



don't guess... measure it!

Agilent Technologies VQT Voice Quality Test Solution Overview and Data Sheet

*Technology to quickly identify
and solve Voice Quality
problems in today's converged
IP networks and equipment*



Agilent Technologies

The Complete Voice Quality Testing Solution

The Agilent Voice Quality Tester (VQT) is a comprehensive and objective voice quality testing solution. It enables the design, deployment, and operation of high quality voice services on next generation networks by providing accurate and objective testing of voice service quality.

The VQT provides detailed test and analysis capabilities for voice quality on modern telephony networks such as IP Telephony and other next generation networks or voice transport systems such as 3G mobile or radio systems. It provides robust and reliable measurements that go beyond basic test scores. The VQT provides detailed scoring and analysis that expose the underlying impairments to voice quality. By including testing for voice clarity, delay, echo, silence suppression, DTMF, and signal loss, all on one box, the VQT provides a total solution for testing voice quality on next generation and legacy networks.

Supporting analog and 10/100/1000 Ethernet VoIP interfaces, the VQT enables end-to-end testing across any telephony or voice network. Connect the VQT to voice gateways, routers, Telco POTS, IP and PC phones, telephone switches, PBXs, cable modem multi-media Terminal Adapters, DSL Integrated Access Devices, IP access networks, radios, mobile phones and more.

Distributed test capabilities allow network professionals to remotely operate multiple VQT test systems anywhere on the network. This remote control capability drastically reduces costly, time-consuming travel requirements, and the need for trained staff working in multiple locations.

The VQT enables companies to shorten the development and deployments of IP telephony networks by identifying and exposing voice quality impairments early in the development life-cycle when they are much less expensive to fix. The VQT also enables companies to maintain networks easier with less investment and cost by allowing engineers to troubleshoot quality impairments efficiently and remotely.

VQT Test Applications

- ⊕ Certify Network Deployments for Voice Services
- ⊕ Determine if Network Meets Voice Quality Standards
- ⊕ Baseline Network Performance Under Varying Conditions
- ⊕ Optimize Systems and Networks for Voice Quality
- ⊕ Monitor Network for Voice Quality Impairments
- ⊕ Troubleshoot Voice Quality Impairments
- ⊕ Assess Network Performance Against Competitor Networks and the PSTN
- ⊕ Test New Products and Designs for Voice Quality
- ⊕ DELIVER TOLL QUALITY!

VQT Measurements and Tools

- ⊕ Voice clarity using ITU P.862 PESQ
- ⊕ Voice clarity using ITU P.861 PSQM+
- ⊕ Voice clarity using PAMS
- ⊕ Voice Delay
- ⊕ Echo delay, intensity, duration in speech, duration in silence
- ⊕ Echo PACE - Perceived Annoyance Caused by Echo
- ⊕ Echo Doubletalk - Performance of echo cancellers under conditions of Doubletalk (Analog card only)
- ⊕ Signal Loss
- ⊕ Silence Suppression Analysis and VAD Front-end Clipping (Analog card only)
- ⊕ DTMF Tone Distortion (Analog card only)
- ⊕ Impulse Response
- ⊕ Network Simulator (Analog card only)
- ⊕ File Play and Record
- ⊕ Tone and Noise Generators
- ⊕ Port Loopback

Design and Maintain Networks to Meet Quality Standards while Optimizing Network Efficiency

IP Telephony and other next generation network technologies have the real potential of increasing network efficiencies, and decreasing capital and operating costs, by orders of magnitude. But delivering toll quality of service is critical to win and maintain market share, reduce churn and maximize service revenue.

The VQT enables network engineers and technicians to design, troubleshoot, and maintain voice networks and carefully balance network efficiency with voice quality.

- ⊕ Objectively measure voice quality from an end-user's perspective, and from different access points on a network.
- ⊕ Easily troubleshoot the root cause of poor voice quality scores
- ⊕ Isolate voice quality impairments and identify network resources that need reconfiguration.
- ⊕ Perform detailed analysis of voice clarity, delay, echo, and DTMF transmissions to get to the root cause of the problem.
- ⊕ Use the VQT in conjunction with the Agilent Telephony Network Analyzer or Triple Play Analyzer (J6900A) to measure VoIP packet performance and correlate network events with voice and service quality.
- ⊕ Optimize networks by determining the exact effects that network configuration and design changes have on voice quality. Test the impact of voice codecs, silence suppression, comfort noise generation, jitter buffers, IP network configurations, QoS and traffic prioritization mechanisms, and other technologies.
- ⊕ Automate voice tests – use pre-configured task lists or design your own test scenarios. Experts can design tests that can be quickly performed in a repeatable fashion without the need for programming knowledge.
- ⊕ Certify and troubleshoot deployments of a global network, remotely from a central site.
- ⊕ Test voice clarity and distortion one-way across any two sites on a network– determine the real experience that your network provides for your users.

Network Platforms

The VQT interfaces are an analog interface and a 10/100/1000 Ethernet NIC interface on a personal computer running the VQT software. The VQT Phone Adapter enables the VQT to test voice quality of IP phones and PC phones by providing an audio interface between the phone's handset interface or the PC's soundcard, and the VQT analog FXO or E&M ports. The handset adapter may also be used to test other voice communications devices such as mobile telephones and radios as long as they have external handset jacks.

The analog test card must be installed in a personal computer meeting the minimum specified requirements that allow the Voice Quality Test solution to fully function. The VQT base software is required to run tests over the analog interface.



VQT analog interface card in a ruggedized PC with the Agilent Phone Adapter

Analog Interface (J1986B)

- ⊕ Quad-port Interface Supports FXO and E&M, both 2-wire and 4-wire
- ⊕ Test voice quality into POTS lines, Cable Modem MTAs, DSL IADs, FXS VoIP Access Routers, and Residential Gateways.
- ⊕ Test voice quality characteristics of analog-access end-users
- ⊕ Dimensions: 12.7 cm x 31.75 cm (5.0 in x 12.5 in)
- ⊕ Includes grounding plane: 12.7 cm x 2.54 cm (5.0 in x 1 in)
- ⊕ Power consumption: 25 watts
- ⊕ Designed to PCI 2.2 specifications

The VQT base software enables voice quality testing via a desktop or notebook PC through a 10/100/1000 NDIS compliant network interface card. This cost effective solution is ideal as a dispatched tool to IP endpoints for VoIP active testing with any VQT. Both SIP and H.323 protocols are supported.

10/100/1000 baseT VoIP Interface

- # 10/100/1000 Mbps Ethernet interface supports VoIP call generation using the Session Initiation Protocol (SIP) and H.323 with G.711 and G.729 codecs
 - SIP RFC 2474
 - SIP RFC 3261
 - SIP RFC 3262
 - SIP RFC 3311
- # Test voice quality directly into an IP network - Troubleshoot voice quality impairments by segmenting an IP network for fault isolation
- # The VQT supports up to one NIC per Personal Computer

VQT Phone Adapter (J1996A)

With the VQT Phone Adapter, users can test voice quality from an IP/PC phone to an IP/PC phone, or from an IP/PC phone to a PSTN phone, gateway, or any access device. Measure voice quality as it is truly experienced by an IP/PC phone end-user.

- # Phone Adapter Interfaces
- # One E&M port: RJ-45
- # One FXO port: RJ-11
- # Handset interface RJ-22
- # Interface to sound cards: two bantam plugs

Key Features and Functionality

- # Test Voice Clarity using PESQ: Perceptual Evaluation of Speech Quality
 - Based on the new ITU P.862.1 standard
 - Provides objective measurements of speech quality based on human perception factors
 - Simple scores that correlate to subjective test results
 - Graphical results of frame disturbance values and the audible error surface
 - Numerical results of PESQ scores and disturbance values
 - Distributed one-way measurements across a global network
- # Test Voice Clarity using PSQM+: Perceptual Speech Quality Measurement
 - Based on the improved ITU P.861 standard to account for severe distortions encountered in packet networks
 - Provides objective measurements of speech quality based on human perception factors
 - Graphical frame-by-frame scoring over time, correlated with transmitted and received signal graphs, exposes impairments in voice quality
 - Numerical results of PSQM+ scores and statistical analysis
 - Distributed one-way measurements across a global network
- # Test Voice Clarity using PAMS: Perceptual Analysis Measurement System
 - Provides objective measurements of speech quality based on human perception factors
 - Simple scores that correlate to subjective test results
 - Enhanced signal processing techniques for a robust measurement across variable-delay networks
 - Graphical results of the audible error surface exposes impairments in voice quality
 - Numerical results of PAMS scores
 - Distributed one-way measurements across a global network

- ⊕ Delay
 - End-to-end voice delay measurements with patented one-millisecond resolution
 - One-way and round-trip measurements
 - Single measurements and trending analysis
- ⊕ Echo
 - Echo and Echo Doubletalk testing with PACE. Perceptual Annoyance Caused by Echo (PACE) is a method developed for determining the level of annoyance the echo is causing the end-user.
 - Detect echo in a voice transmission and measure its impact on conversational quality
 - Measure echo delay and duration with user-set detection thresholds
 - Test echo using real human speech
- ⊕ Echo Doubletalk
 - Test the performance of echo cancellers under conditions of Doubletalk
 - Test echo canceller performance using real human speech
- ⊕ Signal Loss
 - Measure one-way and roundtrip signal loss using voice, tones, or noise
- ⊕ DTMF distortion
 - Measure the attenuation, twist, and frequency deviation of DTMF signals
- ⊕ Silence suppression analysis
 - Test the impact of Voice Activity Detectors and Comfort Noise Generators
- ⊕ Test with over 150 different voice samples in 9 different languages
- ⊕ Off-line clarity measurements on audio files, using PESQ, PSQM+, and PAMS
- ⊕ Automated and Interactive testing
- ⊕ File Play and Record
- ⊕ Tone and Noise Generator
- ⊕ Port Loopback
- ⊕ Impulse response measurement
- ⊕ Network Simulator
- ⊕ Active logging of all test results and configurations, and full graphical viewing of saved test logs
- ⊕ Bearer Path confirmation
- ⊕ Single, repetitive, and continuous test modes
- ⊕ End-to-end and round-trip measurements
- ⊕ Graphical and numerical presentation of test results
- ⊕ Audio monitor with Remote Audio Playback

Professional Telephony Reports Generated with the Click of a Button

With Agilent's Telephony Report Center, you can generate professional looking reports ready for presentations. The cover page, table of contents, glossary, graphs and company logos are all automatically generated with a user-defined look and feel. User comments and summary reports can also be customized anywhere in the report.

Configuration and Ordering Information

J1986B – VQT Analog Interface. Includes dual port analog FXO, dual port analog E&M Interface card. J1988A is required software ordered separately. Includes: four E&M cables, two FXO Cables, and one audio bus jumper cable.

J1988A – VQT Base Software. Includes software for use with J1986B VQT Analog Interface, one software license required for each J1986B VQT Analog Interface. The J1988A VQT Base Software license is required for support of the 10/100/1000 NIC Ethernet Interface. One license supports up to 10 PC NIC 10/100 Ethernet inter-

faces.

J1996A – VQT Phone Adapter. Handset interface for use between the VQT Analog Interface (FXO, E&M) and IP phone handsets. A quantity of 2 Phone Adapters is recommended for doing VQT measurements. Includes: one E&M Cable, one FXO cable, two shielded audio cables, and cell phone adapter cable-RJ10 to right angle audio jack.

J1982A - PAMS Voice Clarity Software License

J1983A - PSQM Voice Clarity Software License

J1997A – PESQ Voice Clarity Software License

Note: Personal Computer ordered separately, requirements shown below.

Recommended PC Configuration and Specifications

Minimum Viable System

Intel Pentium III 800 MHz CPU

Intel 815E chipset w/133MHz FSB

At least 1 full-size PCI slot

One additional card slot for the Grounding Plane (this does not connect to the PC bus, but connects to the VQT analog board)

PC133 512 MB SDRAM

AC97 Compatible Audio

Windows XP SP2 OS installed

Recommended System

Azonix FlexPAC-4 Mobile Rugged Platform

2.8GHz Intel Pentium 4 CPU

40 GB hard drive

1GB RAM

4 slot backplane (3x PCI + 1x PCI/ISA)

Windows XP SP2 OS installed

AC97 compatible audio

Cardbus - 2 Type II or 1 Type III cardbus slots (if testing with Ethernet 10/100/1000 NIC)

Other

Any PC that exceeds or meets the recommended system performance shown above

2.8GHz Intel Pentium 4 CPU or dual core 1.4GHz, or higher

Chip set running at 533MHz FSB or higher

1 full-size PCI slot

One additional card slot for the Grounding Plane (this does not connect to the PC bus, but connects to the VQT analog board)

1GB RAM or higher

AC97 compatible audio

Windows XP SP2 OS installed



Agilent Email Updates

www.agilent.com/find/emailupdates

Get the latest information on the products and applications you select.



Agilent Direct

www.agilent.com/find/agilentdirect

Quickly choose and use your test equipment solutions with confidence.



www.agilent.com/find/open

Agilent Open simplifies the process of connecting and programming test systems to help engineers design, validate and manufacture electronic products. Agilent offers open connectivity for a broad range of system-ready instruments, open industry software, PC-standard I/O and global support, which are combined to more easily integrate test system development.



www.lxistandard.org

LXI is the LAN-based successor to GPIB, providing faster, more efficient connectivity. Agilent is a founding member of the LXI consortium.

Remove all doubt

Our repair and calibration services will get your equipment back to you, performing like new, when promised. You will get full value out of your Agilent equipment throughout its lifetime. Your equipment will be serviced by Agilent-trained technicians using the latest factory calibration procedures, automated repair diagnostics and genuine parts. You will always have the utmost confidence in your measurements.

Agilent offers a wide range of additional expert test and measurement services for your equipment, including initial start-up assistance, onsite education and training, as well as design, system integration, and project management.

For more information on repair and calibration services, go to:

www.agilent.com/find/removealldoubt

For more information on Agilent Technologies' products, applications or services, please contact your local Agilent office. The complete list is available at:

www.agilent.com/find/contactus

Americas

Canada	(877) 894-4414
Latin America	305 269 7500
United States	(800) 829-4444

Asia Pacific

Australia	1 800 629 485
China	800 810 0189
Hong Kong	800 938 693
India	1 800 112 929
Japan	0120 (421) 345
Korea	080 769 0800
Malaysia	1 800 888 848
Singapore	1 800 375 8100
Taiwan	0800 047 866
Thailand	1 800 226 008

Europe & Middle East

Austria	0820 87 44 11
Belgium	32 (0) 2 404 93 40
Denmark	45 70 13 15 15
Finland	358 (0) 10 855 2100
France	0825 010 700*
	*0.125 € fixed network rates
Germany	01805 24 6333**
	**0.14 €/minute
Ireland	1890 924 204
Israel	972-3-9288-504/544
Italy	39 02 92 60 8484
Netherlands	31 (0) 20 547 2111
Spain	34 (91) 631 3300
Sweden	0200-88 22 55
Switzerland	(French)
	44 (21) 8113811 (Opt 2)
Switzerland	(German)
	0800 80 53 53 (Opt 1)
United Kingdom	44 (0) 118 9276201

Other European countries:

www.agilent.com/find/contactus

Revised: October 24, 2007

www.agilent.com/find/tpa

www.agilent.com/find/dna

www.agilent.com/find/networkanalyzer

www.agilent.com/find/sart

Product specifications and descriptions in this document subject to change without notice.

© Agilent Technologies, Inc. 2008

Printed in USA, February 22, 2008

5989-6799EN



Agilent Technologies