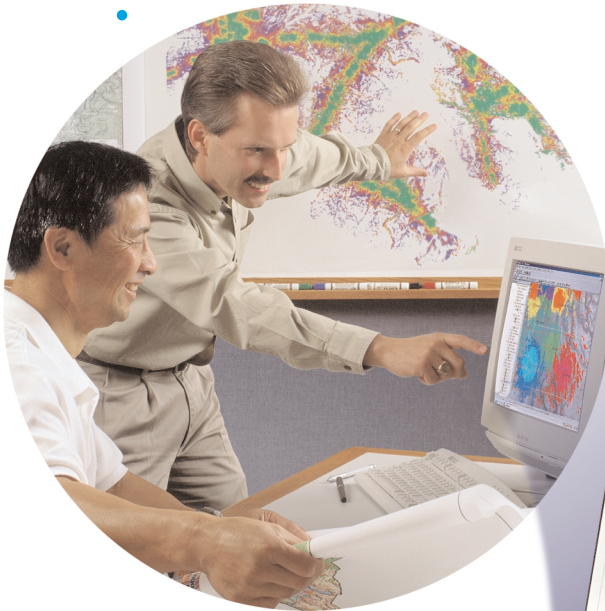


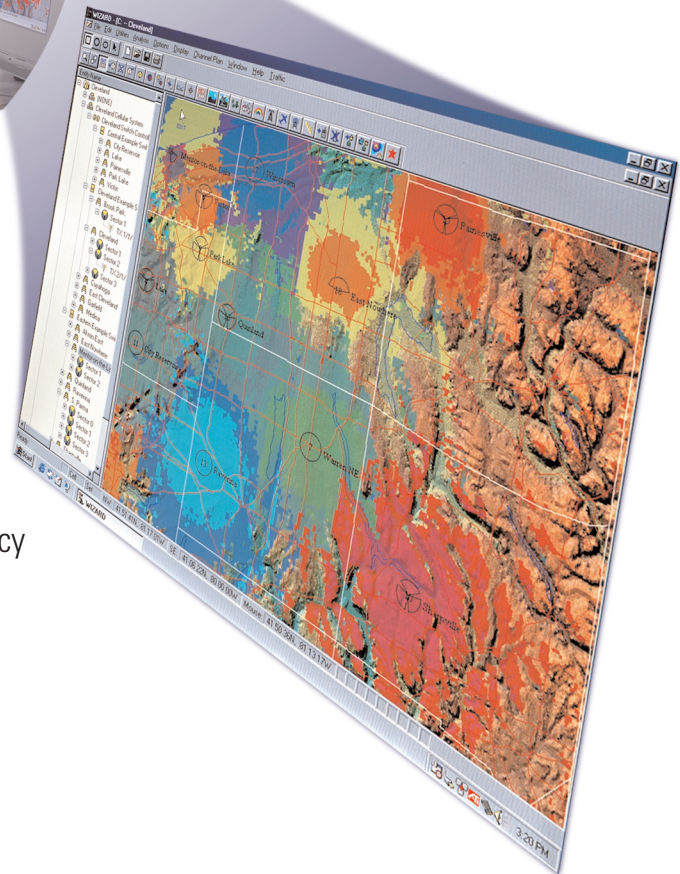
# Agilent E6482A Wizard Wireless Network Planning and Design Tool

## Product Overview



### Deploy high quality next-generation networks faster with Wizard

- reduce deployment costs
- plan for network growth
- maximize engineers' efficiency
- increase design certainty



Agilent Technologies

## Facing the challenges of wireless network expansion

As wireless networks continue to face the most challenging market in industry history, the demands on a network design tool increase. Wireless service providers need to ensure fast return on investment when expanding services. This means that the network design must be right the first time.

Today's tough market environment has driven many companies to focus their efforts on quality network design and management in an effort to maximize Average Revenue per Subscriber (ARPS). The right tools can help meet these challenges by quickly identifying problems on 'paper' before the problem exists in the network. The ideal solution will help manage these challenges by expanding your capabilities on a tight budget.

The Agilent Technologies Wizard Wireless Network Planning and Design Tool (E6482A) offers a solution that solves tough network expansion and migration issues by focusing on Return on Investment (ROI). From a single platform, engineers can design, evaluate, and remedy network problems for all major wireless technologies. Features within Wizard allow the engineer to quickly isolate problems and anticipate future capacity needs.

Wizard offers a unique work environment that allows you to maximize the productivity of your most precious resource – your skilled engineers. The features found in Wizard combine to make your entire staff more efficient and forward thinking, saving the company money in network infrastructure, maximizing capacity and gaining revenue by bringing new services to market faster.



Wizard helps your engineers balance coverage, capacity, and quality of service to solve tough network design problems.

The Wizard planning tool is a flexible package offering basic RF design support for:

### Second generation (2G)

- AMPS
- TDMA
- GSM/GPRS
- cdmaOne
- iDEN

### Third generation (3G)

- cdma2000 (1xEV-RTT & 1xEV-DO)
- W-CDMA (UMTS-FDD)

Plus, Wizard supports advanced equipment configurations such as:

- microwave links
- repeaters
- switched beam antennas
- microcells

The platform can also easily be expanded to include the following advanced automated planning tools from ComOpt:

- CellOpt Automatic Frequency Planner
- CellOpt Automatic Cell Planner

Whether your challenge is keeping up with rapid subscriber growth or migrating to a new technology, Wizard provides a solution that will assist you in addressing these challenges.

**Wizard solves tough network expansion and migration issues on paper - reducing your deployment costs.**

## Network migration in a day

Agilent has focused on the challenge of transitioning your network from one technology to another. Whether you are trying to migrate from TDMA to GSM/GPRS or from one 2G technology to one of the new 3G technologies, Wizard includes the features that can help you deploy your new network faster than your competition.

Wizard comes with a project data **Import/Export** feature that allows site data to be imported easily from any source. Transmitters within Wizard are designated with a technology flag that allows you to convert your current network design into a one-for-one overlay with the new technology. Both the old and new network design can exist in the same project space allowing you to manage the rollout from a single database.

Wizard is the only tool on the market to offer Static Analysis for 3G design evaluations. These fast analysis compliment our Monte Carlo analysis by offering prediction results in about one fourth the time. The analysis allows you to explore various marketing assumptions by predicting the coverage for a specific service type under various loading conditions. The advantage is that you can perform preliminary evaluations of networks faster, be certain of your budget, and ensure you will meet market demand.

**Import/Export** and **Static Analysis** allow your team to create and evaluate a preliminary design in a single day.

## Accuracy – be certain of your design

Finding network quality problems on paper before changes are made in the field saves time during optimization and improves the overall quality of the network. Further, this proactive approach reduces churn by fixing problems before the subscriber experiences them. To implement this phase containment strategy, the engineer has to have confidence in the accuracy of the RF planning tool. Wizard provides features that ensure accuracy. Our solution focuses on propagation modeling, algorithm development and traffic modeling.

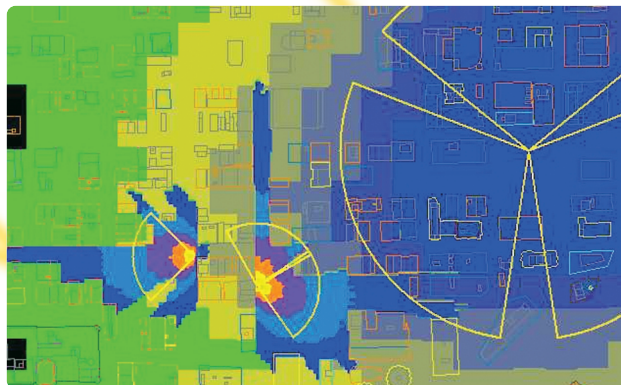
Wizard supports three widely used macrocellular propagation models - Hata-Okamura, Lee, and COST231. Years of experience with these models have allowed us to refine default parameters for each model so your engineers can run accurate predictions out-of-the-box.

For greater accuracy, Wizard includes two easy-to-use optimization routines. The user can optimize the model parameters using a **one-step propagation model optimization routine**, or optimize the clutter adjustment values through an automated routine. Both routines rely on drive test data to fine tune the accuracy of the predictions.

An accurate **microcell model** is also available as an upgrade to the Wizard platform. This model is fully integrated with Wizard to help address the rigorous planning requirements in dense urban settings.

Network modeling has become more complex. It is no longer sufficient to predict coverage and interference for a simple antenna system. You must be able to model advanced equipment deployments as well as vendor specific traffic management techniques (underlay/overlay, hierarchical cell structure, etc).

Wizard algorithm development has kept pace with network improvements by modeling advanced equipment deployments like switched-beam antennas and repeaters. Coverage and interference analysis account for the behavior of these advanced network elements. Wizard can predict the statistical interference gains using switched-beam antennas. Coverage and interference analysis also honor overlay and hierarchical cell structures to accurately model coverage and quality.



Microcell and macrocell predictions are combined in the same analysis.

## Capacity planning – be certain of your future

Capacity planning has become the leading issue with network planners. Whether your network is facing congestion from high subscriber growth or the introduction of spread spectrum technologies like 1XRTT and UMTS-FDD, network planners are looking for tools that provide the best traffic simulations. It has become imperative that the network design guarantees capacity as well as coverage and quality.

Wizard offers a full complement of traffic analysis that allow the engineer to study the amount of traffic served by individual cells. Each analysis provides support for technology-specific coverage.

- **Traffic Served** predicts the mErlangs served per sector and number of required trunks to serve the traffic.
- **Traffic Offloaded** provides a comparison between two network configurations, detailing the amount of traffic offloaded to new site(s).
- **Demand Planner** can turn a traffic distribution map into a full network design.

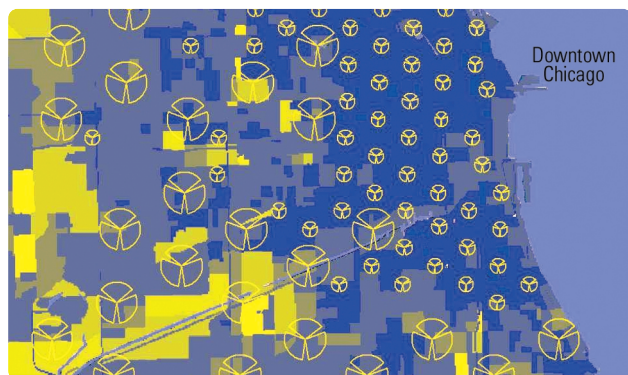
Understanding that the traffic analysis are based on the integrity of the traffic data used, Agilent has devoted time developing the most comprehensive set of utilities for modeling subscriber traffic. Wizard can generate traffic grids that range from simple to complex. The Wizard drawing tool allows users to create simple traffic distributions from hand-drawn figures. If complex GIS data is available, the same process can generate weighted traffic distributions based on the geographical information. Once created, the user can scale grids or add them together to model future growth in the network.

Wizard also allows the engineer to generate traffic distributions from the best source available – traffic data from a live network switch. Voice traffic (mErl) or data traffic (kbps) can be imported and stored for each transmitter in the design.

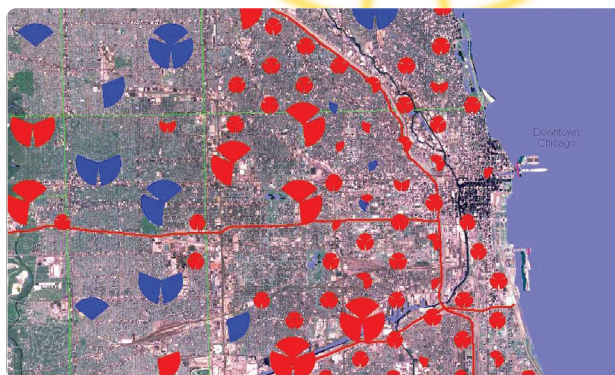
The **Demand Grid Generator** is used to distribute traffic imported from the switch. The routine distributes the traffic from each sector over the coverage area. Wizard even allows the user to distribute unevenly based on a clutter file. This method provides the most accurate method of modeling the demand on your network resources.

All together, Wizard provides the most comprehensive set of traffic modeling tools. Engineers can model various marketing assumptions to be certain that they will meet the network's future capacity needs. Engineers are able to scale present day traffic to predict network requirements to meet future demand.

Plan network growth  
Use switch data and traffic  
trending to anticipate  
future resource needs.



Create sophisticated traffic distributions and scale them to model future demand.



Predict sites/areas that will require additional capacity.

## Quality and speed – deploy high quality networks faster

Wizard has been focusing on the RF design process and engineering problem solving since 1992. This experience has translated into many timesaving features that help you deploy network changes faster than the competition. The Wizard platform offers tools that identify problems while driving the engineer towards a solution. Wizard analysis are some of the quickest and most efficient on the market, and Wizard data is organized to help engineers find and share information across functional groups.

Wizard's unique environment offers a host of interactive tools that help identify problems in the design, assist in evaluating analysis results, and define objective criteria for sound network design. **Smart Analysis**, Wizard's unique **Mouse Tool**, and **Area Statistics**, are just a few of the features that allow engineers to find problems in the design before deployment.

### Maximize efficiency

Wizard is the only tool on the market to offer **Smart Analysis** – a tool for increasing the efficiency of your engineering staff. Smart Analysis provides a convenient, easily understood format for sharing the knowledge of your experienced RF engineers with the rest of your staff. It also provides a method for design quality control, which is important when managing a large project. Further, this feature can evaluate network designs for the team based on one or more user-defined criteria. The results of the evaluation highlight only the critical problems. The engineer is focused on solving problems that are causing lost revenue.

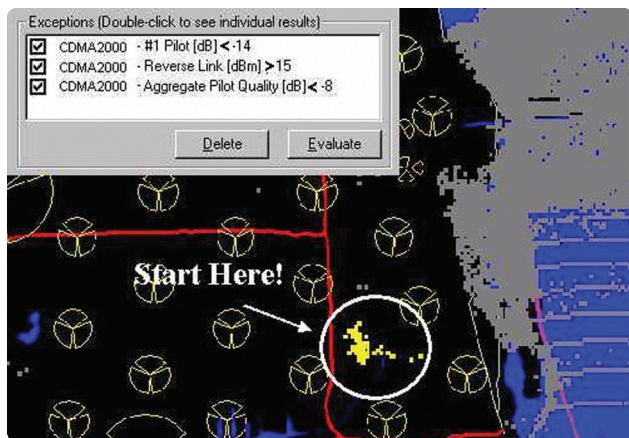
#### Smart Analysis is supported for the following technologies:

- AMPS
- TDMA
- GSM/GPRS
- iDEN
- cdmaOne
- W-CDMA
- cdma2000

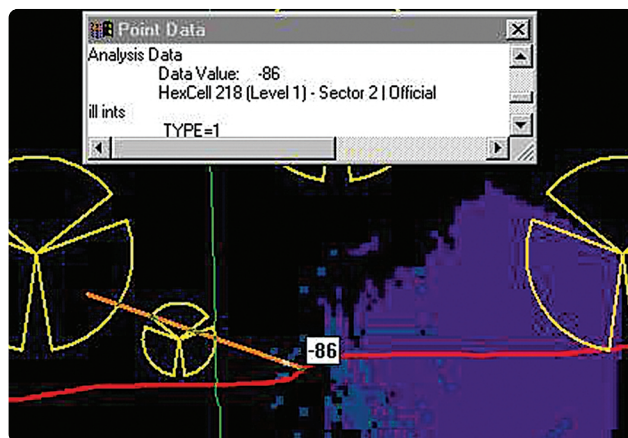
### Accelerate solutions

Analysis results from most planning tools offer nothing more than colored interpretations of network quality. Wizard provides the tools to probe the analysis results, uncovering the reasons for poor network design. The **Isolation**, **Star** and **Point Tools** are all mouse driven interactive tools aimed at delving into network design problems. These features assist the engineer by pulling data from the geographic display and clearly identifying problems.

**Maximize engineers' efficiency and accelerate solutions**  
Use Smart Analysis to define design criteria, transfer knowledge to the rest of the staff, and increase the productivity of your design team.



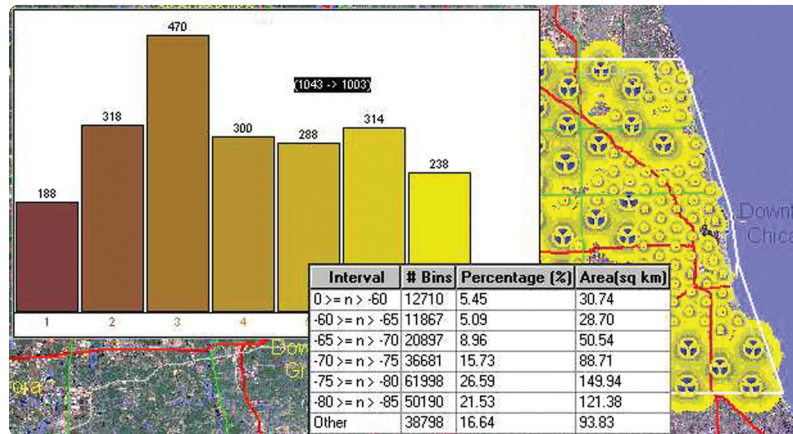
Let Smart Analysis evaluate your network design and show where critical problems exist.



Clearly identify problems using Wizard's interactive tools, like the Isolate and Star tools.

## Increase certainty

The *Area Statistics* tool increases the effectiveness of all engineers by providing objective, statistical evaluations of the analysis results. It is no longer necessary to rely entirely on your engineer's experience to judge the effectiveness of network changes. Every engineer can now evaluate changes by generating analysis statistics for critical areas of the network. Your engineering team becomes more productive and more certain of their design recommendations.



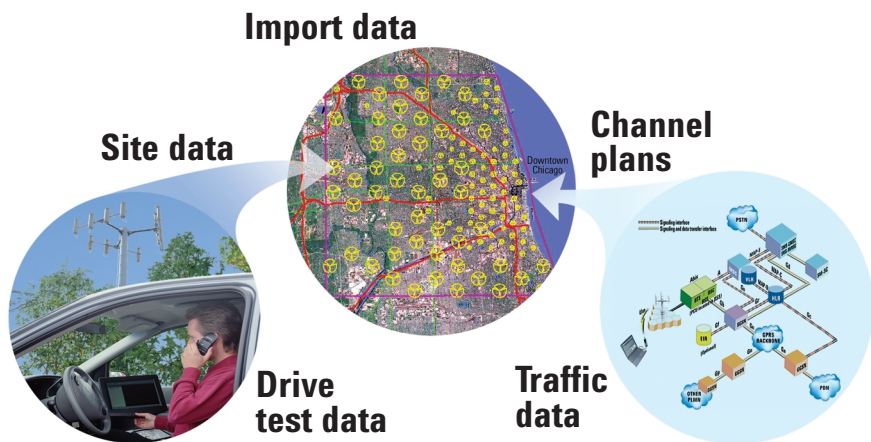
Objectively evaluate network changes with the Area Statistics Tool.

## Accelerate performance

Wizard is packed with automated features that save time by managing analysis results for the user. Combined, these features offer analysis speeds that out perform some UNIX®-based solutions. All analysis steps are saved and results are linked to the respective site or sector. Therefore, engineers sharing project data do not have to wait for results that already exist. Wizard is smart enough to spawn certain analysis steps at the moment a site change is entered. This further reduces analysis run time by eliminating one step from every analysis. The result is UNIX® performance on a PC-platform. Your engineers can now spend more time solving problems rather than waiting for results.

**Increase design certainty**  
Interactive mouse-driven tools help uncover the reasons for poor network design. The Area Statistics tool provides objective evaluations of network quality, eliminating guesswork.

**Accelerate performance**  
Wizard provides UNIX® power and performance on a PC platform putting RF design tools in more engineers hands.



Bring more information into the design using convenient imports for switch and drive test data.

## Facilitate collaboration

Managing information and sharing that information across functional groups is a key factor in detecting problems and managing a network. Wizard provides features that facilitate the flow of information in three ways:

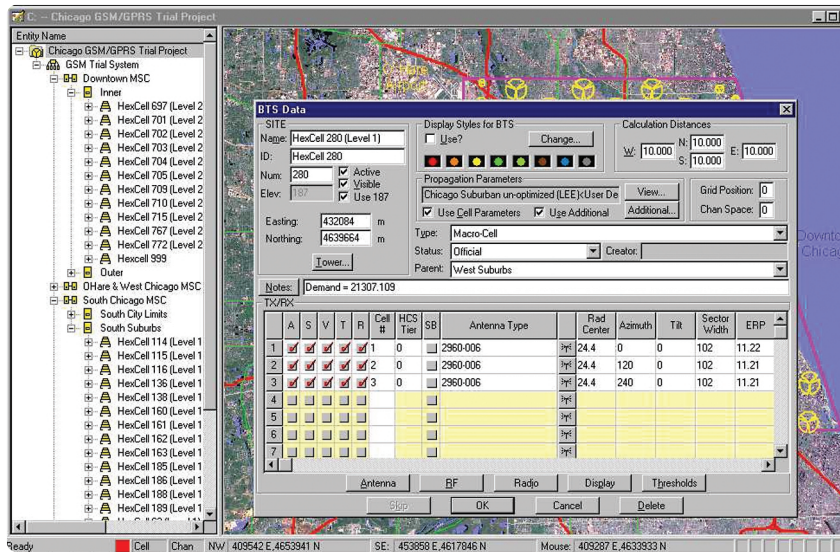
- project data can be shared through an Oracle® database
- the product comes with convenient imports for project data, drive data and switch data
- the platform provides data exchange with Microsoft Office® products and MapInfo®

Wizard has features that facilitate sharing data between applications and organizations. Project data can be managed using Oracle®, providing different organizations within the company access to critical network planning data. Analysis results and network reports are compatible with Microsoft Office products.

Finally, Wizard offers generic and vendor-specific imports for drive test data, channel plans and traffic statistics and neighbor lists from the switch. This suite of features means that you have the tools necessary to share data across your entire company, manage network change effectively and bring those changes to market quicker.

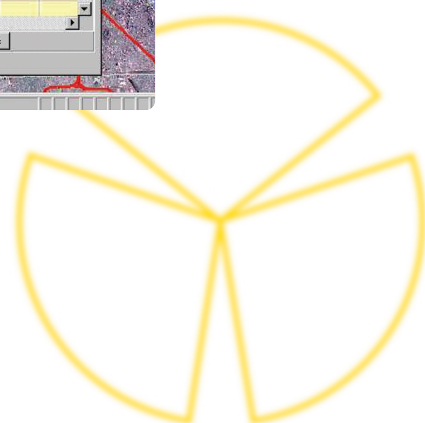
Wizard organizes data into convenient dialog boxes that present all the necessary cell information in a single format. A project hierarchy can be applied to network elements or sites can be grouped using flag designations. Organizing the cell data in this fashion is an effective way to manage network rollouts and track configuration changes. Global editing allows quick changes to one or several variables. Combined, these features limit the time spent looking for project data and reduces the time spent modeling network changes - focusing your efforts on fixing problems.

Agilent's experience in network design and planning has led to these timesaving features. The engineer can maximize the quality of the RF design before changes are deployed in the network. You can be certain of meeting your deadlines with Wizard.



Wizard's work environment presents data in convenient dialogs for quick access.

**Facilitate collaboration**  
Database features within Wizard facilitate the flow of information between groups.



## International technical support

The Wizard support staff is one of the best support teams in the industry. Our support team prides itself in the fact that all incoming calls are answered directly by experienced individuals, so you don't waste valuable planning time wading through dial menus or explaining your issue with inexperienced staff.

In addition, on-call Senior RF engineers are available to consult with our staff, so if your question requires additional research you can be confident that your problem will be solved within 24 hours or less. Support is also linked to our Wizard Development Group providing you a voice in the continued development of the product.

Agilent's monthly technical support newsletter will keep you up-to-date about upcoming features and enhancements. Internet training on targeted features and procedures is also available several times a year. For your convenience, company user group training is also available upon request.

## Product specifications

Wizard provides a fully featured network-planning tool in a portable format, removing the need for UNIX® workstations with their inflexibility and high maintenance costs. When compared to other PC planning tools, Wizard's strength lies in its ease of use and feature rich platform.

Wizard will run on laptops, desktops or servers running any of the Windows® operating systems - Windows® 95, 98 or 2000, Windows® NT® or NT Server and Windows® XP. Agilent offers the following configurations recommendations.

### Hardware requirements

#### Computer platform

For optimum performance, Agilent recommends installing Wizard on a computer with a Pentium IV 700 MHz or faster processor, 512 MB RAM, 1024 pixel x 768-pixel screen resolution and 24-bit graphics accelerator card with at least a 16 MB of video memory.

### Operating system

#### Operating environment

Agilent's Wizard planning and design tool is built for the Microsoft® Windows® operating environment. Wizard's Graphical/Geographical User Interface is consistent with the basic operation and design of other Windows® applications. Wizard can run concurrently with other Windows® applications.

### Network environment

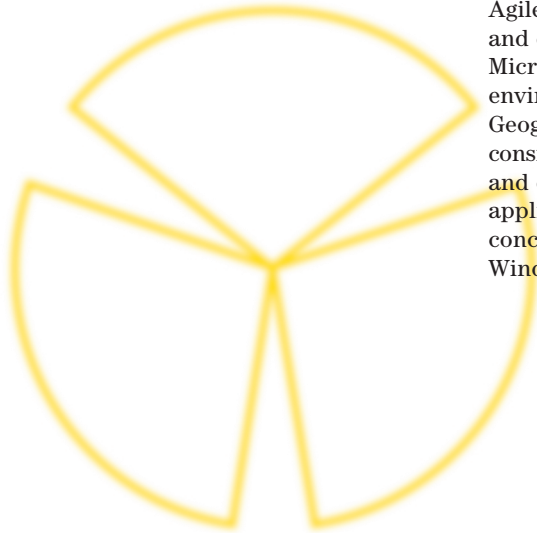
Wizard will run in a stand-alone mode or it can be operated in a network environment. Wizard works best on servers running Windows NT® Server or Novell's server software. When networked, Wizard allows the users to access the project data on the server, but processing takes place on the user's workstation.

#### Multi-user networking

Wizard supports the use of a Microsoft® Access and Oracle® database formats. The tool has been optimized to minimize network traffic, but for optimal data sharing, it is recommended that Wizard operate while connected to the database over a 100-base T network. Since processing, takes place on the local workstation, it is also advantageous to store large files locally, such as terrain and clutter. Wizard can be configured to operate as a Terminal/Server application in instances where network speed is an issue.

#### Multi-tasking

Wizard supports multi-tasking by processing all analysis routines in the background. While an analysis is running, the user can continue to edit the network configuration, view previous analysis, export data or work within another Windows® application. The Wizard analysis are processed in the background.





## Configuration options

Wizard is available in a variety of configurations to fit your needs. Each is packaged with the most popular and useful features in a convenient platform. The product can be licensed on an annual basis or through a perpetual license. Technical support is included in the annual contract while maintenance contracts are available for perpetual licenses.

Wizard is offered in a basic package attractive to most service providers. The Wizard-2G configuration (E6482A-101 – annual license or E6482A-102 – perpetual license) offers all the time saving features described above plus traffic analyses and modeling of switched-beam antennas. This base configuration supports all 2G technologies including: AMPS/TACS, iDEN/TETRA, TDMA, GSM, cdmaOne (IS-95A&B), and GPRS. Analysis and functions include:

- Forward Link coverage and interference analysis
- Reverse Link coverage analysis
- Neighbor List generator
- Smart Analysis
- Pilot Pollution and Monte Carlo simulations for cdmaOne
- Full suite of traffic analysis
- Built in AFP and microcell model

Wizard-UMTS (E6482A-201 - annual license or E6482A-202 - perpetual license) offers support for the 2G technologies above plus a full suite of UMTS-FDD functionality. Analysis and functions include:

- Static analysis for Pilot, Forward and Reverse Link
- Monte Carlo simulations for Pilot, Forward/Reverse Link with reported statistics
- Smart Analysis
- Interactive Scramble Code Planning

Wizard-cdma2000 (E6482A-301 - annual license or E6482A-302 - perpetual license) offers support for the 2G technologies above plus a full suite of cdma2000 functionality. Analysis and functions include:

- Static analysis for Pilot, Forward and Reverse Link
- Monte Carlo simulations for Pilot, Forward/Reverse Link with reported statistics
- Smart Analysis
- Interactive PN Offset Planning
- Includes support for 1xEvDO

## Convenient add-on options

Wizard offers a variety of options to enhance your Wizard platforms.

- The Microcell model E6482A-501 or E6482A-511 provides an integrated solution for modeling difficult urban and dense urban settings.
- Project data conversions E6482A-600's provides a method of getting your current project data into a Wizard format.



## Related products

### Automated planning tools

Agilent's close relationship with ComOpt provides unique advantages for our customers. The CellOpt Automatic Frequency Planning Tool (AFP) provides implementation ready frequency plans. The AFP is tightly integrated with Wizard. The User Interface (UI) within Wizard steps the user through the modeling process. This UI assists the engineer to configure AFP models quicker by eliminating up to 75% of the work normally performed within the AFP.

The file exchange honors the AFP's GSM formats and set/group planning architecture. Finally, Wizard reads CellOpt AFP models allowing the engineer to reload models and fine tune the parameters with less effort.

The CellOpt Automatic Cell Planner (ACP) is configured into Wizard. Agilent worked closely with the ACP team to create a seamless integration between the products. The ACP reads cell data directly and passes the optimized cell configuration back to Wizard. The ACP provides the necessary tools for optimizing 2G, 2.5G and 3G cell designs directly in the Wizard tool.

### Wireless technical training – Wizard product training

Agilent offers two product training courses. The Essentials of Wizard (N4141A) offers basic training for the Wizard product. This three day course covers basic operation, analysis, and functions.

The Wizard CDMA training course is a one-day class that explains the extended functionality connected with CDMA design in the Wizard planning and design tool.

### Wireless technical training – RF engineering courses

Agilent also offers a suite of RF engineering courses. These classes are independent of the Wizard product. They are recommended to Wizard users since many of the techniques and concepts taught in the class are useful in the operation of the tool.

The Basic RF Series (N4100A) covers the following topics over five days:

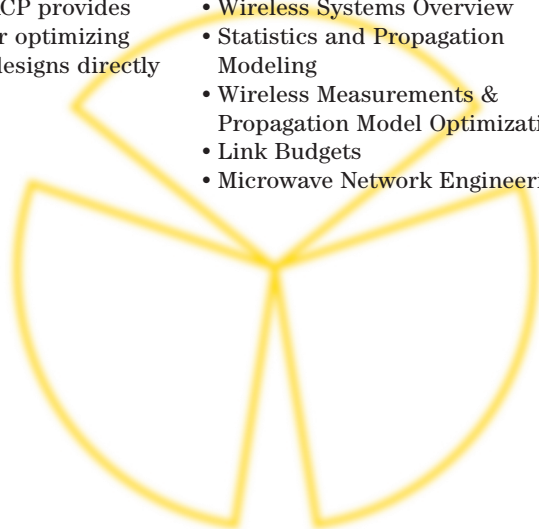
- Wireless Systems Overview
- Statistics and Propagation Modeling
- Wireless Measurements & Propagation Model Optimization
- Link Budgets
- Microwave Network Engineering



The Advanced RF Series (N4110A) covers the following topics over four days:

- Traffic Planning
- Frequency Planning
- RF Planning Criteria
- Antenna Systems for Cellular Communications

The Wireless Institute of Technologies offers additional training courses on specific technologies. Training courses on GSM/GPRS, TDMA, cdmaOne, as well as cdma2000 and UMTS-FDD are available.



## **Wireless Network Services – in-depth propagation model optimization**

Agilent's E6488A-103 Wizard Propagation Model Optimization Boot Camp gives your team the theoretical and practical knowledge to efficiently optimize Agilent's E6482A Wizard software. This class includes five consecutive days of consulting services at your site for up to six of your engineers. The boot camp includes advanced user training and proven engineering processes that boost the effectiveness and accuracy of the Wizard tool based on your network. Agilent professional consultants will work with you to define your morphological classifications, develop your site selection criteria and develop standardized drive test methodology.

During Agilent's E6488A-103 propagation model optimization boot camp you will develop standardized checklists to ensure measurement validity, identify key performance indicators to be captured and determine measurement equipment criteria. Finally, Agilent covers measured data vs. predicted data analysis and quality assurance gates necessary to get the most out of your planning tool.

## **Wireless Network Services – turnkey propagation model optimization**

Also available is Agilent's E6488A-104-108 Turnkey Propagation Model Optimization. Our consultants will perform all necessary engineering steps and provide all needed resources as well as project management to optimize the propagation parameters of Wizard to market specific settings while training your staff. This will include creating morphological classifications, selecting sites, defining routes for drive testing, equipment setup, data collection and measured vs. predicted data analysis. Agilent will assign propagation parameters and create quality assurance gates.

## **Additional Agilent literature**

### **Application notes**

*Deployment, Optimization, and Maintenance of UMTS Networks with Wizard*  
literature number 5988-2272EN

### **Brochures**

*Accelerate the Performance of Next-Generation Networks with Agilent's Wireless Network Services*,  
literature number 5988-5244EN

*Accelerate cdma2000 Performance with Agilent's Wireless Network Solutions*  
literature number 5988-4423EN

### **For more information**

For more information call your local sales representative or visit our Web site at [www.agilent.com/find/wizard](http://www.agilent.com/find/wizard)





For more information about Agilent's solutions for the communications industry visit our Web site at: [www.agilent.com](http://www.agilent.com)

For more information about Wizard, go to: [www.agilent.com/find/wizard](http://www.agilent.com/find/wizard)

You can also contact one of the following centers and ask for a communication solutions representative:

Australia		1800	629 485
Austria		0820	87 44 11
Belgium	+32	(0) 2	404 9340
Brazil	+55	11	4197 3600
Canada		877	894 4414
China		800	810 0189
Denmark	+45		70 13 15 15
Finland	+358	(0) 10	855 2100
France	+33	(0) 825	010 700
Germany	+49	(0) 1805	24 6333
Hong Kong		800	930 871
India		1600	112 929
Ireland	+353	(0)1	890 924 204
Israel	+972	3	6892 500
Italy	+39	(0)2	9260 8484
Japan		0120	421 345
Luxembourg	+32	(0) 2	404 9340
Malaysia		1800	888 848
Mexico	+52	55	5081 9469
Netherlands	+31	(0) 20	547 2111
Philippines		1800	1651 0170
Russia	+7	095	797 3963
Singapore		1800	375 8100
South Korea		080	769 0800
Spain	+34	91	631 3300
Sweden		0200	88 22 55
Switzerland	Italian	0800	80 5353
Switzerland	German	0800	80 5353
Switzerland	French	0800	80 5353
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Printed in USA October 9, 2002

5988-0245EN



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