



TheRadioHub DRM ContentServer™ R5 Product Lines, Editions & Features

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Subject to change without notice.

Our servers are based on the popular Fraunhofer IIS design R5 contentServers. For complete systems including hardware and extended customer support please contact our **OEM Partners** (addresses available on request).

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

TheRadioHub is part of A-Media AS

Broadcast Applications

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Product Lines

To complement individual needs and infrastructure requirements, the TheRadioHub DRM ContentServer is available in the form of two different product lines.

- **TheRadioHub DRM ContentServer R5 – DRM30**

The DRM30 product line is suitable for all DRM broadcasts below 30 MHz, including the SW, MW and LW bands.

The following functionality options listed in the Editions table below can only be combined with this DRM30 product line:
DRM+ (Robustness Mode E) add-on (in the DRM Multiplex Generator section);
HVXC Encoders (in the DRM AudioServer section);
CELP Encoders (in the DRM AudioServer section);
AAC legacy parametric stereo mode (in the DRM AudioServer section)

- **TheRadioHub DRM ContentServer R5 – DRM+**

The DRM+ product line is suitable for all DRM broadcasts above 30 MHz, including the VHF broadcast bands I, II (FM) and III (based on regional regulatory conditions).



Feature List / Functionality Overview

TheRadioHub DRM ContentServer R5 is a highly reliable professional broadcast system for Digital Radio Mondiale ("DRM", see www.drm.org). It supports all options DRM offers and all interfaces for a smooth integration into the broadcast chain.

TheRadioHub DRM ContentServer R5 provides triple functionality:

- **DRM AudioServer**
with multi-stream real-time audio encoding
- **DRM Multimedia DataServer**
supporting all standardized 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 play-out center or at the transmitter site – with full remote control for administration and data provision. The remote web interface featuring TheRadioHub's in-place-editing technology for quick and convenient system configuration can be accessed through any modern web browser.

The output signal of TheRadioHub DRM ContentServer R5 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/transmitter sites (with timing support for SFN single frequency network operation), and monitoring stations.

TheRadioHub DRM ContentServer R5 is based on a highly reliable and secure operating system (Linux based), which remains invisible to the user.

TheRadioHub DRM AudioServer (Module)

This system component provides real-time encoding of up to 4 audio streams in parallel:

- Live analog, digital, Livewire (audio over IP), or file input (MP3, wav, playlist)

- Backup Audio Source: auto-switch from missing live input to uploaded audio content
- xHE-AAC encoding (mono, stereo)
- AAC with SBR (mono, stereo, parametric stereo, 5.1 surround)
- All bitrates, including UEP (unequal error protection)
- All available sampling rates
- MPEG Surround option with automatic real-time stereo-to-5.1 upmix using SX Pro®

TheRadioHub Multimedia DataServer (Mod.)

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

DRM / DAB data applications:

- DRM TextMessages
- Journaline®
- MOT Slideshow (incl. categorized/interactive SLS)
- EPG Electronic Programme Guide
- TMC Traffic Message Channel
- TPEG Traffic Information
- MOT Broadcast Website
- PRBS with internally generated synchronous or asynchronous (standard or user-defined) test patterns

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

- Transparent File Transmission via MOT (optional MOT Directory compression)
- 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/Atom import
- Customer-specific XML formats (option)
- Ftp, ftp-mirroring and http-mirroring (automatically scheduled or manually triggered)
- 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 (API + Win/Linux command line tools for data provision by clients)
- Protected connections for secure and reliable data import restricted to the predefined data sources: ftps, ftps-mirroring, https-mirroring

The DRM Enhanced Packet Mode (FEC protection) is supported.



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

TheRadioHub DRM Multiplex Generator (Mod.)

All DRM signalling features are supported according to ETSI ES 201 980 (v.4.1.1) including the DRM dynamic reconfiguration feature.

Transmission channel options for DRM30:

- 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

Transmission channel options for DRM+:

- Robustness mode E
- Spectrum occupancy 96 kHz (100 kHz nominal)
- MSC modes 4 and 16 QAM
- SDC modes 4 QAM with code rates 0.5 and 0.25
- Interleaver length 0.6s
- EEP and UEP with all possible combinations of protection ratios / code rates

DRM signalling options:

- Service ID
- Service language (short list for scanning and detailed list covering all worldwide languages)
- Service programme type
- Country of origin
- Emergency warnings/alerts
- Current time and date, including local time offset
- Alternative frequencies for the whole DRM Multiplex and for individual DRM services (linking to DRM, AM, AMSS, FM, FM-RDS, DAB services)
- Announcements (traffic, news, weather, alarm, user-defined)
- Full Unicode / UTF-8 support (all international characters, ISO 10646)

for DRM TextMessages and DRM service labels

Multiplex Signal Management

- Extended broadcast info (Multiplex configuration, SDC layout)
- Live monitoring of the DRM Multiplex Generator output signal through the web interface, as a receiver would decode and present the data (DRM Text Messages, Journaline, Slideshow; incl. transmission statistics)
- Recording of the DRM Multiplex Generator output signal (as MDI/DCP, or individual MSC streams) and file-download through the web interface; the duration can be pre-defined

Advanced System Features

Redundancy Group Feature

- Connects two or more ContentServers to one Redundancy Group
- Full failover – each group member independently generates frame-synchronous and co-timed MDI
- Group-wide synchronized dynamic reconfigurations
- Single user interface – automatic internal replication of broadcast configurations, schedules, and uploaded broadcast content
- Mutual system health and availability checks among members
- Audio Cross-Redundancy: the encoded audio stream from another Redundancy Group member replaces a failing/missing audio source

Automatic broadcast configuration scheduling:

- Global broadcast calendar
- Unlimited weekly calendars
- Manual, SNMP triggered, URL triggered or pre-scheduled broadcast activation / reconfiguration

Sound system configuration:

- Live audio level monitoring via web browser
- Audio amplification setup
- Continuous and configurable clipping and silence detection for all audio input signals
- Optional MP3 normalization on import

Powerful security features:

- Professional firewall to separate the potentially public content contribu-

tion from the protected system administration and DRM Multiplex distribution to DRM transmitters

- Secured connections for system administration and data contribution access

Continuous system self-monitoring & status reports

- System status signalling via e-mail report system, local console, relay card and SNMP
- Detailed system status information via HTML web interface
- Web interface access to detailed log files for inspection and download
- System configuration backup and restore mechanism (remote / local)
- Monitoring of attached uninterruptible power supplies (UPS)

Infrastructure and Setup

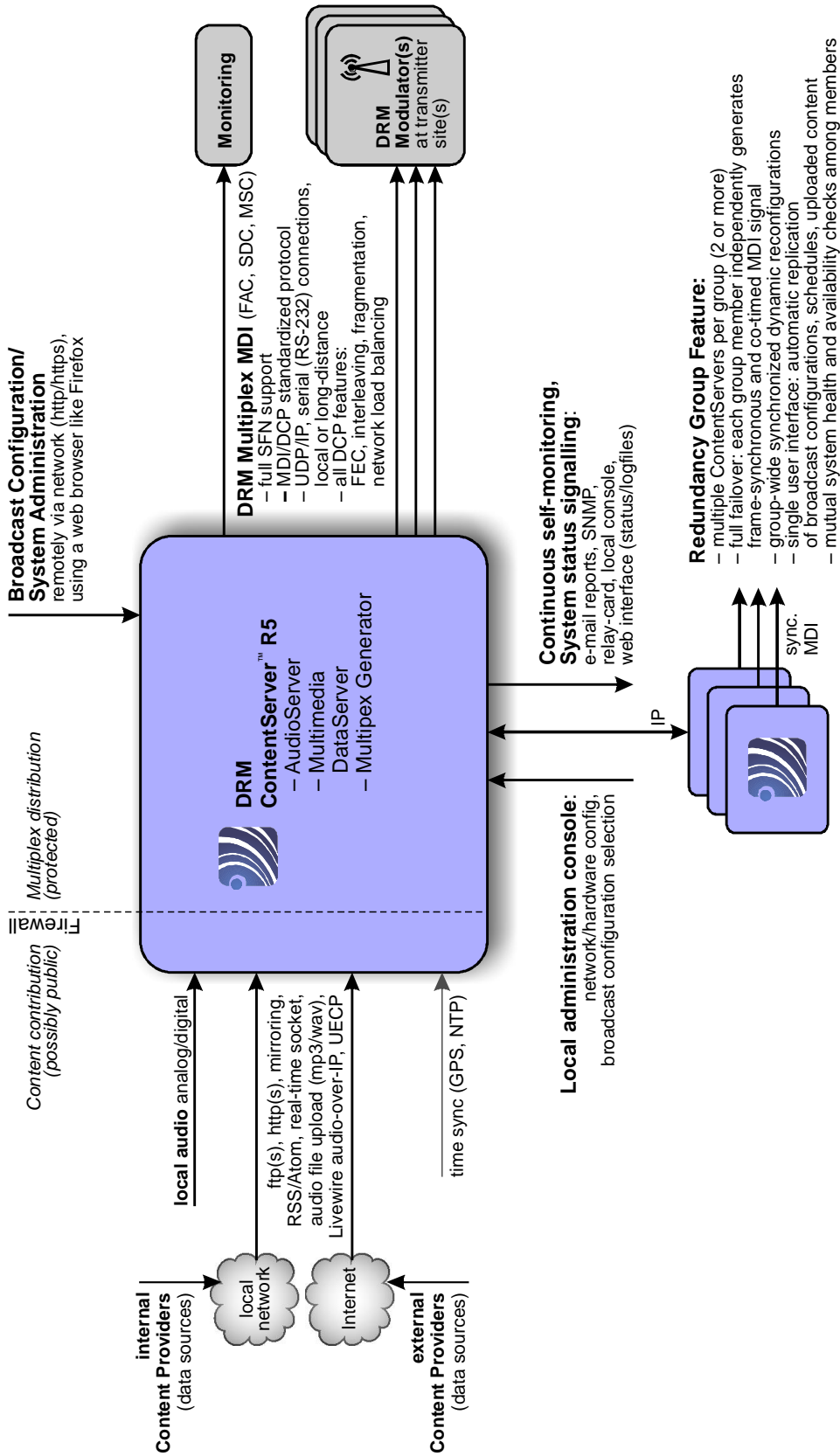
TheRadioHub DRM ContentServer is typically assembled as a highly reliable and redundant 24/7 server hardware system.

Administration, system configuration and data provision are based on Ethernet network or modem dial-in connections for a **completely remote operation**.

The strong firewall functionality guards the access to the system. A detailed user management is provided to control system access and data contribution sources.

In addition a local console display is supported to locally activate configurations, to monitor the system status and to setup the basic hardware parameters (like network settings).

If the MDI/DCP output signal of the DRM ContentServer shall be fed simultaneously to a virtually unlimited number of DRM Modulators/transmitters operating in SFN mode (single frequency networking), the system must be time-synchronized. Supported synchronization methods are direct GPS receiver input via serial line (see list of supported models), or NTP access (network timing protocol) via network.





Editions

Each product line of the TheRadioHub DRM ContentServer R5 is available in 2 Editions: Elementary Edition and Professional Edition.

Both Editions share all basic DRM functionalities, but the Professional Edition provides a different level of enhanced system functionality as a starting point to accomplish typical user scenarios.

Both Editions can be extended easily with additional features at any time after the initial purchase.

- **Elementary Edition**
A carefully-devised selection of essential DRM functionalities to support an initial exploration of the DRM broadcasting world.
- **Professional Edition**
Extends the Standard Edition by adding professional automation features, and provides the full range of broadcaster-specific data transmissions as well as standardized multimedia applications.



Available options	Edition (option package)			
	Elementary		Professional	
Firewall Basic		✓		✗
Firewall Professional		–		✓
Support for serial devices (GPS, modem, ...)		–		✓
Automatic leap second handling		✓		✓
System checks (continuous self-monitoring)		✓		✓
System config backup (at console)		✓		✓
System configuration remote up-/download		–		✓
E-mail reports		✓		✓
SNMP interface		–		✓
Security Summary (network conf. overview)		–		✓
Remote System Update		–		✓
Redundancy Group Feature		–		✓
Audio Cross-Redundancy		–		✓
Unlimited simultaneous DRM Multiplex definitions		✓		✓
SFN Timing Support (Single Frequency Network)		✓		✓
AFS – Alternative Frequency Editor		✓		✓
Broadcast Scheduler (weekly/calendar)		–		✓
Announcement support (via UECP, Funkhaustelegramm, Leitungsprotokoll, HTML interface)		✓		✓
Live Output Monitoring (Slideshow, Text Messages, Journaline decoding)		–		✓
Multiplex MDI / MSC Stream Recording		–		✓
Extended broadcast info (detailed SDC structure and layout)		–		✓
Support for external audio encoders *		–		✓
Upload of AFS information from external sources		–		✓
Support for 4x PAD with audio services *		–		✓
DRM+ (Robustness Mode E) option (for DRM30 product line only)		✗		–
Audio input live analog/digital/Livewire		✓		✓
Audio input as mp3/wav, playlist		–		✓
Silence/clipping detection and configuration		–		✓
Audio input signal amplification/ mp3 normalization		–		✓
xHE-AAC / AAC encoders [max. 4]		1		2
HVXC encoders (obsolete!) [max. 4] (for DRM30 product line only)		–		–
CELP encoders (obsolete!) [max. 4] (for DRM30 product line only)		–		–
MPEG Surround option incl. SX Pro		✓		✓



Available options	Edition (option package)			
	Elementary		Professional	
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 on various protocol levels		–		✓
Support for multiple transmission priority classes		–		✓
Import via HTML interface (Web-GUI)		✓		✓
Import via file FTP upload		✓		✓
Import from existing RSS/Atom sources (Journaline [®])		✓		✓
Import from existing RSS/Atom sources (TextMessages)		–		✓
Import via live socket connection (API)		✓		✓
Import via HTTP/FTP mirroring		–		✓
Import from Funkhaustelegamm, UECP, Zenon, Leitungsprotokoll (TextMessages + Journaline [®])		–		✓
Automatic Scheduled Mirroring option		–		✓
Secure data import connections		–		✓

*) Under development – as soon as option is available in a system update, it will automatically be active for the indicated Editions.



Remarks

Software Update Support

Every system license includes 24 months of free Software Update Support.

During this period, all available system software updates are available free of charge.

The Software Update Support can easily be extended after this initial period by a Software Update Support contract. This contract extends the Software Update Support for all covered systems on a yearly basis.

If Software Update Support shall be enabled for a system that is not currently covered, please contact us for an individual quotation.

Spare System License (Redundancy)

A spare system is a fully functional TheRadioHub DRM ContentServer standby system for backup purposes, typically operated as part of a Redundancy Group with a regular system. The spare system may be used to replace any standard system licensed to the same company. Depending on the backup philosophy of the company, one spare system may be sufficient to cover multiple standard systems.

The following license restrictions apply:

- The spare system must not be operated except as a replacement for a regularly licensed standard system. It must not be operated by another company than the one owning the standard system's license.
- The replaced standard system must be non-functional during the time of the replacement (e.g. hardware failure). It is not sufficient to just manually or temporarily switch off a standard system.
- The spare system must not be sold or lent to any third party.

General Remarks

- The above table only mentions those features that are different among the available Editions. The standard features shared between all Editions of the TheRadioHub DRM ContentServer are contained in the general product description above (Feature List).
- All Editions can be installed on suitable server system.
A list of required and recommended hardware components is available upon request.
- **All Editions can easily be extended by additional options (features).**
If licenses are extended after the initial order, an additional handling fee may apply.
- **Special license restrictions apply to the Developer Edition:**
 - The system is licensed for development purposes only.
 - The system must not be used for regular or commercial broadcasts on air.
 - The system must not be sold or lent to any third party.
- **Customer training on the TheRadioHub DRM ContentServer,**
on Digital Radio Mondiale and Multimedia Services is available upon request.