Thunderbolt™ GM330 PTP Grandmaster Clock

Datasheet V1.10

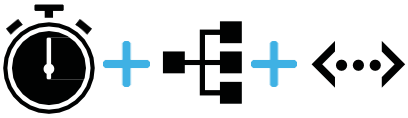
Overview

The Protempis Thunderbolt™ GM330 PTP Grandmaster Clock is designed for networks that require timing & phase synchronization, including applications in:

- Public & Private Wireless
- Data Centers
- Industrial networks & more

It provides continuous availability of UTC traceable time for phase synchronization, a critical need for LTE Advanced/5G networks and services.

Integration of Functions



GNSS Timing | PTP Sync & Distribution | Ethernet Switching

The GM330 reduces the cost of deployment by integrating 3 functions:

- High accuracy GNSS timing with dual frequency & holdover
- Supports a broad range of PTP profiles and a high number of clients
- Integrated switch with optical or copper port options

Versitile Design

The GM330 can be used in either indoor or outdoor deployments that require an extended operating temperature range. It includes versatile I/O, Power-Over-Ethernet+ PD (option, coming soon) and a compact form factor to address a variety of time & sync use cases.

PTP Profiles

IEEE-1588 v2.1
ITU-T G.8265.1
ITU-T G.8275.1
ITU-T G.8275.2,
Telecom-2019 IEEE 802.1AS Enterprise Profile
Power (C37.238 2011, C37.238-2017)
Broadcast (SMPTE ST-2059-2) (Future Release)

Applications

Small Cells

In addition to its rugged design, the GM330 addresses the tight timing requirements of typical small cell private wireless services. As more radios and small cells are deployed to ensure coverage, the GM330 offers a scalable solution with its client count that seamlessly addresses the growing network's time and sync needs.

4G LTE-A & 5G Services

The GM330 is a cost-effective solution for any network that requires stringent phase synchronization of 4G LTE-A/5G services. With its high reliability and purpose-built design, it easily deploys at the edge and/or network aggregation layer.

Private 5G & Industrial Data Networks

Third-party providers and municipalities are building their own private 5G networks instead of relying on WI-FI to achieve superior range and coverage. The GM330, with proven time and sync technologies, enables these organizations to meet key connectivity requirements, while its integration of functions reduces implementation cost.

Integration of Multiple Functions

- World Class GNSS Time & PTP Sync Technology
- Ethernet switch & ports
- NTP & PTP (on the same port)

GNSS Precision Timing

- Dual Frequency (L1 & L5)
- Multi-Constellation (GPS, GLONASS, Beidou, Galileo, NavIC, QZSS)
- 5ns (1-sigma) time stability
- Holdover: ±1.5us over 4 hours
- Anti-Jamming & Anti-Spoofing

PTP & Synchronization

- Widely used PTP Profiles
- Usable as a PTP GM or Boundary Clock

Connections

- Inputs: GNSS Ant, 1588-PTP, PPS, SyncE
- Outputs: 1588-PTP, NTP, SNTP, SyncE, PPS, ToD, 10MHz
- Ethernet Ports:
  - 4x 1G/10G SFP+
  - 2x 10/100/1000 BASE-T RJ45
  - VLAN support
  - IPv4 & IPv6
- Supports SyncE over Optical Fiber & Copper

Other Key Features

- Operating Temperature: -40°C to +50°C
- Hardware Time Stamping
- Supports POE+ PD
- Secure Boot
- Management: Serial port (1xRJ45), WebUI, CLI
- 19" Half-Rack (1U)

Applications

- Small Cell
- LTE Advanced/5G Synchronization
- Private 5G & Industrial Data Networks
- ORAN 5G
- Enterprise
- Oil & Gas and Enterprise
- Power & Utility
- Broadcast
- Financial

Protempis
Precision Time. Perfected.

Thunderbolt™ GM330 PTP Grandmaster Clock

General Specifications

Inputs: .....GNSS Ant, PPS, 1588-PTP, SyncE, CLK
Outputs: .....1588-PTP, NTP, SNTP, FREQ, PPS, SyncE, ToD
Square Wave..... CLK (10MHz)

Management Port:
1x Console Serial Port Up to 230K Bits/s RJ45

Ethernet Ports:
4x 1G/10G Copper/Optical SFP+
2x 10/100/1000BASE-T RJ45 (POE+ available on ETH0)

GNSS Antenna..... SMA (Female)
PPS_IN, PPS_OUT, CLK, FREQ, ToD .....SMA (Female)

Protocols:
IEEE-1588 (PTP), NTPv4, SNTPv4, SyncE, IPv4, IPv6, TELNET, SFTP, SSH, RADIUS, TACACS+, SNMP, DAYTIME, TIME

Monitoring & Management Interfaces:
CLI, Web UI (HTTPS), SNMPv2/v3, NETCONF, RESTCONF

Performance

Time of day stability .....5ns (1-sigma) reference GNSS
Timestamp stability .....<10 ns
Frequency stability ..... 1.16x10-12 (one-day avg)

Time Stability
Tracking to GNSS, dual frequency (L1 + L5)… .....<5ns (locked)
Holdover.....< ±1.5µs/4hrs (7 days locked)

Physical Characteristics

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

Power

DC Power, dual feed..... -36VDC to -72VDC
POE+ PD … .....25W (max)
Current consumption.....500mA (max)
Power consumption.....18-20W

Regulatory & Standards

Operating Conditions
Temperature..... -40˚C to +50˚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, ETSI (EN55032/EN55024)
Electrical ..... EMC, ESD Immunity & susceptibility
FCC Part 15 Class A / ICES 003 Korea KN32 / KN35 Class A
EN ……..…….. 301 489-1, EN 301 489-19 EN 303 413

PTP Profiles: See page 1

Synchronization
ITU-T ..... G.8265.x, G.8275.x (PRTC/T-GM)
IEEE ..... PTP (IEEE 1588v2.1)
IETF..... NTPv4 (RFC5905)
IETF..... SNTPv4 (RFC4330)

Product Compliant with the following directive:
2014/53/EU (RED Directive)
2011/65/EU (RoHS2 Directive)
2012/19/EU (WEEE Directive)

Please visit **www.protempis.com** for the latest documentation and tools, part numbers and ordering information.

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