DATASHEET

Thunderbolt PTP GMC

PTP edge Grandmaster designed for small cell, LTE TDD & LTE-A deployments

Thunderbolt GMC GM100 Grandmaster Clock

The Trimble Thunderbolt® PTP Grandmaster Clock is designed for wireless networks requiring phase synchronization. The GM100 provides continuous availability of UTC traceable time for phase synchronization, a must for LTE-Advanced networks and services..

The Thunderbolt PTP GM100 employs industry leading Trimble GNSS solution & holdover technology.

The PTP GM100 can tolerate harsh environmental conditions supporting both indoors & outdoors deployments with extended operating temperature range.

Small cell phase synchronization

The Thunderbolt PTP GM100 is designed with small cells in mind but also it meets Marco base station requirements for synchronization.

The Thunderbolt PTP GM100 supports small cells networks that require phase synchronization. The most efficient way to implement phase synchronization for LTE & LTE-A services is to deply the grandmaster clock close to target eNodeBs to ensure 1.5 us of phase alignment.

By reducing network hops between the grandmaster and eNodeBs, the risk of network re configuration and load variance on IEEE-1588 signal quality is reduced. The Trimble GM100 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 GM100 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.

NEBS compliance assures that the GM 100 can be deployed in edge and/or aggregation networks.

Key Features

- IEEE-1588 PTP Grandmaster Clock
  - *PTP Telecom Profile (G.8275.1)*
  - *Supports 64 PTP telecom profile clients*
- Multi-Constellation *(GPS, GLONASS, BDS & Galileo-ready)*
- 15ns time accuracy relative to GPS reference
- Holdover of ±1.5us over 4hours *(constant temperature and when locked to GPS for 7 days)*
- Outputs: 1588-PTP, PPS, 10MHz
  - *2 x Gigabit ports (1x RJ45 & 1x SFP)*
- Network Management: SNMP, Web UI, CLI
- IPv4 and IPv6
- NEBS Compliant

Benefits

- Low cost reduces CAPEX of LTE TDD, LTE A & small cell projects
- Extended environmental capabilities enable deployment in difficult locations where small cells and LTE A base stations are deployed
- Superior holdover performance via Trimble proprietary technology gives extra time error budget for network design and dimensioning.

GENERAL SPECIFICATIONS

Inputs……GNSS (GPS, GLONASS, Beidou & Galileo[1])
Outputs……Ethernet: 1x GigE RJ45
1x SFP
Protocols……..PTP(G.8275.1)
GNSS Antenna ……SMA

Protocols:
IEEE-1588 (PTP), IPv4, IPv6, Telnet, SFTP, SSH

Network Management……..SNMPv2
HTTP (information viewing only)

User Interfaces:
CLI……Monitoring and Management
Web UI……..Monitoring Only

[1] Hardware ready: a firmware update is required to enable the Galileo constellation

PERFORMANCE

Time of day accuracy……15ns (1-sigma) from UTC
Time stamp accuracy……..<10 ns rms
Frequency accuracy……1.16x10^{-12} (one day ave.)
Holdover……..<1x10^{-10} /24hrs

Time accuracy
Tracking to PRC……..<15ns (locked)
Holdover……..< ±1.5µs/4hrs (7 days locked)

PTP GM configuration……..64 clients @128 mps
Surveyed accuracy……<3m Horizontal, <5m Vertical
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

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 & Environmental:
UL / CSA 60950-1
EN: 60950-1, 300019
CE, CISPR22 class A
GR-63; Level 3
NEBS GR-1089 section 2 and 3
ETSI (EN55022/EN55024) EN 300019, Class T3.2

Electrical……EMC, ESD Immunity & susceptibility
FCC Part 15 Class A
EN……..300 386, 55022 class A, 55024, 61000-6-2/4
IEEE……1613-1
Telcordia……..GR-1089

Synchronization
ITU……..G.8275 (PRTC/T-GM)
IEEE……..IEEE 1588v2

Environmental
RoHS-II & WEEE Compliant

Visit www.trimble.com/timing for part numbers and information about where to buy.

Parts of the product are patent protected.

Trimble has relied on representations made by its suppliers in certifying this product as RoHS-II compliant.

Specifications are subject to change without notice.

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