

ROHDE & SCHWARZ INSTRUMENT HEALTH GUIDE

For vector network analyzers –
tips for avoiding instrument damage.

For further information on the topics below please consult

- ▶ the safety instructions
- ▶ the Windows malware protection white paper on the Rohde&Schwarz website
- ▶ the user manual for your instrument



Flyer
Version 01.01

ROHDE & SCHWARZ
Make ideas real

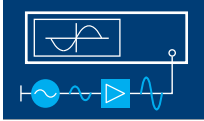


PREVENTING ELECTRICAL DAMAGE

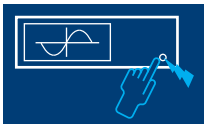
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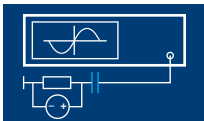
- ▶ Consult the operating manual or data sheet for further information before using any port.



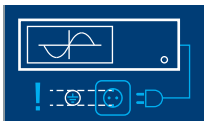
- ▶ Verify that the DUT's RF output power is below the instrument's RF damage level, especially when testing high-power active DUTs (i.e. DUTs providing gain). While the instrument's maximum RF output power is below the RF damage level of its ports, applying gain can result in overload. Set a custom "preset" output power when working with sensitive DUTs. By default, "preset" results in an active RF output power of -10 dBm.



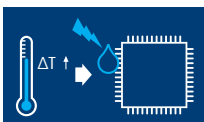
- ▶ Observe ESD precautions. Use a wrist strap and cord to ground yourself, for example by using the ground connector on the back of the instrument, or use a conductive floor mat and a heel ground strap when you connect a DUT or test fixture to, or disconnect it from, the instrument's ports. Install ESD protective covers after each use of the instrument's ports. Electrostatically discharge the DUT with a short or match prior to connecting it to the instrument. Even residual charges on cables can cause damage when discharged across the instrument.



- ▶ Protect ports from DC current/voltage. Applicable limits are specified in the data sheet (see "damage current/voltage/DC voltage").



- ▶ Consult the data sheet on the permissible characteristics of the instrument's power supply. Always use an AC power socket with a protective earth contact. Use a 3-wire power cable.



- ▶ Ensure that the ambient temperature is within the range specified in the data sheet.

DO NOT:

- ▶ Operate the instrument outside specifications. Warning signs are strategically placed at sensitive connectors.

- ▶ Overload the instrument ports by exceeding the applicable limits specified in the data sheet. The RF and direct source and receiver access ports are especially sensitive to overload.

- ▶ Defeat the instrument's earth grounding protection by using a power (extension) cable or an autotransformer without a protective ground conductor.

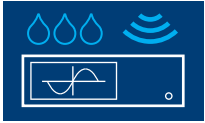
- ▶ Directly connect a DC supply to a port. Instead, use a bias tee for both biasing your DUT and supplying it with the RF signal.

- ▶ Use any AC power cable other than that delivered with the instrument. Other cables may be of poorer quality and could result in damage to the instrument.

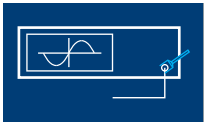
- ▶ Operate the instrument in case it shows signs of condensation. Condensation is the result of rapid temperature changes, for example after transport.

PREVENTING MECHANICAL DAMAGE

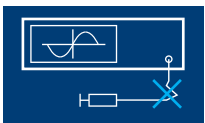
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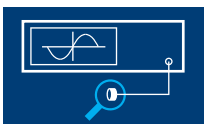
- ▶ Take preventive measures in case of a suboptimal operating site, for example by providing extra shielding for your instrument.



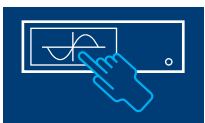
- ▶ Clean and inspect each connector prior to its use. Make sure to align the connectors on the cable and on the instrument along a common axis before tightening. Turn the outer connector nut, not the cable itself. Use a calibrated torque wrench to tighten the connector with the specified torque.



- ▶ Use cables of appropriate length to avoid bending of cables. Sharp bends lead to reflections and possibly to permanent cable damage.



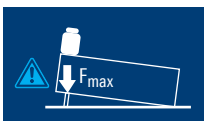
- ▶ Look for dirt and outer and inner conductor damage before using any cable. In case of dirt, apply compressed air to dislodge larger debris. Make use of isopropanol moistened foam cleaning swabs or wooden cocktail sticks to remove the remaining dirt. Dry the connector using compressed air.



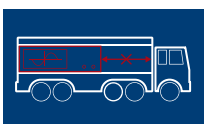
- ▶ Use your fingers or a stylus pen when touching the screen. Use a soft, dry, lint-free dust cloth for cleaning.



- ▶ Use both handles on the front or side of the casing for lifting or carrying the instrument.



- ▶ Fold the feet in or out completely to ensure stability of the instrument. The feet can collapse if they are not folded out completely or if the instrument is shifted while the feet are folded out.



- ▶ Use the original packaging for transportation. It is specifically designed to prevent mechanical damage and to provide ESD protection. In case the original packaging is lost, it can always be ordered separately.

DO NOT:

- ▶ Operate the instrument in a wet or polluted environment or expose it to high electromagnetic interference as these conditions can lead to premature aging or cause damage to the instrument.

- ▶ Tighten cables excessively as this can cause damage to the cables or the connectors. In contrast, insufficient tightening can lead to inaccurate measurement results. Make sure not to mix incompatible connector systems.

- ▶ Repeatedly bend cables as this increases wear and affects the user calibration.

- ▶ Apply too much pressure when cleaning the inside of connectors with foam cleaning swabs or wooden cocktail sticks. In the case of female connectors with an air dielectric, the slotted contacts of the inner conductor are easily bent. In the case of male connectors, the center pin is easily bent.

- ▶ Use cleaning agents as there is a risk of damage to the screen. Never touch the screen with a ballpoint pen or other sharp object.

- ▶ Apply excessive force or load to the handles, for example by carrying the instrument using only one handle.

- ▶ Exceed the maximum load on the instrument, with or without folded-out feet. Applicable limits are specified in the user manual.

- ▶ Leave headroom in the transport box as this means loose cargo and potential damage. Never use styrene pellets for packaging as they do not provide proper cushioning.

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