

THE ONLY WAY TO IMPLEMENT DRM

DRM Exciter DMOD3



Standard Compliant DRM Transmissions
Thanks to Advanced Pre-Correction



TRANSRADIO
Sender Systeme Berlin



THE NEW FEATURES



One Button Automatic Equalizer Adjustment

The DMOD3 was designed to make ITU compliant DRM broadcasts possible with all modern transmitters providing the highest reliability in 24/7 operation. Therefore the DMOD3 is currently used worldwide for the vast majority of DRM systems in operational use.

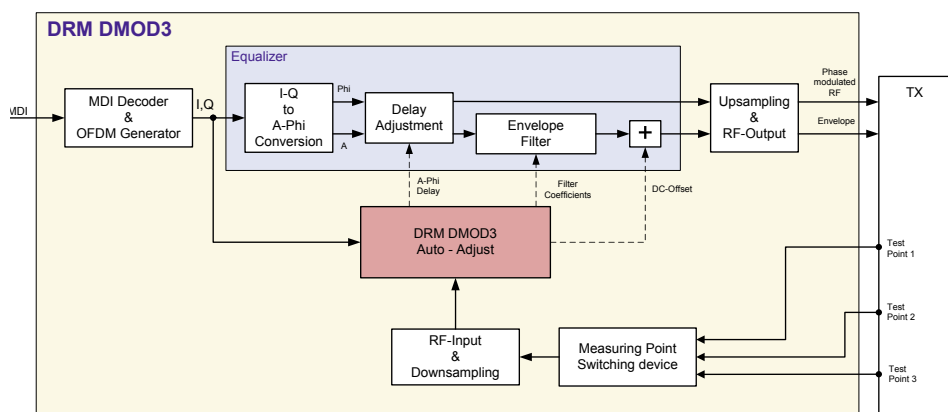
The advanced pre-correction features of the DMOD3 are essential to allow broadcasters to secure DRM transmissions at highest output power with best MER and non-disturbing the analog and digital neighbor channels. Even under difficult broadcast conditions like small bandwidth antennas the automatic equalizer adjustments guarantees standard compliant DRM transmissions. Thus, using the DMOD3 enlarges your coverage area and listenership.

The DRM DMOD3 is designed for mounting in standard 19" requiring 4V space but has equipment pods also to be operated on a table. Low power consumption, reduced operating temperature and a higher MTBF have been achieved by implementing mobile technology components and a hard disk-free design. To provide excellent the ergonomics, the DRM DMOD3 has a comfortable display size of 8.4" which provides a wide viewing angle and a high resolution of 800 x 600 pixels for easy reading. Moreover it is convenient to operate with the integrated keys and toggle wheel.

Broadcast operators demand an automated configuration procedure for DRM equipment and the DRM DMOD3 is the answer. The DRM DMOD3 provides automated functions to pre-equalize the transmit signal in order to reduce out-of-band emissions. The equalizer adjustment can be performed automatically just by the push of a button.

The DRM DMOD3 auto-adjust of the equalizer offers:

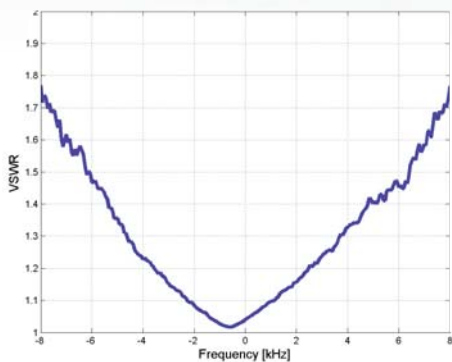
- Automatic initial equalizer adjustment
- Equalizer optimization during DRM operation
- Adaptive equalization
- Automatic switching of up to three different test points
- Crucial parameters like time delay, DC offset and envelope frequency response are optimized in order to minimize out-of-band emissions



Block Diagram of the Automatic Equalizer Adjustment



Safe like a safe



Example of an Antenna VSWR

VSWR Measurement of the Antenna

The DRM broadcast must be compliant with the ITU spectrum mask and requires low antenna VSWR. The DRM DMOD3 is capable of measuring the VSWR of the antenna during DRM operation and to show the result on the screen. This enables the broadcaster to monitor antenna matching during regular operation without additional measuring equipment.

Furthermore the DRM spectrum is measured and visualized by the integrated web server of the DMOD3.

Harddisk-Free Memory Architecture

The new memory architecture of the DRM DMOD3 offers maximum reliability due to the hard disk-free design. All necessary data to boot up and to run the DMOD3 are stored on a static permanent storage (flash1), which has read only access. Inessential dynamic data for logging and configuration, which are written occasionally, are stored on a second flash memory (flash 2).

This separation of the essential and inessential data on two flash storage devices was made to increase the reliability of the architecture, since the likelihood of failure of a flash memory is determined mainly by the number of write cycles.

Static permanent storage

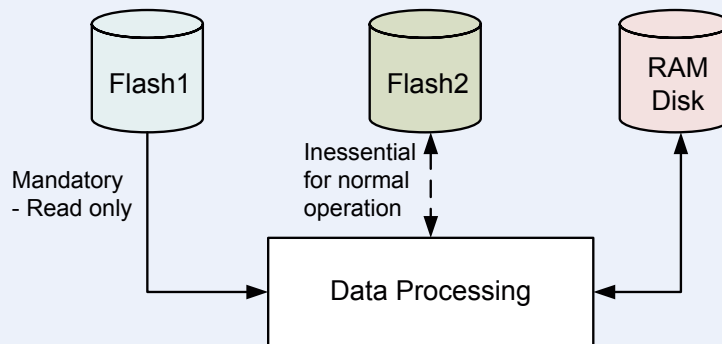
- Startup
- Programs
- Permanent config

Dynamic permanent storage

- Log files
- Dynamic configuration

Dynamic volatile storage

- Temporary data
- Fast logging



Memory Architecture

TECHNICAL DATA DRM DMOD3



Inputs for DRM Modulation Data	<ul style="list-style-type: none"> ■ V.24/RS232 asynchronous serial port with MDI protocol ■ 10/100/1000 Mbit Ethernet port for UDP data transfer using MDI protocol
Inputs for Audio Signals for AM, DRM or Simulcast Transmissions	<ul style="list-style-type: none"> ■ Standard XLR connectors for analog signals with normal line level (+2dBV max.) at 10 kOhm ■ Standard XLR connectors for AES/EBU digital audio input ■ Toslink connectors for ADAT optical audio input
Remote Control	<ul style="list-style-type: none"> ■ V.24/RS232/Network connection with Bitbus syntax ■ Graphical user interface over IP ■ Web interface
Modulator	<ul style="list-style-type: none"> ■ Industrial 19" 4U rack mountable; Linux OS
Supported DRM Modes	<ul style="list-style-type: none"> ■ Modes A, B, C and D with bandwidths of 4.5, 5, 9 and 10 kHz for A/Phi transmitters; 18/20 kHz in addition for linear transmitters ■ Error protection: EEP and UEP ■ Standard and hierarchical modulation
RF Signal	<ul style="list-style-type: none"> ■ Direct-Digital-Synthesis signal generation ■ Tuneable frequency range from 9 kHz to 26.1 MHz ■ Output level 5 Vpp at 50 Ohm
Amplitude Signal	<ul style="list-style-type: none"> ■ Sampling rate of 192 kHz ■ Frequency range from 0 Hz to about 80 kHz ■ Output level 2 Vpp at 600 Ohm
Power Supply	<ul style="list-style-type: none"> ■ 100 ... 240 V single phase, 120W (typ.)
Synchronization	<ul style="list-style-type: none"> ■ integrated GPS synchronization
Environmental Conditions	<ul style="list-style-type: none"> ■ Temperature: -10 ... +50 °C ■ Humidity: 10 ... 80 % RH, non condensing
Fast Switchover	<ul style="list-style-type: none"> ■ Fast switchover is accomplished in less than 5 seconds between all available modes (DRM, MCS, SCS, AM and SSB)
Other	<ul style="list-style-type: none"> ■ RF input for measurement and equalization functions with three selectable input connectors

design: HUSS-MEDIEN GmbH photos: Transradio SenderSysteme AG