



Universal Synaptics

Intermittent Fault Detection Advanced Testing Science

In a typical avionics system, there are thousands of internal and external circuit paths moving electrons through physical interconnection points. All these interconnects are aging to some degree and will fail intermittently long before they fail permanently. It only takes one of these devices reaching this condition to render the unit unreliable.

It is virtually impossible to manually probe an avionics system, and even if attempted, the probability that you would be measuring that specific line, at just the right moment, looking for the right signal, would be infinitesimal and futile.

By any reasonable scientific explanation of the problem, to catch intermittent faults, you need to have phenomenal testing speed (sensitivity) and 100% bandwidth. In other words, the proper technology for the task must be able to test all the potential failing systems lines, all the time, and in a simultaneous and continuous fashion.

Convention test equipment does just the opposite. Most scanning continuity testing devices employ digital sampling and averages techniques to achieve higher levels of parametric accuracy, most will completely "average" a short duration, ohmic, intermittent event out of existence.

A continuity test ONLY verifies that the unit under test is wired correctly and is stable at that specific moment in time. These devices are limited to measurement speeds in the 100 – 200 millisecond range which add up to some massive holes in intermittent test coverage when testing just a single line and intermittent fault detection is nearly impossible when using conventional ATE to test hundreds or thousands of interconnections which are found in typical avionics systems.

To address and overcome these testing limitations, the Intermittent Fault Detector (IFD) was developed specifically with intermittence detection and isolation requirements in mind. Our technology uses super sensitive analog detection on the front end and digital reporting data processing technology on the back end, and does it all in an efficient, parallel circuitry manner.

Our advanced technology simultaneously and continuously monitors all unit under test (UUT) circuits, detecting all intermittent faults that occur, even as short as *50 nanoseconds (0.00000005 seconds) in duration. In addition to detecting and isolating intermittent faults, our advanced testing solutions can also automatically interrogate and store the as-designed wiring configuration for a good unit and then based on that "gold" configuration, detect any open, short, ohmic, impedance, drift or miswiring problem in subsequent UUTs.

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