



TELECOM TEST SOLUTIONS

ParaScope 10GE-2

Handheld Dual Port 10G Ethernet/
Fibre Channel Tester



The ParaScope 10GE-2 is the next generation
in handheld T&M solutions

ParaScope Ethernet Benefits:

- Anytime, anywhere Ethernet/Fibre Channel testing
- Compact, ultra-light weight form factor
- Intuitive Graphical User Interface (GUI)
 - ✓ Reduces training time
 - ✓ Easy to use
- Reduces cost of ownership
- Open architecture H/W and S/W platforms
 - ✓ Capability to Support the Expansion of Your T&M Needs on a Higher Scale

*Test & Measurement's
SMALLEST,
ULTRA
LIGHTWEIGHT
handheld testing solution
for Ethernet & Fibre-
Channel networks*

Key Features

Ethernet

- Dual-port 10G-32 Multi-stream Traffic Generation & Analysis
- Layer 1/2/3/4
- Y.1564 (Multiple streams)
- 10G LAN/WAN Phy
- Ethernet OAM (802.1ag & Y.1731)
- Packet Capture/Decode
- RFC2544 (Delay, Jitter)
- PBB/ PBB-TE (Mac-in-Mac)
- Real Time Traffic Monitoring
- Packet Flooding Generation
- Unframed/L1 traffic test
- Wireless LAN (Wi-Fi)
- VoIP / IPTV
- 100FX/LX (Optic)
- IPv6

Fibre Channel

- 1x/ 2x

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ParaScope 10GE-2

General Specifications

- User-friendly and easy to use Hybrid user interface (UI) with graphical color touch-screen and keypad.
- Multiple testing capabilities: Ethernet, Fibre Channel, VoIP and IPTV
- Software upgrades can be applied through a USB drive or transferred via FTP.
- File Manager: Print/Save/Copy test results, log files, screen captures and packet capture files to a USB memory card or transfer via FTP
- Optical power measurement
- Customizable test profiles for quick and efficient test set configuration

Standard Features

- Performance Measurement (Throughput Test up to 4 multi-streams-1G/10G LAN PHY)
- Packet Filtering
- IP Tools (Ping, DHCP, Trace Route)
- In-Service Traffic Monitoring (Non-Intrusive Mode)
- Loopback Mode (L1-L4, auto, filtered)
- Ethernet OAM (Y.1731 & 802.1ag)
- MPLS (stacking up to 3 MPLSs)
- VLAN, Q-in-Q (up to 3 VLANs)
- Bit Error Test (BERT)
- RFC 2544 (Network Equipment Benchmarking Test)
- Cable Diagnostics
- Remote Control via VNC
- Report Generation – PDF, TXT, CSV
- System Tools

Optional Features

- Packet Capture and Decode
- Packet Flooding – Mac/VLAN/IP/User Defined Field
- Performance Measurement (Throughput Test 32 multi-streams)
- L1/Unframed BERT (Cable BERT-RJ45, Unframed BERT-SFP Optic)
- Network Discovery

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Trendsetter of Network Test & Measurement

- 100 FX/LX (Optic)
- VoIP
- IPTV
- Fibre Channel
- PBB/PBB-TE(MAC-in-MAC)
- 10G WAN PHY
- Y.1564 (SAM)
- IPv6

1. Performance Measurement

(Traffic Generation/Throughput Test)

- Up to 32 Streams Per Port
- Layer 1/2/3/4 Packet Frames (Continuous, Burst-Once, Ramp, Random Length)
- MAC/VLAN/MPLS/ICMP/TCP/UDP Setup
- Payload (PRBS, Increment, Decrement, User Pattern)
- Frame Size (Runt to Jumbo)
- Frame Rate (% , BPS, FPS)
- VLAN Tags (3 Q-in-Q: TPID, Priority, CFI, VLAN ID)
- MPLS Label (3 Stacks: Label, Exp., EoS, TTL)
- Pause Injection with Delay Control
- Error Injection (FCS, Duplicated, Lost, Late Frame, L3/L4 Checksum, Bit Error)
- Ping, ARP, Trace Route, DHCP

2. Packet Filtering

- Source/Destination Addresses (MAC/IP/Port)
- VLAN (Q-in-Q, TPID, Priority, CFI, VID)
- MPLS (Label, Exp., EoS, TTL)
- Packet Fields (TOS/DSCP, Protocol, User Defined)
- Advanced Pattern Matching Based on User Defined Pattern Filters

3. IP Tools

- IP Setup (MAC, IP, Netmask, Gateway, DNS)
- Static and DHCP Support



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- Ping (Destination, Frame Length, Ping Rate, Timeout, Number of Pings)
- Trace Route (Destination IP, Max Hop, Timeout)

4. In-Service Traffic Monitoring

(Non-Intrusive Mode)

- Per Frame/Per Packet Based Measurements
- In-Line Packet Filtering and Capturing
- Error Injection
- Media Conversion (Optic ↔ Copper)

5. Loopback Mode

- Layer 1 (All), L2 (All), L2/3/4 (Filtered)
- Auto Loopback
- Per Frame/Per Packet Based Measurements
- Remote Loopback control
- 802.1ah, 802.1ag, Y.1731

6. Bit Error Test (BERT)

- Framed (Layer 2/3/4) Test Patterns: (PRBS 31 and Inverted)
- Error Packet Generation (Lost/Duplicate/Late Frame):
Single, Burst, Rate

7. RFC2544

- Performance Measurement (Throughput Test)
- Delay Measurement (Latency Test)
- Packet Frame Loss Measurement (Frame Loss Test)
- Back-to-Back Test
- Packet Jitter Test
- Report Generation (PDF, CSV and TXT)

8. Cable Diagnostics

- **Copper Cable (Twist Pair):**
 - ✓ TDR (Time Division Reflector)
 - ✓ Cable Fault, Length
 - ✓ Irregular Impedance of Cable Pair
- **Optic Cable:**
 - ✓ Rx Power Level
 - ✓ Wavelength (λ)

9. Remote Control – VNC

10. File Management

- File Transfer from/to USB Memory Stick
- File Transfer via FTP
- Usage of Space (in %)
- File View, Print, Export to CSV, Rename, Delete

11. Report Generation

- PDF, CSV and TXT

12. System Tools

- Data and Time
- **Network Settings:**
 - ✓ Static vs. DHCP
 - ✓ IP Address, Subnet, Gateway, DNS, Remote Control
- License Control
- Display Control (Brightness)
- Auto Power On/Off
- **System and User Info:**
 - ✓ SN, S/W Version, H/W Version, User Info for Custom Report
- **Printer:**
 - ✓ HP LaserJet Compatible
 - ✓ Network or USB Connection



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- Software Upgrade via FTP
- Software Upgrade via USB

13. Packet Capture & Decode

- Filtered Capture
- **Event Trigger Capture:**
 - ✓ VLAN, Pause Frame, Multicast/Broadcast
 - ✓ FCS Error, Frame Size, L3/L4 Checksum Error
- Decode with WireShark/Ethereal

14. Packet Flooding

- Random or Incremental Flooding
- Flooding - MAC, VLAN, IP, User Defined Field

15. Throughput Test (32 multi-streams)

- Tx - Generate Max. 32 Independent Streams
- Rx - Receive up to 32 Independent Streams
- Ramp, Continuous, Ramp-Cyclic, Burst-Continuous, and Burst-Cyclic Modes

16. L1/Unframed Bit Error Test (BERT)

- **Unframed (Layer 1) Test Patterns**
 - ✓ PRBS 9, 11, 15, 20 and Inverted

17. Network Discovery

- Network Status (Up/Down), IP, MAC, Vendor, Port Info, OS, OS Type, SNMP Info.

18. 100-FX/LX (Optic)

19. VoIP

- **Supported Standard:**
 - ✓ ITU-T G.107 Based Scalable Quality Measurement and Analysis
 - ✓ Analysis of Sudden Packet Loss Based on ETSI TS 101 329-5 Annex E
 - ✓ RTCP XR (RFC 3611) VoIP Measurement; Payload Sampling and Analysis
 - ✓ Japan TTC JJ20101 VoIP Monitoring Specifications
- **VoIP Measurement:**
 - ✓ H.323 QoS Reporting (ITU-T H.460.9 Annex B)
 - ✓ Megaco QoS Reporting (ITU-T H.248.30)
 - ✓ VoIP Trunking Gateway (ITU-T G.799.1)
 - ✓ IETF SIP RTCP Summary draft
 - ✓ IETF RTCP XR MIB draft
- **Quality Measurement:**
 - ✓ Call Calling and Receiving Quality Check (ACR, ITU/TTC Scaling, MOS-LQ, MOS-CQ)
 - ✓ Call Calling and Receiving Quality – R Value Check (R-LQ, R-CQ)
- R Value Checks for R-Burst and R-Gap
- **IP/RTP Measurement:**
 - ✓ Packet Loss Ratio, Packet Abandonment Ratio, Burst Length/Density, Gap Length/Density
- **Quality Degradation Factor Measurement:**
 - ✓ Quality Degradation Rate due to Loss, Jitter, Codec, Delay, Signal Level, Noise Level, and Echo

20. IPTV

- IP Scan
- Per IP Address Statistics
- MPEG-TS Analysis (PAT/PMT/PID)



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21. PBB, PBB-TE (MAC-in-MAC)

- Test connectivity across the network (Edge to Edge)
- MAC-in-MAC Functionality with VLAN IDs and QoS Preservation.
- VLAN Tags (3 Q-in-Q: TPID, Priority, CFI, VLAN ID)
- Configure B-tag, I-tag (PCP, DEI, VLAN ID, I-SID, RES)

- ✓ VLAN Tags (3 Q-in-Q: TPID, Priority, CFI, VLAN ID)
- ✓ MPLS Label (3 Stacks: Label, Exp., EoS, TTL)
- ✓ Pause Injection with Delay Control
- ✓ Error Injection (FCS, Duplicated, Lost, Late Frame, Bit Error)
- ✓ Ping, DHCP

22. Y.1564 (EtherSAM)

- **Provides the Verification of SLA and the Connectivity of Service:**
 - ✓ Verify Network Connectivity
 - ✓ Verify Performance of Network Route
 - ✓ Verify SLA of each Service
- **Measurements:**
 - ✓ CIR (Committed Information Rate)
 - ✓ EIR (Excess Information Rate)
 - ✓ Bandwidth
 - ✓ Packet Jitter
 - ✓ Latency
 - ✓ Frame Loss
 - ✓ Random or Incremental Flooding

23. IPv6

- Generate and Analyze traffic for next generation internet protocol IPv6
- **Performance Measurement:**
 - ✓ Traffic Generation/Throughput Test
- **Configuration:**
 - ✓ Up to 4 Streams Per Port
 - ✓ Layer 1/2/3 Packet Frames (Continuous, Burst-Once, Ramp, Random Length)
 - ✓ MAC/VLAN/MPLS Setup
 - ✓ Payload (PRBS, Increment, Decrement, User Pattern)
- ✓ Frame Size (Runt to Jumbo)
- ✓ Frame Rate (% , BPS, FPS)

Fibre-Channel Features

- 1G/2G Fibre Channel support for Storage Area Networks

Hardware Specifications:

- **Ports:**
 - ✓ Two XFP
- **Dimensions:**
 - ✓ Size: 172.5 (W) x 227 (H) x 58.5 (D) mm
 - ✓ Weight: 1.3 kg with Battery, Battery (0.3 kg)
- **Operating Temp:** 0°C~40°C
- **Storage Temp:** -20°C~ +70°C
- **Display:** Color TFT-LCD Touch Screen
- **User Interface:** Touch Screen & Keypad
- **Humidity:** 10% ~ 90%
- **Power:**
 - AC adaptor: 100V~240 V(50Hz/60Hz)
 - Removable/Rechargeable Lithium-Ion Battery
 - Battery life: 3 hours typical, 8 hour in standby mode
 - Charging time: 1 ~ 2 hours
- **Memory:**
 - 2GByte internal Flash memory included