

Identification of Soft Faults in Branched Wire Networks by Distributed Reflectometry and Multi-Objective Genetic Algorithm

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Abstract : This contribution presents a method for detecting, locating, and characterizing soft faults in a complex wired network. The proposed method is based on multi-carrier reflectometry MCTDR (Multi-Carrier Time Domain Reflectometry) combined with a multi-objective genetic algorithm. In order to ensure complete network coverage and eliminate diagnosis ambiguities, the MCTDR test signal is injected at several points on the network, and the data is merged between different reflectometers (sensors) distributed on the network. An adapted multi-objective genetic algorithm is used to merge data in order to obtain more accurate faults location and characterization. The proposed method performances are evaluated from numerical and experimental results.

Keywords : wired network, reflectometry, network distributed diagnosis, multi-objective genetic algorithm

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