



An approved Public Safety network starts with an accurate public safety network design



iBwave

# Public Safety

## **Plan, design and propose public safety networks that building owners and AHJs will approve.**

iBwave's Public Safety solution is the established standard to design reliable Public Safety networks with proper documentation while saving time and costs. Our software makes it easy to design and simulate network performance for greenfield or existing buildings, and accelerates the approval process with building owners and AHJs by presenting detailed standardized documentation. iBwave has the tools, training and support so you can design Public Safety Networks we all can count on.

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### KEY BENEFITS

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Established standard  
in indoor wireless  
design industry



Design reliable  
networks for mission  
critical applications



Reduce time to  
deployment and  
costs per project



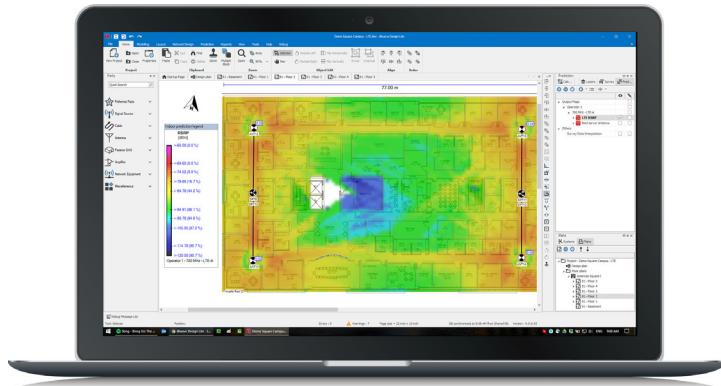
Standardized  
documentation  
accelerates approval  
by AHJs



Integration with  
industry-standard  
3rd party tools



# iBwave Public Safety



## A recognized expertise you can count on

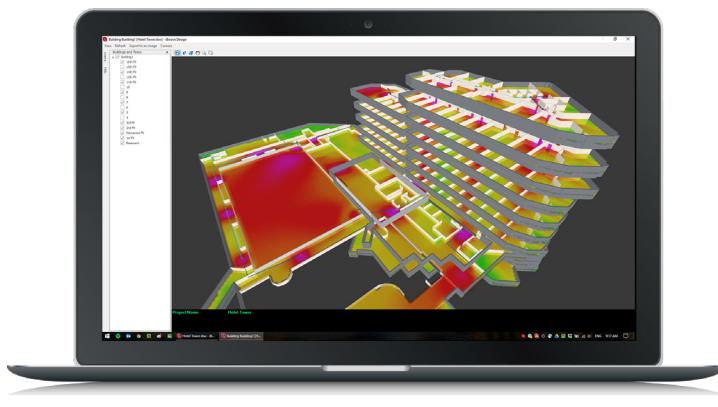
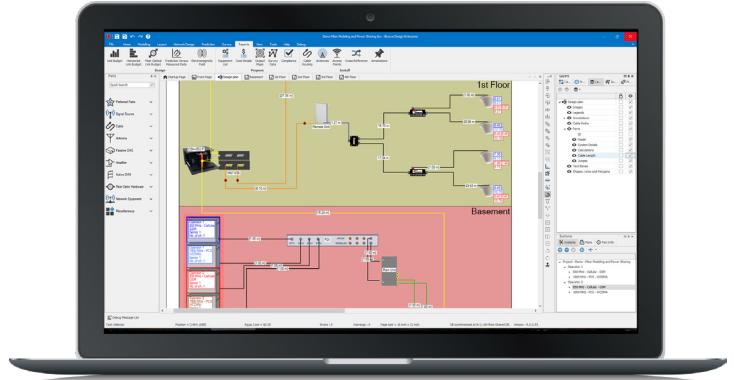
With more than 20 years experience, iBwave's expertise in all things wireless is unparalleled. Along with industry-standard software, we are recognized for world-class support in 100+ countries, providing the industry's most comprehensive components database and a well-established certification program with over 5000 certified professionals around the globe.

- ✓ Design reliable Public Safety networks using Active or Passive DAS on all public safety bands including P25, Tetra and FirstNet
- ✓ Benefit from the most comprehensive component database on the market with over 37,500 components
- ✓ We provide world-class training and certification programs to help you get the most out of your software
- ✓ Unparalleled 24/5 support team with a 95%+ approval rating

## Design reliable networks for mission critical applications

Test the coverage and throughput of your network before it is deployed using our prediction engine proven and trusted by thousands of customers worldwide. Ensure your network's availability by simulating traffic in critical and non-critical areas. Validate the performance compliance based on key requirements and prevent costly changes post installation.

- ✓ Fast Ray Tracing, COST 231 and VPLE (quick design) propagation
- ✓ Precise 3D coverage output maps (Downlink and Uplink RSSI, RSRP, AGC, Near-Far Effect)
- ✓ Signal quality and data rate output maps (SNIR, RSRQ, MADR)
- ✓ Smart Antenna Contouring to show live signal strength predictions
- ✓ Body loss modeling for highly dense venues (stadium, arena, etc.)
- ✓ LTE best server & hand-off matrix to optimize existing design for higher data rate
- ✓ PIM calculations and EMF calculation and analysis
- ✓ Compliance results based on user defined pass/fail criteria
- ✓ Donor Antenna isolation validation
- ✓ Critical/General Zone Identification



## Deploy more sites faster and reduce your costs

Automate and simplify the design your public safety networks to reduce your time to deployment. Eliminate the risk of over designing a network by modeling your venue in detailed 3D and simulating your network before it's deployed to optimize hardware placement for the most cost-efficient design.

- ✓ Detailed network diagrams with automated link budget calculations
- ✓ Coax, CAT5 or Fiber cabling backhaul modeling
- ✓ Customizable equipment cost and list of approved parts
- ✓ Network validation and error checking
- ✓ Automatic error-checking
- ✓ On screen debug list
- ✓ Network simulation
- ✓ Streamlined work with advanced 3D modeling and customizable stencils
- ✓ Free 3D viewer for your clients to accelerate the approval process

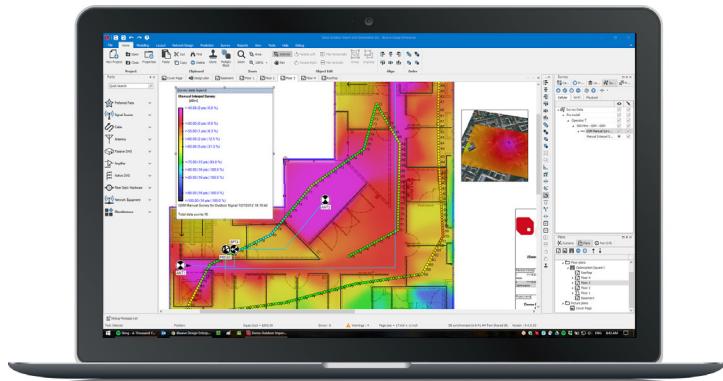
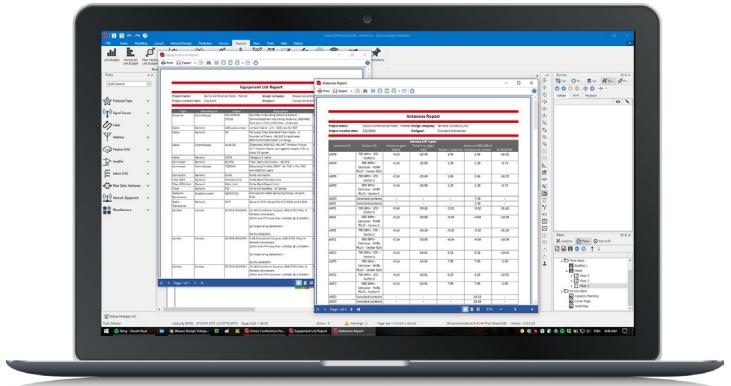


# iBwave Public Safety

## Standardized reporting for faster approvals

Once your design is complete you can quickly generate your link budget, equipment lists and compliancy reports to ensure performance criterias are met so you can get your project approved quickly.

- ✓ View network design and performance in advanced 3D
- ✓ Annotations, Output maps & Survey data reports
- ✓ Equipment list & Cost Details reports
- ✓ Link budget and horizontal link budget reports
- ✓ Antennas report
- ✓ Cable Routing & Cross-reference report
- ✓ Version tracking to ensure design consistency across multiple projects
- ✓ Compliance report



## Integration with 3rd party tools

iBwave Public Safety integrates with all the major collection tools. This means you will spend less time manually transferring data between tools and more time leveraging RF measurements to deliver the most accurate and optimized designs for your customers.

- ✓ Import RF measurements from most leading RF collection tool
- ✓ Consider macro network using a given value, macro planning tool, or survey measurements
- ✓ Calibrate the prediction model using CW field measurements
- ✓ Survey measurement and prediction vs. measured reports

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Without a doubt, iBwave spared us many hours of work. We not only built a network to support the 15,000 people that the stadium can accommodate but we also delivered it within record budget and timescales – within a third of the time when compared with conventional methods.

- Peter Liseborg, Senior Net Planner for Telenor Denmark -

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# Public Safety

## FEATURE SET

### SYSTEM DESIGN

- ▶ LTE, Active/Passive DAS, 802.11y, public safety P25 and TETRA
- ▶ Frequencies: VHF(All), UHF (All), TETRA: 380-400, TETRA: 410-430, TETRA: 450-470, TETRA: 870-876+915-921, 700, 800
- ▶ Trunking diagram for indoor RF system design
- ▶ Multiple systems, technologies, and bands
- ▶ Support base stations and off-air repeaters
- ▶ Power sharing interface (%) for neutral host system designs
- ▶ Coaxial, radiating, fiber-optic and CAT5 cable signal distribution
- ▶ Multi-strand fiber-optic cables and components support for fiber modeling
- ▶ Redundant DAS designs
- ▶ Preferred lists of components
- ▶ Connector validation for coaxial and fiber-optic cables
- ▶ Automatic cable and splitter selection for optimal system balancing
- ▶ Network validation and error checking
- ▶ Grouping of systems by operator and wireless services
- ▶ Full 3D antenna patterns
- ▶ Wizard to duplicate sectors
- ▶ Body loss modeling
- ▶ LTE frequency re-use
- ▶ Edit properties for multiple components at once
- ▶ Support MIMO 2X2, 3X3, and 4X4
- ▶ Donor Isolation Antenna
- ▶ Critical/General Zone Identification

### FLOOR PLANS

- ▶ Multi-layered floor plans with layout plans, walls, DAS equipment, cables and more
- ▶ Import floor plans from .dwg, .dxf, .jpeg, .bmp, .tiff, .gif or .pdf files
- ▶ Automatic cable length measurements
- ▶ Automatic cable alignment
- ▶ Drawing tools for walls, lines, shapes, text and images
- ▶ Ruler to calculate dimensions and areas
- ▶ Display antenna contours and calculations

### RF CALCULATION

- ▶ Downlink calculations
- ▶ Uplink calculations

### PROJECT DOCUMENTATION

- ▶ Use drawing tools to add lines and shapes, also add text and images
- ▶ Create picture plans and photo mock-ups
- ▶ Create annotations (text, audio, picture, video)
- ▶ Create project revisions
- ▶ Protect project file with password
- ▶ Export project to .dxf format and all annotations to zip file
- ▶ Print project documentation

### 3D BUILDING MODELING

- ▶ Draw generic walls and surfaces
- ▶ Show floor plan and building in 3D with DAS equipment
- ▶ Show building cuts in 3D
- ▶ Draw inclined surfaces automatically
- ▶ Support inclined surfaces as trapezoids
- ▶ Draw cables running along inclined surfaces with the ability to stop walls at incline
- ▶ Create elevation view of the building on the Design Plan
- ▶ Show building location in Google Maps or Bing Maps
- ▶ Export building to Google Earth
- ▶ Quickly place frequently used objects on a floorplan with Stencil Library

### REPORTS

- ▶ Antennas, Cable routing and Cross-reference
- ▶ Equipment list and Cost details
- ▶ Link budget and Horizontal link budget
- ▶ Annotations, Survey data, output maps and Prediction vs. measured data
- ▶ Electromagnetic Field (EMF)
- ▶ Compliance
- ▶ Design version tracking

### COMPONENTS DATABASE

- ▶ Centralized component database of active and passive components including detailed technical specifications
- ▶ Over 37,500 components from more than 300 vendors
- ▶ Import and export libraries of components
- ▶ Sub-component support
- ▶ Database editor to add, edit or delete components
- ▶ Customized pricing and part numbers
- ▶ Share component database between multiple users
- ▶ List of approved parts
- ▶ List of equivalent parts
- ▶ List of errors and warnings configurable in the database of components

### TOOLS

- ▶ Frequency calculator
- ▶ Power convertor
- ▶ Intermodulation calculator

### PLATFORM SUPPORT

- ▶ 64-bit support
- ▶ Multiple processor support

### OUTPUT MAPS

- ▶ Signal strength: RSSI, RSRP, Field Strength
- ▶ Signal quality and data rate maps: SNIR, RSRQ, MADR
- ▶ Uplink signal strength: RSSI, AGC, Near-Far Effect, Power at antenna