netinsight

DATASHEET

# Zyntai TimeNode

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**TimeNodes are used as end-nodes in our Zyntai solution to distribute time synchronization on top of existing network infrastructure. The compact, low-power unit is built to run advanced time algorithms in a performance optimal and efficient way to secure resilient synchronization in large critical networks, including 5G, power and other mission-critical services.**

The Zyntai solution is based on the technology Precision TimeNet, developed by Net Insight, that distributes time synchronization across large critical networks. It disaggregates the synchronization function from the hardware, creating a synchronization overlay across the existing IP infrastructure without requiring PTP IEEE1588 hardware support in intermediate nodes. Instead, end-nodes called Zyntai TimeNodes are used to convert and distribute synchronization over the network, also if leased capacity is used. The solution also includes orchestration, Zyntai Director (see separate datasheet), to monitor and manage the synchronization end-to-end.

**Zyntai TimeNode** is a high-precision, 1U timing and synchronization unit built for networks where accuracy, reliability, and ease of deployment are critical. Distributing time synchronization over Wide Area Networks puts high demands on software functionalities and the TimeNode ensures our advanced time algorithms are run in a performance optimal and efficient way.

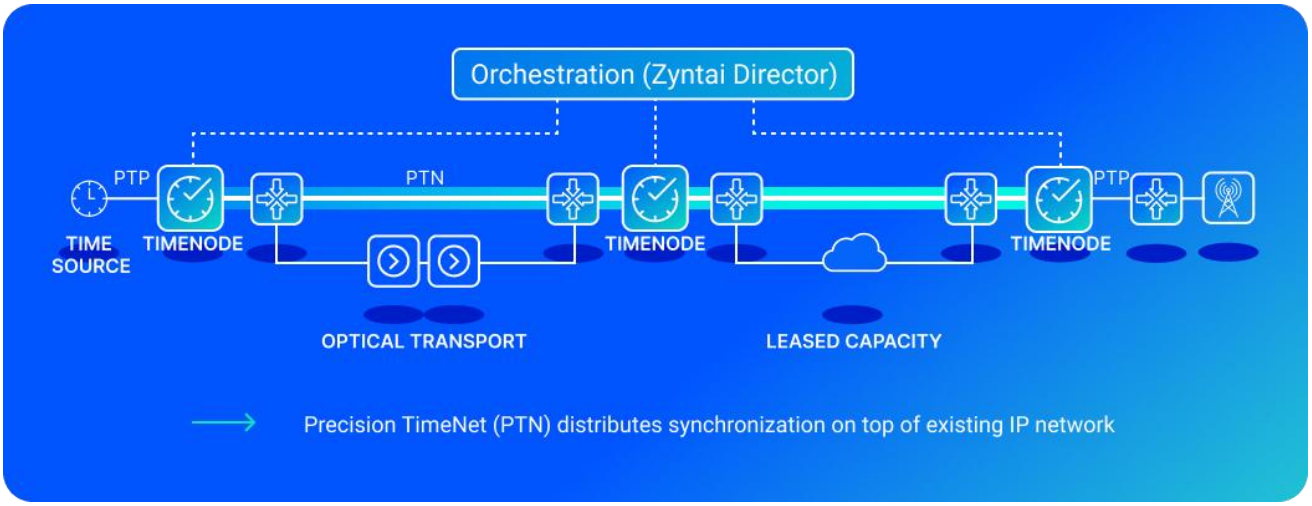
Zyntai TimeNode comes in three models: TN3040 (access node), TN3100 (core node) and TN3100E (enhanced core node) depending on capacity and where in the network it is placed. Designed with low power consumption and a compact form factor, it integrates effortlessly into any network architecture

TimeNode supports a versatile range of synchronization input sources and delivers multiple output profiles. With fast installation, integration, and consistent performance, Zyntai TimeNode ensures robust synchronization across multi-vendor environments and prepares your network for the demands of 5G, power and other mission-critical services.

**Bi-directional timing and mesh** allow the Zyntai TimeNodes to have complete sync information across the network. This is used to evaluate synchronization options, weight different routes, make real-time decisions to use one or more links to synchronize its time or to detect and correlate for network events.

**Advanced time algorithms** are run in order to manage Packet Delay Variation, due to traffic interference, statistical effects, buffer handling in routers and QoS mechanisms. They are also there to manage asymmetries, often caused by changes in delay profiles in the underlying transport, most likely the optical layer, or due to protection switching or traffic reroutes. Asymmetry changes can be as small as 100 nanoseconds and up to microseconds or as large as several milliseconds. If not identified and handled, a constant time error is created in the network.

- **Compact, low-power unit for critical networks**
- **Mesh functionality for network-wide synchronization optimizations and stability**
- **Advanced time algorithms for managing packet delay variation and asymmetries**



**Time Transfer**

| TN3040 | TN3100 / TN3100E |
|---|---|
| 4 Time Transfer sessions | 32 Time Transfer sessions |

Regional Routing and multilink synchronization
1.000 - 32.000 Timestamps/s per Time Transfer session
AES-256 encryption
Differentiated Service Code Points (DSCP)

**PTP**

| TN3040 | TN3100 / TN3100E |
|---|---|
| 256 PTP clients with full message rate | 2048 PTP clients with full message rate |

ITU-T G.8275.1 Full Timing Support
ITU-T G.8275.2 Partial Timing Support
ITU-T G.8265.1 Telecom Frequency Profile
IEEE 1588 Default Profile
SMPTE ST 2059-2 and AES67 Media Profiles
Support for multiple profiles simultaneously

**Interfaces**

| TN3040 | TN3100 / TN3100E |
|---|---|
| 4x 10G/GbE SFP/SFP+<br>2X GbE/FE RJ45 | 10x 10G/GbE SFP/SFP+<br>2X GbE/FE RJ45 |

BASE-T, BASE-SX/SR (300m), BASE-LX/LR (10km), BASE-ER (40km), BASE-ZR (80 km DWDM)
Link Layer Discovery Protocol (LLDP)
IPv4 and IPv6 support

**Synchronization interface**

PPS in/out, 2x HDBNC
10MHz in/out, 2x HDBNC
E1/T1 in/out, ITU-T G.703.

**Synchronous Ethernet**

ITU-T G.8261, G.8262 (EEC), G.8262.1 (eEEC), and G.8264 Ethernet Synchronization Messaging Channel (ESMC)

**GNSS**

| TN3040 / TN3100 | TN3100E |
|---|---|
| Singleband L1<br>Multi-constellation<br>GPS, Galileo, GLONASS, BeiDou and QZSS. | Multiband L1 + L5<br>Multi-constellation<br>GPS, Galileo, BeiDou, QZSS and NavIC<br>OSNMA authentication |

SBAS supported.
T-RAIM
Advanced jamming and spoofing detection and mitigation

**PRTC**

| TN3040 / TN3100 | TN3100E |
|---|---|
| G.8272 PRTC-A / PRTC-B compliant<br>G.8272.1 ePRTC compliant with Cs-assistance | G.8272 PRTC-A / PRTC-B compliant<br>G.8272.1 ePRTC compliant (holdover compliance requires Cs-assistance) |

**NTP**

Single Stratum 1 NTP server
NTPv3 / NTPv4, SNTPv3 / SNTPv4
100 000 TPS (transactions per second).

**Management**

Electrical GbE/FE (RJ-45)
Inband management
USB-C port for onboarding

**Power (PSU)**

Hot-swappable, modular and load-balancing
2 x -48 VDC (-60 to -40 VDC)
2 x 100-240 VAC.

**Environmental**

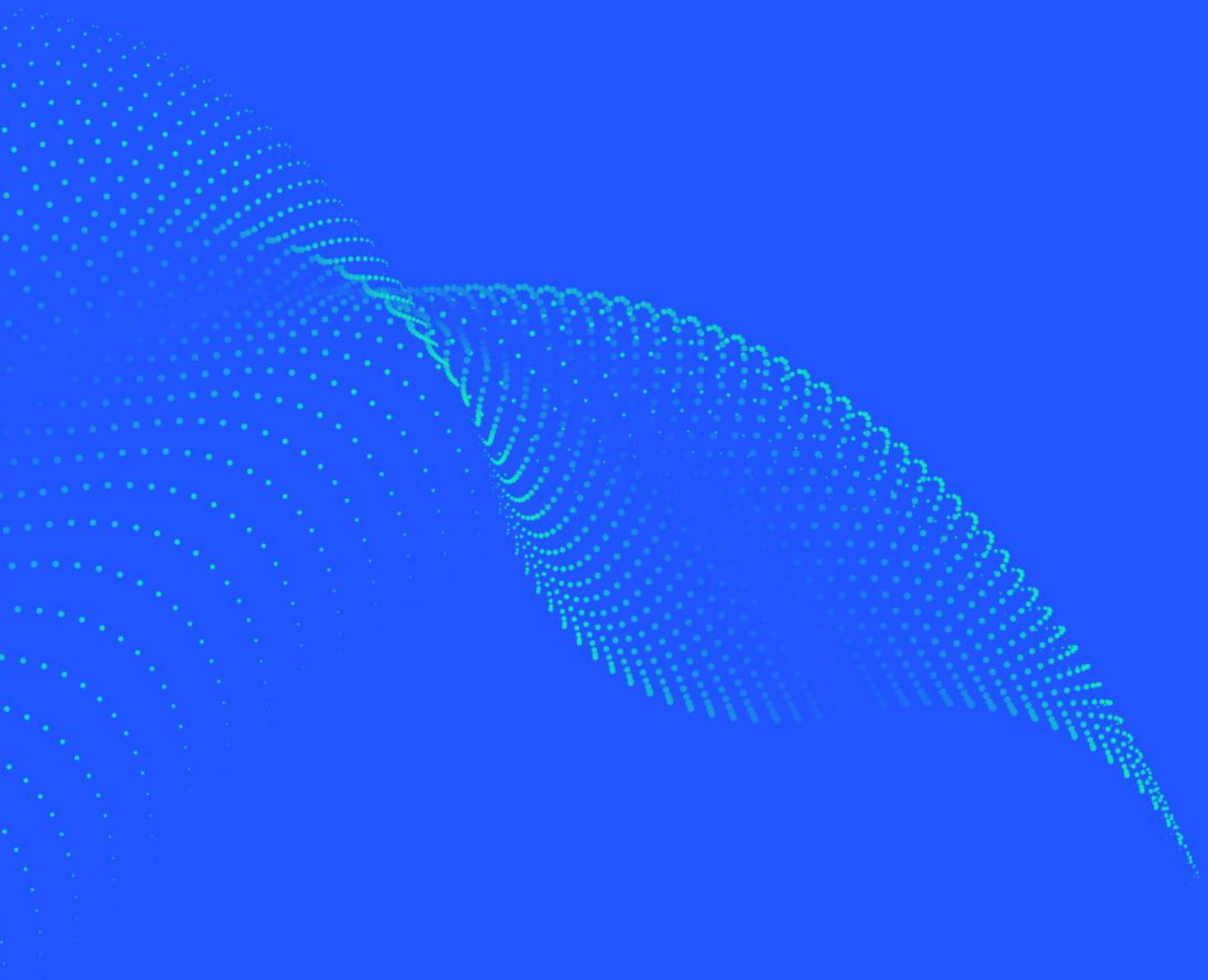
| | TN3040 | TN3100 / TN3100E |
|---|---|---|
| Operating temp. | -40 to 65 °C<br>-40 to 149 °F<br>EN 300 019-1-3 Class 3.3 Not temp-controlled | -5 to 55 °C<br>23 to 131 °F<br>NEBS L3 |
| Storage temp | -40 to 70 °C (-40 to 156 °F) | |

**Regulatory compliance**

| | |
|---|---|
| Safety | CB Scheme International Safety<br>CE EU Safety<br>IEC 62368-1<br>EN 62368-1 |
| ERM/EMC | FCC Part 15 (Class A)<br>ETSI EN 300 386<br>ETSI EN 303 413 V1.2.1 |
| NEBS | NEBS Level 3 |
| EU Directive | 2014/30/EU Low Voltage Directive<br>2014/30/EU EMC Directive<br>2011/65/EU RoHS Directive<br>2014/53/EU Radio Equipment Directive |
| Security | ISO/IEC 27001:2022 for Net Insight |

**Dimensions**

43.5 mm (1.75'' / 1RU) x 444 mm (17.5'') x 302 mm (11.9'')
5.8 kg (with dual power supply units)



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