RelyUm® Industrial

Time-Sensitive Networking
Endpoint Bridge PCIe NIC

RELY-TSN-PCIe

Overview

Time-Sensitive Networking (TSN) allows to combine critical and best effort traffic in a unique deterministic and interoperable Ethernet network. This offers significant cost reductions in terms of equipment investment, maintenance, seamless integration and single vendor dependence reduction.

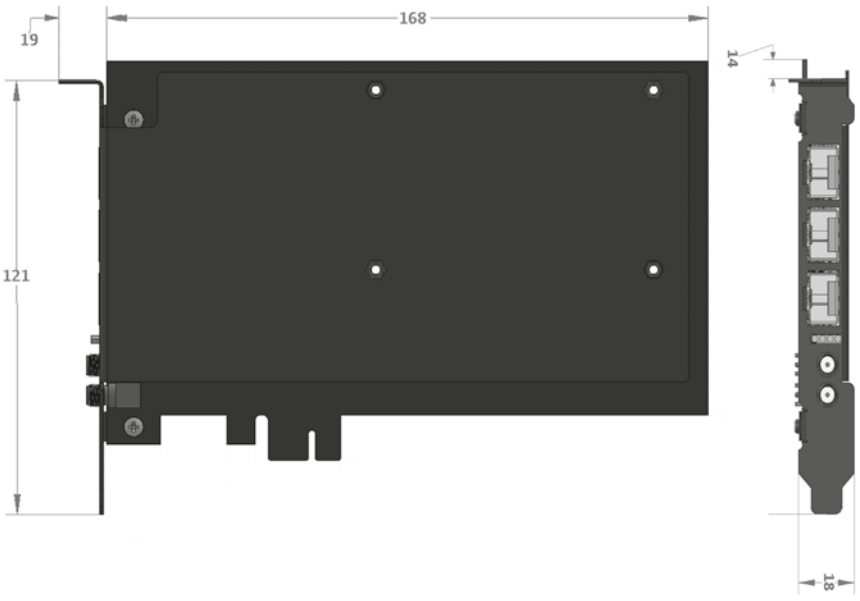
Introducing RELY-TSN-PCIe, a groundbreaking TSN endpoint bridge PCIe NIC that is simplifying deterministic Ethernet networks with ease. With 2 multimedia Gigabit Ethernet ports and 2 internal ports, this device functions as both a PCIe TSN Endpoint and a TSN Bridge, making it easy to integrate TSN technology into any system.

RELY-TSN-PCIe leverages Xilinx UltraScale™ FPGA technology, which offers specialized networking, synchronization, and security services. Its FPGA-based design ensures adaptability to evolving TSN standards. This platform is supported by a robust ecosystem and expertise from SOC-E, ensuring a seamless retrofitting process from start to finish.

Key Features

- **COTS systems retrofitting** to add advanced TSN features, to support deterministic communications.
- FPGA-based solution, powered by **SOC-E's in-house designed** technology, to be **easily upgraded** as TSN standards evolves.
- **"Zero-Packet Loss" redundancy** using TSN FRER for selected traffic combined with MSTP.
- Simplified management and monitoring via a user-friendly HTTPS web interface or SSH accessible CLI. **Compliant with Qcc for centralized configuration through YANG model configuration files**.
- Comprehensive **TSN Ecosystem** offering combined **with SOC-E's TSN Expertise**, to deploy a turnkey project.
- Ethernet **network drivers available for most OS** (Linux, Windows and other RTOS).

Dimensions



Technical Specifications

Communication Interfaces

- 2x 100/1000BASE-SFP TSN Ethernet ports
- 1x 1G PCIe port for attachment to a host computer

Layer 2 Features

- IEEE 802.3-2008 (Ethernet)
- Automatic MAC address learning and aging
- Static MAC Table
- Port-Based Virtual LANs (VLANs):
  - Logical segmentation of network for optimal use of bandwidth
  - IEEE 802.1Q for VLAN tagging (up to 4K VLAN groups)
  - IEEE 802.1p for Class of Service (CoS) / Quality of Service (QoS)
- IEEE 802.1AB for Link Layer Discovery Protocol (LLDP)
- Port rate limiting
- Storm control for flooded broadcast, multicast and unicast
- Layer 2 multicast filtering
- IGMP Snooping (up to 1024 multicast filters)
- Spanning Tree Protocol:
  - IEEE 802.1D (STP)
  - IEEE 802.1w (RSTP)
  - IEEE 802.1s (MSTP)

TSN Features

- IEEE 802.1AS - Timing and Synchronization
- IEEE 802.1Qav - Credit Based Shaper (CBS)
- IEEE 802.1Qbv - Time Aware Shaper (TAS)
- IEEE 802.1Qci - Per-Stream Filtering and Policing
- IEEE 802.1CB - Frame Replication and Elimination for Reliability (FRER)
- IEEE 802.1Qcc - Stream Reservation Protocol (SRP) Enhancements and Performance Improvements

Security

- IEEE 802.1X for port-based network access control
- MAC port binding & authentication for login security
- RADIUS authentication
- RBAC (Role Based Access Control)
- Selective ports disabling capability
- Unsecure protocols disabling capability
- HTTPS for web interface
- Secure Shell (SSH) Protocol v2 for command line interface
- Encryption/authentication & signature for firmware and bitstream

Configuration & Management

- HTTPS web interface
- SSHv2 command line interface (CLI)
- Netconf protocol (YANG model-based configuration) support
- Encrypted and digitally signed firmware/bitstream upgrades
- Saving and restoring configuration
- Internal status monitoring and logging
- Event notification through Syslog
- Statistics independent per port
- In-band management via any Ethernet switch port

Processing

- Xilinx Ultrascale+ MPSoC device:
  - 2x 64bit CPU ARM-Cortex-A53
  - 2x 32bit CPU ARM-Cortex-R5F
  - 1x 16nm UltraScale+ FPGA
- 2GB DDR4 RAM memory
- 16GB eMMC Flash memory
- 256Mb QSPI Flash memory

Physical & Electrical Characteristics

- Fanless design
- Dimensions (mm): 121(W) | 168(D) | 18(H)
- Weight: 255g
- Power Input as defined in PCI-express standard:
  - +12VDC
  - +3.3VDC
- Operating temperature: -40°C to +55°C
- Storage temperature: -40°C to +85°C
- Full-Height PCIe card mounting

Warranty

- 2 years

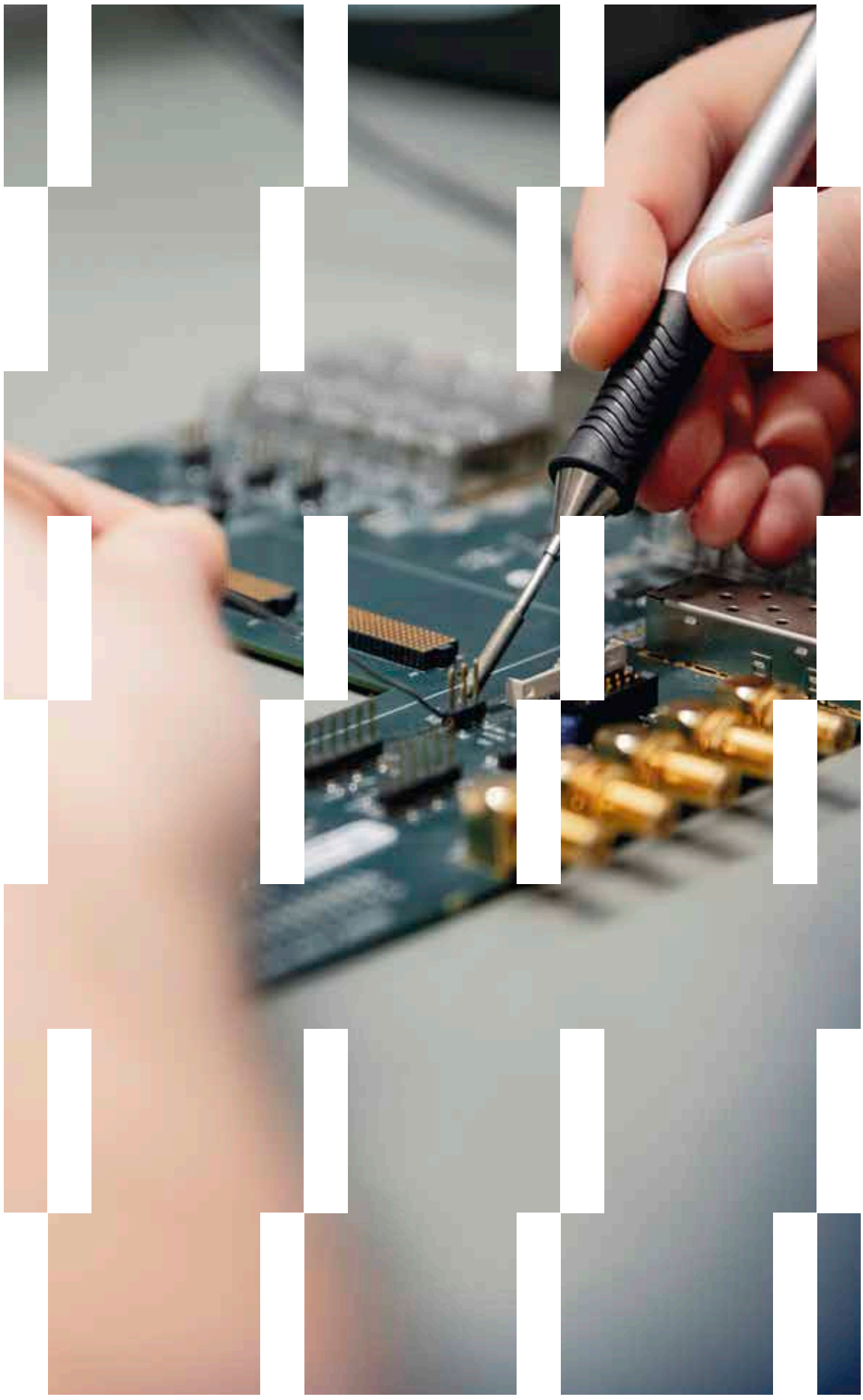
Certifications

- UNE-EN 61326-1:2013
- UNE-EN 61326-2-1:2013

Ordering Code

Ordering code	Model and description
TSN26.17	RELY-TSN-PCIe: Time-Sensitive Networking Endpoint Bridge PCIe NIC
Accessories	
A-SFP-CU-02.01	COPPER SFP (10/100/1000): Copper tri-speed RJ45 SFP Module
A-SFP-FO-MM-01.01	FIBRE SFP (100) – 1310/MM/LC: Multimode Fibre Optic LC Connector 1310nm 100Mbps SFP Module
A-SFP-FO-SM-01.01	FIBRE SFP (100) – 1310/SM/LC: Singlemode Fibre Optic LC Connector 1310nm 100Mbps SFP Module
A-SFP-FO-MM-02.01	FIBRE SFP (1000) – 850/MM/LC: Multimode Fibre Optic LC Connector 850nm 1000Mbps SFP Module
A-SFP-FO-MM-02.02	FIBRE SFP (1000) – 1310/MM/LC: Multimode Fibre Optic LC Connector 1310nm 1000Mbps SFP Module

To know more about other available references, please contact your sales representative.



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By

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SOC-E®

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