Network **Synchronization** Solutions

PolyNet Ptest 5G
Synchronization Analyzer

Key Features

- Built-in Rubidium or OCXO and GPS/GLONASS/BEIDOU/GALILEO/QZSS clock (selectable)
- PPT master/slave emulation
- Wander T1, E1, PTP and SyncE measurements
- 1PPS mesurement
- TE max |TE|, Constant and dynamic TE components
- ESMC / SSM full support
- Y.1564 (e-SAM) FTD, 2-way FDV, FDV, 2-way FTD, FLR SES, PEU and PEA
- Y.1731 QoS statistics
- (A)Symm Y.1564, RFC-2544
- Wander analisys /generation
- Multistreams tests
- MPLS support
- Scan MAC/IP/VLAN/Q-in-Q
- T1, E1, Jitter & Pulse mask
- VNC, LAN or Wi.Fi control
- C37.94 BER, Delay, Defects
- One-way & round trip delay

Benefits

- Quality hold-over
- All-in-one solution
- No modules = no problems
- 100% hardware included
- Field tester extra rugged
- Builtin battery
- GUI by touchscreen, mouse

PolyNet Ptest 5G Technical Data

SyncE and PTP Testing

Synchronous Ethernet	Clock Ref.: built-in Rubidium and GPS, OCXO, internal (<2.0 ppm); external (10 MHz, 2048/1544 Mb/s, 2048/1544 MHz, 1 pps) Line Analysis: frequency (MHz), offset (ppm), drift (ppm/s) [section 10]; Offset Generation ±125 ppm (0.001 ppm) as per ITU-T O.174 Wander generation [ITU-T O.174 section 8.4] and MTIE / TDEV measurement [ITU-T O.172 section 10] SyncE Generation / Decoding ESMC and SSM [ITU-T G.8264]
PTP / IEEE 1588(v2)	Precision Time Protocol (PTP): Master & Grandmaster id., Priority 1-2, Class, Accuracy, Variance, Time source PTP over UDP encapsulation, PTP Generation / Analysis / Emulation; hardware-assisted Decoding; End-point and Through modes Counts: Sync Inter Arrival Delay (IAD) Avg/Curr; Packet Total Delay (PTD): Std Dev/Range; Packet Delay Variation (PDV): Cur/Max/Avg TE and max.|TE|measurement on PTP. Constant and dynamic TE components. Frequenc offset master vs. local clock (ppm)

E1, T1 and Datacom testing

Interfaces	Port C: Unbalanced (BNC) 75 Ω Additional balanced secondary T1, E1 port 0 to -6dB, nominal and PMP -20dB Bit Rate: 1.544 / 2.048 Mbit/s ± 3ppm. Codes: HDB3 / AMI 4 x SMA: Clock Source: Internal Timing: 1.544MHz, 2.048 MHz ± 25000 ppm; External Timing; Recovery from Rx Timing (Loop Timing)
BERT	Unframed: FAS / FAS+CRC4. PCM30: FAS+CAS / FAS+CRC Standard, non-standard PRBS, and user patterns. Transmit Error Rate Force Single Error: Bit, Frame, CRC, and BPV (Bipolar Violation); Alms, Errors Count; G.826, G.821, and M.2100
Datacom	Smart Serial 26p DTE / DCE ports. DTE, DCE emulation and monitor V.11/X.24, V.24/V.28, V.24/V.35, V.24/V.11 (V.36/RS449), EIA530 and EIA-530A. Codirectional according G.703 Rate: 50, 60 bit/s, 1.2, 2.4, 4.8, 8, 9.6, 16, 19.2, 32, 48, 72, 128, 144, 192, 1544 kbit/ Nx56 kbit/s; Nx64 kbit/s, up to 10 Mbit/s

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E1, T1 and Datacom testing

Jitter & Wander	Overpass O.172: Jitter level Wander Generation and Measurem tolerance, transfer and Events (TIE, MTIE, TDEV). Wander results from 20 to 100 000s ent detection. 100% digital based generation and analyzer
C37.94	Test Rate: N x 64 kbit/s; Frame/Unframed BER; ITU-T G.821: ES, SES, UAS, DM. Results with pass / fail indications Frequency (Hz), Deviation (ppm), Max deviation; Round Trip Delay (ms), One-way Delay synchornized with GPS Defects: LOC, AIS, LOF, RDI, LSS, All 0, All 1; Anomalies: FAS, TSE, Slip. Optical Power Meter

Ethernet Testing

Interfaces	SFP / SFP+ : 10GBASE-SR, 10GBASE-LR, 10GBASE-ER, 10GBA SE-SW, 10GBASE-LW, 10GBASE-EW, 1000BASE-T, 1000BASE-SX, 1000BASE-LX, 1000BASE-ZX, 1000BAS E-BX, 100BASE-FX, 100BASE-TX, 10BASE-T WAN Interface Sublayer (WIS), 2xRJ-45; PoE detection/ transparency Autonegotiation: Bit rate at 10, 100, 1000 and 10000 Mbit/s, Disable autonegotiation and direct set up EtherType II (DIX v.2), IEEE 802.3, IEEE 802.1Q, IEEE 802.1ad; IEEE 802.2–LLC1, IEEE 802.3–SNAP; IPv4 (RFC791), IPv6 RFC2460)
Generation (8 streams)	Traffic generation and analysis features up to 10 Gb/s, equivalent to 15 millions of frames, if frame size is set to 64 bytes. MAC address: Source / Destination, Default / User defined, Single / Range VLAN: Single VLAN support, Q-in-Q stacking, VID, DEI, S-VLAN, C-VLAN, and Priority codepoint Type / Length: Generation/Analysis, Jumbo frames with MTU up to 10 kB Bandwidth Profile: Constant, in bit/s and frames/s, Periodic Burst, in high/low traffic, Ramp, in high/low traffic, Poisson Loopback: L1to L4 layers, filtering conditions, broadcast and ICMP frames control Layer 1 BER: HF, LF, MF, Long/Short continuous random, PRBS 231-1, A-seed, B-seed, mixed-frequency Layer 2-4: PRBS 211-1, PRBS 215-1, PRBS 220-1, PRBS 223-1, PRBS 231-1 along with their inverted versions, user (32 bits) SLA payload; All zeros; Insertion of TSE: single, rate, random RTD and VF tone generation

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Ethernet Testing

Filters for Statistics (up to 8 simultaneously)	Ethernet Selection: MAC address, Type/Length, C-VID, S-VID, CoS and Priority with selection mask IPv4 and IPv6 Selection: address, protocol, DSCP, Flow (v6): single value or range. UDP Selection: port: single value or range
Traffic Statistics	Top 16 talkers: Sour/Dest MAC / IPv4 / IPv6 addresses, VID (VLAN), C-VID (Q_in_Q), S-VID (MPLS) Ethernet Frame Counts (RFC 2819): VLAN, Q-in-Q, Priority, Control, Pause, BPDUs Tx/Rx Uni-Multi-Broadcast, Errors, Undersized, Oversized, Fragments, Jabbers, Runts, (Late) Collisions, Sizes, MPLS stack length Bandwidth Statistics: (in bit/s, frame/s, %) Rate, Max, Min, Aver, Occupancy, Unicast, Multicast, Broadcast IPv4 & IPv6 counts: (in bit/s, frame/s, %) Unicast, Multicast, Broadcast, Errors, TCP, UDP, ICMP
Results	Twisted Cable: MDI/MDI-X status, Open, Cable Length Test, Short, Polarities, Pair Skew. PoE: voltage and current SFP: Presence current interface, Vendor, Part number, Optical power (over compatible SFP) Frame Delay (FTD) Y.1563: Min/Max/Med/Mean; Delay Variation (FDV) RFC1889: Peak; Jitter Curr/Max/Min/Mean Frame Loss (FLR) Y.1563, Duplicated: Out-of-Order packets (RFC 5236) Availability: SES and Y.1563 PEU; BER: Count, seconds with errors, Pattern losses, pattern loss seconds
RFC-2544 & Y.1564	RFC 2544: Throughput, Latency, Frame Loss, Back-to-back, Recovery eSAM: test up to 8 non-color or 4 color aware services. Configuration: CIR, EIR, max. throughput for each service Tests (CIR, EIR and policing) with FTD, FDV, FLR and availability Performance test with FTD, FDV, FLR and availability results for all services
ICMP	RFC 792: IP ping / Traceroute, Generation of ICMP echo request: Dest. IP address, Packet length, Generation interval Analysis of ICMP echo reply: Round trip time, Lost packets, Time-To-Live Exceeded, Port unreachable

Ergonomics

Hand-held Instrument	Touchscreen 8 inch 800 x 400 pixels TFT color, Soft LEDS, 223x144x65mm, IP-54; 1.9 kg, Mouse, USB, Ethernet ports; SNMP, VNC support Rechargeable Batteries continuous working up to 24 hs; Operating 0ºC ~ 50º C; Storage -20ºC ~ 70ºC;

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