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

Specifications

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

**OUTPUTS**
- 2.048 kHz - G.703/13 compliant
- 1544 kHz - Square wave 3.2Vpp
- E1/DS1 framer output
- Frame format:
  - E1: HDB3
  - DS1: AMI with B8ZS
- Line code:
  - DS1: D4 (F12) or ESF (F24)
  - E1: HDB3
  - 500Base-T Ethernet

**REDUNDANT POWER CONNECTORS**
- 48DC power connectors

**RS-232 E1/T1/1PPS outputs**
- 1 RS-232
- 1 Ethernet 100Base-T
- BNC for sinusoidal 10 MHz
- Redundant - 48DC power connectors

**CONNECTORS**
- E1/T1/1PPS outputs
- 2 BNC (co-axial)
- 2 RJ-48C (differential)
- 1 RS-232

**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
  - EN61000-4-3 Radiated immunity
  - EN61000-4-4 Electrical fast transient
  - EN61000-4-5 Surge
  - EN61000-4-6 Conducted immunity
- GR-1244-STRatum 3E

**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 300 199-2-1
- ETSI EN 300 199-2-2
- ETSI EN 300 199-2-3
- ETSI EN 300 199-2-4
- ETSI 300 753
- GR-1244-STRatum 3E

**REGULATORY**
- UL
- CE mark
- RoHS, 6 of 6
- CB scheme

**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
- IPD
- PTP metrics

**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

**TYPICAL TIMING PERFORMANCE**
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- 1RS-232
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