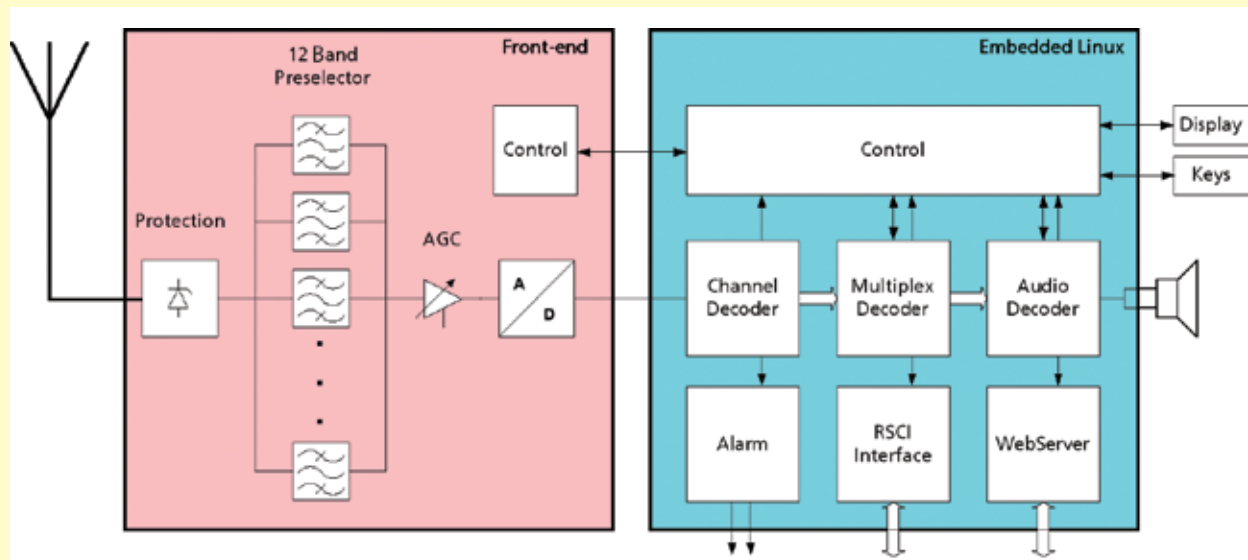


DRM MONITORING RECEIVER DT700



PROFESSIONAL MONITORING RECEIVER FOR DRM



The architecture of the DRM Monitoring Receiver DT700

DRM Monitoring Receiver

- Stand-alone operation
- High-reliability hardware built for continuous operation
- Well-tested DRM receiver software based on Fraunhofer Software Radio
- Easy to use due to comfortable LCD menus
- Full remote control via remote PC and Ethernet
- Easy software update via built-in DVD drive

Applications

- General Purpose DRM/AM/SSB Reception
 - High performance front end
- Transmitter Monitoring
 - Modulation quality measurement (up to 40 dB S/N)
 - Modulation parameters
 - Two configurable alarm signals (relay switch)
- Spectrum Monitoring
 - Spectrum plot with default DRM parameters
 - Span up to 60 kHz

Monitoring Networks

- Full remote control via LAN
- Logging of RSCI
- RSCI output (compatible to ETSI TS 102 349 V1.2.1) via LAN
- Alarm signals configurable with trigger conditions (e.g. audio dropouts or field strength)
- QoS (Quality of Service) monitoring
- Highly accurate field strength measurement

Concept

The DRM Monitoring Receiver DT700 is a professional monitoring receiver perfectly suited for DRM reception and transmitter monitoring. It features a high-performance front end based on a direct sampling reception technology. Together with a 12-band fix-tuned preselector filter bank the DRM Monitoring Receiver DT700 guarantees an outstanding reception performance and low phase noise. The receiver's signal processing is based on a Software Defined Radio (SDR) construction the core of which is an embedded Linux PC.

The latter features an easy software update via built-in DVD drive. Based on the embedded Linux platform a web server allows for easy remote access to all of the receiver's control functions.

Available models and options:

Basic Model B1

- DRM Monitoring Receiver stand-alone unit for the monitoring of DRM signals
- Accuracy of internal reference oscillator 5 ppm

Basic Model B2

- DRM Monitoring Receiver as listed above
- Built-in high-accuracy OCXO reference oscillator
 - Offset < 0.1 ppm
 - Aging < 0.1 ppm/year
- 10 MHz reference input for GPS synchronization

Software Option O1

- Audio decoders for CELP and HVXC (according to ETSI ES201980 V3.2.1)
- CELP/HVXC decoder licensed by Dolby

Mechanical Specifications

- Width 43.2 cm
- Height 13.3 cm, 14.5 cm with pedestals
- Depth 40.6 cm, 46 cm with connectors
- Weight 10 kg
- 19" rack mounting possible

Environmental Specifications

- Temperature range: 0–40° C
- Humidity: 20–80% non-condensing
- Voltage range: 110–230 V, 50–60 Hz AC

Interfaces

- Built-in loudspeaker with volume control
- Outputs for headphones and external speaker

- Line and balanced audio outputs
- Two relay outputs
- Two RS232 and USB 2.0 connectors
- Antenna input N type female (50 Ohms)

RF Front-end

- Input frequency range 100 kHz to 27.4 MHz
- 12-band fix-tuned preselector filter bank
- Level measurement accuracy ± 1 dB true RMS
- RF data bandwidth 40 kHz, ripple 0.2 dB
- DRM spectrum mask monitoring within ± 30 kHz
- Input level -110 to 20 dBm for DRM decoding
- In-channel IP3: +15 dBm (noise figure 15 dB)
- Out of band IP3: +30 dBm (noise figure 15 dB)
- Phase noise at ± 20 Hz: -80 dBc/Hz
- Phase noise at ± 20 kHz: -130 dBc/Hz
- Spectral inversion of input signal possible

DRM Receiver

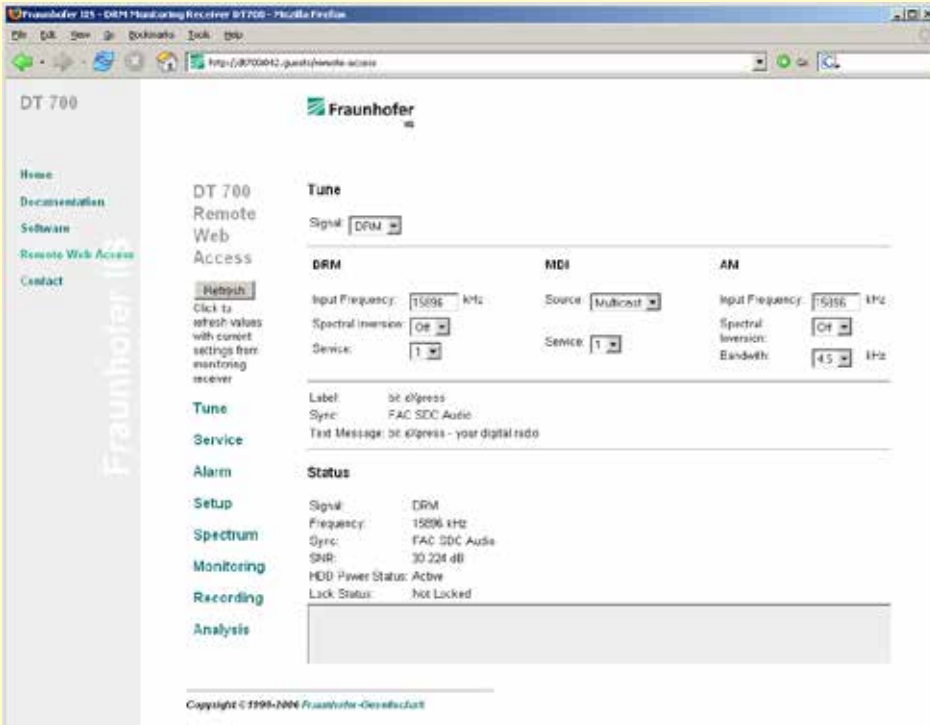
- DRM parameters according to ETSI ES 201 980 V2.1.1
 - 4.5, 5.0, 9.0, 10, 18 and 20 kHz
 - Modes A, B, C and D
 - QAM 4, 16, 64
 - All code rates
 - EEP and UEP
 - Hierarchical modes
 - Simulcast modes

Audio decoder

- xHE-AAC
- HE-AAC + SBR + PS
- HVXC + SBR, CELP + SBR
 - according to ETSI ES201980 V3.2.1
 - requires option O1



Remote front panel executable on Windows and Linux PCs



Remote access via web browser

Monitoring

- Display, recording and online UDP output (RSCI) of
 - Field strength (antenna factor can be specified)
 - Estimated signal-to-noise ratio
 - Estimated delay spread
 - Estimated Doppler spread
 - Audio quality
 - Frequency offset
- Scripts for the conversion of RSCI files into Comma Separated Value (CSV) files for further processing with a spreadsheet or graphics program
- Location information via external NMEA-compliant GPS receiver
 - Interface: RS232 or USB
 - RSCI output contains GPS information (TAG rgps)
- Display of
 - Power spectrum
 - Channel impulse response

- Field strength
- Signal-to-noise ratio

Alarm

Two independent alarms (associated with relays) configurable to multiple trigger conditions:

- Spectrum mask violated above specified level
- RF level below specified value
- S/N level below specified value
- Audio dropouts above specified ratio
- Audio level below specified value
- MDI errors above specified rate
- Frequency offset above specified value (Basic Model B2)

Remote Control

- Via graphical user interface
- Via RSCI (Receiver Status and Control Interface)
- Via web interface

Exemplary Screenshots

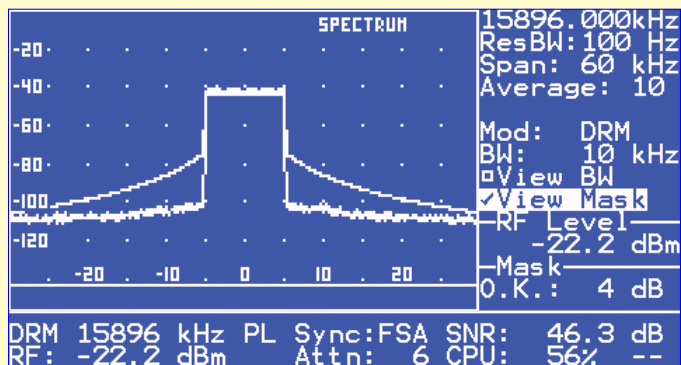
Alarm configuration screen allows enabling and setting of limits for each alarm condition

```
Alarm 1 Configuration
Conditions:
En Ac Condition      Limit      Dur.  Current
[ ] [ ] Spec Fail    0.0dB     1 s   -5.8dB
[ ] [ ] RF lev <     -60.0dBm  1 s   -23.2dB
[ ] [ ] S/N lev <    20.0dB   1 s   45.0dB
[ ] [ ] Aud drop >=  50%       5 s   0%
[ ] [ ] Aud lev <   -30.0dBFS 1 s   -18.7dB
[ ] [ ] MDI err >=  20%      10 s  0%
[ ] [ ] ServID !=   0         1 s  >Service

Action: Relay 1 on, hold for 10 sec

DRM 15896 kHz PL Sync:FSA SNR: 45.0 dB
RF: -22.2 dBm Attn: 6 CPU: 52% hd
```

Spectrum screen features display of DRM/AM spectrum mask



Monitoring screen features display of important DRM parameters

```
MonitoringDRM-Multiplex
Mode: B          SDC: 16-QAM
RfBw: 10.0 kHz  MSC: 64-QAM standard

Interleaver:      long (2.0 sec)
Coderate (H)A/B: 0.00 0.50 0.60
Audio/Data:      1/1 services
Date/Time (UTC): 2004-07-28 11:43

>Reception Parameters/Status of Content
>Bit Error Rate

DRM 15896 kHz PL Sync:FS- SNR: 44.7 dB
RF: -22.5 dBm Attn: 6 CPU: 50% --
```

Scheduler for automatically controlled monitoring of transmission slots

```
Scheduler 11:13:33 UTC
Enable: On State: Init
>Setup
Current Slot: Next Slot:
Start: 11:00:00 UTC 12:00:00 UTC
End: 12:00:00 UTC 12:15:00 UTC
Day: Thursday Thursday
Frequency: 15545.000 kHz 26000.000 kHz
Mode: DRM DRM
Alarms: off off
Recorder: PCM rscIA PCM rscIA
ServiceID: off off
Scheduler
DRM 15545 kHz PL Sync:--- SNR: -128.0 dB
RF: -102.7 dBm Attn: 6 CPU: 48% hd
```

For further information, please visit

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