

DAB-XPlorer — DABRF-X4

Professional quadruple DAB Receiver and quadruple DAB Modulator rolled into one.



Key features

- ◆ Quadruple DAB receiver and quadruple DAB modulator rolled into one
- ◆ RF recording with 4x 1.6 MHz bandwidth
- ◆ Can be combined with software components of the DAB-XPlorer family
- ◆ COFDM modulator for simultaneous generation of up to four DAB ensembles
- ◆ GNSS / GPS receiver integrated
- ◆ Gigabit Ethernet interface
- ◆ Power supply via PoE, USB-C-PD, external 12V_{DC}

Range of applications

- ◆ DAB Signal Recorder / Player / Analyzer
- ◆ Capturing of ETI / EDI files from on-air signals
- ◆ Coverage measuring
- ◆ SFN analysis
- ◆ COFDM modulator for receiver testing
- ◆ Core component for re-transmitters and tunnel break-in systems
- ◆ Redistribution of DAB+ audio in buses or trains

Description

The DABRF-X4 device was developed as core component to deliver high-quality digital radio channels into buses and trains. It is marketed as paxDAB+ device by PaxLife Innovations GmbH.

With a compact receiver installed in the vehicle, paxDAB+ makes high-quality digital radio accessible to every passenger. Passengers can easily tune into up to 4 Ensembles with live radio channels (depending on DAB+ coverage) on their personal devices via the operator's app — whether the app currently handles only ticket sales or more — and enjoy crystal-clear sound from a wide range of live programs throughout their journey.

The radio streams are transmitted to passengers' devices via the vehicle's WiFi access point, either using an existing WiFi network or through the receiver's built-in DAB+ access point if no prior setup is available. The paxDAB+ user interface, displaying a variety of DAB+ channels, is fully integrated with the operator's application.

All digital signal processing functions of DABRF-X4 are implemented in a powerful DSP/ARM and an FPGA. A Gigabit Ethernet interface and 1 GByte internal memory enable a wide-band connection between the DABRF-X4 and a PC or other external system components. The so created device is versatile and suitable for other applications as well.

As of 2025, the DABRF-X4 will replace the established DAB test receiver, DABRF, within the DAB-XPlorer family of DAB analysis tools. In this application, the DABRF-X4 offers a great potential for future extensions of the collection of powerful analysis tools of the DAB-XPlorer suite. It will support the already known functions:

- ◆ recovery of ETI / EDI data streams from a received on-air signal,
- ◆ multiplex analysis,
- ◆ coverage measuring with RF level, SNR, MER, TII and bit error rates,
- ◆ SFN timing analysis.

Additionally, it will enable the following new functions to be realized by software extensions:

- ◆ RF recording in form of I/Q samples at a bandwidth of 1.6 MHz,
- ◆ replay of the recorded RF signal,

- ◆ simultaneous COFDM modulation of up to four different ETI or EDI data streams to four DAB blocks laying within an 80 MHz wide RF band,
- ◆ advanced RF analysis of the received signal, i.e. MER, inband spectrum, constellation diagram, channel impulse response etc.
- ◆ RF probe for MAGIC DABMUX plus Monitoring Decoder of AVT

Product data

Common data

Dimensions	68 * 168 * 165 mm ³ (without connectors)
Weight	ca. 2 kg
Ambient temperature	+5 °C to +40 °C

Inputs and outputs

ETH	RJ45, PoE, Gigabit Ethernet
RF IN	SMA female socket, 50 Ω, optional with 3.3V to 12V for active antenna
RF OUT	SMA female socket, 50 Ω
GNSS IN	SMA female socket, 50 Ω 3.3V power for active antenna
Power supply	max. 20 W external 12 V _{DC} , range 9 V _{DC} to 20 V _{DC} USB-C PD, range 9 V _{DC} to 20 V _{DC} PoE 48V from Ethernet

Receiver performance limits

Frequency range	Band III, 168 to 240 MHz
Input bandwidth	1.6 MHz (3 dB) per DAB block
Sampling rate	2.048 Msps
Resolution of ADC	14 Bit
Input power ³	-99 dBm to -10 dBm
Adj. chan. Selectivity ³	≥ 60 dB
Far Off selectivity ³	≥ 70 dB @ interferer ±5 MHz
MER	≥ 40 dB
NF	≤ 8 dB incl. RF bandpass filter
IIP3	+2 dBm @ max RF/IF gain

Transmitter performance limits

Frequency range	Band III, 168 to 240 MHz
Output bandwidth	1.6 MHz (3 dB) per Ensemble
Sampling rate	2.048 Msps per DAB block 2.097 Gsps on RF output
Resolution of DAC	16 Bit
MER	≥ 40 dB
Output power	-20 dBm typically -10 dBm max. peak

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