

PTP Grandmaster designed for small cell, 4G and LTE-A deployments

# Thunderbolt PTP GM200

## ThunderboltGM200 Grandmaster Clock

The Protempis Thunderbolt® PTP Grandmaster Clock is designed for wireless networks requiring phase synchronization. The GM200 provides continuous availability of UTC traceable time for phase synchronization, a must for LTE-Advanced networks and services.

The Thunderbolt PTP GM200 employs industry leading Trimble GNSS solution & holdover technology.

The PTP GM200 can tolerate harsh environmental conditions supporting both indoors & outdoors deployments with extended operating temperature range.

## Small Cell Phase Synchronization

The Thunderbolt PTP GM200 is designed with small cells in mind but also it meets Marco base station requirements for synchronization. The Thunderbolt PTP GM200 supports small cells networks that require phase synchronization. The most efficient way to implement phase synchronization for LTE & LTE-A services is to deploy the grandmaster clock close to target eNodeBs to ensure 1.5 us of phase alignment. By reducing network hops between the grandmaster and LTE

base stations, the risk of network re-configuration and load variance on IEEE-1588 signal quality is reduced. The Trimble GM200 suits this strategy perfectly due to its small size, low cost, superior accuracy & reliability and flexibility of deployment options.

## Ideal for LTE-A Services

CoMP, eICIC, eMBMS and Carrier Aggregation services require that synchronization networks be requalified and redesigned to support phase synchronization. Non-compliance with phase sync specifications will result in low or no service from LTE-A equipment and degraded bandwidth leading to potential service outages. By engineering current networks to support phase synchronization, LTE-A services downtime can be mitigated. Phase synchronization can easily be supported by current sync networks with the GM200 by adding it where needed. Given its low cost, it can be added to any network requiring support for the stringent phase synchronization specifications that LTE-A services require performing at their optimal levels. High reliability assures that the GM200 can be deployed in edge and/or aggregation networks.

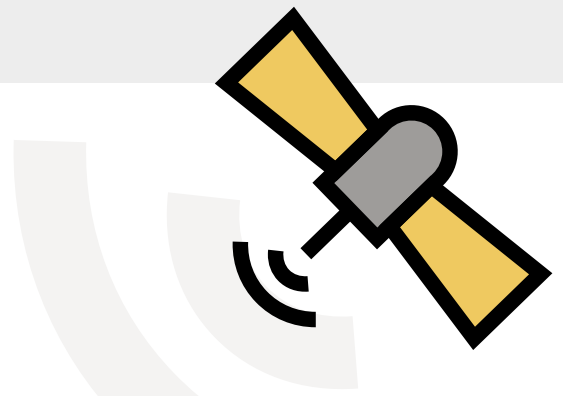


## Key Features

- IEEE-1588 PTP Grandmaster Clock
  - o Multiple PTP Profiles (G.8265.1, G.8275.1, G.8275.2, Telecom-2008 Profile, 802.1AS, Enterprise Profile, Broadcast Profile SMPTE)
- Multi-Constellation (GPS, GLONASS, Beidou & Galileo)
- 15ns (1-sigma) time accuracy relative to GNSS reference
- Holdover of  $\pm 1.5\mu s$  over 4hours (constant temperature and when locked to GPS for 7 days)
- Inputs: GNSS, 1588-PTP and SyncE
- Outputs: 1588-PTP, NTP, SyncE, PPS, and 10MHz
- Dedicated management port (1xRJ45)
- Network Management: SNMP, Web UI, CLI
- VLAN support
- IPv4 and IPv6

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## General Specifications

Inputs: .....GNSS, 1588-PTP, SyncE

Outputs: .....PPS, 10MHz, NTP, PTP, SyncE

### Ethernet Ports:

1x Mgmt RJ45

1x 1G SFP

1x 1G RJ45

Protocols .....PTP, NTP & SyncE

GNSS Antenna .....SMA

### Protocols:

IEEE-1588 (PTP), NTPv4, SyncE, IPv4, IPv6, TELNET, SFTP, SSH, RADIUS, TACACS+, SNMP, DAYTIME, TIME

Network Management.....SNMPv2, v3, HTTPS, CLI

### User Interfaces:

CLI .....Monitoring and Management

Web UI .....Monitoring and Management

## Performance

Time of day accuracy .....15ns (1-sigma) reference GNSS

Time stamp accuracy .....<10 ns rms

Frequency accuracy .....1.16x10<sup>-12</sup> (one day ave.)

Holdover .....<1x10<sup>-10</sup> /24hrs

### Time Accuracy

Tracking to GPS.....<15ns (locked)

Holdover.....< ±1.5µs/4hrs (7 days locked)

Power consumption.....5W average, 10W maximum

## Physical Characteristics

Dimensions in cm (L x W x H) .....20.8 x 20 x 4.4  
(19" half-rack x 1U)

Weight .....< 3Kg (6 lb)

## Power

DC Power, dual feed .....-36VDC to -72VDC

Current consumption .....330mA (max)

## Regulatory & Standards

### Operating Conditions

Temperature .....-40°C to +85°C

Humidity .5%-95% RH non-condensing (+60°C)

Storage Temperature .....-55°C to +105°C

### Safety & Health:

UL EN 62368-1

CE, CISPR32 class A

GR-63; Level 3

ETSI (EN55032/EN55024) EN 300019, Class T3.2

Electrical .....EMC, ESD Immunity & susceptibility

FCC Part 15 Class B / ICES 003 Class-B

Korea KN32 / KN35 Class A

EN.....301 489-1, EN 301 489-19 EN 303 413

IEEE .....613-1

Telcordia .....GR-1089

### Synchronization

ITU .....G.8265.x, G.8275.x (PRTC/T-GM)

IEEE .....PTP (IEEE 1588v2)

IETF .....NTPv4 (RFC5905)

### Product Compliant with following directive:

2014/53/EU (RED Directive)

2011/65/EU (RoHS2 Directive)

2012/19/EU (WEEE Directive)

Please go to [www.protempis.com](http://www.protempis.com) for the latest documentation and tools, part numbers and ordering information.

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