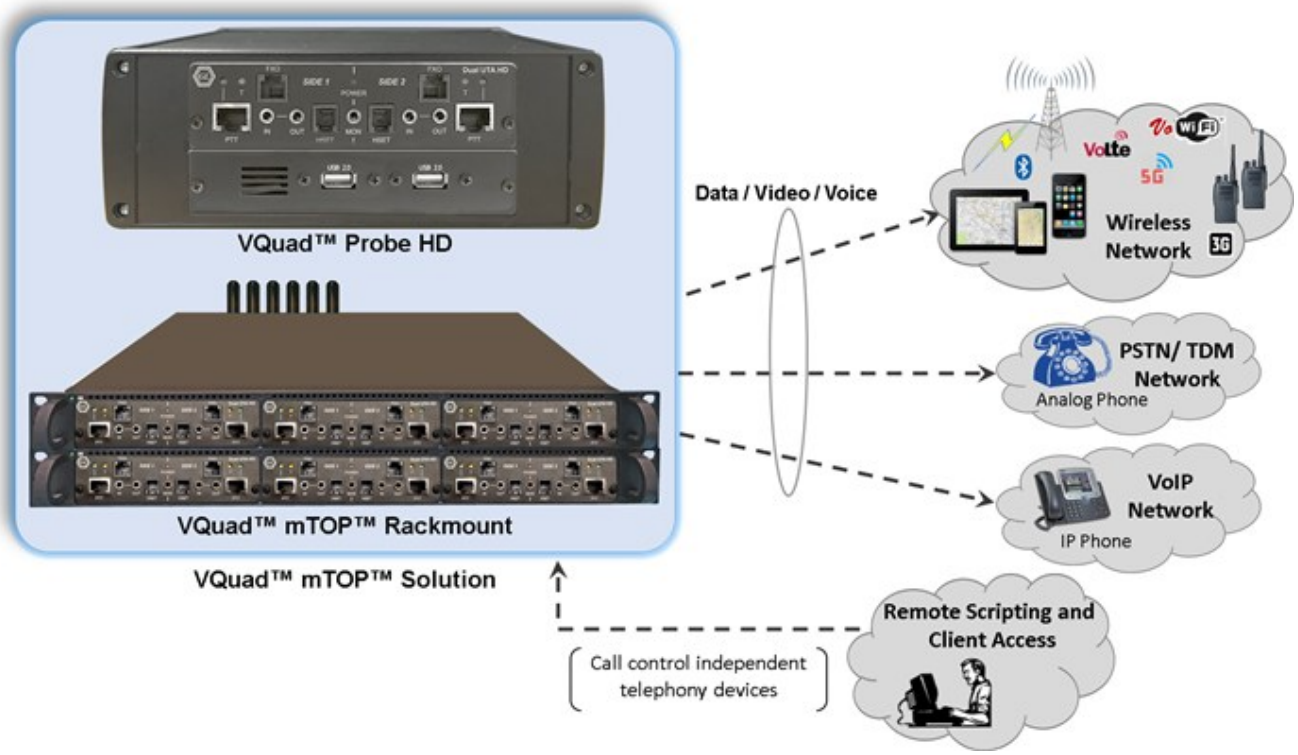
VQuad™ mTOP™ Solution



Overview

GL's VQuad™ mTOP™ solution includes **VQuad™ mTOP™ Rackmount** and **VQuad™ Probe HD** variants which contains VQuad™ with Dual UTA HD test instrument. mTOP™ Rack is a high density form factor solution for testing in lab where as the VQuad™ Probe HD is a portable solution convenient for drive testing.

Two-stacked 1U **VQuad™ mTOP Racks** can support up-to 6 Dual UTA HD units, thus supporting connection to 12 independent telephony devices. It has the ability to generate Wireless as well as 2-Wire and 4-wire analog calls using same hardware. You can perform simultaneous Voice, Video, Data, Fax, and Time Delay Measurements from a single VQuad™ mTOP™ test solution - greatly reducing the licensing costs per device.

VQuad™ Probe HD contains a single Dual UTA HD device with in-built PC designed for easier portability and convenient for drive testing. This comprehensive hardware device incorporates automation and remote accessibility features.

For detailed information, refer Benchmarking and Drive Testing Voice and Data Quality webpage.

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Supported Device Types:

- Any Wireless phone independent of Network. Connects via Bluetooth headset or wired headset with full Call Control and QoS during established calls
- Supports legacy networks as well as VoLTE, 5G, and next generation networks
- Mobile Radios including Military, Government, Mass Transmit, and Commercial
- Includes both audio along with automated radio keying (Push to Talk)
- 2-Wire FXO (simulates analog phone). Connects to PSTN, ATA Media Gateway replaces analog phone in any analog network
- 4-Wire analog (Tx/Rx) replaces headset on any system and also supports replacing phone handset at the curly cord (RJ22)
- SIP Call Agent (act as a SoftPhone while configuring Proxy and Registrar)
- Includes both SIP Call Control as well as RTP audio traffic

Supported Analysis and Functionalities:

- Automated Call Control with Pass/Fail statistics for Place Call and Dropped Call
- Supports 2-wire Analog, Mobile Phone Bluetooth/wired headset, PTT and VoIP SIP
- Voice Quality Analysis using GL POLQA (ITU-P.863) supports NB, WB and SWB audio
- Fully automated testing with MOS along with Speech Level, Noise Level, and Speech Activity
- Audio Analysis includes both Power and Frequency. Confirm if proper audio bandwidth was sustained during the call
- Includes Path Confirmation, Double-Talk analysis, and Audio dropout analysis
- Delay Measurement supports both One-Way and Round-Trip during the established call
- Data Testing using GL NetTest supports Android, IOS and PC devices
- Includes TCP, UDP, HTTP, FTP, DNS, VoIP and network specific tests
- Fully automated (also includes manual operation) and remote controllable
- Video Conference Testing between two Video Agents (Android, WinPC, and Linux PC supported) generates Video and Audio MOS (along with additional metrics)
- User-configurable Reference Video
- Complete Automated testing using VQuad™ scripting supports Call Control, Voice Analysis, Data Testing, and Video Testing
- Remote operation via CLI and API
- Each VQuad™ node can control remote VQuad™ node allowing a single VQuad™ script to control both sides of the call
- Additional Remote operation provided directly from the GL WebViewer™

Specifications

Figure: VQuad™ mTOP™ with SBC

Figure: VQuad™ mTOP™ without SBC

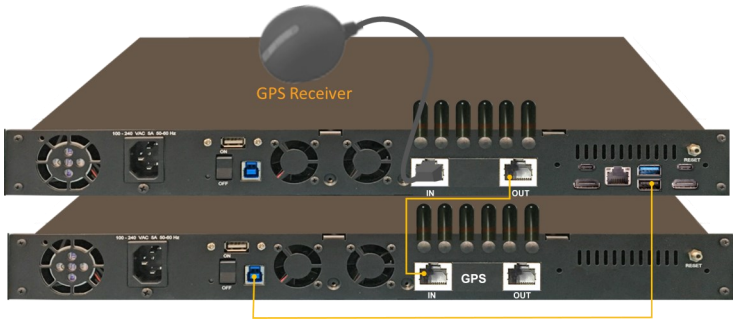


Figure: GPS connection on mTOP™ 1 daisy chains the GPS to multiple mTOP™ systems

Space Requirements

- Height: Two-stacked 1U mTOPs [Total space—2U]
- Length: 16 Inches
- Width: 19 Inches

Compliance

- CE, FCC, TBR21 compliant

Frequency Range Compliance

- FXO PCI card - 300-3400Hz
- Dual UTA HD FXO 2-wire interface - 100-3500Hz
- Dual UTA HD FXO 2-wire WB interface - 100-4000Hz
- Dual UTA HD Balanced, Mobile, PTT, Handset interfaces - 100-3500Hz
- Dual UTA HD Balanced, Mobile, PTT, Handset WB interfaces - 100-7000Hz
- Dual UTA HD Bluetooth interface - 200-4000Hz

Dual UTA Frequency Range

- 4-wire, 8000 Samples - 100 Hz to 3500 Hz
- 4-wire, 16000 Samples - 100 Hz to 7000 Hz
- 2-wire, 8000 Samples - 100 Hz to 3500 Hz
- 2-wire, 16000 Samples - 100 Hz to 4000 Hz

Power Requirements

- 100-240 VAC Power Supply

External Connections

- mTOP™ 1 includes embedded PC (SBC)
- mTOP™ 2 omits PC and connects to mTOP™ 1 via single USB cable
- GPS Receiver on mTOP™ 1 (Optional) can daisy chain the GPS to multiple mTOP™ systems

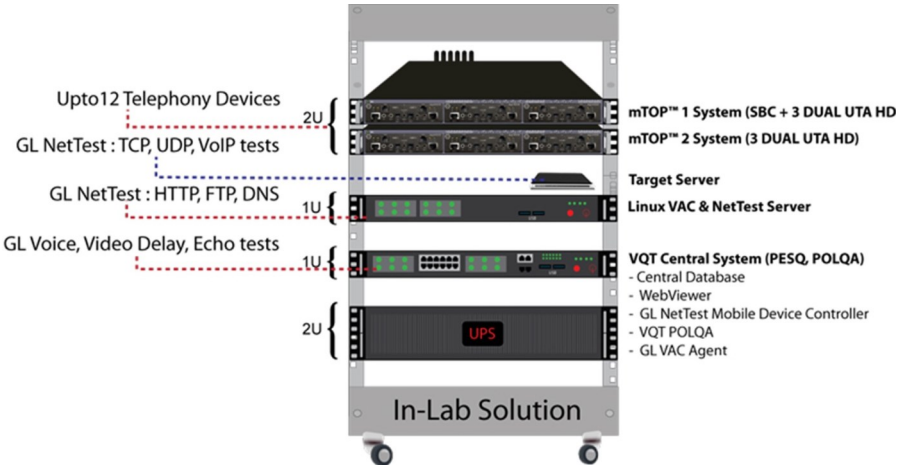
Both mTOP™ units include -

- USB 2.0, USB 3.0: Type A USB Jack (Communication with PC and Power)
- 3.5mm In/Out Jacks (Balanced Audio - Side 1 and 2)
  - Input Impedance - 600 Ω, 1000 Ω and User-Definable
  - Output Impedance - 600 Ω, 1000 Ω and User-Definable
- RJ-11 Jacks (FXO - Side 1 and 2)
- RJ-22 Jacks (Handset/Handset Base - Side 1 and 2)
- 3.5mm (Monitor)
- Dual RJ-45 PTT Jacks (Side 1 and 2)
  - PTT - Side 1 and 2 Input Impedance - 600Ω, 1000 Ω and user-definable
  - PTT - Side 1 and 2 Output Impedance - 600Ω, 1000 Ω and User-Definable
- Bluetooth® Antennas - Side 1 and 2
- Serial COM Port and Display VGA (Video Graphics Array) ports

Embedded PC Specifications

- Intel Core i3 or optional i7 NUC Equivalent, Windows® 11 64-bit Pro Operating System
- USB 2.0 or and USB 3.0 Ports, ATX Power Supply
- USB Type C ports, Ethernet 2.5GigE port
- 256 GB Hard drive, 8G Memory (Min)
- Two HDMI ports for display

VQuad™ mTOP™ Rack Solution for Smartphone/Handset Benchmark Testing



Shown above is a real-time setup where the VQuad™ mTOP™ Rack solution is deployed in the lab to perform simultaneous Voice, Video, and Data Quality tests to benchmark performance of up to 12 telephony devices in the network. For this solution we are using two mTOPs (mTOP™ 1 that includes an SBC connects to mTOP™ 2 via USB). So, essentially creating a system with one VQuad™ system and 6 Dual UTA HDs. All devices on all six Dual UTA HDs are supported including FXO, 4-wire Analog, PTT, and Bluetooth.

Separate 1U PCs are also mounted which include Central Database with WebViewer™, VQT POLQA, GL NetTest Mobile Device Controller (MDC), GL NetTest Target Server, and VAC Agents. All systems are connected to the central system for remote monitoring, remote operation, and storing results/events. All results and events can be queried and filtered using the WebViewer™ (web browser). Create Custom Reports, display results graphically, show results on Google Maps, and display status of all connected systems. Using the WebViewer™ you can also remote control the individual VQuad™ systems.

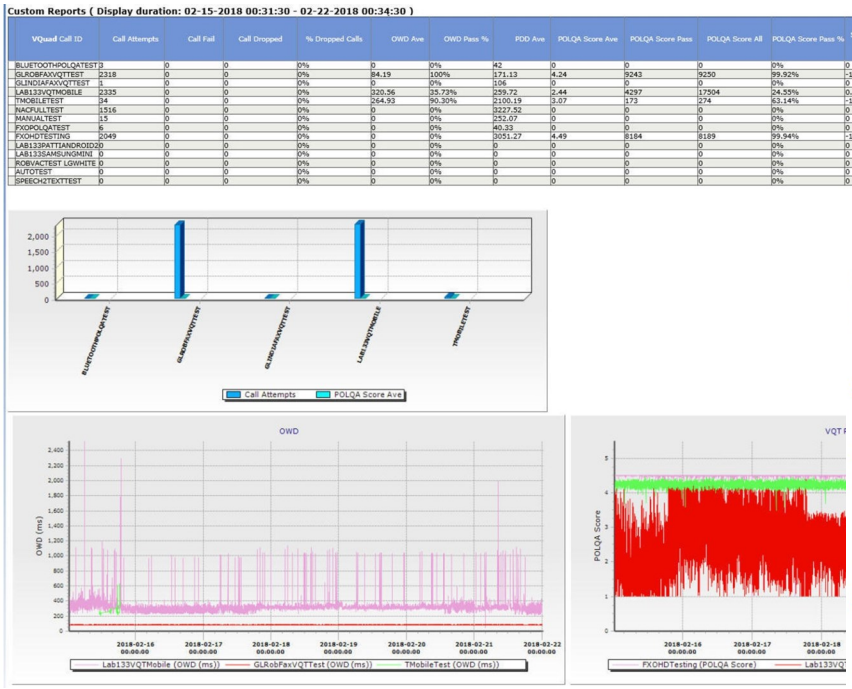


Figure: Custom Report - VQT Drive Testing

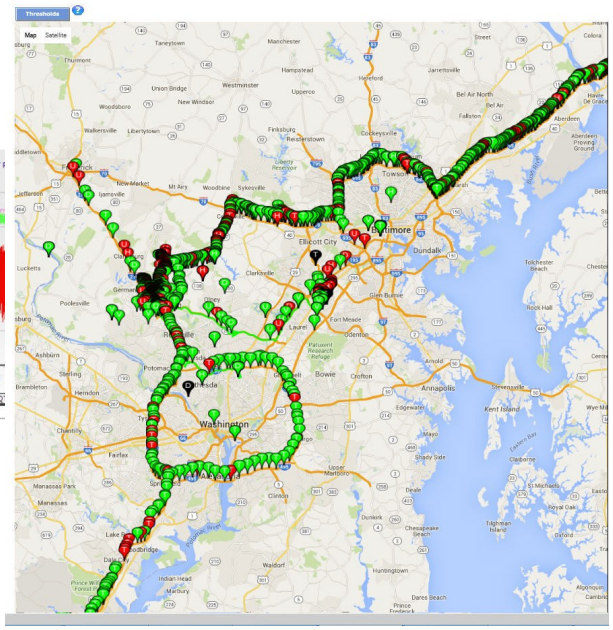


Figure: Google Map Plotting - VQuad™ Drive Testing

VQuad™ Probe HD

GL's VQuad™ Probe HD is an all-in-one self-contained test instrument, which includes Dual UTA HD device combined with the PC in one single portable box. The comprehensive Probe hardware unit is designed for easier portability and convenient for drive testing as it includes necessary PC interfaces along with Windows® 11 64-bit operating system and remote accessibility via scripting and remote desktop. There are no moving parts with the unit, so reliability and longevity are integral. VQuad™ Probe HD solution can perform Voice, Video, Data, Fax, and Time Delay Measurements.

Figure: mTOP™ Probe with VQuad™ Dual UTA HD

Space Requirements

- Length: 10.4 inches
- Height: 3 inches
- Width: 8.4 inches
- Weight: 4 lbs.

External Connections

- GPS Receiver Rear panel
- 2 x USB 2.0 ports (Front Panel)
- 3.5mm In/Out Jacks (Balanced Audio - Side 1 and 2)
  - Input Impedance - 600 Ω, 1000 Ω and User-Definable
  - Output Impedance - 600 Ω, 1000 Ω and User-Definable
- RJ-11 Jacks (FXO - Side 1 and 2)
- RJ-22 Jacks (Handset/Handset Base - Side 1 and 2)
- 3.5mm (Monitor)
- Dual RJ-45 PTT Jacks (Side 1 and 2)
  - PTT - Side 1 and 2 Input Impedance - 600Ω, 1000 Ω and user-definable
  - PTT - Side 1 and 2 Output Impedance - 600Ω, 1000 Ω and user-definable
- Bluetooth® Antennas - Side 1 and 2

SBC specifications

- Intel NUC Core i3 or optional i7 Equivalent, Windows® 11 64-bit Pro operating system
- USB 2.0 and 3.0 ports, Two USB Type C ports, 2.5GigE Ethernet Port, 12V/3A Power Supply
- 256GB Hard drive, 8G Memory (Min)
- Two HDMI ports
- External USB wi-fi adaptor options

Order information

- MT005/ MT005E
- VQT251
- Dual UTA HD Options
- VQuad™ Options

Buyer's Guide

Item No	Product Description
VQT010	VQuad™ Software (Stand Alone)
MT001	1U mTOP™ Rack Mount Enclosure w/SBC (Intel i3 Core)
MT001E	1U mTOP™ Rack Mount Enclosure w/SBC (Intel i7 Core)
MT002	1U mTOP™ Rack Mount Enclosure w/o SBC
MT005	mTOP™ Probe (portable stand-alone unit) (Intel i3 NUC Core)
MT005E	mTOP™ Probe (portable stand-alone unit) (Intel i7 NUC Core)

Item No	Related Software
VQT013	VQuad™ with SIP (VoIP) Call Control
VQT015	VQuad™ with T1 E1 Call Control
VQT022	VQuad™ Fax Emulation (2 simultaneous ports)
VQT002	Voice Quality Testing (PESQ only)
VQT006	Voice Quality Testing (POLQA)
VQT014	AutoVQT™
VQT014U	Upgrade from VQT POLQA to AutoVQT™
VQT601	Mobile Device Controller (MDC) Software
VQT650	Video Application Controller -VAC (includes VAC Server and VAC companion software)
VQT040	Webviewer™
VQT280	VQuad™ Probe HD (with Dual UTA HD)
VQT251	Dual UTA HD Next generation Dual UTA with FXO Wideband
VQT252	Dual UTA HD – Bluetooth Option
VQT611	Target Data Server (1 Gbps)

Note: PCs which include GL hardware/software require Intel or AMD processors for compliance.

For more information, refer Benchmarking and Drive Testing Voice and Data Quality webpage.

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