

Specifications

	Product
Optical Interfaces (all optional)	1GbE: SFP 10GbE: SFP+ 100M: SFP 25GbE: SFP28 40GbE: QSFP+ 100GbE: QSFP28
Electrical Interfaces	1000/100 BASE-T: RJ45
External Reference Clocks	Lock internal timing reference to external reference. External reference inputs: 64 kHz, 2.048 MHz, 10 MHz, T1 BITS clock (1.544 Mb/s), E1 MTS (2.048 Mb/s).
Internal Reference Clock	Frequency stability over temperature – better than $\pm 1 \times 10^{-9}$. Short term phase stability – better than 500 ps. Rb Option – for future upgrades (optional).
Clock Reference Output Ports	2 x 10 MHz/2.048 MHz Reference Outputs (BNC).
Phase Measurement	1 pps – BNC (unbalanced). 1 pps – RJ (balanced).
1 pps + ToD Reference Input	1 pps Unbalanced Input (BNC), 1 pps Balanced Input + ToD (RJ48C). ToD format: CCSA, ITU-T, NMEA.
1 pps + ToD Reference Output	1 pps Unbalanced Output (BNC), 1 pps Balanced Output + ToD (RJ48C). ToD format: CCSA, ITU-T, NMEA.
	PTP
Standards	IEEE 1588-2008 G.8273.2 including Class-C and Class-D devices. G.8272 including Class-B devices. All relevant G.826x/827x standards.
PTP Time Error Measurement Accuracy	Better than 1 ns for 1G and above Optical interfaces. Better than 5 ns for below 1G and all Electrical Interfaces*.
Master/Slave Emulation	Emulate PTP master with full parametric control. Emulate PTP slave. Add Time Error patterns e.g. G.8273.2, G.8271.1, G.8271.2, G.8261, user-defined.
Time Error Metrics	Built-in (CAT) software including industry-standard ITU-T pass/fail masks with clear pass/fail indication. Time Error (2Way and 1Way) – packet selection and filtering as per ITU-T specifications cTE, dTE, etc.
PTP Packet Analysis	Decode and display PTP Fields with PFV. (Additional options with full PFV licence: Display pass/fail to standards-based or user-defined rules; report generation capability.)
	SyncE
Jitter/Wander Measurement	ITU-T G.8262.1, G.8262 and O.174. Jitter/Wander Generation, Wander Transfer, Jitter/Wander Tolerance, Phase Transient, built-in frequency offset plus generation of sinusoidal, MTIE and TDEV Wander.
Wander Analysis	Built-in (CAT) software including industry-standard ITU-T pass/fail Masks with clear pass/fail indication. ITU-T Masks: G.8261, G.8262, G.8262.1, G.8261.1 Wander Measurements: TIE, MTIE, TDEV, clock FFO.
ESMC (SSM) Features	Decode ESMC messages to ITU-T G.8264 and graph/plot Quality Level (QL) changes graphically (bi-directional). Generate ESMC (SSM) packets as per ITU-T G.8264. Enhanced SSM fully supported.
Phase Wander Measurement Resolution	250ps
	General
PC/Mac or Tablet Control Interface	Web-based GUI with built-in controller enables use of any PC or Android Tablet with any browser with screen resolution of 1024 x 768 pixels. RJ 45 LAN connection to instrument.
Workflow	Graphical test-case driven workflow with real-time status and results. Stimulus/Response test configuration tool. Detailed configuration options also available.
Remote Control	Scripting via TCL, Perl and Python. Automatic Script Recorder for TCL, Perl and Python. Compatible with Calnex Test Sequencer (CTS) for creation/use of specific or user-defined test plans.

(*) Future release.
Specification is subject to change without notice.