RelyUm® Industrial

12-port 1G
Time-Sensitive Networking Switch

RELY-TSN12

Overview

Time-Sensitive Networking (TSN) seamlessly integrates critical and everyday traffic in a deterministic Ethernet network, offering significant cost savings and reducing dependence on a single vendor. Emerging from the success of RELY-TSN4, SOC-E's TSN journey evolves with RELY-TSN12, built on the company's proven TSN technology.

RELY-TSN12 device features flexible port options, including 8x 10/100/1000Mbps copper ports and 4x 100/1000 Mbps multimedia ports, supporting a broad range of TSN standards for versatility.

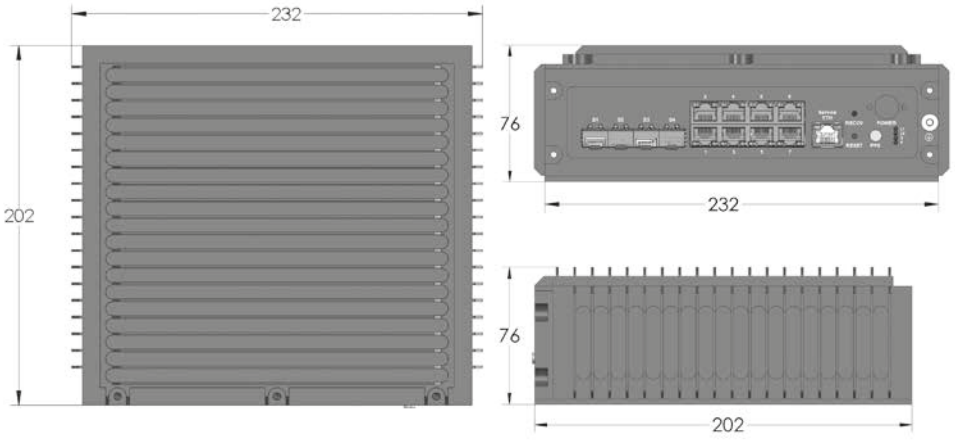
With proven reliability in different critical sectors, the RELY-TSN12 simplifies management through an integrated Web Server for configuration, monitoring, and updates.

Applications for the RELY-TSN12 span real-time precision testing, industrial equipment validation, process automation optimization, secure communication, educational advancements, prototype validation, scientific research, industrial process control, and seamless TSN application development.

Key Features

- **8x 10/100/1000BASE-T TSN** ports and **4x 100/1000BASE-SFP TSN** ports supporting a **wide range of TSN standards**.
- FPGA-based solution, powered with **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.

Dimensions



Technical Specifications

Communication Interfaces

- 4x 100/1000BASE-SFP TSN Ethernet ports
- 8x 10/100/1000BASE-T(X) TSN Ethernet ports
- 1x 10/100/1000BASE-T(X) Ethernet Service port
- 1 x PPS output (SMA 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)
- 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
- 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)
- 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 or out-of-band via Ethernet service port

Processing

- Xilinx UltraScale+ MPSoC device:
  - 4x 64bit CPU ARM-Cortex-A53
  - 2x 32bit CPU ARM-Cortex-R5F
  - 1x GPU ARM-Mali 400MHz
  - 1x 16nm UltraScale+ FPGA
- 4GB DDR4 RAM memory
- 32GB eMMC Flash memory
- 512Mb QSPI Flash memory

Physical & Electrical Characteristics

- Fanless design and full metal enclosure
- Dimensions (mm): 232(W) | 202(D) | 76(H)
- Weight: 2.62kg
- Power input: 5VDC @ 10A
- Included power adapter with voltage range 100-240VAC
- Power consumption: 15-25W
- Operating temperature:
  - Power adapter: 0°C to +40°C
  - Equipment: -35°C to +45°C
- Storage temperature:
  - Power adapter: -20°C to +80°C
  - Equipment: -40°C to +85°C
- Optional mounting over coldplate

MTBF

- 500,000 hours GB@25 (w/out external power adapter)
- MTTR = 0.5 hour (w/out external power adapter)

Warranty

- 2 years

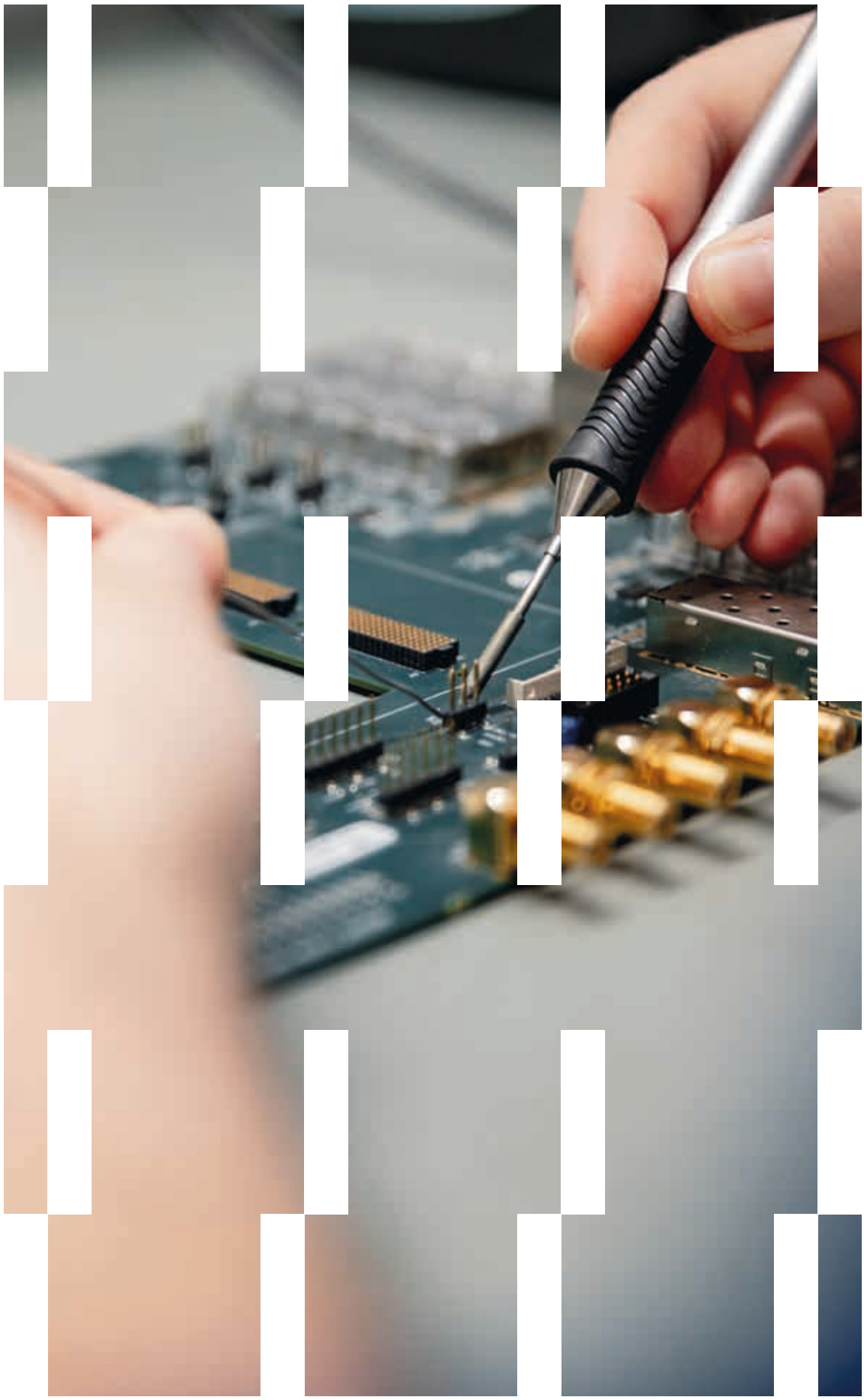
Certifications

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

Ordering Code

Ordering code	Model and description
TSN32.05	RELY-TSN12: 12-port Time-Sensitive Networking Switch
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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