

Next Generation DAB emergency break-in systems

WHITE PAPER

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**Accelerate your business potential
with Paneda DAB Equipment & Services**



PANEDA®

**DAB
TECHNOLOGY
EXPERTS**



DAB EMERGENCY BREAK IN SYSTEM

WHAT is a break-in system and why is it needed?

A break-in system is a solution for interrupting ongoing transmissions in road tunnels or any other public area where people needs to be notified in case of emergency, like fire or accidents. These kind of systems are mainly developed and designed to be used in road tunnels, but is also suitable for use in train stations, parking garages, shopping center or other places where a break-in system can be used, not necessary for emergency but also for information.

For analogue radio, like FM, the principle for a break-in is to shut down the broadcasted signal in the tunnel, and replace the transmitter with an emergency transmitter carrying the emergency messages. Since FM is analogue, this doesn't require any synchronization or other mechanisms to trigger an emergency message.



Unlike FM, DAB is far more complicated due to the fact that DAB radio use a digital technology and cannot use the same principals as for FM since a car receiver will mute if it loose the original signal, even the shortest interruption will cause a switch over failure.



PARTNERSHIP



Paneda, established 2001 is the only partner needed for DAB technology

How does it work?



COVERAGE

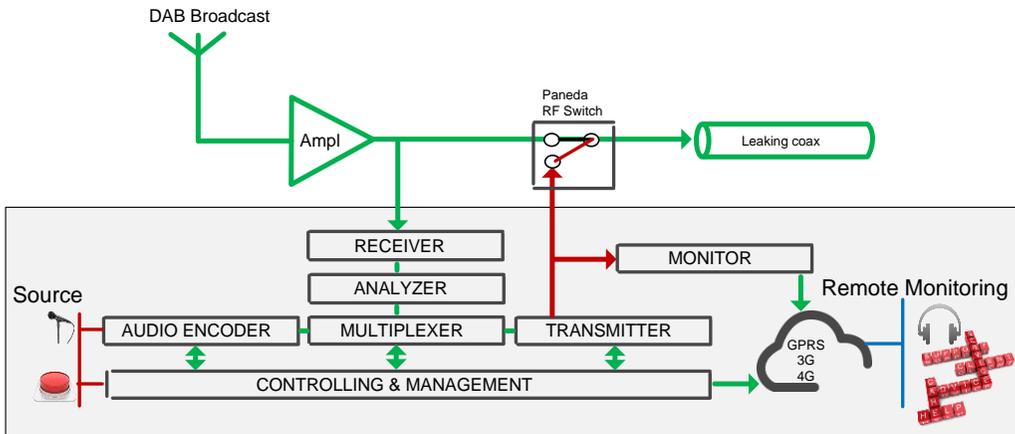
First, the tunnel must be covered with the original broadcasted signal, which is straight forward and uncomplicated:



The on-air signal is amplified and feeds a radiation cable inside the tunnel. This provides DAB coverage in the tunnel, and the radiation cable is also used for other frequencies, as FM, VHF, Mobile Network and others.

BREAK-IN

To add break in functionality, the original signal must be analyzed and a switching function must be added:



Read more about the logical steps at next page ->

REQUIREMENTS

A tunnels system must fulfill a number of requirements and must be designed to work unattended for many years in operation.

A MATTER OF SAFETY!

A Paneda system fulfill all kind of requirements, incl EMC.

Key requirements:

-100% seamless switching

-Monitored

All systems from Paneda can be connected to our 24-7 operation center for 24-7 monitoring and controlling.

-Independent design

Unlike other systems, a Paneda system is fully independent on the original broadcast signal regarding number of services and combination of bitrates. A Paneda system have no limitations.

-Multi addressing

A Paneda system supports addressing emergency messages to different lanes/directions inside the tunnel, using the same single system.

-Multi ensembles

A Paneda system is modular and supports as many ensembles as needed and can be extended at any point.

-Unmodified original signal

Unlike other systems, a Paneda system uses the original signal in normal situations, this ensures an unmodified signal and no interference at the entrances/exits.

The Paneda design ensures a future proof solution.



THE LOGICAL BLOCKS FOR DAB BREAK-IN

- A copy of the original broadcasted signal is received by a DAB receiver.
- The on-air signal is analyzed to determine the number of services, bitrates and configuration data.
- The analyzed signal is sent to the DAB multiplexer for creating an almost exact copy of the original signal with the audio to be replaced with emergency messages.
- The output from the tunnel multiplexer is connected to a local transmitter in standby mode.
- The emergency message source connected to the local audio encoder can retrieve its sources from prerecorded files, live microphones, mobile phones, or from almost any other source defined by the operator. Paneda offers products for all kind of trigger and source handling.
- The system is monitored and controlled by the Controlling & Management system and in parallel a Paneda system is also normally connected to the Paneda 24-7 operation center. Paneda offers connections using mobile networks or direct Internet.
- As an option, the Paneda RF monitor offers full remote listening and decoding of the RF signal, both from the original signal and the standby emergency signal, simultaneous and recording up to 2 years.
- Triggering of the emergency signal can be performed by phone-in systems, push buttons, microphones or directly from the operator. In Norway Paneda has integrated the phone-in system to be used with the road authorities and these systems.
- An emergency triggering will force the switch to replace the original signal with the local standby signal carrying the emergency message.



INNOVATIVE THINKING

The most complicated process in such systems is to ensure seamless switching. The Paneda switching module is developed with unique technology using the principle of comparing the synchronization between the signals and are able to detect as less as 50microseconds differences, and will adjust its delay in real time and automatic.

UNLIKE other systems on the market, Paneda uses the original signal in all normal situations, switching only in case of emergency. This design ensures a interference free signal at the entrance and exists as well as an un-modified original broadcasted signal.

By connecting your Paneda system to the 24-7 monitoring center you can relax, the Paneda technicians are monitoring and controlling your system, 7 days a week, 365 days per year. If a critical error occurred you will be notified according to you agreement. In most cases actions can be taken before affective any services.



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