

MODULAR • SCALABLE • RESILIENT PNT

OPEN TIME NODE WR

WHITE RABBIT TIMING NODE



DEVICE SUMMARY

The Timebeat Open Time Node WR is a compact, rack-optimized White Rabbit timing node engineered to deliver sub-nanosecond synchronisation to edge systems. Accepting a White Rabbit (WR) input, with full support for WR, IEEE-1588 PTP, and SyncE, it outputs stable, traceable reference signals (10 MHz frequency, PPS and other timing outputs), enabling deterministic, ultra-low-jitter clock distribution across critical infrastructure. Housed in a 1-RU chassis (with up to three nodes per rack unit), it is ideally suited for space-constrained data-centre, telecom, or lab environments.

KEY HIGHLIGHTS

- Sub-nanosecond precision and synchronisation accuracy
- Multiple input sources including White Rabbit protocol and frequency references
- Compact form factor with rack kit for 3 units per 1RU of rack space
- 4x WR ports and 10x frequency outputs

PRECISION AT SCALE

With oscillator options such as OCXO or Rubidium for hold-over stability, the Open Time Node WR provides persistent, high-integrity timing even in GNSS-denied or edge sites — making it a dependable last-mile timing solution for finance, telecom, scientific instrumentation, and other precision-driven applications.

White Rabbit

IEEE-1588 PTP

SyncE

10 MHz

Sub-Nanosecond

1PPS



PHYSICAL & INTEROPERABILITY

SPECIFICATIONS

DESIGN & PROTOCOL COMPATIBILITY



HIGH ACCURACY & INTEROPERABILITY

The Open Time Node WR delivers sub-nanosecond synchronisation accuracy using the White Rabbit (WR) protocol — an ultra-precise extension of PTP enhanced with SyncE for deterministic time and frequency transfer. This enables highly accurate timing distribution across metro-scale networks and long-haul optical deployments. The node provides broad interoperability, distributing IEEE 1588 PTP, SyncE, and standard timing outputs such as 10 MHz and 1 PPS. It supports a wide range of industry-standard profiles including Telecom (G.8265.1, G.8275.1) and Power Utility (IEEE C37.238-2011, IEEE/IEC 61850-9-3), along with full NTP compatibility.

RESILIENCY, MONITORING & SECURITY

Designed for mission-critical operation, the Open Time Node WR incorporates a comprehensive multi-source failover system that can transparently switch between WR, PTP, and other references whenever a degradation or failure is detected. A built-in timing source monitoring engine continuously evaluates the performance of all active inputs — including WR, PTP, and 1 PPS/10 MHz sources — while logging detailed synchronisation metrics for long-term diagnostics and export.

● PHYSICAL SPECIFICATION

Dimensions

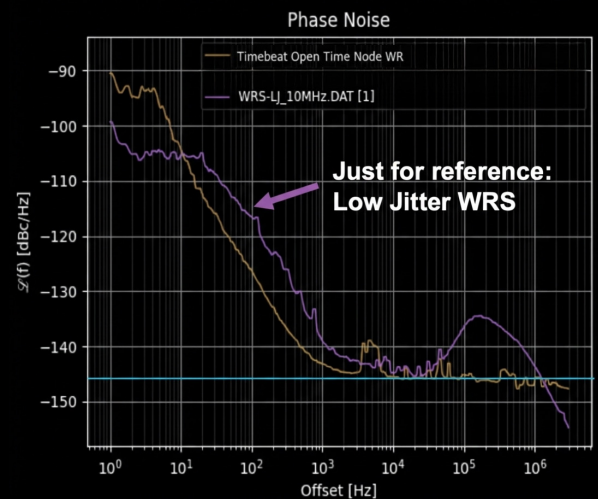
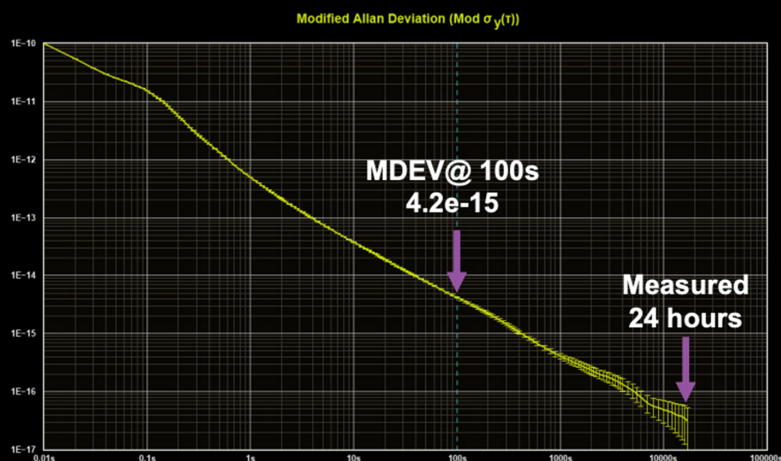
L= 250mm × W= 105mm × H= 40mm

Weight

0.8 KG

Power

12V, 2.5A, <10W



TECHNICAL SPECIFICATIONS

CAPABILITIES & APPLICATIONS

KEY FEATURES & TYPICAL USE CASES

● KEY FEATURES & CAPABILITIES

WR Input	WR compatible optical/Ethernet link
Timing Protocols	WR, IEEE 1588 PTP, SyncE syntonization, deterministic phase tracking
Sync Accuracy	Sub-nanosecond alignment to WR master
Clock Outputs	10 MHz, 1 PPS, configurable additional outputs
Output Jitter	Low-jitter, low-phase-noise
External Reference	Precision ref input (optional)
Monitoring	Remote mgmt & real-time sync via Timebeat
Power	Low-power edge deployment
Physical	Compact; up to 3 nodes per 1RU
Environmental	Data-centre, telecom rack, controlled env.



TYPICAL APPLICATIONS

Telecom & 5G

Precise synchronisation for RAN, fronthaul, and backhaul infrastructure.

Financial Trading

Deterministic timestamping & compliance (MiFID II, CAT, FINRA).

Scientific Instrumentation

Lab equipment, DAQ systems, measurement instruments requiring clean 10 MHz & PPS.

Data Centres

Consistent, low-jitter timing across distributed computing clusters.



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WHITE RABBIT TEST RIG

COMPLETE TIMING CHAIN IN 1RU

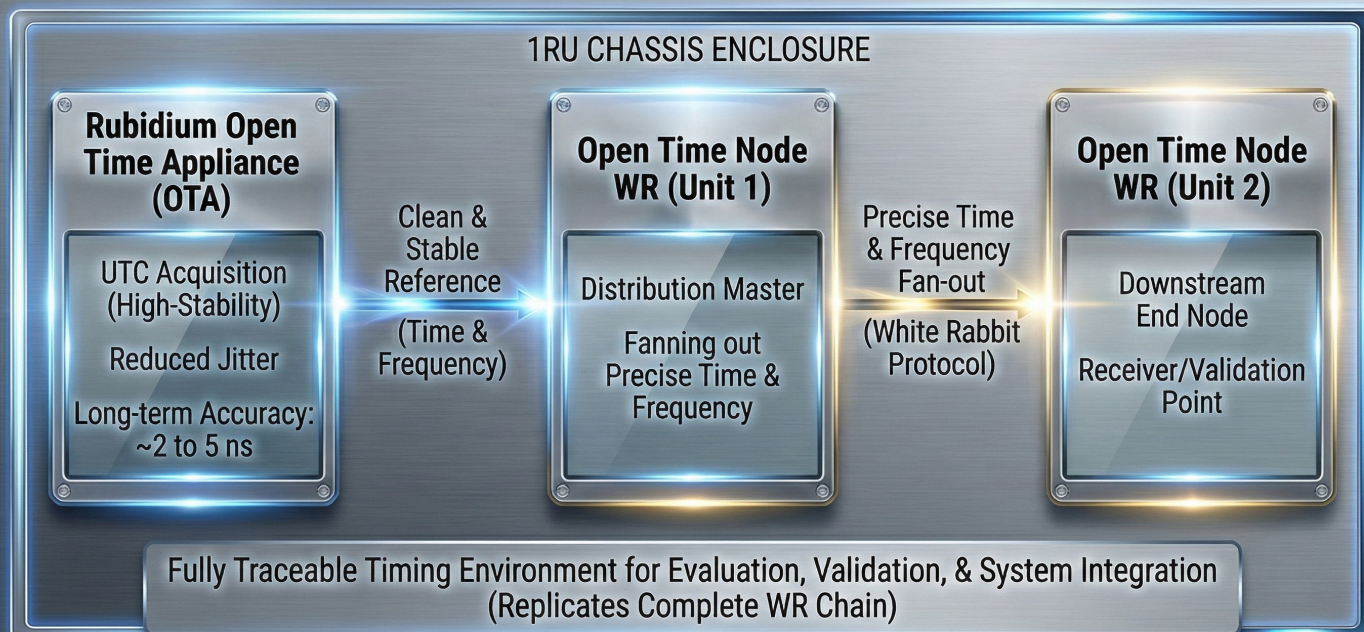


WHITE RABBIT TEST RIG

The White Rabbit test rig combines two Open Time Node WR units with a Rubidium Open Time Appliance to create a compact, fully traceable timing environment for evaluation, validation, and system integration. The Rubidium OTA provides high-stability UTC acquisition with significantly reduced jitter and long-term accuracy in the ~2 to 5 ns range, delivering a clean and stable reference into the first Open Time Node WR.

This WR node operates as the network's distribution master, fanning out precise time and frequency to the second Open Time Node WR, which functions as the downstream end node. Together, the system replicates a complete White Rabbit timing chain — from UTC source to final receiver — within a single 1RU footprint, enabling reproducible testing, training, and performance analysis without requiring a full production network.

White Rabbit Test Rig: Technical Timing Chain Diagram (1RU Footprint)



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