



TELECOM TEST SOLUTIONS

# ParaScope 1GE-2

Handheld Dual-Port Ethernet/  
Fibre Channel Tester



The ParaScope 1GE-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

- 32 Multi-stream Traffic Generation & Analysis
- Layer 1/2/3/4
- Y.1564 (Multiple streams)
- 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 (Wifi)
- VoIP / IPTV
- 100FX/LX (Optic)
- IPv6

### Fibre Channel

- 1x/ 2x

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# ParaScope 1GE-2

### General Specifications

- User-friendly and easy to use Hybrid user interface (UI) with graphical color touch-screen and keypad.
- Supports multi-physical ports such as two Optic 1000BASE-SX/LX/ZX, 100FX/LX, and two Copper 10/100/1000 BASE-T
- 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)
- 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)

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## *Trendsetter of Network Test & Measurement*

- L1/Unframed BERT (Cable BERT-RJ45, Unframed BERT-SFP Optic)
- Network Discovery
- 100 FX/LX (Optic)
- VoIP
- IPTV
- Fibre Channel
- PBB/PBB-TE (MAC-in-MAC)
- Y.1564 (EtherSAM)
- IPv6

### 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)



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- Static and DHCP Support
- 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 ( $\lambda$ )

### 9. Remote Control – VNC

### 10. File Management

- File Transfer via 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

- Date 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)

- ✓ 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
- **Measurement:**
  - ✓ 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)
  - ✓ VLAN Tags (3 Q-in-Q: TPID, Priority, CFI, VLAN ID)

### Fibre-Channel Features

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

### Hardware Specifications:

- **Ports:**
  - ✓ Two SFPs (1000BASE-SX/LX/ZX, 100-FX/LX/SX)
  - ✓ Two 10/100/1000Base-T (RJ45)
- **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