ELECTRONICS & DEFENSE

WHITE RABBIT ZEN TP-32BNC

The reliable node that provides multiple legacy 1ØMHz/xPPS timing outputs.

WHITE RABBIT ZEN TIME PROVIDER:
WR-ZEN TP-32BNC
hw version >v4.0 (Low Jitter version)

The reliable node that provides multiple legacy 10MHz/xPPS timing outputs for all equipment in your rack cabinet through White Rabbit time transfer and its redundant connections.

The WR-ZEN TP-32BNC easily distributes time and frequency to other equipment by implementing standard timing protocols such as PTP, NTP, IRIGB, 10MHz/xPPS, etc.

The WR-ZEN TP-32BNC combines ultra-stable clocks with low jitter and temperature compensated clock resources to enhance its synchronization accuracy.

- Sub-nanosecond time accuracy and picosecond level precision.
- WR, PTPv2 and NTP over optical interfaces.
- Extended management and monitoring.
- Distance range over 80km using fiber.
- Multi-source time references.
- Linux-based WRZ OS.
- Failover mechanisms & Holdover.
- Robusteness & Redundancy.
- 32x Configurable timing ouputs.
- Low jitter/phase noise frequency dissemination

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High Accuracy
The WR-ZEN TP-32BNC implements the White-Rabbit (WR) protocol, an high-accuracy extension of PTP based on SyncE, that allows to easily distribute sub-nanoseconds timing within Metro Area Network distances and beyond. Worth to mention, that a timing network using WR protocol is not affected by the traffic load nor the number of hops.

Interoperability
Used as time provider or interoperability node, the WR-ZEN TP-32BNC can distribute standard PTP IEEE 1588-2008 for the last hop through its 2x fiber ports using the most common profiles such as Telecoms profiles (G.8265.1, G.8275.1) & Power profiles (IEEE C37.238-2011 and IEEE/IEC 61850-9-3). It also provides NTP interoperability and 10MHz/PPS distribution.

Advanced Management
The WR-ZEN TP devices enable extensive monitoring via REST-API and SNMP including the combination of smart alerts with traps. By providing templates, it facilitates its integration with third-party networking and monitoring tools. Moreover, it allows automatic topology discovery via LLDP and comprehensible remote logging through rsyslog.

Low jitter enhacement
The low jitter/low phase noise version of the WR-ZEN TP 32 BNC includes improved clock circuitry in order to enhance the stability and accuracy of the timing outputs. As result of the improved performance, the WR-ZEN TP-FL is able to meet the most demanding requirements in terms of time and frequency

Resiliency
To ensure continuous operation the WR-ZEN TP-32BNC incorporates a failover mechanism. It provides a safer version of the “Best-Master-Clock” algorithm as it only allows switching over multiple (predetermined) timing sources when a failure is detected. Additionally, an optional Holdover oscillator can be included to maintain high accuracy (1.5us < 24h) even if all timing references are down.

Intuitive configuration
The new version of WRZ-OS introduces a complete web interface redesigned to provide an excellent user experience: By the means of timing presets, a complex configuration can be done in a few clicks. Simultaneously, the CLI tool has also been rethought to allow straightforward configuration from the terminal to advanced users.

Enhanced Security
TACACS+/RADIUS have been integrated to enable remote authentication for networked access control through a centralized server. The secure version of most of the protocols such as SFTP, HTTPS, SNMPv3 has been implemented and a firewall has been incorporated to provide a robust system against malicious users..

Technical Specifications

Timing & Synchronization	
Multi-sources	*Failover mechanism to ensure continuous operation by switching over multiple timing sources in case of failure:* • White Rabbit (accuracy <1ns) • External references (GNSS, Atomic Clocks)
WR	Supports GM/ Master/ BC/ Slave modes
PTP IEEE 1588-2008	Supports Master mode, E2E/P2P, L2/L3, Multicast/Unicast. Supported Profiles: • Default • G.8265.1[1] • G.8275.1 [1][2] • IEEE C37.238-2011[1] • IEEE/IEC 61850-9-3 [1]
NTP	Supports Client & Server modes Supports NTP v2, v3 & v4 Supports hardware timestamping
IRIG-B (optional)	Supported via configurable BNC outputs
Holdover (optional)	Accuracy (learning 3 days from GNSS) below 1.5us @ 24h
Management & Communications	
Control	CLI & Web-GUI: HTTP(s)
Authentication	• RADIUS • TACACS+
Monitoring	• SNMPv3 (SNMPv2) + Traps with enterprise MIB • Smart-Alerts • REST-API
Network	• SSHv2 (OpenSSH 8.1) + SFTP/SCP • HTTP(s) • DHCP • LLDP • Rsyslog

[1]: PTP License not included in default package
[2] Not supported in firmware version v5.0

Security Features

- Configurable Password Policy
- Authentication: RADIUS; TACACS+
- Enable/Block protocols
- SFTP/SCP: Securely transfers files to and from the device over an SSH session
- SNMP v3: Remotely configure and manage over an encrypted connection
- HTTPS support
- Firewall configuration
- Alert notifications via SNMP traps and email
- Signed software updates

Specifications: 10MHz output

Phase noise (dBc/Hz)	GM	Slave
1 Hz	-97.2	-96.4
10 Hz	-112.3	-111.4
100 Hz	-134.5	-134.7
1 kHz	-148.1	-148.2
10 kHz	-150.0	-149.9
100 kHz	-150.0	-149.9

ADEV		
@1s	1.02E-12	1.19E-12
@10s	1.20E-13	1.47E-13
@100s	1.42E-14	2.51E-14
@1000s	1.79E-15	3.24E-15

Signal waveform & Levels: LVTTL into 50 ohm, SMA

Specifications: 1PPS output

Accuracy when locked (WR or ext. reference)	< 1ns
Holdover (after 3 days locked to GNSS reference) *requires Holdover option	
After 4 hours	< 100 ns
After 8 hours	< 500 ns
After 24 hours	< 1.5us
Signal waveform & Levels: LVTTL into 50 ohm, SMA	

Front Panel

UART	• RS232 Serial, RJ45 connector (Management) • 1x ARM Mini- USB (B) UART (Management)
Ethernet	2x 100/1000 Base-T RJ45 (Management, NTP)
SFP Ports	2x 1GbE for timing distribution (WR/PTPv2/NTP selectable)
Timing I/O	5x SMA connectors (3V @50Ω, TTL compatible): • 10 MHz SIN OUT (LVTTL) • 10MHz OUT (LVTTL) • PPS OUT (LVTTL) • PPS IN (LVTTL) • 10MHz IN (TTL/CMOS/ECL/clipped sine)
LCD display	Information panel for alerts and basic network configuration
LEDs	3xLEDs for status information
BNC Fanout	32x BNC configurable outputs divided in 2 blocks: • A&B: 10MHz/xPPS/IRIG-B (LVTTL, with selectable 50Ω termination). • C&D: xPPS/IRIG-B (LVTTL, with selectable 50Ω termination).
Power supply	2x Redundant & Hot-swappable • 100-240 VAC, 50-60 Hz • 48 VDC modules available (optional) • 50W (max. 80W)

Physical Specification

Dimension	428 mm x 88 mm x 220 mm (Designed for EIA 19" rack)
Color	White (Metallic)
Certifications	ROHS, FCC, CE, SE
Soldering	IPC-A-610 Ver E Class 2

Environmental Conditions

Temperature	-10ºC ~ +50ºC
Humidity	0% ~ 90% RH

Ordering information

Base unit	P/N: EQP-TP32BNC-LJ-02
Product configuration	**P/N**
WR ZEN TP-32BNC with Holdover	EQP-TP32BNC-LJ-03

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