



WHITE RABBIT ZEN TIME PROVIDER

WR-ZEN TP-FL with wrz-os v3.x

The **fundamental standalone** node that provides the White Rabbit features to a wide range of applications making use of its **redundant connections**.

The WR-ZEN TP-FL easily distributes time and frequency to other equipment by implementing **widely used timing protocols** such as NTP, PTP or White Rabbit, and timing interfaces such as 10MHz/PPS.

The WR-ZEN TP-FL combines ultra-stable clocks with low jitter and **temperature compensated** clock resources to enhance its synchronization accuracy in a **cost-effective** 1U form factor.



Technical Specifications / WR-ZEN TP-FL

System On-Chip

SoC	Xilinx Zynq series
CPU	Dual ARM® Cortex™-A9 MP@ 866MHz
Memory	<ul style="list-style-type: none"> 512 MB DDR3 (32-bit bus) 256 Mbits Quad-SPI Flash 16GB SD Card

Timing

Multi-sources	<p>Failover mechanism to ensure continuous operation by switching over several timing sources in case of failure:</p> <ul style="list-style-type: none"> White Rabbit (accuracy <1ns) External references (GNSS, AC)
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PTP IEEE 1588-2008	<p>Supported Profiles:</p> <ul style="list-style-type: none"> Default G.8265.1^[1] G.8275.1^[1] IEEE C37.238-2011^[1] <p>up to 16 unicast clients</p>
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NTP	NTP v2, v3 & v4 (client and server)
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Holdover (optional)	<p>Accuracy (learning 3 days from GNSS)</p> <ul style="list-style-type: none"> < 100ns @ 4h < 500ns @ 8h < 1.5us @ 24h
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Management

OS	Linux (Kernel v5.4 & buildroot)
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Control	<ul style="list-style-type: none"> CLI & Web-GUI: HTTP(s)
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Authentication	<ul style="list-style-type: none"> RADIUS TACACS+
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Monitoring	<ul style="list-style-type: none"> SNMPv3 (SNMPv2) + Traps Smart-Alerts
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Network	<ul style="list-style-type: none"> SSHv2 (OpenSSH 8.1) + SFTP/SCP DHCP LLDP Rsyslog
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Physical Specification

Dimension	444 mm x 43 mm x 221 mm
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Color	White (Metallic)
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Certifications	ROHS, FCC, CE, ISO-9001, ISO-14001, SE
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Environmental Conditions

Temperature	-10°C ~ +50°C
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Humidity	0% ~ 90% RH
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Fan	<p>2 x Embedded fan modules</p> <p>Airflow: blowing out</p>
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HIGHLIGHTS

- ✓ Sub-nanosecond time accuracy
- ✓ WR and PTPv2 over optical interfaces
- ✓ Extended management and monitoring
- ✓ Distance range over 80 km using fiber
- ✓ Multi-source time references
- ✓ Linux OS
- ✓ Failover mechanisms & Holdover
- ✓ Robustness & Redundancy

Front Panel



UART	RS232 Serial (RJ45 connector)
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Ethernet	2x 100/1000 Base-T RJ45 (Management, PTP, NTP)
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SFP Ports	2x 1GbE for timing distribution (WR/PTPv2 selectable)
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Clocks I/O	<p>5x SMA connectors (3V @50Ω, TTL compatible):</p> <ul style="list-style-type: none"> 10 MHz SIN OUT ref. clock (PLL) 10MHz OUT (LVTTTL) PPS OUT (LVTTTL) PPS IN (LVTTTL) 10MHz IN (TTL/CMOS/ECL/clipped sine)
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LCD	Information panel for alert & network
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Power Supply	<p>2x Redundant & Hot-swappable</p> <ul style="list-style-type: none"> 100-240VAC, 50-60 Hz 50W (max. 80W)
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Expansion modules

FMC 4x1PPS expansion (SMA, 3.3V/50Ω)
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Configurable options:

- 4x 1PPS/10 MHz/xPPS/IRIG-B
- 2x1PPS/10 MHz/xPPS/IRIG-B + 2 x1PPS/10 MHz/xPPS/IRIG-B

FMC 8x1PPS expansion (SMA, 3.3V/50Ω)
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Configurable options:

- 8x 1PPS/10 MHz/xPPS/IRIG-B
- 4x 1PPS /10 MHz/xPPS/IRIG-B + 4x 1PPS/10 MHz/xPPS/IRIG-B



[1]: License not included in default package

