

COMPANY PROFILE

Doewe Technologies, headquartered in Beijing, has been operating for a decade and currently has branches including the Beijing R&D Center, Chengdu R&D Center, Doewe Shanghai, Doewe Shenzhen, and Doewe Hong Kong. The company is fully committed to building its independent brand "Doewe," with its business covering two main categories: Advanced Sensing Measurement and Control (ASMC) and Professional Test and Measurement Solutions (PTMS).

The ASMC product line provides innovative high-precision sensing acquisition and data analytics solutions. PTMS focuses on industry-specific test and measurement solutions for audio, video, and RF applications. It has established the 5XC product system, serving sectors such as transportation, broadcasting, automotive electronics, consumer electronics, and university research institutes.

Through relentless effort, several of the company's products have become benchmark test instruments in their respective industries. Doewe Technologies also holds multiple core patents and software copyrights, participates in relevant industry standards working groups, and contributes to the formulation of national and industry standards. Building on past achievements, Doewe continues to increase its R&D investment. We have never forgotten our original aspiration, firmly believing that only profound technological accumulation creates value. We persistently pursue innovation in test and measurement technology, dedicated to technology development, application software services, and research in test and measurement solutions.

Leveraging its Beijing headquarters, related technical centers, and subsidiaries, Doewe Technologies has gradually established a nationwide pre-sales and after-sales service network, providing customers with professional technical consultation. Guided by the principles of "Rigorous, Efficient, Professional, Innovative," Doewe Technologies will continue steadfastly on this path, living up to the trust of every customer.

The journey ahead is long and challenging. We will accompany you on this path of growth to create a new future of technology together.

Background and Challenges

In emergency situations such as natural disasters and public safety incidents, traditional communication networks (such as mobile communication and the Internet) may be paralyzed due to power outages or damage to infrastructure. The FM-RDS wireless emergency broadcast system, with its advantages of wireless transmission, wide coverage, and strong disaster resistance, has become an important tool for emergency command and disaster warning:

- **Wireless coverage:** Transmitted through the FM broadcast frequency band (76~108MHz), it is not restricted by wired networks and has a wide coverage range.
- **Strong disaster resistance:** Only requiring power supply for the transmitter, it can directionally broadcast emergency commands to terminals, ensuring information accessibility for the "last mile".
- **Dual functions:** It can be used for policy promotion and cultural communication in daily life, and can switch to a disaster warning channel within seconds in emergencies.

However, the reliability of the FM-RDS system highly depends on equipment performance:

- △ Inadequate receiver sensitivity may cause failure to awaken terminals in remote areas;
- △ RDS protocol parsing errors can lead to loss or mis-triggering of emergency information;
- △ Abnormal transmitter modulation may cause adjacent frequency band interference, affecting public broadcasting safety.

How to accurately verify equipment indicators? How to ensure the system is foolproof in emergency scenarios?

Scheme Overview

To ensure the high reliability of FM-RDS systems, Beijing Duowei Technology Co., Ltd. has introduced the EBT (Emergency Broadcast Testing) solution. Based on the RWC2100F multi-channel emergency broadcast tester, it provides full-link testing capabilities from transmitters to receivers, meeting the testing needs of R&D, production, acceptance, and operation and maintenance:

- **R&D stage:** Protocol consistency testing and extreme scenario simulation (weak signal/strong interference).
- **Production stage:** Rapid detection of receiving sensitivity for batch terminals.
- **Operation & maintenance stage:** Real-time transmitter monitoring and fault diagnosis.

Core Application Scenarios

1. FM-RDS Receiver Testing

- **Testing Content:** Receiving sensitivity, RDS decoding capability, audio output quality
- **Solution Composition:**
 - RWC2100F simulates FM-RDS transmission signals (supporting programmable PID, PS NAME, RT text, etc.).
 - Supports airfield radiation or cable direct connection, compatible with parallel testing of multiple terminals (testing 3 receivers simultaneously).
 - **Audio loop analysis:** Real-time monitoring of audio signals output by the receiver to evaluate indicators such as SINAD, THD +N, and SNR.
- **Advantages:**
 - Fully adjustable parameters to simulate real emergency broadcast scenarios
 - Supports RDS advanced function testing (AF/EON/TMC, etc.)
 - One-click generation of test reports to improve efficiency



Core Equipment and Application Scenarios

2. FM-RDS Transmitter Testing

- **Testing Content:** RDS protocol compliance, RF indicators, accuracy of real-time information broadcasting
- **Solution Composition:**
 - The RWC2100F real-time parses the RDS signals output by the transmitter, monitoring fields such as TA/TP/EON/AF.
 - Supports verification of extended content like text and timecodes, and records abnormal data.
- **Advantages:**
 - Full protocol parsing to ensure precise delivery of emergency information
 - Supports signal recording and playback for easy fault reproduction
 - Graphical interface intuitively displays spectrum and modulation parameters

Core Equipment

The RWC2100F is a multi-channel emergency broadcast tester that provides FM-RDS, AM, RDS reception, and audio analysis functions. It supports 3 RF signal generation interfaces, each of which can be configured as FM-RDS or AM. For FM-RDS, it offers numerous editable protocol parameters such as PID, PS NAME, (e)RT(+), etc. It also supports multiple functional tests, including AF, EON, TMC, and more. The RDS reception function captures RDS signals via RF, displays RDS parameters, and records received signals as files for playback using the FM-RDS generation function.

The audio analysis function of the RWC2100F can measure audio signal quality (SINAD, THD+N, SNR) and frequency, while displaying audio waveforms and spectra. All functions are controlled by PC software, and all parameters can be saved and loaded.



FM-RDS Signal Generation

- Supports 3 independent transmission interfaces
- Supports multiple audio signals (MONO/STEREO/SWEEP/WAVE File)
- Supports globally configurable RDS(PRBS)-AF, RT, TMC, EON
- Supports broadcast text (RT, RT+, eRT, eRT+) and RDS encoding, UTF-8, UCS-2
- Supports playback of recorded RDS files

RDS接收

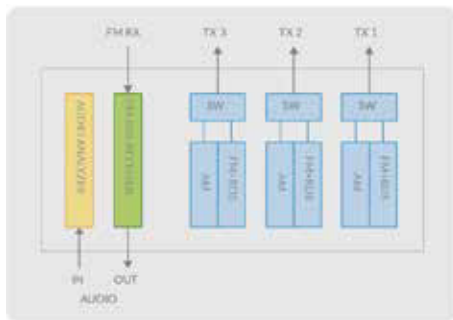
- The RDS receiver demodulates RDS signals from received FM-RDS signals and displays the data;
- It can display all parameters defined in the protocol;
- RDS signals can be saved as files, which can be transmitted via the RDS file transfer function of RWC2100F's FM-RDS TX.



Core Equipment Characteristics and Advantages

AM Signal Generation

- Supports 3 independent transmission interfaces
- Supports multiple audio signals (MONO/SWEEP/WAVE File)
- Supports EON and user-configurable TMC functions



System Block Diagram



FM-RDS / AM

Audio Analysis

- The audio analysis function supports metrics such as SINAD, THDN, signal-to-noise ratio, and frequency;
- By increasing the number of measurements, the displayed values become more stable;
- It supports displaying both audio waveforms and frequency spectra;
- By reducing the TX signal power of the RWC2100F and monitoring the audio output of broadcast receivers, this function is highly advantageous for automated Rx sensitivity testing.



PC Software

- To facilitate the coordination of different applications, the PC application software of RWC2100F combines two functional interface combinations: FM-RDS/AM generation with RDS reception, or FM-RDS/AM generation with audio analysis.
- Through the combined screen of FM-RDS/AM generation and audio analysis, the RWC2100F sends FM or AM radio frequency signals to the user's DUT (Device Under Test). The demodulated audio signal output by the DUT is input into the audio analysis interface of RWC2100F, enabling the measurement of audio indicators such as SINAD of the DUT. This allows users to simply and intuitively measure the performance and audio quality of the DUT.





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