Voice, Video, and Data Quality Testing Solutions
Topics

- Hardware Platforms – VQuad™ and vMobile™
- Voice Analysis Tool (VAT™)
- Voice Quality Testing (VQT) - POLQA and PESQ
- Auto VQT
- Testing Environments – Mobile Phones, Analog, Radios, VoIP SIP
- Available Metrics
- WebViewer™ - Web Based Client for Voice and Data Quality Testing
- Data Testing
- Video Testing
Hardware Platforms
Dual UTA HD Hardware Unit

Back Panel

Front Panel
VQuad™ Probe HD

Back Panel

Front Panel
VQuad™ mTOP™ Specifications

Front and Back Panel of VQuad™ mTOP™ 1

Front and Back Panel of VQuad™ mTOP™ 2

GPS connection on mTOP™ 1 daisy chains the GPS to multiple mTOP™ systems
Current GL Mobile Test Hardware Platforms

- **vMobile™**
- **vMobile™ Interfaces**
- **Dual UTA HD**
- **VQuad™ Probe HD**
- **VQuad™ mTOP™**
vMobile™ Hardware Unit

- Fully Automated
- Mobile Phone and Mobile Radio Testing
- Both Bluetooth and Analog modes
- Drive and Walk Testing
- Voice Quality Testing
- Delay Testing
- Solution supports GL WebViewer™
- Works with GL VQuad™, Voice Analysis Tool (VAT™) and Voice Quality Testing (VQT) solutions
- GPS/WiFi Clock sync, High Precision Clock Oscillator with 40 ms daily precision
vMobile™ Configuration and Operation using Console and Console App

- The vMobile™ Console can run from any web-browser or using the Console App from any Android/IOS device
- Used to Monitor, Configure, and Operate the individual vMobile™ units
- vMobile™ Console can be used to create and edit vMobile™ scripts as well as upgrade the vMobile™ software when available
- Multiple vMobile™ units can be controlled from a single Console or Console App
- Remotely Upgrade vMobile™ software and audio files
- vMobile™ Error logs can be accessed from the Console or Console App
vMobile™ Control and Operation

vMobile™ Console

<table>
<thead>
<tr>
<th>Module Name</th>
<th>Wi-Fi Network</th>
<th>Side 1</th>
<th>Side 1 Script</th>
<th>Side 2</th>
<th>Side 2 Script</th>
<th>GPS Latitude</th>
<th>Longitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>GLComms_Dev_1</td>
<td>O3</td>
<td>160707Doc (MobilePhone)</td>
<td>answercallast1.srt</td>
<td>160707doc2 (mobilePhone)</td>
<td>answercallast2.srt</td>
<td>12.911302</td>
<td>77.88564</td>
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<td>O3</td>
<td>USP37Doc (V1200ET)</td>
<td>central3000executive1.exe</td>
<td>USP37Doc2 (V1200ET)</td>
<td>central3000executive2.exe</td>
<td>39.143382</td>
<td>-122.215813</td>
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<td>GLComms_Dev_3</td>
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<td>central3000executive1.exe</td>
<td>USP37Doc2 (V1200ET)</td>
<td>central3000executive2.exe</td>
<td>39.143382</td>
<td>-122.215813</td>
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<tr>
<td>GLComms_Dev_4</td>
<td>O3</td>
<td>INVO3Doc1</td>
<td>sideftr.exe</td>
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<td>GLComms_Dev_5</td>
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<td>INVO3Doc1</td>
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<td>77.847732</td>
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<tr>
<td>GLComms_Dev_7</td>
<td>O3</td>
<td>USP37Doc (Not Yet Connected)</td>
<td>USP37Doc2 (Not Yet Connected)</td>
<td>USP37Doc3 (Not Yet Connected)</td>
<td>USP37Doc4 (Not Yet Connected)</td>
<td>39.1434</td>
<td>-122.215813</td>
</tr>
</tbody>
</table>

Configuration and Operation through Internet connection

Configuration and Operation through Bluetooth connection

vMobile™ Console APP

GL Communications Inc.
**vMobile™ Status**

### Console Status

<table>
<thead>
<tr>
<th>vMobile Name</th>
<th>Wi-Fi Network</th>
<th>Side 1</th>
<th>Side 1 Script</th>
<th>Side 2</th>
<th>Side 2 Script</th>
<th>GPS Latitude - Longitude</th>
</tr>
</thead>
<tbody>
<tr>
<td>GLIndia_Dev_Unit</td>
<td>DJSPTeam</td>
<td>160073Dev1 (MotorPhone1)</td>
<td>answercallside1.vms</td>
<td>160073Dev2 (motorPhone2)</td>
<td>vboxside2.vms</td>
<td>12.911302, 77.89264</td>
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<tr>
<td>v5p1-VM107-5G</td>
<td>qmesh</td>
<td>US107Test (VELVET)</td>
<td>centra3000boxwboxside1.vms</td>
<td>US107Test2 (RobGalaxy)</td>
<td>answercallside2.vms</td>
<td>39.143862, -77.21553</td>
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<tr>
<td>v5p1-160106-India2</td>
<td>qmesh</td>
<td>US109Test1 (Q6)</td>
<td>wallcenterrevisetiveside1.vms</td>
<td>US109Test2 (Q6)</td>
<td>answercall vms</td>
<td>12.326155, 77.661742</td>
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<td>v5p1-160106-India1</td>
<td>qmesh</td>
<td>INV100Test1</td>
<td>side1vms</td>
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<td>NA</td>
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<td>v5p1-VMPPT</td>
<td>qmesh</td>
<td>USPTTest1 (Not Yet Connected)</td>
<td>side1vms</td>
<td>side2vms</td>
<td>side2vms</td>
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<td>Zhiyong22</td>
<td>Zhiyong_test</td>
<td>8Test113 (8G8)</td>
<td>centra3000boxwboxside1.vms</td>
<td>BTTest121 (Zhiog)</td>
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<td>RobMobile3</td>
<td>qmesh</td>
<td>LTest1 (RobGalaxy)</td>
<td>centra3000boxwboxside1.vms</td>
<td>LTest1 (ZDBTest1)</td>
<td>answercallside2.vms</td>
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<tr>
<td>v5p1-VM101-rob</td>
<td>qmesh</td>
<td>LTest1 (RobGalaxy)</td>
<td>US160106Test1 (VELVET)</td>
<td>US160107Test2 (RobGalaxy)</td>
<td>runscriptoptionside2.vms</td>
<td>39.1645, -77.215525</td>
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<tr>
<td>Sonny50m</td>
<td>qmesh</td>
<td>GURUMNARA</td>
<td>LTest1 (Sonny5Phone)</td>
<td>side1vms</td>
<td>side2vms</td>
<td>39.104778, -77.227692</td>
</tr>
</tbody>
</table>

### Console App Status

- **GLIndia_Dev_Unit**
  - Mode: Bluetooth
  - Side 1: Idle
  - Side 2: Idle

- **v5p1-VM107-5G**
  - Mode: Bluetooth
  - Side 1: Idle
  - Side 2: Idle

- **v5p1-160106-India2**
  - Mode: Bluetooth
  - Side 1: Idle
  - Side 2: Idle

- **v5p1-160106-India1**
  - Mode: PTT
  - Side 1: Idle
  - PTT Status: On
  - Side 2: Idle

- **v5p1-VMPPT**
  - Mode: Bluetooth
  - Side 1: Idle
  - Side 2: Idle
vMobile™ Configuration, Status and Operation via Bluetooth

- Console App can be used to configure, get the status and operate vMobile™ via Bluetooth easily
- This feature helps the user to operate, configure, or view status during slow internet/no internet areas
Voice Analysis Tool (VAT™)
Voice Analysis Tool (VAT™)

- GL VAT™ supports analyzing any Raw PCM voice file including NB, WB, and SWB. Audio files can be generated from any application including GL VQuad™ and vMobile™
- Fully automated operation with log file containing results and stored in the GL Central Database which can be accessed easily using the GL WebViewer™
- VAT™ CLI (Command Line Interface) supports remote operation
- Audio analysis includes, Round Trip and One Way Delay, Dropout Audio analysis, Double-Talk, Power Level and Frequency Analysis, Speech Activity, Active Speech Level and Noise Level, and DC Offset
- Supports VQT analysis when coupled with the GL VQT software
- Supports multiple analytical tests per individual voice file
Voice Quality Testing (VQT)
Centralized Voice Quality Testing

- **POLQA, PESQ LQ/LQO/WB**
- **MOS, Jitter, Clipping, Speech and Noise Levels**
- **Data Testing** - Wired and Wireless Networks
- **Call Events** - Progress & Failures
- **Fax Events** - Encoding, Resolution, ECM
- **Delay Measurements** - RTD, OWD
- **E-Model, SNR, Signal Level**
- **Echo Measurements** - ERL, Delay
- **QoS, Timeouts, Retransmissions**
- **Google Mapping and Indoor Tracking System**

**VQuad™ with Dual UTA HD and vMobile™**

**vMobile™ and VQuad™ Probe HD**

**POLQA**

**PESQ**

**Central Location Database**

**WebViewer™**
• Automatically analyze the degraded files using GL VQT Software
• Detailed results including Jitter (min / max / avg), Clipping (front/back/all), Latency, and Noise / Signal Measurements (activity / peak)
• VQT uses the File Monitor to perform automated measurements on remote locations VQT Solutions
Voice Quality Test Software
VQT Highlights

• Supports ITU Standards (POLQA, PESQ LQ/ LQO / WB)
• Supports NB, WB and SWB codecs
• Auto-Measurement Capabilities
• Detailed Results / Statistics
• Criteria Rating System
• Remote Access Capabilities
• Delay Measurement
• Jitter (Min, Max, Average per Utterance)
• Clipping (front, back, all)
• Noise/Signal Levels (Activity, Peak, etc.)
AutoVQT™ Operations

Wireless
(Bluetooth®, Wi-fi, 3G, 4G, LTE, 5G, PTT)

VoIP

Analog, TDM
(2-Wire, 4-Wire)

Supports NB, WB, SWB

vMobile™

VQuad™ Probe HD

GPS

Send Voice

Record Voice

Recorded PCM Files from any other Devices/Applications

Reference Voice Files

AutoVQT™ Application

Application Running PC

POLQA MOS
E-Model
R-Factor
Signal Level
Noise Level
Delay
Jitter

Locally Saved Results

Results Sent to WebViewer™

WebViewer™
The following table summarizes the average time taken to analyze PCM files when they are provided at the same time using Windows® 11 Pro 64-bit operating system, equipped with a 12th generation Intel® Core™ i9-12900K processor at 3.20 GHz and on 32 GB of RAM:

<table>
<thead>
<tr>
<th>PCM Type</th>
<th>Approximate Time Required to Process 1000 PCM Files Simultaneously (Min : Sec)</th>
<th>Approximate Time Required to Process 1 PCM File (Sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Narrowband (NB)</td>
<td>02:01</td>
<td>0.12</td>
</tr>
<tr>
<td>Wideband (WB)</td>
<td>02:13</td>
<td>0.13</td>
</tr>
<tr>
<td>Super wideband (SWB)</td>
<td>02:26</td>
<td>0.14</td>
</tr>
</tbody>
</table>

On average, when the application is required to analyze multiple PCM files with different sampling rates (300 NB, 300 WB, and 400 SWB files), the total time taken to analyze all the 1000 PCM files at the same time is approximately **02 minutes and 31 seconds**.
Testing Environments
Wireless Phone Network

• **Connectivity** - Bluetooth® NB & WB, PTT, GPS, Wired Headset Smartphone ACC, 4-wire Balanced I/O Interfaces on Dual UTA HD and vMobile™

• **Devices** – Military/Mobile Radios, 5G/4G/3G/WiFi Smartphones (all Mobile phones), Bluetooth® Headsets/Car Kits, Mobile devices with Smartphone ACC
Analog Network (2-wire FXO and 4-wire)

- **Connectivity** – 2-Wire FXO, 4-Wire Balanced I/O, HSET Interfaces on Dual UTA HD
- **Devices** – Analog Phones, Next Generation Gateways, PBX, ATAs over PSTN network
Mobile Radios (PTT)

- The vMobile™ and Dual UTA HD provides a contact-closure control to support the push-to-talk (PTT) function of a mobile radio
- Software (VQuad™/vMobile™) Script:
  - Enable PTT
  - Pause for User-Defined Period
  - Send Audio (VQT Reference) File
  - Pause for User-Defined Period
  - Disable PTT
VoIP (SIP) Interface, Digital VoIP Phones, VoIP Softphones

- **Connectivity** – Internal SIP cores within VQuad™ (SIP Signaling - Does not require Dual UTA HD), 4-wire Balanced I/O, HSET Interfaces on Dual UTA HD
- **Devices** – VoIP Phones, Soft Phone, HATS

![VoIP Diagram]

- VoIP
  - SIP Phone
  - HATS (Head and Torso)
  - PCMU, PCMA, G726_40, G726_32, G726_24, G726_16, GSM, G729, & Wideband (HD Audio) Codecs

SIP

RTP
Interactive Voice Response (IVR) Systems

IVR SYSTEM

T1 E1, Analog, Digital, IP, Wireless

Caller Agents
Voice Mail

Menu
(DTMF digits)

Announcements
(Voice Prompts)

Supports NB, WB

Dual UTA HD

VQuad™

2-wire FXO

4-Wire (NB, WB, SWB)

Over IP

WiFi / 3G / 4G / LTE/5G

GPS

Supports NB, WB

vMobile™

IP Phone

Smart Phones

Radio with PTT

Handset

Smart Phones

Phone

Interfaces

VQuad™

Voice Mail

GL Communications
Available Metrics
**Delay Measurements**

**ONE-WAY DELAY (OWD)**
- **End Points at same Location**

**RTD - End points at same Location**

**SIDE 1 PROCEDURE:**
1. Tx Audio: Send Audio through network
2. Rx Audio (detect) and Stop Timer
3. Records Audio into PCM file
4. Generate Reports for RTD Delay

**SID 2 PROCEDURE:**
1. Start Timer: At exact time of Side 1 Tx's Audio
2. Rx Audio (detect) and Stop Timer
3. Records Audio into PCM file
One Way Delay (OWD)

End points at two separate locations

1. Tx AUDIO
   At pre-determined time (12:00:00.000)
   Send pulse through network

1. Start Timer
   At pre-determined time (12:00:00.000)
2. Rx (detect) pulse and Stop Timer
   Report delay (12:00:00.000 delay)
Round Trip Delay Functionality

RTD on two systems (geographically separated)
Automated Voice Quality Testing

Send Voice

Record Voice

VQuad™ w/ Dual UTA HD

vMobile™

VQuad™ / vMobile™ Scripting

Place Call: TEL=5551212;
Do: Iterations=1;
Tx/Rx File: Sync;
TxFile1=C:\item1\POLQAas.pcm;
Rx/Rx File: Sync;
RxFile1=C:\testPolqa.pcm;

VQuad™ / vMobile™ Scripting

If: Incoming Phone Call;
Pause Timer: Interval=4;
Answer Call;
Pause Timer: Interval=360;
Disconnect Call:Device ID=7;
Disconnect Call;

(Bluetooth®, WiFi, 3G, 4G, LTE),
PTT
Military Radios
Balanced I/O
HATS (Head and Torso)
SIP/RTP
VoIP
PSTN/TDM
2-Wire FXO/FXS
Analog & Digital Phones

(Bluetooth®, WiFi, 3G, 4G, LTE),
PTT
Military Radios
Balanced I/O
HATS (Head and Torso)
SIP/RTP
VoIP
PSTN/TDM
2-Wire FXO/FXS
Analog & Digital Phones
Voice Band Analysis

- Monitor voice band traffic
- Active Speech Level
- Noise Level
- Power & Frequency
- Audio Dropout analysis
- RMS Factor
- DC Level

GL Central QoS System

- Speech Level Analysis
- Line Echo Analysis
- Traffic Classification
- FaxScan™ Analysis
- Tone Decoder

WebViewer™

vMobile™

Dual UTA HD

Voice Calls

Voice Calls

Tx/Rx

Tx/Rx

Recorded Voice Files

Control, Analysis, Data Retrieval

Voice Band Analysis
Echo Measurements

Echo Identification

Network Interface

- Measure / ID Echo's (Levels, Delays, etc.)

Acoustic Echo Canceller Testing

Network Interface With Acoustic Echo Canceller

- Measure / ID Echo's (Levels, Delays, etc.)

DUAL UTA HD
Automated FAX Testing

- Sending and receiving 4 independent and simultaneous T.30 faxes (selectable up to V.34)
- Configurable Tx Rx fax rate from 2400 bps up to 33600 bps (V.34 fully supported)
- Fax Testing using the Dual UTA HD 2-wire FXO or 4-wire analog interfaces
- VQuad™ Fax events includes messages, summary, and errors log
- Ability to auto save fax (both East and West directions) to PCM file for enhanced analysis using GL Insight™ and GL Fax Demodulator/Decoder
End-to-End SMS Testing

Wireless & Wired

GSM Call

GSM Call

Target Server

IP Network

HTTP, FTP, DNS
Email, TCP, UDP

NetTest
Script based control

Result

Central Database System

WebViewer™

vMobile™

VQuad™ Probe HD

Smartphone

gSM Call

Smartphone

(NetTestApp)

PC based NetTest
(wired Ethernet, WiFi, or even Broadband card)

vMobile™

VQuad™ Probe HD

End-to-End SMS Testing

Wireless & Wired

GSM Call

GSM Call

Target Server

IP Network

HTTP, FTP, DNS
Email, TCP, UDP

NetTest
Script based control

Result

Central Database System

WebViewer™
WebViewer™
(Web Based Client for Voice and Data Quality Testing)
GL WebViewer™

Captured files analyzed at central system for Voice, Video, and Data Quality

Send the Events/Results to Central System and receive remote commands from Central System

Voice Testing
- Bluetooth®, WiFi, 3G, 4G, LTE, 5G, PTT
- Microcell
- Mobile Hotspot
- 3G, 4G, LTE Router

Video Testing
- vMobile™
- VQuad™ Probe HD

Data Testing
- TCP, UDP, VoIP
- DNS Testing
- Route Testing
- HTTP Testing
- SMS Testing

Smart Phones/Tablets/PCs w/ NetTest App
- Target Servers

VQuad™ running NetTest

GL WebViewer™

Central System
- VAC (Video Application Controller with Analysis)
- MDC (Mobile Device Controller)
- VQT (PESQ and POLQA)
- EMU (Echo Measurement Utility)
- Analysis (VQT, MDC, VAC, EMU, VBA & Fax)

Custom Report Generator

GL’s WebViewer™
### GL WebViewer™ Records

- Accessible remotely via any browser-based clients
- Database (MySQL or Oracle) stores the real-time and historic data

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#### VOT-POLQA Results between 05/26/2023 01:56:15 and 06/26/2023 02:06:15 (Last 10 Minutes)

**Date & Time:** Standard | 10 Minutes | 1 Hour | 12 Hours | 24 Hours | Today | Yesterday | 7 Days | 1 Month | 6 Months
---
**Timestamp Type:**
- **QVQuad Timestamp**

**Event ID Filter:**
- **Contains**

**Actions**
- **Records Per Page:** 200

<table>
<thead>
<tr>
<th>VQQuad Timestamp</th>
<th>Call Timestamp</th>
<th>QVQuad Device ID</th>
<th>QVQuad GPS</th>
<th>Latitude</th>
<th>Longitude</th>
<th>Degraded Filename</th>
<th>Rating</th>
<th>POLQA v3 MOS</th>
<th>POLQA MOS</th>
<th>EM:Model (n-factor)</th>
<th>Speech Level Gain (dB)</th>
<th>Noise Level Gain (dB)</th>
<th>Active Speech Level Ref (dBm)</th>
<th>Active Speech Level Deg (dBm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/26/2023 02:03:07</td>
<td>01:59:42</td>
<td>RobFX02</td>
<td>N39°08'37&quot; W077°12'58&quot;</td>
<td>39.14</td>
<td>-77.22</td>
<td>fem1POLQ</td>
<td>Excellent</td>
<td>4.23</td>
<td>86.19</td>
<td>-12.01</td>
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<td>-24.28</td>
<td>-30.89</td>
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<td>06/26/2023 02:02:20</td>
<td>01:59:42</td>
<td>RobFX02</td>
<td>N39°08'27&quot; W077°12'58&quot;</td>
<td>39.14</td>
<td>-77.22</td>
<td>fem1POLQ</td>
<td>Excellent</td>
<td>4.21</td>
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<td>-24.28</td>
<td>-36.89</td>
<td></td>
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<tr>
<td>06/26/2023 01:58:08</td>
<td>01:54:44</td>
<td>RobFX02</td>
<td>N39°08'37&quot; W077°12'58&quot;</td>
<td>39.14</td>
<td>-77.22</td>
<td>fem1POLQ</td>
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<td>-24.28</td>
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<tr>
<td>06/26/2023 01:57:31</td>
<td>01:54:44</td>
<td>RobFX02</td>
<td>N39°08'37&quot; W077°12'58&quot;</td>
<td>39.14</td>
<td>-77.22</td>
<td>fem1POLQ</td>
<td>Excellent</td>
<td>4.18</td>
<td>84.44</td>
<td>-12.63</td>
<td>-12.27</td>
<td>-24.28</td>
<td>-36.91</td>
<td></td>
</tr>
</tbody>
</table>
Network Status and Remote Access

• Displays status of all the VQuad™ probes (along with script running status), vMobile™, MDC, VQT, and File Monitor application status
• The VQuad™ and vMobile™ connected to the WebViewer™ can be accessed or controlled remotely through the web interface
• Various options are available to operate and control the systems remotely such as Load desired scripts along with script parameters, Start/Stop the scripts, and make configuration changes to the VQuad™ systems
# Filters

## Modify filters

**Select Filter**: VQT_POLQA

### Select dates Range

- **03/13/2023 01:00:00**
- **03/15/2023 01:00:00**

### Select Map Region

**Select**

- **Omit Failed Calls**
- **Auto set to browser Timezone**

### Call Direction (Inbound / Outbound)

- **Both**

## Results List

**Saved criteria**: Click on any row in the below table to edit

<table>
<thead>
<tr>
<th>Audio/Delay</th>
<th>QWD (ms)</th>
<th>In range of</th>
<th>0</th>
<th>400</th>
<th>AND</th>
</tr>
</thead>
<tbody>
<tr>
<td>VQT_POLQA</td>
<td>Active Speech Ratio - Deg (%)</td>
<td>Greater than or equals</td>
<td>50</td>
<td>--</td>
<td>AND</td>
</tr>
<tr>
<td>VQT_POLQA</td>
<td>Active Speech Ratio - Ref (%)</td>
<td>Equals</td>
<td>57</td>
<td>--</td>
<td>AND</td>
</tr>
<tr>
<td>VQT_POLQA</td>
<td>POLQA MOS</td>
<td>Greater than or equals</td>
<td>4</td>
<td>--</td>
<td>AND</td>
</tr>
<tr>
<td>VQT_POLQA</td>
<td>Active Speech Level - Ref (dBm)</td>
<td>Equals</td>
<td>-24.28</td>
<td>--</td>
<td>AND</td>
</tr>
<tr>
<td>VQT POLQA</td>
<td>POLQA DWD (ms)</td>
<td>Greater than or equals</td>
<td>600</td>
<td>--</td>
<td>AND</td>
</tr>
<tr>
<td>VQT POLQA</td>
<td>Jitter Ave (ms)</td>
<td>Less than or equals</td>
<td>2</td>
<td>--</td>
<td>AND</td>
</tr>
<tr>
<td>VQuad DeviceID</td>
<td>Contains</td>
<td>FX01</td>
<td>--</td>
<td>--</td>
<td>OR</td>
</tr>
<tr>
<td>VQuad Call ID</td>
<td>Contains</td>
<td>FX01POLQA</td>
<td>--</td>
<td>--</td>
<td>OR</td>
</tr>
</tbody>
</table>

## Actions

- **Save Filter**
- **Delete Filter**

**Updated successfully**
Report Generation

- The user can save the search results to a local PC in *.xls / *.csv / *.pdf formats. Custom reports are generated using DataImport for Events and Statistics, which can be saved to text or Excel output files via WebViewer™
- Google Maps plotting of various test results (VQT, VBA, VAC, EMU, NetTest, FAX, Call Control)
- Console View - customizing the threshold values for the test result parameters to populate the consolidated Average, Min, Max results in tabular format and plot corresponding graphics statistics
Call Events and Scheduling the Reports

WebView
VQuad WebViewer - Real Time Monitoring System

Custom Reports - Dynamic Report
Report Name: RobGroup1 (RobVQuadTest, RobDelayTest, RobNetTest, RobPOLQAResults)
Start Datetime: 2021-10-13 00:27:02
End Datetime: 2021-10-20 00:30:02
User: Administrator

Custom Reports

Filters

Timestamp Search: VQuad Timestamp
Load Filter: Off
Event ID / Device ID Filter: GLROBFAVGITTEST
Drive and Walk Testing for Wireless Networks

- Drive test with any Wireless device with real-time GPS mapping
- GPS connectivity for recording timing and location of tests performed
- The GPS mapping records and adds the real-time GPS information to all test results and vMobile™ call control
- GPS Location includes stamping each result with Latitude, Longitude, and GPS Time Stamp
- GPS information is automatically sent to central database and accessed via Google Maps feature in WebViewer™
Real-time GPS and ITS Plotting

Real-time GPS Plotting

Real-time ITS Plotting
Results in WebViewer™ - Custom Reports

<table>
<thead>
<tr>
<th>vQuad Call ID</th>
<th>Call Attempts</th>
<th>Call Completed %</th>
<th>Call Dropped %</th>
<th>Call Failed %</th>
<th>VQT POLQA Ave</th>
<th>Speech Level Gain Ave</th>
<th>Noise Level Gain Ave</th>
<th>Call Failed</th>
<th>Call Dropped</th>
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**POLQA**

vMobileShoreTest20Jul23 (POLQA Score)
Results in WebViewer™ - From Drive and Walk Test

Drive Test with Net Test

Walk Test with Voice Quality
GL NetTest - Data Testing
Automated Data Testing over Wired & Wireless (Bluetooth®, WiFi, 3G, LTE, 5G) Networks
Mobile Device Controller (MDC) GUI

- GL's Mobile Device Controller application and the supporting downloadable apps on the Smartphones (iPhone, Android), can remotely perform the data tests when the phone is within a voice call or outside a voice call.
VQuad™ NetTest Events Log

- Mobile Device NetTest and PC based NetTest Statistics and complete results are relayed back to VQuad™, which can be accessed via WebViewer™.

Note: NetTest requires a GL Data Server at each target location, and the mobile device requires a GL deployed app (Apple or Android based) for operation.
Data Tests running on Android and Apple Devices using GLNetTest App
Video Testing
Automated and Manual Video Quality Testing
(Android, Windows® and Linux Interface)

Initiate Video Tests From Devices running GLNetTest App

Video End Clients Running on Android, Windows, or Linux PCs

Interactive Video Clients

Network

VAC SERVER
(Video Test Plans)

VIDEO APPLICATION CONTROLLER

MOBILE DEVICE CONTROLLER

Initiate Video Tests From Multiple VQuad™ Nodes

Video End Clients Running on Android, Windows, or Linux PCs

Interactive Video Clients

Video Quality Tests (Video and Audio)
MPEG, H.261, H.263, H.264 & more

• Video/ Audio Quality Metrics
• Network Diagnostics Statistics
• Call Configuration Information

WebViewer™

Control, Analysis
Data Retrieval

GL Central QoS System

WebViewer™
## Video Test Results in WebViewer™

<table>
<thead>
<tr>
<th>Absolute MOS-V</th>
<th>Relative MOS-V</th>
<th>Video Frame Rate (Frames per Second)</th>
<th>Impaired F Rames (%)</th>
<th>Impaired B/F Frames (%)</th>
<th>Loss Rate within B/F Frames (%)</th>
<th>EPSNR</th>
<th>ADJUO QUALITY</th>
<th>AUDIO QUALITY</th>
<th>AUDIO-VIDEO QUALITY</th>
<th>IP NETWORK HEALTH</th>
<th>CALL CONFIG INFO</th>
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**Note:**
- EPSNR: End-to-End Speech Quality Number
- ADJUO QUALITY: Audio Quality
- AUDIO QUALITY: Audio Quality
- AUDIO-VIDEO QUALITY: Audio Video Quality
- IP NETWORK HEALTH: IP Network Health
- CALL CONFIG INFO: Call Configuration Information
Thank you!

For more information contact us at info@gl.com

(Please subscribe to our newsletter: https://www.gl.com/subscribe.php)