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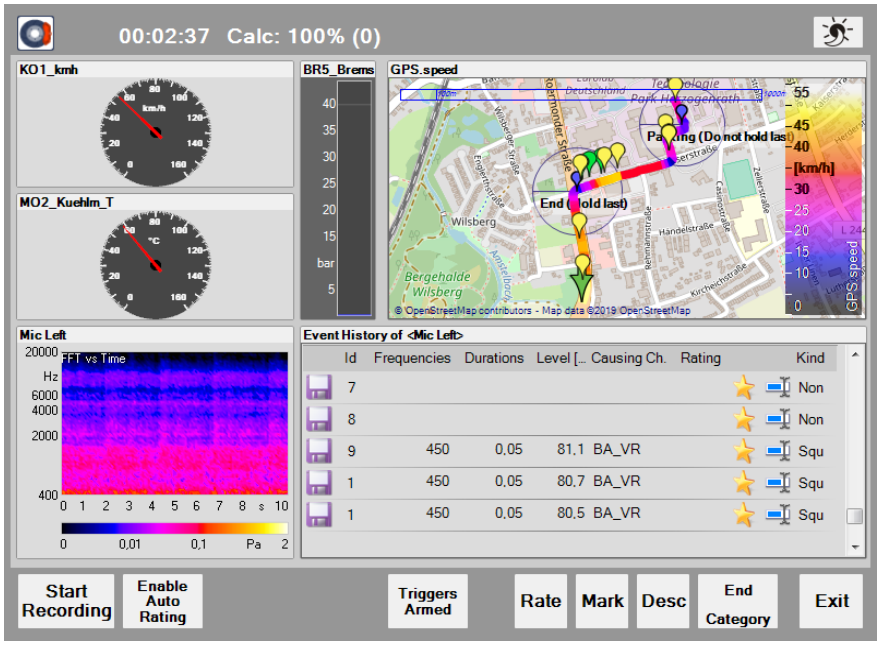
DATA SHEET

BrakeOBSERVER (Code 4960)

Software for recording, detection and evaluation of brake noise while driving;
incl. BrakeOBSERVER Configuration Application (Code 4961)



Features

- Software for development, optimization and approval of brake systems
- Detection of brake noise, based on Hearing Model algorithms developed from HEAD acoustics and the Impulsiveness analysis
- Reduced amount of data, as only relevant brake noise (including "off-brake noise") is detected and saved
- High flexibility thanks to customizable user interface
- Various trigger options, including "off-brake noise" trigger
- Easy and convenient operation
- Dual-screen support (2 x HCP or 1 x HCP and notebook display)
- Judgement of the braking situation during the measurement
- Recording of GPS data in connection with the brake events and the corresponding parameters
- Several export options, e.g., VDA 305 (EKB 3008) / Wav / CSV
- Offline configuration of the front-end settings

Options

(not included)

- MMF III.0, the multi-channel frontend of the BrakeOBSERVER system (required) for the simultaneous connection of
  - 12 Line/ICP sensors
  - 6 strain gauges
  - 6 temperature sensors
  - 2 pulse sensors
  - 2 CAN FD/CAN/OBD-2 or 1 FlexRay
  - HEAD Control Panel (HCP II or HCP)
  - GPS receiver
  - 2 HEADlab modules: labT6, labSG6, labDX, labHMS, labM6, labV12 (no Dual-Link), labV6HD, labCF6 (required: BOTP 01)
- Panasonic toughbook CF-33
- TFT touchscreen HCP II or HCP for the evaluation of a braking event on a scale by the user
- Software HEAD Noise Event Manager for the individual processing and evaluation of measurement data from BrakeOBSERVER

Overview

With BrakeOBSERVER, HEAD acoustics has developed a software solution, which is capable of distinguishing disturbing brake noise, including "off-brake noise", from normal operating noise.

The core of the BrakeOBSERVER are the Hearing Model algorithms developed by HEAD acoustics which are based on the pattern recognition characteristics of human hearing and delivers excellent detection results regarding which brake is the origin on the noise. In order to detect impulsiveness noises, the Impulsiveness analysis is available.

Combined with the required frontend MMF III.0 (not part of the standard delivery), BrakeOBSERVER provides inputs for easy connection of different sensors to measure brake noise, temperature, brake pressure, humidity, vehicle acceleration, etc. In addition, two separate pulse inputs, two CAN FD/CAN, OBD-2, or FlexRay inputs, and a GPS interface are available. Furthermore, two HEADlab modules can be connected.

During the test drive, BrakeOBSERVER provides immediate feedback of brake noise statistics or notes about the events. Using the TFT touchscreen HEAD Control Panel (HCP II or HCP), users can operate the driver display of the BrakeOBSERVER system and thus receive information concerning individual measurement channels, for example.

The software HEAD Noise Event Manager can be used for a sophisticated evaluation. It allows for example the data to be narrowed down to the relevant information. Parameters relevant for the noise generation are presented in customizable reports, and the brake events shown are linked to the corresponding audio data.

Brake*OBSERVER*

The core of the Brake*OBSERVER* system system, consisting of software and hardware, is the intelligent detection software. All audio signals are examined by algorithms based on the Hearing Model method developed by HEAD acoustics. The principle of the Hearing Model is based on the characteristics of human hearing. The algorithms react to quickly changing temporal and spectral structures in signals, resembling the specific pattern recognition of human hearing. Thus, the user obtains excellent detection results. Furthermore, for detecting impulsiveness noises, the Impulsiveness analysis is available.

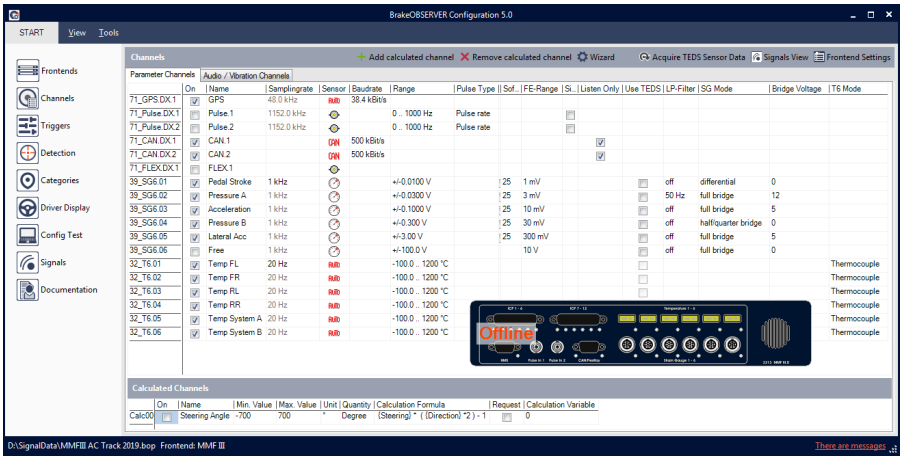
By saving only relevant braking events, including “off-brake noise”, the amount of data to be analyzed is reduced significantly, thus also reducing the time required for the evaluation.

The power and flexibility of the system is also shown by the various trigger possibilities. Besides manual triggering, it is also possible to use external signals like brake pressure, pedal position etc. as triggers. An “off-brake noise” trigger is available, too, which continuously monitors the incoming audio signals for brake noise.

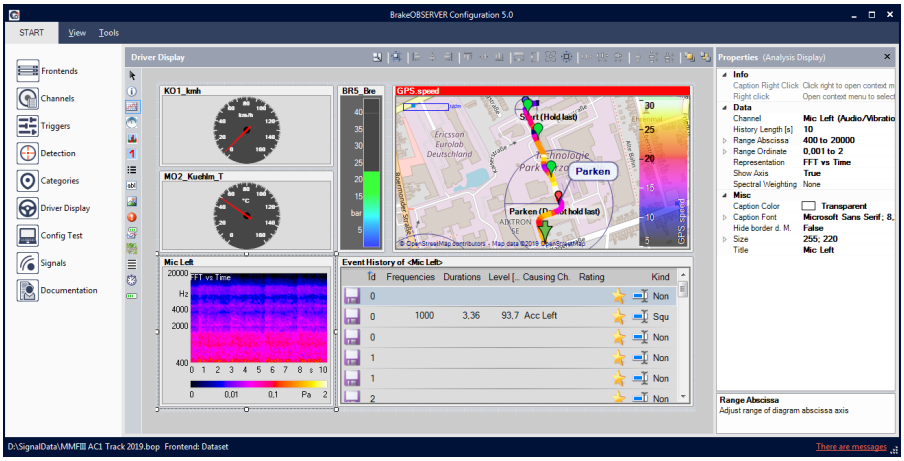
The user interface shown during the measurement on the TFT touchscreen HEAD Control Panel or on the notebook display is freely customizable and can be adapted to different requirements with a few mouse clicks. As a help, Brake*OBSERVER* offers a number of templates for the customization of the interface. The user can decide about the number, size, position, type and layout of the information windows. Furthermore, it is also possible to set up displays for extended information about braking events, which are then available already during the test drive.

Brake*OBSERVER* enables the execution of simple functional tests by having audio channels be displayed online as Time Signal, as Instant FFT Spectrum, as FFT vs. Time or Peak Hold Level representation.

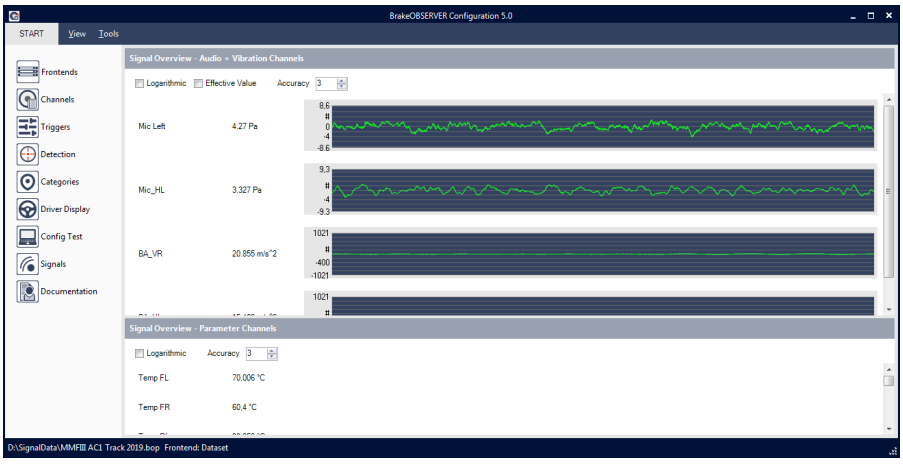
Immediately after a braking event, the driver can enter a judgment. For this purpose, the HEAD Control Panel displays a (categorial) rating scale in one or two-steps, on which the driver can judge the respective braking situation. It is also possible to combine and rate several braking events in a group.



With the help of an Offline Frontend, all necessary settings for a measurement project can be configured in advance. After connecting the real MMF III.0, the entire configuration of the Offline Frontend can be transferred to it.



The Driver Display displays the information in the measurement application. This allows for a direct and intuitive checkup of the arranged measurement channels.

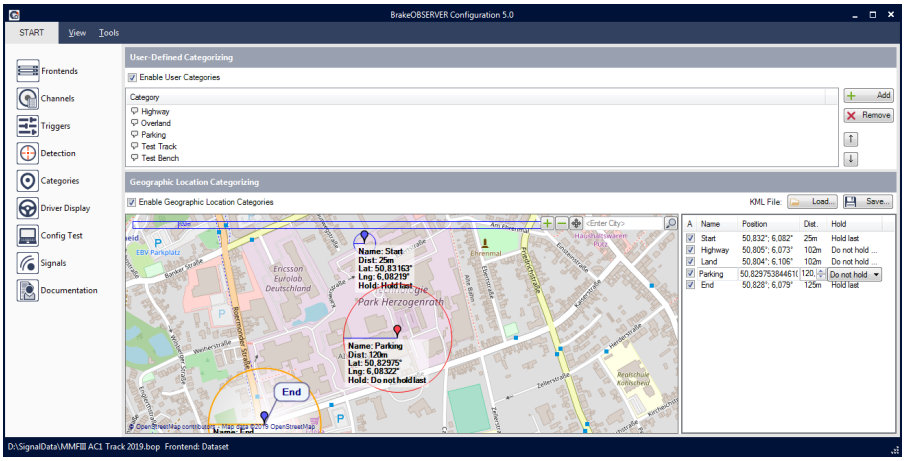


The Signal Overview allows a quick summary of the available signals of all audio and parameter channels.

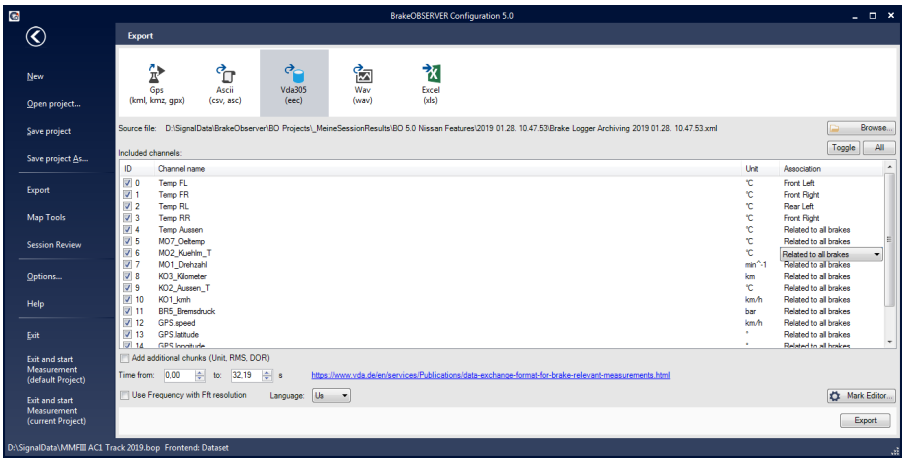
BrakeOBSERVER enables the graphical representation of the test vehicle’s position by displaying an appropriate marker on a map using OpenStreetMap. Additionally, the

driving route is shown whereby any parameter channel is coded in terms of color. The required information therefore is extracted from the GPS signals of an connected GPS device CDG I.1.

In oder to use a map representation even without an existing internet connection in the configuration application as well as during a measurement in the measurement application, the corresponding data have to be downloaded previously from OpenStreetMap and be stored in the project.



While driving, the current car position is displayed in the map via GPS. Furthermore, location-markers can be placed e.g. to remember the driver to perform special test scenarios at a specific location and to categorize the measurements (events).



In addition to other export options, the format VDA 305 (EKB 3008) is available. The export can be configured automatically or manually.

Scope of Supply

- Brake*OBSERVER* (Code 4960)
  Software for recording, detection and evaluation of brake noise while driving
- Setup DVD
- Brake*OBSERVER* Configuration Application (Code 4961)

Required Frontend

(not included)

- MMF III.0 (Code 3313)
  Multi-channel frontend with docking station

  or (the variant):

  MMF III.0-V1 (Code 3313-V1)
  Multi-channel frontend without docking station

Recommended Hardware

- Panasonic toughbook CF-33
- HCP II (Code 1981)
  HEAD Control Panel
  10.4“ TFT touchscreen
- HCP (Code 1980)
  HEAD Control Panel
  7“ TFT touchscreen

Brake*OBSERVER* Tool Packs (BOTP)

- BOTP 01 (Code 4965)
  MMF Channel Extension
  Required for connecting HEAD*lab* modules to MMF III.0 / MMF III.0-V1

Recommended Software

- HEAD Noise Event Manager (Code 4963)
  Software for interactive evaluation and documentation of noise events

System Requirements

- Windows 10 (32 Bit and 64 Bit: Pro, Enterprise, Education; languages: US/Western European)

  or:
- Windows 7 (32 bit and 64 bit: Professional, Enterprise, Ultimate; languages: US / Western European), Service Pack 1
- Min: Core2Duo Processor 2 GHz; recommended: Intel i7 Quad.
- Min: 4 GB RAM; recommended: 8 GB
- DirectX 9.0c-compliant graphics card with 256 MB; recommended: 1 GB
- DirectX 9.0c
- .NET Framework 3.5 / 4.0
- HASP dongle driver
- HCP driver (for HCP)
- HEAD USB driver (for MMF III.0)

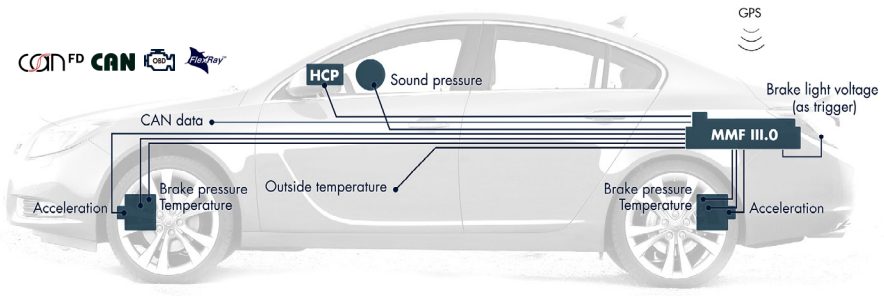
A graphics card with at least 256 MB dedicated memory and a driver supporting DirectX 9.0c is recommended; when using external screens with a high resolution, a suitable graphics card with more memory is required.

In order to install software and drivers from HEAD acoustics, administrator rights are required. To operate the software, only standard user rights are needed.

Brake*OBSERVER* system

The Brake*OBSERVER* system combination of hardware and software is excellently suited for recording and processing brake events.

Combined with the required frontend MMF III.0, the Panasonic toughbook CF-33, and the TFT touchscreen HCP II or HCP, Brake*OBSERVER* is a complete all-in-one solution, which can be flexibly supplemented with the software HEAD Noise Event Manager for the individual processing and evaluation of the measurement data.



Example of a Brake*OBSERVER* system.

Frontend MMF III.0 (docking station included)

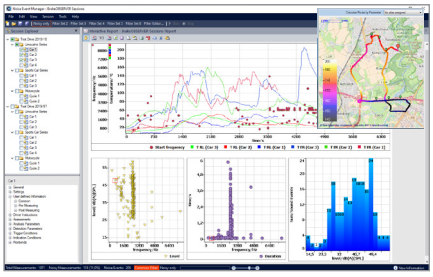
The multi-channel frontend MMF III.0 with its built-in docking station for the Panasonic toughbook CF-33 is equipped for acquiring the signals necessary for brake examinations.

Customizable connectors for 12 Line/ICP sensors with individual level configuration, 2 pulse sensors, and CAN FD/CAN/OBD-2/FlexRay are provided as well as 6 temperature sensors and 6 strain gauges for measuring brake pressure, humidity, vehicle acceleration etc. Furthermore, HCP II or HCP, 1 GPS receiver, and 2 HEAD*lab* modules can be connected.

HCP II (10.4“ display) and HCP (7“ display)

The HEAD Control Panels HCP II and HCP are TFT touchscreens that allow users to operate the Driver Display, for example, or to evaluate braking events on a scale.

The smaller HCP 7“ display has a suction mount for smooth surfaces, the HCP II 10.4“ display has the adjustable HCP-SM suction mount, which can be used for uneven surfaces, too. The HEAD Control Panels are powered via the frontend MMF III.0.



Software HEAD Noise Event Manager

The HEAD Noise Event Manager software presents important details about the detected brake noise events and their descriptive parameters. The data can be conveniently managed in a configurable tree structure.

An overview table shows noise events and the associated parameter values at the time of the respective event. Extensive, multi-stage table filters allow the data to be narrowed down to the relevant information. Parameters relevant for the noise generation are presented in customizable reports, and the brake events shown are linked to the corresponding audio data.