



TECNOROLL BMB s.r.l.

# Clever FM Broadcast

## Introduction

In spite of the perceived competition of apparently more modern systems such as DAB or DRM, evidence shows that the FM broadcast system is still going to maintain a large technological value in the future, provided it is deployed in a smart, simple and efficient way.

The main reason why FM is still the winning standard after more than two decades since the introduction of digital broadcast, is to be found primarily in the relationship between its infrastructure cost and its efficiency in reaching the end user.

It is unlikely for any other competing standard to ever be able to reach the same penetration and critical mass as the FM system. Even those countries that have only recently begun to show interest in digital radio distribution usually prefer to fulfill their technological needs with FM broadcast systems rather than approaching new technologies.

In this context, providing an efficient system that is also easy to install and manage, while at the same time offering optimized resources and a scalability of investments, represents a key factor for those networks that are creating their own new infrastructure or need to expand/renew an existing one.

The same opportunity is granted to technology suppliers: these new technologies make it possible for them to easily meet their clients' needs and open up a way to new and different implementations of FM distribution.

## The FM broadcast [r]evolution

The "Clever FM" technology by TECNOROLL allows for a drastic reduction of signal transport costs and provides maximum flexibility of use. The system can be quickly installed and managed, and offers high levels of technical performance.

The evolution consists of abandoning the classic infrastructure based on MPX signal transport through expensive microwave radio links and embracing a new, 'leaner' infrastructure concept.

Using technically and economically more efficient solutions, like for example satellite distribution, the signal can also be broadcast to a significant number of small relay stations, keeping the investments low and cost-effective, and at the same time reducing the transmission power (with its connected expenses) and simplifying the whole infrastructure.

This new concept involves a hybrid network composed not only by the existing high-power transmitters, but also by several new micro-cells that cover new areas without the need to add any more expensive transmission towers and dedicated buildings.

This also involves significantly less power consumption (a few hundred Watts as compared to the several thousand Watts needed to supply a standard tower) and lower deployment and maintenance costs.

The need for the optimization of resources has lead TECNOROLL to design a fully integrated system where all the elements needed for a complete standalone transmission station can be mounted onto a single antenna mast. A true revolution in the FM signal distribution world.

The integration of such a TX station with a SMART LNB allows every single transmitter to be equipped also with an embedded remote management channel.

This is an extremely compact, cost-effective and versatile solution that also offers high technical performances and allows to monitor and manage the whole network remotely in a quick and reliable way.



Complete TX

Broadcast station example

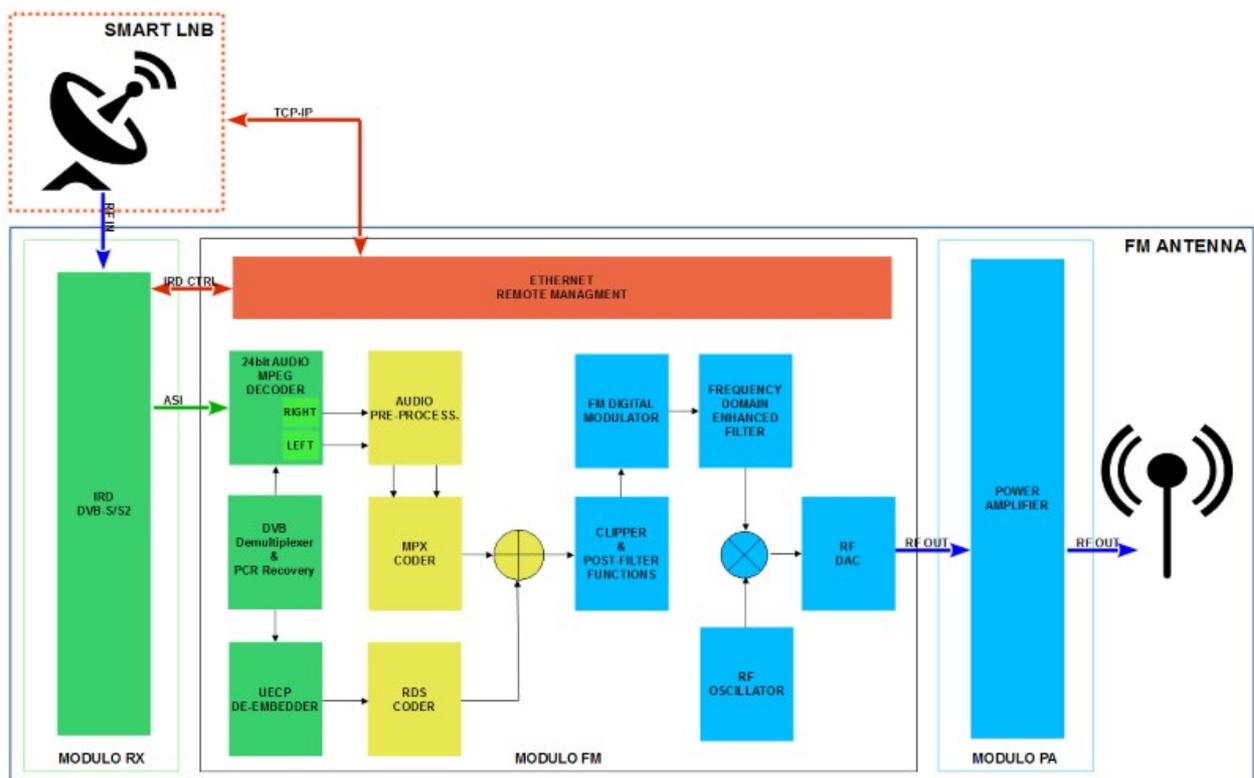


## System block diagram

The "Clever FM" system is composed by an antenna and some integrated modules that are mounted on the antenna itself.

The system receives the DVB or IP stream from satellite and provides the MPEG decoding, the audio processing, the UECP and RDS encoding, and the subsequent FM modulation.

The whole system can be configured and managed remotely via TCP-IP through an ethernet port.



## Integration with a “Smart LNB”

When integrated with a “Smart LNB”, the Clever FM system offers several strategic advantages.

- Designed to deploy a large number of low-cost broadcast repeaters:
  - *cuts signal transport costs dramatically;*
  - *improves network performance.*
- The Smart LNB provides:
  - *remote management and real-time telemetry & alarm delivery;*
  - *upload of content to local transmitters;*

### Main features:

- DVB-S/S2 and IP UDP Streaming contribution.
- Low bandwidth occupation: typically 200Kbit/s for stereo signal + RDS + Traffic Information.
- Standard IP remote management.
- The same baseband HW can be used for either FM, DAB, DRM, or DVB-T/T2 (with different implementations).
- The mast-mounted transmitter includes all system elements:
  - easy to use and install: you only need to point the satellite dish (no need for skilled technicians – antenna installers can do it);
  - reduced network OPEX and CAPEX;
  - better coverage and quality of service when compared with a traditional high-power broadcasting network;
  - power amplifier modules from 0,5 to 20W.
- Reduced time-to-market for network deployment.



## Retrofitting option

TECNOROLL has developed a special module that allows to retrofit and digitalize the old transmitters, in order to offer clients a quick and effective solution without forcing them to throw away their old analog equipment that is still in working order.

In this case, the equipment can output either the MPX, the L/R audio or the RF exciter signal, which is sent to the existing station and to the already installed transmitter.

