RelyUm® Industrial

HSR/PRP/PTP Redbox/
DAN/Switch PCIe NIC

RELY-PCIe

Overview

In a market that is undergoing the revolution of new powerful small sized equipment, RELY-PCIe provides the most demanding networking features to any kind of PC, regardless of its size.

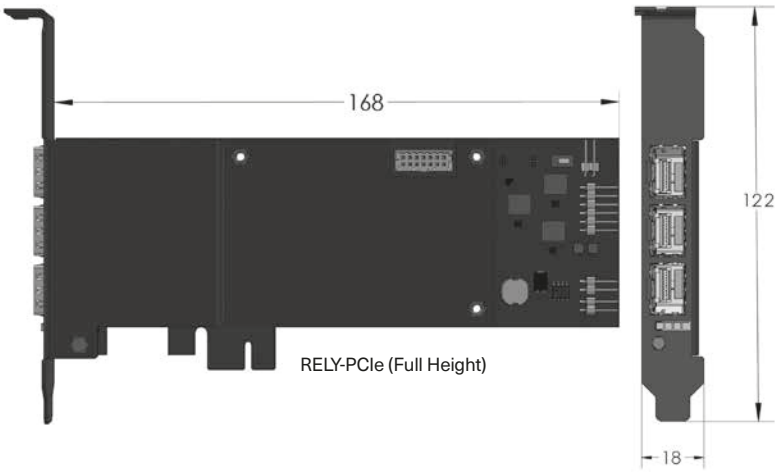
PCI Express (PCIe) is the most extended high-speed serial computer expansion bus. It is the de-facto standard for expansion boards in PC computers and it is gaining acceptance in Industrial PCs and even in SCADA systems. RELY-PCIe is a smart pluggable board that comprises in the same device hardware and software resources to implement specialized networking, synchronization and security-oriented services. Its flexible design allows it to be fitted in full height or low profile slots.

RELY-PCIe can be used as a multi-media PCIe Redbox-DAN, operating as an HSR/PRP node of a high-availability network and connecting an Ethernet network segment with an HSR/PRP network. The device uses dedicated hardware for low latency switching and for implementing high accuracy clock synchronization based on IEEE 1588 standard.

Key Features

- Full in-house design (SOC-E IP Cores) based on a **reconfigurable platform, upgradable and customizable**.
- Support for **HSR/PRP** "Zero-Packet Loss" redundancy and **NTP/PTP** sub-microsecond synchronization.
- COTS **systems retrofitting** to add advanced synchronization and redundancy features, and multimedia and multi-rate ports.
- **Simplified management and monitoring** via a user-friendly HTTPS web interface or SSH accessible CLI.
- Ethernet **network drivers available for most OS** (Linux, Windows and other RTOS).

Dimensions



Technical Specifications

Communication Interfaces

- 2x 100/1000BASE-SFP HSR/PRP Ethernet ports
- 1x 100/1000BASE-SFP Regular Ethernet port (Redbox interlink)
- 1x 1G PCIe port for attachment to a host computer
- 1 x PPS output (MMCX connector)

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)
- Switching port mask for forwarding
- Port rate limiting
- Storm control for flooded broadcast, multicast and unicast
- Layer 2 multicast filtering
- Zero-Recovery Time redundancy:
  - High-availability Seamless Redundancy (HSR) - IEC 62439-3 Clause 5
    - Supported modes: H, N, U, HSR-SAN, PRP-HSR, HSR-HSR
    - Cut-through operation for the HSR ring to minimise the latency in the ring
  - Parallel Redundancy Protocol (PRP) - IEC 62439-3 Clause 4
    - Supported modes: Duplicate discard, duplicate accept, transparent reception, PRP-HSR
    - Store & Forward for PRP and Ethernet operation
- Spanning Tree Protocol:
  - IEEE 802.1D (STP)
  - IEEE 802.1w (RSTP)
  - IEEE 802.1s (MSTP)

Synchronization

- IEEE 1588-2008 v2 (PTPv2)
- IEEE 1588 Stateless Transparent Clock (TC)
- IEEE 1588 Ordinary Clock (Master-Slave)
- Time Bridge operation: NTP <-> PTP
- NTP (Server/Client)

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
- Per port ingress and egress port mirroring
- 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)
- SNMP V1/V2c/V3 protocol support
- SNMP V3 encrypted authentication and access security
- Encrypted and digitally signed firmware/bitstream upgrades
- Saving and restoring configuration
- Internal status monitoring and logging
- Event notification through Syslog
- Graphic representation of Network status (only in HSR/PRP networks)
- Statistics independent per port
- In-band management via any Ethernet switch port

Processing

- Xilinx Zynq-7000 SoC device:
  - 2x 32bit CPU ARM-Cortex-A9
  - 1x 28nm Programmable FPGA
- 1GB DDR3 RAM memory
- 16GB eMMC Flash memory
- 256Mb QSPI Flash memory

Physical & Electrical Characteristics

- Fanless design
- Dimensions (mm):
  - Full Height: 168(W) | 122(H) | 18(D)
  - Low Profile: 168(W) | 81(H) | 18(D)
- Weight: 155g
- 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 or Low Profile PCIe card mounting
- Power Consumption: 4.2W (6W with 3x SFP copper modules)

MTBF

- 1,925,000 hours GB@25
- MTTR = 0.5 hour

Warranty

- 2 years

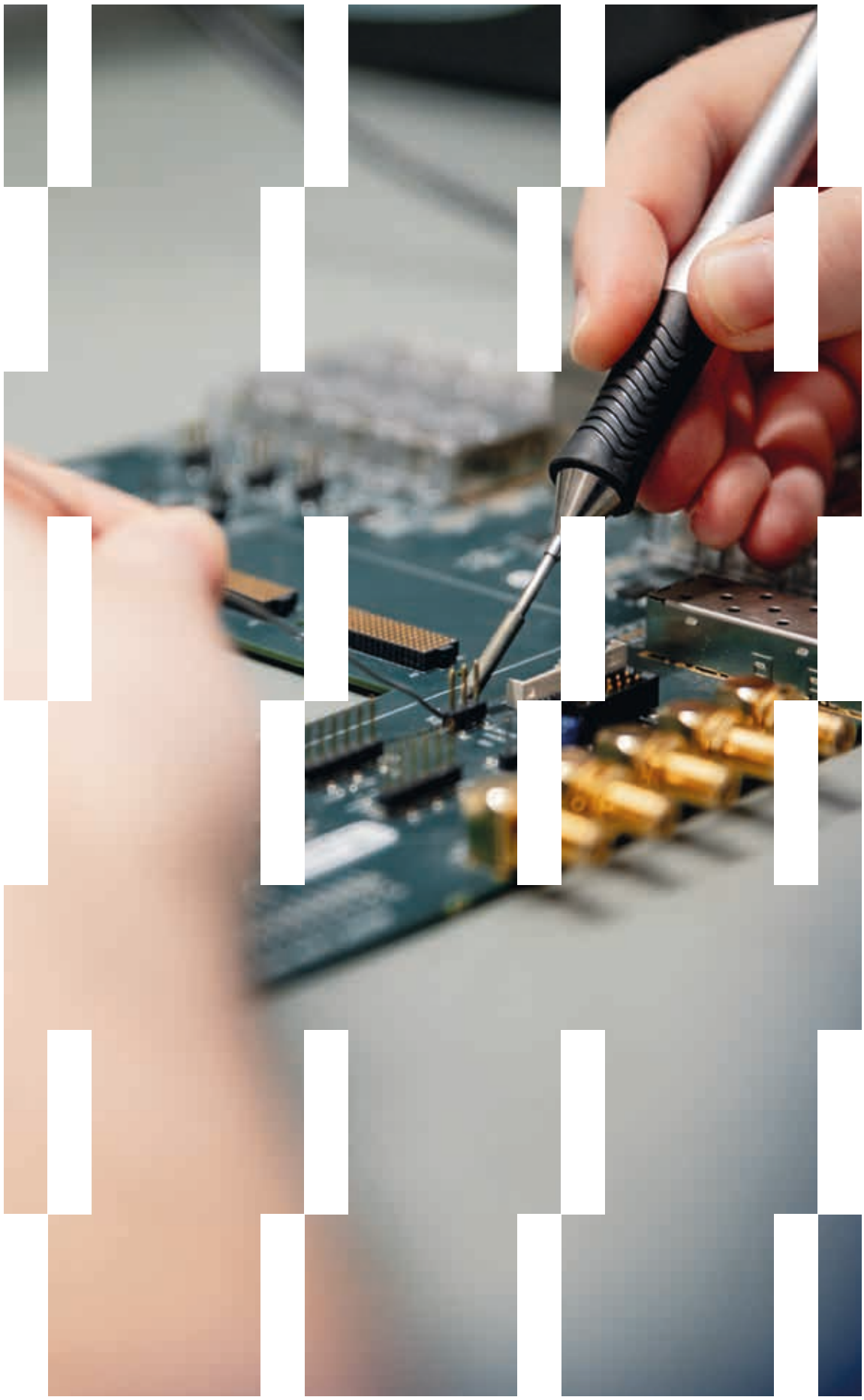
Certifications

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

Ordering Code

Ordering code	Model and description
RB19.19	RELY-PCIe (Low Profile): HSR/PRP/PTP Redbox/DAN/Switch PCIe NIC for Low Profile slot
RB19.20	RELY-PCIe (Full Height): HSR/PRP/PTP Redbox/DAN/Switch PCIe NIC for Full Height slot
Accessories	
SFP-CU-01	COPPER SFP (10/100/1000)
SFP-FO-01	FIBER SFP (100) – MM/LC
SFP-FO-02	FIBER SFP (100) – SM/LC
SFP-FO-04	FIBER SFP (1000) – 850/MM/LC

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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