

# QVoice World

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4U! – QVoice 4.2

**ascom**

## From the Desk of Beat Gerber

Dear Customers,  
Dear QVoice Users,  
Dear Colleagues



As I write these words, a happy first group of QVoice users is already getting to grips with our latest product release, QVoice 4.2. The release, described in this issue, contains several important expansions of 'traditional' QVoice functionalities, including MMS measurements, WCDMA testing, the new PACE TA (time alignment) algorithm, new features in post processing, the new OT290 test mobile and an extension box that allows QVM to control up to eight test mobiles simultaneously.

For over 10 years, operators worldwide have worked with us to solve many of the challenges encountered during the testing, operation and maintenance of quality performance in past and present mobile networks. The challenges posed by 3G infrastructure are

greater than ever before due to the complexity of the technology, and the variety of user services will be correspondingly larger.

However, we are once again combining QVoice's unrivalled and constantly-developing technical expertise – as currently embodied in the 4.2 release – with the operating experience and feedback of our customers worldwide. I have no doubt that we will tackle the problems of 3G testing and monitoring as effectively as those of every previous generation of mobile technology. We are looking forward to the challenge.

Sincerely  
Beat Gerber, Head of Ascom AG, Carrier Products

## Roadmap 2004 Outlines 'Three Lanes to Success'

The QVoice Roadmap for 2004/2005 is now available.

It outlines the direction foreseen for product and service development over the next two years to meet the requirements of both current and future customers, based on three strategic development parameters, or 'lanes to success':

- Expanding technologies
- Building on existing strengths
- Deeper service testing

Highlights include:

- EDGE testing – both Quality of Service aspects and air interface parameters to assist in trouble-shooting

- Streaming tests – audio and video, in accordance with ETSI recommendations
- Video telephony bearer tests – radio aspects as well as ETSI recommendations
- CDMA 1x measurements – Quality of Service and Benchmarking

A detailed presentation of QVoice's vision for shared success is available on request. To obtain a copy, please contact your QVoice Partner.

## QVoice Welcomes New Customers

2004 has got off to a bumper start for QVoice, with entry into a new national market and a range of major extension orders from existing countries.

In April 2004, QVoice finalised its entry into a new national market, Pakistan, by concluding a major new contract with Pakistani mobile operator Mobilink.

### New strategy already bearing fruit

The successful order completion represents a first concrete vindication for Ascom's strategic decision last year to enter the Indian and Pakistani markets.

Meanwhile, customers across Europe and beyond have shown that they continue to consider QVoice their best bet for keeping one step ahead of the competition, by announcing QVoice system renewals.

### Order extensions all round

In recent months, a range of major network operators and service providers have announced order extensions to help them meet the ongoing challenge of ensuring superior network quality across a range of platforms and technologies (voice, CSD, GPRS, SMS, 3G, WAP testing). They include:

- O<sub>2</sub>, UK and Ireland
- Motorola, UK
- Mobifon, Bulgaria
- Siemens, Germany
- KB Impuls, Russia
- Vodafone, Albania
- Vodafone, Egypt
- Vodafone D2, Germany

## Testing Applications & Services

New QVoice literature focuses on user applications and support services.

**Portable Walk Testing** – Details the need and range of 'Walk Testing' options of the QVoice system.

**Optimisation** – Explains how QVoice Companion & Field Analyser can help engineers responsible for operation, trouble-shoot, maintain and optimise their networks for performance and quality.

**Professional Customer Support** – Describes the QVoice back-up services and range of benefits for users.

You can download them from the 'Technical Literature' section of the QVoice web site at:  
[http://www.qvoice.com/4-literature/clit\\_4100.html](http://www.qvoice.com/4-literature/clit_4100.html)



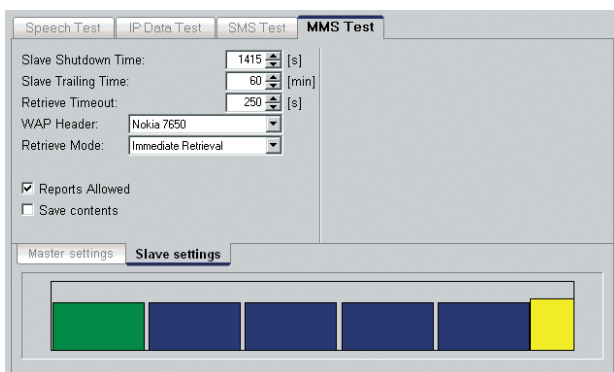
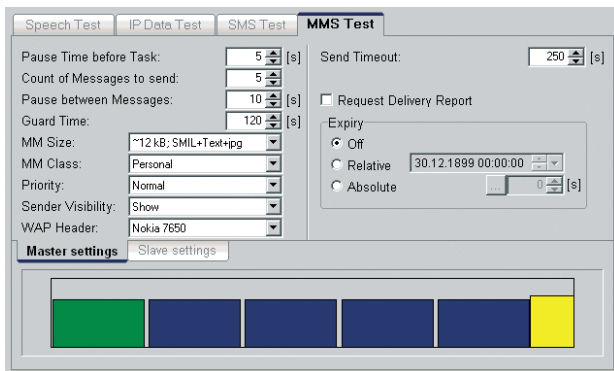
# Latest QVoice release paves way for 3G 'rollout'

QVoice 4.2 has now been released, and the first users are already benefiting from a range of major new advanced functionalities.

Following is a brief outline of the main new features and functions. For more detailed technical explanations and upgrading options, a user functions document is available from your nearest QVoice sales/support office.

## MMS measurements

One major advantage of using QVoice to test MMS is that QVoice has implemented the MMS/WAP stack in the QVM. This makes it possible for the test equipment to access different messages and trigger points during the MMS process, allowing in-depth analysis – especially in transmission error situations – to be carried out based on these messages, and comparisons to be made using defined trigger points. It goes without saying that these features represent far more valuable functionalities than simple go/no-go MMS testing. (The diagram below shows how to set up tests using the programme editor screens):



Reports/statistics are prepared using parameters including send time, notification time and retrieval time. These parameters and markers (i.e. send fail, notification fail) can be shown in QVP Map. The QVP network analyser can show MMS and WAP stack messages/events and network/MMS problems can be investigated – a clear advantage of having a MMS/WAP stack in the QVM. Air interface engineering parameters and messages (i.e. layer 3 messages) are also available in parallel, and the user thus has an excellent simultaneous view of all the different layers of the MMS operation – from MMS stack to the air interface (MMS, WAP, LLC, RLC, etc.).

## WCDMA testing

As well as the WCDMA scanner already available from previous releases, QVoice measures WCDMA networks with a test mobile, currently the Nokia 6650. As in other air interface technologies like GSM testing, test connections can be built up using speech calls or mobile data applications (i.e. FTP, UDP). Engineering parameters of the WCDMA network, including layer 3 messages and layer 1 and 2 parameters, are recorded during these test connections.

The "Radio" display on the QVM shows the status of the connection in real time. One powerful new feature is the linkage between the transport channels, the logical channels and the radio access bearer. The user can thus see the relationship between the higher/logical layer and the lower/physical channel – a valuable new functional addition by any standards.

## PACE TA algorithm

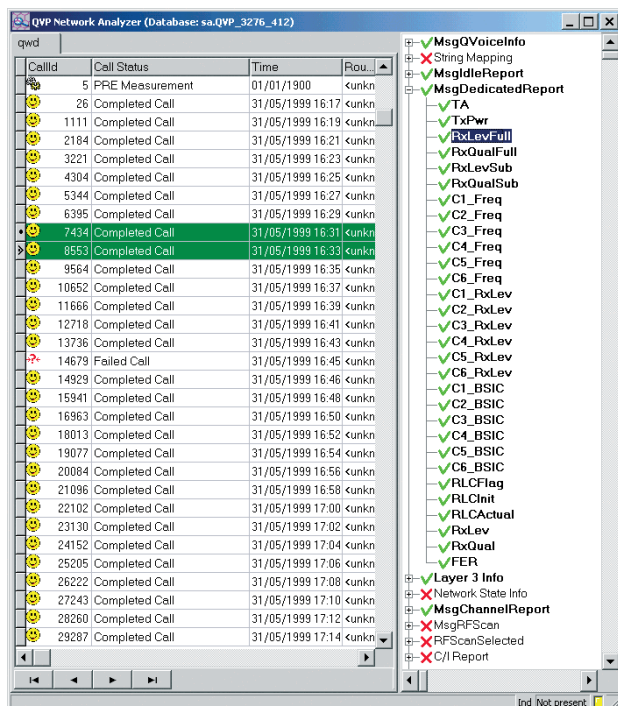
QVoice has always prided itself on offering customers quality measurements standards that are both state-of-the-art in technical terms and closely aligned to their actual needs under ever-changing market conditions. Release 4.2 demonstrates this commitment once again. PACE TA (time alignment) is the extension of the industry standard PACE speech quality algorithm. As Voice over IP, for example in the core network, becomes more popular, it is advantageous to have PACE TA, which will deliver MOS values on audio signals that may have been affected by jitter, packet delay, packet loss, etc..

As well as MOS values, the QVoice option special audible effects can also be used with PACE TA to detect/measure silence, echo, volume level and gaps in audio signal. As in previous software releases, noisy samples (clean speech sample plus noise) can be used to investigate the behaviour of noise suppression functions in the network.

### New post processing features

New functions have been added in the Network Analyser and QVP Map and new reports introduced in QVP Report.

The "look and feel" of the network analyser has been expanded, with a new "drag and drop" function. Users can now pick a parameter from the list and drop it into, for instance, the line chart (see below). In the line chart, it is now possible to show parameters from two calls/routes. In QVP Map, tool bar functions have been brought to the front, and the menus have been re-ordered (see below). Another interesting feature is the addition of Geocode floor plans or scanned maps, where a point in the picture is referenced to a point in the co-ordinate system. In QVP, corresponding report statistics have been added.



### Extension box

The extension box enables QVM to control up to eight test mobiles simultaneously. It comprises an electronics section (including on/off switch) and a handy box housing up to four test mobiles, with charged batteries. A QVM3G or a QVoice Companion can control this box via an USB interface.

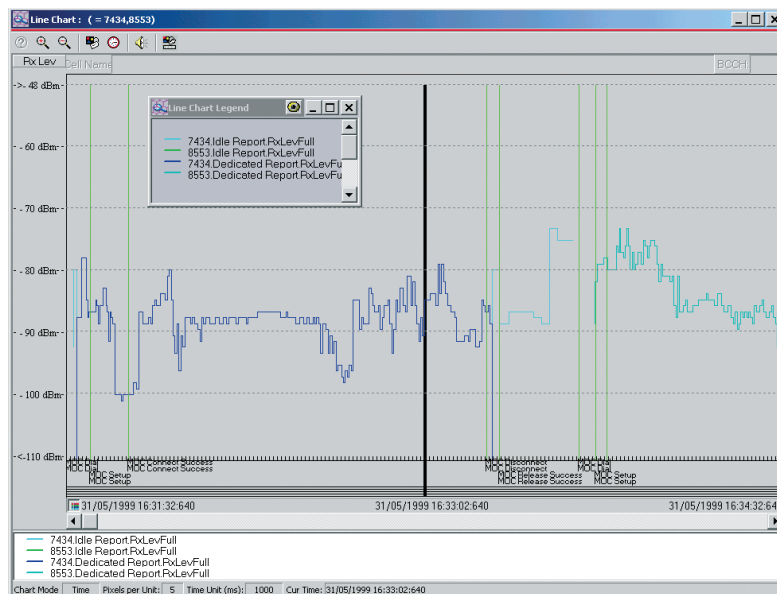
All measurements except speech quality can be done with the test mobiles in this extension box. The QVoice cables and the dummy batteries for test mobiles can be used, and the box can be powered by an external 9 to 16 volt DC source, i.e. a car battery.

### OT290 test mobile

The OT290, the latest GSM/GPRS test mobile from Sagem, has added features including multi-slot 1 to 10 (except 7) in GPRS and the full range of codec: half rate, full rate, enhanced full rate and AMR. Users can get more information on AMR use by examining the "QVoice Info" and layer 3 messages within QVP.

### Other functions

QVoice also contains other new value-added functionalities. For more details, see the user functions document, available from your QVoice partner.



# WCDMA Service Performance

QVoice UMTS technical specialist Christian Nänni gave a keynote speech on WCDMA Service Performance at the IIR GSM/GPRS & 3G Performance Measurement Conference in Prague (March 22<sup>nd</sup> to 25<sup>th</sup>). Below is a summary of his main points:

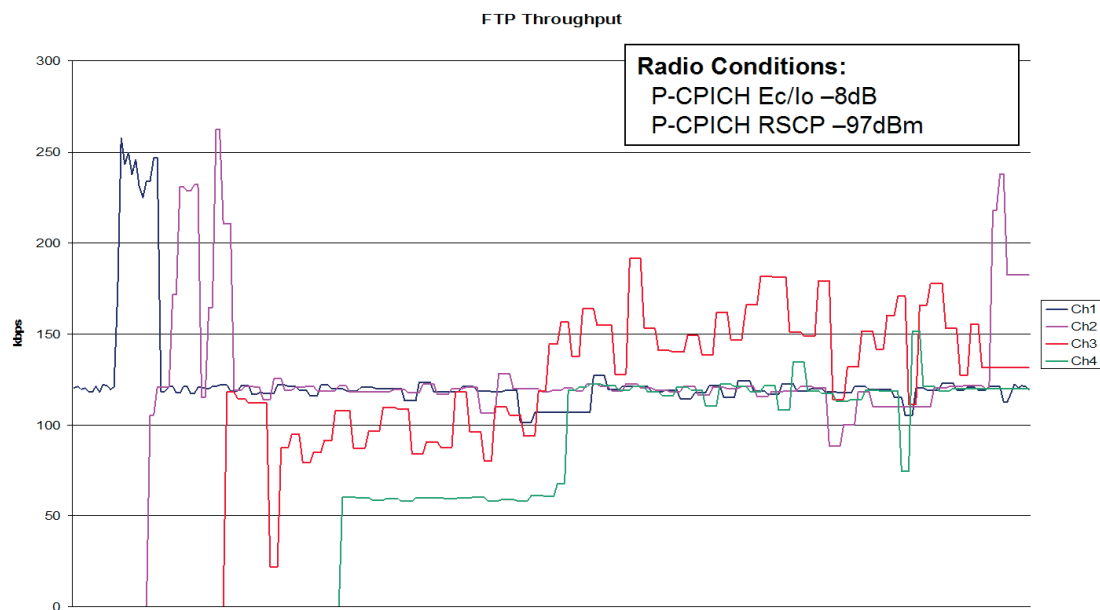
Today's WCDMA networks are already showing very promising data service performance, with good stability and throughput even when driving on a motorway.

## Moving rapidly towards GSM values

Good old speech service is also quickly moving towards the KPI (key performance indicator) values known from GSM. Speech quality and data throughput remain at acceptable levels even under radio conditions where, with GSM, one would be happy simply not to lose the network. Thus, many operators have now begun to tackle new challenges, such as WCDMA/GSM interworking, or are seeking answers to the biggest question of all – how will WCDMA perform in practice under heavy load conditions?

## Network Performance Under Load

With the typical data bearers of 64 kbps in uplink and 384 kbps in downlink, capacity will be limited by the downlink running out of power as soon as there are about three or four simultaneous users (assuming a three-sector site with 20 watts per cell). This limit can already be reached running simultaneous data connections using four phones on the same network, assuming that all phones 'camp' on the same cell. The chart below shows the FTP throughput results during such a test, the channels having been started successively. While the first two channels initially reached the expected throughput with a 384 kbps bearer, the bearer bit rate was reduced to 128 kbps when the third user entered the cell.



The fourth user had only 64 kbps at the beginning and was then ramped up to 128 kbps. At some point the third user was assigned a 384 kbps bearer but application throughput never reached a maximum level. Possibly there was not enough power at the base station to provide an adequate BLER (block error rate).

To conclude, the network is showing typical best effort behaviour. But this raises an intriguing question – how would the same test look if the users had different QoS profiles in action?

## WCDMA/GSM Interworking

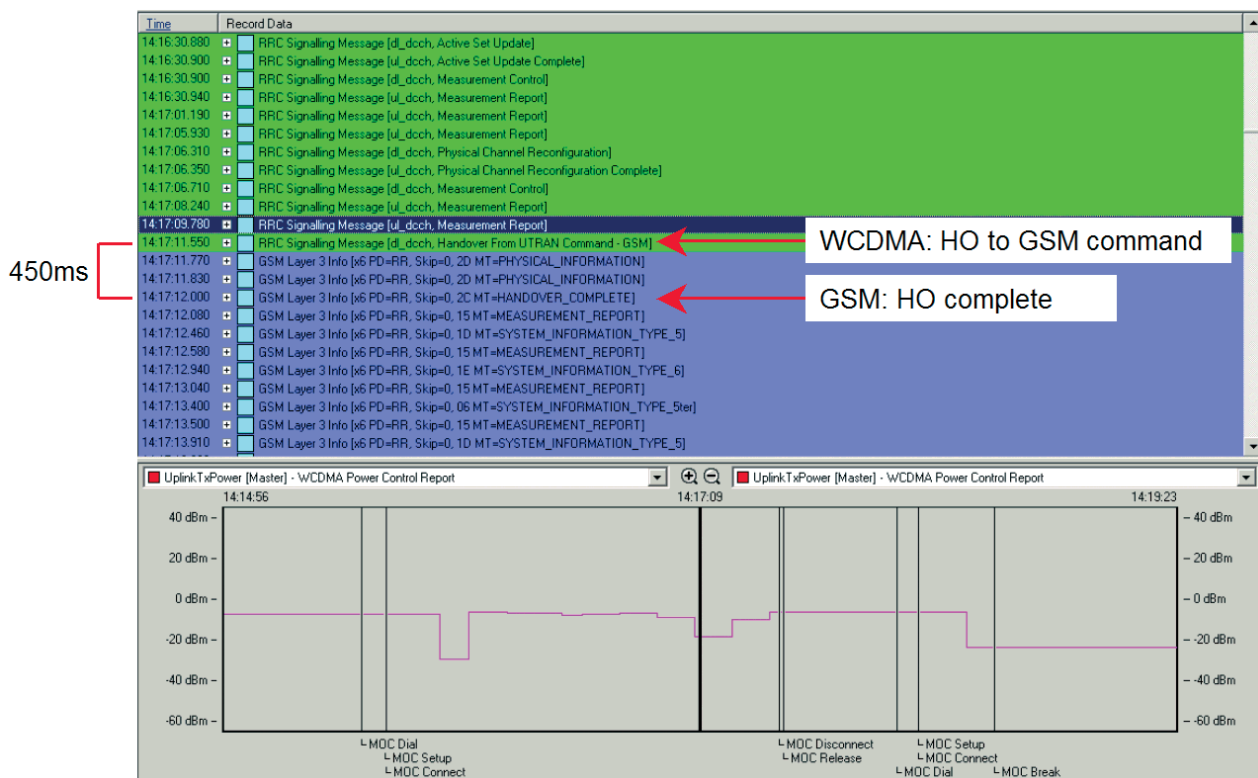
If considering only the air-interface related part of a system change, the packet switched inter-system cell reselection already works in both direction. However, on many occasions, the Routing Area Update needed to conclude the system change fails, in either direction.

One finding possibly contrary to expectations is that, homogeneous networks (i.e. GSM BSS and WCDMA RAN from same vendor) do not necessarily mean fewer problems in terms of 'interworking' issues. During a handover from WCDMA to GSM speech quality is affected, but not severely degraded.

On the other hand, speech handover from WCDMA to GSM seems to work quite well, at least in some infra-structures. The other direction appears to be more difficult – or at least less heavily promoted by the industry because it is seen as less crucial from the customer's point of view.

## Considerable grounds for optimism

To conclude, while there is obviously still much work to be done, the current data performance levels of WCDMA networks give considerable ground for optimism about the future of the industry. We are living in interesting times ...



## Teaser Corner

Logic: The painted green cube

A nine centimeter cube is painted green on all its sides and allowed to dry. The cube is then cut into 27 smaller cubes of three centimeter square. All the three centimeter cubes are collected and thrown like dice on to a flat surface.

What is the probability that all the top facing surfaces are painted green?



## QVoice – The “Voice of Quality” ... for speech ... and data

A single system and shared database for end-to-end QoS & Network Optimisation

If you would like to know more about anything you have read in this 'QVoice World' please contact us:

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