

Installation
Guide

For use with Keysight PDU kits
and PDU installation kits for
Keysight racks

Keysight Power Distribution Unit (PDU)

Notices

© Keysight Technologies, Inc. 2015

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

Manual Part Number

5000-0039

Edition

Eleventh Edition, August 2015

Printed in

Malaysia

Published by

Keysight Technologies, Inc.
900 S. Taft Ave.
Loveland, CO 80537 USA

Trademarks

PICMG[®], Compact PCI[®] are registered trademarks of the PCI Industrial Computer Manufacturers Group.

AdvancedTCA[®] and ATCA are registered trademarks of the PCI Industrial Computer Manufacturers Group.

PCI-SIG[®], PCI Express[®], and PCIe[®] are registered trademarks of PCI-SIG.

Technology Licenses

The hardware and/or software described in this document are furnished under a license and may be used or copied only in accordance with the terms of such license.

Declaration of Conformity

Declarations of Conformity for this product and for other Keysight products may be downloaded from the Web. Go to <http://keysight.com/go/conformity>. You can then search by product number to find the latest Declaration of Conformity.

U.S. Government Rights

The Software is “commercial computer software,” as defined by Federal Acquisition Regulation (“FAR”) 2.101. Pursuant to FAR 12.212 and 27.405-3 and Department of Defense FAR Supplement (“DFARS”) 227.7202, the U.S. government acquires commercial computer software under the same terms by which the software is customarily provided to the public. Accordingly, Keysight provides the Software to U.S. government customers under its standard commercial license, which is embodied in its End User License Agreement (EULA), a copy of which can be found at <http://www.keysight.com/find/sweula>. The license set forth in the EULA represents the exclusive authority by which the U.S. government may use, modify, distribute, or disclose the Software. The EULA and the license set forth therein, does not require or permit, among other things, that Keysight: (1) Furnish technical information related to commercial computer software or commercial computer software documentation that is not customarily provided to the public; or (2) Relinquish to, or otherwise provide, the government rights in excess of these rights customarily provided to the public to use, modify, reproduce, release, perform, display, or disclose commercial computer software or commercial computer software documentation. No additional government requirements beyond those set forth in the EULA shall apply, except to the extent that those terms, rights, or licenses are explicitly required from all providers of commercial computer software pursuant to the FAR and the DFARS and are set forth specifically in writing elsewhere in the EULA. Keysight shall be under no obligation to update, revise or otherwise modify the Software. With respect to any technical data as defined by FAR 2.101, pursuant to FAR 12.211 and 27.404.2 and DFARS 227.7102, the U.S. government acquires no greater than Limited Rights as defined in FAR 27.401 or DFAR 227.7103-5 (c), as applicable in any technical data.

Warranty

THE MATERIAL CONTAINED IN THIS DOCUMENT IS PROVIDED “AS IS,” AND IS SUBJECT TO BEING CHANGED, WITHOUT NOTICE, IN FUTURE EDITIONS. FURTHER, TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, KEYSIGHT DISCLAIMS ALL WARRANTIES, EITHER EXPRESS OR IMPLIED, WITH REGARD TO THIS MANUAL AND ANY INFORMATION CONTAINED HEREIN, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. KEYSIGHT SHALL NOT BE LIABLE FOR ERRORS OR FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH THE FURNISHING, USE, OR PERFORMANCE OF THIS DOCUMENT OR OF ANY INFORMATION CONTAINED HEREIN. SHOULD KEYSIGHT AND THE USER HAVE A SEPARATE WRITTEN AGREEMENT WITH WARRANTY TERMS COVERING THE MATERIAL IN THIS DOCUMENT THAT CONFLICT WITH THESE TERMS, THE WARRANTY TERMS IN THE SEPARATE AGREEMENT SHALL CONTROL.

Keysight Technologies does not warrant third-party system-level (combination of chassis, controllers, modules, etc.) performance, safety, or regulatory compliance unless specifically stated.

Safety Information

CAUTION

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

WARNING

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

Safety Information

The following general safety precautions must be observed during all phases of operation of this instrument. Failure to comply with these precautions or with specific warnings or operating instructions in the product manuals violates safety standards of design, manufacture, and intended use of the instrument. Keysight Technologies assumes no liability for the customer's failure to comply with these requirements.

General

Do not use this product in any manner not specified by the manufacturer. The protective features of this product must not be impaired if it is used in a manner specified in the operation instructions.

Before Applying Power

Verify that all safety precautions are taken. Make all connections to the unit before applying power. Note the external markings described under "Safety Symbols".

Ground the Instrument

Keysight chassis' are provided with a grounding-type power plug. The instrument chassis and cover must be connected to an electrical ground to minimize shock hazard. The ground pin must be firmly connected to an electrical ground (safety ground) terminal at the power outlet. Any interruption of the protective (grounding) conductor or disconnection of the protective earth terminal will cause a potential shock hazard that could result in personal injury.

Do Not Operate in an Explosive Atmosphere

Do not operate the module/chassis in the presence of flammable gases or fumes.

Do Not Operate Near Flammable Liquids

Do not operate the module/chassis in the presence of flammable liquids or near containers of such liquids.

Cleaning

Clean the outside of the Keysight module/chassis with a soft, lint-free, slightly dampened cloth. Do not use detergent or chemical solvents.

Do Not Remove Instrument Cover

Only qualified, service-trained personnel who are aware of the hazards involved should remove instrument covers. Always disconnect the power cable and any external circuits before removing the instrument cover.

Keep away from live circuits

Operating personnel must not remove equipment covers or shields. Procedures involving the removal of covers and shields are for use by service-trained personnel only. Under certain conditions, dangerous voltages may exist even with the equipment switched off. To avoid dangerous electrical shock, DO NOT perform procedures involving cover or shield removal unless you are qualified to do so.

DO NOT operate damaged equipment

Whenever it is possible that the safety protection features built into this product have been impaired, either through physical damage, excessive moisture, or any other reason, REMOVE POWER and do not use the product until safe operation can be verified by service-trained personnel. If necessary, return the product to an Keysight Technologies Sales and Service Office for service and repair to ensure the safety features are maintained.

DO NOT block the primary disconnect

The primary disconnect device is the appliance connector/power cord when a chassis used by itself, but when installed into a rack or system the disconnect may be impaired and must be considered part of the installation.

Do Not Modify the Instrument

Do not install substitute parts or perform any unauthorized modification to the product. Return the product to an Keysight Sales and Service Office to ensure that safety features are maintained.

In Case of Damage

Instruments that appear damaged or defective should be made inoperative and secured against unintended operation until they can be repaired by qualified service personnel

CAUTION

Do NOT block vents and fan exhaust: To ensure adequate cooling and ventilation, leave a gap of at least 50mm (2") around vent holes on both sides of the chassis.

Do NOT operate with empty slots: To ensure proper cooling and avoid damaging equipment, fill each empty slot with an AXle filler panel module.

Do NOT stack free-standing chassis: Stacked chassis should be rack-mounted.

All modules are grounded through the chassis: During installation, tighten each module's retaining screws to secure the module to the chassis and to make the ground connection.

WARNING

Operator is responsible to maintain safe operating conditions. To ensure safe operating conditions, modules should not be operated beyond the full temperature range specified in the Environmental and physical specification. Exceeding safe operating conditions can result in shorter lifespan, improper module performance and user safety issues. When the modules are in use and operation within the specified full temperature range is not maintained, module surface temperatures may exceed safe handling conditions which can cause discomfort or burns if touched. In the event of a module exceeding the full temperature range, always allow the module to cool before touching or removing modules from the chassis.

Safety Symbols








CAUTION

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

WARNING

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

Products display the following symbols:

-  Warning, risk of electric shock
-  Refer to manual for additional safety information.
-  Earth Ground.
-  Chassis Ground.
-  Alternating Current (AC).
-  Standby Power. Unit is not completely disconnected from AC mains when switch is in standby.
-  Antistatic precautions should be taken.
- CAT I IEC Measurement Category I, II, III, or IV
- CAT II
- CAT III
- CAT IV

For localized Safety Warnings, Refer to Keysight Safety document (p/n 9320-6792).



The CSA mark is a registered trademark of the Canadian Standards Association and indicates compliance to the standards laid out by them. Refer to the product Declaration of Conformity for details.



Notice for European Community: This product complies with the relevant European legal Directives: EMC Directive (2004/108/EC) and Low Voltage Directive (2006/95/EC).



The Regulatory Compliance Mark (RCM) mark is a registered trademark. This signifies compliance with the Australia EMC Framework regulations under the terms of the Radio Communication Act of 1992.

ICES/NMB-001

ICES/NMB-001 indicates that this ISM device complies with the Canadian ICES-001.



This symbol represents the time period during which no hazardous or toxic substance elements are expected to leak or deteriorate during normal use. Forty years is the expected useful life of this product.



South Korean Class A EMC Declaration. This equipment is Class A suitable for professional use and is for use in electromagnetic environments outside of the home.

A 급 기기 (업무용 방송통신기자재) 이 기기는 업무용 (A 급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라 며 , 가정외의 지역에서 사용하는 것을 목적으로 합니다.



Waste Electrical and Electronic Equipment (WEEE) Directive 2002/96/EC

This product complies with the WEEE Directive (2002/96/EC) marking requirement. The affixed product label (see below) indicates that you must not discard this electrical/electronic product in domestic household waste.

Product Category: With reference to the equipment types in the WEEE directive Annex 1, this product is classified as a "Monitoring and Control instrumentation" product.

Do not dispose in domestic household waste.

To return unwanted products, contact your local Keysight office for more information.



Contents

General Information	6
E7685A PDU Installation Kit Contents	7
Tools Required	7
PDU Kit Contents	7
PDU Specifications	9
General Installation Information	10
Installation procedure	10
Connecting the Old Style Switch	20

General Information

The Keysight E7685A PDU Installation Kit enables you to mount an Keysight Power Distribution Unit (PDU) in an Keysight instrument rack. This kit is required if the rack is not already equipped with a PDU, or if you want to install a switched PDU in a rack containing an unswitched PDU. Each PDU installation kit allows the installation of up to two PDU kits. Instrument racks are designed to house two PDU kits only. The voltage of a second PDU must match that of the installed PDU for correct operation of the illuminated master switch.

WARNING

The low voltage master switch removes power only from the PDU outlet receptacles. To completely remove power from the PDU and rack system, the PDU power cord must be removed from the premise electrical system or, if the rack is connected to a dedicated circuit breaker, the breaker shall be opened.

NOTE

Keysight uses the “supplemental” type of circuit breakers on all PDUs.

To support worldwide power requirements, four Keysight PDU kits are available. The Keysight E7685A PDU Installation Kit allows the installation of any of the following PDU kits:

Kit Number	Description
E4451-67000	PDU - 1.3m, North America (100-120V) (NEMA receptacles)
E4453-67000	PDU - 1.3m, International (200-240V) (IEC receptacles)
E4455-67000	PDU - 1.6m/2.0m, North America (100-120V) (NEMA receptacles)
E4457-67000	PDU - 1.6m/2.0m, International (200-240V) (IEC receptacles)
E4451-67000	PDU - 1.3m, North America (100-120V) (NEMA receptacles)

The above-listed PDU kits are intended to be used only in the following Keysight rack enclosures: E3661B, E3662B, and E7590A.

E7685A PDU Installation Kit Contents

The Keysight E7685A PDU Installation Kit contains the following:

Item	Quantity	Description	Part Number
1	1	Forehead Assembly - with switch cutout	5061-8750
2	2	PDU Support Bracket	C2786-00021
3	4	Sheet Metal Nuts (10-32)	0590-0804
4	4	Machine Screw, Torx® T25—10-32x0.5inch	2680-0278

NOTE

The installation of a first PDU requires the purchase of the Keysight E7685A PDU Installation Kit. This kit provides hardware and rack components required to complete the installation. The installation of a second PDU does not require an additional kit. However, you will need the kit's switch and hardware if the first PDU was not switched, and you are adding a switched PDU.

The voltage of a second PDU must match that of the installed PDU for correct operation of the illuminated switch.

When the remote switch is not utilized, the plug is considered to be the disconnect device. When the plug is the disconnect device the socket-outlet shall be installed near the equipment and shall be readily accessible.

Tools Required

To install the PDU kit, you will need the following tools:

- T25 Torx® driver.
- Wrench or nut driver to fit 3/8 inch hex nut.

PDU Kit Contents

The four KeysightKeysight PDU kits contain the following:

PDU Kit Number	Quantity	Description
1.3m Kit: E4451-67000 E4453-67000	1 PDU	1.3m PDU: 100-120V North American (NEMA receptacles) 200-240V International (IEC receptacles)
1.6m Kit: E4455-67000 E4457-67000		1.6m PDU: 100-120V North American (NEMA receptacles) 200-240V International (IEC receptacles)

PDU Kit Number	Quantity	Description
All	3	Machine Screw, Torx® T25, 10-32x0.5 inch (p/n 2680-0278)
All	2	Washer-external tooth, #10 (p/n 2190-0565)
All	1	Nut-Hex w/Ext. tooth lock washer, 10-32 (p/n 2740-0003)
All	1	Cable assembly, ground (p/n C2786-60065)

PDU Specifications

The specifications for the customer orderable PDUs are given in the following table:

Model Number	E4451-67000 PDU for 1.3 M racks	E4453-67000 PDU for 1.3 M racks	E4455-67000 PDU for 1.6, 2.0 M racks	E4457-67000 PDU for 1.6, 2.0 M racks
Input	100-120V, 50/60 Hz (N. America)	200-240V, 50/60 Hz (International)	100-120V, 50/60 Hz (N. America)	200-240V, 50/60 Hz (International)
Output	100-120V, 50/60 Hz, 15A 1-IEC 320 C13 Receptacle 5-NEMA 5-15R Receptacles	200-240V, 50/60 Hz, 15A 6-IEC 320 C13 Receptacles	100-120V, 50/60 Hz, 15A 1-IEC 320 C13 Receptacle 9-NEMA 5-15R Receptacles	200-240V, 50/60 Hz, 15A 1-IEC 320 C19 Receptacle 10-IEC 320 C13 Receptacles
Operating Temperature	0° C to 40° C	0° C to 40° C	0° C to 40° C	0° C to 40° C
Operating Humidity	5% to 80% RH, non-condensing	5% to 80% RH, non-condensing	5% to 80% RH, non-condensing	5% to 80% RH, non-condensing
Operating Environment	Indoor Location	Indoor Location	Indoor Location	Indoor Location
Input	100-120V, 50/60 Hz (N. America)	200-240V, 50/60 Hz (International)	100-120V, 50/60 Hz (N. America)	200-240V, 50/60 Hz (International)

NOTE

100-120V, 50/60 Hz PDUs (E4451-67000 and E4455-67000) are supplied with a power cord terminated with a NEMA 5-20P plug to fit a 20A receptacle.

200-240V, 50/60 Hz PDUs (E4453-67000 and E4457-67000) are supplied without a power plug—the PDU power cord is un-terminated. The installer must install the correct plug for the country of installation.

All PDUs (100-120V or 200-240V) must be connected to a dedicated 20A circuit.

General Installation Information

Use the following table to select the type of installation you are doing.

Columns in following Installation Procedures tables	Type of PDU Installation
A	First PDU-Switched*
B	First PDU-Unswitched*
C	Second PDU-Switched (first one was also switched)
D	Second PDU-Unswitched (first one was switched)
E	Second PDU-Switched (first one was unswitched)*
F	Second PDU-Unswitched (first one was also unswitched)

* Needs PDU Installation Kit

In the following tables, use the legend shown below to determine if the steps are required for items A-F above:

	A shaded cell means the step applies.
	A non-shaded cell means that the step does not apply.

Installation procedure

Step	A	B	C	D	E	F
1 Turn off power to the rack and disconnect AC power.						

WARNING

Failure to disconnect AC power could result in a severe electric shock causing injury or death.

NOTE

When the remote switch is not utilized, the plug is considered to be the disconnect device. When the plug is the disconnect device the socket-outlet shall be installed near the equipment and shall be readily accessible.

Step	A	B	C	D	E	F
2 Remove the two screws securing the top cap to the frame at the rear of the rack. Slide the top cap towards the rear and liftoff the top cap completely. See Figure 1.						

Step	A	B	C	D	E	F
3 If your rack is configured with a rear door, open the door and remove the four screws securing the side cover to the rear door hinges.						

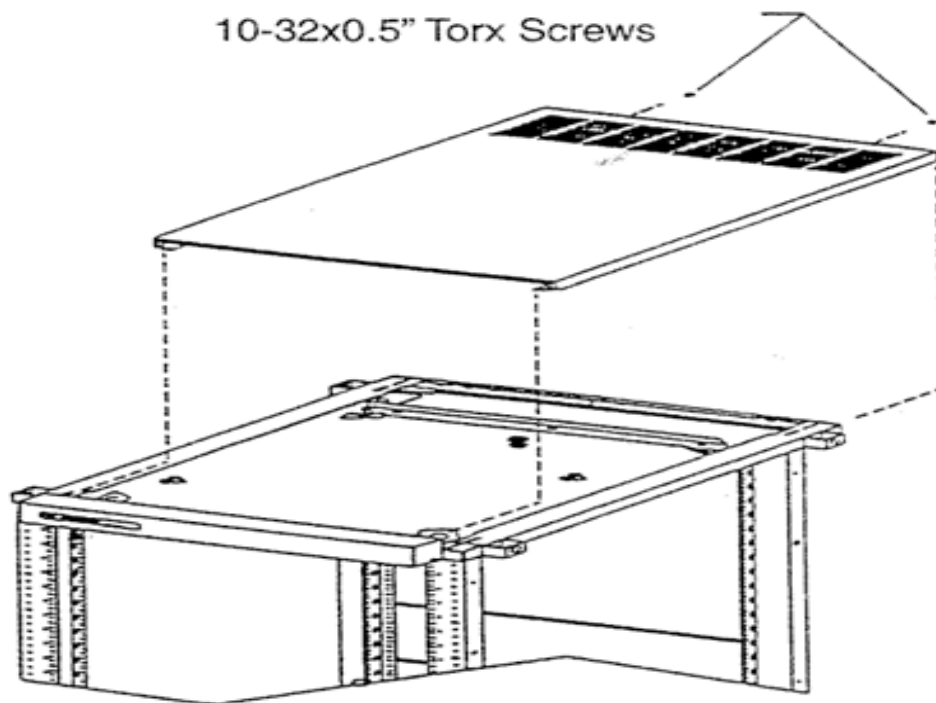


Figure 1 Removing the top cap

Step	A	B	C	D	E	F
4 Remove the two screws securing the side cover to the base of the rack enclosure. Lift the side cover slightly up and remove completely. See Figure 2.						

Step	A	B	C	D	E	F
5 Remove the three screw used to secure the non-switchable forehead assembly completely. Retain the three screws as they will be re-used in step 12. See Figure 3.						

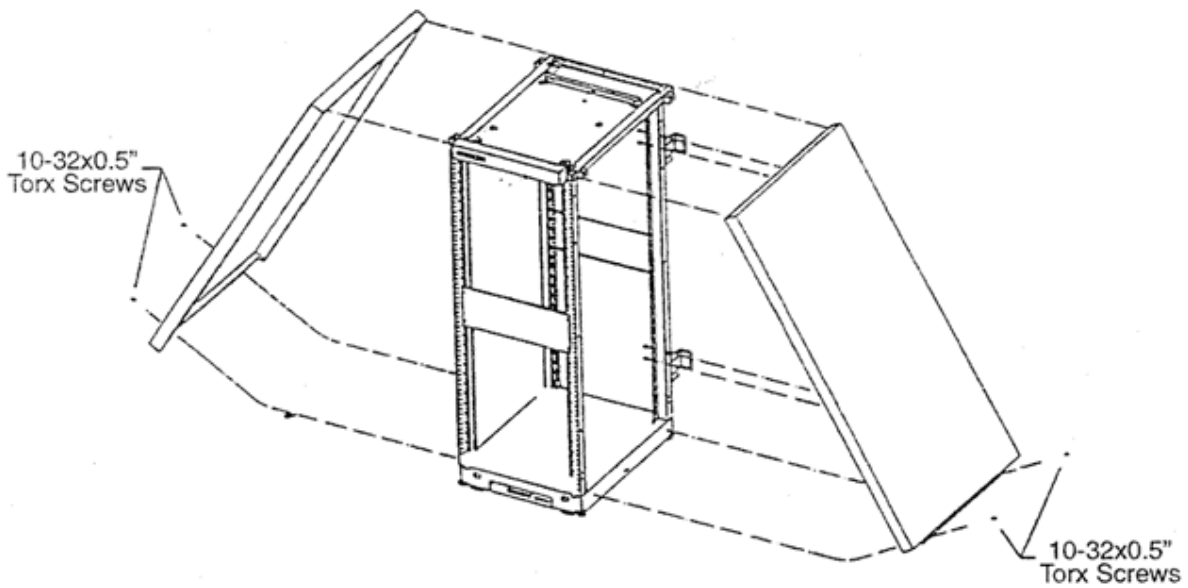


Figure 2 Removing the side covers

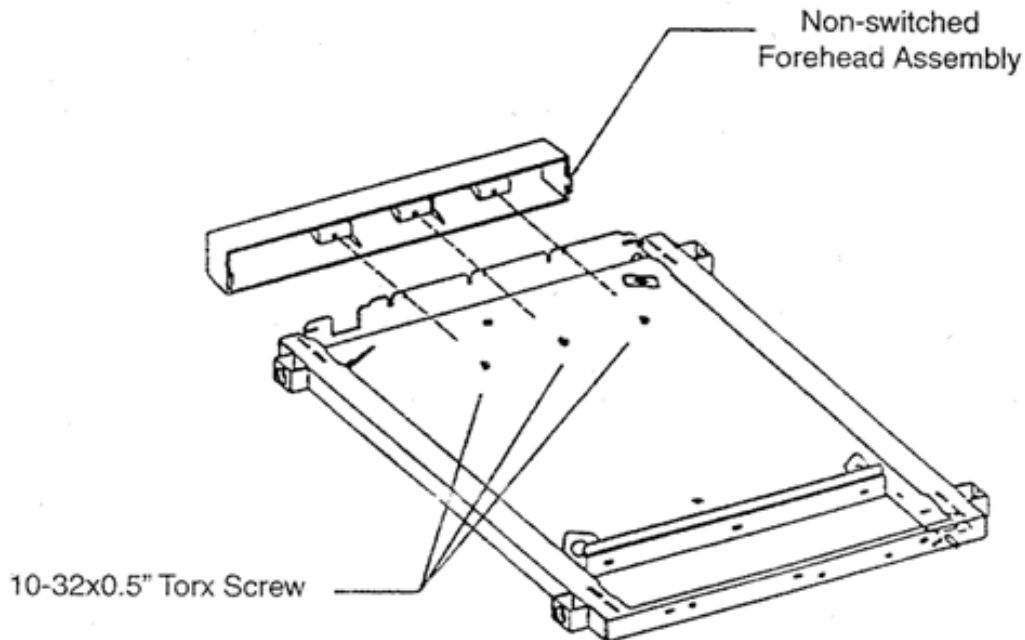


Figure 3 Removing the forehead assembly

Step	A	B	C	D	E	F
6 Snap four sheet metal clip nuts onto the column in the appropriate locations for the PDU brackets (see the table below). Attach the two PDU brackets using four 10-32 x 0.5 inch machine screws. See Figures 4 and 5.						

Clip Nut Placement			
Rack Size	Top PDU Bracket	Bottom PDU Bracket	Door Catch
1100mm	4th Increment Mark	16th Increment Mar	1st Increment Mar
1300mm	7th Increment Mar	26th Increment Mar	4th Increment Mar
1600mm	7th Increment Mar	25th Increment Mar	13th Increment Mar
2000mm	16th Increment Mar	34th Increment Mar	22nd Increment Mar

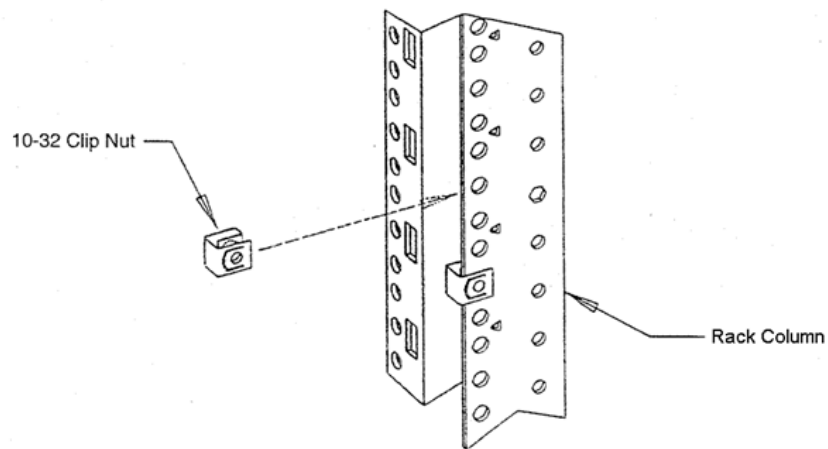


Figure 4 Attaching sheet metal clip nuts to the column

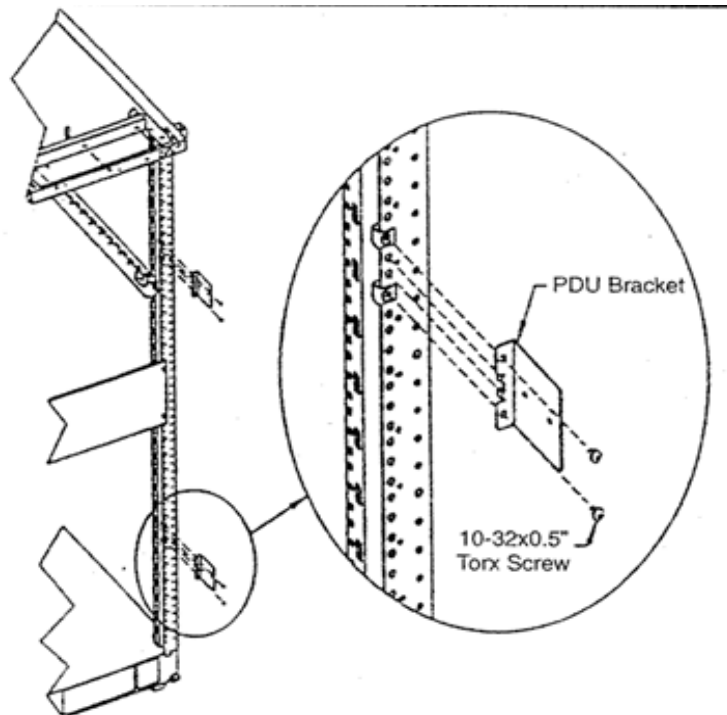


Figure 5 Attaching the PDU brackets

Step	A	B	C	D	E	F
<p>7 Position the first PDU by placing it against the PDU brackets and align the inner holes that are closest to the column on the brackets to the mounting holes in the PDU. Secure the PDU using two 10-32 x 0.5" machine screws from the PDU kit.</p> <p>If you are installing a second PDU place the second PDU against the PDU brackets and align the outer holes on the brackets with the mounting holes of the PDU. Secure using 10-32 x 0.5" screws from the kit. See Figure 6.</p>						

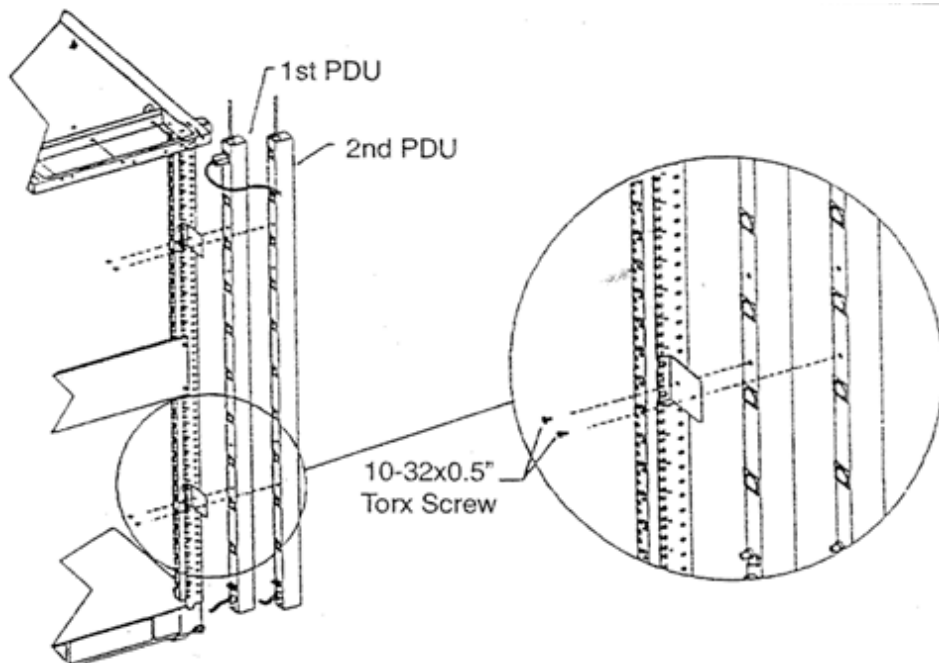


Figure 6 Attaching the PDUs

Step	A	B	C	D	E	F
<p>8 Attach one end of the PDU ground cable assembly to the PDU at the bottom of the PDU using one #10 ext. tooth star washer and one 10-31 x 0.5" machine screw. Make sure the washer is between the PDU and the connector of the cable assembly. Make sure that the cable does not block the PDU receptacles and the cable is not pinched. See Figure 7.</p>						

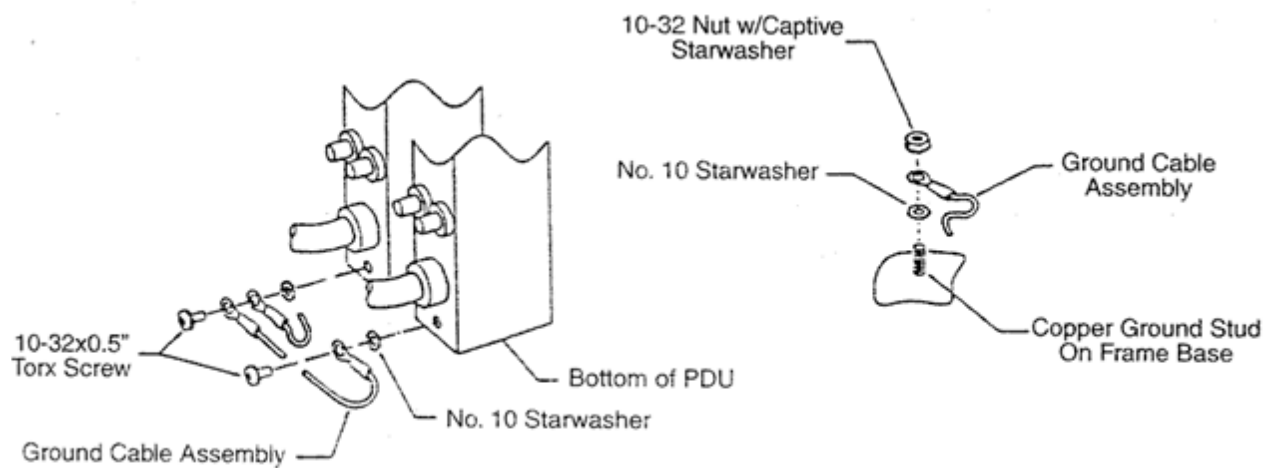


Figure 7 Attaching the ground cable assembly

WARNING

The PDU /rack combination is a safety Class 1 product and has a protective earthing (grounding terminal).

The PDU ground strap must be attached to the PDU and rack column with the supplied hardware. Failure to do so can result in a severe hazard and/or personal injury in the event of equipment failure or product misuse.

Additionally, there must be an uninterruptible safety earth ground from the main power source to the product's internal wiring terminals, power cord, or supplied cord set. Whenever it is likely that the protection has been impaired, disconnect the power cord until the ground has been restored.

WARNING

Protect from Shock Hazards. As the number of instruments that connect to a PDU increases, the magnitude of leakage current also increases. The magnitude of the leakage current depends on the characteristics of each instrument. To avoid electric shock, the PDU must connect to the premise electrical ground system. The PDU earth ground connection must not be interrupted in any way. Failure to provide an earth connection can result in injury to the user and damage to the connected instruments. To assure proper grounding, a qualified electrician should be consulted.

Step	A	B	C	D	E	F
<p>9 Attach the other end of the PDU ground cable assembly to the nearest copper ground stud on the frame base or the rack enclosure (there are four located on the base). Use a 10-32 nut with an external tooth captive washer and a #10 ext. tooth star washer to secure the cable assembly to the ground stud. Again, the #10 star washer must be placed between the frame base and the connector of the cable assembly.</p> <p>To ground the second PDU, attach the PDU ground cable assembly to the bottom of the PDU as described earlier. Attach the other end either in the same manner or to the first PDU as shown. See Figure 7.</p>						

Step	A	B	C	D	E	F
<p>10 Route the PDU switch cable harness up through the provided channel at the top of the rack enclosure and secure the cable harness with the pre-mounted cable clips. See Figure 8.</p>						

Step	A	B	C	D	E	F
<p>11 Install the power switch supplied with your PDU Installation Kit.* Align the switch so that the LED indicator is toward the left side (when viewed from the front), and snap it into the forehead assembly provided in the PDU installation kit. See Figure 8.</p>						

* The power switch supplied has five terminals. If you have an older installation with a six terminal switch, see “Connecting the Old Style Switch” on page 18.

Step	A	B	C	D	E	F
<p>12 Align the switched forehead assembly to the top of the rack enclosure, and attach it using the same three 10-32 x0.5” screws used to hold the non-switchable forehead assembly. Tighten the screws to 20-inch pounds. See Figure 8.</p>						

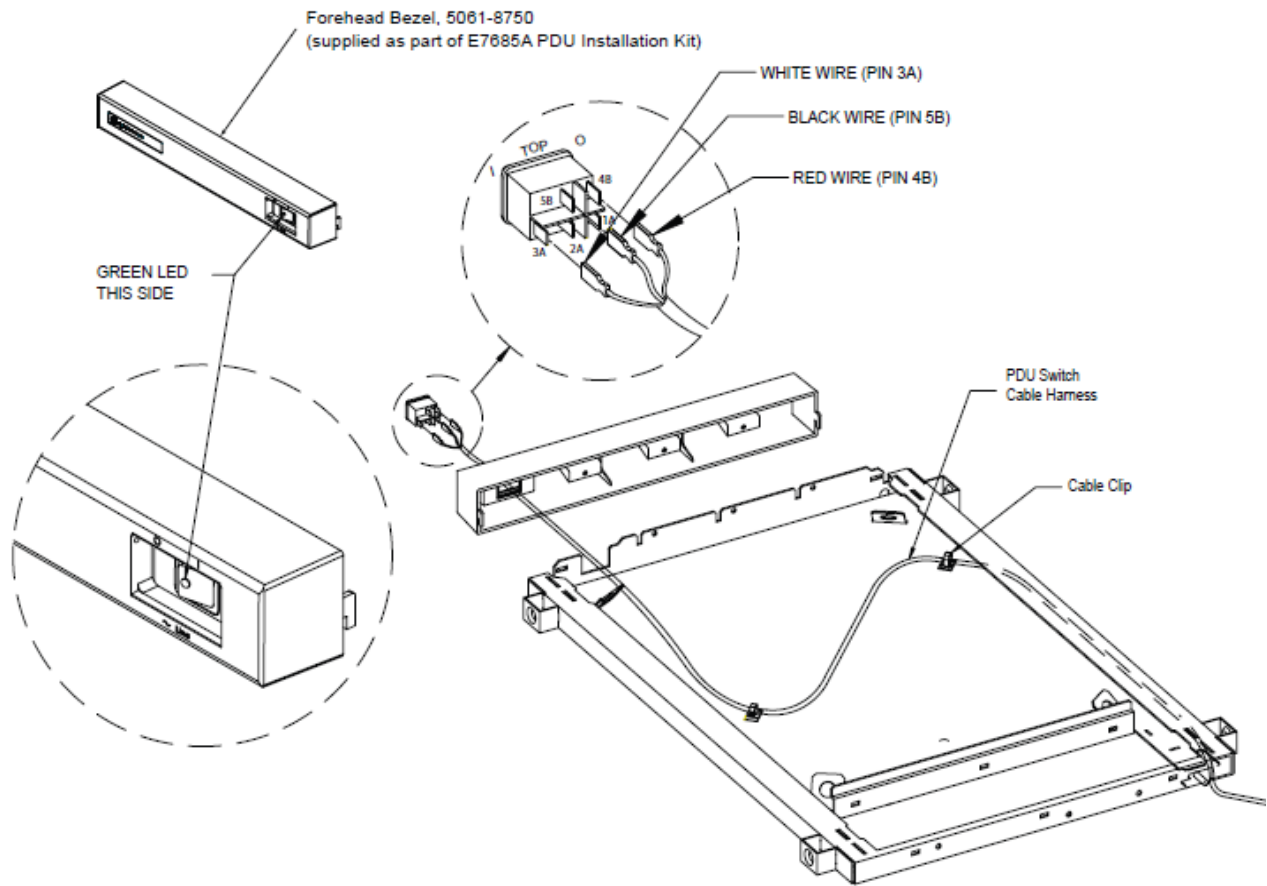


Figure 8 Configuring the Forehead Assembly

Step	A	B	C	D	E	F
13 Connect the PDU switch cable harness to the dual power switch. Make sure the connectors slide completely onto the spade terminals on the back of the switch. See Figure 9.*						

CAUTION Connection from the PDU front panel switch harness and the switch in the forehead must be made correctly to ensure normal PDU operation. Failure to do so can result in PDU failure or inconsistent PDU operation.*

* The power switch supplied has five terminals. If you have an older installation with a six terminal switch, see [“Connecting the Old Style Switch”](#) on page 20.

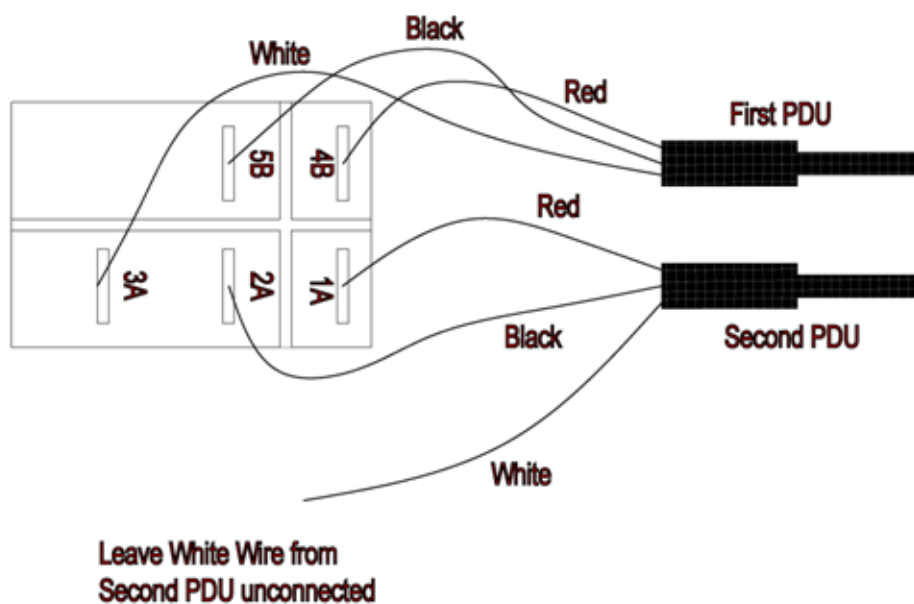


Figure 9 Main Power Switch Connection (new-style switch)*

* The power switch supplied has five terminals. If you have an older installation with a six terminal switch, see [“Connecting the Old Style Switch”](#) on page 20.

WARNING

The low voltage master switch removes power only from the PDU outlet receptacles. To completely remove power from the PDU and rack system, the PDU power cord must be removed from the premise electrical system or, if the rack is connected to a dedicated circuit breaker, the breaker shall be opened.

Step	A	B	C	D	E	F
14	Reassemble the rack enclosure by following steps 1-4 but in reverse order. Make sure no wires or electrical cords are pinched.					

Step	A	B	C	D	E	F
15	Reconnect AC power to the rack enclosure.					

Verify that the PDU is functioning correctly. The LED lamp on the rocker switch should light up when the switch is in the On (1) position. The lamp should remain unlit when the switch is in the Off (0) position.

This completes the installation of the Power Distribution Unit (PDU). Place this Guide with your rack documentation.

Connecting the Old Style Switch

The PDU Installation Kit and current-production instrument racks contain a switch with five terminals on the back. This switch has a green LED indicator that should appear on the left when the switch is installed (see Figure 8). However, if you are installing a new PDU in an older rack installation, it may have the older switch with six terminals on the back. This switch has the indicator light on the right side when installed. If your system has this older, six-terminal switch, the correct wiring connections are as shown in Figure 10 below.

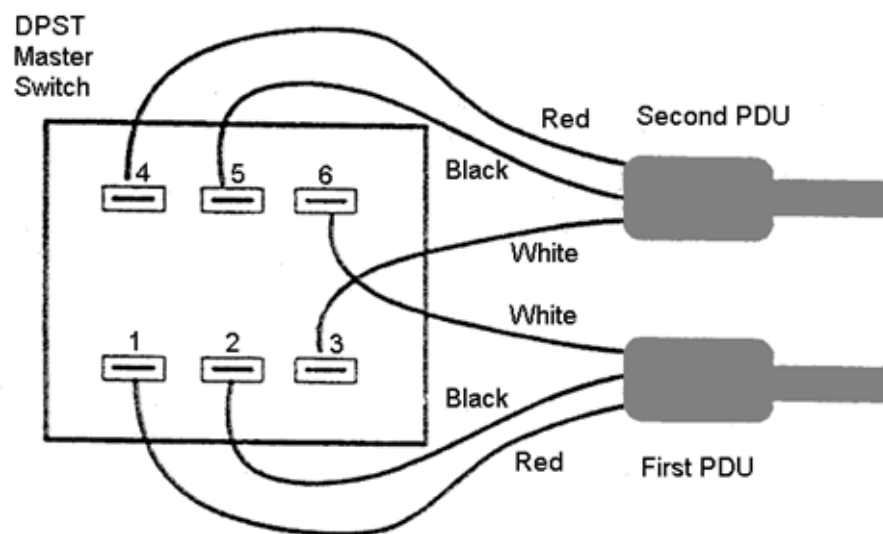


Figure 10 Main Power Switch Connection (old-style switch)

NOTE

If you replace the old six-terminal switch in your rack installation with the new five-terminal switch provided in the PDU Installation Kit, you must wire the PDU(s) as shown in Figure 9.

WARNING

The low voltage master switch removes power only from the PDU outlet receptacles. To completely remove power from the PDU and rack system, the PDU power cord must be removed from the premise electrical system or, if the rack is connected to a dedicated circuit breaker, the breaker shall be opened.



This information is subject to change
without notice
© Keysight Technologies 2015
Edition 11 August 2015
Published in USA



5000-0039
www.keysight.com