

Quality of Service Analyzer for GSM Networks

► M366plus



► Features & Benefits

Quality of Service, O&M and Network Optimization for GSM900, DCS1800, Dual Band, PCS1900 and GSM-R

- Voice Quality Measurements
 - Clipping
 - Echo Delay
 - Echo Loss
 - Loudness Rating
 - Impulse Noise
 - Psophometric Noise

Cellular Data & Fax Quality Test

SMS Verification

Subscriber Satisfaction Level Determination

Automatic Call Generation from Cellular Phones to Fixed or Cellular Phones

Simultaneous Measurements on up to 4 Different Networks

Runtime Results Display on Digital Maps

Postprocessing of Data Obtained During Measurement Campaigns

Real Voice Samples

► Applications

Quality of Service Measurements

Optimizing the Mobile Network

Measuring Quality from the Subscriber's Point of View

Over 250 cellular operators worldwide compete everyday to provide the best quality and increase their market penetration. These operators now understand that quality is the key to success: not only voice quality, but quality in all services. But measuring quality is useless if you do not have the means to preserve and improve it – everywhere, all the time. The M366plus system from Tektronix allows you to do this accurately and objectively.

Optimizing the "Mobile" Network

A cellular network is a "mobile" network in more ways than one: customers can move freely through the service area, and the network itself is never stationary – new BTSs are deployed, frequency plans vary and so on. In other words, the network is always being optimized.

The M366plus system is the best solution for this changing environment.

The M366plus collects protocol information and significant events and uses powerful post-analysis tools to identify critical zones and pinpoint the cause of the problems.

The M366plus

The M366plus is no longer a single all-purpose test set. It has evolved into a full-fledged system. This evolution was inevitable, as testing needs and circumstances have become increasingly complex and distinct.

The M366plus system provides the best, most differentiated solution for routine long-term quality surveys, accurate localization of network defects and competitive analysis of several networks.



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QoS: Voice, Data, Fax and SMS

The M366plus system objectively measures not only the quality of voice service, but also of SMS, data and fax transmission over a cellular network. SMS measurement sessions provide statistical reports similar to those for voice calls.

For data calls, the system originates and receives sequences of data which are used to calculate BER, number of errored bits, net transmission speed and other relevant parameters.

For fax calls, measurements are carried out by transmitting test pages.

More Standards - More Networks

The GSM standard is evolving, and so is the M366plus System.

The following interfaces are supported:

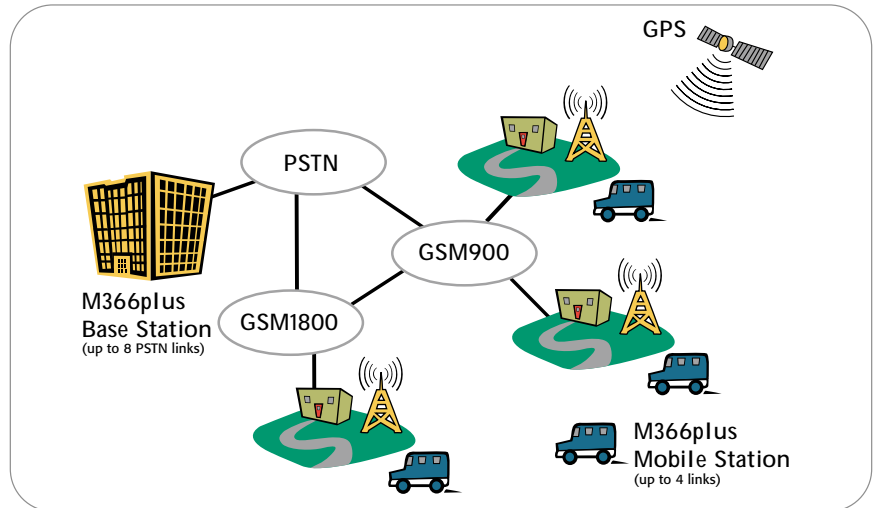
- GSM Dual Band 900/1800 Full Rate
- GSM Dual Band 900/1800 Enhanced Full Rate
- PCS1900
- PSTN
- ISDN BRA and ISDN PRA adapters

All these standards may be combined within a system without any particular constraint. Up to four radio interfaces can be housed in an M366plus Mobile Station. This allows you to simultaneously measure and compare up to four different networks.

QoS: The Ultimate Approach

When dealing with the problem of quality assessment, several methods may be used.

Although "Quality is not a matter of opinion," each of us has a different ear and method of judgment. To assess network quality, objective forms of measurement are needed. The accuracy, simplicity and unquestionable precision of our technology, based on the measurement of impairment factors (clipping, impulsive noise, psophometric noise, loudness rating and echo), can be combined with the immediateness and confidence that arises from the automated measurements of real speech samples.



The M366plus System

The M366plus System consists of several components, each flexible, configurable and powerful.

The Base Station

The M366plus Base Station is the fixed node of the M366plus System.

It is configurable with up to four interfaces and DSP measurement boards and can emulate eight PSTN interfaces. A local PC controller is also provided. The system can originate and receive voice, data and fax calls, measure quality and store data.

The Mobile Station

The new generation of M366plus Mobile Station boasts a remarkably increased capacity of up to four test phones in any combination of GSM900, 1800, Dual Band, PSC1900 and GSM-R. Together with a notebook, the mobile station offers all the new powerful quality measurements and protocol analysis capabilities.

The Postprocessing System

In some cases, the M366plus Measurement Units can collect huge amounts of data and information. In order to quickly and effectively focus on the data of interest, Tektronix offers a powerful analysis tool: M366plus REPORT.

M366plus REPORT

REPORT is the software tool used to store, organize and analyze the information collected by the measurement units.

The measurement files separately produced by the base and mobile stations must first be matched and organized in a database structure: REPORT does so by using the Microsoft® Access or the Oracle® database structure.

REPORT offers the user various views on single or multiple sessions to compare networks, filter data in any combination, generate reports and present data in graphical form.

The level of detail can be as specific as a single event occurring during one of the calls.

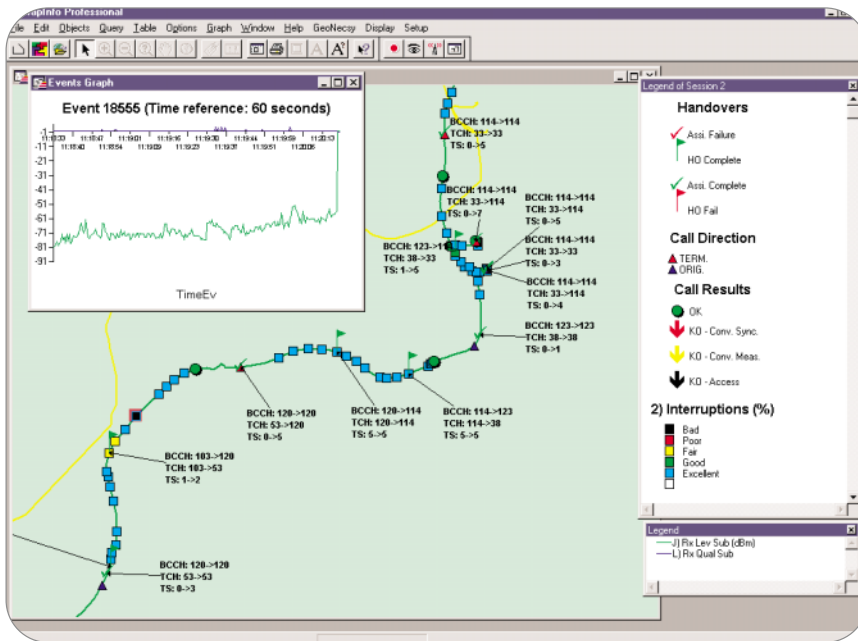
A drive-around test system is of little use without an easy way to associate measurements with the relevant geographic locations.

The M366plus measurement units, which incorporate a GPS receiver and may also utilize an external dead reckoning system, provide full positioning information.

This information is fully exploited by M366plus GEO REPORT, which utilizes MAPINFO-based software to allow viewing of measurement information on digital geographic maps.

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If, for example, a voice quality measurement campaign along the busiest national road is represented on a map with color-coded MOS values, the network planner will immediately be able to take action and improve the situation in the critical areas. In another example, a cellular network operator performs a data test session on a railroad line, where (in addition to heavy voice traffic) significant data traffic is incurred by business travelers equipped with notebooks and mobile phones. Positive BER measurements represented on a map lead to an advertising campaign emphasizing the operator's excellence in this type of service.

PC Stand-alone and Client-server: Two Compatible Solutions for Different Data Storage Needs

The M366plus System offers two architectures for the postprocessing environment, which both support the same REPORT application.

You can begin with the simpler and more economic stand-alone architecture, which uses a Microsoft Access database. As your network grows, the

subscriber base increases, or application requirements become increasingly more sophisticated, you can migrate to a client-server based Oracle database – without changes in the organizational structure or staff skills.

For stand-alone scenarios, Tektronix recommends the PC-embedded solution, which uses the Microsoft Access Database Management System (DBMS). This solution is economical and easy to install and maintain.

When data is to be shared and/or a higher level of integration with other applications is necessary, the client-server architecture with the Oracle database can be used. This powerful architecture guarantees superior performance in query execution time with any amount of data, as well as better data security and integrity, and concurrent access by several users.

- Standalone based on Microsoft ACCESS
- Client-server based on ORACLE

► Characteristics

Description

Quality Analyzer for GSM900, DCS1800, PCS1900 and Dual Band 900/1800 Cellular Networks, based on measuring units (fixed and mobile) and a postprocessing (HW/SW) system.

Hardware

Interface Modules –

PSTN with pulse/DTMF dialing.
GSM Mobile 900 MHz.
DCS Mobile 1800 MHz.
PCS Mobile 1900 MHz.
Dualband Mobile 900/1800 MHz.

Power Supply –

(Measuring Equipment)
Input Voltage: 10 – 18 VDC (12 VDC nominal), 220 VAC (with external AC/DC converter).
Max. current: 12 A at 10 V, 6.7 A at 18 V.

Environmental Conditions:

	Safety	EMC
7KM366-BS	EN60950/A3 (1995) class III	EN55022/AI (1995) class A EN50082-1 (1992)
7KM366-VMS	EN60950/A4 (1997) class III	EN55022/AI (1995) class EN50082-1 (1992)

Ambient Temperature –

Operating: 0 to +35°C (incl. notebook PC); 5 to +40°C (measurement equipment only).
Nonoperating: –10 to +55°C.

Dimensions (all units) –

410 x 370 x 305 mm (no carrying handle).
16.1 x 14.6 x 12.0 in.

Weight –

7KM366-BS: approx 15 kg (full configured, PC not included).
7KM366-MS-900: approx. 18 kg (full configured, PC not included).

Notebook PC (all units) – P150 MHz MMX 32 MB RAM, 2.1 GB HD or equivalent.

Software

Measuring Equipment –

Operating System: Windows® 95 or Windows® NT 4.0.

Postprocessing (stand-alone) –

Operating System: Windows 95 or Windows NT 4.0.
Database: Microsoft Access 97.

Postprocessing (client-server) –

Operating System: Windows NT 4.0 (Server), Windows 95 or Windows NT 4.0 (client).
Database: Microsoft Access 97, Oracle® 8.

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► Ordering Information

Base Station

7KM366-BS – M366plus/GSM base station platform. Includes two interfaces to access a PSTN network, removable notebook, DSP board, power supply and AC/DC converter.

7KM366-MT – M366plus/GSM PSTN Interface Board. Extends the base station with two interfaces to access a PSTN network.

7KM366-DSP – M366plus/GSM DSP Board.

7KM366-BS-SW-R70 – M366plus base station software release 7.0. Software license for one base station.

Mobile Station (Four Interfaces)

7KM366-VMS – M366plus Mobile Station for four interfaces. Includes removable notebook, one controller board with DSP processor (mobile not included), power supply (12 VDC), battery backup unit, AC/DC converter.

7KM366-VMR – Mobile controlboard with DSP processor (only for 7KM366-VMS). Interface board for one mobile (mobile not included).

7KM366-VGPS – M366plus/GSM GPS board, including antenna.

7KM366-VMS-SW-R70 – M366plus mobile station software release 7.0. Software base license for one mobile station, media and manual.

7KM366-VOT35-P – SAGEM mobile For GSM1900 network. Antenna not included.

7KM366-VOT35-P-A – Antenna kit for SAGEM GSM1900 mobile.

7KM366-VOT75-M – SAGEM OT75 dual band GSM900, 1800 mobile. Supports EFR. Includes 220 V battery charger, two rechargeable batteries, user manuals.

7KM366-VOT75-M-A – Antenna kit for SAGEM dual band mobile.

7KM366-OT95-R – SAGEM OT95-R Mobile Phone. Includes 110-220 V battery charger, 2 rechargeable batteries, user manuals and cable.

7KM366-OT95-M – SAGEM OT95-M Mobile Phone. Includes 110-220 V battery charger, 2 rechargeable batteries, user manuals and cable.

Postprocessing

7KM366-PC – Desktop PC, Pentium® 400 MHz, 128 MB RAM, 9 GB HD, 17 in. color monitor, internal modem, Ethernet LAN communication board, CD-R unit, Windows® NT 4.0 in English. Optional.

7KM366-PP-CSW-R70 – Client software of postprocessing tool for data analysis, report generation and mapping of measurements on geographical maps based on Oracle. License for one client in a client-server architecture. Includes also one MAPINFO runtime license.

7KM366-PP-SSW-R70 – Server software of postprocessing tool for data analysis, report generation and mapping of measurements on geographical maps based on Oracle. License for server in a client-server architecture.

7KM366-PP-SW-R70 – Postprocessing tool for data analysis, report generation and mapping of measurements on geographical maps based on Microsoft Access. Includes MAPINFO runtime license. Software license for one stand-alone version.

Training

7KM366-Train-base – Training course for M366plus (four days), max 12 persons.

7KM366-Train-upd – Update course for M366plus (two days), max 12 persons.

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Product manufactured in ISO 9001 registered facilities  

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