

How to protect sensitive RF instrumentation

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Spectrum and vector network analyzers like the SIGLENT SSA, SVA, and SNA series products feature very sensitive circuitry that can be easily damaged by electrostatic discharge or ESD. In many cases, ESD events aren't obvious. It isn't always a visible/noticeable event like the "wool sock shock" you may have tried as a child. ESD events often go unnoticed.

ESD events that occur near a sensitive RF circuit can cause:

- Complete loss of measurement capability. This can be verified visually. There may be no trace changes on the display when a known good signal is delivered to the input, etc..
- Increased amplitude measurement error. The additional error could cause the readings to be higher or lower than expected.. from 0.1 dB to 10's of dB.
- Increased tracking generator/stimulus source error.

Instrument designers include ESD prevention and protection in their designs, but this can only minimize the risk of damage.

Here are some steps you can implement to further minimize ESD events when working with sensitive circuitry:

1. Maintain a relative humidity above 40%. Low humidity increases the likelihood of ESD events.
2. Short the center pin and outer shield of cables to neutralize any potential differences before connecting the cable to any sensitive input
3. Use proper ESD protection when working with input connectors or sensitive boards. Basic protection includes using a 1 MOhm resistor-isolated ESD wrist strap and ESD minimized work surfaces.
4. Always use properly grounded power outlets and power cords

You can learn more at <https://www.esda.org/>



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