RELEASE 2.0

TimeProvider 500

IEEE 1588-2008 (PTP) Translator

KEY FEATURES

- Standalone IEEE 1588-2008 Translator
- Multicast/hybrid communications
- Unicast Telecom Profile
- PTP Performance Metrics
- PTP over Microwave
- PTP over SHDSL
- ToD and Phase support
- SNMP Proxy Management
- VLAN Support
- TimePictra NMS Support

KEY BENEFITS

- Eliminates Need for GPS at BTS/ Node B locations
- Accelerates PTP Client Deployments
- No Impact to Existing BTS/Node B Equipment
- PTP Performance Analysis
- Complete End-to-End PTP Solution

PRODUCT OVERVIEW

TimeProvider 500 is a standalone PTP translator that enables network service providers to accelerate the upgrade of their existing network infrastructure to accommodate next-generation, packet-based timing and synchronization solutions.

Because it is a standalone device, TimeProvider 500 enables seamless migration of wireless base stations, DSLAMs, LTEs and other end-point network devices to PTP, providing immediate cost savings and a quick return on investment (ROI).

Designed to deliver cost-effective frequency and time synchronization for Next-Generation Networks, TimeProvider 500 is a compact and easy way to provide synchronization in the Metropolitan Area Network or Access network.

TimeProvider 500 translates IEEE 1588-2008 protocol into T1/E1, 1 pps, 10MHz and Time of Day (TOD) output signals for synchronization of legacy network devices that do not have their own embedded PTP client. TimeProvider 500 is also fully interoperable with Symmetricom's TimeProvider 5000, TimeHub and SSU-2000 PTP Grandmaster products.

When combined with Symmetricom's grandmasters and TimePictra Element Management System, TimeProvider 500 delivers complete end-to-end visibility into the operation and performance of all PTP clients located within the network.

Because it is IEEE 1588-2008 standards compliant, TimeProvider 500 is also fully interoperable with third party PTP grandmasters that comply with the IEEE 1588-2008 standard.

TimeProvider 500 also provides a rich set of metrics such as TIE, MTIE, PDV, minTDev and MAFE. These metrics enable service providers to conduct detailed PTP traffic analysis, measure signal quality at remote sites and optimize overall PTP network performance.

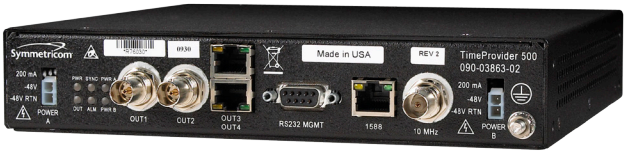
TimeProvider 500 allows network operators to achieve the same level of precise timing and synchronization over IP/packet-based networks that was previously provided by traditional TDM circuits.

TimeProvider 500 enables service providers to lower operating costs by rapidly migrating away from TDM to Ethernet backhaul without compromising quality of service or performance.

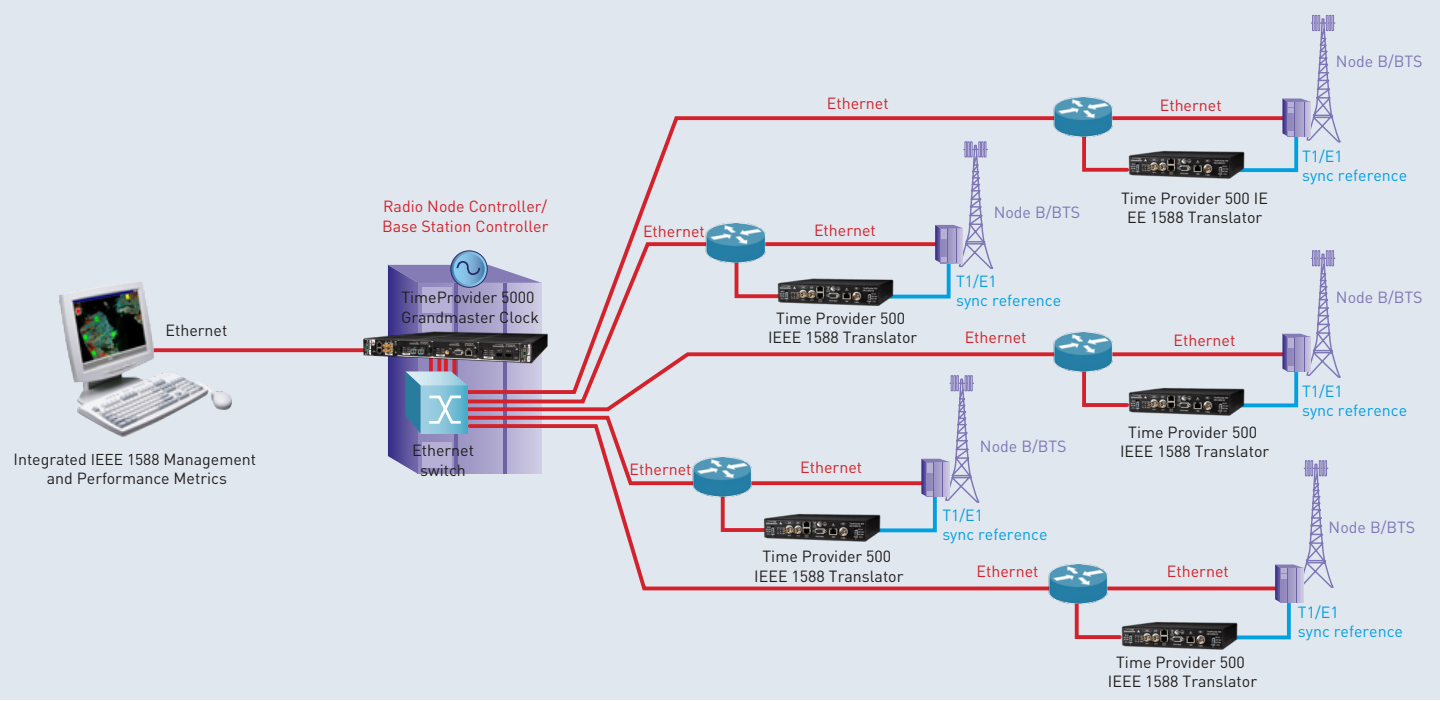
TimeProvider 500 comes equipped with a single 100 Base-T PTP port, 2 configurable T1/E1/1PPS ports and a dedicated sinusoidal 10 MHz port for synchronizing network elements.

Typical Applications Include:

- Wireless Ethernet Backhaul (UMTS)
- Circuit Emulation Services (CES)
- Passive Optical Networks (PON)
- PTP over Microwave
- PTP over SHDSL
- WiMAX
- LTE



TimeProvider 500 IEEE 1588-2008 (PTP) Translator



Typical application utilizing the TimeProvider 5000 Grandmaster Clock and TimeProvider 500 PTP Translators to provide precise timing and frequency for remote base stations over an Ethernet wireless backhaul network infrastructure.

TimeProvider 500 Specifications

INPUTS
- IEEE 1588-2008
- RJ-45 10/100BaseT Ethernet

OUTPUTS
- 2048 kHz - G.703/13 compliant
- 1544 kHz - Square wave 3.2VP-P
- E1/DS1 framer output
  - Line Code: E1: HDB3, DS1: B8ZS or AMI
  - Frame Format
    - E1: Double-frame or Multi-frame, DS1: F4, D4 (F12), ESF (F24) or F72
  - Alarm indication signal: AIS
  - CRC: Yes
  - Signaling mechanism: CAS, CCS
  - Compliance: G.703/9
- G.823/G.824 sync interface compliant
- 10MHz/1PPS
- TOD messaging via serial port

MAINTENANCE AND DIAGNOSTICS
- Local and remote management
- Management via PTP node manager - TimeProvider 5000 supports PTP node management
- CLI based configuration using local craft port
- Console port for local management
- Telnet support
- Logging
  1. Configuration log
  2. Event log
- Firmware remotely upgradable
- Configuration save/restore – non volatile configuration
- Factory default reset
- System administrator password protection
- Hardware and firmware version query
- LEDs and system status
- IEEE 1588 V2 PTP client status
- IEEE 1588 V2 PTP network status and performance statistics

PTP OVER PACKET SUPPORT
- IEEE 1588-2008
- ITU submission 'IEEE-1588v2 Telecom Profile for Constrained Networks'
- Unicast/Multicast (Hybrid)
- ITU-T G.8261 compliant

POWER REQUIREMENTS
- -48VDC

CONNECTORS
E1/T1/1PPS outputs
- 2 BNC (co-axial)
- 2 RJ-48C (differential)

- 1 RS-232
- 1 Ethernet 100-BaseT
- BNC for sinusoidal 10 MHZ
- Redundant - 48DC power connectors

LEDs
- Power On
- Sync status
- Outputs active
- Power Alarms

ENVIRONMENTAL SPECIFICATIONS
- Operating temperature: -5°C to +65°C
- Storage temperature: -40°C to +70°C
- Operating humidity: 5% to 95% RH

PROTOCOL
- IEEE 1588-2008
- T1 (1.544 Mbps and 1.544 MHZ)
- E1 (2.048 Mbps and 2.048 MHZ)
- SHDSL
- DHCP
- TELNET

PHYSICAL SPECIFICATIONS
- Weight: 870g (1.9 lbs)
- Size: 215.9mm W X 203.2mm D X 40.64mm H (8.5 in W X 8.0 in D X 1.6 in H)
- Options
  - 19" rack mountable, 1 RU
  - 19" rack side-by-side mountable, 1RU

REGULATORY
- UL
- cUL
- CB scheme
- GS Mark
- CE Mark

EMISSIONS/IMMUNITY
- FCC Part 15 Class B
- ICES-003 Class B
- VCCI Class A
- AS/NVS CISPR Class B
- ETSI 300 386 Class B
- EN 55022/24 Class B
- KN 55022/24 Class B
- EMC Immunity meets criteria
  - ENG1000- 4-2 ESD
  - 4-3 Radiated Immunity
  - 4-4 Electrical Fast Transient
  - 4-5 Surge
  - 4-6 Conducted Immunity

MANAGEMENT AND PERFORMANCE METRICS
- SNMP Proxy via TimeProvider 5000
- CLI serial port and TELNET
- PTP Node Manager via TimeProvider 5000
- IPDV
- PTP Metrics
- Node Manager (PTP Clause 15)
- Remote Telnet

HOLDOVER PERFORMANCE
- Compliant with G.812 Type III and GR-1244 stratum 3E requirements

TYPICAL TIMING PERFORMANCE
Advanced G.8261-based tests (more severe conditions)
- Fractional Frequency Offset: < 1ppb
- 1PPS Output (compared with Grandmaster 1PPS): < ±3µs

G.8261-based tests (5 switches)
- Fractional Frequency Offset: < 1ppb
- 1PPS Output (compared with Grandmaster 1PPS): < ±1µs

Transport includes microwave, SHDSL, or TDM over packet
- Fractional Frequency Offset: < 5ppb