

VIAVI

Timing Expansion Module V2 (TEM V2)

Field timing and synchronization reference for T-BERD/MTS-5800 and OneAdvisor 800 Wireless.

The field-optimized TEM V2 is an industry-leading reference for field portable timing and synchronization measurements. It features a multi-band GNSS antenna and a Rubidium oscillator that delivers nanosecond accurate measurements even when a satellite signal is not present, and the module is running in holdover.

With a TEM V2, 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 either instantly or over a 24-hour period
- Troubleshoot the accuracy of equipment 1 PPS output signals with 1 PPS wander analysis
- Measure T1 and E1 jitter and wander
- Measure PTP Frequency accuracy using a Floor Package Percentile (FPP) analysis

Features

- Enable fast and accurate satellite acquisition with a multi-channel, multi-band GNSS receiver
- Confirms frequency, phase, and time synchronization with near-lab grade accuracy in the field using ITU G.8265.1, G.8275.1 and G.8275.2 profiles
- Verifies Ethernet and IP one-way-delay
- Proves out GNSS antenna installations including measuring individual satellite signal strength, overall Dilution of Precision and automatically displaying the number of usable satellite signals
- Concurrent multiple GNSS constellations including GPS, GLONASS, Galileo, BeiDou, and SBAS
- Supports multiple 1 PPS and 10 Mhz inputs and disciplined outputs concurrently; BITS/SETS clock inputs are available
- Includes a standard RJ-45 V.11 interface per G.703 Amendment 1 supporting 1 PPS and Time of Day inputs
- PTP grand master (PRTC) emulation
- Wander Analysis per ITU, G.8262.1, G.8273.1, and G.8273.2

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 error	<= 176 ns over 8 hours at room temperature with no vibration (in Holdover)
Average frequency stability*	<= 6E-12 over an 8-hour period (in Holdover)
Inputs	Two (2)
Output	One (1) — disciplined
Time Accuracy Compared to UTC	± 5ns 1-sigma
Interfaces	
GNSS Antenna	
Connector	SMA
Power	0, 3.3, and 5V
1 PPS - 45RJ	
Connector	RJ-45
Input	1 PPS and Time of Day (ToD) over V11 serial interface per G.703
Output	1 PPS per G.703 with adjustable voltages
1 PPS	
Connector	SMB
Inputs	Two (2)
Output	One (1) — disciplined
External Clock	
Connector	SMB
Input	BITS/SETS, 2 MHz, 10 MHz
10 Mhz Output	
Connector	SMB
Input	One (1)
Output	One (1) — disciplined
GNSS	
Constellations	GPS, GLONASS, Galileo, BeiDou, and SBAS; sky plot
Channels	184 channels with per channel signal strength
Time formats	UTC, GPS, Galileo, BeiDou, Glonass
Location information	Fixed (configurable), dynamic, survey
Oscillator	
Sync source	GNSS, 1 PPS, 10 Mhz, BITS/SETS Atomic clock with rubidium oscillator

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



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