

TWRT: TRAVELLING WAVE RELAY TESTING

The RTDS® Simulator's TWRT™ functionality enables our users to comprehensively and flexibly test travelling wave protection devices in a closed loop.

The emergence of travelling wave line protection and fault location is a true breakthrough in the power industry, improving power system performance by increasing transient stability margins, increasing public and personnel safety, and limiting equipment wear and damage. The ultra high-speed protective devices incorporating these techniques trip securely in a few milliseconds, record events in the MHz sampling rate range, and locate faults with unprecedented accuracy. The RTDS Simulator's TWRT functionality is the most robust tool available for testing these devices.

KEY FEATURES OF TWRT

- Accurately test travelling wave protection and fault location (found in the SEL-T400L and SEL-T401L relays) in a closed loop with the simulated power system.
- The industry's only tool with robust Frequency Dependent Phase Domain transmission line models operating at the necessary small timestep for travelling wave testing. Also the only tool successfully used to perform closed-loop testing of travelling wave protection devices with trip circuits live to the breakers.
- Multiple line segments represent physical transposition and allow fault modeling at multiple locations.
- GTFPGA-TWRT is compatible with both NovaCor and PB5 processor card-based simulation hardware.

TWO HARDWARE OPTIONS FOR VARYING CAPABILITIES AND BUDGETS

TWRT ON NOVACOR™

TWRT's high-speed frequency dependent phase domain transmission line models can run directly on the powerful multicore processor-based NovaCor simulation hardware. This is a highly flexible and expandable option with the ability to simulate larger systems — for example, parallel line schemes.

TWRT ON THE GTFPGA UNIT

Using the dedicated GTFPGA Unit running the TWRT firmware allows for the high-speed simulation of frequency dependent phase domain transmission lines in parallel with the rest of the real-time simulation running on main processing hardware. The GTFPGA Unit is a low-cost option that can be used in cases where small- or medium-sized systems are being simulated. GTFPGA-TWRT is directly interfaced with the small timestep simulation environment via a fibre cable.



**LEARN MORE ABOUT TWRT BY SEARCHING OUR
KNOWLEDGE BASE AT KNOWLEDGE.RTDS.COM**

