



TEM Timing Module

Field timing and synchronization measurements for the T-BERD®/MTS-5800

The Viavi Solutions® TEM is the preferred tool for installing and maintaining networks with stringent timing and synchronization requirements.

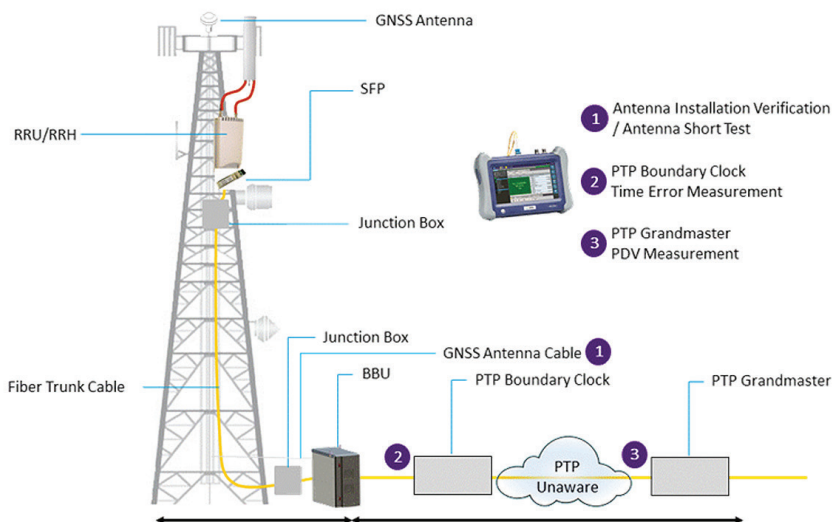
Together with the T-BERD/MTS-5800, the field-optimized TEM delivers industry-leading accuracy to field portable timing and synchronization measurements. It features a GNSS antenna and a miniature atomic clock (MAC) to ensure nanosecond-accurate measurements even when a satellite signal is not present and the module is running in holdover.

With a T-BERD/MTS 5800 and a TEM, you can:

- Perform one-way delay measurements that help you root out asymmetric network delays
- Precisely measure PTP one-way delay, constant time error (cTE), dynamic time error (dTE) using wander analysis with ITU masks and maximum time error max |TE|
- Qualify GNSS antenna installations by evaluating satellite signal strength and viewing 360° sky plot
- Troubleshoot the accuracy of equipment 1 PPS output signals with 1 PPS wander analysis
- Measure T1 and E1 jitter and wander

Key Features

- Performs 1588v2 (PTP) measurements including nanosecond-accurate PDV and time error (TE) measurements
- Verifies Ethernet and IP one-way delay network latency
- Confirms frequency, phase, and time synchronization with near-lab grade accuracy in the field
- Proves out GNSS antenna installations and faults
- Supports multiple GNSS constellations including GPS, GLONASS, BeiDou, SBAS, and QZSS
- Enable fast and accurate satellite acquisition with a modern 72 channel GNSS receiver
- Supports multiple 1 PPS and 10 Mhz inputs and disciplined outputs
- PTP grand master (PRTC) emulation
- One-Way-Delay measurements for 1 & 10 GE circuits accurate in nanoseconds



Specifications

General	
Weight	0.45 kg (1.0 lb)
Dimensions	12.9 x 13.5 x 4.7 cm (5.9 x 5.4 x 1.8 in)
Time drift in holdover, after stabilization	7 μ s over 24 hours at a 0°C to 60°C temperature range
Oscillator stability*	1.5e-11 over a 2 hour period
Interfaces	
GNSS Antenna	
Connector	SMA
Power	0, 3.3, and 5V
1 PPS	
Connector	SMB
Inputs	Two (2)
Output	One (1) — disciplined
10 Mhz	
Connector	SMB
Input	One (1)
Output	One (1) — disciplined
GNSS	
Constellations	GPS, GLONASS, BeiDou, SBAS, QZSS, and Galileo with firmware upgrade; Sky plot supported
Channels	72 (32 for satellite tracking; 40 for acquisition aiding and noise estimation)
Signal strength	Per channel
Time formats	UTC, GPS
Location information	Fixed (configurable), dynamic, survey
Oscillator	
Sync source	GNSS, 1 PPS, 10 Mhz, BITS/SETS from 5800
	Atomic clock with rubidium oscillator

* Stability is based on a constant room temperature environment with no vibration and a stable magnetic environment.

Ordering Information

Description	Part Number
Timing expansion module for T-BERD/MTS-5800	C5TEM-R
Test Options	
10/100/1000 Mbps and 1 GE optical IEEE 1588v2 (PTP)	C5LS1588
1 PPS and 10 Mhz timing and clock analysis	C5TIMING
10/100/1000 Mbps and 1/10 GE one-way delay	C5OWD
1 GE optical sync-e	C5LSSYNCE
10 GE optical sync-e	C510GESYNCE
1 GE optical Ethernet wander	C5LSETHWANDER
PDH (DS1, DS3, etc.) Rx and Tx electrical wander	C5PDHWND
10 GE Optical Ethernet IEEE 1588v2 (PTP)	C510G1588



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