pass
testing solutions

Data Sheet
PTS HW FAULT INJECTION MODULE

Features

- PTS Engineering Fixture (standard)
- Integrated HW Fault Injection Unit
  - Up to 8 Relays Cartridges à 48 Relays
  - Up to 2 Fault Rails
  - Ethernet Interface
  - Up to 384 test points
  - Max. Current 1A
  - Connected via backplane
- Mapping Test Points and Relays
- Full integration in Hardware-in-the-Loop (HiL) setup
- Controlled via PTS Testing Framework or other standard tools (e.g Vector CANoe)

Applications

- Verification and Validation: Essential for the thorough assessment of software-based monitoring functions and safety mechanisms, ensuring their operational integrity in diverse scenarios.

- Continuous Automated Testing: Integrates seamlessly into the product development cycle, facilitating automated testing across all software updates to uphold stringent safety standards.

- Compliance with Safety Analyses: Executes tests derived from detailed safety analyses such as FMEA (Failure Mode and Effects Analysis) and FMEDA (Failure Modes, Effects, and Diagnostic Analysis) for HW related failures.

- Adherence to Safety Standards: Meets the requirements set by safety standards like ISO 26262 and IEC 61508 for hardware fault injection. The HW fault injection tests are essential for the safety case of the DUT and its functionality.

Visual

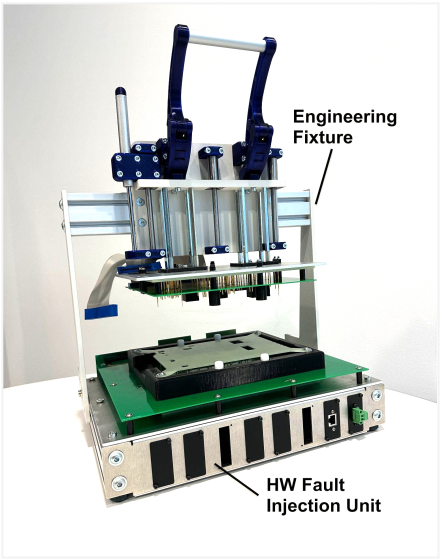

Figure 1: General Overview

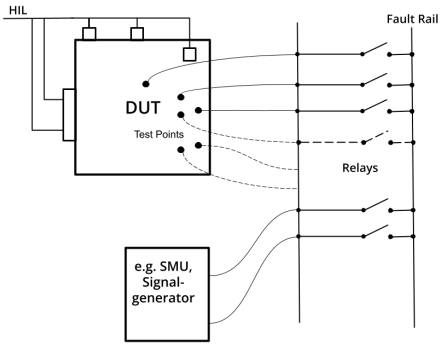

Figure 2: Fault Injection Architecture

General Description

The PTS HW Fault Injection Module is designed to facilitate automated testing of HW-related safety functions in a Hardware-in-the-Loop (HiL) environment. This advanced tool is capable of emulating a wide range of hardware faults on the Device Under Test (DUT) to ensure that software enabled monitoring and safety functions are working correctly.

Integration with the HiL system is seamless, with all DUT test points interconnected through a standard Engineering Fixture with a needle bed. This setup allows for the precise injection of hardware faults into the DUT through the use of relays, which are controlled by the HiL system over an Ethernet connection. The test cases are defined and executed within the HiL's testing framework, ensuring comprehensive coverage and reliability of results.

The PTS HW Fault Injection Module is adept at simulating common hardware failure modes automatically, including but not limited to:

- Electrical shorts between test points
- Shorts to the ground
- Variations in signal or voltage levels at specific test points

This capability ensures a thorough validation of the DUT's resilience to hardware failures, highlighting the robustness of safety mechanisms and software responses under fault conditions.