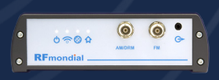
Model RFbox RF-SE1



Application
- Continuous signal and content monitoring in harsh environments
- Cost-effective monitoring
- Integration into RFmonitor network

Mechanical
- Robust chassis: Industrial design 200x197x55mm, operating temperature: 0 - 50°C, humidity: 20 - 80% non-condensing.
- LED indicators: Power on, receiver running, connection to RFmonitor database server.
- Antenna BNC

Features
- User interface: Remote via RSCI
- 12V DC input for mobile operation
- Robust setup: Quick local setup. No need for reconfiguration after power recycling

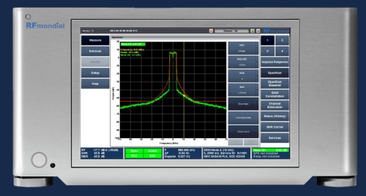
Model RF-SE7

Application
- Modulation quality and parameter measurements
- Content verification
- RSCI logging
- Integration into RFmonitor network

Mechanical
- All aluminium chassis
- 435 x 175 x 390mm
- 7” TFT touch screen, 800x480 resolution
- Weight: 8kg
- Operating temperature: 0 - 40°C
- Humidity: 20 - 80% non-condensing.
- Antenna N, direct path BNC

Features
- Built-in loudspeaker
- User interface: Touchscreen, web-interface, remote via RSCI

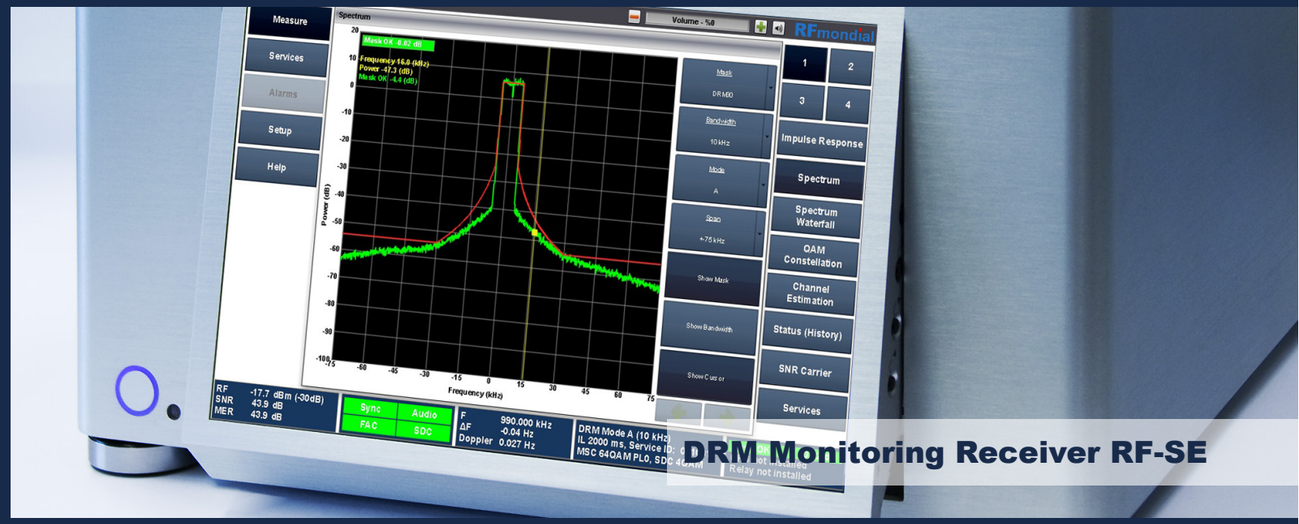
Model RF-SE12



Application
- Transmitter monitoring
- Modulation quality and parameter measurements
- Spectrum monitoring
- RSCI logging and analysis
- High accuracy field strength measurement
- Content verification
- Long term measurement logging and analysis
- Integration into RFmonitor network

Mechanical
- All aluminium chassis
- 435 x 220 x 390mm
- 12.1“ TFT touch screen display, 1280x800 resolution
- Weight: 12kg
- Operating temperature: 0 - 40°C
- Humidity: 20 - 80% non-condensing.
- Antenna N, direct path BNC

Features
- Built-in loudspeaker
- Alarm system
- Integrated RSCI long-term logging and analysis
- User interface: Touchscreen, web-interface, remote via RSCI



DRM Monitoring Receiver RF-SE

About us

RFmondial offers professional products and services for digital broadcasting. This covers stand-alone products for transmitting, receiving, and monitoring of digital broadcasts as well as IP core implementations and services in the field of digital radio technology. As a DRM consortium member RFmondial possesses a wide record of experience and know-how in the field of digital audio broadcasting. DRM30 and DRM+ measurement campaigns as well as technologies like transmitter diversity for digital broadcasts are part of its innovative portfolio.

The DRM standards family: DRM30 and DRM+

DRM, Digital Radio Mondiale, the international consortium founded in 1998, developed a digital transmission system for the AM-bands, i.e. for long-, medium- and short waves up to 30 MHz (DRM30) and launched this system worldwide. The extension of the DRM system family to upper frequency bands above 30MHz (DRM+) is a possible system to enhance and/or replace analog FM radio transmission. A close placement of a DRM+ signal to an FM signal is possible and can be flexibly configured depending on the existing use of spectrum. In this way, DRM+ may be introduced into the FM frequency bands and the analog distribution can be kept.

RFmondial GmbH

Appelstr. 9a
30167 Hannover
Germany

Phone: +49 (511) 76219704
Fax: +49 (511) 76219705

Email: info@rfmondial.de
Web: www.rfmondial.de

Managing Directors: Stefan Galler, Dr. Jens Schroeder
Technical Director: Albert Waal

RFmondial

Products and Services for Digital Broadcasting

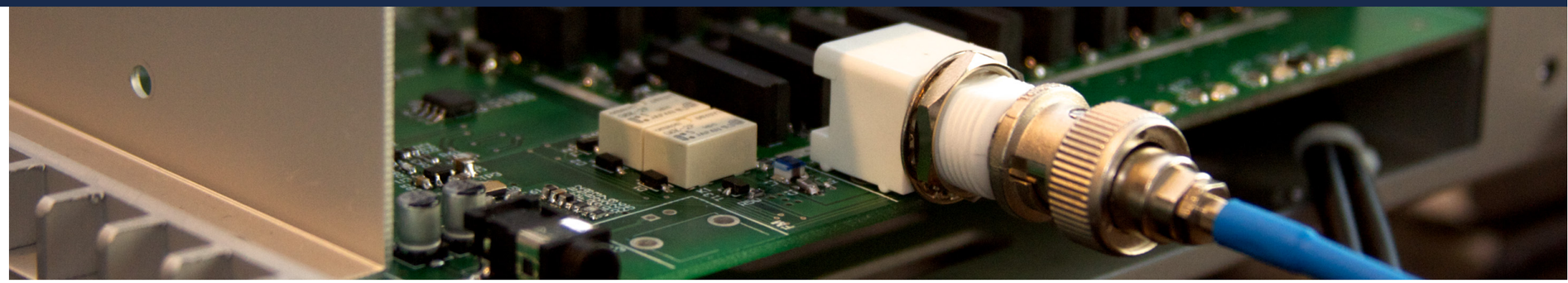
V121008

RFmondial

Products and Services for Digital Broadcasting

DRM Monitoring Receiver RF-SE

RF-SE is a professional digital radio monitoring and measurement receiver, which is available in different models depending on the desired application.
The outstanding reception characteristics are based on a high-performance frontend with preselector filter banks and a digital direct-down conversion system approach.
After the well-proven digital base-band decoder various modular blocks like RSCI capability, audio and multimedia decoder, alarm feature, web-interface, RFmonitor connector are available to suite the specific needs of the desired application.



Basic Features
- Demodulation: DRM, AM, SSB
- Highly reliable embedded platform
- Proven long term stability
- Available languages: English, Russian
- RSCI compatible to ETSI TS 102 349

Application Decoder
- Audio: MPEG-4 AAC, HVXC, CELP, all with SBR
- Data: Service information, TextMessages, Journaline, Alarm feature, Slideshow, Broadcast Website, TPEG

Measurements
- RSCI (Receiver Status and Control Interface) measurements, e.g. bit error rate (BER), signal to noise ratio (SNR >45dB), modulation error ratio (MER >45dB), audio frame error rate, power spectral density (PSD), delay spread, Doppler spread, frequency offset, field strength
- Additional measurements, e.g. channel impulse response, channel estimation, QAM constellation, spectrum waterfal, carrier SNR, time sync

Alarm System (optional)
- Flexible alarm rules, e.g. spectrum mask violation, Audio drop-out / silence, low signal strength / SNR, MDI errors

DRM Demodulation (depending on model)
DRM30: below 30MHz, including the SW, MW and LW bands
- Robustness modes A, B, C, D
- Spectrum occupancy
- 4.5, 5, 9, 10, 18, 20kHz
- MSC modes 16 QAM, 64 QAM, and hierarchical (HMmix, HMsym)
- SDC modes 4 QAM and 16 QAM
- Interleaver depth 0.4s and 2s
- EEP and UEP with all protection ratios / code rates

DRM+: above 30 MHz, incl. the VHF broadcast bands I, II (FM) and III
- Robustness mode E
- Spectrum occupancy 96kHz
- MSC modes 4 and 16 QAM
- SDC modes 4 QAM, code rates 0.5 & 0.25
- Interleaver depth 0.6s
- EEP and UEP with all protection ratios / code rates

Configuration / remote control
- Webinterface (via Ethernet)
- Via touch TFT Display (optional)
- Receivers can be remotely scheduled, controlled and automatically tuned via RSCI

System Features
- Data transmission: connection to RFmonitor network, i.e. Ethernet, WLAN, GSM, analogue modem, or local storage. Encrypted data transfer possible. Failover mechanism if network is temporarily unavailable (optional)
- Mobile measurements: Possible with local data storage and GPS connection

Interfaces
- RF inputs 50Ohm
- Ethernet
- USB
- Line out / headphones
- External GPS (optional)
- Built-in loudspeaker (optional)
- Two relay outputs (optional)
- RS232 (optional)
- External loudspeaker out (optional)
- CD/DVD (optional)

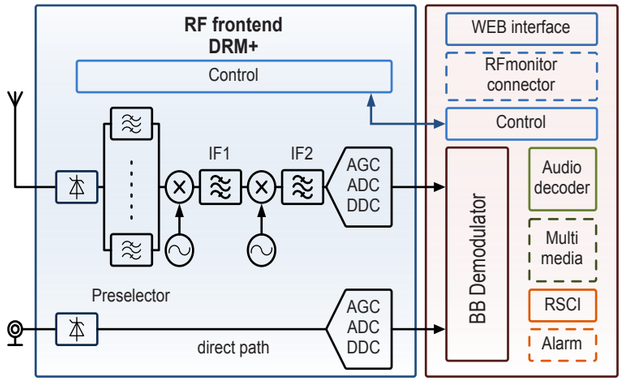
Electrical
- AC Input: 100 - 240V, 50/60Hz

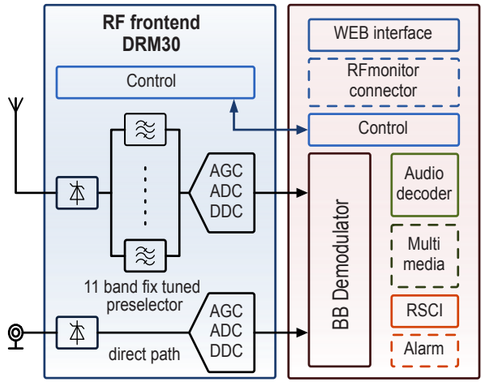
APPLICATIONS
- Transmitter, spectrum and coverage monitoring
- Modulation quality and parameter measurements
- RSCI (long-term) logging and analysis
- High accuracy field strength measuremnts
- Content verification (and logging)
- Integration into RFmonitor network

KEY FEATURES
- Fully compliant to DRM standard
- Advanced GUI to evaluate reception characteristics in real-time
- High-class tuner front-end with digital baseband output

AVAILABILITY
- Robust monitoring receiver RFbox RF-SE1
- Measurement receiver RF-SE7
- Full feature monitoring receiver RF-SE12

RECEIVER IP CORE
The field-proven DRM base band decoding core is as well available as IP core for quickly enhancing multi-standard receiver products or chipsets to DRM. It can easily be combined with other software libraries like AAC audio and multimedia decoding





Specification DRM30 frontend

Parameter	Value
Input frequency range	100kHz to 30MHz Fixed-tuned 11-band pre-selection filter bank
Input level	-110dBm to +20dBm
Oscillator accuracy	< 0.01ppm, aging <0.1ppm/year
Phase noise at ± 20Hz	< -120dBc/Hz
Phase noise at ± 20kHz	< -150dBc/Hz
Field strength accuracy	±1dB (if calibrated)
RF bandwidth	40kHz, ripple 0.2dB
Mask monitoring	±75kHz
In-channel IP3	+15dBm (noise figure 15dB)
Out of band IP3	+30dBm (noise figure 15dB)

Specification DRM+ frontend

Parameter	Value
Input frequency range	47-230MHz Fixed-tuned pre-selection filter bank and direct path
Input level	-105dBm to 20dBm
Input impedance	50Ohm
Internal IF frequencies	270MHz / 21.4MHz
Internal IF bandwidth	120kHz Combination of crystal and SAW IF filter

drm MEMBER