The right one.™

THUNDERBOLT E GPS DISCIPLINED CLOCK

KEY FEATURES

- Ovenized quartz oscillator provides stable 10 MHz and 1 PPS output to maximizes bandwidth
- Combined GPS receiver and ovenized oscillator on one board
- High volume manufacturing provides reliable low-cost products
- RoHs-Compliant (Pb-free)

PRECISE GPS CLOCK FOR WIRELESS INFRASTRUCTURE

The Trimble® Thunderbolt™ E GPS Disciplined Clock is Trimble's latest offering for GPS synchronization devices targeting the wireless infrastructure. This fifth-generation GPS clock combines a 12-channel GPS receiver, control circuitry, and a high-quality ovenized oscillator on a single board, providing increased integrity and reliability at a lower size and cost.

The GPS clock's level of integration makes it a perfect solution for precise timing applications in the wireless industry. Among its uses are synchronizing the E911 positioning infrastructure and maximizing bandwidth for wireless local loop.

The architecture is comparable to systems currently used to maintain the tough CDMA holdover specification. This makes the Thunderbolt E GPS clock a natural for a CDMA clock, the digital standard for cellular phones.

The Thunderbolt E GPS clock outputs a 10 MHz reference signal and a 1 PPS signal with an over-determined solution synchronized to GPS or UTC time. The 10 MHz reference accommodates applications requiring sub-microsecond timing.

The Trimble T-RAIM (Time-Receiver Autonomous Integrity Monitor) algorithm is used to monitor satellites to ensure signal integrity.

Matching the Thunderbolt E GPS Clock with the Trimble Bullet™ antenna creates a system that provides reliable performance in hostile R/F environments. The system can be easily calibrated for different cable lengths.

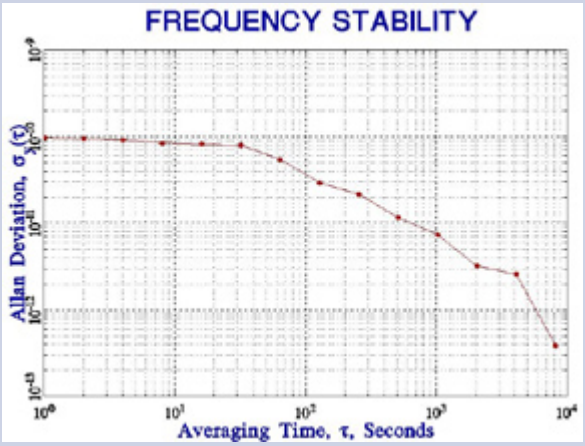
The high level of integration and volume production techniques make the Thunderbolt E GPS Disciplined Clock an extremely cost-competitive timing solution for volume synchronization applications.

Trimble®

THUNDERBOLT E GPS DISCIPLINED CLOCK

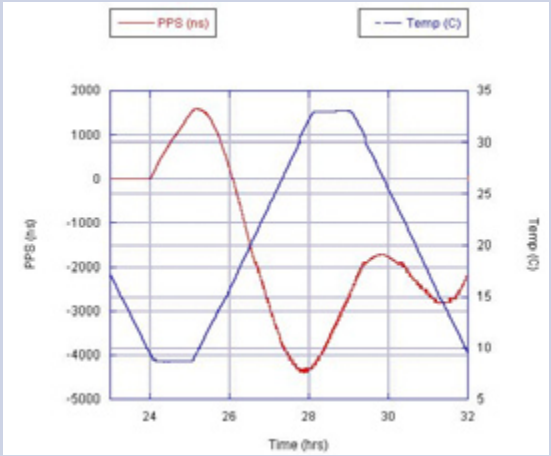
PERFORMANCE SPECIFICATIONS

General . . . . . L1 frequency, CA/code (SPS), 12-channel continuous tracking receiver
Update rate . . . . . 1 Hz
PPS accuracy . . . . . UTC 15 nanoseconds (one sigma)
10 MHz accuracy . . . . . 1.16×10^{-12} (one day average)
10 MHz stability . . . . . See graph below



Harmonic level . . . . . –40 dBc/Hz max
Spurious . . . . . –70 dBc/Hz max
Phase noise . . . . . 10 Hz –120 dBc/Hz
100 Hz –135 dBc/Hz
1 kHz –135 dBc/Hz
10 kHz –145 dBc/Hz
100 kHz –145 dBc/Hz

Typical performance below
(For increased holdover performance, please contact your local Trimble representative.)



ENVIRONMENTAL SPECIFICATIONS

Operating temp . . . . . 0 °C to +60 °C
Storage temp . . . . . –40 °C to +85 °C
Operating humidity . . . . . 95% non-condensing

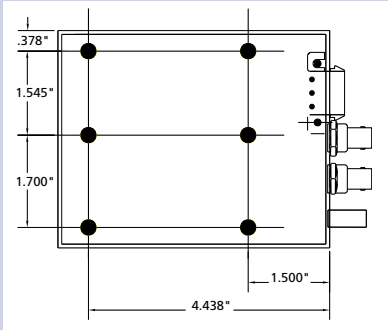
INTERFACE SPECIFICATIONS

Prime power . . . +24V and return using DC to DC power supply (19V–34V)
Mechanical connection uses a three-pin locking connector.
1 PPS Interface Specification

- BNC Connector TTL levels into 50 Ω 10 microseconds-wide pulse with the leading edge synchronized to UTC within 15 nanoseconds (one sigma) in static, time only mode.
- The rising time is <20 nanoseconds and the pulse shape is affected by the distributed capacitance of the interface cable/circuit.

10 MHz . . . BNC connector. Waveform is sinusoidal 7 dBm ± 2 into 50 Ω
Serial interface . . . . . RS-232 through a DB-9 connector
RF antenna connector . . . . . BNC
Serial protocol . . . . . Trimble Standard Interface Protocol (TSIP) binary protocol @ 9600, 8-None-1

PHYSICAL CHARACTERISTICS



Power consumption . . . . . 15 watts cold; 10 watts steady state
Dimensions . . . . . 5"L x 4"W x 2"H (127 mm x 102 mm x 51 mm)
Mounting . . . . . Six mounting holes for #6-32 screws. Max. depth 3/8"
Weight . . . . . 0.628 lbs (0.285 kg)

ORDERING INFORMATION & ACCESSORIES

Please go to www.trimble.com/timing for the latest documentation, tools, part numbers and ordering information.

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

Specifications subject to change without notice.

Trimble Navigation Limited is not responsible for the operation or failure of operation of GPS satellites or the availability of GPS satellite signals.

NORTH AMERICA
Trimble Navigation Limited
Corporate Headquarters
935 Stewart Drive
Sunnyvale, CA 94085
+1-800-787-4225
+1-408-481-7741
timing@trimble.com

EUROPE
Trimble Navigation Europe
Phone: +49-6142-2100-161

KOREA
Trimble Export Ltd, Korea
Phone: +82 2 555 5361

CHINA
Trimble Navigation Ltd, China
Phone: +86-21-6391-7814

Trimble

www.trimble.com