BroadCMS Drive Test System: Broadcast Signal Coverage Testing Solution

Doewe Technology Application Notes-075-V1.0

https://www.doewe.com

1. Introduction

In today's rapidly evolving broadcast and communication technology landscape, whether it's the pleasing audio quality of FM radio or the lifeline role of emergency broadcasting, both rely on stable signal coverage systems. However, radio waves are invisible and intangible. Traditional manual drive testing methods are inefficient, produce subjective data, and make systematic analysis difficult. How to scientifically and accurately evaluate coverage effectiveness has long been a core challenge facing the industry.

Against this backdrop, Beijing Doewe Technology introduces the "BroadCMS Field Strength Coverage Testing System," specifically designed to work with the "RWC2500A Plus Broadcast Modulation Analyzer." This is not merely a software package, but a comprehensive solution integrating real-time monitoring, route recording, and coverage analysis—providing effective reference for your signal coverage quality assessment.。

2. Application Background

2.1 Why is a Professional Drive Test System Needed?

1. Compliance Requirements and Industry Regulation: The National Radio and Television Administration has clear requirements for broadcast station coverage range and quality. The CMS system provides objective, compliant test data to support acceptance inspections, annual audits, and frequency approval processes.

2. Network Optimization and O&M Needs: After transmitter stations are built, the CMS system can conduct signal testing to assist maintenance personnel in identifying signal blind spots, weak zones, co-channel interference, and adjacent-channel interference issues. It provides data support for adjusting transmission power, optimizing antenna angles, and other operations, helping improve the quality and efficiency of maintenance work.

3. Market Competition and Value Demonstration: For broadcast stations and network operators, detailed signal coverage test reports can serve as reference materials to demonstrate broadcast coverage to advertising clients, providing data-level support for industry competition.

4. Emergency Support and Public Safety: During major event coverage or emergency broadcasting activation, ensuring signal coverage effectiveness in critical areas is essential. CMS can conduct signal coverage assessments, providing basis for command decision-making.。

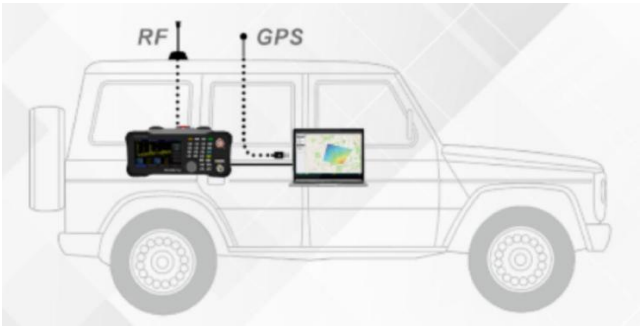
2.2 In What Scenarios is it Used?

1. Radio and Television Administration Departments: For comprehensive broadcast signal monitoring, frequency planning, station acceptance, and interference investigation across entire regions.
2. Broadcast Stations/Network Companies: For daily coverage range assessment, new station construction effect verification, advertising coverage effect demonstration, and network optimization.
3. Radio Monitoring Stations: For electromagnetic environment monitoring, illegal station detection, and spectrum management.
4. Research Institutes and Third-party Testing Agencies: For communication technology research, standard development, and professional testing certification services.

三、BroadCMS Testing System

3.1 System Setup

The BroadCMS software connects directly to the RWC2500A Plus analyzer via Ethernet cable, combined with a GPS receiving antenna, to build a high-precision mobile testing platform. Users can begin real-time signal data acquisition with simple configuration. The system supports online/offline maps and automatically records position, time, signal strength, and other information.



This simple and efficient connection method enhances the real-time performance and accuracy of data collection while significantly reducing on-site deployment complexity.

3.2 Core Functions

1. Real-time Signal Monitoring and Statistics

- Real-time display of AM/FM signal level values with unit conversion support (e.g., dBμV/m)
- Automatic signal strength distribution statistics with customizable threshold alarming

2. Positioning and Route Mapping

- Built-in GPS positioning for real-time test route recording
- Support for point and line route drawing, intuitively displaying signal coverage conditions

3. Flexible Map Support

- Supports Google, Bing, and other online maps, with offline map and caching capabilities
- Real-time test point data display on maps with distance measurement and transmitter tower marking

4. Data Export and Report Generation

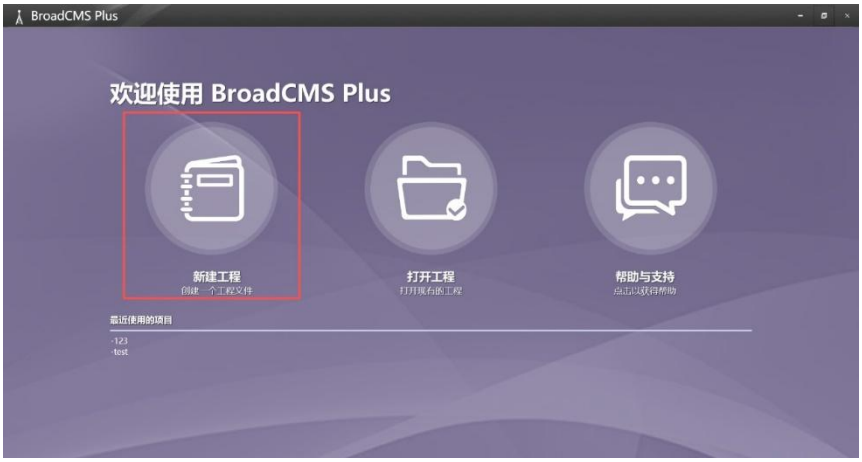
- Test data can be exported to Excel or Google Earth formats
- Automatic generation of Word format test reports with customizable templates and threshold settings

5. Coverage Analysis Visualization

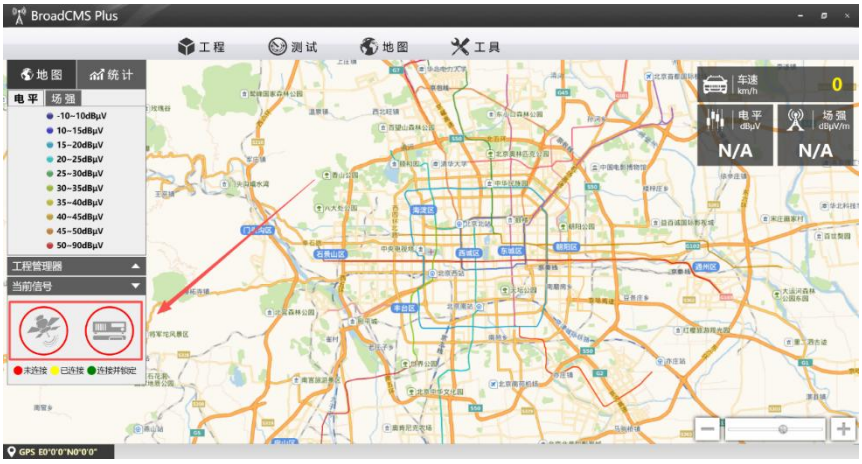
- Support for 2D area coverage map drawing for intuitive assessment of signal strength distribution
- Data playback function to reproduce the entire testing process

3.3 System Interface

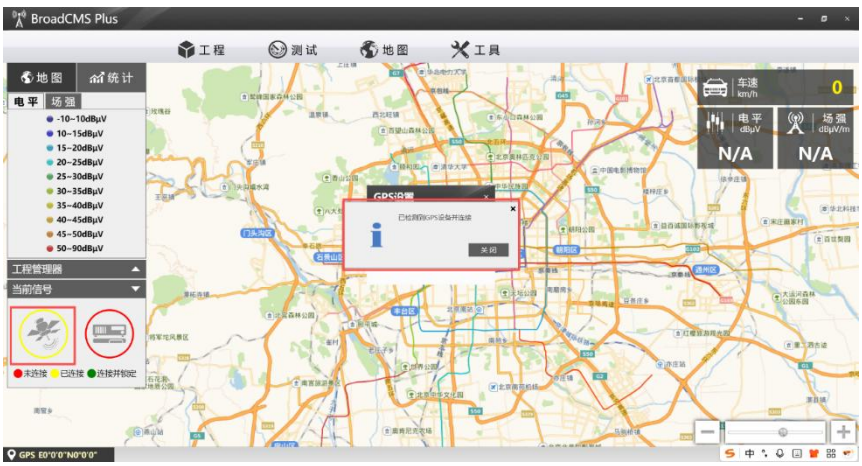
After connecting the equipment, double-click to open the BroadCMS software and select "New Project" in the main interface.



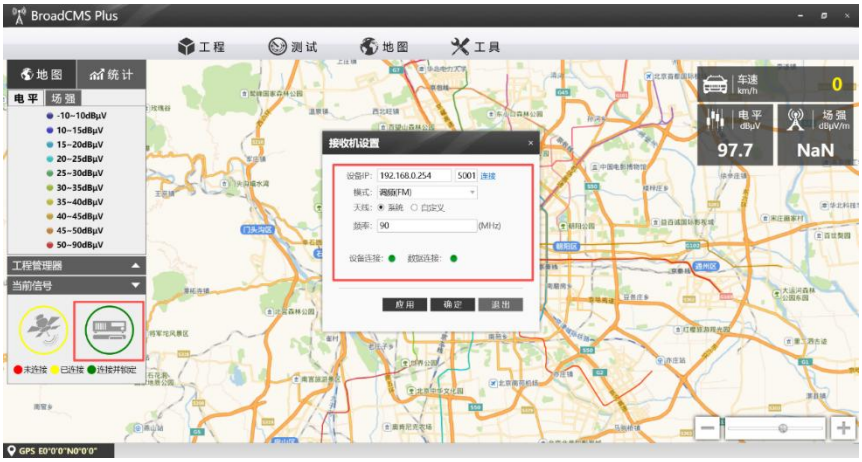
In the new project interface, first configure the GPS and device connections.



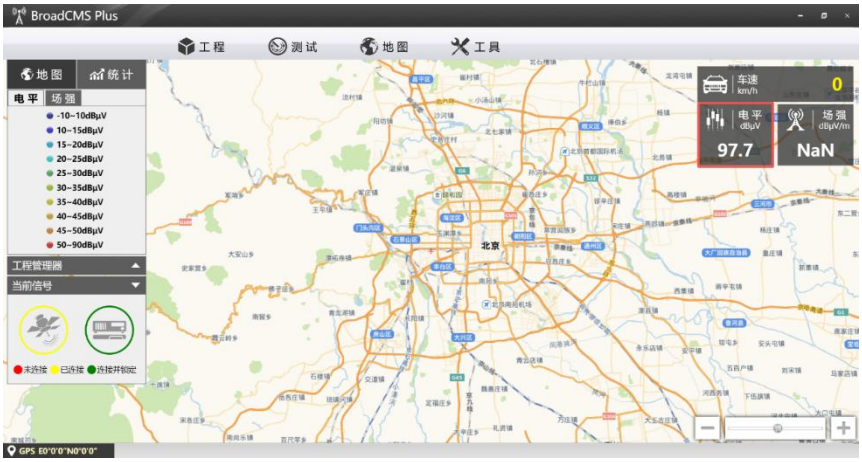
Connect and configure the GPS.



Connect and configure the receiver.



At this point, you can observe and record the received signal level values in the upper right corner of the interface.



3.4Typical Operation: Four Steps to Complete Professional Coverage Assessment

Step 1. Preparation Phase: Create a test task in the CMS software, setting the test frequency, mode, and other parameters. Meanwhile, connect the test receiver, GPS antenna, and other equipment to the vehicle-mounted computer and complete the relevant configuration.

Step 2. Execute Testing: Start the test task, and the system will automatically begin data acquisition. Test personnel only need to drive along the predetermined route; the software will display the route and signal status in real-time.

Step 3. Data Analysis: After testing is complete, playback the test data in the software. Conduct in-depth analysis through heat maps, statistical charts, and other functions to identify coverage blind spots and interference areas.

Step 4. Report Output: Select a report template, and the system will automatically

generate a professional report including coverage maps, key indicator statistics, test conclusions, and recommendations.

3.5Supporting Hardware: RWC2500A Plus Broadcast Modulation Analyzer

As the core hardware of BroadCMS, the RWC2500A Plus features:

- AM/FM high-precision demodulation with stereo analysis support
- Wide frequency coverage: AM 500kHz~30MHz, FM 76MHz~108MHz
- High-sensitivity input: -30dBm~30dBm
- Local oscillator frequency accuracy up to 1ppb, SNR: AM: 70dB(Typ.), FM: 75dB(Typ.)
- Multiple audio interfaces: balanced/unbalanced/digital output
- Real-time display of RF spectrum, demodulated audio spectrum and waveform
- Audio analysis support for measuring distortion, SNR, frequency response, and separation
- Audio generation capability, outputting single-tone or sweep signals with multiple interface support
- Customizable upper and lower thresholds for test items, with real-time alerts for out-of-limit indicators
- Test results overview and data export support, with one-click report generation
- Color touchscreen and button collaborative operation
- PC remote control with automation system integration support

4. Conclusion

The software and hardware combination of BroadCMS and RWC2500A Plus forms a complete broadcast signal coverage testing solution. It enables real-time signal monitoring, precise positioning, visual analysis, and professional report generation. It meets the practical needs of various scenarios including broadcast and television management,

station operation and maintenance, spectrum monitoring, and research testing, providing solid data support for broadcast signal coverage assessment and optimization.

Doewe Technology has long been dedicated to the broadcast and television testing field, providing industry clients with suitable signal testing solutions through professional products and technology. Whether you are a broadcast operator, signal optimization engineer, or research institution, the BroadCMS + RWC2500A Plus combination will provide you with a "reliable, efficient, and professional" field strength testing experience. For more product details, please visit: https://www.doewe.com , or contact us at Tel: 010-64327909 , Email: info@doewe.com .