

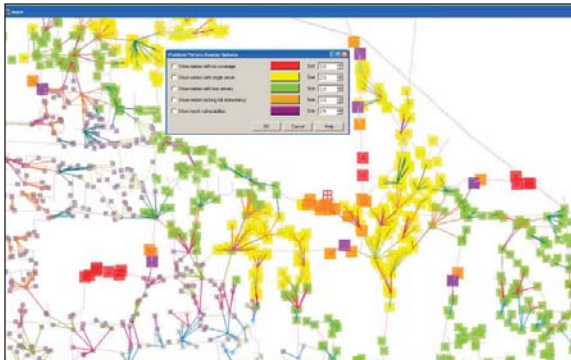
SignalMX® is an add-on module to EDX® SignalPro® for designing, deploying and optimizing Smart Grid AMI, Wi-Fi and other wireless mesh networks. SignalMX includes automatic node layout, automatic router selection, automatic traffic loading, and automatic gateway selection. SignalMX provides detailed performance predictions that save operators time and money in their network planning processes.

Studies

Smart Grid AMI Analysis

The SignalMX Module has a custom Smart Grid design tool that allows Utilities, Smart Grid Vendors and System Integrators to efficiently plan, deploy, and optimize large scale mesh and traditional AMI (Advanced Metering Infrastructure) networks at every point in the system lifecycle. This ensures proper dimensioning, the most efficient network architecture, lowest cost deployment and most reliable operation. Some significant new analysis features include:

- The ability to accommodate large numbers of network equipment by syncing with external databases
- Fast pre-sales layouts of meters and distributed access points
- RF-optimized automatic router selection and mesh analysis of up to 200,000 meters in one study
- Detailed reports of system performance, traffic, mesh vulnerabilities and critical mesh points. These provide the engineer with essential information in the process of designing a robust, reliable and redundant Smart Grid network.
- Creation of professional layouts and coverage/performance diagrams which can also be exported to industry standard GIS tools such as Google Earth®, MapInfo®, and ArcGIS®

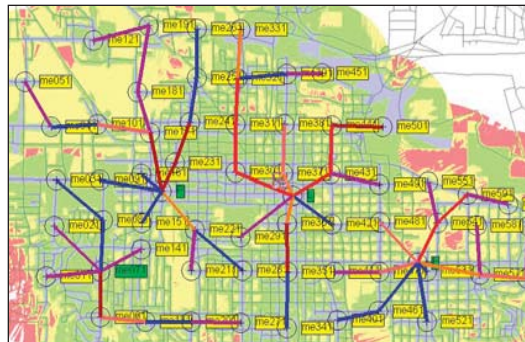


Smart Grid mesh details with problem meters emphasized.

Mesh Analysis

SignalMX gives you powerful analyses for mesh networks through specific studies and displays that are meaningful for mesh architecture. These analyses:

- Determine path loss between all Access Points (APs) using point-to-point link calculations that take into account terrain, buildings, and clutter
- Calculate received signal at each AP from all other APs
- Calculate interference at each AP from all other APs based on frequency or channel
- Take into account directional antennas



Mesh Routing display along with coverage from routers. Mesh link color selection determined by available data rate.

Features

Automatic AP and AMI router Layout

SignalMX provides automatic layout of cells/Access Points (APs) and AMI routers. Whether you're in the bidding process, initial deployment, or planning for growth, the power to automatically distribute APs and mesh routers in your market area will give you the ability to quickly plan your network to meet capacity demands.

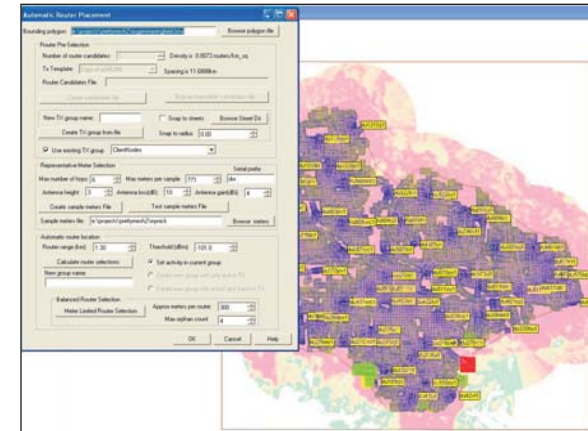
The automatic distribution of APs and routers is based on market-specific databases such as census/population information or land use/clutter specifications, and can make use of databases that provide potential locations, such as geographically referenced street lamp databases. An intelligent "snap to intersections" feature places APs at street intersections to make the most of street canyon environments.

Multiple groups of APs and routers can be automatically generated, with each group having specific RF parameters and distribution techniques, providing for easy modeling of multiple service level agreements.

The advanced mapping features in EDX software let you display aerial photos and satellite images as map backgrounds, and adds to the ease of laying out mesh and AMI networks.

Automatic Selection of AMI Routers

Streamline AMI router placement and selection by using this RF-optimized selection feature. The feature will select the minimum number of routers to cover meters based on receive sensitivity, maximum number of hops for meters, and maximum router distance. A balanced router selection mode can also be used to include maximum number of meters per router.



Automatic router placement for AMI Smart Grid mesh systems.

Automatic Selection of Gateway Nodes Based on Backhaul Conditions

This feature automatically identifies and assigns nodes as gateways based on the best connectivity conditions to a WiMAX or Multipoint backhaul network. Save time and make it easy to reliably repeat network designs with consistent criteria.

Automatic Traffic Loading

Model the traffic in your service area with more accuracy. Automatically calculate traffic loading on individual nodes based on real service areas and a selection of multiple service types. You can consider multiple service mixes such as voice, e-mail, web browsing, audio streaming, and video streaming.

Planning with Routing Information

In order to do meaningful traffic analysis on mesh networks, it is important to consider the routing techniques used by equipment. A generalized "fewest hops to the gateway" routing technique and distance limitation settings are included.

SignalMX also includes Application Programming Interfaces (APIs) that provide for proprietary routing algorithms to be used in your traffic analysis and what-if scenarios.

Signal MX[®] Module

Features - (cont.)

Use Clutter for Fast 3D Modeling

SignalMX provides an innovative way to effectively model the 3D environment. A Clutter Carving technique is used to provide a realistic description of the street canyon propagation environment in which the network operates. The technique provides network designers with the ability to quickly build a reasonable location-specific model of the environment without purchasing building/structure databases.

This innovative feature adds relevant height values to terrain, based on underlying clutter categories and GIS data, such as streets/major roads/highways.



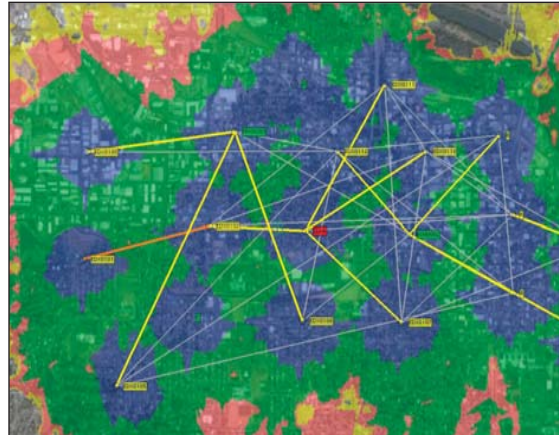
Wi-Fi client coverage before Carved Clutter technique.



Wi-Fi client coverage after Carved Clutter technique

Detailed Consideration of the 3D Environment

EDX SignalPro, the core network design tool, offers a comprehensive selection of propagation models. The included models use deterministic calculations that predict path loss in clutter-rich environments by considering the attenuation of the local clutter and the specific locations of building walls. These considerations are essential for accurate predictions of coverage and interference in dense mesh networks where the low power equipment is located within the clutter.



Wi-Fi client coverage map with mesh routes to gateway/backhaul points (green labels). Links are colored by data rate. Also visible are alternate mesh paths that meet.

Path Profile & Quick Reports for Complete Details

Quick right-click commands let you access path profile details with information about obstacles and clutter types along the link paths. You can also generate a report that tells the power and path loss to the next AP, as well as the data rate in both directions and how many hops to the gateway.

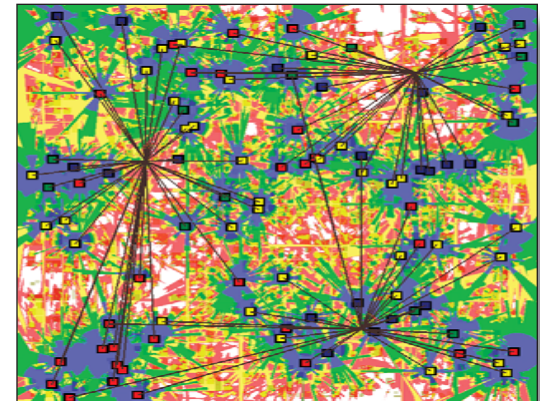
Complete Smart Grid and Municipal Network Planning Tools

Adding the Network Design Module to EDX SignalPro adds the ability to include Customer Premise Equipment (CPE) when using fixed broadband networks for backhaul networks. This gives you a single tool that integrates the design work for your mesh client service, mesh interconnect (AP-to-AP), point-to-multipoint backhaul, consecutive point backhaul and also wide-area systems.

Studies and map views can be simultaneously displayed so that you can see the performance of multiple networks in a single study.

Modules

- **SignalProof™**
Toolkit for customer pre-qualification and call center support.
- **Building Editor**
For importing and editing floor plans and outdoor building databases.
- **Microcell/Indoor Module**
For use with EDX SignalPro or SIGNAL; optional module for microcell indoor and outdoor communication system design; features 2D and 3D ray-tracing models.



Multiple network performance displayed in a single view. Point-to-Multipoint backhaul system colored at CPE by performance results along with link lines to assigned server, overlaid on Wi-Fi gateway coverage study. Available only with EDX SignalPro®.



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