Agilent
Wireless Data Measurement

Product Overview

Maximize your wireless data transmission performance

- Capture and retain your data subscribers through good QoS
- Migrate quickly to packet switched data services
- Quantify performance of your new wireless data network

Agilent Technologies

Innovating the HP Way

Manage your data integration

There is a rapid surge of growth in the wireless communications industry, with service providers racing to offer fast data services and Internet access via mobile terminals. To accommodate this, network equipment manufacturers and wireless service providers are migrating to 2.5G and 3G technologies with data services. The move to data oriented wireless communications requires fundamental structural changes and provides the network equipment manufacturers and wireless service providers with an array of new technical challenges. Agilent Technologies offer the test and measurement tools, which meet these challenges and allow a smooth transition to the new enhanced networks and services.

Agilent's GPRS and data test platform offers a true drive test solution, providing end-to-end data testing combined with air interface testing. Users can easily identify and resolve problems to speed network deployment. Agilent's drive test platform will allow the addition of up to four phones, or a combination of phones and digital receivers, to evaluate 2G, 2.5G and 3G networks simultaneously from the same laptop PC. The flexible, scalable drive test platform is evolving to address the new technology formats required to meet future 3G network deployment goals.

Your customer expects a high quality of data services.

Agilent's established series of drive test systems have been expanded to include a wireless data measurement capability. This tool is an invaluable aid at the initial trials, network installation and in-service / network optimization life cycle phases, giving the service provider full confidence that the end user is receiving a high quality of service.

Data measurements

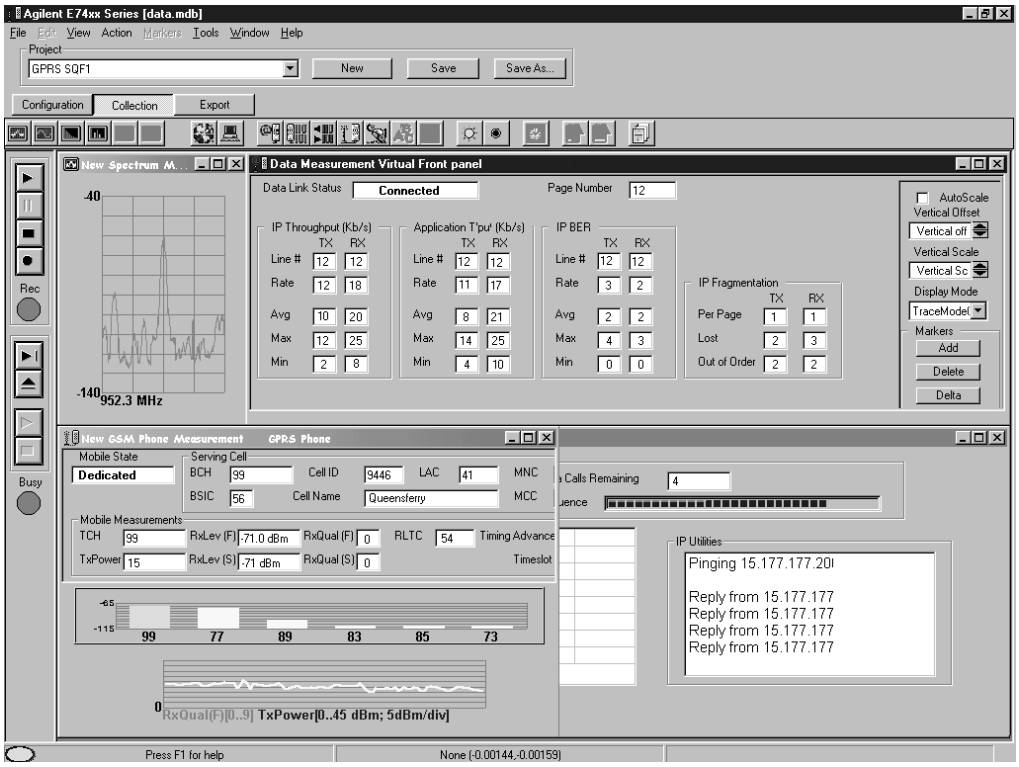
With the convergence of mobile phones and the Internet, wireless networks need to be optimized for data services. Two new options for our drive test products allow end-to-end testing of data connections with independent transmit and receive measurement capabilities. Key data characteristics such as bit error ratio, packet error rate and data throughput can be measured together with network accessibility and recorded for post processing analysis.

The wireless data measurement capability utilizes the drive-test platform and is based on a mobile client(s) and fixed server(s) architecture with user selectable data application sequencing. Test results are collected and displayed on the mobile client(s).

This new addition to our drive test portfolio can be seamlessly integrated with all Agilent Technologies' existing drive test solutions (check for availability) allowing measurements to be made simultaneously across multiple packet switched network technologies.

Scalability

The scalability of Agilent Technologies' drive test tools allow quick migration to multiformat (CDMA, GSM, GPRS, W-CDMA/UMTS and cdma2000) and multi-application (outdoor, indoor, optimization and benchmarking) configurations.



Powerful integrated measurement capabilities

Ensure your data transmission quality

The wireless data measurement software for mobile client and fixed server allows you to view your data transmission capability from a subscriber's viewpoint and to characterize the air interface performance, while transmitting data over the network. The functionality enables you to quantify the whole network performance, to diagnose problem areas quickly and to maximize the quality of data services now.

The Agilent client/server data measurement approach gives you an invaluable and flexible set of tools for use during the trials, integration and in-service phases of your data network life-cycle.

Powerful troubleshooting capability

The server can be connected at various stages of the network's communication chain, where an IP interface is available. This allows elements of the system to be eliminated from the test 'loop' giving a powerful diagnostic capability. In addition a single server can support several clients simultaneously.

Data measurement system architecture

The architecture is based on a mobile client(s), which consist of a laptop PC, related software and test mobile phone(s), and a fixed server(s), which enable user selectable data application sequencing. Multiple data transfers can be initiated. Both mobile transmit and mobile receive paths are independently measured with the results being collected and displayed on the mobile client(s). This test architecture ensures that the users perspective of the end-to-end network is quantified.

Typical data measurement results provided include:

- Data integrity; accuracy of data transmitted
- Bit error ratio, line errors, packet errors
- Data throughput; speed of data transfer in both directions
- Max, min and and average throughput at link and application layers
- Network accessibility
- Server connectivity, including Ping and Tracert utilities

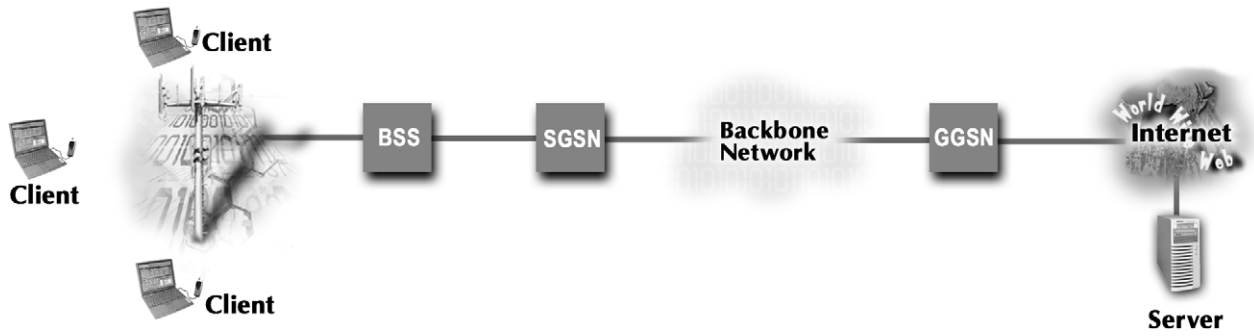
Basic client and server functionality

Client Functionality:

- Initiate network connections
  - Directly connected mobiles
  - Sends Uplink data to the server
- Process downlink data from the server
- Log measurement results
  - Data measurements
  - Regular drive test measurements

Server Functionality :

- Data Reflector
  - Process Uplink data from client(s)
  - Returns Uplink results to client(s)
  - Generates Downlink test data sent to Client(s)



High level depiction of the wireless data measurement architecture

Data measurement methodology

The existing Agilent Drive-Test System is used as the platform for the client during the wireless data testing. The client(s) communicate with the test server(s). This communication chain encompasses the mobile network as well as the backbone infrastructure, giving you visibility from the end-user's perspective. The server(s) can be positioned at strategic IP Interface compatible points within the communications infrastructure to give powerful air interface and network component troubleshooting capabilities through a combination of multiple network taps (via the servers) and protocol stack logs (via the client).

The server software provides a number of use scenarios that can be sequenced during a drive-test. These test sequences will simulate customer usage of the wireless data connection, such as web browse, e-mail, WAP access, financial transactions, and news group access.

Utility tools such as PING and Traceroute can be used to validate the server's availability and to give visibility of the connection route, enabling consistency on subsequent comparison testing.

Data is transferred over-the-air from the client into the network and then to the server. The server software verifies the integrity of the data, and returns reply data containing the results of the integrity verification along with the relevant test data sequence. This data is then transferred through the network, to the base station, where it is transmitted to the client. The client software carries out performance measurements on the return path and verifies the data integrity.

System requirements

Client

For client platform minimum laptop PC specification and relevant hardware requirements please refer to the relevant wireless solutions specification.

The client's full trace functionality is available when used in conjunction with a data-enabled test mobile. Check for availability of test mobiles appropriate to your target technology. A maximum of two mobiles can be supported by each client laptop when carrying out simultaneous data and trace measurements. Agilent Technologies can supply hardware, if required.

A partial, basic test capability is possible through the use of commercial mobile phones. Up to four commercial data-enabled mobiles may be connected to the drive test system's client laptop for data collection, and/or loading of the network.

The client's wireless data measurement application software is supplied on CD-ROM together with a software protection key.

Server

The server effectively acts as a reflector for client data and is designed to be unmanned, after initial setup. The server performs error checking on the incoming data and replies with encoded pages including the results information. The minimum server system requirements are as follows:

- Windows 2000 server operating system platform
- PIII, 500 MHz, 64Mb RAM

Agilent Technologies can supply hardware, if required.

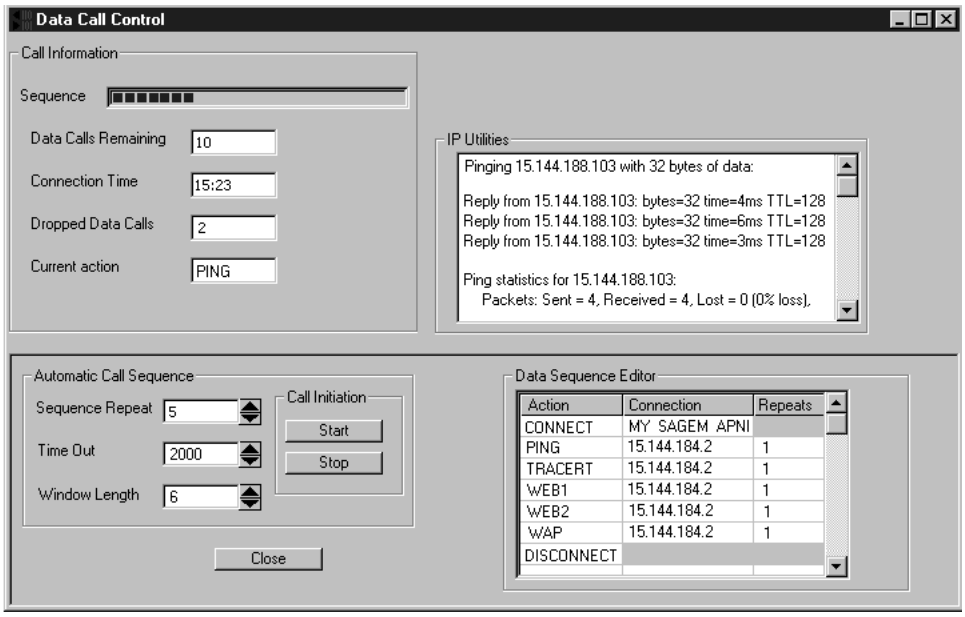
The server's wireless data measurement application software is supplied on CD-ROM together with a software protection key.

Key features and specifications

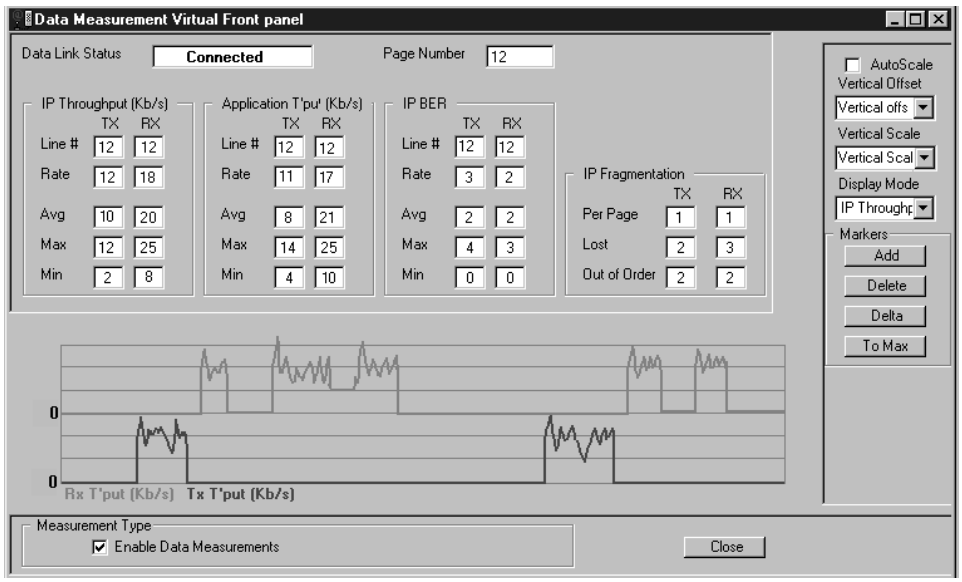
The wireless data measurement capability are software options available on Agilent Technologies' drive-test systems for all packet switched technologies (check for current availability).

Use the software options to:

- Get a user's point-of-view of wireless data network performance
- Characterize data transmission performance (end-to-end)
- Measure transmit and receive paths independently
- Simulate data applications (e-mail, SMS, WAP applications, web browsing)
- Measure and report on data integrity
- Measure and report data throughput
- Measure and report on network accessibility



Flexible control of data transactions



Measure key data parameters

Ordering Information

E7478A GPRS drive test system
❑ Option 200 – Data Measurement Software License
❑ Option 220 - Data Measurement Server Software License

E7476A W-CDMA drive test system
❑ Option 200 – Data Measurement Software License
❑ Option 220 - Data Measurement Server Software License

E7477A CDMA2000 drive test system
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❑ Option 220 - Data Measurement Server Software License

E7473A IS95 CDMA drive-test system
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