

Reference Guide

Keysight

Tips for Preventing Damage
to N4974A and N4975A
PRBS Generators

Notices

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Safety Notices

CAUTION

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

WARNING

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

Safety Summary

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

General This product is a Safety Class 1 instrument (provided with a protective earth terminal). The protective features of this product may be impaired if it is used in a manner not specified in the operation instructions.

All Light Emitting Diodes (LEDs) used in this product are Class 1 LEDs as per IEC 60825-1.

Environment Conditions This instrument is intended for indoor use in an installation category II, pollution degree 2 environment. It is designed to operate at a maximum relative humidity of 95% and at altitudes of up to 2000 meters.

Refer to the specifications tables for the ac mains voltage requirements and ambient operating temperature range.

Before Applying Power Verify that all safety precautions are taken. The power cable inlet of the instrument serves as a device to disconnect from the mains in case of hazard. The instrument must be positioned so that the operator can easily access the power cable inlet. When the instrument is rack mounted the rack must be provided with an easily accessible mains switch.

Ground the Instrument To minimize shock hazard, the instrument chassis and cover must be connected to an electrical protective earth ground. The instrument must be connected to the ac power mains through a grounded power cable, with the ground wire firmly connected to an electrical ground (safety ground) 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 instrument in the presence of flammable gases or fumes.

Do Not Remove the Instrument Cover Operating personnel must not remove instrument covers. Component replacement and internal adjustments must be made only by qualified personnel.

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

Safety Symbols

Table 1. Safety Symbol

Symbol	Description
	Indicates warning or caution. If you see this symbol on a product, you must refer to the manuals for specific Warning or Caution information to avoid personal injury or damage to the product.
	Frame or chassis ground terminal. Typically connects to the equipment's metal frame.
	Indicates hazardous voltages and potential for electrical shock.
	Indicates that antistatic precautions should be taken.
	Indicates hot surface. Please do not touch.
	CSA is the Canadian certification mark to demonstrate compliance with the Safety requirements.
	CE compliance marking to the EU Safety and EMC Directives. ISM GRP-1A classification according to the international EMC standard. ICES/NMB-001 compliance marking to the Canadian EMC standard.
	The RCM mark indicates that this product meets EMS/Product Safety Requirements and may be imported to Australia and New Zealand.
	This mark indicates compliance with the Canadian EMC regulations.
ISM 1-A	This text denotes the instrument is an Industrial Scientific and Medical Group 1 Class A product.
	China RoHS regulations include requirements related to packaging, and require compliance to China standard GB18455-2001. This symbol indicates compliance with the China RoHS regulations for paper/fiberboard packaging.
	Indicates 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 the product.



The South Korean Class A EMC declaration (KC) mark indicates that this product is Class A suitable for professional use and is for use in electromagnetic environments outside of the home.

The KC mark includes the marking's identifier code that has up to 26 digits and follows this format: KCC-VWX-YYY-~~ZZZZZZZZZZZZZZ~~.

Compliance and Environmental Information

Table 2. Compliance and Environmental Information

Safety Symbol	Description
	<p>This product complies with WEEE Directive (2002/96/EC) marking requirements. The affixed label indicates that you must not discard this electrical/electronic product in domestic household waste.</p> <p>Product Category: With reference to the equipment types in WEEE Directive Annex I, this product is classed as a "Monitoring and Control instrumentation" product.</p> <p>Do not dispose in domestic household waste.</p> <p>To return unwanted products, contact your local Keysight office, or see www.keysight.com/environment/product/ for more information.</p>

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Ensure proper grounding

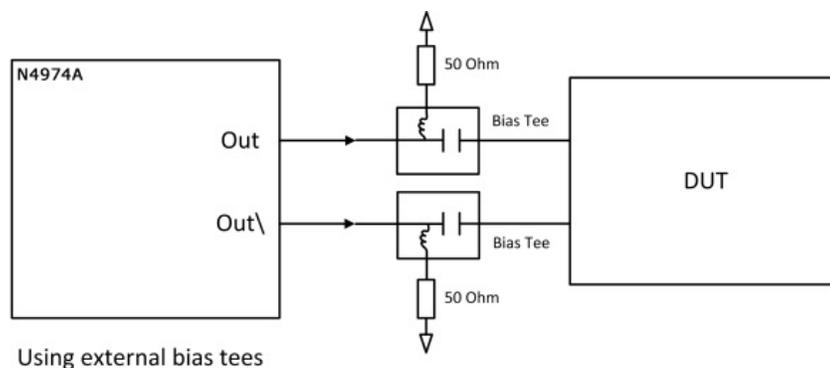
- Always use the three-prong AC power cord supplied with the product.
- Proper grounding of the instrument will prevent a build-up of electrostatic charge which may be harmful to the instrument and the operator.
- Do not damage the earth-grounding protection by using an extension cable, power cable or autotransformer without a protective ground conductor.
- Check AC power quality and polarity; typical AC voltage required is 100 to 240 VAC, 47 to 63 Hz. Use only the power converter module supplied with the instrument.

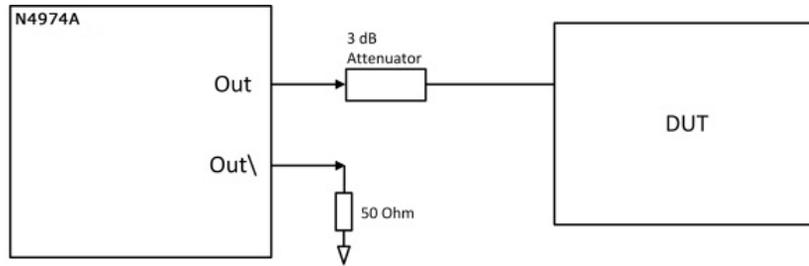
Read the warning labels and specifications

- Do not exceed the values provided in the datasheet or as indicated by the warning labels on the product.
- Refer to the user guide for conditions required to meet the listed specification. Note information regarding warm up time and operating temperature range.

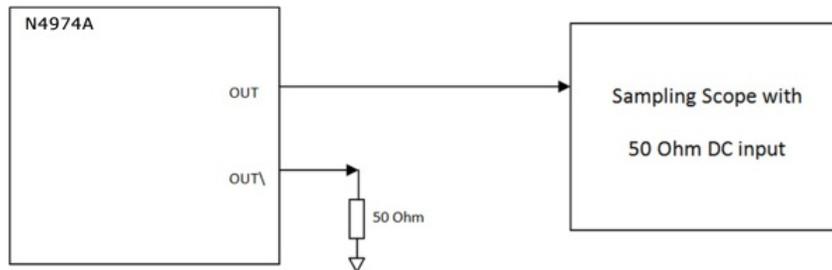
Terminate outputs properly

- Before turning on the instrument, ensure that the output connectors are terminated properly. Operating the PRBS generator without proper termination can damage the instrument.
- The outputs are DC coupled and must be externally DC terminated with 50 Ω to ground.





Using a 3 dB attenuator



Be careful when tuning phase adjuster

- Phase adjustment may be necessary when the frequency is changed.
- Use a proper screwdriver and never force the phase adjuster beyond its upper or lower stop.

Protect the connectors

- Avoid repeated bending of cables; a single sharp bend can damage a cable instantly.
- Limit the number of connections and disconnections to reduce wear. For connector saver recommendations, refer to the N495xA through N498xA Connector Care Reference Guide at www.keysight.com/find/N4974A.
- Inspect the connectors prior to use; look for dirt, nicks, and other signs of damage or wear. A bad connector can ruin the good connector instantly.
- Clean dirty connectors to prevent poor electrical connections and damage to the connector. For more cable and connector care tips, refer to Application Note 326 found at: www.keysight.com/find/cable_care.

Follow electrostatic discharge (ESD) precautions

- Electrostatic discharge (ESD) can damage or destroy electronic components. Whenever possible, conduct testing at a static-safe workstation.
- Ensure grounded environment and personnel.
- Wear ESD suitable clothes and shoes.
- Keep static-generating materials e.g. plastic boxes, tape, PC mouse, keyboard, etc. at least one meter away from all components.
- Damage of components by ESD can occur at 100 V discharge.
- When testing a passive DUT, work on an ESD workstation or utilize an air ionizer. Discharge the test point by using a probe directly grounded to the earth.
- When testing an active (powered) DUT, be aware that the capacitors can hold charges even after power is removed from the DUT.
- Loose cables are like a capacitor and can hold electrostatic charges. The free end of a cable touching surfaces that have voltage levels will cause product damage. Before connecting any cable to product connector, short the center and outer conductors of the cable together to ground momentarily.
- For more information about electrostatic discharge, contact the Electrostatic Discharge Association www.esda.org.

Get more information

- Considerations for instrument grounding 5989-9200ENA
- 10 step daily ESD self-check 5989-5752ENA

Get the latest information about your product

- Check for updated service notes:
www.keysight.com/find/servicenotes
- Subscribe to the Keysight e-mail updates:
www.keysight.com/find/emailupdate
- Check BERT product information:
[www keysight.com/find/bert](http://www.keysight.com/find/bert)
- For worldwide service locations information visit:
www.keysight.com/find/assist

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