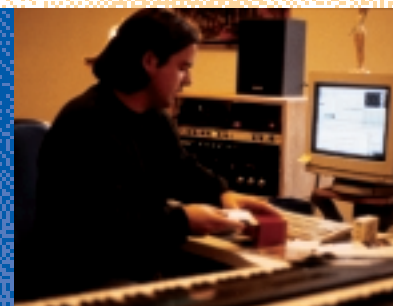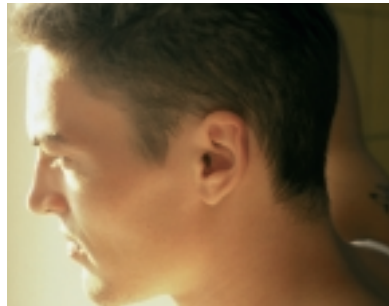# OPTICOM

OPERA

YOUR
DIGITAL
EAR

What do they really hear?

Crystal clear digital audio sound? Probably not.

Compression has become the state of the art technology in modern communications – thus allowing for many and diverse inexpensive new components of the information age, such as: Mobile Phones, VoIP, MP3 Internet Audio, Radio and TV satellite networks, DAB, DVD, and many more.

On the other side, the economic benefit of lowering data rates further to a minimum is controversy to clear sound. In spite of „all digital technology", sound quality and speech intelligibility have become issues again, and thus of much more impact than in those good old „analog" days!
And what are you going to do about the quality of YOUR service?

Hören Ihre Kunden wirklich lupenreinen Klang? Nein?

Kein Wunder, denn Sprach- und Musikdatenkompression sind längst überall im Einsatz. Viele neue Technologien des Informationszeitalters sind dadurch erst möglich geworden: Handys, Voice-over-IP, MP3 – Musik per Internet, digitale Rundfunk- und Fernsehprogramme über Satellit, DAB, DVB und so weiter.

Nur all zu häufig überwiegt dabei das wirtschaftliche Interesse an möglichst effizienter Bandbreitennutzung gegenüber der gegensätzlichen Forderung nach gutem Klang.
Audioqualität und Sprachverständlichkeit sind aller „digitalen Technik" zum Trotz mehr denn je ein Thema.
Und was unternehmen Sie in puncto Qualität?

Win the vocal competition!

Our new generation of quality testers, called OPERA™ – short for „Objective Perceptual Analyzer" – represent the latest development to objectively evaluate and assure the quality of compressed speech and wide-band audio signals by modeling the human ear: OPERA™ is your digital ear!
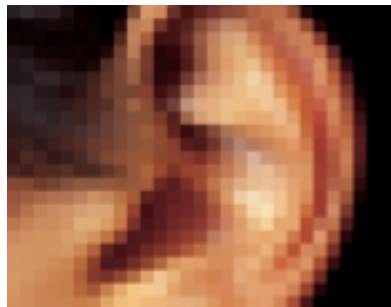
Unsere neue Generation von OPERA™ Meßsystemen – der Name steht für „objektive wahrnehmungsangepaßte Analyse" – stellt die neuesten Verfahren zur objektiven Qualitätsbewertung und Qualitätssicherung von komprimierten Sprach- und Musiksignalen zur Verfügung.

win

subjective

Objectivize the subjective perception of sound.

Comprehensive end-to-end quality analysis

OPERA is not only suitable for assessing a single processing device. With OPERA you can achieve a comprehensive analysis of the end-to-end quality, from the studio source to the receiver, or from the caller to the called. And because OPERA works quite similar to the human ear, it will be able to distinguish between imperceptible, and more or less annoying transmission errors.

Neben der Messung einzelner Systemkomponenten eignet sich das OPERA Meßsystem aufgrund des neuen Ansatzes besonders für die Analyse der Ende-zu-Ende Qualität, sei es vom Studio zum Empfänger, oder zwischen beiden Teilnehmer-endgeräten bei einer Telefonver-bindung. Möglich wird dies, da OPERA ähnlich dem menschlichen Gehör arbeitet und somit zwischen unhörbaren und mehr oder weniger stark wahrnehmbaren Störungen unterscheiden kann.

Measurement of perceived audio quality according to latest psycho-acoustic based analysis techniques

Other than traditional measurement methods (like S/N, THD+N), the new OPERA system will be able to simulate the subjective evaluation of human subjects. The analysis will be based on the most recent perceptual techniques, such as PEAQ and PSQM.

Im Gegensatz zur traditionellen Meßtechnik werden nicht Signal-kenngrößen (S/N, THD+N) ermittelt, sondern der Vorgang der Gehörwahrnehmung selbst modelliert. Hierbei finden modernste standardisierte, gehörangepaßte Meßverfahren Einsatz, wie PEAQ und PSQM.

Evaluation based on natural speech and music fragments

As a major advantage, OPERA will employ the same kind of natural stimulus for a measurement as in practical operation: human speech or music programme material. This makes it even possible to monitor the quality during network operation! Also, cultural and language differences may be taken into account by the evaluation.

Ein für die Praxis entscheidender Vorteil des OPERA Meßprinzips ist die Tatsache, daß Messungen auf normalen Sprach- oder Musik-sequenzen beruhen, also auch bei laufendem Programm vorgenommen werden können. Dies gestattet nicht nur eine Qualitätsüberwachung „on-line", sondern auch die Berücksichtigung kultureller und sprachbedingter Artefakte.

Includes original reference implementations of the most current ITU Recommendations in force

OPERA is based on
- *PSQM+ an advanced version of the original reference implementation of the „Perceptual Speech Quality Measure" (PSQM) by KPN Research, which was the source for ITU-T Recommendation P.861, and*
- *the original reference implementation of the „Perceived Audio Quality" Measure (PEAQ), which was the source for ITU-R Recommendation BS.1387*

OPERA basiert auf
- PSQM+ einer Weiterentwicklung des Original PSQM-Referenz-Codes von KPN Research, der als Grundlage für ITU-T Empfehlung P.861 diente, ebenso wie auf
- dem Original PEAQ-Referenz-Code, der im Rahmen der Standardisierungsarbeiten für die ITU-R Empfehlung BS.1387 entwickelt wurde.

Objective characterization of human listener's subjective quality impression

As a consequence of the novel approach to measure the perceived audio quality instead of signal characteristics, for the first time it is possible to gain an objective quality metrics which truly characterizes the quality of service („QoS") of a network.

Aufgrund des neuartigen Ansatzes zur Messung der wahrnehmbaren Audioqualität ergibt sich erstmals eine objektivierbare praxisbezogene Aussage über die „Quality of Service", also den Qualitätsstandard beispielsweise eines Telekommunikations-netzes.

objective

Compare the features.
Make the difference.

compare
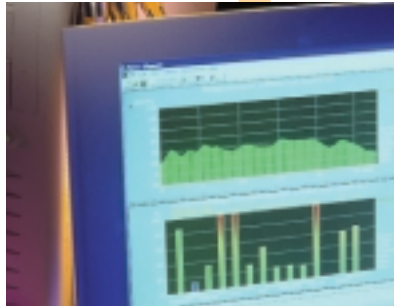
Scalability from single stand-alone tester to network-wide distributed systems

OPERA's flexible scalability may range from a single stand alone tester up to powerful network-wide setups with distributed systems sharing information over IP. Web based user front ends will also be provided.

Die flexible Skalierbarkeit des OPERA Systems reicht vom Stand-alone System bis hin zu ganze Netzwerke umfassende, verteilten Systemen, die über Internet administriert und gesteuert werden.

Supports both, interactive as well as fully automated, unattended operation

OPERA may be used interactively as an analyzer, or will run fully automated according to a predefined schedule.

Jedes System unterstützt sowohl den interaktiven, also benutzergesteuerten Meßvorgang, als auch vollautomatische Meßprozeduren.

Open interface for user defined measurement algorithms

User defined measurement algorithms may be integrated upon request.

Ebenso lassen sich bei Bedarf anwenderspezifische Meß-algorithmen integrieren.

Future-proof open framework concept for advances in measurement algorithms

The open framework concept of OPERA will allow to add advanced measurement algorithms as plug-ins in the future as soon as they become available.

Das offene OPERA Systemdesign erlaubt die problemlose Einbindung zukünftiger Meßalgorithmen.

Easy to adapt integrated interfaces for telecom or broadcast audio quality testing

*OPERA comes fully equipped with high quality, loop start or ISDN telephony interfaces, which are approved for most countries.
In the broadcast version, high quality studio A/D, D/A and AES/EBU interfaces with all necessary synchronization features are provided.*

Das OPERA Meßsystem stellt international zugelassene Telefonie-schnittstellen als analoge a/b oder digitale ISDN Version zur Verfügung.

More Features:

- *Workstation as well as portable version available*
- *Comes with test samples for standard setups*
- *State-of-the-art Windows NT Architecture*
- *Wizard guided graphical user interface*
- *Easy documentation of measurements by „copy and paste" of diagrams*
- *Support for standard color printers*
- *Easy ODBC database integration*
- *Real time test inputs*
- *Automated test scheduling*
- *Fully programmable in VBA (Visual Basic for Applications)*
- *Web based user front end*
- *OEM modules for various abstraction levels available (DLLs, ActiveX)*
- *Custom tailored solutions available*

features

telecom version

Features

- ITU-T P.861/PSQM perceptual based measurements of speech quality

- PSQM+ perceptual measurements (PSQM improved for GSM)

- PSQM/IP™ **New!** Further advanced PSQM improved for VoIP measurement

- PAMS Perceptual **New!** Analysis/Measurement System

- Echo measurement

- Delay measurement

- Call setup time measurement

- Level measurement

- Interfaces to loop start (a/b), ISDN lines and wireless

- VoIP interfacing

- Bulk call generation

*An example application of OPERA in a telephone network environment. A single stand-alone OPERA system runs cyclic quality checks via a loop back connection to ensure the quality-of-service (QoS)*

A Stand alone loop measurement with OPERA

A fully automated, distributed system of OPERA units may monitor the quality according to a scheduled order of measurements
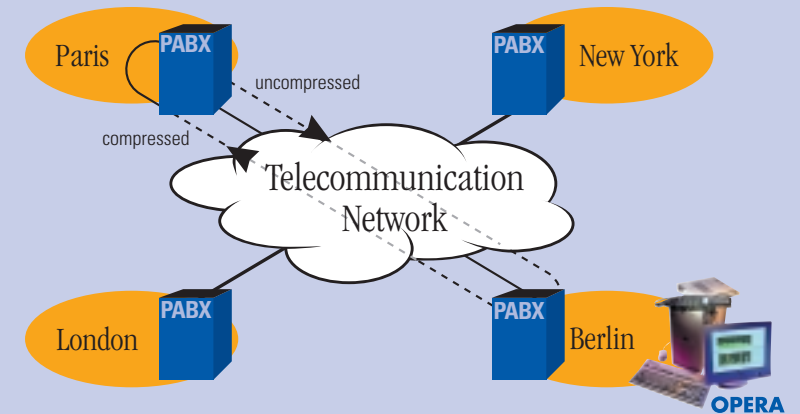
B Automated distributed System, off-line data exchange
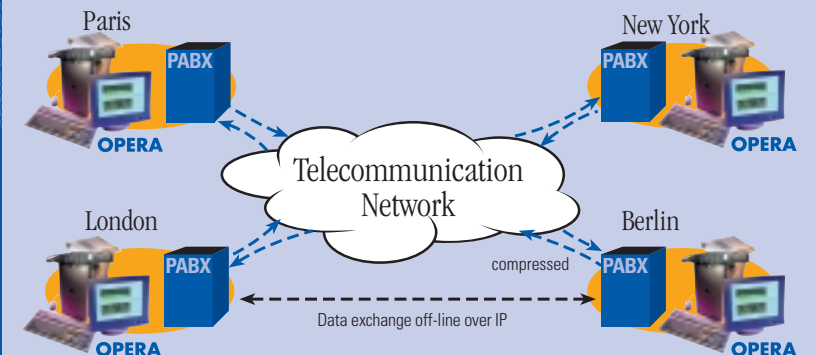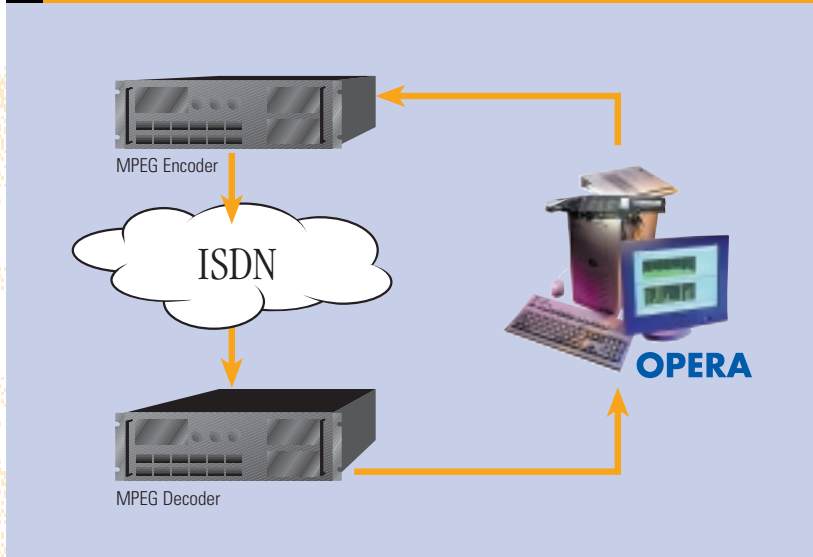
broadcast version

A | Stand alone testing with OPERA

MPEG Encoder

ISDN

MPEG Decoder

OPERA

Testing a single audio processing device (e.g. a dial-up codec) with the broadcast-version of OPERA.

B | On-line monitoring with OPERA

Satellite Radio Programme

Studio

Receiver
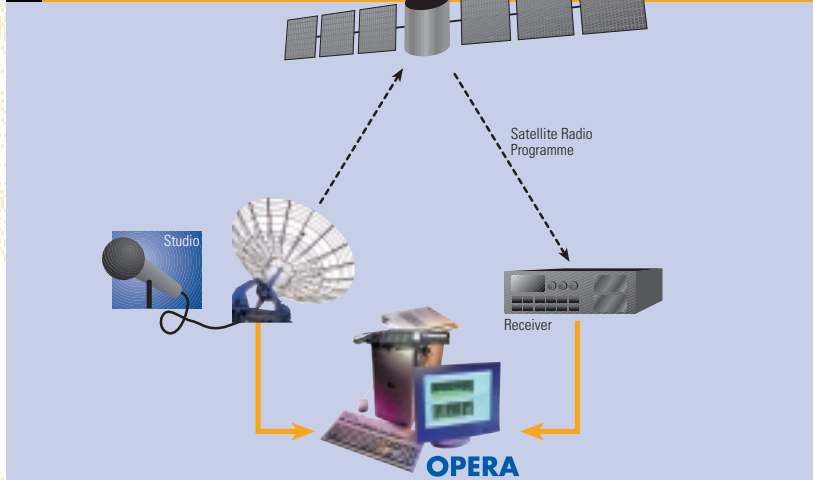
OPERA

On-line network monitoring with OPERA based on a live programme feed.

Features

- ITU-R BS.1387 (PEAQ) perceptual measurement of wide-band audio quality

- PEAQ „Basic" and „Advanced" version

- Delay measurement

- Level measurement

- Real time measurement

- Interfaces to file (*.wav), analog XLR balanced (20 bit) and digital AES/EBU

OPTICOM

Quality

Quality
is our business

No matter if it's speech quality in telecommunications, audio quality of music and broadcast signals or video quality of TV signals, quality is our business!

Under the mission statement „optimum solutions for multimedia communications", OPTICOM focuses on top notch developments to gain for its customers improved quality in audio and video communications. With the new OPERA family of perceptual analyzers, the company again proves it's worldwide reputation for state-of-the-art solutions to improve the audio quality of new media.

OPTICOM was founded by Michael Keyhl in 1995 as a „spin-off" company of the Fraunhofer-Institute, Germany's leading organization for applied research. OPTICOM's developers benefit from their broad experience in the research and development of perceptual based coding and evaluation techniques, lasting back to the late 1980's.

Through many international contacts and cooperations with leading research organizations, OPTICOM has gained an active role in the international standardization business, e.g. of the new ITU-R standard „PEAQ". OPTICOM is also continuously active in, or observing the work of the AES, EBU, ITU-T, ETSI, ISO/MPEG and others.

After being successful in business since 1995, OPTICOM received the 1995 award as the best start-up company. The company is continuously growing and seeking to expand the number of their employees. OPTICOM is located in Erlangen, Northern-Bavaria, GERMANY.

Ob es sich nun um Sprachqualität in der Telekommunikation, Tonqualität von Musiksignalen im Internet, im Hörfunk und Fernsehen oder gar um Videoqualität handelt – bei uns dreht sich alles um das Thema Qualität.

Unser Ziel sind optimale Lösungen in der Multimedia-Kommunikation. Daher beschäftigen wir uns mit innovativen Produkten und Systemen zur Verbesserung der Qualitätsstandards in der modernen Kommunikationstechnik.

Mit unserem wahrnehmungsangepaßten Meßsystem OPERA können wir einmal mehr unseren inzwischen weltweit anerkannten Fortschritt auf diesem Gebiet beweisen.

OPTICOM wurde 1995 von Dipl.-Ing. Michael Keyhl als Spin-Off aus dem Fraunhofer-Institut Erlangen (IIS) ausgegründet. Daraus resultierend profitieren OPTICOM Entwickler auf den Gebieten der Audiocodierung

und der objektiven Qualitätsbewertung von Erfahrungen, die bis in die Anfänge dieser Entwicklungen in den späten 80er Jahren zurückreichen.

Neben zahlreichen internationalen Kontakten und Kooperationen mit führenden Forschungszentren spielt OPTICOM auch in den internationalen Standardisierungsgremien eine große Rolle – wie beispielsweise beim neuen ITU-R Standard PEAQ. Weitere aktive Kontakte bestehen zu AES, EBU, ITU-T, ETSI, ISO/MPEG und anderen Organisationen.

1999 wurde das Unternehmen mit dem Gründerpreis der IHK Nürnberg ausgezeichnet.

Portfolio

Software

Development of business-to-business and business-to-consumer software products

Systems

Complete turnkey systems in hard- and software

Solutions

Comprehensive customer specific solutions

Strategy

Strategic partnerships and OEM licensing offers

Seminars

Complementary on site training, seminars and workshops

www.opticom.de

fax response

Name:

Position:

Company:

Country:

Street:

City:

Postal Code:

Phone:

Fax:

E-Mail:

☐ Please contact me via
  ☐ E-Mail
  ☐ Phone
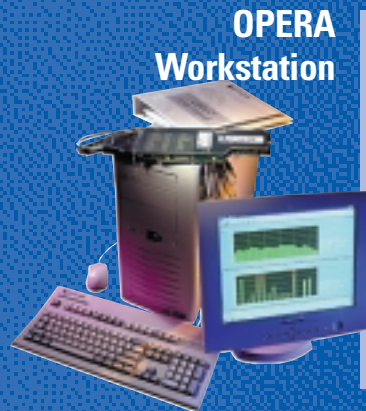 ☐ Fax

☐ Please send further technical information on
  ☐ OPERA telecom version
  ☐ OPERA broadcast version

☐ Please send purchasing information

+49 (0) 91 31 - 69 13 25

OPERA Product Line

OPERA Workstation

Telecom Version

Objective Perceptual Analyzer, OPERA™ Workstation Version, incl.

- OPERA framework software
- PSQM+, PSQM/IP™
- PAMS
- Echo measurement
- Various types of line interfaces
- OPTICALL™ Signal Acquisition Software

Broadcast Version

Objective Perceptual Analyzer, OPERA™ Workstation Version, incl.

- OPERA framework software
- PEAQ basic version
- PEAQ advanced version
- Time and spectrum domain analysis
- Analog and digital audio interfaces
- Real time measurement

OPERA Portable

Objective Perceptual Analyzer, OPERA™ Portable Version, incl.

- OPERA framework software
- PSQM+, PSQM/IP™
- PAMS
- Echo measurement
- Various types of line interfaces
- OPTICALL™ Signal Acquisition Software

Objective Perceptual Analyzer, OPERA™ Portable Version, incl.

- OPERA framework software
- PEAQ basic version
- PEAQ advanced version
- Time and spectrum domain analysis
- Analog and digital audio interfaces
- Real time measurement

Ask for our customer specific solutions for automated quality of service (QoS) testing systems.

OPTICOM

OPTICOM Dipl.-Ing. M. Keyhl GmbH
Am Weichselgarten 7
D-91058 Erlangen
Germany

Tel. +49 (0) 91 31 - 69 11 60
Fax +49 (0) 91 31 - 69 13 25
eMail: info@opticom.de
www.opticom.de

www.opticom.de