

## Perfecting Network Design with Ranplan Software Solutions

Design, optimize and simulate in-building  
and urban outdoor wireless networks



# Achieve cost-effective seamless connectivity with **Powerful HetNet Designs**



Achieve  
**30%**  
CAPEX / OPEX  
savings



Design  
productivity  
enhanced by  
**50%**





## Perfecting Network Designs

We pioneer software solutions that perfect the design, optimization and automation of in-building and urban outdoor wireless networks.

Our open platform simplifies network planning by allowing imports of geographical data, floorplans, mesh objects, and 3D building models from BIM authoring software. The intelligent automation and 3D ray-tracing simulations expedite the design process, expertly identifying potential issues and optimizing network performance for reliable connectivity.

Our software has proven to **enhance design productivity by 50%** and **reduce CAPEX/OPEX by 30%**. This supports the swift and cost-effective delivery of advanced wireless networks, providing an unmatched quality of service for end-users and businesses.

## Leading the way

We are on a mission to greatly improve the wireless communication between people and machines by developing software solutions that can perfect the way the world is wirelessly connected.

Ranplan Wireless is at the forefront of research and development in radio propagation, small cells and DAS networks, automatic RAN optimization and the deployment of complex HetNets for cellular, private wireless, public safety, IoT and Wi-Fi communications.

Our experts harness the latest in computer science and Artificial Intelligence (AI) to elevate the quality and performance of our network engineering platforms supporting current and future wireless technologies and services.



Private Wireless



Public Safety



Cellular Networks



Enterprise Wi-Fi



Buildings



Cities



Industrial



Stadiums



Tunnels



Campuses



Ports

# Ranplan Professional

## All-in-One Network Planning Solution

**Unified Design:** Simultaneously design in-building and urban outdoor wireless networks.

**Efficient 3D Environment Creation:** Import geographical data, floorplans, mesh objects, and 3D building models from BIM software.

**Realistic Scenarios:** Assign building materials for accurate replication.

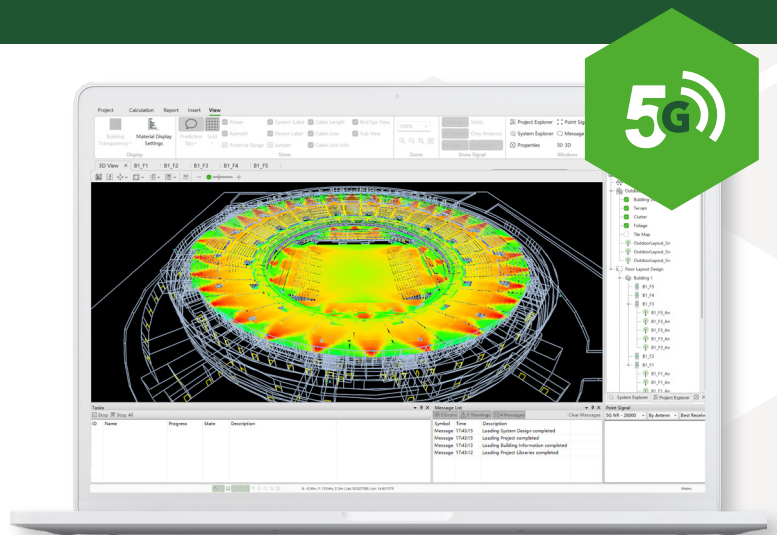
**Advanced 3D Simulation:** Simulate coverage, capacity, latency, and reliability with 3D ray-tracing.

**Real-World Accuracy:** Calculate signal propagation interactions between indoor/outdoor environments.

**Boost Performance:** Automate network configuration for optimal performance and energy efficiency.

**Predict Quality of Service:** Evaluate and forecast end-user wireless service experience.

**Measure ROI:** Use results to deploy cost-effective solutions that meet key performance indicators.



### Complete HetNet Design

Fully model and plan your indoor and urban outdoor networks.



### Rapid and Cost-Effective

Boost productivity by **50%** and save up **30%** in CAPEX / OPEX.



### Fast 3D Ray-Tracing

Realistic 3D modelling and propagation for design precision.

## Network Planning Precision

Reduce network planning time and improve design accuracy with the Ranplan automatic network optimization modules, such as:

**Efficient Network Topology:** Optimize cable routes and component selection.

**Reduce Interference and Signal Leakage:** Fine-tune channel allocation and transmission power.

**Antenna Optimization:** Adjust location, quantity, transmission power, and type.

**Performance Metrics:** Define and analyze signal strength, coverage, and leakage for optimal design.





# Ranplan In-Building

## Predict and Optimize Indoor Coverage and Capacity

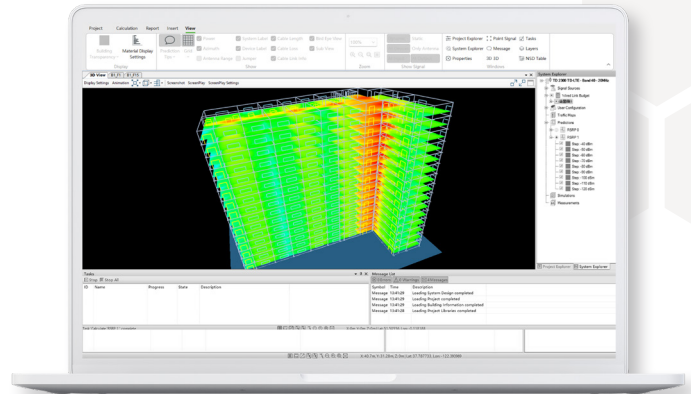
**Swift & Cost-Effective:** Design and optimize indoor wireless networks efficiently for a diverse range of applications.

**Fast Building Modelling:** Import 3D building models from Building Information Modelling (BIM) IFC files or CAD floorplans.

**True 3D Ray-Tracing:** Predict and evaluate wireless coverage capacity, latency, and reliability in complex indoor environments accurately.

**Intelligent Optimization:** Ensure networks meet wireless service KPIs across multiple technologies.

**Automated Reporting:** Generate diverse reports quickly with a simple click of a button.



### Indoor Design Solutions

Perfect for large, complex in-building projects such as DAS, small cells and Wi-Fi networks.



### Multi-Technology Support

Supports multiple technologies such as 5G NR, 4G (LTE), 3G, IoT, Wi-Fi, TETRA, DMR and P25.

# Ranplan In-Building Lite

## Accelerate and Validate In-Building Network Design

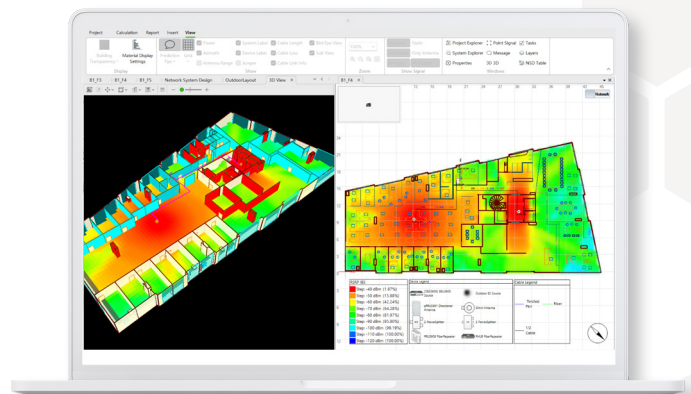
**Intelligent Design Modules:** Simplify the planning of passive DAS, small cells and non-fibre based Public Safety networks.

**Intelligent Topology Optimization:** Automatically optimize in-building network physical topology.

**Validation with 3D Ray-Tracing:** Ensure reliable signal coverage and strength in emergencies before deployment.

**Cost and Time Savings:** Precise planning reduces errors and upgrade needs, saving time and cost.

**Automatic Reporting:** Stay on track with real-time project information and reports from a single click.



### Cost-Effective Designs

An agile tool for designing small to medium enterprise projects requiring ubiquitous coverage.



### Public Safety Networks

Ideal for rapidly designing indoor public safety networks that meet wireless coverage and capacity KPIs.







## Ranplan Certification Program

Advance your wireless network design skills



### Real World Examples

Directly apply the knowledge and experience you gain to a live working scenario.



### Certify your Skills

Accelerate your career with Ranplan credentials in complex HetNet design.



### Designed by Experts

Courses created by experts who have extensive experience designing wireless networks.



### Dedicated Support Team

Our teams are on hand if you have any require assistance during the course.





# Ranplan Tablet

## Simplify and Speed Up Onsite Wireless Network Design

**Easy Building Info Capture:** Quickly gather building details to begin network planning.

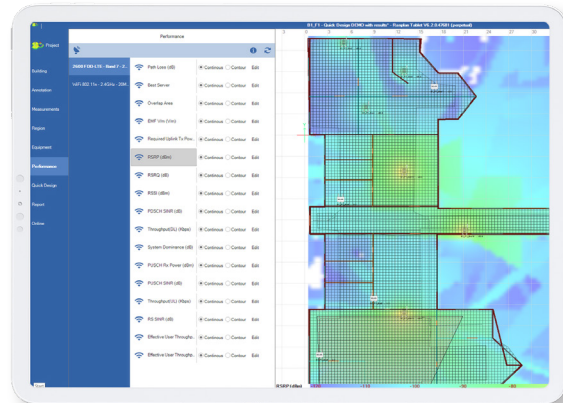
**User-Friendly Interface:** Ideal for users with limited RF planning knowledge.

**Intelligent Design Module:** Rapidly create preliminary indoor network designs.

**3D Performance Visualization:** Use capacity and coverage heatmaps to see predicted network performance based on KPIs.

**Seamless Reporting:** Generate reports for easy verification and validation.

**Streamlined Bidding Process:** Quickly produce quotes and timelines for projects.



### Automate Onsite Design

Quickly and easily capture site information to begin the in-building network design.



### Seamlessly Interoperates

All Ranplan planning tools and Collaboration Hub interoperate with Ranplan Tablet.

# Ranplan Device Hub

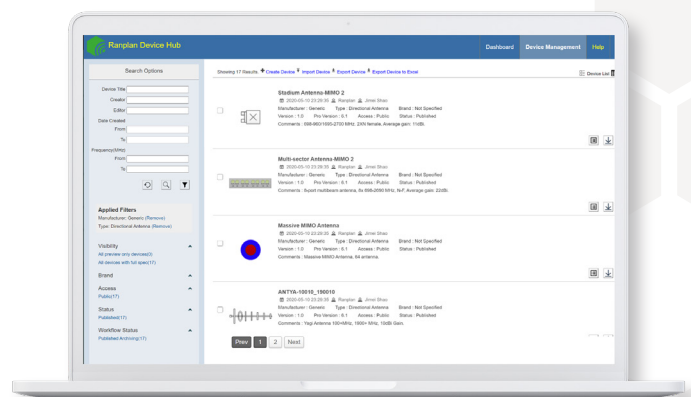
## Comprehensive Database of Vendor Approved Components

**Extensive Database:** Over 12,000 devices from 175+ equipment vendors.

**Independent and Neutral Partner:** Up-to-date device information and fair representation in network designs.

**Centralized Database:** Secure environment for collaborative device modelling and interactive 2D/3D evaluation before importing into the network design.

**Enhanced Accuracy:** Use approved devices for precise radio propagation predictions and simulations, especially for Massive MIMO antennas, multi-beam antenna modelling, and multi-core fibre cables.



### Access the Latest Devices

Incorporate the latest components from equipment vendors in your wireless network designs.



### Interfaces Seamlessly

Instant access to the Device Hub from all Ranplan design software, including Tablet.





# Discover the right software for you

	Feature	Professional	In-Building	In-Building Lite	Tablet
Indoor and Outdoor Modelling	Manual indoor building modelling with network devices	✖	✖	✖	✖
	Import IFC 3D building models from BIM authoring software	✖	✖	✖	
	Import floor and wall plans	✖	✖	✖	Floor only
	Environment Zone Modelling	✖	✖	✖	✖
	Stair, tunnel and inclined plane modelling	✖	✖	✖	
	Walls (linear, inclined and curved), ground and roof drawing	✖	✖	✖	
	Curved and circular doors and windows	✖	✖	✖	
	Building objects with 3D Mesh	✖	✖	✖	
	Inclined plane and tunnel with Mesh type	✖	✖	✖	
	Assign building materials from material database	✖	✖	✖	✖
	Point, trace and region vector data import support	✖	✖	✖	
	Export building to Google Earth	✖	Indoor only	Indoor only	Indoor only
	Outdoor and foliage modelling with terrain, clutter, tile map	✖			
	Integrated GeoConverter	✖			
	Association for an Indoor Building with an Outdoor Building	✖			
Network System Design and Optimization	Supporting 5G NR, 4G, 3G, 2G, TETRA, PMR, DMR, P25, IoT, Wi-Fi	✖	✖	✖	✖
	Indoor Small Cell, Passive DAS and Wi-Fi network design	✖	✖	✖	✖
	Indoor active DAS network design	✖	✖		
	Outdoor network design including Macro, Micro, Small cells, VRAN & outdoor DAS	✖			
	Multiple sources modelling (base stations, CU, DU, small cells and Wi-Fi APs)	✖	✖	✖	✖
	Support uplink and downlink MIMO modelling with 2x2, 4x4 and 8x8	✖	✖	✖	✖
	Massive MIMO and beamforming modelling	✖	✖	✖	✖
	Broadcast and service beam for advanced antenna array in 2D and 3D	✖	✖	✖	✖
	Cable modelling with coaxial, radiating and jumper	✖	✖	✖	✖
	Multi-strand optical fibre and corresponding components modelling	✖	✖		
	Antenna output power and contour display	✖	✖	✖	✖
	Smart layout and device grouping	✖	✖	✖	✖
	Virtual DAS functionality	✖	✖	✖	
	Connection validation and assistant for fast connection	✖	✖	✖	
	Source planning	✖	✖		
	Site, riser and cable tray modelling	✖	✖	✖	
	Cell merge and cell split	✖	✖	✖	✖
	Antenna coverage display based on arrow configuration	✖	✖	✖	
	Antenna isolation and near-far effect calculation	✖	✖	✖	
	Redundant loop DAS design	✖	✖	✖	
	Intelligent optimization modules	✖	✖	Topology only	Quick design
	Automatic Topology Optimizer	✖	✖	✖	
	Automatic Cell Optimizer (Multiple system and multiple objective optimization)	✖	✖		
Automatic Power Sharing	✖	✖			



# Discover the right software for you

	Feature	Professional	In-Building	In-Building Lite	Tablet
Propagation Modules	RF propagation pathloss modelling and calculations	3D calculations	3D calculations	2.5D calculations	2.5D calculations
	Outdoor signal propagation with / without foliage	✖			
	Outdoor terrain diffraction	✖			
	Consider indoor to outdoor and outdoor to indoor scenario	✖			
	Body loss modelling	✖	✖	✖	
	Calibration of path loss exponent and materials based on measurement data	✖	✖	✖	
	Morphology propagation model	✖	✖	✖	✖
	Extended Hata model	✖	✖	✖	✖
	Configurable transmission, reflection and diffraction calculation	✖	✖	✖	✖
	Atmosphere absorption	✖	✖	✖	✖
	Support 2D and 3D antenna pattern	✖	✖	✖	✖
Prediction Modules	5G NR KPI predictions (SS RSRP, PDSCH SINR, PDSCH throughput etc.)	✖	✖	✖	✖
	Carrier aggregation in 4G and 5G	✖	✖	✖	✖
	4G, 3G and other wireless network KPI predictions	✖	✖	✖	✖
	Wi-Fi KPI predictions	✖	✖	✖	✖
	Effective user throughput based on configurable traffic map	✖	✖	✖	✖
	System dominance prediction	✖	✖	✖	✖
	Nth Best Server, Overlapping areas and uplink predictions	✖	✖	✖	✖
	3D visualisation of building models, network system designs and signal heatmaps	✖	✖	✖	✖
	Point / trace / region calculation	✖	✖	✖	✖
	Prediction comparison	✖	✖	✖	✖
	Beamforming interference modelling	✖	✖	✖	✖
	Specific beams for massive MIMO antenna analysis	✖	✖	✖	
	Uplink transmission power for public safety	✖	✖	✖	✖
	5G NR SS-RS and CSI-RS power offset configuration	✖	✖	✖	✖
	Energy Consumption analysis	✖	✖	✖	✖
	Ultra-Reliability, Low Latency communication (URLLC) analysis	✖	✖	✖	
	Reconfigurable Intelligent Surface (RIS) modelling and predictions	✖	✖	✖	
	Simulation Modules	Configurable traffic map size and traffic type	✖	✖	✖
Simulations based on configurable traffic map		✖			
5G, 4G and other wireless technologies KPIs simulation		✖			
Configurable snapshots and TTIs simulation		✖			
DL and UL user status simulation		✖			
HetNet capacity analysis with hotspot zones		✖			
Wi-Fi and LTE aggregation		✖			
Data	Measurement data modules	✖	✖	✖	✖
	Comprehensive reporting	✖	✖	✖	✖
	Over 12,000 components from 175+ vendors in device database	✖	✖	✖	✖



# Here's what our customers have to say about Ranplan

*"Providing reliable connectivity that meets our customer's needs in the Enterprise Industry with the most challenging environments requires partnering with the best-in-class and high-quality solutions vendors like Ranplan Professional which speeds up our planning processes for Private 4G/5G Networks. For business-critical Private Networks, Ranplan's accuracy has been a major advantage."*

Timo Mäkelä, Senior Radio Engineer,  
EDZCOM - a Cellnex company

*"Freshwave have been delighted by the relationship with Ranplan. They are a flexible, responsive team and our engineers love their user interface and enhanced functionality. They've helped us deliver expert designs for hundreds of customer sites."*

Tom Bennett, CTO, Freshwave

*"Ranplan Professional is used intensively by Media Broadcast. The fast and easy 3D building modelling is to be emphasised. The integrated material database defines the physical properties of the building substance. A picture is worth a thousand words. The presentation of the common KPIs gives our customers a comprehensible impression, e.g. the planned coverage."*

Paul Weiss, Media Broadcast



*"Ranplan Professional will help us design our indoor networks in offices, shopping malls, underground rail systems, stadia and many other facilities and will enable us to keep pace with growing coverage needs and all the complexities that come with 5G and the Internet of Things."*

Dr. Robert Joyce, Group Head of  
Radio Access Technology, Ooredoo

*"Ranplan Professional provides our customers with an all-in-one independent network planning platform which is leading the way companies design and maintain their local 5G networks. The ability to precisely model the unique environments and optimize the network designs with the use of 3D RF simulations and productivity-enhancing automation tools has delivered and will continue to deliver substantial time and cost savings for our customers."*

Shun Miyamoto - Information &  
Communications Team, Marubun


*"Ranplan Professional's ability to accurately simulate the network as a whole rather than cell by cell helped us to optimize the overall performance."*

Amr Albanna, CEO,  
Omega Wireless

*"The only thing I like better than the speed at which I can complete designs with Ranplan is the support I receive with timely responses from courteous and knowledgeable people."*

Edward Ridley - Staff Systems  
Engineer, CommScope





Revolutionizing the way  
wireless networks are planned  
in a smart connected world



### About Ranplan Wireless

Ranplan Wireless pioneer software solutions for the design, optimization and simulation of in-building and urban outdoor wireless networks. Our open platform, intelligent automation and 3D ray-tracing simulations streamline the network planning process, expertly identifying potential issues and optimizing network performance for reliable connectivity. This results in an unparalleled quality of service, ensuring seamless and efficient wireless communication for end-users and businesses.

Ranplan Wireless is a subsidiary of Ranplan Group AB (Nasdaq First North: RPLAN) whose head office is in Stockholm, Sweden. The group operates out of offices in the UK, USA and China.

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