

POLQA® is a registered trademark of OPTICOM. GL is one of the Test & Measurement manufacturers that has adopted POLQA/P.863 in its Voice Quality Test solution, by obtaining the essential rights to use POLQA® standard, and hereby acknowledge that the images or text references to POLQA used in this document originally copyrights with Opticom.

Overview

GL's **Voice Quality Testing (VQT)** software supports the next-generation voice quality testing standard for fixed, mobile and IP-based networks using POLQA v2.4 and v3 (ITU-T P.863), PESQ (ITU-T P.862), PESQ LQ / LQO (P.862.1), and PESQ WB (P.862.2).

The VQT fully supports analysis using POLQA ITU version 2.4 algorithm for Narrowband (NB 8000 sampling), Wideband (WB 16000 sampling), and Super Wideband (SWB 48000 sampling) in both manual and automated testing. It also supports analysis using latest PESQ ITU release including ITU-T P.862, 862.1 and 862.2 (supports PESQ, PESQ LQ, PESQ LQO, PESQ WB).

The optional POLQA v3 (latest version of the POLQA algorithm) supports Full Band Audio analysis which provides improved scoring for mobile based VoLTE, 5G and OTT applications using EVS and OPUS codecs. This latest POLQA v3 includes analysis which is more sensitive to distortions across the entire audio spectrum. In addition, POLQA v3 supports less harsh analysis of micropauses within the speech, reacts with less sensitivity to linear frequency distortions, and includes a significantly improved and streamlined perceptual model.

The VQT software can work either independently, or with <u>vMobile[™]</u>, <u>VQuad[™] - Dual UTA HD</u>, <u>Voice Analysis Tool (VAT[™]</u>), and <u>VQuad[™]</u> <u>Probe HD</u>. VQT performs PESQ LQ/LQO/WB, and POLQA (NB, WB, SWB) simultaneously, using two voice files (Reference File and Degraded File) and provides the algorithm results in both a graphical and tabular format. Additional analytical results are displayed as part of the assessment such as MOS, E-Model, Signal Level, SNR, jitter, clipping, noise level, and delay (end to end as well as per speech utterance).

All results can also be sent to a Central Database where GL's web-based dashboard, known as <u>WebViewer</u>[™], is deployed. These results are saved to database for post-processing viewing, featuring sophisticated searching through WebViewer[™] for both remote and local access

For more details, refer to Voice Quality Testing (VQT) Software webpage.



818 West Diamond Avenue - Third Floor, Gaithersburg, MD 20878, U.S.A (Web) <u>www.gl.com</u> - (V) +1-301-670-4784 (F) +1-301-670-9187 - (E-Mail) <u>info@gl.com</u>

Automated Voice Quality Testing Software with POLQA v2.4

GL has improved its voice quality test with AutoVQT[™], an advanced automatic application that utilizes the POLQA algorithm (following the ITU-T P.863 version 2.4 standard). This enhancement allows for the analysis of thousands of voice files within minutes, effectively evaluating the quality of voice communication across various applications, including VoIP, Mobile, and PSTN networks.

For more details, refer to <u>AutoVQT[™] - Automated Voice Quality Testing Software with POLQA v2.4</u> webpage.

Key Features

- Voice quality testing using POLQA version 2.4 (ITU-T P.863), with an optional upgrade to POLQA version 3 (ITU-T P.863), and PESQ (ITU-T P.862)
- Updates associated with POLQA v3 include redesign perceptual model for Full Band Audio analysis which is validated for VoLTE, 5G and OTT apps (supporting EVS and OPUS codecs)
- Provides Active Speech and Noise Levels, Latency, Jitter, Clipping, and Power measurements
- Manual or Auto modes of operations with centralized data access
- Testing the voice quality over all types of telecom networks Wireless, VoIP, TDM, and PSTN
- Automatic mode allows the GL's VQT to execute on a network system
- VQT Command Line Interface (CLI) or API is enhanced to support both Windows® and Linux® for remote operations
- Support for Central DB Primary and Secondary IP addresses configuration for backup and redundancy
- Remote monitoring with result query and real-time statistics using web based WebViewer™
- Real-time mapping of results with GPS option used in conjunction with VQuad™
- Full support for IPv6 as well as IPv4 (includes VQT, GL Listener, and VQTCLI)
- Enhanced to support Python scripting for automation and remote access of voice quality testing
- Playback and display of audio from within VQT software using Goldwave software
- The WebViewer[™] directly plots results or events from Drive or Walk tests on Google Maps when GPS is available
- When GPS is unavailable, the VQuad[™] and vMobile[™] Indoor Tracking option actively plots results on user-provided JPG floor plans or location diagrams associated with the testing environment

POLQA v3 Upgrade Enhancements

- POLQA v3 SWB supports 14kHz to full audio bandwidth up to 24kHz
- Full band analysis improves accuracy in assessment of codecs such as EVS, OPUS, AAC and LC3, as these codecs are used in many OTT applications
- With Full band support the discriminative power of POLQA at the upper high quality range of the MOS scale is increased
- Current OTT voice services using VoLTE/5G include highly dynamic delay jitter which leads to variations of the duration of very short pauses during speech. POLQA v3 handles these variations with increased precision
- POLQA v3 reacts with less sensitivity to linear frequency distortions than POLQA v2.4. This makes measurements less dependent on the frequency characteristics of headsets
- Perceptual model of POLQA v3 is significantly improved and streamlined

🚳 GL Communications Inc.

Modes of Operation

Manual Measurement

The GL VQT software provides a user-friendly interface to perform manual voice quality assessments using Reference File and Degraded File. The results of the VQT algorithms, POLQA, PESQ LQ/LQO/WB are displayed both in tabular format as well as graphically. All results may be saved to file for post processing viewing along with sophisticated searching on the results within the VQT application.



Auto Measurement

VQT can be executed in Auto Mode, which is used when VQT resides on a network computer and point to a single or multiple userspecified network drives/directories. Voice files are recorded to this network drive/directory and GL VQT automatically performs the voice quality algorithms and displays the results. Multiple GL VQT Auto-Measurement sessions may be configured, each session with a unique set of requirements and a unique reference voice file. In addition, it includes an option to analyze 12-bit degraded files in comparison with 16-bit reference files (NB, WB, SWB POLQA). Along with the standard sampling rates, POLQA also supports userspecified Sampling Rate (between 8K to 48K).

Auto Con	afigurations	<u> </u>	Auto Profile				
egraded Directory	Reference File		Туре	Option	Inventory	User ID	Counts
C:\VQT_degraded\1	C:\VQT_Reference\	VQuad_Auto\Raw\fem1.pcm	Raw PCM, 16,8000, LSM	Auto Del		fem1	1
C:\VQT_degraded\2	C:\VQT_Reference\	VQuad_Auto\Raw\fem2.pcm	Raw PCM, 16,8000, LSM	Auto Del		fem2	
C:\VQT_degraded\3	C:\VQT_Reference\	VQuad_Auto\Raw\fem3.pcm	Raw PCM, 16,8000, LSM	Auto Del		fem3	
C:\VQT_degraded\4	C:\VQT_Reference\	VQuad_Auto\Raw\male1.pcm	Raw PCM, 16,8000, LSM	Auto Del		mal1	
C:\VQT_degraded\5	C:\VQT_Reference\	VQuad_Auto\Raw\male2.pcm	Raw PCM,16,8000,LSM	Auto Del		mal2	
C:\VU1_degraded\6	C:\VQT_Reference\	VQuad_Auto\Raw\male3.pcm	Haw PCM,16,8000,LSM	Auto Del		mal3	
			11			_	
Add	Modity L	Delete Delete All	Start	Stop	Start All	Stop A	
Add	C:\VQT_Degraded\0	Delete All	User ID test POLQA Only Enable Level Alignment Analyze 12-bit Degraded I	Stop Prohibit G (save pro Hign Ac	Start All iraphic Redraw icessor power) curacy Mode ITU ce files will remain 16-	Version 2	
Add	C:\VQT_Degraded\0 C:\VQT_Reference\VQ caded file after measurem	Delete All	User ID Test POLOA Only Enable Level Alignment Analyze 12-bit Degraded I File Format	Stop Prohibit G (save pro Hign Ac illes (Referen	Start All iraphic Redraw icessor power) curacy Mode ITU ice files will remain 16-	Version 2 bit)	
Add	C:WQT_Degraded\0 C:WQT_Reference\VQ raded file after measurem to the inventory directory	Delete Delete All	User ID Test POLQA Only Fable Level Alignment Analyze 12-bit Degraded I File Format Encoding [Defaul	Stop Prohibit G (save pro Hign Ac illes (Referen	Start All iraphic Redraw cessor power) curacy Mode ITU ce files will remain 16- Samples Per Second	Version 2 bit)	•
Add	C:WQT_Degraded\0 C:WQT_Reference\VQ raded file after measurem to the inventory directory	Delete Delete All	User ID Test POLDA Only Enable Level Alignment Analyze 12-bit Degraded I File Format Encoding Defaul	Stop Prohibit G (save pro Hign Ac illes (Reference) t	Start All iraphic Redraw cessor power) curacy Mode ITU corracy	Version 2 bit) 32000	
Add	C:WQT_Degraded\0 [C:WQT_Reference\VQ raded file after measurem to the inventory directory	Delete Delete All	Start User ID Test POLOA Only Enable Level Alignment Analyze 12-bit Degraded I File Format Encoding [Defaul Byte Order records]	Stop Prohibit G (save pro Hign Ac- iles (Reference)	Start All iraphic Redraw cessor power) curacy Mode ITU ce files will remain 16- Samples Per Second T User Specified: Bab Bac Samples	Version 2 bit) [8000 [32000	
Add	C:WQT_Degraded/Q C:WQT_Reference/VQ raded file after measurem to the inventory directory const]	Delete Delete All	Start User ID Test POLDA Only Canady Content Canadyze 12-bit Degraded I File Format Encoding Defaul Byte Order [for 16 br file only] [LSMS]	Stop Prohibit G (save pro Hign Ac iles (Reference t Intel)	Start All iraphic Redraw ccessor power) curacy Mode ITU ce files will remain 16- Samples Per Second User Specified: Bits Per Sample	Stop A Version 2 bit) 8000 16	
Add blions Degraded Directory Reference File * Auto-delete the degr Save degraded files Inventory Directory* Saving Critieris (opti Excellent)	C:WQT_Degraded/0 C:WQT_Reference/VQ raded file after measurem to the inventory directory innal]	Delete Delete All	User ID Test POLDA Only Enable Level Alignment Analyze 12-bit Degraded 1 File Format Encoding Defaul Byte Order (for 16 bit file only) [LSMS] Duck Modify Configurations	Stop Prohibit G (save pro Hign Ac- iles (Reference t (ntel)	Start All iraphic Redraw cessor power) ceracy Mode ITU' ce files will remain 16- Samples Per Second User Specified: Bits Per Sample		
Add	C:WQT_Degraded/Q C:WQT_Reference/WQ raded file after measurem to the inventory directory onal]	Delete Delete All	Start User ID Test POLDA Only Enable Level Alignment Analyze 12-bit Degraded 1 File Format Encoding Defaul Byte Order [for 16 bit file only] LSMS[Quick Modily Configurations- Start 1 End [5	Stop	Start All araphic Redraw cessor power) curacy Mode ITU' ce files will remain 16- Samples Per Second User Specified: Bits Per Sample 7.	Version 2 iii) 32000 16 Save Chan	y y ges

🚳 GL Communications Inc.

VQT Results

Analytical results are displayed as part of the assessment such as POLQA/PESQ MOS, E-Model, Signal Level, SNR, jitter, clipping, noise level, and delay (end-to-end as well as per speech utterance).

Measurement Result	ts Manual Me	asurement		Ana	lysis	Rating Cr	iteria
		degraded	reference	-		PESO	POLOA
C Jitter	POLQA:						
S. 65 (1)	Speech Activity (%)	62	94		Speech Level Cain (dBm)	-14.74	-14.64
C Clipping	Active Speech Level (dBov)	-36.23	-19.7		Speech Lever Gain (Goin)		
	Mean noise Level (dBov)	-70.25	-56.59	=			
• Level	SNR (dBov)	34.02	36.89		Noise Level Gain (dBm)	-2.76	-13.66
- Innernand	ITU P.56 (POLQA):						
C PESO/Utterance	Active Speech Level (dBov)	-34.4	-19.75	1.1.1	TTU P.56 Note:		
	PESQ:				The VOT always perform	s the ITU P.56	
C Delay/Utterance	Speech Activity (%)	45	65		algorithm (Method B) or	the reference	and
. being, occerunce	Mean DC Level (dBov)	-0.94	-0.2		degraded data and calcu	lates mean act	ive
	Active Speech Level (dBov)	-33.11	-18.37		speech level, activity fac	tor and peak v	alue
Report	Mean Noise Level (dBov)	-66.22	-63.46		for each input		
	RMS Level (dBoy)	-36 23	-19 7				

VQT System statistics provides Algorithm and Rating statistics available for all measurement results.

Result	Maxir	num	Minimum	Average	-
POLQA	4.	5	0	0.73	
POLQA EModel	10	0	0	15.22	
PESQ	4.	5	0	1.89	
PESQ LQ	4.	5	0	2.05	
PESQ LQO	4.5	5	0	2.11	=
PESQ WB	0		N/A	N/A	
PAMS Listening Quality	4.9	3	1	2.36	
PAMS Listening Effort	4.9	98	1.33	2.72	
PSQM	1		5	2.38	
PSQM+	1		5	2.04	
Jitter/Average Offset (ms	ec) 69	2	0	104.07	-
Clipping/Muted %	20.	56	Ū	10.37	
Clipping/Max Muted (mse	c) 24	8	0	112.59	
Noise Level (dbm)	-55.	12	-84.57	-73.44	
Delay (msec)	1000	2.5	126.88	1882.65	-
•					•
Excellent	Good	Fair	Poor	Disregard	
0	5	224	1820	0	

Timestamp	Timeslot/Trunk	Rating	Fair/Poor Causes	Scores	Degraded File 🖉
2024/02/07 2:29:42 PM	Auto	Fair	POLQA,	POLQA=2.98, PESQ=0.00, PESQ_LQ=0.00,	C:WQT Degrac
2024/02/07 2:30:00 PM	Auto	Excellent		POLQA=4.50, PESQ=0.00, PESQ_LQ=0.00	C:WOT Degrad
2024/02/07 2:30:19 PM	Auto	Good		POLQA=3.54, PESQ=0.00, PESQ_LQ=0.00,	C:WQT Degrac
2024/02/07 2:30:38 PM	Auto	Excellent		POLQA=4.44, PESQ=0.00, PESQ_LQ=0.00,	C:WQT Degrac
2024/02/07 2:30:58 PM	Auto	Fair	POLQA,	POLQA=2.96, PESQ=0.00, PESQ_LQ=0.00,	C:WQT_Degrac
024/02/07 2:31:16 PM	Auto	Excellent		POLQA=4.50, PESQ=0.00, PESQ_LQ=0.00,	C:WQT Degrac
2024/02/07 2:31:35 PM	Auto	Good		POLQA=3.44, PESQ=0.00, PESQ_LQ=0.00,	C:WQT Degrac
024/02/07 2:32:55 PM	Auto	Excellent		POLQA=4.44, PESQ=0.00, PESQ_LQ=0.00,	C:WQT_Degrac
024/02/07 2:33:14 PM	Auto	Fair	POLQA,	POLQA=2.91, PESQ=0.00, PESQ_LQ=0.00,	C:WQT_Degrac
024/02/07 2:33:32 PM	Auto	Excellent		POLQA=4.50, PESQ=0.00, PESQ_LQ=0.00,	C:WQT Degrac
024/02/07 2:33:52 PM	Auto	Good		POLQA=3.49, PESQ=0.00, PESQ_LQ=0.00,	C:WQT_Degrac
024/02/07 2:34:11 PM	Auto	Excellent		POLQA=4.48, PESQ=0.00, PESQ_LQ=0.00,	C:WQT_Degrac
024/02/07 2:34:30 PM	Auto	Fair	POLQA,	POLQA=2.97, PESQ=0.00, PESQ_LQ=0.00,	C:WQT Degrac
c					>

The user may configure a Rating Criteria for all VQT algorithms as well as the additional analytical results. The rating criteria may be configured for Excellent, Good, Fair, and Poor and the results of the rating criteria may be saved to file for post processing viewing.

Criteira				
Cricolia			[
POLQA	4.5 4	4 3	3 2	20
₽ESQ	4.5 4	4 3	3 2	20
🗹 PESQ LQ	4.5 4	4 3	32	20
🗹 PESQ LQO	4.5 4	4 3	3 2	2 0
₽ESQ WB	4.5 4	4 3	3 2	2 0
🗹 PAMS LQ	5 4	4 3	3 2	20
Default 5 •	Excellent			• • • •
Re-Evaluate Disregard	4		3	<u> </u>

GL Communications Inc.

Voice Quality Testing (PESQ)

PESQ provides an objective measure that predicts the results of subjective listening tests on telephony systems. PESQ incorporates many new developments that distinguish it from earlier models for assessing codecs. These innovations allow PESQ to be used with confidence to assess end-to-end speech quality as well as the effect of such individual elements as codecs. The below screenshot shows VQT PESQ Measurement Results.



- VQT PESQ supports analysis of 16-bit uncompressed PCM and WAV files, including NB (8000 sampling) and WB (16000 sampling)
- VQT PESQ supports analysis of 8-bit compressed a-Law and mu-Law files
- PESQ analysis results include PESQ, PESQ LQ, PESQ LQO, PESQ WB, PESQ Ie, and PESQ per Utterance
- PESQ Results also include Signal Level, Noise Level, Delay, Delay per Utterance, and Jitter
- Playback and display of audio from within VQT software using Goldwave Software



Voice Quality Testing (POLQA)

Perceptual Objective Listening Quality Analysis (POLQA), the successor of PESQ (ITU-T P.862) analysis, is the next generation voice quality testing standard for fixed, mobile and IP-based networks. Based on ITU-T P.863 standard, POLQA supports the HD-quality speech coding and network transport technology, with higher accuracy for 3G, 4G/LTE and VoIP networks. Upgrading to 3rd edition of ITU-T P.863, POLQA extends its scope and applicability towards 5G telephony and OTT codecs. The below screenshot shows VQT POLQA Measurement Results.



- VQT POLQA supports analysis of 16-bit uncompressed PCM and WAV files, including NB (8000 sampling), WB (16000 sampling),
 SWB (48000 sampling)
- POLQA supports user-specified Sampling Rate (specify any rate between 8K to 48K)
- VQT POLQA supports analysis of 8-bit compressed a-Law and mu-Law files
- VQT POLQA supports 12-bit Raw PCM Degraded voice files (NB, WB, SWB)
- POLQA analysis results include POLQA MOS, E-Model R-Factor, Signal Level, Noise Level, Delay, and Jitter
- VQT optionally supports POLQA v3 for VoLTE, 5G and OTT analysis
- Playback and display of audio from within VQT software using Goldwave software



Automated Voice Quality Testing - AutoVQT™

GL's <u>Auto VQT</u>[™] is an advanced, automated solution that analyzes thousands of voice files in mere minutes, effectively evaluating the quality of voice communications across various networks, including VoIP, Mobile, and PSTN. This solution utilizes the Perceptual Objective Listening Quality Assessment (POLQA per ITU-T P.863 version 2.4) algorithm, which is widely acknowledged as the industry benchmark for assessing voice quality. The GL VQT POLQA Auto[™] application works in conjunction with GL's <u>VQuad[™]</u>, <u>Voice Analysis Tool</u> (VAT[™]), <u>Message Automation and Protocol Simulation</u> (MAPS[™]), or <u>T1 E1 Analysis</u> platforms reducing analysis time and increasing efficiency.

The AutoVQT[™] fully supports analysis using POLQA ITU version 2.4 algorithm for NB (8000 sampling), WB (16000 sampling), and SWB (48000 sampling) in automated testing. The tool offers a user friendly interface for automatic operation and generates comprehensive reports that provide detailed information on voice quality metrics such as Mean Opinion Score (MOS), Delay, Jitter, Packet Loss and more. These reports help user to identify issues to improve voice quality. The tool supports a wide range of codecs, including G.711, G.722, AMR, and EVS, making it suitable for testing various types of voice communication.





VQT WebViewer™

The results/events associated with VQT (PESQ, POLQA) analysis is sent to the central database and can be queried using the GL VQT WebViewer[™] (web browser). Outputs of the query can be displayed in tabular or graphical format while also output to Excel or Text. Results can also be plotted on Google Maps (GPS connectivity is required). For details, visit <u>Web Based Client for Voice and Data Quality</u> <u>Testing</u> webpage.



- Real-time mapping of results with GPS option used in conjunction with VQuad™
- The results can be accessed remotely from a database, queried and displayed in web browser using WebViewer™ either in

tabular or graphic format

@ GL Webviewer	Version 6.0																R	efresh Ә	
Results 👻	Call Events		Status	s & Statis	tics 👻		Reports	•		Lo	ad Filters	-Select	t Filter				~ 0		
VQT-POLQA Results between 11/09/202	2 05:27:04 and 05/0	9/2023 05:27:04	(Last 6 Moi	nths)															
Date & Time Standard 10 M	finutes 1 Hour 12	Hours 24 Hours	Today Yes	terday 7 L	Days 1 Mon	th 6 Months													
Timestamp Type VQuad Timestamp																			
Event ID Filter Contains																			
Apply																			
Actions Records Per Page: 2	00 🗸																		
VQuad Call VQuad Call ID Timestamp Timestamp	VQuad Device ID	VQuad GPS	Latitude	Longitude	Degraded Filename	Rating	POLQA v3 MOS	POLQA MOS	EModel (R-factor)	Speech Level Gain (dB)	Noise Level Gain (dB)	Active Speech Level - Ref (dBm)	Active Speech Level -) Deg (dBm)	Mean Noise Level - Ref (dBm)	Mean Noise Level - Deg (dBm)	SNR - Ref (dB)	SNR - Deg (dB)	Active Speech Ratio - Ref (%)	Active Speech Ratio - Deg (%)
05/06/202:05/06/202:GLRobFaxVQTTest 14:41:01 14:37:54	RobFXO2	N39°08'36'' W077°12'57''	39.14	-77.22	fem1POLQ/	Excellent		4.16	83.95	-14.86	-13.47	-24.28	-39.14	-62.79	-76.26	38.51	37.12	57	50
05/06/202:05/06/202:GLRobFaxVQTTest 14:40:48 14:37:54	RobFXO1	N39°08'36" W077°12'57"	39.14	-77.22	fem1POLQ/			N/A	0	0	0	0	0	0	0	0	0	0	0
05/06/202:05/06/202:GLRobFaxVQTTest 14:40:31 14:37:54	RobFXO2	N39º08'36" W077º12'57"	39.14	-77.22	fem1POLQ/	Excellent		4.09	81.67	-14.86	-13.8	-24.28	-39.14	-62.79	-76.58	38.51	37.44	57	50
05/06/202:05/06/202:GLRobFaxVQTTest 14:40:18 14:37:54	RobFXO1	N39°08'36" W077°12'57"	39.14	-77.22	fem1POLQ/	Excellent		4.26	86.91	-12.6	-12.78	-24.28	-36.88	-62.79	-75.58	38.51	38.7	57	50
05/06/202:05/06/202:GLRobFaxVQTTest 14:36:52 14:33:45	RobFXO2	N39º08'36" W077º12'58"	39.14	-77.22	fem1POLQ/	Excellent		4.17	84.11	-14.85	-13.85	-24.28	-39.13	-62.79	-76.64	38.51	37.51	57	51
05/06/202:05/06/202:GLRobFaxVQTTest 14:36:39 14:33:45	RobFXO1	N39º08'36" W077º12'58"	39.14	-77.22	fem1POLQ/	Excellent		4.15	83.66	-12.59	-12.73	-24.28	-36.87	-62.79	-75.52	38.51	38.65	57	50
05/06/202:05/06/202:GLRobFaxVQTTest 14:36:22 14:33:45	RobFXO2	N39°08'36" W077°12'57"	39.14	-77.22	fem1POLQ/	Excellent		4.16	83.84	-14.86	-14.04	-24.28	-39.14	-62.79	-76.83	38.51	37.69	57	50
05/06/202:05/06/202:GLRobFaxVQTTest 14:36:09 14:33:45	RobFXO1	N39º08'36" W077º12'57"	39.14	-77.22	fem1POLQ/	Excellent		4.23	86.17	-12.6	-12.7	-24.28	-36.88	-62.79	-75.49	38.51	38.61	57	50
05/06/202:05/06/202:GLRobFaxVQTTest 14:31:14 14:28:07	RobFXO2	N39°08'36" W077°12'57"	39.14	-77.22	fem1POLQ/	Excellent		4.19	84.86	-14.85	-13.83	-24.28	-39.13	-62.79	-76.62	38.51	37.49	57	50
05/06/202305/06/2023GLRobFaxVQTTest 14:31:01 14:28:07	RobFXO1	N39°08'36" W077°12'57"	39.14	-77.22	fem1POLQ/	Excellent		4.25	86.72	-12.6	-12.42	-24.28	-36.88	-62.79	-75.21	38.51	38.33	57	50
05/06/202:05/06/202:GLRobFaxVQTTest 14:30:43 14:28:07	RobFXO2	N39°08'36" W077°12'57"	39.14	-77.22	fem1POLQ/	Good		3.91	77.11	-14.84	-13.47	-24.28	-39.12	-62.79	-76.26	38.51	37.14	57	50

🚳 GL Communications Inc.

VQuad[™] POLQA Events

As an option, POLQA can be added directly to VQuad[™] software with support for automated testing within the VQuad[™] script. In this scenario the degraded voice files remain at the VQuad[™] node for analysis and display within the VQuad[™] software. The below screenshot shows VQuad[™] POLQA Events.

l'imestamp	Phone ID	Deg File	POLQA S	E-Model	Rating	Speech L	Noise Le	Ave Jitter	Min Jitte
2/19/2013 11:22:42 AM	VQFX0-1	fem1test	3.62	70.47	Pass	-14.50	-7.29	2.19	0.00
2/19/2013 11:23:00 AM	VQFX0-1	male1test	3.47	67.35	Fail	-14.78	-3.04	0.06	-0.13
2/19/2013 11:24:07 AM	VQFX0-1	fem1test	3.60	69.97	Pass	-14.51	-7.44	2.56	0.00
2/19/2013 11:24:24 AM	VQFX0-1	male1test	3.48	67.54	Fail	-14.79	-2.74	0.31	0.00
2/19/2013 11:27:16 AM	VQFX0-1	fem1test	3.68	71.79	Pass	-14.50	-7.22	1.81	0.00
2/19/2013 11:27:33 AM	VQFX0-1	male1test	3.44	66.75	Fail	-14.78	-2.74	0.56	-1.13
2/19/2013 11:28:40 AM	VQFX0-1	fem1test	3.57	69.50	Pass	-14.50	-7.23	1.81	0.00
2/19/2013 11:28:58 AM	VQFX0-1	male1test	3.46	67.15	Fail	-14.79	-2.55	0.31	0.00
2/19/2013 11:31:50 AM	VQFX0-1	fem1test	3.61	70.33	Pass	-14.50	-6.64	0.25	-0.50
2/19/2013 11:32:07 AM	VQFX0-1	male1test	3.35	65.00	Fail	-14.79	-2.03	0.31	0.00
2/19/2013 11:33:14 AM	VQFX0-1	fem1test	3.69	71.97	Pass	-14.50	-6.86	0.31	0.00
2/19/2013 11:33:31 AM	VQFX0-1	male1test	3.43	66.51	Fail	-14.77	-2.46	0.06	-0.13
		П	1						*

VQT CLI

The VQT CLI is designed to remotely access various application functionalities and thus controlling VQT nodes located at various destinations. The supporting commands helps the VQT users to run the application installed on remote PC, get the connection status, run the analysis, load Auto Measurement configuration, start/stop Auto Measurement, save events captured to file, transfer the events captured to client, get any file from server or even get latest log, and other operations. The VQT CLI is supported on Windows[®] and Linux systems .

📼 Administrator: C:\Windows\system32\cmd.exe - vqtcli 192.168.1.188	X
Microsoft Windows XP [Version 5.1.2600] (C) Copyright 1985–2001 Microsoft Corp.	^
C:\Documents and Settings\Poornimaa>cd\	
C:\>cd C:\Program Files\GL Communications Inc\VQT	
C:\Program Files\GL Communications Inc\VQT>vqtcli 192.168.1.18 VQT Remote Access (client) v.4.8.0	Ш
VQT IP Address: 192.168.1.18	
UQT: Connecting Deamon: Connecting UQT: Connected. UQT: Connecting Deamon: Connected.	
vqt C:\VQT_Reference\VQuad_Auto\Raw\fem1.pcm C:\VQT_Degraded\1\record_2013032112 4609_I_Port1ToPort0_f2_20130321124601_p.pcm 1 1 VQT: Message sent. PAMS LE: 4.96 PAMS LQ: 4.90 PSQM: 0.00 PSQM PLUS: 0.00 PSQM PLUS: 0.00 PESQ: 4.44 PESQ LQ: 4.47 PESQ LQ: 4.51 PESQ UB: -1.00 POLQA: 4.50 EModel: 100.00	+

🌑 GL Communications Inc.

VQT with Python API

The VQT Python libraries provide a range of Python functions which can be used to remotely or locally control these two applications. The VQT library can be used to run automatic and manual VQT tests with custom settings.

Python for VQT works by connecting to the existing VQT CLI and using a portion of the CLI commands to run manual and automated VQT tests. Class variables are linked to the settings for each test and can be changed easily.



Main Features

- Python scripts support accessing and VQT functionalities remotely
- Controls VQT nodes located at various destinations
- Automation with enhanced Python scripting and remote operation includes traffic generation, call control, and automated scheduling of operation

For complete details, refer to Python Scripting for Automation and Remote Access of Voice Quality Testing webpage.



Buyer's Guide

Page 11	

Item No	Product Description
<u>VQT002</u>	Voice Quality Testing (PESQ only)
<u>VQT006</u>	Voice Quality Testing (POLQA v 2.4)
<u>VQT007</u>	Voice Quality Testing (POLQA v3)
Item No	Related Hardware
<u>VQT251</u>	Dual UTA HD Next generation Dual UTA with FXO Wideband support
<u>VQT252</u>	Dual UTA HD – Bluetooth Option
<u>VQT280</u>	VQuad™ Probe HD (with Dual UTA HD)
Item No	Related Software
<u>VQT010</u>	VQuad™ Software
<u>VQT010</u> <u>VQT014</u>	VQuad™ Software AutoVQT™ (POLQA v2.4)
<u>VQT010</u> <u>VQT014</u> <u>VQT014U</u>	VQuad™ Software AutoVQT™ (POLQA v2.4) Upgrade from VQT POLQA to AutoVQT™
VQT010 VQT014 VQT014U VQT014U VBA032	VQuad™ Software AutoVQT™ (POLQA v2.4) Upgrade from VQT POLQA to AutoVQT™ Near Real-time Voice-band Analyzer
VQT010 VQT014 VQT014U VQT014U VBA032 EMU037	VQuad™ Software AutoVQT™ (POLQA v2.4) Upgrade from VQT POLQA to AutoVQT™ Near Real-time Voice-band Analyzer Echo Measurement Utility (EMU) Software
VQT010 VQT014 VQT014U VBA032 EMU037 VQT040	VQuad™ Software AutoVQT™ (POLQA v2.4) Upgrade from VQT POLQA to AutoVQT™ Near Real-time Voice-band Analyzer Echo Measurement Utility (EMU) Software VQT WebViewer™

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

For more details, visit Voice Quality Testing (VQT) Software webpage.



818 West Diamond Avenue - Third Floor, Gaithersburg, MD 20878, U.S.A (Web) <u>www.gl.com</u> - (V) +1-301-670-4784 (F) +1-301-670-9187 - (E-Mail) <u>info@gl.com</u>