

# DRM – Digital Radio Mondiale

Digital FM for Commercial Stations

Best Solution for Substantial Cost Savings

## Saving money with the Digital Radio Mondiale (DRM) standard

Commercial radio stations have invested heavily in analogue transmissions (FM) over many years. Despite its age (some 80 years old) FM is still a functional technology which provides good sound but is also very energy hungry and broadcasters are often faced with huge energy bills for just one programme per allocated frequency transmitted to their listeners.

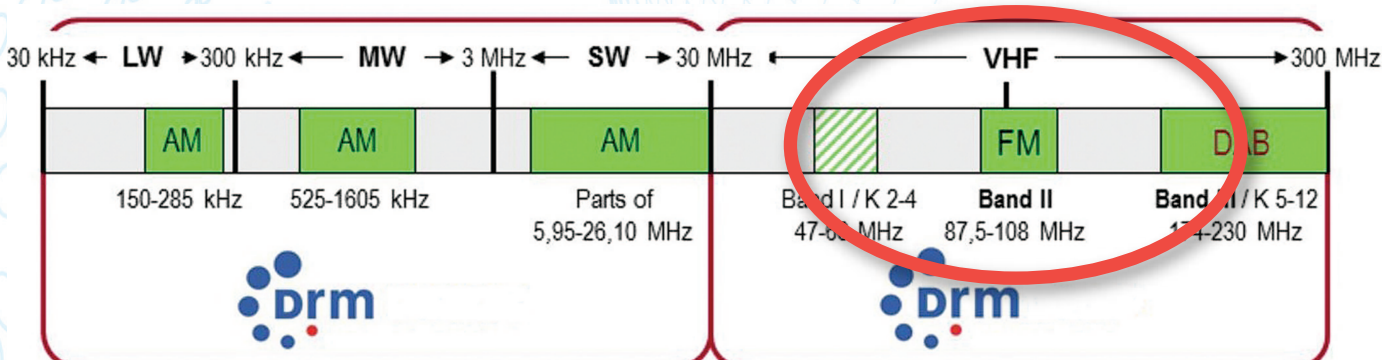
In this age of fierce competition when broadcasters fight to attract and keep listeners, the huge energy costs need to be lowered while programmes need to be diversified and targeted at the various needs of listener groups.

This is where digital radio with the DRM standard comes in.

## What is DRM, the Digital Radio Mondiale technology?

The DRM terrestrial radio broadcasting standard has been specifically designed as a high-quality digital replacement for current expensive analogue radio broadcasting in **all the frequency bands, from the AM to the FM/VHF bands. DRM is therefore an efficient and easy to implement solution for digitising the energy-hungry FM band.**

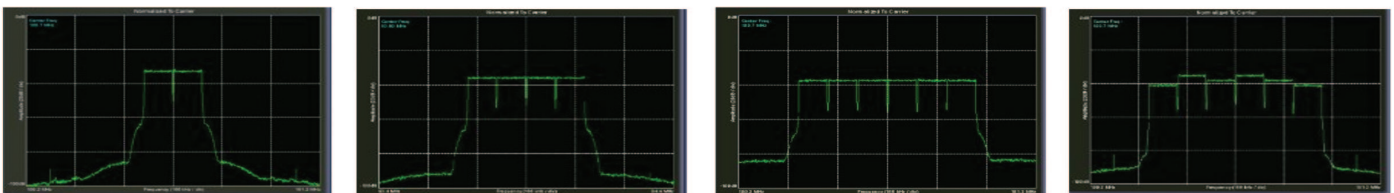
DRM is an **open standard**, it does not belong to a commercial company, which means that both broadcasters and all manufacturers have free access to the complete technical specifications, without the need of special licences and associated fees.



## What is the financial gain when using the DRM standard?

- Energy bill reduction of between 50% to 80%.** Digital DRM transmitters are significantly more energy efficient than analogue ones and allow for massive operational savings – or increase the coverage area, accordingly, depending on the broadcaster's needs or preferences.
- Make minimum investment as the existing infrastructure could be reused or repurposed in some instances.** By using DRM broadcasters can utilise their existing transmitters and antennas which may only need some modifications and/or upgrades for digital broadcasting. Therefore, there is no need of a completely new infrastructure.
- Diversify and increase the number of channels.** Instead of one programme per allocated frequency in analogue FM, broadcasters can air by using DRM **up to 3 radio programmes along with multimedia components on a single frequency of 96 kHz bandwidth only** (half of an existing analogue FM frequency bandwidth). This allows either for more diversified content offering, or for drastically reducing the amount of dedicated FM transmitter networks and thus installation/maintenance/running costs for a given set of programmes. Broadcasters can offer dedicated services to audience groups unserved in the past. This means they can potentially increase their audiences and revenue potential (through advertising for instance).
- In addition, there is the option of **sharing a transmitter and antenna between independent broadcasters.** This is the latest enhancement of the DRM standard in the FM band. Broadcasting of as many as six individual DRM signals from a single transmitter and antenna has been successfully demonstrated (e.g., India). One DRM channel carries two to three audio programmes, so on a single transmitter one could broadcast as many as 18 programmes in pure DRM mode. In this scenario each broadcaster, using the same transmitter and antenna, remains still in full control of its own broadcasts not needing to rely on an expensive third-party large multiplex operator.

### Pure Digital - Multi DRM configuration



Test case	Transmitter		Signal Configuration and Receiver Tuning Frequency (MHz)												
	Center (MHz)	Power (W)	100,35	100,4	100,45	100,5	100,55	100,6	100,65	100,7	100,75	100,8	100,85	100,9	100,95
Test case 1: "Multi-DRM Showcase A"	100,65	200						100%	100%						
Test case 2: "Multi-DRM Showcase B"	100,65	600	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Test case 3: "Multi-DRM Showcase C"	100,65	100	25%	100%	50%	100%	50%	100%	50%	100%	50%	100%	25%	100%	100%
Test case 4: "Multi-DRM Showcase D"	100,65	100	100%	100%				100%					100%		

Colour code:

DRM

analogue FM

Up to 6 DRM signals ( 18 Audio + 6 Multimedia Journaline services )  
side-by-side from the same transmitter

5. **Unlike analogue, the same frequency can be used to cover wider areas. DRM supports single-frequency network operation (SFN)** to serve a region or even the whole country on a single broadcast frequency for optimised listener coverage. In addition, SFN allows for easy installation of local gap-filler transmitters to cover black-out/shadowed areas, without the need for additional frequencies or related licenses and costs.
6. **Multimedia applications** are unique to digital and can enhance the audio by offering:
  - a. Text Messages on bigger screen
  - b. Journaline advanced text in several languages/dialects as required – e.g., link to the RSS feeds of a particular station
  - c. Listener interactivity and geo-referenced information – by advertising URLs, addresses, and phone numbers
  - d. Slideshows – images to complete or enhance audio content
  - e. Traffic updates via TPEG/TMC
  - f. Service logos via SPI, etc. as frequencies are no longer required and labels can be used to advertise and enhance the brand of a station

## What are the most common expenses for analogue FM broadcasters?

### Capital Expenses – CAPEX (one-time setup investment)

- Equipment

### Operational Expenses – OPEX (ongoing)

- Signal Distribution
- **Energy!!**
- Cooling
- Floor space



## How can broadcasters save money by using DRM in FM?

A: Typical cost comparison between analogue and DRM digital FM installations

Approximate set-up costs based on Manufacturers' pricing	New analogue FM tx on existing FM site	Pure DRM transmitters on existing FM site	DRM upgrade of existing FM transmitters
Power level (TX)	10 kW	1 kW	
Transmitter	\$ 40,000	\$ 20,000	\$ 10,000
Mask Filter	\$ 0	\$ 0	\$ 0
Cooling System	\$ 5,000	\$ 2,000	\$ 0
Antenna & RF Line, Installation	Exists	Exists	Exists
TX Installation	\$ 5,000	\$ 2,000	\$ 2,000
Total site cost (per site)	\$ 50,000	\$ 24,000	\$ 12,000
Studio Head-End (1x for network)	\$ 0	(\$ 20,000)	(\$ 20,000)
Number of programmes	1	3	3
Cost per programme and site	<b>\$ 50,000</b>	<b>\$ 8,000</b>	<b>\$ 4,000</b>

**Overall set-up cost savings of between \$ 46,000 and \$ 42,000**

B: Substantial energy cost savings between Analogue FM and DRM in FM

Transmitter	FM	DRM
Power	10 kW	1 kW
Efficiency	72%	50%
Energy consumption per Transmitter	13.9 kW	2 kW
Annual Energy Bill per Transmitter	\$ 18,250	\$ 2,640
Programmes per Transmitter	1	3
Annual Energy Bill per Programme	<b>\$ 18,250</b>	<b>\$ 880</b>

**Overall set-up cost savings of \$ 17,370!!**

## C: Reduced Service and Operational Costs

- Maintenance is seen as the 2nd largest cost factor after energy bill
- Reduced part diversity
- Reduced maintenance effort
- Reduced heat load / cooling effort
- Reduced space

### Example:

9 x FM Transmitter  
@ high power



3 x DRM Transmitter  
@ lower power



## Conclusions

1. The DRM digital broadcasting standard supports **all VHF bands** including the **FM band**. It has been developed specifically for allowing broadcasters to serve their individual target audiences in their defined and often unique coverage areas, while co-existing peacefully and without any interference with existing analogue FM services during the transition period. This DRM flexibility cannot be replicated by any other digital radio standard today.
2. DRM is a perfect standard for digitising FM services, keeping broadcasters in **full control** of their transmission infrastructure and optimised for the broadcaster's individual coverage needs at much reduced overall costs.
3. DRM's **advanced features** revolutionise the radio experience for listeners, allowing broadcasters to develop new revenue streams and to intensify listener engagement.
4. Successful DRM in VHF trials and demonstrations have been carried out all over the world during the past few years, such as in India, Russia, Germany, UK, the Vatican, Norway, Sri Lanka, Brazil, Sweden, Indonesia, South Africa and France (in VHF bands I, II FM and III).

**Now is the time for radio broadcasters to evaluate DRM and its overall benefits to make their successful FM services fit for the digital age.**

The DRM Consortium welcomes you as members and together with existing members and major domestic receiver chipset companies are ready to support local demonstrations and rollouts.

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Please contact us by sending an email to: [projectoffice@drm.org](mailto:projectoffice@drm.org)

For further information, please visit our website: [www.drm.org](http://www.drm.org) and stay up-to-date on latest DRM developments around the globe by signing up to the DRM newsletters (global and India editions): [newsletter.drm.radio](http://newsletter.drm.radio)

The recently updated **DRM Handbook** provides an efficient functionality overview and particularly focusses on the benefits of DRM for broadcasters. The document is available as a free download from the DRM web site: [handbook.drm.radio](http://handbook.drm.radio)