
Voice Quality testing using GL's Ultra-Portable handheld device: vMobile™



818 West Diamond Avenue - Third Floor, Gaithersburg, MD 20878
Phone: (301) 670-4784 Fax: (301) 670-9187 Email: info@gl.com
Website: <https://www.gl.com>

Current GL Mobile Test Hardware Platforms



vMobile™



vMobile™ Interfaces



Back Panel



Front Panel

VQuad™ Probe HD



Back Panel



Front Panel

Dual UTA HD



Front Panel

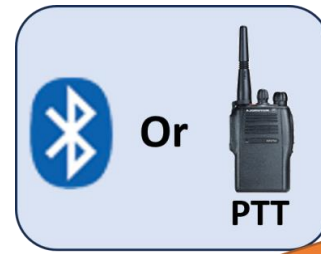


Back Panel

VQuad™ mTOP™

vMobile™ – Ultra Portable Mobile Tester

- 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™

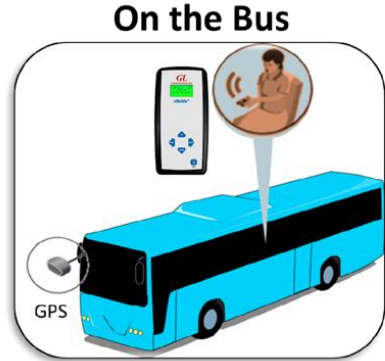
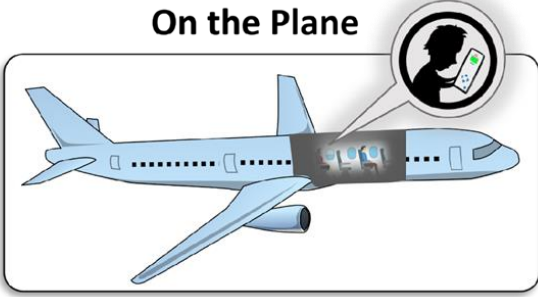


vMobile™ Interfaces

vMobile™ Portable Applications



vMobile™ in Hand

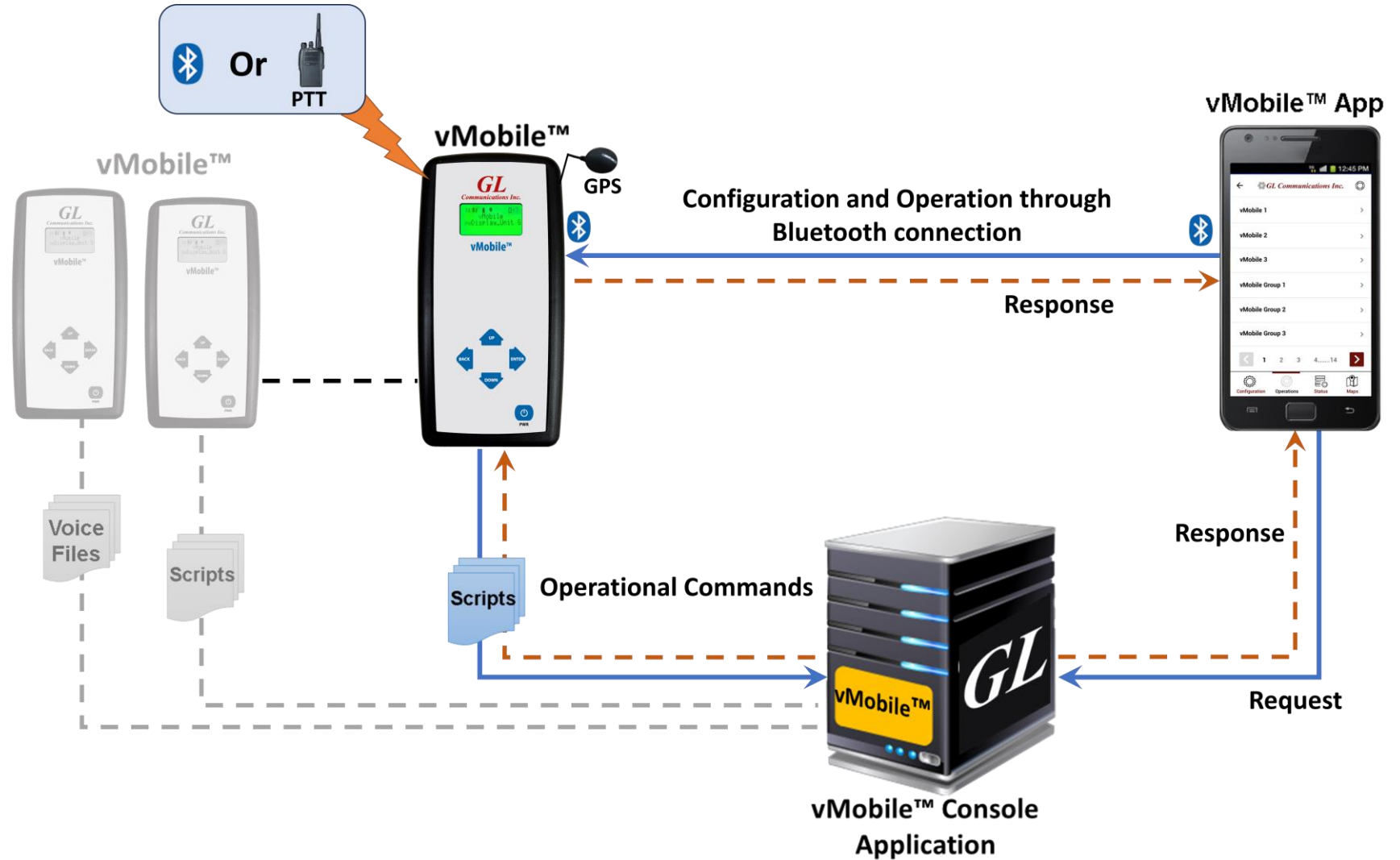


vMobile™ Interfaces



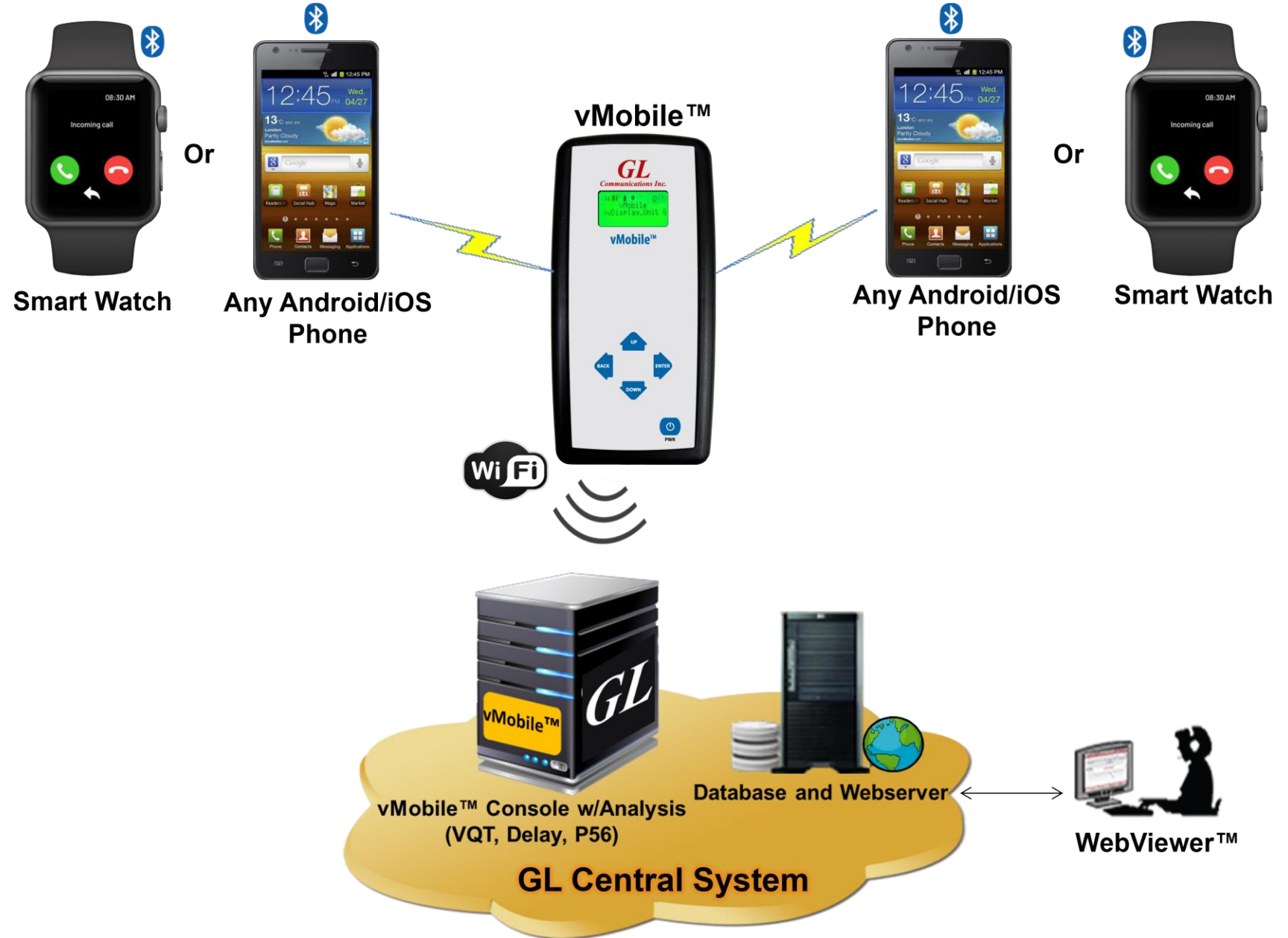
vMobile™ Configuration and Operation using Console and Console App

- 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



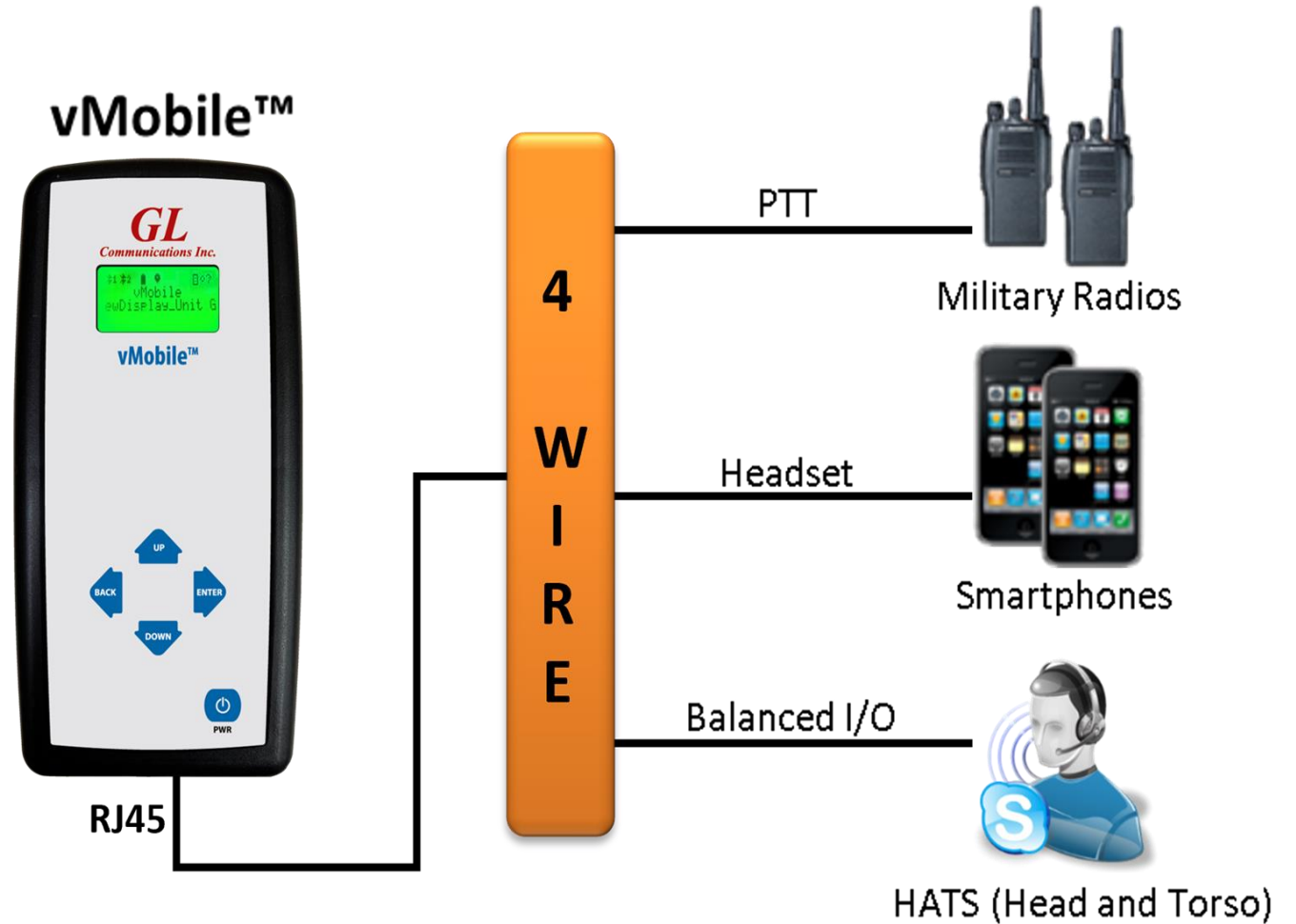
Automated Call Control via Bluetooth®

- Supports Mobile (5G, VoLTE, VoWi-Fi, VoFemto, 3G) network with both NB and WB voice
- Supports Bluetooth connection to any Mobile phone, any Carrier, and any Network
- Voice Quality Analysis using POLQA algorithm of recorded voice files, supporting legacy as well as 5G and VoLTE networks
- Bluetooth® connectivity also supports RSSI, Battery level functions, and Network identity



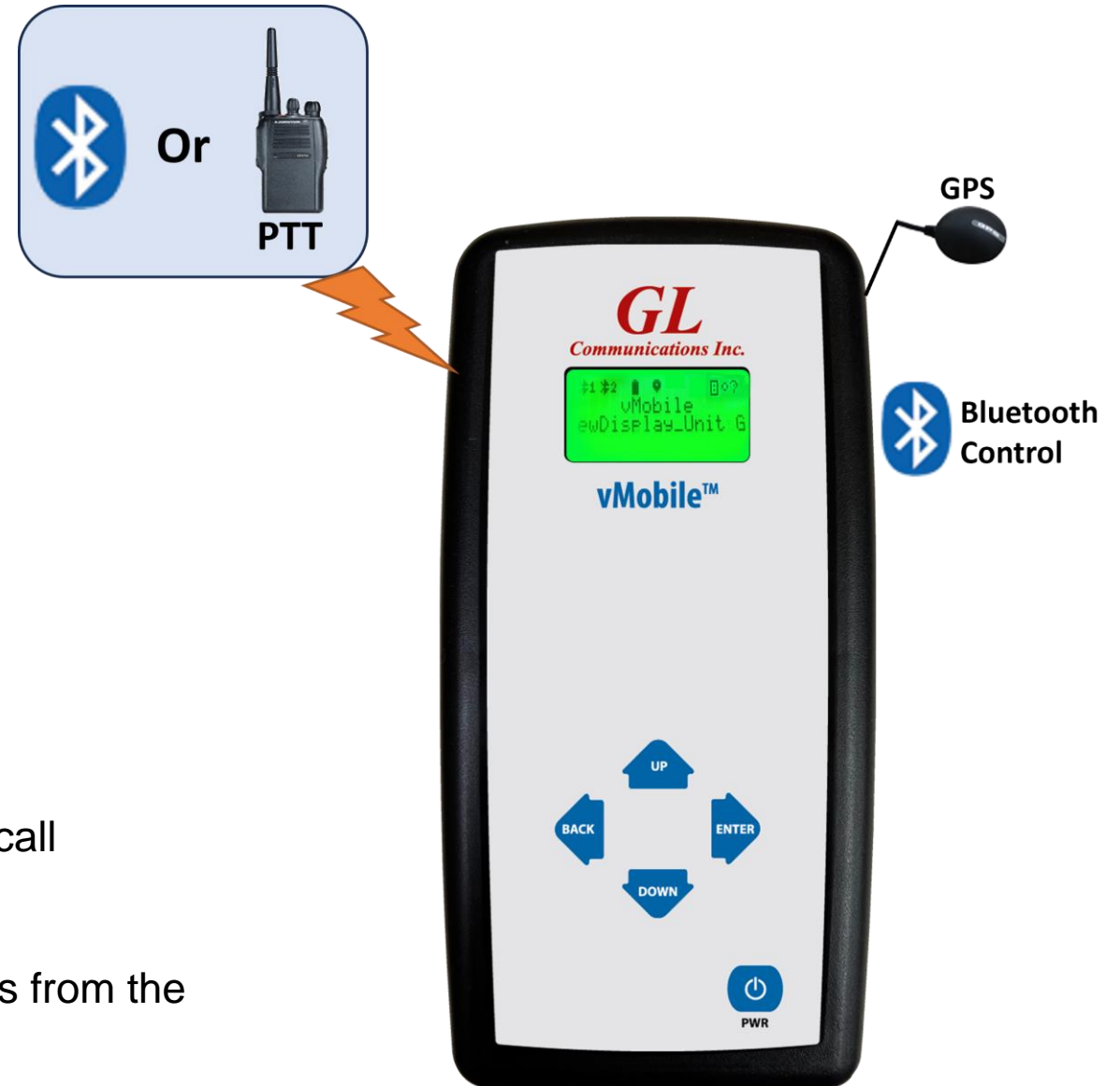
Automated Analog (4-Wire) Testing

- vMobile™ Analog (4-wire) testing
- Connect to any Mobile Radio or replace any analog headset to any device
- Control Mobile Radios with automated Push-to-Talk functionality



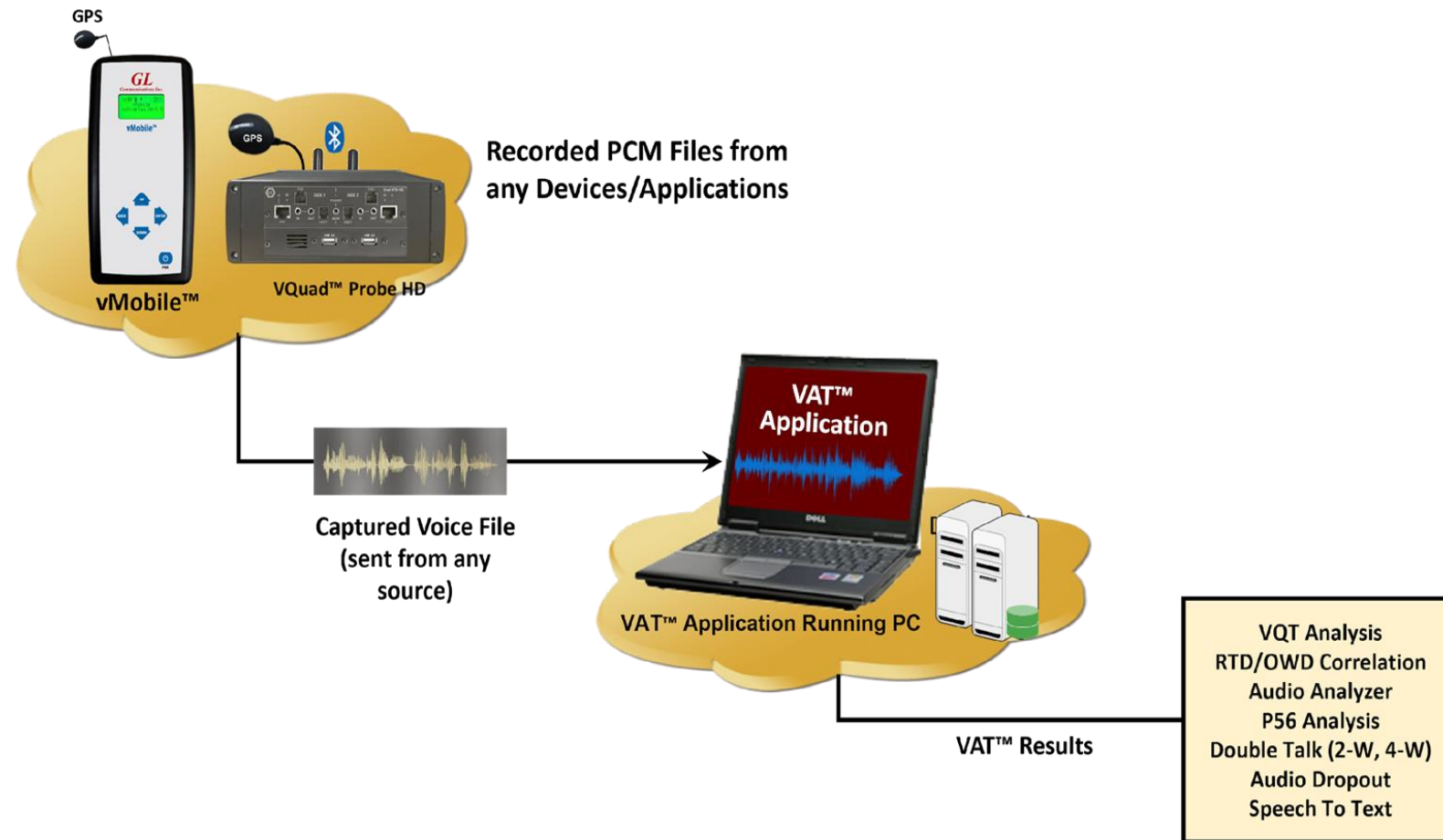
vMobile™ Audio and Data Testing for Mobile Networks

- Automated Voice Quality Testing (VQT)
- Voice Analysis Tool (VAT™)
- Delay Measurements
- Automated Data Quality Testing
- vMobile™ Control and Operation
- Drive and Walk Testing for Wireless Networks
- Accurate Time Synch between two ends of the call
- Remote control vMobile™ and VQuad™ devices from the vMobile™ script

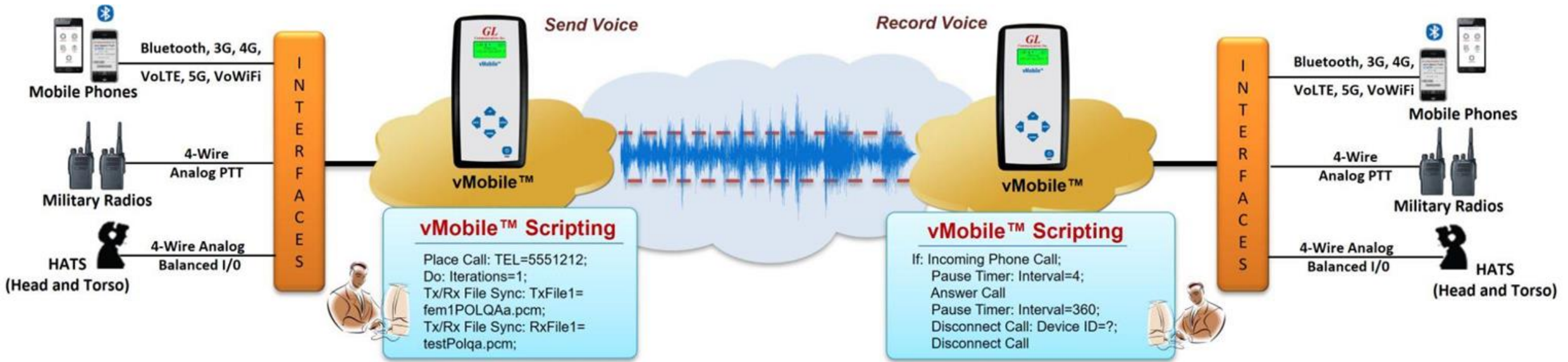


Voice Analysis Tool (VAT™)

- 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



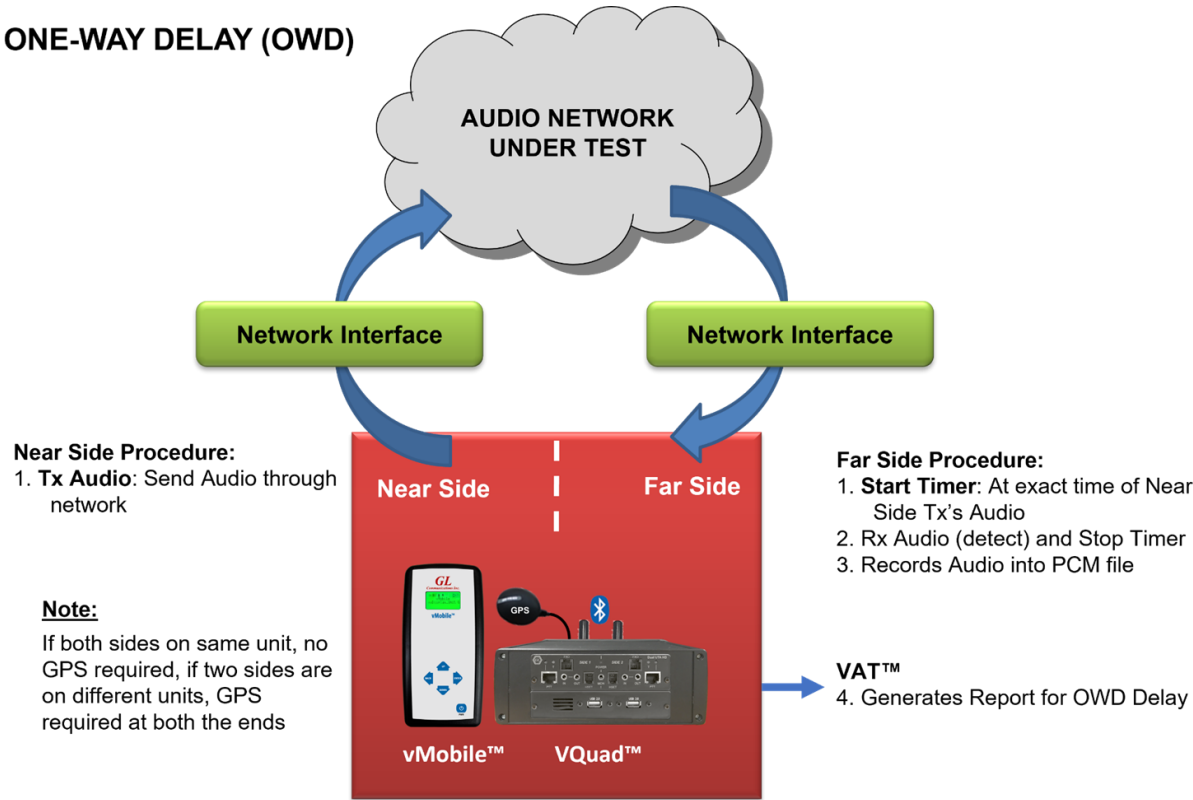
Automated Voice Quality Testing



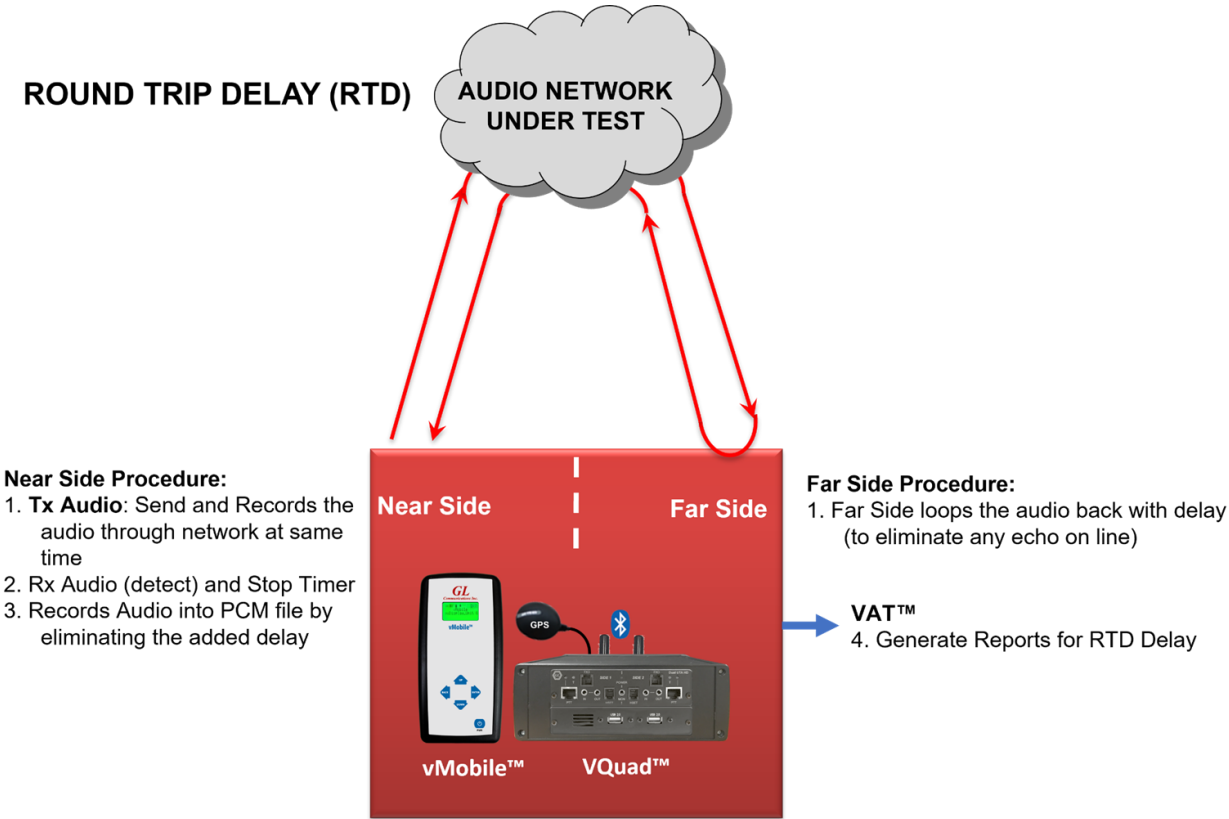
- Network-independent VQT – Supports legacy, as well as Next Generation networks
- POLQA (ITU-T P.863), PESQ (ITU-T P.862), PESQ LQ, LQO (P.862.1), PESQ WB (P.862.2), DAQ for Mobile Radios
- Call control analysis (Failed Calls, Dropped Calls, and Call ID)
- Includes Text-to-Speech technology for automatically creating the necessary voice prompt for placing call over Siri or Google Voice
- Supports POLQA v2.4 and POLQA v3 (NB, WB, and SWB) measurements
- Supports both Narrowband (NB) and Wideband (WB) audio for Bluetooth interface
- Supports Narrowband (NB), Wideband (WB), and Super Wide-Band (SWB) audio for PTT (Analog) interface

Delay Measurements

ONE-WAY DELAY (OWD)

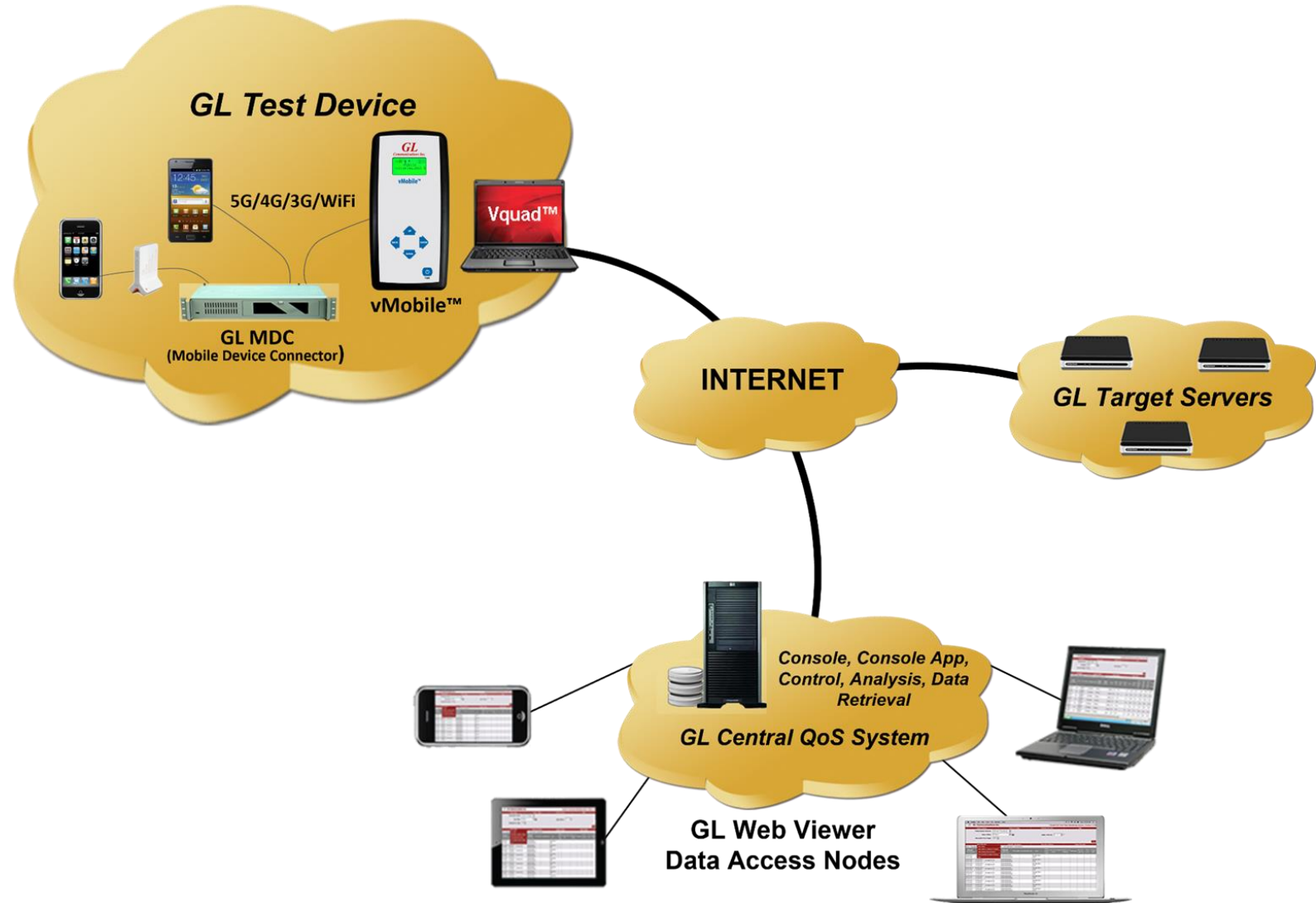


ROUND TRIP DELAY (RTD)



Automated Data Quality Testing Using GL NetTest

- Network independent, supports 5G, 4G LTE, 3G, WiMax, and Wired Internet connections
- Supports IOS and Android devices
- Different type of tests supported - TCP, UDP, HTTP, FTP, DNS, VoIP, Video, SMS, Email, PhoneInfo
- End-to-End SMS Testing over wireless network directly and remotely
- Fully automated and remote testing with all results accessible via GL WebViewer™



vMobile™ Control and Operation

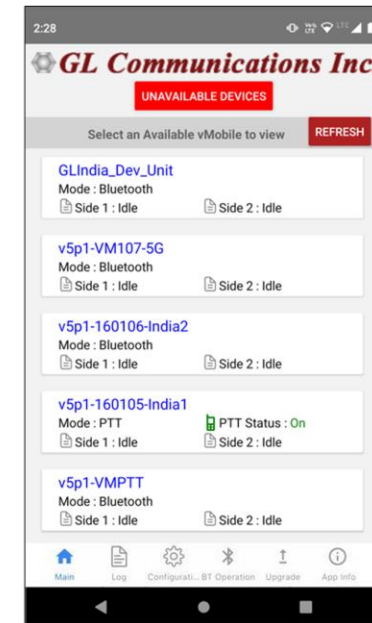
vMobile™ Console

vMobile™ Console APP

GL Communications Inc.

vMobile Status

vMobile Name	Wi-Fi Network	Side 1	Side 1 Script	Side 2	Side 2 Script	GPS Latitude - Longitude
GLIndia_Dev_Unit	DSPTeam	160073Dev1 (MotoPhone1)	answercallside1.vms	160073Dev2 (motoPhone2)	wbxxside2.vms	12.911302 , 77.89264
v5p1-VM107-5G	glmesh	US107Test1 (VELVET)	central3000bxxwbside1.vms	US107Test2 (RobGalaxy)	answercallside2.vms	39.143362 , -77.215513
v5p1-160106-India2	DSPTeam	US109Test1 (Q6)	waiteventreceivetests1.vms	US109Test2 (Q6)	answercall.vms	12.926155 , 77.601742
v5p1-160105-India1	DSPTeam	IN105Test1 PTT On	side1r.vms	NA	NA	12.926363 , 77.601412
v5p1-VMPTT	glmesh	USPTTTest1 (Not Yet Connected)		USPTTTest2 (Not Yet Connected)		39.1434 , -77.215535
Zhiyong22	Zhiyong_test	BTTest113 (RobG8)	central3000bxxwbside1.vms	BTTest213 (Zhi5g)	answercallside2.vms	39.143375 , -77.215552
RobvMobile3	glmesh	LTest1 (RobGalaxy)		LTest2 (ZDBTTest1)		39.14334 , -77.215473
v5p1-VM101-rob	glmesh	US160101Test1 (VELVET)	answercallrunscriptside1.vms	US160101Test2 (RobGalaxy)	runscriptoptionside2.vms	39.1434 , -77.215525
Sonny50m	GURUMNARA	LTest1 (SonnysiPhone)	side1r.vms	LTest2 (GalaxyJ7Prime)	side2m.vms	39.104778 , -77.227892



Configuration and Operation through Internet connection



Configuration and Operation through Bluetooth connection



vMobile™ Status

GL Communications Inc.

vMobile Status

vMobile Name	Wi-Fi Network	Side 1	Side 1 Script	Side 2	Side 2 Script	GPS Latitude - Longitude
GLIndia_Dev_Unit	DSPTeam	160073Dev1 (MotoPhone1)	answerallside1.vms	160073Dev2 (motoPhone2)	wbtxrxside2.vms	12.911302 , 77.89264
v5p1-VM107-5G	glmesh	US107Test1 (VELVET)	central3000brrxwside1.vms	US107Test2 (RobGalaxy)	answerallside2.vms	39.143362 , -77.215513
v5p1-160106-India2	DSPTeam	US109Test1 (Q6)	waiteventreceptestside1.vms	US109Test2 (Q6)	answerall.vms	12.926155 , 77.601742
v5p1-160105-India1	DSPTeam	IN105Test1 PTT On	side1r.vms	NA	NA	12.926363 , 77.601412
v5p1-VMPTT	glmesh	USPTTTest1 (Not Yet Connected)		USPTTTest2 (Not Yet Connected)		39.1434 , -77.215535
Zhiyong22	Zhiyong_test	BTTest113 (RobG8)	central3000brrxwside1.vms	BTTest213 (Zhi5g)	answerallside2.vms	39.143375 , -77.215552
RobvMobile3	glmesh	LTest1 (RobGalaxy)		LTest2 (ZDBTTest1)		39.14334 , -77.215473
v5p1-VM101-rob	glmesh	US160101Test1 (VELVET)	answerallrunscriptside1.vms	US160101Test2 (RobGalaxy)	runscriptoptionside2.vms	39.1434 , -77.215525
Sonny50m	GURUMNARA	LTest1 (SonnysiPhone)	side1r.vms	LTest2 (GalaxyJ7Prime)	side2m.vms	39.104778 , -77.227892

Console Status

2:28

GL Communications Inc.

UNAVAILABLE DEVICES

Select an Available vMobile to view REFRESH

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

v5p1-160105-India1

Mode : PTT PTT Status : On

Side 1 : Idle Side 2 : Idle

v5p1-VMPTT

Mode : Bluetooth

Side 1 : Idle Side 2 : Idle

Main Log Configurati... BT Operation Upgrade App Info

Console App Status

Device Configuration

The screenshot shows a web-based configuration interface for 'GL India160073Dev1' and 'GL India160073Dev2'. The interface includes a sidebar with navigation options like 'vMobile Status', 'vMobile Operation', and 'vMobile Configuration'. The main content area is divided into sections for 'vMobile List', 'Device Parameters', 'Paired Bluetooth Devices', and 'Available Bluetooth Devices from Scan'. The 'Device Parameters' section contains fields for 'vMobile Device Name', 'vMobile Bluetooth Name', 'Connected Phone', and 'Auto Reconnect Bluetooth Device'. The 'Paired Bluetooth Devices' section features two tables, one for each device, with columns for device name and 'Connect', 'Disconnect', and 'Remove' actions. The 'Available Bluetooth Devices from Scan' section shows 'No Devices Found' for both.

Console

The screenshot shows the mobile application interface for 'GLIndia_Dev_Unit'. It features a top navigation bar with 'Return', 'GLIndia_Dev_Unit', and 'OPERATION', 'DEVICE PARAM', 'GLOBAL PARAM' tabs. The main screen is organized into two columns, 'Side 1' and 'Side 2', each containing fields for 'Device ID', 'BT Name', 'Connected Phone', and 'Auto Reconnect'. Below these fields are two red buttons labeled 'BT CONFIG 1' and 'BT CONFIG 2'. At the bottom of the screen are two more red buttons labeled 'REFRESH' and 'SUBMIT'.

Console App

Operation

The screenshot shows the 'vMobile Operation' console interface. The top navigation bar includes 'vMobile Status', 'vMobile Operation' (highlighted), 'vMobile Configuration', 'Console App Status', 'Log Configuration', 'Manage Scripts', 'Upgrade vMobile', 'Maps', 'User Configuration', 'ITS', and 'Help'. The main content area is divided into two sections: 'Side 1' and 'Side 2'. Each side has a 'vMobile List' with a dropdown menu (currently showing 'GLIndia_Dev_Unit') and a 'Refresh' button. Below the list, there are fields for 'Start New Variable' (Enter Place Call Number and Enter Call ID) and a 'vMobile Script' dropdown (currently showing 'answercallside1.vms') with a 'Start' button. At the bottom, there are sections for 'Upload Scripts or Reference PCM files to vMobile' (Script File or PCM File), 'Download Scripts or Reference PCM files available on vMobile' (Script File or PCM File), and 'Delete Scripts or Reference PCM files available on vMobile' (Script File or PCM File). A 'Submit' button is located at the bottom right of the console.

Console

The screenshot shows the 'Console App' interface for 'GLIndia_Dev_Unit'. The top navigation bar includes 'Return', 'GLIndia_Dev_Unit', 'OPERATION' (highlighted), 'DEVICE PARAM', and 'GLOBAL PARAM'. The main content area is divided into two sections: 'Side 1' and 'Side 2'. Each side has a 'vMobile List' with a dropdown menu (currently showing 'answercall.vms') and a 'Start' button. Below the list, there are fields for 'Start Variables' (5552121, vMobileTest) and 'Sampling Rate' (16000). At the bottom, there are 'REFRESH' and 'SUBMIT' buttons.

Console App

vMobile™ Console with Script Editor

The screenshot displays the vMobile Console interface. The top navigation bar includes the logo for GL Communications Inc. and the user profile 'GL User Testing'. The left sidebar contains navigation items: vMobile Status, vMobile Operation, vMobile Configuration, Console App Status, Log Configuration, Manage Scripts (highlighted), Create/Edit Scripts, Script List, Upload VATProfile, Upgrade vMobile, Maps, User Configuration, ITS, and Help.

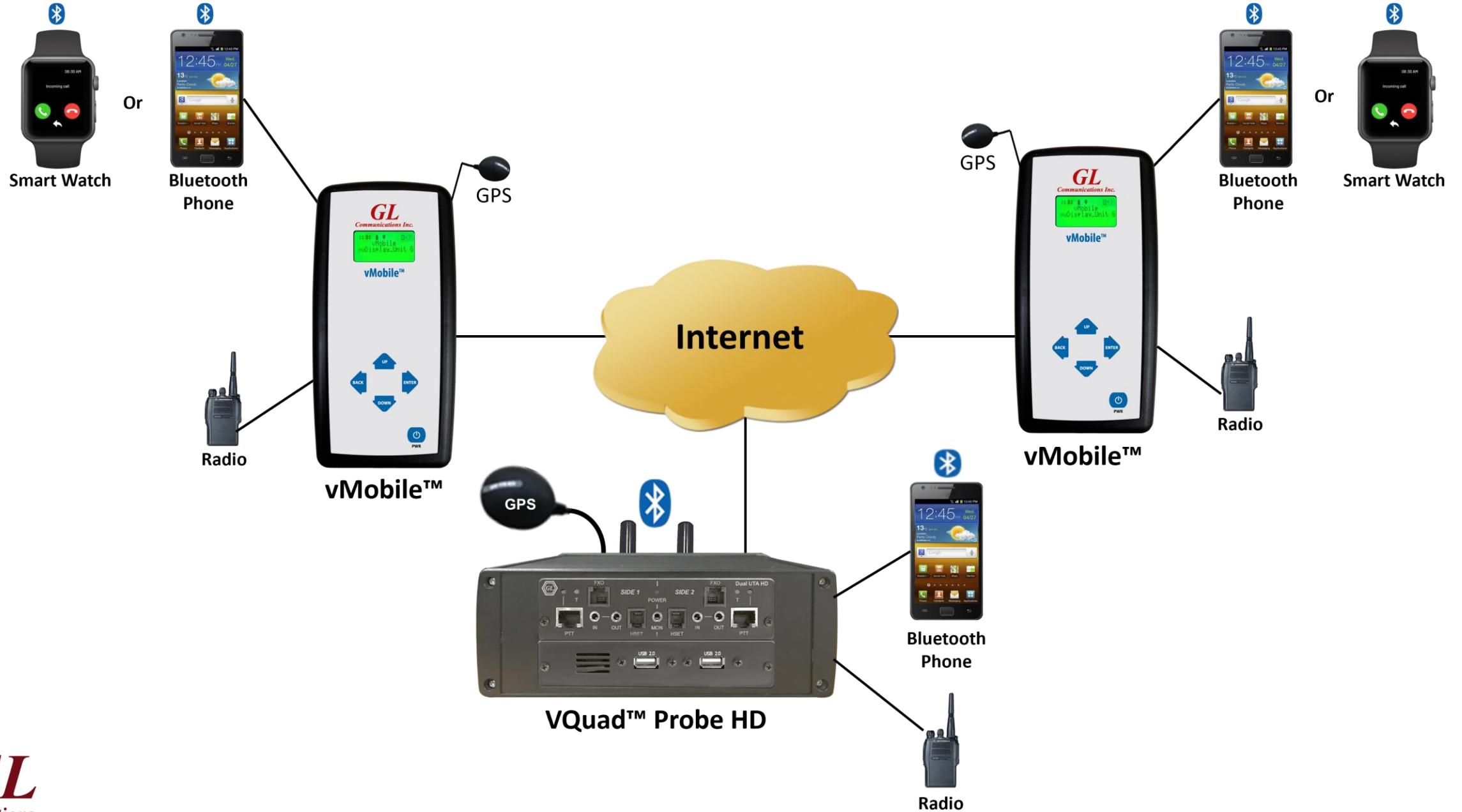
The main content area is titled 'Create New Script or Edit existing vMobile Scripts'. It features a 'vMobile List' dropdown set to 'GLIndia_Dev_Unit' and a 'vMobile Script file to edit' dropdown set to 'answercallside1.vms'. Action buttons include 'Edit', 'New Script', and 'Save and Upload to vMobile'. A note states: 'Note :Script Name Should not contains underscore (_), dash (-).'.

Below this is the 'Script Components' section, which includes a 'Browse From Local PC' button and a table for editing script components. The table has columns for 'Script Name' and '.vms'. The script content is as follows:

Script Name	.vms
1	//Answer Incoming Call
2	start of script
3	WaitEvent: Event=Incoming Call; Interval=45; Device ID=1;
4	If: Incoming Call;Device ID=1;
5	Answer Call:Device ID=1;
6	//Pause Timer: Interval=1500;
7	End If
8	end of script
9	//
10	//

Additional buttons for 'Copy', 'Paste', 'Delete', 'Comment Line', and 'Clipboard' are visible on the right side of the script editor.

vMobile™ Automated Testing

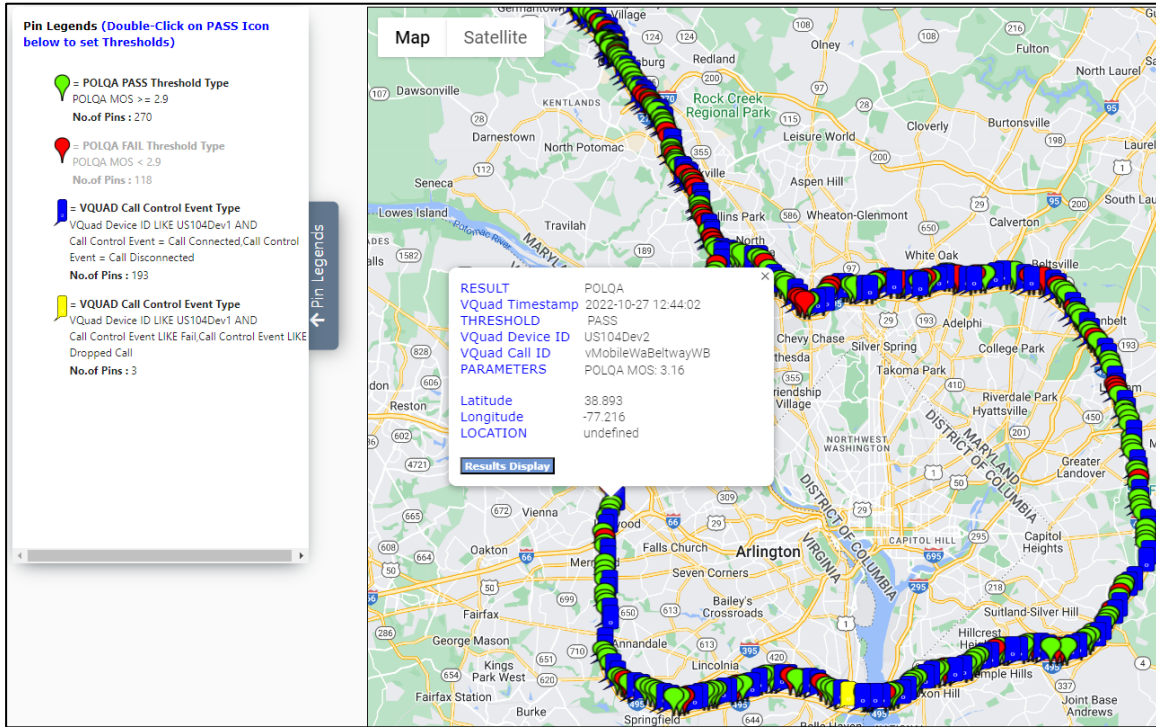


Drive Testing for Wireless Networks

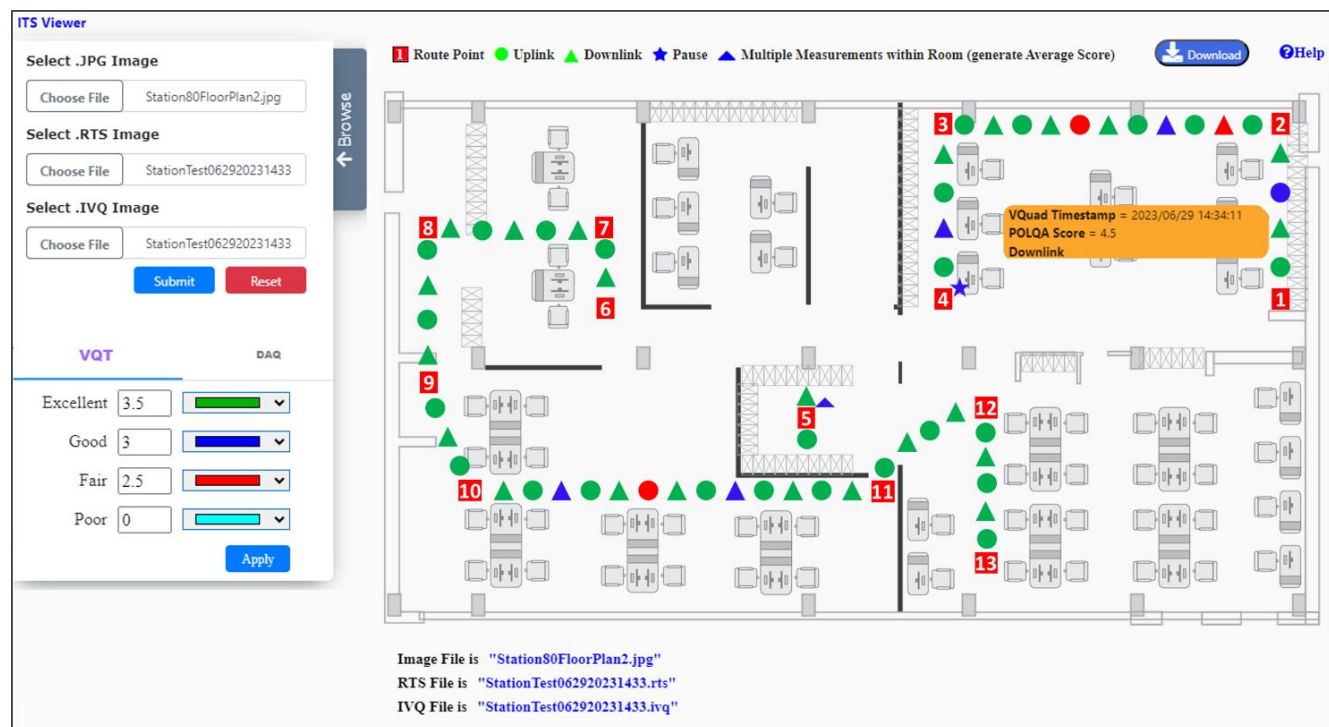


- Drive test with any Wireless device with real-time GPS mapping
- GPS connectivity for recording timing and location of tests performed
- The GPS mapping records and adds the real-time GPS information to all test results and vMobile™ call control
- GPS Location includes stamping each result with Latitude, 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

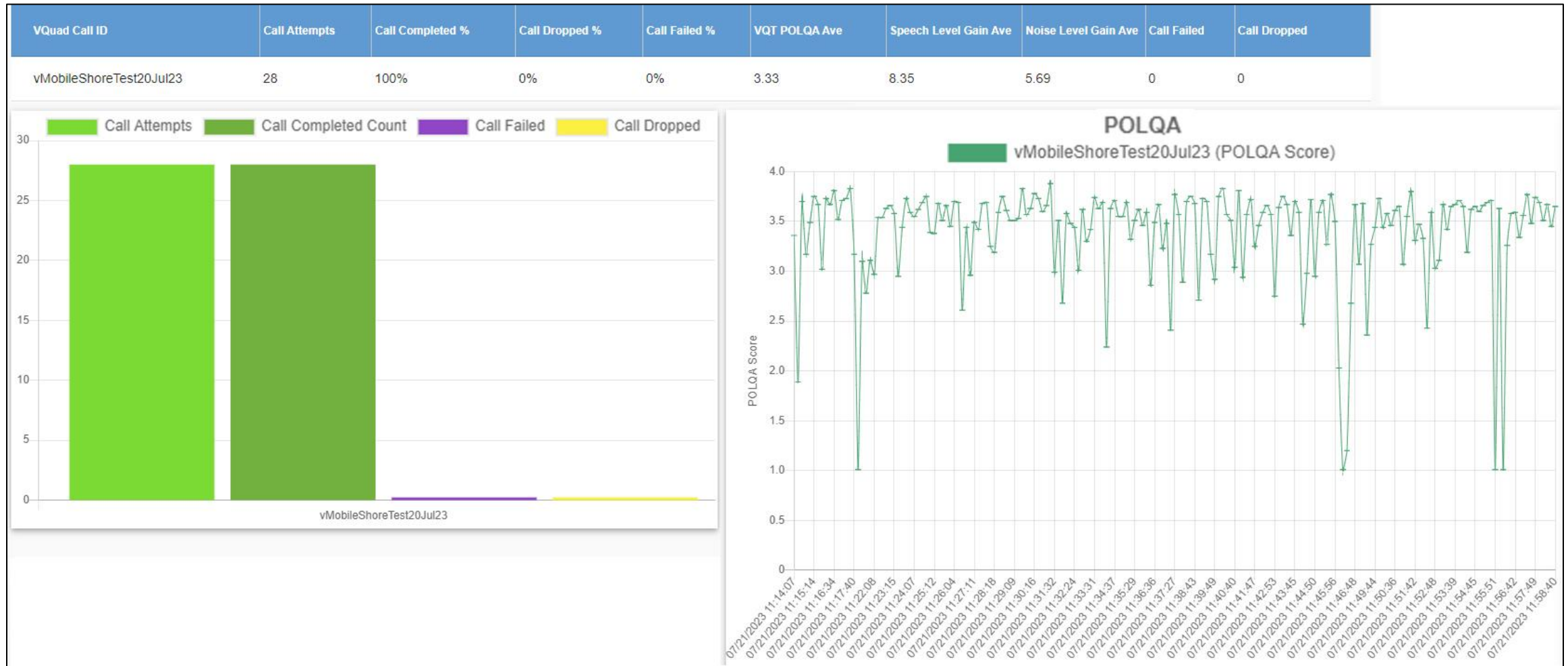


Real-time GPS Plotting

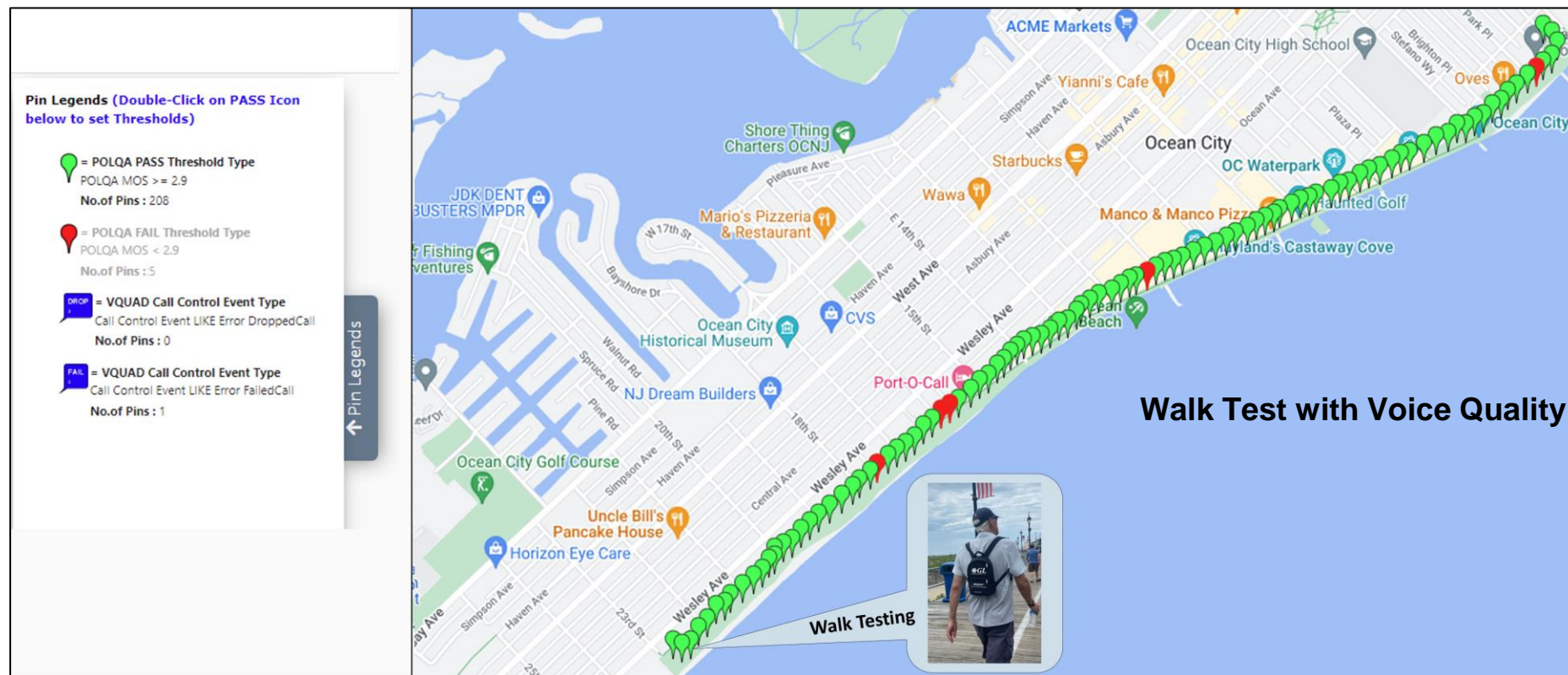
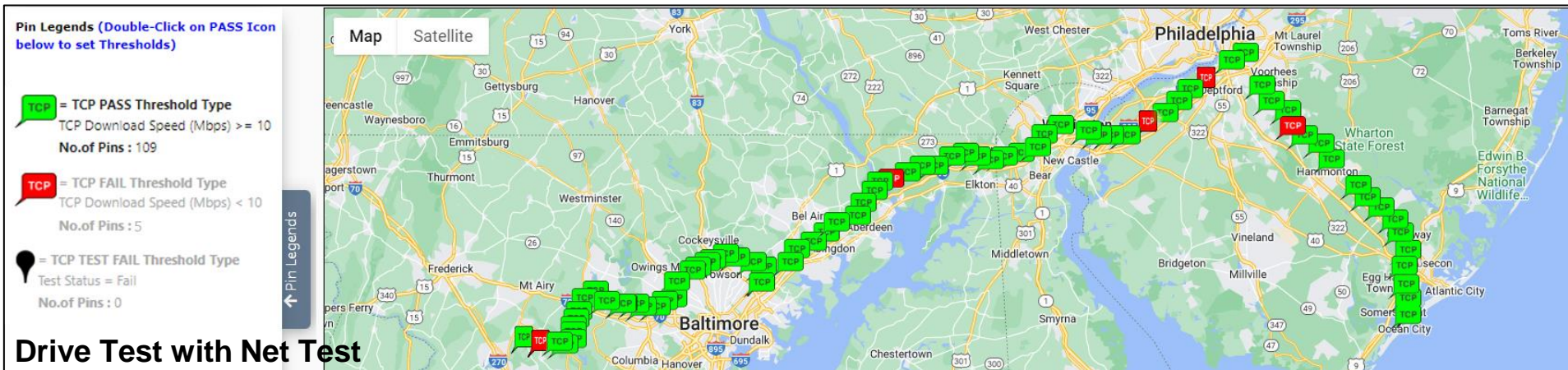


Real-time ITS Plotting

Results in WebViewer™ - Custom Reports



Results in WebViewer™ - From Drive and Walk Test



Thank you!

For more information contact us at info@gl.com

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