

TimeProvider® 500

IEEE 1588-2008 (PTP v2) Translator



Key Features

- Standalone IEEE 1588-2008 client
- High quality crystal oscillator
- Advanced timing algorithm
- PTP performance metrics
- TOD and phase support
- SNMP proxy management
- VLAN support

Key Benefits

- Eliminates need for GPS at BTS/nodeB locations
- Filters accumulated packet delay variation of multi-hop networks
- PTP performance analysis
- End-to-end solution with Symmetricom PTP grandmasters

Applications

- Ethernet backhaul for wireless
- PTP over microwave
- PTP over SHDSL
- WiMax
- Metropolitan Area Networks (MAN)
- Passive Optical Networks (PON)
- Circuit Emulation Services



The Symmetricom® TimeProvider® 500 is a standalone Precision Time Protocol (PTP) client that enables network service providers to accelerate the upgrade of their existing network infrastructure to accommodate next-generation, packet-based timing and synchronization solutions. TimeProvider 500 translates the IEEE 1588-2008 protocol into T1/E1, 1PPS, 10MHz and Time of Day (TOD) output signals for synchronization of legacy network devices. As a standalone device, TimeProvider 500 enables seamless migration of wireless base stations, DSLAMs, LTE equipment and other end-point network devices to PTP, providing immediate cost savings and a quick return on investment (ROI).

Designed with a high quality crystal oscillator and advanced timing algorithms, the TimeProvider 500 enables Ethernet network access devices to meet the synchronization requirements of 2G and 3G mobile base stations—even in multi-hop, high jitter environments. TimeProvider 500 allows network operators to achieve the same level of precise timing and synchronization over IP/packet-based networks that were previously provided by traditional TDM circuits.

TimeProvider 500 enables service providers to lower operating costs by rapidly migrating away from TDM to Ethernet

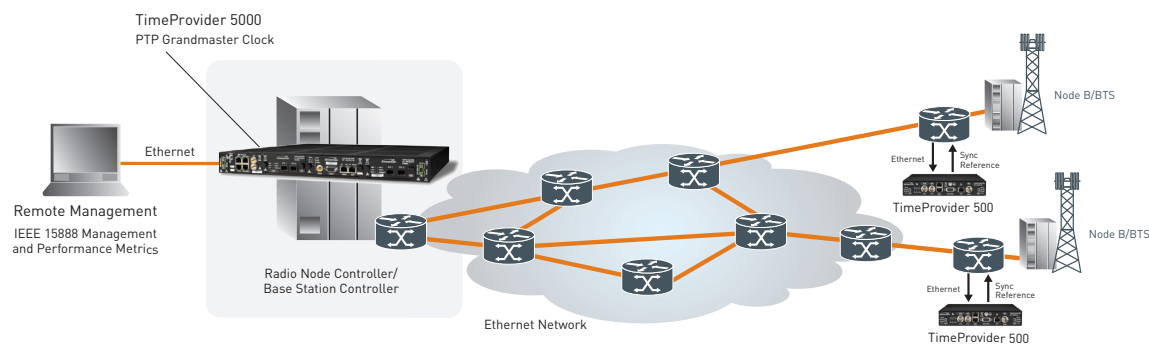
backhaul without compromising quality of service or performance. Designed to deliver cost-effective synchronization for Next Generation Networks, TimeProvider 500 is a compact and easy way to provide synchronization at mobile base transceiver station (BTS) sites and in metropolitan area network (MAN) or access networks.

TimeProvider 500 is fully interoperable with Symmetricom's TimeProvider 5000, TimeHub 5500 and SSU 2000 PTP Grandmaster products and with third party PTP grandmasters that comply with the IEEE 1588-2008 standard. When deployed 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.

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

TimeProvider 500



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

Specifications

INPUT

- 1 port, RJ-45, 10/100Base-T Ethernet
- IEEE 1588-2008 (PTP v2)

OUTPUTS

- 2048 kHz - G.703/13 compliant
- 1544 kHz - Square wave 3.2Vpp
- E1/DS1 framer output
 - Line code:
 - E1: HDB3
 - DS1: AMI with B8ZS
 - Frame format
 - E1: Double-frame or multi-frame
 - DS1: D4 (F12) or ESF (F24)
 - Alarm indication signal: AIS
 - CRC: Yes
 - Signaling mechanism: CAS, CCS
 - Compliance: G.703/5/9
- G.823/G.824 sync interface compliant
- 10MHz/1PPS
- TOD messaging via serial port

PTP OVER PACKET SUPPORT

- IEEE 1588-2008
- Unicast/multicast (hybrid)
- ITU-T G.8261 compliant

CONNECTORS

- E1/T1/1PPS outputs
 - 2 BNC (co-axial)
 - 2 RJ-48C [differential]
- 1 RS-232
- 1 Ethernet 100Base-T
- BNC for sinusoidal 10 MHz
- Redundant - 48DC power connectors

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

HOLDOVER PERFORMANCE

- Aging performance compliant with G.812 Type III and GR-1244 stratum 3E requirements

PROTOCOL

- IEEE 1588-2008
- T1 (1.544 Mbps and 1.544 MHz)
- E1 (2.048 Mbps and 2.048 MHz)
- DHCP
- TELNET

LEDs

- Power on
- Sync status
- Outputs active
- Power alarms

MANAGEMENT AND DIAGNOSTICS

- SNMP Proxy via TimeProvider 5000
- CLI based configuration using local craft port
- Console port for local management
- Telnet
- 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
- IPDV
- PTP metrics

PHYSICAL SPECIFICATIONS

- Size: 216.7mm W X 203.2mm D X 41.4mm H (8.53 in W X 8.00 in D X 1.63 in H)
- Options 19" rack mountable, 1 RU 19" rack side-by-side mountable, 1RU
- Weight: 870g (1.9 lbs)

POWER REQUIREMENTS

- -48VDC (operating range: -40VDC to -72VDC)
- 5.3W typical

EMISSIONS/IMMUNITY

- FCC Part 15 Class B
- ICES-003 Class B
- VCCI Class A
- AS/NZS CISPR Class B
- ETSI 300 386 Class B
- EN 55022/24 Class B
- KN 55022/24 Class B
- EMC Immunity meets criteria
 - EN61000
 - 4-2 ESD
 - 4-3 Radiated immunity
 - 4-4 Electrical fast transient
 - 4-5 Surge
 - 4-6 Conducted immunity
- GR-1089-CORE sections 2 and 3

ENVIRONMENTAL SPECIFICATIONS

- Operating temperature: -5°C to +65°C
- Storage temperature: -40°C to +70°C
- Operating humidity: 5% to 95% relative humidity
- ETSI EN 300 019-2-1
- ETSI EN 300 019-2-2
- ETSI EN 300 019-2-3
- ETSI EN 300 019-2-4
- ETS 300 753
- GR-63-CORE sections 4.1, 4.3, 4.4

REGULATORY

- UL
- CE mark
- cUL
- RoHS, 6 of 6
- CB scheme