Agilent Technologies

VQT Portable Analyzer – J1981A

Technical Specification

Telephony Interfaces

Analog FXO

Number of ports:	2
Connector:	RJ11 modular jack
Line impedances:	600, 900 ohms
Limit Loop Current:	variable
Signaling:	supports analog loop and ground start
Accuracy of transmission or reception of sine wave:	+/- 1 dBm under conditions: 300 Hz to 3400 Hz; -3 dBm to -50 dBm

Analog E & M

Number of ports:	2
Connector:	RJ45 modular jack
Line impedances:	600, 900 ohms
Addressing:	Delay-dial, Immediate-start, Wink-start
Signaling:	Type I, II, III, V
Transmission:	two-wire, four-wire operation
Accuracy of transmission or reception of sine wave:	+/- 1 dBm under conditions: 300 Hz to 3400 Hz; -3 dBm to -45 dBm

T1

Number of ports:	2
Jack:	RJ48C
Signalling:	ISDN PRI and CAS
Framing:	D4, ESF
Line Coding:	AMI, B8ZS
Zero bit suppression:	selectable B8ZS, ZCS, no suppression

E1

Number of ports:	2
Jack:	RJ48C
Impedance:	120 ohms (75 ohm converter available)
Signalling:	ISDN PRI and CAS
Framing:	CEPT G.703/G.704 Channel Associated Signaling
Line Coding:	HDB3 or AMI (no zero code suppression)
Zero bit suppression:	selectable B8ZS, ZCS, no suppression

Physical

Dimensions

Height:	10.5"
Length:	7"
Width:	16"
Weight:	9.6 kg (21.1 lbs)

Platform

Processor:	Pentium®II 400MHz
Memory:	128MB
Hard disk drive:	20GB
External drive:	1 LS-120 high capacity (120MB) floppy drive
External drive:	1 CDROM 32X
Display type:	14.1" XGA 1024x768
Network Interface Card:	10/100 Mbps
Built-in mouse:	touchpad
External mouse:	serial mouse
Keyboard:	1
External Video output:	1
Audio line out:	1, stereo
Serial ports:	2
Parallel port:	1
PCMCIA Type II slots:	2
Operating system:	MS Windows®NT 4.0, SP 6a
Power:	115/230 V~, 50/60 Hz, 4/2A
Regulatory compliances:	UL/CUL, CE, C-Tick

Feature Summary

- Distributed VQT software allows client software for PC control of remote VQT Servers.
- Delay (one-way and roundtrip)
- Clarity using PESQ (ITU P.862)
- Clarity File using PESQ applied off-line to audio files
- Clarity Trending using PESQ (trending results on multiple repetitions)
- Clarity using PAMS
- Clarity File using PAMS applied off-line to audio files
- Clarity Trending using PAMS (trending results on multiple repetitions)
- Clarity using PSQM+ (enhanced version of ITU P.861)
- Clarity File using PSQM+ applied off-line to audio files
- Clarity Trending using PSQM+ (trending results on multiple repetitions)
- Clarity Distributed One-Way Measurements for PAMS and PSQM+ measurements.
- Over 150 voice samples in 9 languages for testing
- Echo – PACE (Perceived Annoyance Caused by Echo)
- Echo Double-Talk (measures performance during two-way conversation)
- Signal loss measurement
- DTMF twist and attenuation
- Voice Activity Detector: front-end clipping, hold-over time, and comfort noise generation
- Remote Audio Playback Tool
- Path confirmation
- Impulse response
- Network Simulator
- Automated Testing
- Interactive Testing
- Pre-defined tasklists
- Single, repeat, and continuous test modes
- End-to-end and round-trip measurements
- File Play and Record
- Noise Generator
- Tone Generator
- Port loopback
- Colorful, graphical presentation of test results
- Audio monitor
- Log files of results and configurations
- Active log viewing
- Full graphical viewing of saved test logs

Delay

Description:	Measures transmission delay of VF signal from source port to destination port (end-to-end), and from source port to destination port to source port (round-trip).
Test signal:	MLS
Gain applied to test signal:	-40dBm to 0dBm
Audio path:	end-to-end, roundtrip
Measurement iterations:	single, repeat, continuous
Max iterations:	1440
Max measurement window:	2 seconds
Resolution:	1 millisecond
User-set thresholds:	maximum delay, minimum delay
Measurements[i]:	minimum delay, maximum delay, average delay, last delay, duration, max threshold exceeded, below min threshold, duration, tests completed, timeouts
Graph:	delay (over entire duration of transmission), max threshold, min threshold, summary, last measurement made

Clarity (PESQ)

Description:	Measures perceptual quality of voice transmitted across a network
Measurement Standard:	ITU P.862 Perceptual Evaluation of Speech Quality
Test Signal:	Natural voice
Audio Path:	Local one-way and local round-trip; distributed one-way and distributed round-trip
Measurement Iterations:	Single (use Clarity Trending for multiple iterations)
User-set thresholds:	PESQ score
Reported Results:	PESQ score, PESQ threshold, Average Symmetrical Disturbance, Average Asymmetrical Disturbance, estimated delay
Graphical Results:	Symmetrical Disturbance, Asymmetrical Disturbance, Error Surface, transmitted signal, received signal

Clarity Trending (PESQ)

Description:	Performs PESQ measurement in multiple iterations for trending data. Adheres to Clarity (PESQ) specification, with the following exceptions:
Measurement Iterations:	repeat *n* times or continuous
Maximum Iterations:	1440
User-set thresholds:	PESQ score
Reported Results:	Averaage PESQ score, last PESQ score, High PESQ score, Low PESQ score, Overall Average Symmetrical Disturbance, Overall Average Asymmetrical Disturbance, average estimated delay
Graphical Results:	PESQ score per iteration, average PESQ score, minimum PESQ score, maximum PESQ score

Clarity File (PESQ)

Description:	Performs offline Clarity (PESQ) measurement for pre-recorded audio files. Adheres to Clarity (PESQ) specification.

Clarity (PSQM+)

Description:	Measures perceptual quality of voice transmitted across a network
Measurement Standard:	PSQM+, an enhancement to the ITU P.861 recommendation for Perceptual Speech Quality Measurement (PSQM)
Test Signal:	Natural voice
Audio Path:	Local one-way and local roundtrip, distributed one-way and distributed roundtrip.
Measurement Iterations:	Single (user Clarity Trending for multiple iterations)
Measurement Resolution:	0.01 PSQM+
User-set Thresholds:	maximum PSQM+, average PSQM+, outliers percentage
Reported Results:	average PSQM+, average PSQM+ threshold exceeded, maximum PSQM+, maximum PSQM+ threshold exceeded, outliers percentage, outliers percentage threshold exceeded, PSQM+ standard deviation, MOS equivalent, delay, loss/gain, correlation timeout
Graphical Results:	reference signal, received signal, PSQM+ scoring over time, maximum PSQM+ threshold

Clarity Trending (PSQM+)

Description:	Performs Clarity (PSQM+) measurement in multiple iterations for trending data. Adheres to Clarity (PSQM+) specification, with the following exceptions:
Measurement Iterations:	repeat *n* times or continuous
Maximum Iterations:	1440
User-set Thresholds:	overall average PSQM+, maximum average PSQM+, outliers percentage
Reported Results:	*Results are reported against the average PSQM+ score for each iteration:* overall average PSQM+, overall average PSQM+ threshold exceeded, last average PSQM+, high average PSQM+, low average PSQM+, average outliers percentage, average outliers percentage threshold exceeded, average delay, average loss/gain, test duration, tests completed, correlation timeouts
Graphical Results:	average PSQM+ per iteration, maximum PSQM+ per iteration, average PSQM+ threshold, outliers percentage per iteration, outliers percentage threshold

Clarity File (PSQM+)

Description:	Performs offline Clarity (PSQM+) measurement for pre-recorded audio files. Adheres to Clarity (PSQM+) specification.

Clarity (PAMS)

Description:	Measures perceptual quality of voice transmitted across a network
Measurement Standard:	Perceptual Analysis Measurement System (PAMS)
Test Signal:	Artificial speech, natural voice
Audio Path:	Local one-way and local roundtrip, distributed one-way and distributed roundtrip.
Measurement Iterations:	Single (user Clarity Trending for multiple iterations)
Measurement Resolution:	0.01 LQS, 0.01 LES
User-set Thresholds:	Listening Quality Score, Listening Effort Score
Reported Results:	Listening Quality Score, Listening Effort Score, Listening Quality Score threshold exceeded, Listening Effort Score threshold exceeded, correlation timeout
Graphical Results:	Error surface, reference signal waveform, degraded signal waveform

Clarity Trending (PAMS)

Description:	Performs Clarity (PAMS) measurement in multiple iterations for trending data. Adheres to Clarity (PAMS) specification, with the following exceptions:
Measurement Iterations:	repeat *n* times or continuous
Maximum Iterations:	1440
User-set Thresholds:	Listening Quality Score, Listening Effort Score
Reported Results:	average LQS, minimum LQS, maximum LQS, average LES, minimum LES, maximum LES, LQS threshold exceeded, LES threshold exceeded, test duration, tests completed, correlation timeouts
Graphical Results:	LQS, average LQS, minimum LQS, maximum LQS, LQS threshold, LES, average LES, minimum LES, maximum LES, LES threshold

Clarity File (PAMS)

Description:	Performs offline Clarity (PAMS) measurement for pre-recorded audio files. Adheres to Clarity (PAMS) specification.

Echo – PACE

Description:	Measures echo received during and after transmission of voice, and the Perceived Annoyance Caused by Echo (PACE)
Test Signal:	Natural voice
Audio Path:	End-to-end, roundtrip with network echo simulation
Measurement Iterations:	Single
Measurement Resolution:	0.01 PSQM+, 1 msec echo duration, 1 msec echo delay
User-set Thresholds:	Average PSQM+, maximum PSQM+, percentage of echo-free speech, outliers percentage
Reported Results:	Average PSQM+, average PSQM+ threshold exceeded, maximum PSQM+, maximum PSQM+ threshold exceeded, percentage of echo-free speech, percentage of echo-free speech threshold exceeded, outliers percentage, outliers percentage threshold exceeded, duration of echo in speech, duration of echo in silence, echo delay, correlation timeout
Graphical Results:	Reference signal, received echo signal, echo-in-speech duration, echo-in-silence duration, PSQM+ scoring over time, maximum PSQM+ threshold

Echo – Doubletalk

Description:	Measures performance of echo cancelers under conditions of Doubletalk
Test Signal:	Natural voice
Audio Path:	End-to-end in both directions
Measurement Iterations:	Single
Measurement Resolution:	0.01 PSQM+
User-set Thresholds:	Average PSQM+, maximum PSQM+, outliers percentage
Reported Results:	Average PSQM+, average PSQM+ threshold exceeded, maximum PSQM+, maximum PSQM+ threshold exceeded, outliers percentage, outliers percentage threshold exceeded, correlation timeout
Graphical Results:	Reference signal, doubletalk signal, received signal, PSQM+ scoring over time, maximum PSQM+ threshold

Signal Loss

Description:	Measures the mean loss or gain of an audio signal transmitted across the system under test. The mean loss or gain is computed by comparing the average received signal level in dB with the average reference signal level in dB
Test Signal:	Natural voice, white noise, and a single frequency tone. White noise and tone signals may be selected in the range of –40 to 0 dBm and a tone signal has a selectable frequency range from 400 to 3400 Hz
Audio Path:	End-to-End, roundtrip
Measurement Iterations:	Single
Measurement Resolution:	0.01 dB.
User-set Thresholds:	signal loss\gain threshold (dB)
Reported Results:	mean signal loss\gain in dB, signal loss threshold exceeded, correlation timeout
Graphical Results:	reference signal, received signal

Impulse Response

Description:	Measures and records the I/O transfer function of a network by transmitting test signal and measuring individual delays and amplitudes of time-segmented received signal. Records function as polynomial coefficients to be used in Network Simulator.
Test signal:	MLS
Audio path:	end-to-end
Measurement iterations:	single
Max measurement window:	2 seconds
Maximum FIR taps:	100
Resolution:	1 millisecond
User-set thresholds:	max delay threshold
Measurements:	impulse response (saved to IR file), max delay threshold exceeded, last delay, loss/gain, timeout
Graph:	delay and amplitude of received signal (over entire duration of transmission)

DTMF Tone

Description:	Measures impact of system under test on DTMF signal transmissions, in terms of twist, attenuation, and frequency deviation.
Test signal:	DTMF (1 to 16 signals)
Audio path:	end-to-end
Measurement iterations:	single
User-set thresholds:	twist threshold (max and min amplitudes)
Measurements:	twist, low-freq tone amplitude, high-freq tone amplitude, low-freq tone frequency shift, high-freq tone frequency shift, timeout.
Graph:	frequency response, low-freq tone marker, high-freq tone marker, low-freq tone amplitude marker, high-freq tone amplitude marker.

Voice Activity Detector

Description:	Measures the impact of a VAD on a VF signal in terms of front-end clipping and hold-over time.
Test signal:	MLS
Gain applied to test signal:	-30db to -5 db
Test signal duration:	100 to 5000 msec
Gain applied to tracer signal:	-60db to -20db
Audio path:	end-to-end
Measurement iterations:	single
Max correlation window:	2 seconds
Resolution:	1 msec
Measurements:	Front-end clipping, hold-over time, transmitted signal duration, received signal duration
Graph:	received signal amplitude, received signal frequency spectrum, pulse start marker, VAD open marker, pulse end marker, VAD close marker.

File Play and Record

Description:	Transmits a user-selected audio file on one port, records the received signal on another port and saves to audio file. Tone and/or noise may be added to audio file transmission.
Gain applied to transmitted file:	-60db to 60db
Measurement iterations:	single, repeat, continuous

Network Simulator (Analog Only)

Description:	Simulates a previously tested network by applying the impulse response file to a test signal. Gain, delay, tone, and/or noise may be added to test signal.
Gain applied to test signal:	-60db to 60 db
Delay applied to test signal:	11 to 1000 msec

Noise Generator

Description:	Transmits noise signal over selected port.
Signal:	MLS
Signal duration:	128 to 16384 msec
Gain applied to Signal:	-60db to 0db

Tone Generator

Description:	Transmits single-frequency tone over selected port.
Tone duration:	not limited
Gain applied to signal:	-60db to 0db

Audio Monitor

Selectable source port monitoring modes:	transmit, receive, transmit and receive, none
Selectable destination port monitoring modes:	transmit, receive, transmit and receive, none
Selectable Remote audio monitor modes:	Record, "record and upload", "record, upload, and automatically play", none

Controlling PC Hardware Requirements

Minimum Configuration

CPU: Pentium® 3 200 MHz
Memory: 64 MBytes
Hard Disk: 100 MB
Screen Resolution: 800x600
TCP/IP Stack: Microsoft's built-in TCP/IP stack
Supported OS's: Windows® 98 SE, Windows® NT 4.0 SP 5, Windows® 2000

Recommend Configuration

CPU: Pentium® 3 500 MHz
Memory: 128 MBytes
Hard Disk: 100 MB
Screen Resolution: 1024x768
TCP/IP Stack: Microsoft's built-in TCP/IP stack
Supported OS's: Windows®98 SE, Windows® NT 4.0 SP 5, Windows 2000®

Operating Conditions

Temperature

Operating:	+5°C to +40°C (+41°F to +104°F)
Non-operating:	-40°C to +70°C (-40°F to +158°F)

Humidity

Operating:	5% to 93% relative humidity, non-condensing
Non-operating:	5% to 93% relative humidity, non-condensing

Altitude

Operating:	-305 to 4570 meters (-1000 to 15,000 feet)
Non-operating:	-460 to 12,200 meters (-1500 to 40,000 feet)

Related Literature

Downtime is not an Option for Enterprise	Brochure	5988-2430EN
VQT Portable Analyzer J1981 A/B, VQT Network Server J1987A, Advisor VQT Undercradle J4630A	Product Overview	5968-7723E
VQT Network Sever J1987A	Technical Specification	5988-3045EN

Warranty

Hardware: 1 year warranty
Software: 90 day replacement only

Notes

Agilent Technologies' Test and Measurement Support, Services, and Assistance

Agilent Technologies aims to maximize the value you receive, while minimizing your risk and problems. We strive to ensure that you get the test and measurement capabilities you paid for and obtain the support you need. Our extensive support resources and services can help you choose the right Agilent products for your applications and apply them successfully. Every instrument and system we sell has a global warranty. Support is available for at least five years beyond the production life of the product. Two concepts underlie Agilent's overall support policy: "Our Promise" and "Your Advantage."

Our Promise

Our Promise means your Agilent test and measurement equipment will meet its advertised performance and functionality. When you are choosing new equipment, we will help you with product information, including realistic performance specifications and practical recommendations from experienced test engineers. When you use Agilent equipment, we can verify that it works properly, help with product operation, and provide basic measurement assistance for the use of specified capabilities, at no extra cost upon request. Many self-help tools are available.

Your Advantage

Your Advantage means that Agilent offers a wide range of additional expert test and measurement services, which you can purchase according to your unique technical and business needs. Solve problems efficiently and gain a competitive edge by contracting with us for calibration, extra-cost upgrades, out-of-warranty repairs, and on-site education and training, as well as design, system integration, project management, and other professional engineering services. Experienced Agilent engineers and technicians worldwide can help you maximize your productivity, optimize the return on investment of your Agilent instruments and systems, and obtain dependable measurement accuracy for the life of those products.

www.agilent.com

Agilent Ordering Information

J1981A VQT Network Server

Related Hardware Products

Opt. 200 VQT Analog Interface
Opt. 201 VQT T1 Interface
Opt. 202 VQT E1 Interface

Education

H7211B Essentials of VoIP Protocols

Opt. 207 Instructor Led Training

By internet, phone or fax, get assistance with all your Test and Measurement needs.

Online assistance:
http://www.agilent.com/find/assist

United States:
(Tel) 1 800 452 4844

Canada:
(Tel) 1 877 894 4414
(Fax) (905) 282 6495

China:
(Tel) 800-810-0189
(Fax) 1-0800-650-0121

Europe:
(Tel) (31 20) 547 2323
(Fax) (31 20) 547 2390

Japan:
(Tel) (81) 426 56 7832
(Fax) (81) 426 56 7840

Korea:
(Tel) (82-2) 2004-5004
(Fax) (82-2) 2004-5115

Latin America:
(Tel) (305) 269 7500
(Fax) (305) 269 7599

Taiwan:
(Tel) 080-004-7866
(Fax) (886-2) 2545-6723

Other Asia Pacific Countries:
(Tel) (65) 375-8100
(Fax) (65) 836-0252

Printed in U.S.A. October 22, 2001

5968-8811E

Use this link to go directly to our network troubleshooting solutions:

http://www.agilent.com/comms/onenetworks

Agilent Technologies