

# DAB-XPlorer — DABRF

DAB test receiver with integrated modulator



## Key features

- ◆ Test receiver and modulator rolled into one
- ◆ RF recording with 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 blocks
- ◆ GPS receiver integrated
- ◆ Gigabit Ethernet interface

## Range of applications

- ◆ Recording and analyzing DAB signals
- ◆ Capturing of ETI files from on-air signals
- ◆ Coverage measuring
- ◆ SFN analysis
- ◆ COFDM modulator for receiver testing
- ◆ Core component for re-transmitters and tunnel break-in systems

## Description

The DABRF device was developed as core component of the tunnel break-in system, MAGIC TBR, that, in the event of a disaster, allows to supply a street tunnel with live warning messages via digital radio. Those systems require the DAB signal containing the warning message transmitted within the tunnel to mimic the ensemble outside the tunnel, as well with regard to its multiplex structure as to its timing. If not doing so, when the emergency warning begins, the DAB receivers inside the tunnel would lose the signal, and would be required to perform a time consuming re-synchronisation.

The DABRF combines all essential functions for this highly complex task within one module:

- ◆ reception of the DAB signal,
- ◆ recovery of a time reference with an integrated GPS receiver,
- ◆ analysis of the multiplex of the received signal,
- ◆ replacing the audio data in the multiplex by those delivered from an external audio encoder,
- ◆ COFDM modulation of the so regenerated ETI data stream to up to four frequency blocks within a bandwidth of 37 MHz.

All digital signal processing functions are implemented in one powerful DSP and one FPGA. A Gigabit Ethernet interface and 512 MByte internal memory enable a wide-band

connection between the DABRF and a PC or other external system components. The so created device is versatile and suitable for other applications as well.

In particular, as of 2015, the DABRF will replace the established DAB test receiver, UEB400-DXP, within the DAB-XPlorer family of DAB analysing tools. In this application, the DABRF 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 data streams from a received on-air signal,
- ◆ multiplex analysis,
- ◆ coverage measuring with bit error rates and RF level,
- ◆ SFN analysis.

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

- ◆ RF recording in the form of I/Q samples at a bandwidth of 1.6 MHz,
- ◆ replay of the recorded RF signal with a high dynamic range,
- ◆ simultaneous COFDM modulation of up to four different ETI or EDI data streams to four DAB blocks laying within a 37 MHz wide RF band,
- ◆ advanced RF analysis of the received signal, i.e. MER, in band spectrum, constellation diagram, channel impulse response etc.

## Product data

### Common data

Dimensions 110mm × 175mm

### Inputs and outputs

Gigabit Ethernet, RJ45  
RF In SMA female socket, 50 Ω  
RF Out SMA female socket, 50 Ω  
GPS Ant SMA female socket, 50 Ω  
Power supply 12V<sub>DC</sub>

### Performance limits

Frequency range  
Band III: 168–240 MHz  
L-Band: 1452–1492 MHz  
Input bandwidth (3 dB) 1.6 MHz  
Sampling rate 2.048 Msps  
Resolution of ADC 14 Bit  
Resolution of DAC 14 Bit  
Output bandwidth 40 MHz  
Output power  
typically 0 dBm  
max. peak 10 dBm

#### Representative:

STREY Consult  
Kuntzschberg 27 ♦ 01169 Dresden  
phone: +49 351 412 95 35 ♦ fax: +49 321 211 045 68  
www.strey.biz ♦ email: mstrey@strey.biz

#### Manufacturer:

Ingenieurbüro Mulka  
Gostritzer Straße 146 ♦ 01217 Dresden  
phone: +49 351 40340500 ♦ fax: +49 351 40350505  
www.ib-mulka.de ♦ email: info@ib-mulka.de