



THE THUNDERBOLT® LAB KIT

GPS-DO CLOCK FREQUENCY AND TIME REFERENCE

for Laboratory, Manufacturing and Research

KEY FEATURES & BENEFITS

Low cost lab reference for frequency and precise time

10 MHz and PPS reference

Complete kit including GPS receiver, antenna, software and power supply

Improve CMC (Calibration and Measurement Capability) under ISO/IEC 17025

Lock your lab instruments to a traceable source

Add value to existing equipment

SAVE WITH GPS-DISCIPLINED 10 MHZ AND 1 PPS REFERENCE

Laboratories and research facilities often need a high-accuracy frequency and time standard. Possession of such a standard improves the CMC (Calibration and Measurement Capability) of the laboratory leading to opportunities for increased business and revenue.

With the Thunderbolt® E GPS disciplined oscillator (GPS-DO) you can achieve high accuracy in a less complex and more cost effective way. This combination of GPS receiver and oscillator is inherently "on time". Your reference is locked to the atomic time reference of the GPS system and in turn to UTC.

Eliminate Reference Calibration Requirements

This product eliminates the time consuming and costly process of calibrating stand-alone reference sources.

The GPS receiver calculates the time from the available satellites and adjusts the oscillator to remove the major inaccuracies from the 10 MHz frequency and pulse per second (PPS) outputs.

The Thunderbolt frequency and time outputs are now locked to the GPS master clock and in turn to UTC providing traceability to a national standard as required by lab accrediting organizations.

Enhance Capabilities of Equipment You Already Own

The Thunderbolt Lab Kit may be used as an external time base for frequency counters and other lab test equipment. Your counter time base is now locked to a traceable source, specifically GPS and UTC.

Carry Your Reference In The Field

The Thunderbolt E GPS-DO is easy to deploy at customer sites for enhanced accuracy.

Start With Complete Kit "Ready To Go"

The kit is complete and ready to be used in the lab including the GPS-DO Clock (GPS receiver with double-ovenized oscillator and communications), active GPS antenna, power supply, connectors and extra power cable for wiring into test apparatus, enclosures, panels or racks.

The kit is supported by the Trimble GPS Studio software (downloadable from the Trimble website). Trimble GPS Studio offers complete control, monitoring and data logging and data conversion features. The logging features can be used to create audit records to support traceability and operating status for the system. This data can also be made available to other applications including spreadsheets and databases allowing integration into other reporting and analysis systems.



75 feet of RG-6 cable, Terminated with TNC Connectors at both ends



Protempis Bullet antenna (5 V with TNC Connector)



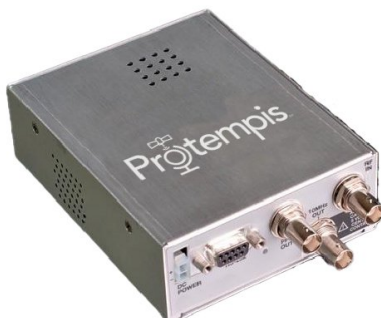
Power cable



Power pin adapters



Power Converter (24 VDC AC/DC)



ThunderBolt E module

BNC-m / TNC-f connector



Disclaimer

Protempis does not assume any liability arising out of the application or use of any product described or shown herein nor does it convey any license under its patents, copyrights, or any rights of others. Licenses or any other rights such as, but not limited to, patents, utility models, trademarks or trade names, are neither granted nor conveyed by this document, nor does this document constitute any obligation of the disclosing party to grant or convey such rights to the receiving party.



Thunderbolt E GPS Disciplined Clock

Precise GPS Clock for Wireless Infrastructure

Protempis 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 double-ovenized oscillator on a single board, providing increased integrity and reliability at a lower size and cost.

The Thunderbolt E'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 providing precise time and frequency for WiMax and LTE-TDD applications, along with digital broadcast applications.

The architecture is comparable to systems currently used to maintain the tough CDMA, WiMax, and LTETDD holdover specification. The Thunderbolt E is available in its enclosure, or as an OEM board.

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 PPS output accommodates applications requiring sub-microsecond timing.

The Protempis 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 Protempis 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.



Key Features

- Double-ovenized quartz oscillator provides stable 10 MHz and 1 PPS output to maximize bandwidth
- Combined GPS receiver and 10 MHz oscillator on one board
- High volume manufacturing provides reliable low-cost products
- Meets holdover specifications of 8 μs over 24 hours

Disclaimer

Protempis does not assume any liability arising out of the application or use of any product described or shown herein nor does it convey any license under its patents, copyrights, or any rights of others. Licenses or any other rights such as, but not limited to, patents, utility models, trademarks or trade names, are neither granted nor conveyed by this document, nor does this document constitute any obligation of the disclosing party to grant or convey such rights to the receiving party.

