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 does not require any synchronization or other mechanisms to trigger an emergency message. DAB is far more complicated due to stiff requirements of synchronization and timing.

PANEDA OVERVIEW

The Paneda tunnel break-in system is a complete system for DAB break-in with audio replaced with important messages. The unit supports dual ensembles simultaneously and includes dual COFDM modulators with approximately 0db output.

To avoid interference and that unwanted RF signals are used in the tunnel, the unit included a dual selective amplifier which filter out the two needed DAB frequencies from the off-air signal.

The system support reference clock from GPS (10 MHz) but is developed to work without using an internal clock synchronization handling, phase locked to the off-air signal.

The Paneda system is the most used world-wide and is installed in over 200 tunnels.

The system uses a modern HTML5 web interface with real-time data presented for all status.

The system support DAB Alarm announcement, forcing a receiver to switch to DAB even if they are using another media as FM, Bluetooth or USB. (Not all receivers support this feature)

UNLIKE other systems for tunnels, the Paneda DAB Break-in system PDBS, offers:
- 100% synchronized with the on-air signal, using a unique "Null symbol" detector ensuring that the switching is fully compliant and works with all kind of DAB receivers.
- A Unique regeneration of reference clock, eliminating the need of external GPS systems.
- A compact solution, 2 ensembles in 1U rack space.
- A built-in selective amplifier.
- Real-time status of synchronization.
- The Paneda system replicates ALL services exactly as from off-air, with preserved settings as individual bitrates.
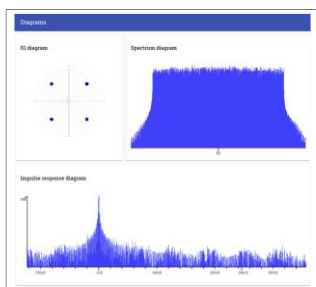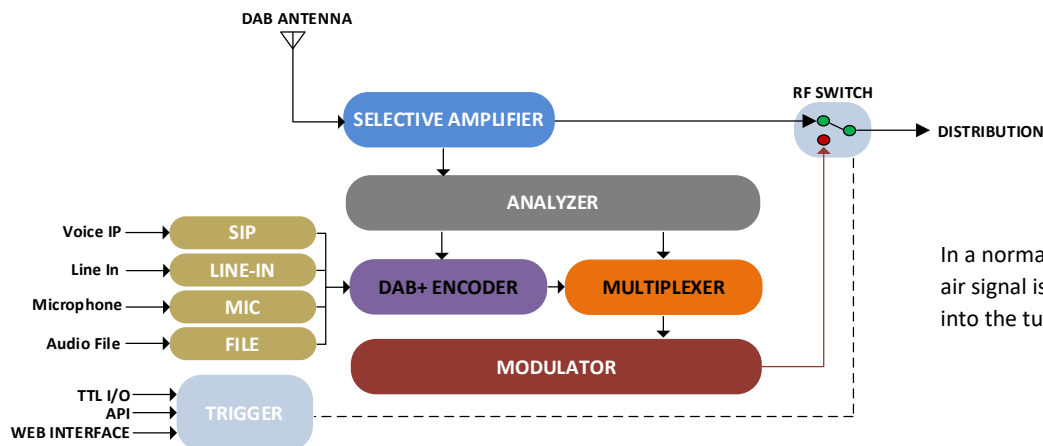- The Paneda system is not limited in number of encoders.
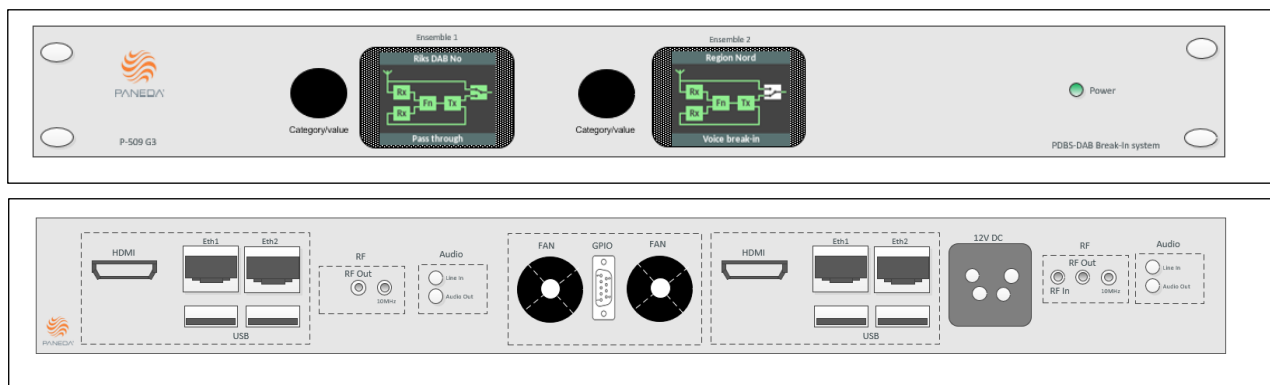
KEY FEATURES
- Low maintenance and high reliability.
- No GPS needed
- Real-time monitoring.
- Support for up to 32 audio channels, DAB or DAB+
- Compact low weight 1U design.
- Front panel with on scene status monitoring and fully integrated in the Paneda management system with full status control.
- Low lifetime cost.
- Multi ensemble support.
- SNMP.
- Linux.

DAB ANTENNA

SELECTIVE AMPLIFIER

RF SWITCH

DISTRIBUTION

ANALYZER

Voice IP — **SIP**
Line In — **LINE-IN**
Microphone — **MIC**
Audio File — **FILE**

DAB+ ENCODER → **MULTIPLEXER**

MODULATOR

TTL I/O — **TRIGGER**
API
WEB INTERFACE

In a normal situation, the off-air signal is broadcasted as is into the tunnel.

The web interface uses real-time updates of timing and synchronization.

RF INPUTS		EXTERNAL SYNCHRONIZATION INPUT	
Input type	1x SMA, 50 Ohm	Reference frequency	Not needed, 10Mhz supported
Level	Typical -80dbm ~ -15dbm	**ENVIRONMENT AND MECHANICAL DATA**	
Frequency Range	175MHz ~240MHz	Temperature range	+5 to +50 °C
RF Outputs		Housing	19" cabinet, 1 height units
Output type	2x SMA, 50 Ohm (1 per Ensemble)	Depth	250 mm
Level	0dbm	Weight	3kg
Band III	174.928 ~239.200 MHz	**POWER SUPPLY**	
		Mains voltage	+12V DC External PSU 100-240 VAC, incl.
Audio Input		Frequency	48-64 Hz
Connector	3,5mm LINE-IN	Power consumption	30W
IP	SIP support		
Network		**STANDARDS**	
Type	RJ45 x 2 with Gbps	DAB+ (ETSI 102 563)	
		DAB (ISO/IEC 13818-3)	
		STI (ETS 300 797)	
General		Display	TFT
Monitoring	SNMP, TRAPS	PSU	5A @ 12VDC, MTBF 176.000h
Storage	M-Sata SSD 60GB	Filter	Built in selective amplifier with AGC
CPU	Intel i5 2.3GHz or higher	EMC	CE, EN55022, EN55024
OS	Embedded Linux Arch	GPIO	15P DSUB (for trigger and status)
Dimensions	482x44x250 mm		

info@paneda.no
support@paneda.no