

TimeProvider® 5000

IEEE 1588-2008 PTP Grandmaster Clock



Key Features

- Redundant hardware: inputs, outputs, clock, power
- Hardware-based packet processing
- User configurable PTP profiles
- Compliant with ITU-T G.8265.1 standard telecom profile
- Dual GPS inputs
- Input source priority auto-switching
- PTP and carrier grade NTP server
- PTP probe for PDV measurement
- Symmetricom PTP client performance metrics with TP 500
- SNMP and CLI management

Key Benefits

- Fully interoperable with standards-based clients
- Highly scalable PTP grandmaster supports 1000 PTP clients at full 128 messages per second rate
- No performance degradation as client capacity grows
- Simultaneously supports both PTP and NTP elements in your network
- Capabilities grow with TimeProvider Expansion products

Applications

- Wireless Ethernet Backhaul
- 3G and 4G / LTE
- Circuit Emulation Services (CES)
- Passive Optical Networks (PON)
- WiMAX

TimeProvider® 5000 is an IEEE 1588-2008 standard compliant Grandmaster Clock with a carrier grade design that provides high client capacity, hardware-based packet processing and redundant hardware to deliver scalable performance and maximum network availability.

With dual Input/Output Clock cards in active and standby mode, TimeProvider 5000 ensures there is no impact on client performance when failover occurs. Redundant cards provide protection far superior to “network redundancy” models that must re-acquire synchronization from a different grandmaster somewhere else in the network.

Protection of input clock source has become increasingly important. TimeProvider 5000's new IMC card has support for dual GPS inputs. In addition, TimeProvider 5000 supports auto-switching of input source between E1 and GPS based on clock quality level and user priority settings.

TimeProvider 5000, with hardware-based time stamping and packet processing, delivers high client capacity at full rates —up to 128 messages per second— with performance that does not degrade as the number of clients increases.

TimeProvider 5000 supports user configurable PTP profiles; the selection includes default, telecom-2008, ITU-T

G.8265.1 and hybrid profiles. Support for multiple standard profiles ensures full interoperability with clients in multi-vendor environments.

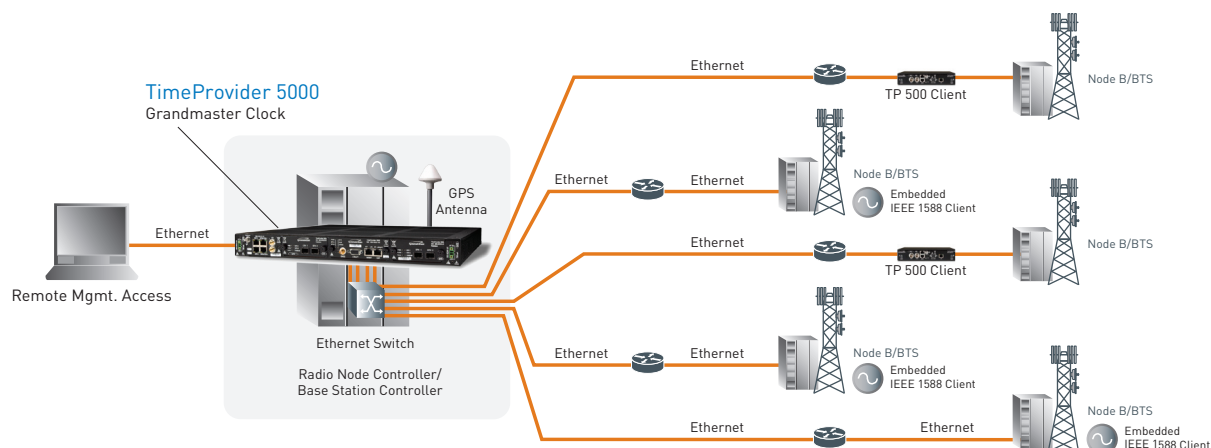
With optional NTP server capability, TimeProvider 5000 supports the multiple vendors and protocols found at mobile network base station sites. Both PTP and NTP protocols operate simultaneously with PTP-based and NTP-based clients. The two ports of an IOC card can be separately configured, one for PTP and one for NTP, allowing the standby IOC card to protect for both protocols. NTP capacity is up to 20,000 transactions per second, and PTP capacity remains at up to 1000 clients.

TimeProvider 5000 serves as the initial unit in a “rack and stack” configuration with TimeProvider Expansion products. These units add capabilities to the TimeProvider portfolio. Each Time Provider Expansion10 adds 16 Ethernet ports that support SyncE as well as PTP, while each TimeProvider Expansion30 adds 12 E1 and 12 1PPS/TOD ports.

TimeProvider 5000 also offers a PTP probe function to enable PDV measurements: a critical factor for determining PTP network performance. The PTP probe mode supports layer 3 unicast, layer 3 multicast, and layer 2 multicast measurements.

TimeProvider 5000 can be managed remotely and locally via CLI or by SNMP.

TimeProvider® 5000



Typical wireless backhaul application utilizing the TimeProvider 5000 Grandmaster Clock with fully redundant, carrier-class architecture to provide precise timing and frequency for remote base stations over a packet-based Ethernet network infrastructure.

Specifications

GNSS INPUT OPTIONS

- 1 x GPS
- 1 x GPS and 1 x GPS/Beidou
- 2 x GPS
- All use antenna type: L1 band

I/O INPUTS

- 2 x E1 (2.048 Mbps and 2.048 MHz)
- 2 x T1 (1.544 Mbps and 1.544 MHz)
- 2 x 1PPS and TOD

I/O OUTPUTS

- 2 x GigE output per IOC (optical and electrical)
- 4 x E1 (2.048 Mbps and 2.048 MHz)
- 2 x T1 (1.544 Mbps and 1.544 MHz)
- 1 x 10MHz
- 1 x 1 PPS

PHYSICAL SPECIFICATIONS

- Dimensions: 44mm H x 483mm W x 435mm D (1.75" H x 19" W x 17" D)
- Weight: 4.4 kg (9.6 lbs)

POWER REQUIREMENTS

- -38.4 VDC to -75 VDC (dual redundant) @ 43W typical

ENVIRONMENTAL SPECIFICATIONS

- Operating temperature: -5°C to +45°C
- Storage temperature: -40°C to +70°C
- Humidity: 5% to 100% w/condensation

TIME STAMP PRECISION

- <10 ns rms typical

HARDWARE MODULES

- I/O Module (includes 4 x I/O ports)
- IMC Module
- IOC (Quartz) Module
- IOC (Rubidium) Module

NTP SERVER OPTION

- Stratum 1 sever via GPS
- Up to maximum 20,000 transactions per second

CLIENT CAPACITY

- PTP: 500 clients per port, 1000 per IOC card, at 128 messages per second rate (L3, unicast)
- PTP with NTP option
 - One port with PTP: 1000 clients
 - One port with NTP: 20,000 transactions per second

FREQUENCY ACCURACY

- Tracking to GPS: PRS/PRC quality
- Holdover (over constant temperature):
 - Rubidium (G.812 type II): $<1 \times 10^{-11}$ /day
 - Quartz (G.812 type I): $<1 \times 10^{-10}$ /day

TIME ACCURACY

- Tracking to GPS : <100ns when locked to GPS
- Holdover (over constant temperature):
 - Rubidium (G.812 type II): 10 µsec over 5 days
 - Quartz (G.812 type I): 10 µsec over 1 day

INDUSTRY STANDARDS/REQUIREMENTS

- ITU G.811, G.812, G.823, G.8261
- G.703, G.704, ETSI 300/Class 3.1

PROTOCOLS

- IEEE 1588-2008 (PTP)
- NTPv4
- IPv4
- DHCP
- SFTP, FTP
- DiffServ/DSCP
- VLAN (up to 500 per port)
- TELNET
- SYSLOG
- RADIUS
- SSH

MANAGEMENT

- TimePictra
- SNMP v2c, v3
- CLI

CERTIFICATIONS

- CE certified
 - CISPR22
 - Safety – CB Scheme 60950-1 2nd edition
- EMC
 - FCC part 15 AS/NZS Class B, EN300 386, EN55022/24, CISPR22, KN55022/24
 - NEBS GR-1089 section 2 and 3
- ENVIRONMENTAL
 - ETSI (EN55022/EN55024) EN300019, Class T3.2
 - NEBS W/Exclusion of GR-63 4.2, 4.5
- Safety
 - UL/cUL 60950-1, IEC 60950-1 CB, EN60950-1 2nd edition
- RoHS
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