019 Measure port must be an SMU or a pin connected to an SMU.**

Measurement port address is not correct. Measurement port address must be SMU port address or the pin number of the pin board connected to the SMU. Check the port address and specify the proper value.

- **6-20020 3rd parameter must be 1 (voltage source) or 2 (current source).**

Wrong value was specified for the third parameter of `Force_meas` command. The value must be 1 (voltage source) or 2 (current source). Check the value and specify the proper value.

- **6-20021 Wait time must be 0 to 655.35 sec.**

Specified value for the wait time is out of range. The value must be 0 to 655.35 seconds. Check the value and specify the proper value.

- **6-20022 Hold time must be 0 to 655.35 sec.**

Specified value for the hold time is out of range. Available value for the hold time is 0 to 655.35 sec. Check the value and specify the proper value.

- **6-20023 Port must be CMH when forcing voltage on CMU.**

Invalid port was specified for the `Force_v` command. When setting the dc bias of CMU, the CMH port address must be specified. Check the port address and specify the correct port.

- **6-20024 Wait time must be 0 to 655.35 sec.**

Wait time value is not correct. Available value for the wait time is 0 to 655.35 sec. Check the value and specify the proper value.

- **6-20025 Size of port array must be greater than or equal to 1.**

No port is defined for the array used to specify the multiple ports. Check the value and size of the array, and define the array properly.

- **6-20026 1st parameter must be an SMU port address or a pin connected to an SMU.**
Wrong value was specified for the first parameter of the `Stand_by_port` command. The value must be the SMU port address or the pin number of the pin board connected to the SMU. Check the value and specify the value properly.
- **6-20027 2nd parameter must be an SMU port address or a pin connected to an SMU.**
Wrong value was specified for the second parameter of the `Stand_by_port` command. The value must be the SMU port address or the pin number of the pin board connected to the SMU. Check the value and specify the value properly.
- **6-20028 3rd parameter must be an SMU port address or a pin connected to an SMU.**
Wrong value was specified for the third parameter of the `Stand_by_port` command. The value must be the SMU port address or the pin number of the pin board connected to the SMU. Check the value and specify the value properly.
- **6-20029 Nth parameter must be an SMU port address or a pin connected to an SMU.**
Wrong value was specified for the *N*th parameter of the `Stand_by_port` command. The value must be the SMU port address or the pin number of the pin board connected to the SMU. Check the value and specify the value properly.
- **6-20030 Cannot connect Extended I/O port to the Chuck terminal.**
Cannot specify Extended Path port for the `Connect_chuck` command. Specify an SMU, GNDU, or AUX port address for the `Connect_chuck` command.
- **6-20031 Ports must be SMU or CMU.**
Invalid port was specified for the `Disable_port` command. Must specify an SMU or CMU port address, or the pin number of a pin board connected to the SMU or CMU. Check the port value and specify the port properly.
- **6-20032 Adc must be 0 (ADC_PERCH) or 1 (ADC_REF).**
Wrong value was specified for the parameter to select ADC. The value must be 0 (high-speed ADC) or 1 (high-resolution ADC). Check the value and specify the value properly.
- **6-20033 Filter must be 0 (FILTER_OFF) or 1 (FILTER_ON).**
Wrong value was specified for the parameter to select SMU filter status. The value must be 0 (filter off) or 1 (filter on). Check the value and specify the value properly.
- **6-20034 Wait time ratio must be 0.0 to 10.0.**
Wrong value was defined for the wait time factor. The value must be 0 to 10. Check the value and specify the value properly.
- **6-20035 Integration time mode setting must be 0, 1, 2, or 3.**
Wrong value was specified for the mode parameter of the `Set_smu` or the `Set_adc` command. The value must be 0 (manual), 1 (short), 2 (medium) or 3 (long). Check the value and specify the proper value.
- **6-20036 Averaging or integration time is out of range.**
Wrong value was specified for the integration time or averaging parameter of the `Set_adc` or the `Set_smu` command, or the integration time parameter of the `Set_adc3458` command. Check the value and specify the proper value.

- **6-20037 Autozero must be 0 (AUTOZERO_OFF) or 1 (AUTOZERO_ON).**

Wrong value was specified for the auto zero parameter of the `Set_adc` or the `Set_adc3458` command. The value must be 0 (auto zero off) or 1 (auto zero on). Check the value and specify the proper value.

- **6-20038 Port must be an SMU or a pin connected to an SMU.**

Port address setting is not correct. The port address must be the SMU port address or the pin number of the pin board connected to the SMU. Check the value and specify the proper value.

- **6-20039 Port must be an SMU or a pin connected to an SMU.**

Port address setting is not correct. The port address must be the SMU port address or the pin number of the pin board connected to the SMU. Check the value and specify the proper value.

- **6-20040 Search mode must be 0 to 15 for `Set_bsearch`, 0 to 11 for `Set_lsearch`.**

Wrong value was specified for the search mode parameter of the `Set_lsearch` or the `Set_bsearch` command. The search mode value for the `Set_lsearch` must be 0 to 11, and the value for the `Set_bsearch` must be 0 to 15.

- **6-20041 Upper search boundary is equal to lower search boundary.**

Same value was set for the start/stop parameters of the `Set_lsearch` command or the min/max parameters of the `Set_bsearch` command. Start (or min) value must be different from the stop (or max) value.

- **6-20042 Step value must be greater than 0 for `Set_lsearch` or `Set_bdv_search`.**

Wrong value was specified for the step parameter for the `Set_lsearch` or the `Set_bdv_search` command. The value must be greater than 0.

- **6-20043 Target value must be less than measurement compliance.**

Too large value was specified for the target parameter of the `Set_lsearch` or the `Set_bsearch` command. The value must be less than the value of the compliance parameter.

- **6-20044 Convergence condition in Accuracy mode must be 0 to 100.**

Value of the convergence condition parameter of the `Set_bsearch` command in the Accuracy mode is out of range. The value must be 0 to 100.

- **6-20045 Convergence condition in Times mode must be 0 to 16.**

Value of the convergence condition parameter of the `Set_bsearch` command in the Times mode is out of range. The value must be 1 to 16.

- **6-20046 Delay time must be 0 to 65.535 sec.**

Setting value of the delay time is out of range. The value must be 0 to 65.535 sec. Check the value and specify the proper value.

- **6-20047 Skip_back value must be 0 to 100.**

Wrong value was specified for the skip back parameter of the `Set_lsearch` command. The value must be 0 to 100.

- **6-20048 `Set_skip` may not be used with `Set_bsearch` or `Set_bdv_search`.**

Cannot use the `set_skip` command with the `set_bsearch` or the `Set_bdv_search` function in C language programming environment. Use the `set_skip` command with the `set_lsearch`.

- **6-20049 Set_bsearch or Set_lsearch is not called before Search is called.**

Before executing Search command, the Set_lsearch or the Set_bsearch command must be executed to define the search measurement setup. The setup defined by the Set_lsearch or the Set_bsearch command is canceled by the Init_system command.

- **6-20050 Compliance mode is not available for voltage measurement of Set_lsearch.**

For the search mode 8 to 11 (compliance mode) of the Set_lsearch command, the output mode of sense port SMU must be set to VF (voltage force) mode. Before executing the Set_lsearch command, enter statement (for example, Force_v) to set the SMU output mode to VF mode.

- **6-20051 Sweep mode setting must be -4 to 4 (integer).**

Improper sweep mode was specified for the Set_iv or the Set_piv command. The value must be -4 (Current, log, double), -3 (Voltage, log, double), -2 (Current, log, single), -1 (Voltage, log, single), 1 (Voltage, linear, single), 2 (Current, linear, single), 3 (Voltage, linear, double), or 4 (Current, linear, double). Check the sweep mode setting and set the proper mode.

- **6-20052 Number of steps must be 2 to 1001.**

Improper number of steps was specified for the Set_iv or the Set_piv command. Value must be 2 to 1001. Check the value and set the proper value.

- **6-20053 Improper power compliance is specified.**

Setting of the power compliance is out of range. Check the value and set the proper value.

- **6-20054 Sweep stop mode must be 1 (continue on error) or 2 (stop on error).**

Improper stop mode was specified for the sweep measurement command. The value must be 1 (continue on error) or 2 (stop on error). Check the setting and set the proper value.

- **6-20056 Measurement mode must be 1 (voltage) or 2 (current).**

Improper measurement mode was specified for the Sweep_iv or the Rsweep_iv command. The value must be 1 (voltage measurement mode) or 2 (current measurement mode).

- **6-20057 Start and stop values have different polarity.**

In the logarithmic sweep measurement mode, polarity of the start and stop value must be the same.

- **6-20058 Hold time must be 0 to 655.35 sec.**

Setting of hold time is wrong. The value must be 0 to 655.35.

- **6-20059 Difference of start and stop must be greater than *Voltage***

For the Set_bdv command, the difference between the *start* value and the *stop* value must be 10 V or more.

For the Set_ileak command, the difference between the *output voltage* value and the *start* value must 10 V or more.

- **6-20060 Detection interval mode must be 0 (short) or 1 (long).**

Improper *detection interval* was specified for the Measure_bdv or the Measure_ileak command. The value must be 0 (short mode) or 1 (long mode).

- **6-20061 Skip value must be 1 to 20000.**

Improper *skip* value was specified for the Set_lsearch command. The value must be 1 to 20000.

- **6-20062 Target value must be less than the sense port compliance.**

Improper target value was specified for the `Set_lsearch` command. The value must be less than compliance of sense port.

- **6-20063 Sync port must have the same V/I output mode as the control variable.**

SMU output mode of the sync SMU defined for the `Set_sync` command must be the same output mode of the search SMU defined for the `Set_bsearch` or the `Set_lsearch` command. Set the SMU output mode of the sync SMU by entering the `Force_v` or the `Force_i` command before entering the `Set_sync` command.

The `Force_v` command is used to set the voltage output mode, and the `Force_i` command is used to set the current output mode.

- **6-20064 Improper synchronous search offset value is specified.**

Offset value of the `Set_sync` command is out of range. Or the offset value is not correct for the settings of the start/stop values of the `Set_lsearch` command or the min/max values of the `Set_bsearch` command. Set the proper value.

- **6-20066 Offset value of synchronous search port or compliance is improper.**

Sync port SMU output did not match to the compliance value. Check the offset and compliance values of the `Set_sync` command, and the start/stop values of the `Set_lsearch` command or the min/max values of the `Set_bsearch` command, and set the proper value.

- **6-20067 Synchronization polarity mode must be 0 (positive) or 1 (negative).**

Improper synchronization polarity mode was specified for the `Set_sync` command. The value must be 0 (positive sync) or 1 (negative sync).

- **6-20068 Synchronous sweep ratio must be 0.01 to 10.0.**

Improper synchronous sweep ratio value was specified for the `Set_sync` command. The value must be 0.01 to 10.0.

- **6-20069 Improper synchronous sweep offset value specified.**

Improper synchronous sweep offset value was specified for the `Set_sync` command. Check the value and set the proper value.

- **6-20070 Calculated start, stop or compliance of synchronous sweep is improper.**

Sync port SMU output is out of range, or does not match to the compliance value. Check the offset, ratio and compliance values of the `Set_sync` command, or the start/stop values of the command for sweep measurement.

- **6-20071 Measurement mode must be 0 (linear) or 1 (saturation).**

Invalid mode was specified for the `Measure_vth` command. The mode must be 0 (linear region) or 1 (saturation region).

- **6-20072 Number of points must be 2 to 20.**

Invalid number of points was specified for the `Measure_vth` command. The number of points must be 2 to 20.

- **6-20073 Compliance must be specified when SMU V/I output mode is changed.**

In the optimization level is 2 or 3, compliance value cannot be omitted for a command (`Force_v`, `Force_i`, etc.) that changes the SMU output mode. Confirm the optimization level and set the compliance value properly.

- **6-20074 Invalid pin number specified for Hpin.**

Invalid pin number was specified for the CMU high port of the `Corr_cmu` command. Check the pin number and set the correct number.

- **6-20075 Invalid pin number specified for Lpin.**

Invalid pin number was specified for the CMU low port of `Corr_cmu` command. Check the pin number and set the correct number.

- **6-20076 C Compensation file is not loaded.**

TIS command requires that capacitance compensation was executed before loading the capacitance compensation data file. Check `/etc/opt/hp4070/ccdata` file and `/etc/opt/hp4070/ccdata0` file, and the permission of the files.

- **6-20077 Cp should not be 0.**

Cp value of the `Conv_mode` command was set to zero. Cp value must not be zero.

- **6-20078 Proper sweep measurement is not done.**

`Status_miv` command could not read the measurement status of the last sweep measurement. Sweep measurement was not done properly. Check the measurement program. Or sweep measurement may be now in progress.

- **6-20079 Current is too large.**

Too large current value was set for the `Set_bdv` command. Set the proper value.

- **6-20080 Vg_start and Vg_stop should not be same.**

Same value was set for gate start and stop voltages of the `Set_vth` command. The same value cannot be set for these parameters. Set the values properly.

- **6-20081 Gate step voltage value must be greater than 0 V.**

Gate step voltage must be greater than 0 V for the `Set_vth` command. Set the value correctly.

- **6-20082 Id_start must be less than measurement port compliance.**

Drain search start current of the `Set_vth` command must be less than the compliance value of the measurement port. Set the value properly.

- **6-20083 Delay time must be 0 to 65.535 sec.**

Delay time value of the `Set_vth` command is out of range. Value must be 0 to 65.535 seconds. Set the value properly.

- **6-20084 Vg Skip_back value must be 0 to 100.**

Vg Skip_back value of the `Set_vth` command is out of range. Value must be 0 to 100. Set the value properly.

- **6-20085 Vg Skip value must be 1 to 20000.**

Vg Skip value of the `Set_vth` command is out of range. Value must be 1 to 20000. Set the value properly.

- **6-20086 Id_start value must be -0.1 to 0.1 A.**

Drain start current value of the `Set_vth` command is out of range. Value must be -0.1 to 0.1 A. Set the value properly.

- **6-20090 Sweep_miv or Rsweep_miv can be used with Set_iv, not Set_piv.**

Sweep_miv and Rsweep_miv commands for the multi-channel sweep measurement can only be used for sweep that was set up by the Set_iv command. The commands cannot be used with pulsed sweep, which is set up by the Set_piv command. Check and change the program.

- **6-20100 Measurement port is not connected to any pins.**

Measurement SMU port is not connected to any pin board. Connect the SMU to the measurement pin.

- **6-20101 Sweep port is not connected to any pins.**

Sweep measurement SMU port is not connected to any pin board. Connect the SMU to the measurement pin.

- **6-20102 The synchronous sweep port is not set up.**

An array was specified in the Sweep_miv command for returning source values of synchronous sweep port, but synchronous port was not set up. Either delete the array name from the Sweep_miv or set up synchronous sweep port by using the Set_sync.

- **6-20103 The synchronous sweep port is not connected to any pins.**

Synchronous sweep port is not connected to any pin board. Connect the SMU to the measurement pin.

- **6-20120 Force mode must be 1 (voltage force) or 2 (current force).**

Improper mode was specified for the force mode of the Set_pbias command. The value must be 1 (voltage force) or 2 (current force).

- **6-20121 Pulse sweep mode setting must be -4 to 4 (integer).**

Improper *pulse sweep mode* was specified for the Set_piv command. The value must be 1 (linear voltage), 2 (linear current), 3 (linear voltage double), 4 (linear current double), -1 (logarithmic voltage), -2 (logarithmic current), -3 (logarithmic voltage double), or -4 (logarithmic current double).

- **6-20122 Measurement mode must be 1 (voltage) or 2 (current).**

Improper *measurement mode* was specified for the Measure_p command. The value must be 1 (voltage measurement) or 2 (current measurement).

- **6-20123 Peak and base current must have the same polarity.**

For current, the *pulse base* and *pulse peak* values must be the same polarity for the Set_pbias command. Check the values and set the proper values.

- **6-20124 Peak, start and stop current must have the same polarity.**

For current, *pulse base*, *start value*, and *stop value* must be the same polarity for the Set_piv command. Check the values and set the proper values.

- **6-20125 Width value must be 0.0005 to 2 sec.**

Pulse width value is out of range. Value must be 0.0005 to 2 sec with 0.0001 sec resolution. Set the correct value.

- **6-20126 Period value must be 0.005 to 5 sec.**

Pulse period value is out of range. Value must be 0.005 to 5 sec with 0.0001 sec resolution. Set the correct value.

- **6-20128 Period value must be greater than width + 2ms.**

Pulse period value must be greater than pulse width + 2 ms. Set the pulse period or pulse width value correctly.

- **6-20200 Set_pbias must be executed before Measure_p.**
No setup for the Measure_p command. Execute the Set_pbias command before executing the Measure_P command.
- **6-20201 Set_iv or Set_piv must be executed before Sweep_iv.**
No setup for the Sweep_iv command. Execute the Set_iv or the Set_piv command before executing the Sweep_iv command.
- **6-20202 No measurement to stop by Rsweep_stop.**
No real time sweep measurement to stop. Rsweep_stop is used for stopping *real-time* sweep measurements only.
- **6-20203 Set_iv or Set_piv must be executed before Rsweep_iv.**
No setup for the Rsweep_iv command. Execute the Set_iv or the Set_piv command before executing the Rsweep_iv command.
- **6-20204 Set_iv must be executed before Rsweep_miv.**
No setup for the Rsweep_miv command. Execute the Set_iv command before executing the Rsweep_miv command.
- **6-20205 Set_iv must be executed before Sweep_miv.**
No setup for the Sweep_miv command. Execute the Set_iv command before executing the Sweep_miv command.
- **6-20206 Set_lsearch, Set_bsearch, or Set_bdv_search must be executed before Search or Search_iv.**
No setup for the Search or the Search_iv command. Execute the Set_lsearch, Set_bsearch, or Set_bdv_search command before executing the Search or the Search_iv.
- **6-20207 Synchronous port must be different from the primary sweep port.**
Must use different SMU ports for the primary sweep port and synchronous port.
- **6-20208 Synchronous port must be different from the primary search port.**
Must use different SMU ports for the primary search port and synchronous port.
- **6-20209 No sweep or search setup was set before Set_sync.**
No setup for the Set_sync command. Execute the Set_iv, the Set_piv, the Set_bsearch, or the Set_lsearch command before executing the Set_sync command.
- **6-20210 Set_bdv must be executed before Measure_bdv.**
No setup for the Measure_bdv command. Execute the Set_bdv command before executing the Measure_bdv command.
- **6-20211 Set_ileak must be executed before Measure_ileak.**
No setup for the Measure_ileak command. Execute the Set_ileak command before executing the Measure_ileak command.
- **6-20212 Set_lsearch, Set_bsearch, or Set_bdv_search must be executed before Rsearch or Rsearch_iv.**
No setup for the Rsearch or the Rsearch_iv command. Execute the Set_lsearch, the Set_bsearch, or the Set_bdv_search command before executing the Rsearch or the Rsearch_iv.

- **6-20213 No measurement to stop by Rsearch_stop.**
No real time search measurement to stop. Rsearch_stop is used for stopping *real-time* search measurements only.
- **6-20214 Set_vth must be executed before Measure_vth.**
No setup for the Measure_vth command. Execute the Set_vth command before executing the Measure_vth command.
- **6-20215 Synchronous port must be different from the pulse bias port.**
Must use different SMU ports for the pulse bias port and synchronous port.
- **6-20216 Pulse bias port must be different from the Synchronous port.**
Must use different SMU ports for the synchronous port and the pulse bias port.
- **6-20220 Cannot call Status_miv during a sweep measurement.**
Cannot execute the Status_miv command while *real-time* sweep measurement is executing.
- **6-20221 Fine search start current value must be smaller than breakdown current value.**
The current value for fine search start must be smaller than the breakdown current value which sets compliance of an SMU in the Set_bdv_search command.
- **6-20222 Fine search start current and breakdown current must have the same polarity.**
The setup current values for fine search start and breakdown current must be the same polarity for the Set_bdv_search command. Check the polarity and set the correct values.
- **6-20223 Cannot omit fine search start parameter.**
Fine search start value must be specified when the skip parameter value is greater than 1 for the Set_bdv_search command.
- **6-20224 Compliance check delay time must be 0 to 65.535 sec.**
Setting value for compliance check delay is out of range. The value must be 0 to 65.535 sec. Check the value and specify it correctly.
- **6-20301 Invalid mode number specified.**
Mode number specified in the Set_rangemode is incorrect. The mode number must be 0 or 1.
- **6-20402 Integration time mode setting must be 0, 1, 2, 3, or 4.**
Integration time mode setting must be 0, 1, 2, 3, or 4. Enter a valid value.
- **6-20403 Must specify integration time mode setting for higher current range (0, 1, 2, 3, or 4).**
The integration time mode is not set for the higher current range. You must specify the integration time.
- **6-21001 Specified pin is not connected to any ports.**
Pins specified by the Disable_port command are not connected to any port. Specify the pin number of a pin board that is connected to a port.
- **6-21002 SMU output voltage incompatible with set voltage range.**
Wrong value was set for the SMU output voltage and voltage range. Set the values properly.
- **6-21003 SMU output current incompatible with set current range.**
Wrong value was set for the SMU output current and current range. Set the values properly.

- **6-22001 CMU bias voltage must be –40 to 40 Vdc.**
Wrong value was specified for the bias voltage of CMU. The value must be 0 to ± 40 Vdc for 4284A equipped with option 001.
- **6-22002 CMU bias voltage must be –2, –1.5, 0, 1.5, or 2 Vdc.**
Wrong value was specified for the bias voltage of CMU. The value must be 0, ± 1.5 , or ± 2 Vdc for 4284A without option 001.
- **6-22003 CMU integration time mode setting must be 1, 2, or 3.**
Invalid parameter was set for the integration time of the Set_cm84 command. The value must be 1 (short), 2 (medium) or 3 (long).
- **6-22004 CMU signal level must be 0.005 V or more.**
Too small value was set for the signal level by the Set_cm84 command. The value must be greater than 0.005 V.
- **6-22005 CMU signal level must be 20.0 V or less.**
Too large value was set for the signal level by the Set_cm84 command. The value must be 20 V or less for 4284A equipped with option 001.
- **6-22006 CMU signal level must be 2.0 V or less.**
Too large value was set for the signal level by the Set_cm84 command. The value must be 2 V or less for 4284A without option 001.
- **6-22007 CMU frequency must be 19.8 Hz or more.**
Too small value was set for the measurement frequency of CMU. The value must be 19.8 Hz or more.
- **6-22008 CMU frequency must be 1 MHz or less.**
Too large value was set for the measurement frequency of CMU. The value must be 1 MHz or less.
- **6-22009 CMU is defective or not installed.**
CMU (4284A) is not installed in the 4070, or may be defective. Execute hp4070 -login command and check the configuration of the 4070. If necessary, do the diagnostics.
- **6-22010 There is no capacitance and conductance data in buffer.**
Capacitance/conductance measurement was not executed properly. CMU (4284A) may be defective. Do the diagnostics.
- **6-22011 Set_cv84 must be executed before Sweep_cv84.**
No setup for the Sweep_cv84 command. Execute the Set_cv84 command before executing the Sweep_cv84 command.
- **6-22012 Number of C-V sweep steps must be 2 to 1001.**
Number of steps for the Set_cv84 command is out of range. The value must be 2 to 1001.
- **6-22013 Hold time and delay time must be 0.0 to 650.0 sec.**
Hold time or delay time value of the Set_cv84 command is out of range. The value must be 0.0 to 650.0.
- **6-22014 4284A option 001 is not present.**
C-V sweep measurement needs 4284A equipped with the option 001. Execute hp4070 -login command and check the configuration of the 4070.

- **6-23001 DVM is defective or not installed.**

DVM (3458A) is not installed in the 4070, or may be defective. Execute `hp4070 -login` command and check the configuration of the 4070. If necessary, do the diagnostics.

- **6-23002 DVM is not set to DC voltage measurement mode.**

DVM (3458A) is not in the dc voltage measurement mode. Set the mode correctly using front panel or GPIB command. Or DVM may be defective. If necessary, do the diagnostics.

- **6-23003 DVM GPIB address is not set or invalid.**

`Address3458` command was executed even though the DVM (3458A) is not installed in the 4070. Confirm the measurement program.

- **6-23100 Failed to call `igpiibusstatus()`.**

GPIB interface card may be defective.

- **6-24001 Testhead Power Fail state.**

Testhead is turned off. Turn on the testhead. If testhead cannot turn on, check the testhead power supply.

- **6-24002 Testhead Emergency state.**

Testhead is in the emergency status. Do the diagnostics.

- **6-25000 *Command* is UNSUPPORTED.**

The 4070 system software does not support the command specified by *Command*. Do not use *Command*.

- **6-25001 Improper PGU unit address *Address*. Enter correct value.**

The available value depends on the configuration of the PGUs. To get the unit address from the port number, use `FNPort` or `PORT`.

- **6-25002 No PGU on the unit address. Enter correct value or check PGU.**

There is no PGU on the unit address you specified, or the PGU is defective. Confirm the unit address and enter a valid value. Verify the PGU is operating correctly.

- **6-25003 Must specify unit address of PGU disconnected from testhead.**

You must specify the unit address of the PGU disconnected from the testhead. Execute `pgconn4070` and verify that the value in the PG connection file matches the actual PGU connection, then specify the unit address of the PGU disconnected from the testhead.

- **6-25004 Pin number must be 1 to 24 for the HF port. Enter correct value.**

An invalid pin number was entered. Pin numbers 1 to 24 are available for the HF port you specified.

- **6-25005 Pin number must be 25 to 48 for the HF port. Enter correct value.**

An invalid pin number was entered. Pin numbers 25 to 48 are available for the HF port you specified.

- **6-25006 Pin number must be 1 to 48 for the THF port. Enter correct value.**

An invalid pin number was entered. Pin numbers 1 to 48 are available for the THF port you specified.

- **6-25007 Port address must be 20201 to 20206, or 20211 to 20213.**

An invalid port address was entered. Addresses 20201 to 20206 are available for the HF port, and addresses 20211 to 20213 are available for the THF port. Enter a valid port address.

- **6-25008 Must specify the port connected to the PGU.**
You must specify the port connected to the PGU. Execute pgconn4070 and verify that the value in the PG connection file matches the actual PGU connection, then specify the port connected to the PGU.
- **6-25009 Only CH1 is available for the PGU in 3-level pulse output mode.**
The PGU specified is in the 3-level pulse output mode. Only CH1 is available for the PGU. Use CH1.
- **6-25010 Only CH1 is available for the PGU in 3-level pulse output mode.**
The PGU specified is in the 3-level pulse output mode. Only CH1 is available for the PGU. Use CH1.
- **6-25011 Improper port address. Enter correct value.**
Improper port address value is specified. You must specify the correct value for port connected to the PGU.
- **6-25012 Mode value must be 0 or 1. Enter correct value.**
Set_sr_control TIS error. The mode parameter value must be 0 (independent) or 1 (synchronous).
- **6-25013 Port number must be PSC1, 2, or PSO1 to 5.**
Set_sr_mode TIS error. The port address parameter must be PSC1, 2, or PSO2 to 5.
- **6-25014 Mode value must be 0 or 1. Enter correct value.**
Set_sr_mode TIS error. The mode parameter value must be 0 (Normally Closed) or 1 (Normally Open).
- **6-25015 Port number must be PGU address, PSC1, 2, or PSO1 to 7.**
Connect_sr TIS error. The port address parameter must be PGU address, PSC1, 2, or PSO1 to 7.
- **6-25016 PGU must be connected to the pulse switch control port 1 or 2.**
Connect_sr TIS error. When a PGU unit address is specified for the port parameter the PGU must be connected to pulse switch control port 1 or 2. Specify a valid unit address and verify the PGU is connected correctly.
- **6-25017 To use Connect_sr/Switch_sr, independent mode must be set by Set_type_pg.**
Set_sr_pg TIS error. To control switching by using the Connect_sr or the Switch_sr the mode parameter value must be 1 (independent mode).
- **6-25018 Port address must be HF, THF, AUX, PSI, or PGU address.**
An illegal port address was specified. Port address must be HF, THF, AUX, PSI, or PGU address.
- **6-25019 Must specify the port connected to the PGU.**
You must specify the port connected to the PGU. Execute pgconn4070 and verify that the value in the PG connection file matches the actual PGU connection, then specify the port connected to the PGU.
- **6-25020 Only CH1 is available for the PGU in 3-level pulse output mode.**
Set_type_pg TIS error. The PGU you specified is in the 3-level pulse output mode. Only CH1 is available for the PGU. Use CH1.
- **6-25021 Mode value must be 1 to 3. Enter correct value.**
Set_type_pg TIS error. The mode parameter value must be 1 (2-level pulse), 2 (3-level pulse by one PGU), or 3 (3-level pulse by multiplexer). Enter a a valid mode value.
- **6-25022 Only CH1 is available for the PGU in 3-level pulse output mode.**
Set_type_pg TIS error. Mode=2 is available only for CH1 of the PGU. Use CH1.

- **6-25023 Mode value must be 1 or 3 for this port.**

Set_type_pg TIS error. For the 8114A pulse generator. Mode 1 (2-level pulse) and 3 (3-level pulse by multiplexer) are available for this port. Enter a valid mode value.

- **6-25024 PGU must have two channels for 3-level pulse output.**

The PGU you specified has only one channel. For 3-level pulse output use a PGU with two output channels.

- **6-25025 Must specify the port connected to the PGU.**

You must specify the port connected to the PGU. Execute pgconn4070 and verify the value in the PG connection file matches the actual PGU connection, then specify the port connected to the PGU.

- **6-25026 Only CH1 is available for the PGU in 3-level pulse output mode.**

Set_level_pg TIS error. The PGU specified is in the 3-level pulse output mode. Only CH1 is available for the PGU. Use CH1.

- **6-25027 Invalid port for using pulse switch.**

Set_level_pg TIS error. The PGU specified is in the 3-level pulse output mode. Pulse switch is available for the port set to the 2-level pulse or 3-level pulse by the multiplexer. Enter a valid port value.

- **6-25028 Port address must be HF, THF, AUX, PSI, or PGU address.**

An improper port address was specified. Port address must be HF, THF, AUX, PSI, or PGU address.

- **6-25029 Must specify the port connected to the PGU.**

You must specify the port connected to the PGU. Execute pgconn4070, and verify the value in the PG connection file matches the actual PGU connection, then specify the port connected to the PGU.

- **6-25030 Only CH1 is available for the PGU in 3-level pulse output mode.**

The PGU specified is in the 3-level pulse output mode. Only CH1 is available for the PGU. Use CH1.

- **6-25031 PGU must have two channels for 3-level pulse output.**

The PGU specified has only one channel. Use a PGU with two output channels for 3-level pulse output.

- **6-25032 Invalid port for using pulse switch.**

Set_time_pg TIS error. The PGU specified is in the 3-level pulse output mode. Pulse switch is available for the port which is set to the 2-level pulse or 3-level pulse by the multiplexer. Enter a a valid port value.

- **6-25033 Specify width2 parameter value.**

Set_time_pg TIS error. A Width2 parameter must be specified. Values from 3.3 nsec to 999 msec, or 10.0 nsec to 900 msec (for the 8114A) are available. See the Set_time_pg command reference for the required parameters.

- **6-25034 Delay2 parameter value must equal width1 plus delay1 or more.**

Set_time_pg TIS error. A Delay2 parameter value must equal width1 plus delay1 or more. Values from 0 to 999 msec, or 0 to 900 msec (for the 8114A) are available.

- **6-25035 Mode value must be 0, 1, or 2. Enter correct value.**

Set_sr_pg TIS error. The mode parameter value must be 0 (reset), 1 (independent), or 2 (synchronous with pulse). Enter a a valid mode value.

- **6-25036 Specify width parameter value, if mode is set to 2.**

Set_sr_pg TIS error. A width parameter must be specified. Values from 2 msec to 999 msec, or 2 msec to 900 msec (for the 8114A) are available. The width parameter is optional if the Set_sr_pg mode parameter is not 2.

- **6-25037 Must specify the PGU connected to the pulse switch control port.**

Set_sr_pg TIS error. Connect the PGU to the pulse switch control port correctly and execute pgconn4070. Verify the value in the PG connection file matches the actual PGU connection, then specify the PGU connected to the pulse switch control port. See the Set_sr_pg command reference for restrictions on the PGU.

- **6-25038 period value too short.**

Force_pg and Prep_pg TIS error. The period parameter must be more than or equal to the sum of the timing parameters defined by the Set_time_pg command. Enter a valid value.

- **6-25039 Cannot execute the TIS during pulse output.**

During pulse output the 4072A reports this error by the TIS which controls the PGU setup or the switching matrix PGU path. The TIS stops the program with this error, and also stops pulse output.

- **6-25040 Count value must be 0 to 10000000.**

Force_pg or Start_pg TIS error. The count parameter value must be from 0 to 10000000. If the count value is 1 to 10000000, Force_pg or Start_pg starts the pulse output, and waits for the last count of the pulse. For a count value of 0, the Force_pg or Start_pg triggers a continuous pulse output and finishes immediately. The pulse output continues until a Stop_pg TIS is received. During continuous pulse output the 4072A can receive TIS, but causes error 6-25039. See 6-25039.

- **6-25041 Install or turn on master PG.**

Cannot detect the master PG. Install or turn on the master PG. The master PG is the pulse generator unit which has the PG logical number 1. See the configuration file (/etc/opt/hp4070/config/1) to specify the master PG. This file contains the PG name, PG logical number, bus address, and GPIB address.

- **6-25042 Time accuracy mode must be 0 or 1.**

Set_mode_pg TIS error. The mode parameter value must be 0 (normal) or 1 (pattern). Mode=1 is not available for the 8114A.

- **6-25043 Define slave #1 PG.**

Pattern mode (Set_mode_pg, mode=1) needs slave #1 PG. The slave #1 PG is the pulse generator unit which has the PG logical number 2. Edit the configuration file (/etc/opt/hp4070/config/1) and define the slave #1 PG. See 6-25044.

- **6-25044 Install or turn on slave #1 PG.**

Pattern mode (Set_mode_pg, mode=1) needs slave #1 PG. Install and turn on the slave #1 PG. See 6-25043.

- **6-25045 For pattern mode, period value must be 120 µsec or more.**

In the pattern mode (Set_mode_pg, mode=1), the period parameter value must be 120 µsec or more. Enter a valid period value.

- **6-25046 Do not enter Set_level_pg for the pulse switch control port.**

You cannot set the pulse output level of the PGU connected to the pulse switch control port. Do not enter Set_level_pg.

- **6-25047 Do not enter Set_type_pg for the pulse switch control port.**

You cannot set the pulse mode of the PGU connected to the pulse switch control port. Do not enter Set_type_pg.

- **6-25048 Must specify the pulse switch control port connected to the PGU.**

You must specify the pulse switch control port connected to the PGU. Execute pgconn4070 and verify the value in the PG connection file matches the actual PGU connection, then specify the pulse switch control port connected to the PGU.

- **6-25049 Do not use 8114A as the slave #1 PG.**

When the time accuracy is set to pattern mode (Set_mode_pg, mode=1) the 8114A pulse generator cannot be used as slave #1. Use normal mode (Set_mode_pg, mode=0), or change the configuration by editing the configuration file /etc/opt/hp4070/config/1. See 6-25042 and 6-25043.

- **6-25050 Period value for 8114A must be Max msec or less.**

The period value of the 8114A pulse generator must be Max msec or less. Enter a valid period value.

- **6-25051 Specify period value. The value for 8114A must be Max msec or less.**

The 4072A automatically calculates the period parameter setting for the 8114A pulse generator in the Force_pg or the Prep_pg command. If this automatically calculated value exceeds Max msec, then you must manually or explicitly specify the period value.

- **6-25052 PGU (N) is defective or not connected. Check PGU and enter correct port.**

You must specify the port connected to the PGU. Specify the correct port, and verify the PGU is installed and working correctly.

- **6-25053 Cannot execute Command Name during pulse output.**

During pulse output, the 4072A causes this error by the TIS which controls the PGU setup or the switching matrix PGU path. The TIS stops the program with this error, and also stops pulse output.

- **6-25054 Output voltage of PGUs connected to PSO N must be same polarity or the difference must be 45 V or less.**

When an 8110A and an 8114A are connected to PSO1, 6, or 7 using a multiplexer switch, the absolute value of the amplitude of the pulses must be 45 V or less. If the amplitude of the pulses must be 45 V the polarity of the pulses must be the same.

- **6-25055 PG Voltage exceeds the limit. Check the PG voltage connected to PSO N.**

When using the 8110A and 8114A with a multiplexer, the signal was not output correctly. Verify that the 8110A and the 8114A are connected to PSO N and that amplitude of the pulse is set correctly. If this does not correct the error, reduce the amplitude of each pulse.

- **6-25056 PGU output voltage exceeds the limit. Check PGXX output amplitude.**

Check the amplitude of the PGXX output. The limit is -19 V. If necessary, reduce the amplitude of the signal. If this does not correct the error, contact the nearest Agilent Technologies Sales and Service office.

- **6-25057 Mode value must be 0 to 2. Enter correct value.**

Switch_sr TIS error. Mode must be 0, 1, or 2. Enter a valid mode number.

- **6-25058 Mode value must be 0 to 2. Enter correct value.**

Connect_sr TIS error. Mode must be 0, 1, or 2. Enter a valid mode number.

- **6-25059 Port number must be PSC1, 2, or PSO1 to 7.**

Switch_sr TIS error. The port address parameter must be PSC1, 2, or PSO1 to 7.

- **6-25501 PG Error.**

An error occurred in the pulse generator unit. The pulse generator will provide detailed error messages.

- **6-25502 PGN pulse level is out of range.**

The pulse level value is out of range. See the Set_level_pg command reference for the available range, and then enter a valid range.

- **6-25503 Load impedance value must be 2.5 ohm to 999 kohm.**
The load impedance value must be 2.5 ohm to 999 kohm. Enter a valid impedance value.
- **6-25504 Load impedance value must be 10 ohm to 999 kohm.**
The load impedance value of the 8114A must be 10 ohm to 999 kohm. Enter a valid impedance value.
- **6-25505 *AmpN* value is out of range.**
Set_level_pg TIS error. The *AmpN* parameter value is out of range. See the Set_level_pg command reference for the available range, and then enter a valid value.
- **6-25506 3-level pulse output value (*AmpN*) is out of range.**
Set_level_pg TIS error. The *AmpN* parameter value is out of range for the 3-level pulse output port (Set_type_pg, mode=2). See the Set_level_pg command reference for the available range, and then enter a valid value.
- **6-25507 Sum of 3-level pulse output value is out of range.**
Set_level_pg TIS error. The sum of Amp1 and Amp2 is out of range for the 3-level pulse output port (Set_type_pg, mode=2). See the Set_level_pg command reference for the available range, and enter a valid value.
- **6-25508 Invalid setup combination of Amp and Base.**
Set_level_pg TIS error. Cannot set the pulse level due to an invalid combination of the Amp value and Base value. See the Set_level_pg command reference for the available range, and then enter a valid combination.
- **6-25509 Pulse width (Value) is out of range.**
Set_time_pg TIS error. The width parameter value must be 3.3 nsec to 999 msec, or 10 nsec to 900 msec for the 8114A. Enter a valid range value.
- **6-25510 Delay time (Value) plus skew is out of range.**
Set_time_pg TIS error. The delay parameter value must be 0 to 999 msec, or 0 to 900 msec for 8114A. Enter a valid delay value. The skew between the PG outputs can cause this error.
- **6-25511 Invalid pulse leading time (Value). The value must be 2.0 nsec to 200 msec.**
Set_time_pg TIS error. The leading edge transition time must be 2.0 nsec to 200 msec. Enter a valid transition value.
- **6-25512 Invalid pulse trailing time (Value). The value must be 2.0 nsec to 200 msec.**
Set_time_pg TIS error. The trailing edge transition time must be 2.0 nsec to 200 msec. Enter a valid transition value.
- **6-25513 Leading time and trailing time must be in the same range.**
Set_time_pg TIS error. Both the leading and trailing time must be in the same range. See the Set_time_pg command reference for available ranges and then enter a valid value.
- **6-25514 PG Error. Cannot change arming source.**
Cannot change the arming source. The PGU may be defective or it may be a TIS fatal error. Verify the PGU is operating correctly.
- **6-25515 PG Error. Cannot change pattern mode.**
Cannot change the pattern mode. The PGU may be defective or it may be a TIS fatal error. Verify the PGU is operating correctly.

- **6-25516 PG Error. Cannot measure trigger period.**

The pulse generator cannot measure the trigger period. The trigger cable may be disconnected or defective. Or the PGU may be defective. Verify the trigger cable connection and the operation of the PGU.
- **6-25517 Cannot open file (errno = Error No.): *File_name***

Cannot open the specified file. Check the file name, permission, and so on.
- **6-25518 Cannot write file (errno = Error No.)**

Cannot write the file. Check the file name, permission, and so on.
- **6-25519 Cannot read file (errno = Error No.)**

Cannot read the specified file. Check the file name, permission, and so on.
- **6-25520 PG setup file revision mismatch.**

The PG setup file does not match the present revision.
- **6-25521 Configuration mismatch.**

The current configuration does not match the configuration written in the PG setup file. The PG setup file is the file saved by Save_pg TIS.
- **6-25522 PG (N) Error. No response to combined channel query.**

No response from the PGU for the combined channel query. The PGU may be defective or it may be a TIS fatal error. Verify the PGU is operating correctly.
- **6-25523 PG (N) Error. No response to arming source query.**

No response from the PGU for the arming source query. The PGU may be defective or it may be a TIS fatal error. Verify the PGU is operating correctly.
- **6-25524 PG (N) Error. No response to period source query.**

No response from the PGU for the period source query. The PGU may be defective or it may be a TIS fatal error. Verify the PGU is operating correctly.
- **6-25525 PG (N) Error. No response to trigger count query.**

No response from the PGU for the trigger count query. The PGU may be defective or it may be a TIS fatal error. Verify the PGU is operating correctly.
- **6-25526 PG (N) Error. No response to pattern mode query.**

No response from the PGU for the pattern mode query. The PGU may be defective or it may be a TIS fatal error. Verify the PGU is operating correctly.
- **6-25527 PG (N) Error. No response to period query.**

No response from the PGU for the period query. The PGU may be defective or it may be a TIS fatal error. Verify the PGU is operating correctly.
- **6-25528 PG (N) Error. No response to switch query.**

No response from the PGU for the switch query. The PGU may be defective or it may be a TIS fatal error. Verify the PGU is operating correctly.
- **6-25529 PG (N) Error. No response to rload query.**

No response from the PGU for the rload query. The PGU may be defective or it may be a TIS fatal error. Verify the PGU is operating correctly.

- **6-25530 PG (N) Error. No response to delay query.**
No response from the PGU for the delay query. The PGU may be defective or it may be a TIS fatal error. Verify the PGU is operating correctly.
- **6-25531 PG (N) Error. No response to width query.**
No response from the PGU for the width query. The PGU may be defective or it may be a TIS fatal error. Verify the PGU is operating correctly.
- **6-25532 PG (N) Error. No response to leading edge query.**
No response from the PGU for the leading edge query. The PGU may be defective or it may be a TIS fatal error. Verify the PGU is operating correctly.
- **6-25533 PG (N) Error. No response to trailing edge query.**
No response from the PGU for the trailing edge query. The PGU may be defective or it may be a TIS fatal error. Verify the PGU is operating correctly.
- **6-25534 PG (N) Error. No response to complement query.**
No response from the PGU for the complement query. The PGU may be defective or it may be a TIS fatal error. Verify the PGU is operating correctly.
- **6-25535 PG (N) Error. No response to voltage level query.**
No response from the PGU for the voltage level query. The PGU may be defective or it may be a TIS fatal error. Verify the PGU is operating correctly.
- **6-25536 PG Error. Cannot change period source.**
Cannot change period source. The PGU may be defective or it may be a TIS fatal error. Verify the PGU is operating correctly.
- **6-25537 Set_level_pg Amp value is out of range.**
Set_level_pg TIS error. For 8114A pulse generator. The Amp parameter value is out of range. See the Set_level_pg command reference for the available range, and then enter a valid value.
- **6-25538 Can't open file. filename: *File***
Could not open the file specified by *File*. Confirm the file name and permissions of the file.
- **6-25539 Can't load the offline configuration file. File format incorrect.**
Could not read the offline configuration file because the file format is incorrect. Check the format of the file you loaded.
- **6-25540 Can't save the offline configuration file.**
Could not save the offline configuration file. Check the permissions of the file and directory.
- **6-25901 [F_ROM] Port address (Terminal Name) must be unique.**
Each terminal must be set to a unique port address. Set each terminal to a unique port address.
- **6-25902 [F_ROM] Relay mode must be enabled.**
Relay mode must be enabled to use pulse switch. Execute F_set_relay_md(1) to enable the relay mode.
- **6-25903 [F_ROM] Port (Terminal Name) must be connected to pulse switch output.**
A port must be connected to the pulse switch output. Connect the port and specify the correct port.
- **6-25904 [F_ROM] Port (Terminal Name) must be connected to pulse switch output 1, 6, or 7.**

A port must be connected to the pulse switch output 1, 6, or 7. Connect the port and specify the correct port.

- **6-25905 [F_ROM] Port (Terminal Name) must be connected to pulse switch output 2, 3, 4, or 5.**

A port must be connected to the pulse switch output 2, 3, 4, or 5. Connect the port and specify the correct port.

- **6-25906 Invalid count (Value). The value must be 1 to 1000000000.**

The count parameter value must be 1 to 1000000000. Enter a valid value.

- **6-25907 [F_ROM] PGU (Terminal Name) must be unique.**

Each terminal must be connected to a unique PGU. Connect each terminal to a unique PGU.

- **6-25908 [F_ROM] Invalid port address for Terminal Name.**

F_set_fport PARA error. The port address must be 20201 to 20206 for HF port, and 20211 to 20213 for THF port, and 20101 to 20108. Enter a valid port address.

- **6-25909 [F_ROM] Invalid PGU connection for Terminal Name.**

The PGU must be connected to the specified port through the pulse switch. Connect the PGU to the pulse switch input and specify a valid port.

- **6-30002 SMU Calibration Fail.**

SMU failed the calibration. Do the diagnostics, and do troubleshooting.

- **6-30003 Automatic SMU Calibration Fail.**

SMU failed the automatic calibration. Do the diagnostics, and do troubleshooting.

- **6-30004 Automatic SMU Calibration Pass.**

SMU passed the automatic calibration.

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- **7-10001 Power Fail occurred.**
Testhead power fail occurred. Troubleshoot the testhead power supply and the testhead.
- **7-10002 Over Current or Voltage occurred.**
Over current or over voltage occurred in the testhead. Troubleshoot the testhead.
- **7-10003 Fixture is opened.**
Prober/Fixture Sense switch of the testhead is open. Close the sense switch of the testhead.
- **7-10004 Interlock is opened.**
Interlock of the testhead is open. Close the interlock switch of the testhead.
- **7-10005 Illigal Run Mode in Testhead.**
This error occurs if the testhead CPU receives any command when the testhead CPU is rebooting. You do not need to care this error.
- **7-10006 Hardware Status returned to the normal state.**
The 4070 hardware status returned to the normal state. The 4070 can be used normally.

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- **8-10001 Failed to fork TIS Server (errno = *Error_No.*).**

hp4070 command or START program failed to start up the TIS server in fork().

 - ❑ If *Error_No.* is 11: Too many processes are running. Kill unnecessary processes or reconfigure kernel to extend maximum number of processes.
 - ❑ If *Error_No.* is 12: Too small swap space or memory to execute TIS server. Increase the swap space or memory.
- **8-10002 Failed to exec TIS Server (errno = *Error_No.*).**

hp4070 command or START program failed to start up the TIS server in execv().

 - ❑ If *Error_No.* is 13: Check the permission and directory path of tis_online or tis_offline file.
 - ❑ If *Error_No.* is 249: Too many symbolic links are made for directory path of tis_online or tis_offline file.
 - ❑ If *Error_No.* is 8: tis_online or tis_offline file is not set as an executable file. Set the file as an executable file.
 - ❑ If *Error_No.* is 12: Too small memory to execute TIS server.
 - ❑ If *Error_No.* is 26: tis_online or tis_offline file is opened without write protection.
- **8-11001 TIS server died.**

hp4070 -shutdown command was executed, or testhead was turned off. Or fatal error occurred in testhead.
- **8-11002 Inconsistent exception (*Error_No.*).**

TIS server detected illegal error that is not defined as 4070 error condition.
- **8-20001 Invalid parameter.**

Improper command parameter was specified for hp4070 command. Check the parameter.
- **8-20002 Inconsistent parameters.**

Invalid multiple command parameters were specified for hp4070 command. Check the parameter.
- **8-20003 Incomplete parameter specification.**

Command parameter defined for hp4070 command is insufficient. Check the parameters.
- **8-20004 Already logged in.**

You have already logged into the 4070 operating environment.
- **8-20005 No such session (*Error_No.*).**

You have not logged into the 4070 operating environment yet. No session to log out.
- **8-20006 System busy (Used by session: *Session_ID*).**

The 4070 has already been logged into as the on-line mode by another user specified by *Session_ID*. On-line mode allows one user to use the 4070.
- **8-20007 Session ID must be 1 to 999999.**

Improper session ID was specified for the environmental parameter PCS_SESSION_ID. The value must be 1 to 999999.

- **8-20008 Optimization level setting must be 0, 1, 2 or 3.**
Improper value was specified for hp4070 -optimize command. Value must be 0, 1, 2, or 3.
- **8-20009 Too many OFF LINE sessions.**
Too many users logged into the 4070 off-line mode. Maximum 5 users can log into the 4070 off-line mode.
- **8-20010 Invalid unit on port *Port_No.*.**
Invalid measurement unit is assigned for the 4062 port number *Port_No.* on the port map file. Maybe the port map file was edited incorrectly. Define the port number mapping properly.
- **8-20011 Invalid 4070 port selection on 4062 port *Port_No.*.**
Improper 4070 port number is assigned for the 4062 port number *Port_No.* on the port map file. Maybe the port map file was edited incorrectly. Define the port number mapping properly.
- **8-20012 Duplicate 4142B slot specification on 4062 port *Port_No.*.**
Multiple measurement units are assigned for the 4062 *Port_No.* on the port map file. Only one unit must be defined for one port. Define the port number mapping properly.
- **8-20013 41420A SMU is in slot 1 on 4062 port *Port_No.*.**
Cannot assign the 41420A SMU for 4062 port *Port_No.* on the port map file because the 41420A uses two module slots of the 4142B. Define the port number mapping properly.
- **8-20014 Can't read the port map file. *Reason.***
Port map file could not be read because of the reason shown in *Reason*. Check the file name and the permission of the file and directory.
- **8-20015 Can't load the portmap file. File format incorrect.**
Port map file could not be loaded because the file format is incorrect.
- **8-20016 Can't load the DUMCONFIG file. File format incorrect.**
The 4062UX DUMCONFIG file used for port mapping could not be loaded because the file format is incorrect.
- **8-20017 Can't read the DUMCONFIG file *Reason.***
The 4062UX DUMCONFIG file could not be read because of the reason shown in *Reason*. Check the file name, and the permission of the file and directory.
- **8-20018 Can't save the portmap file. *Reason.***
Port map file could not be saved because of the reason shown in *Reason*. Check the directory name, and the permission of the file and directory.
- **8-21001 Testhead Over Voltage.**
SMU in testhead is over voltage. Testhead is automatically shut down.
- **8-22001 Insufficient args (Something's wrong).**
8-22002 Invalid auto cal interval specified (Something's wrong).
Error occurred in cal4070 command. Internal error.
- **8-22003 Failed at Matrix Mother Board C/G measurement (status: *Status*).**
8-22004 Failed at Matrix Mother Board offset measurement (status: *Status*).
8-22005 Failed at Matrix Mother Board R/L measurement (status: *Status*).
8-22006 Failed at Testhead offset measurement (status: *Status*).
Improper capacitance compensation data was returned by CMU (4284A). Check the measurement cable, or execute the relay test of testhead.

- **8-22008 Invalid configuration; Pin Board *Pin_No.* is not present.**
- **8-22009 Invalid configuration; Chuck Connection Pin Board is not present.**

Cannot execute the capacitance compensation measurement, because the pin board specified by *Pin_No.* or the chuck connection pin board is not installed in the testhead, or defective. Check the configuration and install the pin board properly.

- **8-22010 Cannot read the file. The file does not exist or does not have read permission.**

The specified file cannot be read because the file does not exist or does not have read permission.

- **8-22011 Cannot write the file. The file does not exist. Or the file or the directory does not have write permission.**

The specified file cannot be written. Because the file does not exist, or the file or specified directory does not have write permission.

- **8-22021 Unable to use the same matrix *Pin_No.* for CMH and CML. Specify different pin number.**

Unable to measure compensation data for level 2 capacitance measurement because the same matrix pin number shown as *Pin_No.* for CMH and CML is specified. Use a different pin number for each port.

- **8-22022 The specified matrix *Pin_No.* does not exist. Use a valid pin.**

When executing compensation data measurement for level 2 capacitance measurement, a non-existing matrix pin was specified as *Pin_No.* Check available pins and use a valid pin number.

- **8-22030 Cannot find available SMU.**

The system cannot find any SMUs to measure the PGU compensation data. To execute the PGU calibration, at least one SMU must be installed. Check the actual SMU configuration.

- **8-22031 Cannot find available Matrix Pin.**

The system cannot find any pin boards for the PGU calibration. To execute the PGU calibration, at least one pin board must be installed for each matrix block. Check the actual pin board configuration.

- **8-22032 Can't save pg calibration data into `"/etc/opt/hp4070/pgcaldata"` file.**

The compensation data cannot be saved in the `/etc/opt/hp4070/pgcaldata` file. Check the following items:

- ☐ The `/etc/opt/hp4070/pgcaldata` must exist.
- ☐ The permission, owner, and group of this file must be `-rw-r--r--`, “root”, and “sys”, respectively.

- **8-22033 Can't load pg calibration data file `"/etc/opt/hp4070/pgcaldata"`.**

The cal4070 program cannot load the PGU compensation data correctly because of the wrong data format. Copy the `/etc/opt/hp4070/pgcaldata` file from the `/opt/hp4070/newconfig` directory, then execute the cal4070 again.

- **8-22050 Failed at timing calibration *PGnn*. Error: *Error_message***

The timing calibration for *PGnn* (81110A) from cal4070 program is failed.

- **8-23001 Can't open C compensation data file *File_name* for loading (*errno* = *Error_No.*).**

Capacitance compensation data file could not be open because of the reason specified by *Error_No.*

- **8-23002 Can't open C compensation data file *File_name* for saving (*errno* = *Error_No.*).**

Capacitance compensation data file could not be saved because of the reason specified by *Error_No.*

- **8-23003 Can't read C compensation data file *File_name* (errno = *Error_No*).**
Capacitance compensation data file could not be read because of the reason specified by *Error_No*.
- **8-23004 Invalid C compensation data file format.**
Capacitance compensation data file could not be read because of invalid file format. Check the file name.
- **8-23005 C compensation data file does not match the present Pin Board configuration.**
Pin board configuration might be changed. Cannot execute the capacitance compensation properly for the present pin board configuration.
- **8-23501 Cannot find HF Matrix board. Check Port value in PG connection file.**
The HF matrix board is not installed or it is defective. Edit the PG connection file and delete the PG address set to the specified port (Port).
- **8-23502 One PG must be defined for the relative HF and THF ports. Check Port value in PG connection file.**
Different PG addresses are defined for the relative HF and THF ports. A single PG address must be defined for the ports. Edit the PG connection file and set a single PG or PSO address, or delete the address set to the specified port (Port).
- **8-23503 Invalid PG connection data on Port. Specified PG or PSO does not exist.**
An invalid PG or PSO address is defined in the PG connection file. Set the available PG or PSO address to the specified port (Port).
- **8-23504 Cannot find Pulse Switch Block N. Check Port value in PG connection file.**
Pulse switch block 1 or 2 is not installed or is defective. Edit the PG connection file and delete the PG address set to the specified port (Port) and to port PSI1/2/3/4 or PSI5/6/7.
- **8-23505 Invalid parameter for pgconn4070.**
An invalid parameter was set for the pgconn4070 command execution. Set the parameter properly or execute pgconn4070 with no parameter.
- **8-23506 Syntax error in dump command.**
An improper command is entered in the print dialog box. Enter the proper command.
- **8-23507 Cannot search connection for OFF LINE session.**
Actual PG connection cannot be searched for offline session.
- **8-32002 File already exists. OK to overwrite the file?**
The file name you specified already exists. Click OK to overwrite the file. Click No to cancel.
- **8-24001 Usage: *Parameter***
Improper command parameter was specified for the set1f command. Specify the command parameter properly.
- **8-24002 Can't open Optical Interface device file (*Reason*).**
Failed to open the optical interface device file by set1f command because of the reason shown in *Reason*.
- **8-24003 Can't open Optical Interface device file (*Reason*). Perhaps shutting down the system by hp4070 -shutdown is required.**
Failed to open the optical interface device file by set1f command because the 4070 is used by another user (process ID).

Execute `hp4070 -shutdown` before executing `setlf` command.

- **8-24004 Can't write to the Optical Interface device file (*Reason*).**
Failed to write the optical interface device file by `setlf` command because of the reason shown in *Reason*.
- **8-24005 Can't read from the Optical Interface device file (*Reason*).**
Failed to read the optical interface device file by `setlf` command because of the reason shown in *Reason*.
- **8-25020 Can't load the offline configuration file. File format incorrect.**
Could not read the offline configuration file because the file format is incorrect. Check the format of the file you loaded.
- **8-25021 Can't save the offline configuration file.**
Could not save the offline configuration file. Check the permission of the file and directory.
- **8-27001 Failed to monitor the log file (/var/opt/hp4070/syslog4070). The log file might not exist.**
The System Management Panel failed to monitor the log file (/var/opt/hp4070/syslog4070). Verify the file exists. Check the permissions of the file or directory.
- **8-27002 Online TIS daemon is not running.**
The online TIS daemon is not running. Execute the `hp4070 -start` command.
- **8-27003 Online TIS daemon is already running.**
Another online TIS daemon is already running. Only one online TIS daemon can run at a time.
- **8-27004 The selected file is not writable. Select another file.**
The selected file is not writable. Select another file or check the permissions of the file.
- **8-40004 The port map table has been modified. Is it OK to discard the changes?**
The port map table was modified. Click **OK** to close the dialog box without saving the changes. Click **No** to cancel.
- **8-40005 File already exists. Do you want to overwrite it?**
The file name you specified already exists. Click **OK** to overwrite the file. Click **No** to cancel.
- **8-40006 Is it OK to overwrite the default port map file?**
You are going to overwrite the default port map file. Click **OK** to overwrite the file. Click **No** to cancel.
- **8-40007 HF port map table has been modified. Is it OK to discard the changes?**
The HF port map table was modified. Click **OK** to close the dialog box without saving the changes. Click **No** to cancel.
- **8-40008 Is it OK to overwrite the default HF port map file?**
You are going to overwrite the default HF port map file. Click **OK** to overwrite the file. Click **No** to cancel.
- **8-40009 Pulse switch table has been modified. Is it OK to discard the changes?**
The pulse switch table was modified. Click **OK** to close the dialog box without saving the changes. Click **No** to cancel.
- **8-40010 Is it OK to overwrite the default pulse switch file?**
You are going to overwrite the default pulse switch file. Click **OK** to overwrite the file. Click **No** to cancel.

- **8-42016 Failed to measure calibration data of following PGU.**
PGnn, PGnn, PGnn
Please check using diag4070.
PG level calibration data will not be updated.

Abnormal data is measured for the *PGnn*. The level calibration data for the *PGnn* is not updated. Confirm the PG functions by using the diag4070.
- **8-43001 PG connection table was modified. OK to exit the program without saving?**

The PG connection table was modified. Click **OK** to exit the program without saving the changes. Click **No** to cancel.
- **8-43002 OK to overwrite the default PG connection file?**

You are going to overwrite the default PG connection file. Click **OK** to overwrite the file. Click **No** to cancel.
- **8-43003 PG connection table was modified. OK to open new file without saving?**

The PG connection table was modified. Click **OK** to open the new file without saving the changes. Click **No** to cancel.
- **8-43004 OK to exit the program?**

You are going to exit the program. Click **OK** to exit the program. Click **No** to cancel.
- **8-43005 Searching PGU connections.**

This message is displayed while searching the PG connection.
- **8-46001 Offline configuration was modified. Is it OK to exit the offline configuration tool without saving?**

To exit the offline configuration tool without saving, click the **OK** button. If you do *not* want to exit, click the **Cancel** button.
- **8-46002 Is it OK to overwrite the default Offline configuration file?**

To overwrite the default offline configuration file, click the **OK** button. If you do *not* want to overwrite the file, click the **Cancel** button.
- **8-46003 Offline configuration was modified. Is it OK to open a new file without saving?**

To open a new file without saving the existing file, click the **OK** button. If you *want* to save the existing file, click the **Cancel** button.
- **8-46004 Is it OK to exit the offline configuration tool?**

To exit the program, click the **OK** button. If you do *not* want to exit, click the **Cancel** button.
- **8-46005 Is it OK to select 12 pins (pins in multiples of 4)?**

To select 12 pins (pins in multiples of 4), click the **OK** button. If you do *not* want 12 pins, click the **Cancel** button.
- **8-46006 Is it OK to select 24 pins (even number of pins)?**

To select 24 pins (even number of pins), click the **OK** button. If you do *not* want 24, click the **Cancel** button.
- **8-46007 Is it OK to select 48 pins?**

To select 48 pins, click the **OK** button. If you do *not* want 48, click the **Cancel** button.
- **8-46008 Is it OK to clear all pins?**

To clear all pins, click the **OK** button. If you do *not* want to clear all pins, click the **Cancel** button.

- **8-47001 Is it OK to exit the System Management Panel?**

To exit the System Management Panel, click the **OK** button. If you do *not* want to exit, click the **Cancel** button.

42-xxxxx

- **42-11020 Parameter name can consist of alphanumeric, space, underscore and period characters only.**
42-11022 Parameter name must be 15 characters or less.

Maximum number of characters for parameter name in the IDP setup window is 15.

- **42-11023 Failed to start idpcgen program (*Reason*).**

Number of processes may be more than the limitation specified in kernel parameter, or available swap space or memory is not sufficient. The error message reported by the HP-UX kernel is shown in Reason.

- **42-11024 A directory name must be specified.**

A directory name must be specified in the Code Directory field of the Generate Code window.

- **42-11025 A file name must be specified.**

A file name must be specified in the Source Code Name field of the Generate Code window.

- **42-11026 BASIC line number and its incremental number must be positive.**

The line number and the incremental number in the BASIC Program Line Numbering field of the Generate Code window must be positive.

- **42-11028 Must specify Algorithm Function Name.**

An algorithm function name must be specified in the Code Generation Setup window.

- **42-11029 Algorithm function name must begin with an alpha character.**

- **42-23000 Syntax error.**

Usage: idpcgen {-b|-c} [-mhpfvSP] [-t directory] [-i file] [-o name] [-l 0(TIS)|1(algorithm)|2(program)] [-L [begin_num[,increment_num]]]

-b	Generates BASIC program
-c	Generates C program
-m	Generates Makefile for C language compile
-h	Generates C language header (.h file extension) file
-p	Generates program code for IDP running in the same session idpcgen executed
-f	Forces the specified output file to be overwritten
-v	Displays warning messages
-S	Generates or overwrites SPECS algorithm library spec file
-P	Generates program code using template file for pules
-t directory	Specifies that directory template file exists
-i file	Specifies IDP setup file (.dps file extension) from which program code is generated
-o name	Specifies file name (without file extension) program is saved to
-l 0 1 2	Specifies code generation level
-L begin num, increment_num	Specifies BASIC line numbering

- **42-23001 Must specify one option: -b (BASIC) or -c (C)**

Idpcgen command must be used with -b (BASIC) or -c (C) option to specify generated programming language.
- **42-23002 Unable to specify -b (BASIC) and -c (C) language options together.**

Idpcgen command cannot specify both -b (BASIC) and -c (C) language options at the same time.
- **42-23003 Unable to specify -i and -p options together.**

Idpcgen command cannot specify both -i (specifies .dps IDP setup file) and -p (specifies IDP setup window currently open) options at the same time.
- **42-23004 Failed to open input file *File_name* (Reason).**

Idpcgen command failed to open specified *File_name.dps* IDP setup file. Cause of the error is shown in *Reason*.
- **42-23005 Must specify IDP setup file name with -i option.**

Idpcgen command must specify IDP setup file name from which the command generates the measurement program file.
- **42-23006 Failed to open output file *File_name* (Reason).**

Idpcgen command failed to open output file specified as *File_name*. The cause of the error is shown in *Reason*.
- **42-23007 The specified file name already exists. Use -f option to overwrite it.**

The output file name for measurement program generated by the idpcgen command already exists. To overwrite the file, specify the -f option with the idpcgen command, or if you do not want to overwrite the file, change the output filename.
- **42-23008 Must specify file name with -o option.**

When -o option is specified, the idpcgen command must specify a file name without a file extension.
- **42-23009 Failed to open template directory *Directory_name* (Reason).**

The idpcgen command, used with the -t option, failed to open the specified directory *Directory_name*. The cause of the error is shown in *Reason*.
- **42-23010 Must specify directory name with -t option.**

When -t option is specified, the idpcgen command must specify a directory name.
- **42-23011 Improper generation level *Level_number*. Specify 0, 1, or 2 with -l option.**

Idpcgen command has the wrong *Level_number* setup for -l option (code generation level option). With -l option, specify 0, 1, or 2.
- **42-23012 Must specify 0, 1 or 2 with -l option.**

When -l option is specified, the idpcgen command must specify a code generation level number.
- **42-23013 Failed to open IPC connection to IDP (Reason).**

Idpcgen command with -p option failed to open IPC connection to IDP. The cause of the error is shown in *Reason*.
- **42-23014 Failed to connect IPC to IDP (Reason).**

Idpcgen command with -p option failed to connect IPC to IDP. The cause of the error is shown in *Reason*.

- **42-23015 idpcgen failed to communicate with IDP process (*Reason*).**

Idpcgen command with -p option failed to communicate with the process IDP generated because of the error shown in *Reason*.
- **42-23016 Possible incorrect IDP setup file. Record format mismatched.**

The file specified by the idpcgen command includes an unrecognized record. May be using an incorrect or incorrectly modified IDP setup file.
- **42-23017 Unable to generate program coding for IDP file created by Rev. B.01.20 or earlier.**

Idpcgen cannot generate program code for IDP setup file created by 4070 system rev. B.01.20 or earlier. Load the IDP setup file in the 4070 rev. B.01.20 IDP setup window, then save the setup and execute the idpcgen command again. Or, after loading the IDP setup file in the rev. B.01.20 environment, generate program code in the IDP environment.
- **42-23018 Possible incorrect IDP setup file. Record format mismatched.**

The file specified by the idpcgen command includes an unrecognized record. May be using an incorrect or incorrectly modified IDP setup file.
- **42-23100 Identical name (*Parameter_name*) cannot be used for different data types.**

The IDP setup file, specified by the idpcgen command, has the identical parameter name setup shown in *Parameter_name* for a different data type. Change the parameter name in the IDP setup window.
- **42-23101 Failed to open template file *File_name* (*Reason*).**

Idpcgen command failed to open the template file shown as *File_name*. The cause of the error is shown in *Reason*.
- **42-23102 Failed to read template file (*Reason*).**

Idpcgen command failed to read the template file. The cause of the error is shown in *Reason*.
- **42-23200 Unknown Token. Replace `@` with `@@`.**

There is an unknown token starting with `@` in the template file specified by the idpcgen command. Replace `@` with `@@`.
- **42-23301 Unknown variable type found: *Variable_type* (*Variable_name*); assumed REAL.**

In the Algorithm Spec Editor, the setup for *Variable_type* shown in *Variable_name* is incorrect. The setup variable type is ignored and the code is generated as type real.
- **42-33000 Unrecognizable input record: Record**

The IDP setup file specified by the idpcgen command, has an incorrect record that is not recognized by the code generation function. The IDP setup file may be modified incorrectly. The incorrect record is ignored.
- **42-33001 Duplicate *Parameter_name* exists. Change th *Parameter_name*.**

The IDP setup file, specified by the idpcgen command, has a duplicate *Parameter_name*. Change the *Parameter_name* in the IDP setup window.
- **42-33002 Template file *File_name* is not in directory shown in *Directory_name*.**

Template file *File_name* does not exist in the directory specified by *Directory_name*, when using idpcgen with the -t option.

- **42-33003 Unable to access the specified template directory. Default template *File_name* is loaded.**
Unable to find the template file. The idpcgen command cannot access the specified template directory.

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