Agilent Technologies

VQT Network Server – J1987B

Technical Specification

Telephony Interfaces

Analog FXO

Number of ports:	2
Connector:	RJ11 modular jack
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
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

10/100 Ethernet VoIP

Number of ports:	1
Jack:	RJ45
Transmission:	10/100Base-T (10/100 Mbps)
Signaling:	SIP (IETF RFC 2543); H.323
Media:	RTP (IETF RFC 1889)

Physical Specifications

Dimensions

Height:	88 mm (3.46 inches) (2 RU)
Length:	450 mm (17.7 inches)
Width:	482 mm (19 inches)
Weight:	10.2 kg (22.5 lb)

Platform

Processor:	Pentium III® 850 MHz
Memory:	256 MB
Hard disk drive:	40 GB
Floppy drive:	1.44 MB 3.5"
Network Interface Card:	10/100 Mbps
Audio line out:	1, stereo

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 :	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 Listening Quality (LQ) score
Reported Results:	PESQ Listening Quality (LQ) 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 Listening Quality (LQ) score
Reported Results:	Average PESQ (LQ) score, last PESQ (LQ) score, High PESQ (LQ) score, Low PESQ (LQ) score, Overall Average Symmetrical Disturbance, Overall Average Asymmetrical Disturbance, average estimated delay
Graphical Results:	PESQ (LQ) score per iteration, average PESQ (LQ) score, minimum PESQ (LQ) score, maximum PESQ (LQ) score

Clarity File (PESQ)

Description:	Performs off-line 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 (PSQM)

Description:	Measures echo received during and after transmission of voice, and the Perceived AnnoyanceCaused 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 – PACE (PESQ)

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 PESQ LQ, 1 msec echo duration, 1 msec echo delay
User-set Thresholds:	Average PESQ LQ, maximum PESQ LQ, percentage of echo-free speech, outliers percentage
Reported Results:	Average PESQ LQ, average PESQ LQ threshold exceeded, maximum PESQ LQ, maximum PESQ LQ exceeded, percent age of echo-free speech, percentage of echo-free speech threshold exceeded, outliers percentage, outliers percentage threshold exceeded, duraction of echo in speech, duration of echo in silence, echo delay, Average Symmetrical Disturbance, Average Asymmetrical Disturbance, correlation timeout.
Graphical Results:	Reference signal, received echo signal, echo in speech duration, echo in silence duration, Symmetrical Frame Disturbance, Asymmetrical Frame Disturbance

Echo – Doubletalk (PSQM)

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

Echo – Doubletalk (PESQ)

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 PESQ LQ
User-set Thresholds:	Average PESQ LQ
Reported Results:	Average PESQ LQ, Average PESQ LQ threshold exceeded, Average Symmetrical Disturbance, Average Asymmetrical Disturbance, correlation timeout.
Graphical Results:	Reference signal, doubletalk signal, received signal, Symmetrical Frame Disturbance, Asymmetrical Frame Disturbance

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

Physical 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:	0°C to +40°C (+32°F to +104°F)
Non-Operating:	-40°C to +60°C (-40°F to +140°F)

Humidity

Operating:	20% to 80% relative humidity, non-condensing
Non-Operating:	20% to 90% relative humidity, non-condensing

Altitude

Operating:	3km (10kft)
Non-Operating:	3km (10kft)

Power Requirements

Line Input Rating;	100-127V~, 60Hz, 9.0A 200-240V~, 50Hz, 4.5A

Regulatory Compliances

Electromagnetic Compatibility

IEC 61326-1
European Low-Voltage and EMC Directives
AS/NZS 2064.1
ICES/NMB-001
This ISM device complies with Canadian ICES-001.
Cet appareil ISM est conforme a la norme NMB-001 du Canada.

Safety

IEC 61010-1 (self-certify)
CSA C22.2 No. 1010.1
UL 3111 (self-certify)

Related Literature

Downtime is not an Option for Enterprise	Brochure	5988-439EN
VQT Portable Analyzer J1981A/B, VQT Network Server J1987A, Advisor VQT Undercradle J4630A	Product Overview	5968-7723E
VQT Portable Analyzer J1981B	Technical Specification	5988-4041EN

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Notes

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Agilent Ordering Information

J1987B	VQT Rackmount Network Server
Module Interfaces	
J1987B-200	VQT Analog interface
J1987B-201	VQT T1 interface
J1987B-202	VQT E1 interface
J5479A	VQT 10/100 SIP and H.323 interface software license
Software	
J1979A	Additional VQT Client software license
J1982A	License to use PAMS voice clarity measurement
J1983A	License to use PSQM voice clarity measurement
J1997A	License to use PESQ voice clarity measurement
J5422A	IP Telephony Reporter
Accessories	
J1996A	VQT phone adapter
Education	
H7211B-207	Voice over IP Technology and Testing
Warranty and Support Services	
Hardware	1 year Agilent Instrument Warranty and Service Plans Agilent Instrument Phone Support
Software	90 day media warranty

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Switzerland-Italy	+39 (0) 2 92 60 8484
Switzerland-French	+33 (0) 825 010 700
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