

DAB-XPlorer

A set of tools to analyze DAB data streams



Key features

- ◆ Modular system consisting of hard- and software tools
- ◆ Hardware ETI interface and receiver hardware available
- ◆ Analysis of DAB multiplex on ETI, EDI and RDI signal
- ◆ Measuring of synchronism in SFNs
- ◆ Recording of ETI files from on-air signals via RDI

Range of applications

- ◆ ETI analysis for broadcasters
- ◆ Transmitter setup
- ◆ Coverage measuring
- ◆ SFN test
- ◆ Test of transmitter components
- ◆ Receiver test

Description

For historical reasons the term DAB-XPlorer stands for two things a) the DAB-XPlorer software suite providing a collection of software tools to analyze DAB data streams and b) for the DAB-XPlorer hardware providing an ETI/RDI-to-USB interface. Originally, both the software and the hardware have been one product, the DAB-XPlorer, developed and manufactured by Ingenieurbüro Mulka. In the course of the evolution of this product, the software was modified and extended to support additional hardware products from other vendors. At this time the DAB-XPlorer software suite supports and can be delivered with

- ◆ the ETI/RDI-to-USB converter DAB-XPlorer from Ingenieurbüro Mulka,
- ◆ the DAB test receiver and modulator DABRF from Ingenieurbüro Mulka,
- ◆ all Ethernet interfaces that can be used to receive EDI data streams,
- ◆ the DAB test receiver UEB400-DXP provided under the trademark VAD, and
- ◆ the products of VDL's DABSTOR family.

The DAB-XPlorer software application is modular. The following tools are available:

- ◆ Ensemble Viewer
- ◆ ETI-XPlorer
- ◆ FIC-XPlorer
- ◆ FIC-XTractor
- ◆ PRBS-Analyzer
- ◆ Message Viewer
- ◆ Recorder / Player / Timeshift Buffer
- ◆ RDI-ETI-Converter
- ◆ GPS-Campaign-Converter
- ◆ Triggered Recorder

Together with the various hardware options, the software modules can be combined to support a great variety of use cases by broadcasters, transmitter network operators and manufacturers.

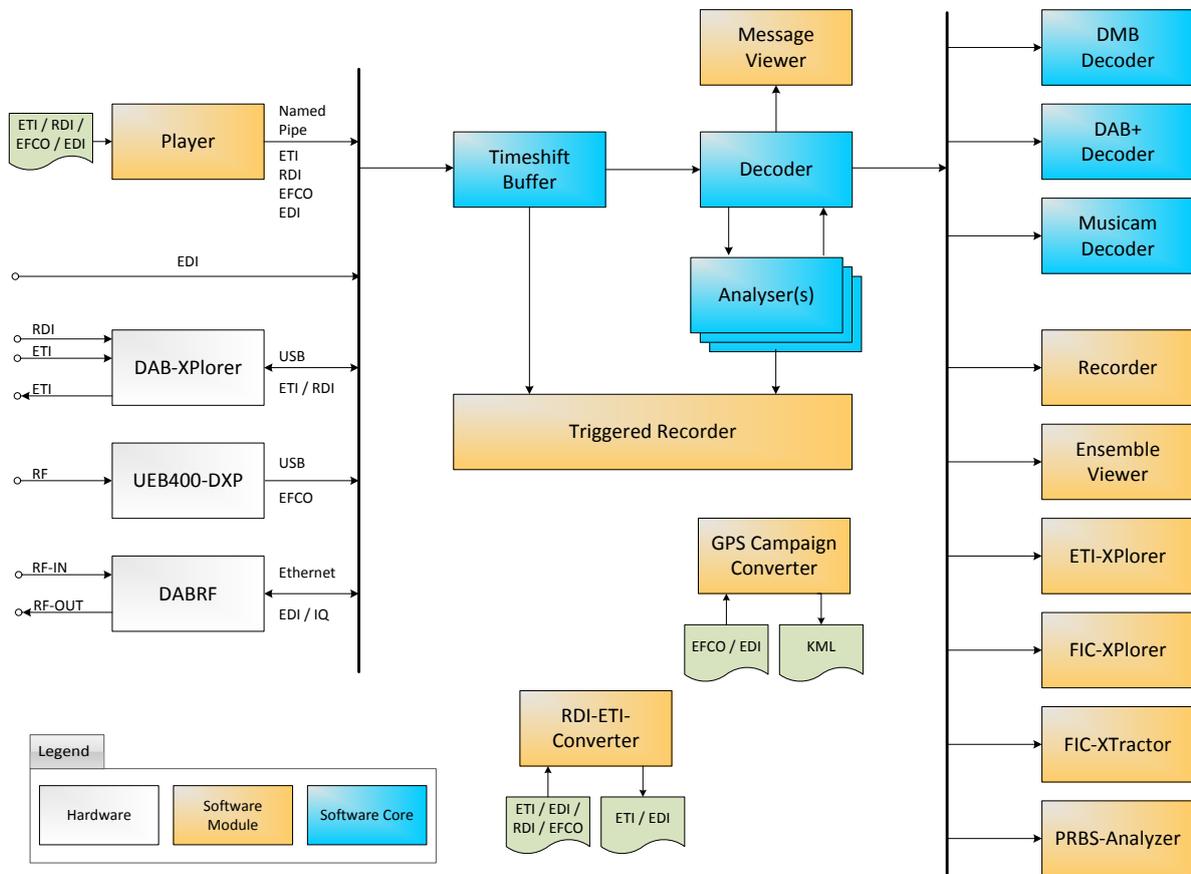
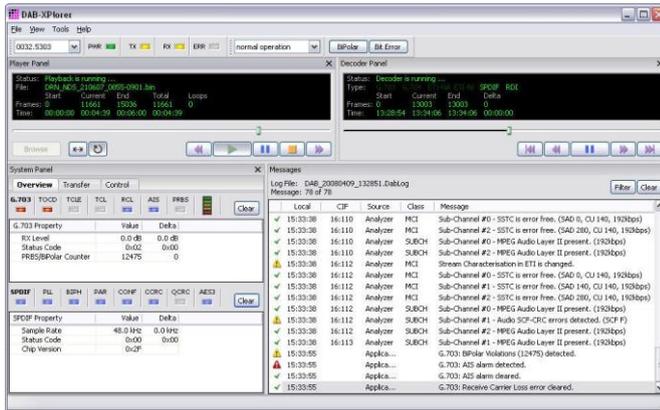


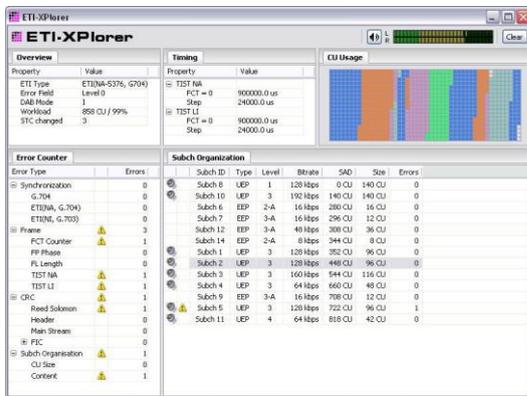
Figure 1: Overview of the hard- and software modules of the DAB-XPlorer family

Screenshots



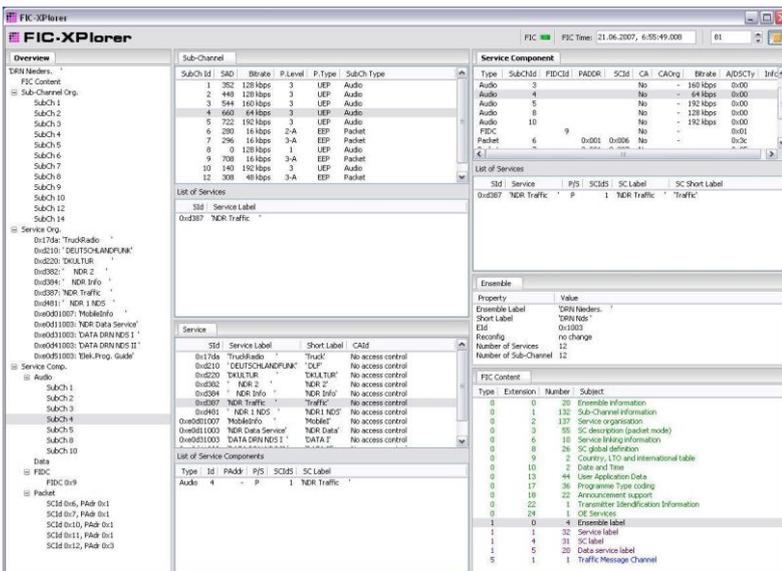
DAB-XPlorer

- ◆ System Panel
- ◆ Recorder / Replayer
- ◆ Decoder / Time shift
- ◆ Message list with results of analyses



ETI-XPlorer

- ◆ Overview
- ◆ Error status, error counters
- ◆ Timing of TIST-NA/LI
- ◆ Sub-Channel list
- ◆ Graphical overview of CU allocation



FIC-XPlorer

- ◆ MCI overview
- ◆ FIC overview
- ◆ Ensemble Information
- ◆ Various views on MCI:
 - ◆ Sub-Channel View
 - ◆ Service View
 - ◆ Component View

Overview of deliverable hard- and software components

Hardware components

DABXP-CM

USB dongle CodeMeter

DABXP-HWU

DAB-XPlorer hardware

- G.703/SPDIF to USB converter box
- USB 2.0 A/B cable

DABRF-HWU

DAB(+)/DMB test receiver and modulator with GPS receiver

- DAB receiver and modulator
- antenna for VHF band III and L-band
- active GPS antenna
- wall power supply 230V AC to 12 V DC
- Ethernet Cat 6 cable

DABRF - specific software options

DABRF-RX

DAB receiver firmware and DABXP-BASIC PC software with recorder, player and configuration

- configuration, tuning, scanning, receiver status, FIC-BER, MSC-BER, RSSI level
- recording as EDIX, IQX or IQ
- local playback of EDIX and IQX
- measurement of the SFN, MER, constellation, inband spectrum

DABRF-TX

DAB modulator firmware

- Playing of IQ, IQX, EDIX, EDI, ETI files and output as DAB signal on DABRF
- Up to 4 Ensembles parallel
- Input streaming via EDI (ETI over IP)

Software options

DABXP-BASIC

Option Recorder, Player, ETI-XPlorer, and FIC-XPlorer

- configuration, hardware status
- recording of ETI and RDI
- playback of ETI and local playback of RDI and EFCO
- service, sub-channel and SC list
- decoding of the selected audio sub-channel (MUSICAM)
- RDI, ETI Decoder/Analyzer
- ETI-XPlorer, FIC-XPlorer, and Messages-Viewer

DABXP-OCO

Option RDI/EFCO/ETI Converter. Converter of RDI, EFCO, IQX, EDIX, EDI, ETI-NI, ETI-NA, ETI-LI files with off-line analysis, replacement and post-processing

- converting to EDI, ETI-NI or ETI-NA
- offline analysis of the data stream, analyzing results may be exported as XML file
- optional extracting of the FIC or sub-channel content
- changing of DAB transmission mode
- replacement of labels and sub-channel content by file content
- replacement of sub-channel content by PRBS
- insertion of bit or frame errors

DABXP-OPL

Option DAB+/FEC/Streaming. DAB+ audio decoder, analysis of FEC, sub-channel streaming, EDI decoder

- DAB+ audio decoder incl. VIA license
- Analyzing errors within the DAB+ Fire-Code, RS-Code or AU-CRC (requires ETI-XPlorer)

- analyzing errors within the DMB RS-Code (requires ETI-XPlorer)
- sub-channel streaming to external decoders via UDP/TCP
- decoding, recording, playback of EDI streams
- analyzing errors within the Enhanced Packet Mode RS-Code or Packet-CRC (requires ETI-XPlorer)

DABXP-OPR

Option PRBS Analyzer. Real-time PRBS analyzer

- displays the signal level over the time
- displays the Viterbi-BER and RS-BER over the time
- displays the error position (error bitmap) within the sub-channel over the time

DABXP-OXT

Option FIC-XTractor. Analyzer of the Fast Information Channel on bit-stream level like a protocol analyzer

- frame oriented list of received FIGs
- FIG list sorted by type or extension
- database oriented list of received FIGs, all doublets are removed from the view, gets statistic of the FIGs
- tree view of the decoded FIG

DABXP-OCC

Option GPS Campaign Converter. Converter of EFCO, EDIX and IQX to KML and CSV

- displays the measured data on the map of Google Earth

DABXP-OTR

Option Triggered Recorder

- ETI, EDI, EDIX, EFCO recording triggered by an external event

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