

HSR/PRP/1588v2 IP-Core

Seamless Ethernet redundancy for safety-critical applications

General description

The HSR/PRP/1588v2 IP-Core is a Link Redundancy Entity (LRE) implementation according to the IEC 62439-3.4/5 standard featuring PRP and HSR protocols. These protocols extend the Standard Ethernet (IEEE 802.3) networks with seamless redundancy through frame and communication path duplication. In case of a single frame loss in an HSR/PRP-network, no frame re-transmission is needed. At the same time, no changes to existing protocol stacks are required due to HW-only implementation. Both parallel (PRP) and cost-saving ring (HSR) Ethernet topologies are supported. The optional P2P Stateless Transparent Clock (SLTC) performs high-accuracy corrections according to IEEE 1588v2 standard.

Key features

- Fully transparent communication,
- Predictable delays for hard real-time,
- Cut-through operation (delay < 1µs),
- Integrated network health supervision,
- VLAN-based Quality of Service (QoS),
- IEEE 1588v2 P2P SLTC (accuracy < 25 ns),
- Triple (10/100/1000Mbit) link speed,
- (R)(G)MII and reverse PHY interface styles,
- Avalon and AXI-Lite interfaces for SoCs,
- Low pin-count µCU interfaces (SMI/SPI),
- Evaluation kit available,
- Small resource footprint:

Target technology	Resource usage*
Altera Cyclone V	8k ALMs, 58 RAMs
Altera Cyclone IV	20k LEs, 59 RAMs

*16/8kB buffers, 1588v2 SLTC, Nodes Table

Deliverables

- Technology-independent VHDL source code,
- Reference designs for Altera and Xilinx IDEs,
- User testbench and simulation scripts,
- Comprehensive documentation,
- SDC timing constraints.

Company profile and contact

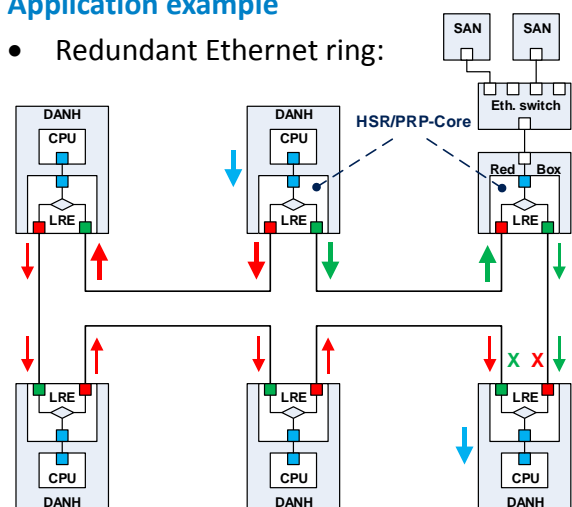
VeryLogic GmbH offers FPGA-related design services, especially IP-Core development and verification. For further questions about the products and services, contact us at contact@verylogic.de

Applications

- Rail transport,
- Industrial networks,
- Substation automation,
- Defence and Aerospace.

Application example

- Redundant Ethernet ring:



Related products

- Stateless Transparent Clock IP-Core,
- Universal (R)(G)MII Adapter IP-Core,
- Simple Switch IP-Core.