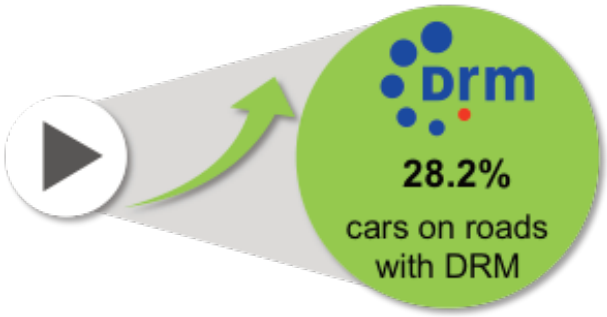
DRM Receivers

An update

Available DRM Receiver Offers

A. DRM for Cars

The Indian automotive market has achieved the fastest digital radio adoption, with 28% of new cars on the road currently being equipped with a DRM digital radio receiver.



The number of cars equipped with DRM radio is ever-increasing with over 4.2 million cars on road since 2017.

The radio receiver industry both in India and abroad has invested millions of dollars in the development of DRM digital radio capable receivers for use in Indian cars. The car brands listed below are major international players and can equip their vehicles with a DRM digital radio in any country which is planning or rolling out the DRM standard.

1. Car Brands and Models with DRM Digital Radio

According to the information made available to the DRM Consortium, the following models include DRM digital radios:

MARUTI SUZUKI

WagonR, Dzire, S-Presso, Ertiga, Vitara Brezza, XL6, S-Cross, Ciaz, Baleno, Ignis.

HYUNDAI

The latest models with DRM for 2021 are ***i10, Santro, Venue, Aura.***
The models ***Santro, Grand i10, Elite i20, Active i20, Aura, Verna, Venue, Elantra, Tucson, Creta, Xcent*** were sold with DRM until 2020.

Mercedes-Benz

S-Class

TOYOTA

Glanza V, Urban Cruiser

MG

MG-Hector, MG-Hector Plus, MG-Gloster, MG-Astor

Mahindra

XUV300

Please check with the actual manufacturers the availability of the DRM digital radios for specific models at the time of the order or purchase.

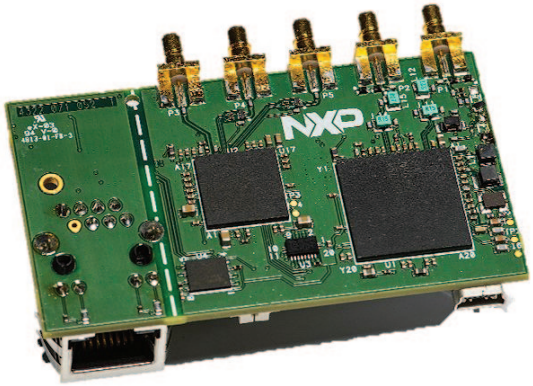
More international car brands are planning or are in the process of fitting DRM digital receivers in their vehicles.

2. Chipsets and modules for OEMs

OEMs use available chips from various manufacturers, such as NXP, Skyworks, Bosch, CML Microcircuits and others.

Chipsets

NXP (www.nxp.com), the number one in automotive infotainment systems and the global market and innovation leader for car radio solutions has developed new DRM solutions for OEMs. The company has added FM band support to DRM, Journaline data forwarding, and the xHE-AAC audio codec for music and speech.



In addition, NXP demonstrated dual tuners and a cost-effective single tuner on DRM platforms shown above. These tuners also support the traditional analogue frequencies.

Entry platform (DRM in AM and FM band):
Atomic2 (TEF6659) + Saturn (SAF36xx)
- Low cost and low footprint radio tuner platform
- Basic analogue and digital audio interface

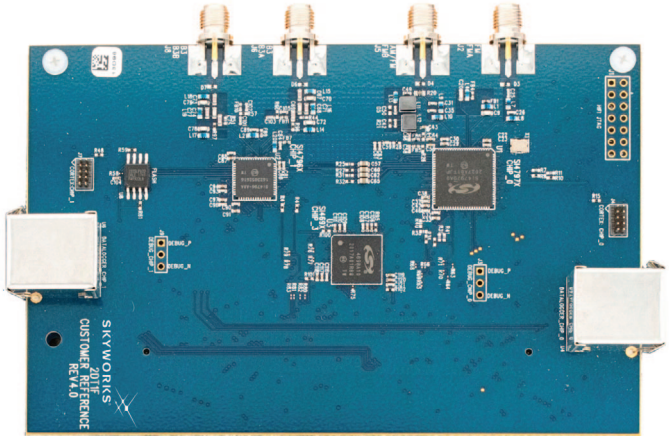
Mid-end platform (DRM in AM and FM band):
HERO (TEF6638) + Saturn (SAF36xx)
- Single tuner, scanning antenna diversity radio platform
- Audio processing and routing
- Analogue and digital audio interfaces

High-end platform (DRM in AM and FM band):
DiRaNa3 (SAF775x) + Saturn (SAF36xx)
- High performance dual tuner platform
- Advanced audio processing and routing
- Analogue and digital audio interfaces

Modules

SKYWORKS®

Skyworks (www.skyworksinc.com), a leading provider of automotive solutions, has introduced a new cost-effective DRM for AM radio solution to meet the growing needs of automotive customers. Skyworks' new DRM for AM platform enables Tier-1 and Tier-2 customers to support all global mainstream digital radio standards (DRM for AM, HD Radio™, DAB/DAB+/DMB) with a single hardware and software design. In addition, Skyworks' DRM FOR AM platform solution enables customers to scale their platform with its pin/package compatible single and dual tuners to support different product segments.



Entry platform (DRM for AM):
Global Eagle (Si47907) + Falcon (Si4694[1])

- High performance & low-cost single tuner digital radio platform
- Common digital radio coprocessor footprint and API enables a single platform design to support all digital radio standards (HD Radio/DAB/DAB+/DRM FOR AM)

Mid-end platform (DRM for AM):
Global Eagle (Si47925) + Falcon (Si4694[1])

- High performance & low-cost single tuner digital radio platform with integrated audio DSP
- Audio DSP supports both Skyworks and third-party enhanced audio post-processing algorithms

High-end platform (DRM for AM):
Dual Eagle (Si47975) + Falcon (Si4694[1])

- High performance & low-cost dual tuner digital radio platform with integrated audio DSP
- Audio DSP supports both Skyworks and third-party enhanced audio post-processing algorithms
- Optional FM phase diversity reception

Entry/Mid/High SDR platform (DRM for AM):
Global Eagle or Dual Eagle + SoC

- Tuner equipped with SDR-friendly features enabling rapid SDR platform development
  - DRM Detect – Enables scanning of digital-only stations
  - Dynamic I/Q Output – Enables co-existence of different digital radio standards
  - DRM digital AGC – Enables tuner to provide I/Q signals to SoC at optimal power level

Note:
For a global platform, the Si4694 can be replaced with pin/package compatible digital radio coprocessor Si4699, which supports all global mainstream digital radio standards

3. Line-fit and Aftermarket Car Receiver Solutions

The Chinese company **Gospell (www.gospell.com)** has recently developed DRM car solutions for both DRM in **AM and FM:**

a. OEM module DRM PCBA.
b. The after-market devices GR-501 and GR-502 BCW. These units will enable the cars already on road to DRM digital reception.

GR501 and GR502 – both After-market and for OEM

The two models have the following DRM features:

- Double DIN in-dash car stereo
- 2GB RAM + 32GB ROM
- Quad core
- DRM designed for AM band and FM band
- Journaline support
- DRM Slideshow support
- AM/FM radio
- Bluetooth music / Handsfree calling / Wi-Fi
- Navigation / backup camera
- USB/SD player
- Internal 4x25w amplifier

Inntot Technologies (www.inntot.com) based in India has an **SDR based automotive receiver solution** for DRM digital radios. Inntot is working with some of the major automotive tier-1 companies to launch the DRM receiver through OEMs. The Inntot solution meets all the DRM RF performance requirements for the automotive industry and has been field tested in several cities and rural areas in India. It is expected that the first Inntot DRM receivers will be fitted in India cars by end of 2021.

B. DRM in Mobile Phones

Fraunhofer IIS

The **Fraunhofer DRM MultimediaPlayer (https://www.iis.fraunhofer.de/en.html)** is available for receiving digital radio broadcasts on smartphones, tablets or PC receivers. The software can be used also for professional receivers and is available to Fraunhofer partners for integration in their products.

STARWAVES

Starwave (www.starwaves.com) is a German/Swiss company and has developed a DRM SoftRadio App for Android mobile phones and tablets.

The **DRM SoftRadio app** enables phones and tablets to receive news and entertainment items in perfect sound and as text information using the terrestrial broadcasting DRM Digital Radio standard.

The app supports many DRM digital radio features such as the Emergency Warning Functionality (EWF), image slideshows, station logos, and radio programme service descriptions. To provide all these services, the app only requires a standard off-the-shelf SDR RF dongle that is attached to the device's USB port.

The app is available in the Amazon and Google app stores:

https://s.drm.org/Amazon-DRM-Softradio

https://s.drm.org/Google-DRM-Softradio

Technical details, installation and usage instructions of mobile phone and tablet app can be found on **Starwaves** website by going to: https://drmsoftradio.starwaves.com

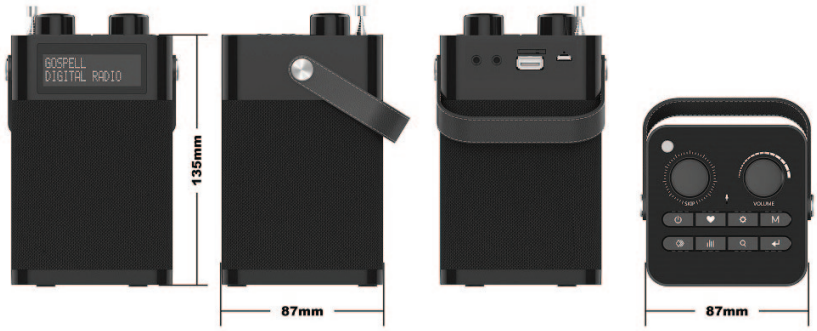
C. DRM in Standalone and Portable Receivers

Gospell Digital Technology Co Ltd. (www.gospell.com) is based in China and first developed the DRM standalone Receiver **GR 216**.

Three more advanced portable radios, GR- 224, GR-226 and GR-228, have come onto the market.

GR-224BP Portable DRM/AM/FM Radio
(DRM/AM/FM | Bluetooth | USB/TF player |AUXin)

GR-226BP Portable DRM/AM/FM Radio
DRM/AM/FM | Bluetooth | USB/TF player | AUX in)



GR-228BP Portable DRM/AM/FM Radio
(DRM/AM/FM | Bluetooth | USB/TF player | AUX in | Stereo speaker)

The unit price of all these receivers will be based on the order volume.

A new Gospell receiver series, the GR220, has just been made available commercially.

GR-220P Pocket DRM/AM/FM Pocket Radio

All Gospell receivers have the following features:

- Full band DRM (MW/SW VHF-II) and AM/FM stereo reception
- DRM xHE-AAC audio decoding
- DRM Journaline* and scrolling text message
- DRM emergency warning reception
- DRM alternative frequency switching
- DRM expert mode for reception status inspection
- FM RDS station name display
- 60 station memory presets
- 1kHz step tuning allows fast and precise station reception
- Station auto seeking and store
- Rechargeable battery
- Automatic time set
- Operates on internal battery or AC adapter

The company has an Indian distributor called **Antriksh Digital Solutions**, which can be accessed via their website http://www.antrikshdigital.com (Section 'DRM Products'). The DRM receivers on Antriksh's website are coded and customised to Indian requirements and sold to customers in India. Their unit price will be based on order volume.

Antriksh
Digital Solution LLP

Antriksh Digital Solutions can be contacted at deepak@antrikshdigital.com

Gospell in China can be contacted at: huangbs@gospell.com (China)

The Gospell receivers are also available on the **Alibaba** website:
c. https://s.drm.org/Alibaba-Gospell-Freesat-DRM-216
d. https://s.drm.org/Alibaba-Gospell-GR-224BP
e. https://s.drm.org/Alibaba-Gospell-228

Starwave in Germany have developed two receiver types ready to receive substantial order for mass production. These receivers are:

These receiver types are:

a Portable W24BT radio

b Small radio for after-market cars (CarBox or “Tuk-Tuk” radio)

The Starwaves receiver models are illustrated below:

Standalone W24BT radio

S-India CarBox – DRM Digital Car Receiver (TukTuk Radio)

(for aftermarket cars)

Features for both radios are:

- DRM in the AM, SW and FM Band
- Also plays analogue AM, FM and SW
- High quality tuner
- Journaline
- DRM Emergency Warning Functionality (EWF)
- Frequency and station name can be scrolled on the LED display

The **standalone W24BT** and the DRM **CarBox** (‘TukTuk’) after-market digital radio are available on the **Alibaba** website:

https://s.drm.org/Alibaba-Starwaves-W-293 https://s.drm.org/Alibaba-Starwaves-Carbox

In addition, the Starwaves standalone receiver **W24BT** is also available on the **TradeIndia** website:

https://s.drm.org/tradeindia-Starwaves-W-293

The company’s website is: http://starwaves.com
Starwaves can be contacted at: sales@starwaves.com

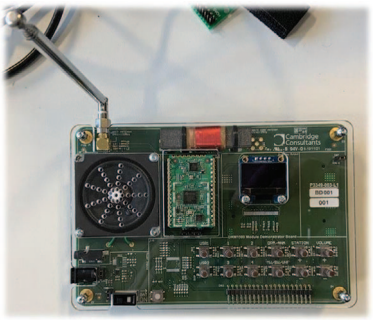
Planned Modules and Receiver Offers

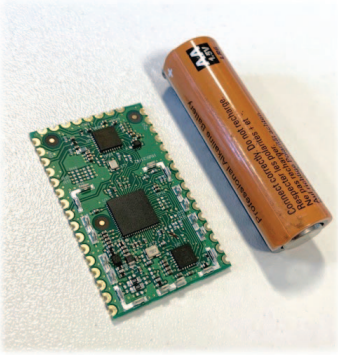
Other manufacturers currently in the process of developing or upgrading their DRM automotive, portable or desktop receiver solutions are:

Inntot Technologies Pvt Ltd, India (for AM and FM)
Their desktop radio is based on a generic processor and meets all the specifications for the Minimum Receiver Requirements for mediumwave (MW). The receiver supports all frequency bands (AM and FM), the xHE-AAC audio codec, Journaline, Slideshow feature, Service and Programme information, as well as the DRM EWF emergency alert feature. The design has been field tested in number of cities and rural areas in India and is currently being tested in Japan.

The company's website is: https://www.inntot.com **Inntot** can be contacted at: info@inntot.com

Cambridge Consultants' Proof-of-Concept / Demonstrator





Cambridge Consultants in co-operation with CML Microcircuits (UK) are developing a small, low-power and low-cost (under $20) DRM portable receiver module for both DRM in AM and FM, as well as the corresponding analogue frequencies (www.cambridgeconsultants.com; https://www.cmlmicro.com/)

Future **Starwaves** (Germany) portable receiver models illustrated below are:

- Pocket radio W5BTBoombox V66 (available soon)
- Standalone radio W41 (available soon)
- Standalone radio W42 (one speaker, available soon)

RF2Digital ((South Korea) are in advanced development of their SDR solution for the automotive industry, supporting both DRM and analogue frequency bands. In addition, RF2Digital supports other standards as well (www.rf2digital.com)

Communications Systems Inc, India (India) have developed their first Indian DRM receiver a few years back and are considering substantial improvements to their product, Avion AV-1401 (www.avionelectronics.in)

For more information on available manufacturer products and general DRM news and information, please go to https://products.drm.org/ and to https://newsletter.drm.org/