



# ParaScope mPA

## *Triple Play Test Set*

The ideal tool for field engineers and technicians responsible for verifying and assuring successful delivery of triple play services on ADSL1/2/2+, VDSL2 and 10/100 circuits.



## *Main Features*

- Large 7" bright touch-screen LCD and rugged enclosure.
- Unmatched ease of use with Pass/Fail results. Use at customer premises, remote location or the central office and reduce truck rolls.
- Copper qualification to identify physical layer faults and qualify the local loop for handling triple play services. Suite of tools includes integrated digital multi-meter (DMM), RFL meter, Longitudinal balance meter, TDR etc.
- Complete service verification to determine the upstream and downstream rates, emulate the modem or STB, PING the ADSL or Ethernet and much more. Ethernet testing facilitates FTTH deployments.
- Triple Play Analysis including IPTV and VoIP QoS measurements, streaming video, phone emulation and more over ADSL1/2/2+, VDSL2 and 10/100 links.

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# ParaScope mPA Features / Functions

## Hardware

**WAN Interfaces** - xDSL and 5 banana jacks for copper testing.

**Ethernet Interfaces** - LAN 10/100 Base-T.

**External Interfaces** - USB Host and Slave 1.1 ports, RGB monitor DB15, SD Card, Headset microphone and earphones.

**User Memory Media**- SD card, *per SD Memory Card Specification Version 1.01 and SDIO Card Specification Version 1.*

**LED's - Main Chassis indicates** Power, WAN and LAN Ethernet Ports selected and activity, **xDSL module indicates** DSL Power and DSL Synchronized.

**Rechargeable Battery Pack** - Li Ion battery pack, 7.4V, 9600 mAHrs, field replaceable.

**External Power** - AC/DC power converter outputs 12VDC at 3A, 110-240 VAC, 50-60 Hz.

**Enclosure** - Ruggedized ABS with rubber shell.

**Display**— 7" TFT LCD superbright, 16:9 aspect ratio, with 480 x 800 resolution, white backlight.

**Dimensions**— 210mm wide, 146mm tall, 58mm deep.

**Weight**— 3lbs without battery.

**Battery weight**— 350g regular capacity, 680g double capacity.

## Copper Testing

**Digital Multi-meter (DMM)** - Measures AC and DC voltage, DC current, resistance and leakage resistance, capacitance on pair 1 or pair 2.

DC voltage: 0-250V, 1% or +/-0.5V accuracy

AC voltage: 0-175V RMS, 1% or +/-0.5V accuracy

DC current: 0-90mA, 1% or +/-0.5mA accuracy

Resistance: 0-99MOhm

Accuracy: 0-9999Ohm:1% or +/-5 Ohm

10kOhm-99.9kOhm: +/-1%

100kOhm-999kOhm: +/-3%

1MOhm– 9.9MOhm: +/-3%

Leakage resistance:

0-99MOhm at 110V test voltage

Capacitance:

0.2nF to 3000nF, +/-5% accuracy

## TDR

Mode: continuous

Distance Range: 3m to 6000m

Pulse amplitude: 10V

Pulse type: square wave, step

Pulse Width:

Adjustable: narrow 10ns,

200ns-32.6us width 41.7ns resolution

V.O.P: 120– 299 m/us

## RFL

Test type: single pair and separate good pair

Fault location: total resistance, near-end to fault resistance, fault to strap resistance, total length, distance from fault to strap, distance to fault.

Accuracy 50mOhm or 1m

**LB** - max frequency 2 Mhz

Range: 0 to -80 dB

## ADSL1/2/2+ Service Verification

### Standards Compliance

Annex A Plug-in Module:

ADSL2+ G.992.5 Annex L,M

ADSL2 G.992.3/4 Annex L,M

RE-ADSL2 Annex L, M

ANSI T1.413 Issue 2

ADSL G.992.1/2

Annex B Plug-in Module:

ADSL2+ G.992.5 Annex L,M

ADSL2 G.992.3/4 Annex L,M

RE-ADSL2 Annex L, M

ADSL G.992.1/2

**DSL Measurements** - Max attainable bit rate with speedometers and text, link rate, SNR margin, Attenuation, Output Power

**Encapsulation** - PPPoA, PPPoE, PPPoA/VC-MUX, RFC 1483 Routed, RFC 1483 Bridged, Static and DHCP, Bridged Ethernet

**Power Spectral Density** - Bits per tone chart, SNR chart.

**ATM** - ATM F4, F5 OAM Loopback

# ParaScope mPA Features / Functions

**Link Errors** - FEC, CRC, HEC

**Alarms** - Upstream and Downstream: LOS-Loss of Signal, LOF-Loss of Frame, LPR-Loss of Power, LOM-Loss of margin, NCD-No Cell Delineation, LCD-Loss of Cell Delineation

**Load Coil Detection** - Detect up to 5 load coils up to 8000 meters or 27,000 feet. Requires DTR option.

**Operation** - Terminate or Pass-Through

## VDSL2 Service Verification

**Standards** - VDSL2 per ITU-T G.993.2

Bandplans:8,12,17,30mhz

Profiles:8a,8b,8c,8d,12a,12b,17a,30a

Plan 997, Plan998

ADSL2+ G.992.5 Annex A,L,M

ADSL2 G.992.3/4 Annex A,L,M

ADSL G.dmt G.992.1/2 Annex A,B

**DSL Measurements** - Max attainable bit rate with speedometers and text, Link rate, SNR margin, Attenuation, Output Power.

**Link Errors** - FECS, ES, SES, LOSS, UAS

**Channel Errors** - CV, FEC, FECV, CW

**Encapsulation** - PPPoA, PPPoE, PPPoA/VC-MUX, RFC 1483 Routed, RFC 1483 Bridged, Static and DHCP, Bridged Ethernet.

**Power Spectral Density** - Bits per tone chart, SNR chart.

**ATM** - ATM F4, F5 OAM Loopback, HEC Violation, HEC Loopback, HEC Violation, HEC total, User Total, IBE.

**Alarms** - Upstream and Downstream: LOS-Loss of Signal, LOF-Loss of Frame, LPR-Loss of Power, LOM-Loss of margin, NCD-No Cell Delineation, LCD-Loss of Cell Delineation.

**Load Coil Detection** - Detect up to 5 load coils up to 8000 meters or 27,000 feet. Requires TDR option.

**Operation** - Terminate or Pass-Through.

## IPTV Testing

**Physical Layers Supported** -

ADSL1/2/2+, VDSL2 and 10/100 Ethernet.

**Recognized Video Compression Standards** - MPEG2, MPEG4 part 2&10 (H.264), WM9.

**Signaling Protocols** -

IGMP

**STB Emulation** -

PID channel list & multicast unicast address, active stream source and destination addresses, video codec, video PID and audio PID, ZAP time, video preview (live 1 frame per second).

**Perceptive Quality Metrics** -

Video: MOS-V, VSPQ,, Gap VSPQ, Burst VSPQ, VSTQ, EPSNR.

Audio: MOS-A, VSAQ, MOS AV, VSMQ.

Degradation Factors due to: Loss, discard, delay, codec type, A-V sync, recency.

**Video Stream Metrics:**

MPEG-TS Packets I, P Q types: loss, discarded, received.

Video Stream Description: codec type, GoP type, GoP length, image size.

**Transport Metrics:**

MPEG-TS Packet Loss Metrics:

FEC Metrics: FEC effective, FEC block size, FEC correctible.

PCR Jitter Metrics: PCR jitter, max positive PCR jitter, max negative PCR jitter, positive jitter percentile, negative jitter percentile.

TR 10129 MPEG: TS sync loss, sync byte error, transport error, PCR repetition error, PCR discontinuity indicator error, PTS error.

**Operation** - Terminate and Pass-Through, Stand-alone with STB IGMP emulation.

**IP Connectivity** - DNS, DHCP, client/server, NAT, VLAN.

# ParaScope mPA Features / Functions

## VoIP Testing

**Physical Layers Supported** - ADSL1/2/2+, VDSL2 and 10/100 Ethernet.

**Signaling Protocols** - Session Initiation Protocol (SIP).

**Operation** - Through-mode over xDSL and 10/100 Ethernet.

**Call Emulation (Soft Phone)** – Originate and receive VoIP calls using SIP. Settings include NAT traversal options, SIP addresses and Codec selections.

**Call Analysis** - SIP flow.

**Call Log** - Start/End time of call, status, IP address, Alias Name, Codec Indicator (G.711, G.&29, G.726, G.723), Codec rate and RTCP available.

**Voice Quality**– MOS score, R-factor score, Evaluation.

**VoIP Transmission Quality**– Delay, Jitter, Loss, Gap, Packets Received, Packets Lost.

**Packet Loss Analysis**– Burst excess, Gap excess, Call duration, Loss density, Average Net Loss Rate, Average Discard Rate, Burst Count, Gap Count, Average Burst Loss Rate, Average Gap Loss Rate, Average Burst Length, Average Gap Length.

**Delay Analysis**– Network, Encoding, Packetization, Buffering.

**IP Connectivity** - DNS, DHCP, client/server, NAT, VLAN.

## IP Testing

**Physical Layers Supported** - ADSL1/2/2+, VDSL2 and 10/100 Ethernet.

**IP Ping** - Check the connectivity of the network. Configurable packet sizes (32 to 1500) bytes, configurable number of pings (1-99). Results indicate packets sent/received, minimum/average/maximum round trip time.

**TraceRoute** - Trace the IP addresses of all the gateways or routers from the ParaScope mPA. Configurable TTL, configurable max number of hops. Results indicate number of hops and round trip time.

**Web Browser** - Calculate Web page speed download

**FTP Test** - Calculate FTP speed upload and FTP download.

## Operational

**File Handling** - Save, export, view and delete test data..

**Exporting** - Test data can be exported with the USB disk.

**Online Help** - Provides operational prompting and instructions.

## Maintenance Plans

One or two year Maintenance packages are available and include:

- One or two year hardware warranty
- One or two year software subscription updates
- Unlimited technical support

## *ParaScope mPA Specifications*

<b>Item</b>	<b>Description</b>
WAN Ports	One RJ-45 for xDSL, Five banana jacks for copper testing
Ethernet Ports	Two 10/100/1000Base-T, Two 100/1000Base-X
External Interfaces	Two USB (Host and Slave) 1.1 ports, One RGB Monitor DB15, One SD Card, Headset, Microphone and earphone.
Display	7" TFT Touch screen LCD. Resolution: 480 (v) x 800 (h) with 16.9 aspect ratio, white backlight
Rechargeable Battery Pack	Li Ion, 7.4V, 9600mAh, field replaceable battery pack, 8 hrs of operation.
External Power	AC/DC power converter, 100-240VAC, 50-60 Hz, Output 12V@3A
Memory	SD Card
Operating Temperature	0 to 45 degrees C, 32 to 113 degrees F
Humidity	10% to 90% non-condensing
Storage Temperature	-20 to 60 degrees C, -6 to 140 degrees F
Dimensions	210mm (L) x 146mm (W) x 58mm (H)
Weight	1.36 Kg or 3.0 lbs. Add 350g or .77lbs for regular capacity battery pack and 680g or 1.501lbs for double capacity battery pack.

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