

Resistive Fault Location (RFL) Pre-Testing with HST-3000 OneCheck



Resistive faults are a common source of broadband service impairment, and a time domain reflectometer (TDR) can typically locate faults with lower resistive values such as dead shorts or grounds across tip and ring. However, more highly-resistive faults can be difficult if not impossible to locate using this method. Instead, an RFL test should be used.

An RFL test locates where a contact fault is occurring on wire or tip (A)/ring (B) in a cable pair. It is a series of resistive (ohmmeter) measurements executed with a strap in place at the far end of the cable section. By measuring the resistance of the faulted wire between the test set and fault, and factoring in wire gauge and temperature, the distance to the fault can be determined.



A two-ended test provides accurate fault identification for wideband services

Test Challenge

An RFL test may, at first glance, look simple and straightforward. In reality, it is anything but. Experienced technicians know that to be successful in locating faults accurately, they need to select the proper RFL mode, put the right strapping condition in place at the far end, and put the strap in the proper location—among other things.

Single-Pair RFL

This mode should be used when only one wire in a pair has a fault and the other is not faulted. The strap is placed at the far end between the known good (not faulted) and faulted wire as shown below.

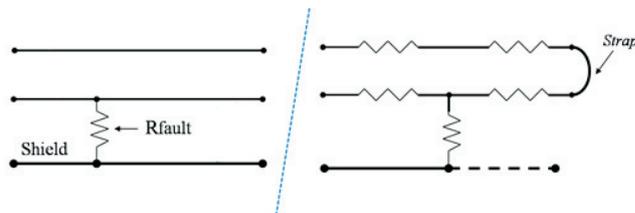


Figure 1. Single-pair RFL

Separate-Pair RFL

This mode is typically used when both wires in a pair are faulted but there is a known good pair (with no faults) available to be used as a reference, as shown below.

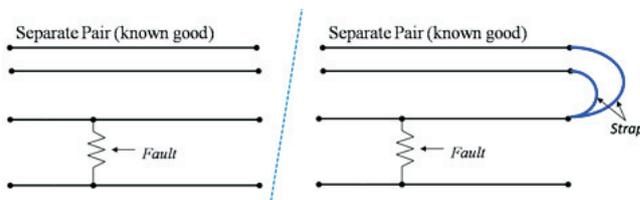
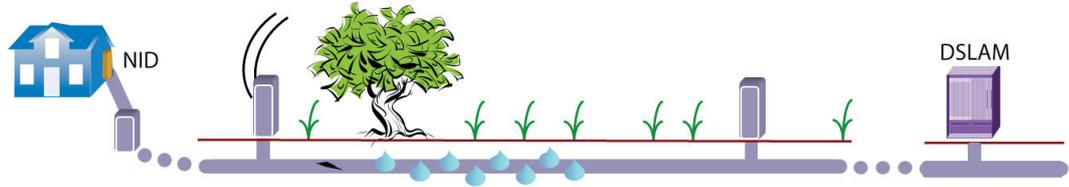


Figure 2. Separate-pair RFL

K Test

This test mode should be used when both wires in the pair are faulted and there is no known good spare pair available to use as a reference. A typical K-test scenario would be a wet section of pulp or paper cable. The K test works on loops up to 7 K ohms and for fault sizes up to 20 M ohms. The fault ratio of the two wires must be at least 2:1, the highest fault value should be at least 100 times greater than the loop ohm reading, and the two faults must occur at the same physical point along the cable.



As described above, knowing which mode to use and how to strap the far end can be challenging and time consuming—but it must be done correctly to ensure an accurate fault-location result.

The OneCheck RFL Pre-Test used with the JDSU UltraFED™ IIB takes the guesswork out of choosing which RFL mode to use. It also saves time by automating the process in a one-button test.

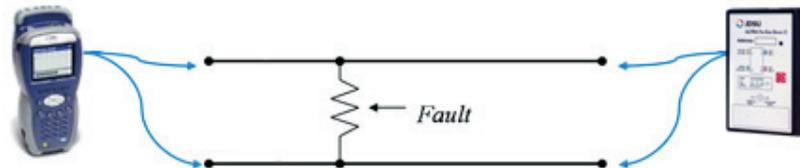


Figure 3. RFL pre-test

Addressing the Challenge with OneCheck and the UltraFED IIB

The OneCheck RFL Pre-Test automatically runs end-to-end between the HST and UltraFED IIB, measures circuit and loop resistance and determines the RFL mode and set-up appropriate to the measured pair and fault conditions as shown below.

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