

OPERA™ Voice/Audio Quality Analyzer



OPTICOM OPR-101-SQM-P

OPERA™ - The Objective Perceptual Analyzer setting the Standards

Comprehensive, end-to-end quality analysis based on perceptual measurement

OPTICOM's new generation of OPERA™ voice and audio quality analyzers represent the latest development to objectively evaluate and assure the quality of compressed speech and wide-band audio signals, based on modeling the human ear. With OPERA you can achieve a comprehensive analysis of the end-to-end quality of current and next generation networks, such as VoIP, xDSL, ISDN, GSM, POTS, from the caller to the callee. Or you can test the audio quality of MP3, AAC, AC3, MS Audio from the studio source to the receiver, or from the server to the client. OPERA's comprehensive scalability may range from a single stand alone tester to powerful network-wide setups with distributed systems, remotely controlled over IP.

The open framework concept of OPERA™ allows for the fastest updates of advanced measurements, such as PESQ - the new ITU-T rec. P.862 [2001] – simply as a plug-in. Also future updates will be just plug-ins as soon as they will become available. User defined measurement algorithms may also be integrated upon request. Besides many configurations of completely pre-installed portable analyzers, OPERA™ is also available as a software suite with restricted functionality. The operating system currently supported is Microsoft Windows NT 4.0, Win 2000 will follow.

Key Functionality at a glance

Voice Quality Measurement

- **End-to-end voice quality testing** of VoIP, xDSL, ISDN, GSM, POTS, based on real world speech signals
- **PESQ**, the brand-new perceptual evaluation of speech quality according to **ITU-T rec. P.862 [2001]**, combines PSQM with PAMS, optimized for VoIP and hybrid end-to-end applications
- **PSQM/IP**, perceptual speech quality measure according to **ITU-T rec. P.861 [1996]**, incl. advanced

delay compensation for end-to-end measurements, developed by OPTICOM

- **PSQM+**, advanced perceptual speech quality measure according to **ITU-T COM 12-20 [1998]**
- **Echo** measurement based on real speech, ERLmin and ERLpeak
- **Delay jitter** vs.time measurement (with PESQ only)

Audio Quality Measurement

- **PEAQ**, perceptual evaluation of audio quality according to **ITU-R rec. BS.1387 [1999]**, Basic and Advanced Model
- **48kHz** and **44.1kHz** sampling rates supported

Common Functionality

- Advanced delay compensation for end-to-end measurements, suitable for constant and variable delays (VoIP), developed by OPTICOM
- Delay measurement in samples and ms, delay confidence status
- Attenuation measured in dB
- On-line real time acquisition and analysis capability
- OPERA™ Control Center automation software > 3.000 calls per day and channel (ODBC database interoperability)
- Comprehensive scripting interface
- Remote Control over IP

Graphical Displays

- Time signal displays, zoomable
- FFT Spectra, zoomable
- Excitation and various representations of psychoacoustic processing, audible distortion measurement
- Result summary display with MOV/MOS bar graphs
- Echo Return Loss vs. delay

New Features with Version 3.0

- **PESQ ITU-T P.862 [2001]**
- **Delay Jitter** vs. Time measurement (only available w/ PESQ)
- **PEAQ Advanced Model**
- **PEAQ Basic Model** with improved accuracy @44.1kHz
- new version of **OptiCall™** signal acquisition software, now also applicable to wide band measurements
- **DDLC** improved timing accuracy (Dynamic Driver Latency Compensation)

Why OPERA sets the Standards

- Objective perceptual evaluation of compressed voice/audio signals based on natural speech/music, modeling recognized listening test procedures
- Original reference implementations from the developers and originators of the ITU standards, incl. KPN, BT, OPTICOM
- Direct relation of measured QoS results to customer's satisfaction
- Efficient diagnostic tool for next generations hardware/networks design



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Configurations and Ordering Information

Model	Common Specifications
OPR-1XX-XXX-P	Objective Perceptual Analyzer, OPERA™ Basic portable framework system, incl. Dual Pentium III architecture 15" XGA TFT Display, 1024x768 German, US or International keyboard Integrated Trackpad Power Supply Unit 240/120 V Microsoft Windows NT 4.0 WS SP4 OPERA Framework Software OPERA User's Manual Trolley Case 1 year extended maintenance and support
Model	Voice Testing Configurations
OPR-101-SQM-P	OPERA voice quality tester, incl. - PSQM/P.861, PSQM+, PSQM/IP - Echo - Four port analog POTS interface - OPTICALL™ Signal Acquisition Software
OPR-111-SQM-P	same as OPR-101-SQM-P, add. incl. - 2x 24bit analog/digital audio interface option for multimedia terminal testing
OPR-101-ESQ-P	OPERA voice quality tester, incl. - PESQ/P.862 - PSQM/P.861, PSQM+, PSQM/IP - Echo - Four port analog POTS interface - OPTICALL™ Signal Acquisition Software
OPR-111-ESQ-P	same as OPR-101-ESQ-P, add. incl. - 2x 24bit analog/digital audio I/O interface option for multimedia terminal testing
Model	Options
OPR-002-E1T-P	E1/T1 Option for OPERA OPR-1XX-XXX-P - Dual Port T1 Interface - Dual Port E1 Interface (available Q2/2001)
OPR-000-EAQ-P	Wide band option for OPERA OPR-1XX-XXX-P incl. - PEAQ/BS.1387 Advanded - PEAQ/BS.1387 Basic Model
OPR-000-CTR-P	OPERA™ Control Center server software for automated use incl. remote administration, also over IP (needed to control more than a single OPERA system) - 5-User license - 10-User license - others on request
Model	Audio Testing Configurations
OPR-120-EAQ-P	OPERA audio quality tester, incl. - PEAQ/BS.1387 Advanded - PEAQ/BS.1387 Basic Model - 2x Stereo 24bit analog/digital audio interface option, sym. XLR, AES/EBU, incl. adapter set

Model	Options
OPR-991-SUP-X	optional renewal for 1 year extended maintenance and support, available to all OPR-1XX-XXX-P products
Model	Other available configurations
OPR-000-XXX-S	OPERA software suite v3.0, restricted functionality (wav) file-based only, no real time/online streaming, may optional include: - PESQ/P.862 - PSQM/P.861, PSQM+, PSQM/IP - PEAQ/BS.1387 Advanded - PEAQ/BS.1387 Basic Model

Available Literature

OPERA™ - Your Digital Ear, coloured brochure

OPTICOM White Paper "State of the Art Voice Quality Testing",

OPTICOM Application White Paper #1, "PSTN, VoIP and others"

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