

# GTSOC V1: AUXILIARY HARDWARE FOR REAL-TIME BLACK BOX CONTROL

The GTSOC (**Giga-Transceiver System-on-a-Chip**) V1 is a new auxiliary hardware component for the RTDS® Simulator. This rack-mountable unit features a powerful FPGA board with multi-processor system-on-a-chip technology to facilitate the integration of black box control models into the real-time power system simulation. This hardware works in parallel with the NovaCor™ generation of central RTDS Simulator processing hardware.



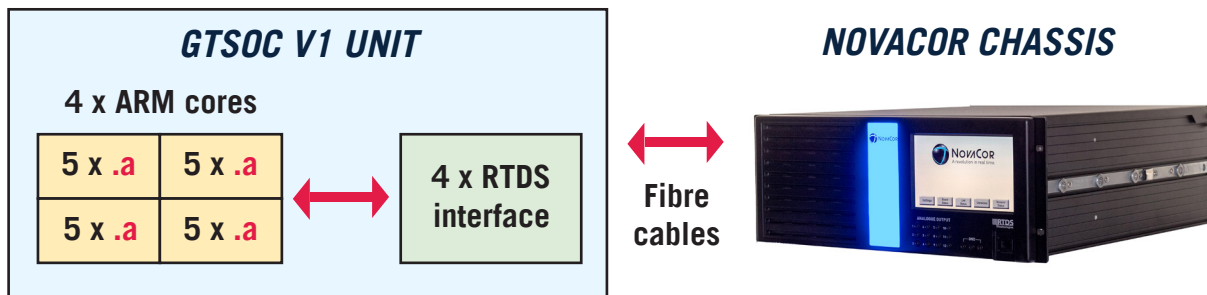
**THE GTSOC V1 HAS 8 FIBRE PORTS FOR CONNECTION TO NOVACOR PROCESSING HARDWARE**

## SUPPORTING REAL-TIME INTEGRATION OF BLACK BOX CONTROL MODELS FROM MANUFACTURERS

As the power system becomes more complex and dominated by converter-based technologies, the ability to accurately model the behaviour of control and protection devices is critically important. The interoperability of devices from different manufacturers and the surrounding power system can be validated via real-time simulation and hardware-in-the-loop testing. However, the ability to integrate proprietary models into a real-time simulation is a challenge in terms of both intellectual property and parallel processing. The source code for these control models is typically compiled in file types which are not inherently capable of deterministic real-time operation.

The GTSOC allows for convenient and deterministic integration of black box controllers into the real-time simulation environment, providing IP security and high performance. Using its ARM processors, the GTSOC runs bare-metal **.a static library files** containing the controller source code in parallel with the real-time simulation.

- Each of the GTSOC's four ARM cores can run up to 5 **.a** instances, for a maximum of 20 **.a** library instances per GTSOC unit
- Each **.a** instance supports up to 64 inputs and 64 outputs



The timestep achieved by the GTSOC depends on the quantity and complexity of control library instances running on it.

**TO LEARN MORE ABOUT THE GTSOC, EMAIL [MARKETING@RTDS.COM](mailto:MARKETING@RTDS.COM)**

