IIS

Fraunhofer Institut
Integrierte Schaltungen

Fraunhofer
DRM ContentServer™ R4

DRM Multiplex
ETSI MDI format to
DRM Modulators

Fraunhofer
DRM ContentServer™ R4

Audio 4x
analog / digital / Livewire / MP3 playlist

Data Services
collecting, merging, conversion, encoding
– DRM TextMessages
– Journaline®
– DRM-EPG, MOT Slideshow, BWS, …

DRM Signalling
– International service labels
– AFS Alternative Frequencies, …

**Remote
administration**
via web browser

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Fraunhofer DRM ContentServer™ R4
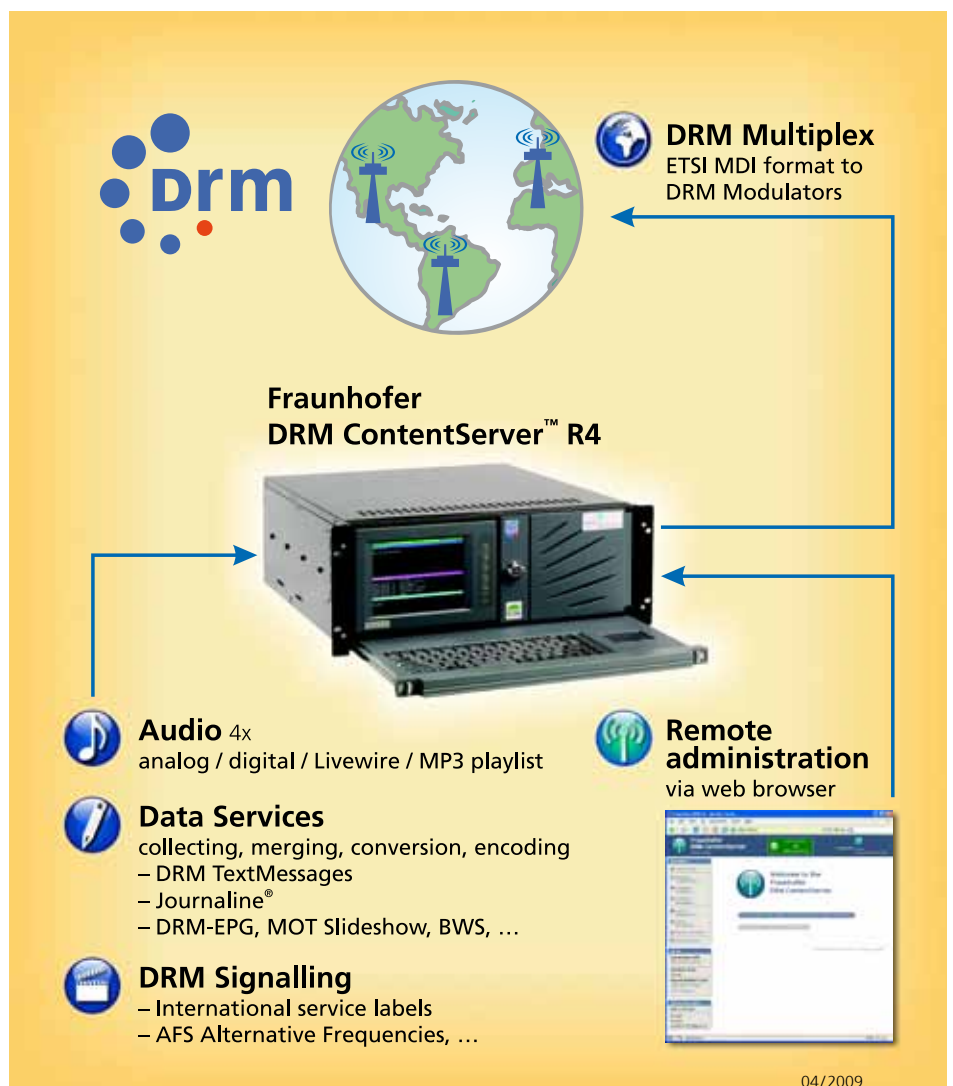
The Fraunhofer DRM ContentServer™ R4 is a highly reliable professional broadcast system for Digital Radio Mondiale ("DRM", see www.drm.org). It provides all options DRM offers and all interfaces for a smooth integration into the broadcast chain.

The Fraunhofer DRM ContentServer™ R4 provides triple functionality:

– **DRM AudioServer** with multistream real-time audio encoding

– **DRM Multimedia DataServer** supporting all standarized as well as broadcaster specific data services, covering import, processing, encoding and broadcast

– **DRM Multiplex Generator** managing the extensive DRM signalling capabilities, generating the full digital DRM Multiplex and providing standard MDI/DCP output streams

The One-box DRM Broadcast Solution

The system is typically located in the studio, at a playout center or at the transmitter site – with full remote control for administration and data provision. The remote web interface featuring Fraunhofer´s in-place-editing technology for quick and convenient system configuration can be accessed through any modern web browser.

The output signal of the Fraunhofer DRM ContentServer™ R4 carries the complete DRM Multiplex (FAC, SDC, MSC) in MDI/DCP format according to ETSI TS 102 820 (Multiplex Distribution Interface) and ETSI TS 102 821 (Distribution and Communications Protocol). This DRM Multiplex can be fed simultaneously to any number of DRM Modulators (optional SFN operation) and monitoring stations.

Fraunhofer DRM AudioServer

This system component provides realtime encoding of up to four audio streams in parallel:

– Live analog, digital, Livewire or MP3 playlist input
– AAC (mono/stereo/parametric stereo), HVXC and CELP encoding with SBR
– All possible bitrates including UEP (unequal error protection)
– All available sampling rates (8/12/16/24/48 kHz)
– MPEG Surround option

Fraunhofer Multimedia DataServer

This component supports the import/collecting, merging, checking, conversion and encoding of data for all standardized DRM/DAB as well as individual data applications.

DRM/DAB data applications:

– DRM TextMessages
– Journaline®
– MOT Slideshow
– MOT Broadcast Website
– TPEG Traffic Information
– PRBS – internally generated synchronous or asynchronous test patterns
– EPG – Electronic Programme Guide
– TMC – Traffic Message Channel

Open interfaces allow the transmission of any custom-tailored individual application at various protocol levels:

– Transparent File Transmission via MOT
– IP Insertion – (Internet Protocol tunneling)
– TDC – Transparent Data Channel
– DRM Data Units
– MSC Data Groups
– Synchronous/asynchronous data streams

Versatile data import interfaces and automation features allow for a smooth integration into production environments:

– RSS import (automatically scheduled or manually triggered)
– Ftp, ftp-mirroring and http-mirroring
– Web-interface for quick data editing using a standard web browser
– UECP, Funkhaustelegramm, Leitungsprotokoll and ZENON studio interfaces
– Socket interface for real-time data insertion
– Protected connections for secure and reliable data import restricted to the predefined data sources: ftps, ftps-mirroring, https-mirroring

The protocol standard MOT 2.1.1 (Multimedia Object Transfer) for enhanced file and directory structure transmissions is supported.

Fraunhofer DRM Multiplex Generator

All DRM signalling features are supported according to ETSI ES 201 980 (v.3.1.1) including the DRM dynamic reconfiguration feature.

Transmission channel options:

– Robustness modes A, B, C, D
– Spectrum occupancy 4.5, 5, 9, 10, 18, 20 kHz
– MSC modes 16 QAM, 64 QAM and hierarchical (HMmix, HMsym)
– SDC modes 4 QAM and 16 QAM
– Interleaver length 0.4s and 2s
– EEP (equal error protection) and UEP (unequal error protection) with all possible combinations of protection ratios/code rates
– DRM+ option: robustness mode E, 100 kHz, MSC modes 4/16 QAM, SDC modes 4 QAM code rate 0.5/0.25, interleaver length 0.6s

DRM signalling options:

– Service ID
– Service language (short list for scanning and detailed list covering all worldwide languages)
– Service programme type
– Country of origin
– Current time and date, including local time offset
– Alternative frequencies for the whole DRM Multiplex and individual DRM services
– Announcements (traffic, news, weather, alarm, etc.)

Full Unicode / UTF-8 support (all international characters, ISO 10646) for DRM TextMessages and DRM service labels.

Advanced System Features

Automatic broadcast scheduling:

– Global broadcast calendar
– Unlimited weekly calendars
– Manual, SNMP triggered, or scheduled broadcast activation/reconfiguration

Sound system configuration:

– Live audio level monitoring via web browser
– Audio amplification setup
– Audio clipping and silence detection
– Optional MP3 normalization on import

Powerful security features:

– Professional firewall
– Secured connections for administration and data upload
– Continuous system self-monitoring
– Monitoring of attached uninterruptible power supplies (UPS)
– System status signalling via e-mail report system, console, relay card and SNMP

– Detailed system status information via HTML
– HTML access to detailed log files for inspection and download
– System configuration backup and restore mechanism (remote and local)

Hardware

The Fraunhofer DRM ContentServer™ R4 is based on robust and redundant 19" server hardware for reliable 24/7 operation.

A console display is supported to locally activate configurations, to monitor the system status and to setup the basic hardware parameters.

Administration and data provision are based on Ethernet network or modem dial-in connections featuring a detailed user management. The strong firewall functionality guards the access to the system.

The audio A/D conversion and system synchronization rely on a GPS clock source. Alternatively the system synchronization can be done via network timing protocol (NTP).

The system as a complete package including hardware and specific customers support services is available from our OEM Partners.
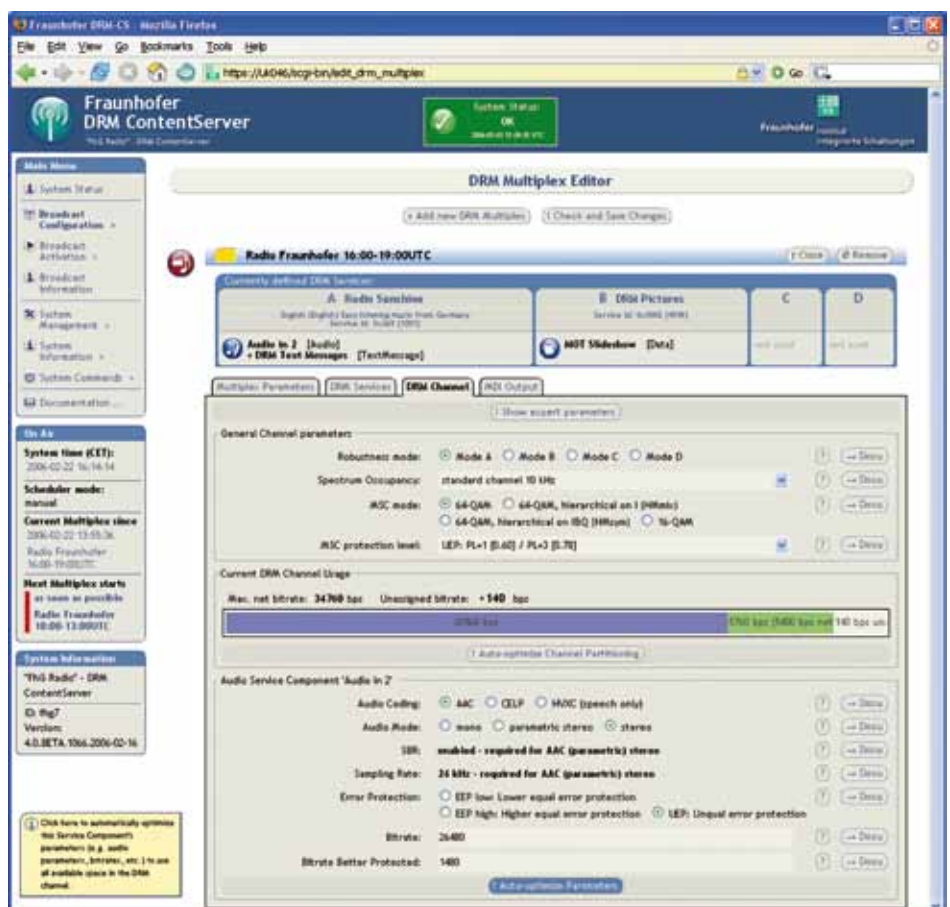
*feature is under development

Editions

The Fraunhofer DRM ContentServer™ R4 is available in three Editions (option packages). All Editions share all the basic DRM functionality, but each Edition provides a different level of system functionality by default.
All Editions can easily be extended by additional features at all times.

– **Basic Edition**
  The perfect starter kit for smaller broadcasters or for use at the transmitter site (accompanying a DRM Modulator) with the option of future extension to the customer´s growing requirements

– **Standard Edition**
  Combines the most important DRM features (like AFS) and functionality (like Broadcast Scheduling) for easy integration into a studio or playout center environment

– **Professional Edition**
  Extends the Standard Edition by professional automation features and provides the full range of individual data transmissions as well as standardized multimedia applications like DRM-EPG

The **Developer Edition** is designed to support the efficient development and testing of DRM receivers. It provides the full functionality of the DRM system with regard to signalling and transmittable content (incl. dynamic reconfigurations).

In combination with the Fraunhofer DRM Test Equipment DT 230 and its modulator option a full broadcast chain with RF output can easily be set up. The chain may well include features of the channel simulation option.
This edition is restricted to laboratory use by license. It cannot be used for public or commercial broadcast.

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Available options / Edition	Compact	Basic	Standard	Professional	Developer
General System Features					
Firewall Basic	–	✓	✗	✗	✗
Firewall Professional	–	–	✓	✓	✗
Support for serial devices	–	✓	✓	✓	–
E-mail reports	–	✓	✓	✓	✗
System checks	–	✓	✓	✓	✗
System backup (at console)	✓	✓	✓	✓	✗
SNMP interface	–	–	✓	✓	✗
System configuration remote up-/download	–	–	–	✓	✗
Security Summary	–	–	–	✓	✗
DRM Multiplex Generator					
Unlimited DRM Multiplex defs.	–	✓	✓	✓	✓
AFS – Alternative Frequency Editor	–	–	✓	✓	✓
Broadcast Scheduler (weekly/calendar)	–	–	✓	✓	–
Announcement support via UECP, Funkhaustelegramm, Leitungsprotokoll	–	–	–	✓	–
Extended broadcast info (SDC layout)	–	–	–	✓	–
Support for external audio encoders	–	–	–	✓	✗
Upload of AFS information from external sources	–	–	–	✓	✗
DRM+ (Robustness Mode E) opt.	–	–	–	✓	–
DRM AudioServer					
Audio input live analog/digital/Livewire	✓	✓	✓	✓	✗
Audio input as mp3/wav, playlist	–	✓	✓	✓	✓
Silence/clipping detection and configuration	–	–	✓	✓	–
Audio input signal amplification / mp3 normalization	–	–	✓	✓	–
AAC encoders [max. 4]	1	1	1	1	1
HVXC encoders [max. 4]	–	–	1	2	1
CELP encoders [max. 4]	–	–	1	2	1
MPEG Surround opt. incl. SX Pro*	–	✓	✓	✓	✓

Available options / Edition	Compact	Basic	Standard	Professional	Developer
DRM Multimedia DataServer					
Data Application Types					
DRM TextMessages	✓	✓	✓	✓	✓
Journaline®	✓	✓	✓	✓	✓
EPG – Electronic Programme Guide	–	–	–	✓	✓
MOT Slideshow	–	–	–	✓	✓
MOT Broadcast Website/ Transparent File Transmission	–	–	–	✓	✓
TPEG traffic information	–	–	–	✓	✓
TMC – Traffic Message Channel	–	–	–	✓	✓
PRBS Generator (sync/async)	–	–	–	✓	✓
IP Insertion	–	–	–	✓	✓
TDC – raw data (any individual data on any protocol level)	–	–	–	✓	✓
Support for multiple MOT priority classes	–	–	–	✓	✓
Data import methods					
Import via HTML interface	✓	✓	✓	✓	✓
Import via file FTP upload	–	✓	✓	✓	✓
Import via HTTP/FTP mirroring	–	–	✓	✓	–
Import via live socket connection	–	–	✓	✓	✓
Import from existing RSS sources (TextMessages + Journaline®)	–	–	✓	✓	–
Import from Funkhaustelegramm, UECP, Zenon, Leitungsprotokoll (TextMessages + Journaline®)	–	–	✓	✓	–
Import via automatic scheduled mirroring	–	–	✓	✓	–
Secure data import connections	–	–	–	✓	✗

Symbols: ✓ Option is included in the package
– Option is not included but can be added to the package
✗ Option can not be combined with the package

Note: This list is informative only. A binding list of options per Edition is contained in the current price list