

CABLE & WIRE TROUBLESHOOTING MADE EASY

Using MTI Instruments' 1510A Precision Signal/Function Generator

Cable & Wire troubleshooting is important to identify and resolve problems with electrical or data transmission systems. Without proper troubleshooting, systems can fail, causing a range of issues including downtime, lost productivity and safety hazards. MTI Instruments' 1510A is ideal for troubleshooting in the instrumentation room, factory floor, flight-line or laboratory.



1510A KEY BENEFITS

The 1510A is a portable signal source used for calibrating electronic equipment and machinery monitoring systems. Its portability and ruggedness make it ideal for use in the instrumentation room, factory floor, flight-line or the laboratory. Benefits include:

- Ability to generate precise voltage and charge signals with an accuracy of 0.05%
- Capable of generating multiple waveforms
- Has programmable sweep
- Wide frequency range 0-100Khz
- 40 memory settings
- A fully transfer-of-standard calibrator which is NIST Traceable

WIRE & CABLE TESTING APPLICATIONS

The 1510A is commonly used for routine cable and end-to-end systems testing in a variety of industries:

- Aviation, Aerospace, Defense, Drones
- Energy (Hydro, Wind, Nuclear, Oil & Gas)
- Transportation (Automotive, Rail)
- Mining / Science
- Medical (Electromedical / Electrotherapeutic)
- Environmental Control (Construction / Roads, Water Management)

Mechanical Damage

Modern cords are coated with an elastomer insulation jacket such as PVC. Because the jacket is non-conductive, this protective insulation allows power to be safely delivered through the conductor. Unfortunately, cord damage can happen fast and penetrate the protective barrier. As a result, cords can develop nicks and/or be compressed, which compromises this insulation.

Heat Damage

Jacketed conductors subjected to sharp bending radius or overcurrent situations are threatened with damage to the insulation jacket. A heat-compromised insulating jacket can therefore fail to meet the insulation specification.

Electrical Noise and Distortion

When constructing harnesses for small-signal and high-speed communications interconnects, good design and layout practices need to ensure against degraded performance inherent to "transmission line effects." Incorrect material selection, suboptimal pin assignments, bad routing, etc., can degrade signal quality and contribute to communications losses.

USING THE 1510A FOR WIRE & CABLE TESTING

Regular cable testing allows the user to detect problems early, thus preventing unnecessary and costly outages. The 1510A is ideal for conducting common cable tests:

Continuity/Resistivity Analysis

The 1510A can generate a NIST-traceable signal from millivolt levels to 10Vpk. Both a precise AC and/or DC component may be synthesized. By injecting a precise signal into a harness, the user can measure the outgoing signal from the cable that is under test and characterize the cable in question.

Signal Integrity Validation

The 1510A has two output channels that can function independently or be combined to form a single output electrical signal. As a result, it can generate unique signals on separate conductors for the validation of signal integrity. Additionally, a signal can be generated from output A versus B with a defined and deterministic phase relationship.

Noise-to-signal Ratio Analysis

Electrical noise is a common side effect of poor or improper shielding, cable damage or poor grounding. 1510A's ability to generate a precise electrical signal makes it an ideal tool for injecting a known signal into a cable under test in order to measure the resulting signal. An effective transfer function may be derived; as the output signal may be compared to the (known/precise) input signal.

Frequency Loss Analysis

Due to their shielding, possible damage or length, some cables can act as electrical filters. Using the 1510A, a frequency sweep can be injected in situ (i.e., not in a laboratory setting) to ascertain whether the network effects of a harness are exhibiting high-pass or low-pass filter characteristics.

To learn more about MTI Instruments products for cable & wire troubleshooting visit www.MTIInstruments.com, e-mail sales@MTIInstruments.com or call (800) 342-2203.