



## Product Line DAB Monitoring Receiver RF-DAB

### RF-DAB monitoring receiver

RF-DAB is a professional DAB monitoring receiver for transmitter, content and field monitoring. Its modular design enables flexible configuration for various specific applications.

### Key Features

Depending on the configuration, the following key features are available:

- Field proven DAB demodulator
- Parallel full Ensemble decoding
- Complete EDI reconstruction from RF
- Full Ensemble EDI output to LAN
- Simultaneous decoding of all audio and data services
- Extensive RF measurements
- Browser-based HTML5 user interface with remote audio and data streaming

### Applications

- Transmitter monitoring
- RF measurements and synchronization monitoring
- Content verification and monitoring
- Listen to DAB over IP
- Relay (ball) reception, e.g. for FM
- Off-air EDI reconstruction for DAB retransmission
- Field measurements and verification
- Short-term logging and analysis

### Basic Version

#### Common Features

- Stand-alone monitoring receiver for reception analysis and content verification
- Fully compliant to DAB standards family (ETSI EN 300 401)
- DAB Mode I, II, III & IV
- VHF Band III
- NTP synchronization
- Field proven demodulator
- Browser based configuration and services decoding. No installation of software necessary.
- Proven long term stability
- Extendible to work with RFmonitor / RFarchiver network for long-term monitoring and content archiving

### RF-Frontend

Parameter	Value
Input frequency range	168-240 MHz 1452-1492 MHz (optional)
Max. input level	0dbm
Max. input level for optimal decoding	-15dBm
Min. input level for optimal decoding	-96dBm
IIP3	-15 dBm typ.
Noise figure	2.2 dB

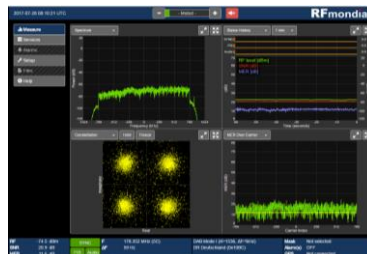
### DAB Decoder

- Full ensemble decoding
- Decoding status
- Display of all services
- Audio decoding of a single service
- Full ensemble EDI output to Ethernet
- DCP/EDI output via Ethernet (including multicast support)

### Advanced GUI

The RF-DAB graphical user interface (GUI) is designed to provide the full experience of a modern and professional measurement device:

- State-of-the-art HTML5 technology
- No software / plug-in installation necessary
- Same browser based advanced GUI remotely and locally (if available)
- Touchscreen and mouse capability
- Adapts to different screen sizes
- Either four window view or full screen display of diagrams



### Front Panel Signaling

- LCD display with status information and IP address
- LED status

### Remote Control

- Full remote control via Ethernet

- Browser-based user interface
- SNMP (Get, Set, Treewalk)

### Interfaces

- Antenna 50 Ohm BNC (N optional)
- 2 Ethernet
- USB
- 10 MHz ref. input 3 - 4.5 V TTL, BNC
- HDMI / Displayport (optional)
- Digital/analog audio output (optional)
- Internal GPS (optional)
- External GPS input 10 MHz, 1 pps, NMEA (optional)
- ETI in / out (optional)

### Power Supply AC Input

- Auto-sensing supply, 100 VAC to 240 VAC, 50-60 Hz
- DC input (optional)
- Power consumption: 20 W

### Mechanical

- Aluminum extrusion front bezel
- Industrial 19" 1RU, rack mountable
- 420 (483) x 250 x 44 mm
- Weight: 5.5 kg
- Operating temperature: 0 – 50°C
- Humidity: 20 – 80% non-condensing

### Options

#### RF Measurements (RFM)

High quality measurements on various stages of the reception and decoding chain:

- Spectrum
- QAM constellation
- Channel impulse response
- RF input power
- Frequency offset
- SNR
- MER
- MER over carrier
- TII decoding
- BER (MSC, FIC) before Viterbi
- BER (Audio, FIB) after Viterbi

Relevant measurement values are available on SNMP

## Advanced Application Decoder (AAD)



Integrated audio and data decoding, licensed by Fraunhofer IIS:

- Parallel full ensemble decoding and access of all audio and data services
- Browser-based selection and decoding of audio and data services
- Audio decoding: MPEG-1 Audio Layer 2 (DABclassic), HE AAC v2 (DAB+), each incl. MPEG Surround
- Optional: DMB-Audio
- Display of audio related information, e.g. audio rate, sampling rate, mode
- Streaming of selected audio service to remote PC
- Download of selected audio service in original format and wave
- Service information (Service label, Ensemble label, Service country, Program Type)
- Dynamic Label und DL+, Intellitext
- Journaline®
- MOT Slideshow, Broadcast Website
- Optional: TPEG
- EPG/SPI
- PAD and NPAD, primary and secondary services
- Display of all audio levels in parallel
- Statistical information of each service
- Relevant audio values are available on SNMP



## Local GUI and Audio (LGA)

- Displayport / HDMI touch screen can be attached locally
- Local digital AES/EBU XLR and analog (3.5TRS) audio output

## Ball Receiver (BAL)

- 2 AES/EBU XLR outputs
- 2 selectable audio services
- Smart conversion of Dynamic Label or Journaline content for RDS
- Requires AAD option

## Alarm System (ALM)

Flexible, built-in alarm system with the following features:

- Configurable thresholds
- Measurements/content parameters, e.g. MER, input level, BER, audio level, single stream data rate

- Alarm and status signaling via SNMP (Traps, Informs)

## SFN monitoring (SFN)

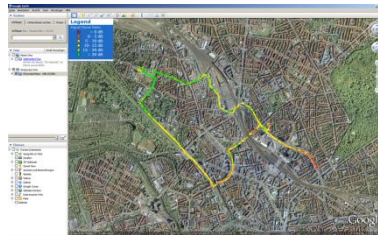
- SFN synchronization monitoring
- Display of echoes and Null symbol
- Impulse response alarms for synchronization monitoring and TII
- Alarm and status signaling via SNMP (Traps, Informs)
- Requires RFM and ALM options



## Field Measurements (FIM)

This package provides a comprehensive tool set for mobile field measurements:

- Delivery with USB GPS mouse
- Integration of external GPS information into rgps tag
- 12VDC input in addition to VAC
- Recording of measurements to file
- Live DCP/UDP output of measurements
- Writing of selected tags (e.g. audio frame error, SNR, MER, field strength) in Open Geospatial Consortium KML/KMZ and CSV format
- Classification of tag values in meaningful level ranges including legend generation
- Import to Google Earth possible
- Requires RFM option



## EDI Input (EDI)

- DCP/EDI input via Ethernet
- Either RF frontend or EDI input can be used
- Requires AAD option

## ETI (G.703/704) (ETI)

- ETI input hardware interface
- ETI output hardware interface

## Mask Measurement (MAM)

- $\pm 3$  MHz spectrum mask compliance measurement according to ETSI EN 302077
- $\pm 1$  dB power level measurement
- Crest factor measurement
- Requires additional hardware

## 3 day logging / analysis (LOG)

- All RF measurements and content information are logged for 3 days
- Display of parameter over time
- Export of all measurements and content information incl. audio as wav/MP3
- Playback of audio and data services at selected point of time

## ETI Analyzer (EAN)

The ETI Analyzer option parses STI/ETI/EDI content and displays the following information in detail:

- Service structure (services, service components and data application signaling)
- MSC layout (position within MSC, protection level)
- Announcement information (when was which announcement signaled)
- Service linking information (which alternatives are signaled for which service; what dynamic changes are made to the service linking)
- Dynamic PTy information
- List of all FIGs
- MNSC information
- The ETI Analyzer checks for correct and consistent FIC signaling, especially regarding signaling of data applications. Also audio and data applications are checked on various protocol levels and errors are reported.
- Conversion of EDI/ETI

## Ordering Information

**RF-DAB:**

**Basic DAB receiver**

**Option RFM:**

**RF Measurements**

**Option AAD:**

**Advanced Application Decoder**

**Option LGA:**

**Local GUI and Audio**

**Option BAL:**

**Ball Receiver**

**Option ALM:**

**Alarm System and SNMP**

**Option FIM:**

**Field Measurements**

**Option EDI:**

**EDI Input**

**Option ETI:**

**ETI Input and Output**

**Option MAM:**

**Mask Measurement**

**Option SFN:**

**SFN monitoring**

**Option LOG:**

**3 day logging and analysis**

**Option EAN:**

**ETI Analyzer**

**Option DMB:**

**Decoding DMB-audio**