Product Information CANalyzer.MOST
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Documentation Note

Valid for CANalyzer.MOST 8.0

This document presents the CANalyzer.MOST application areas of analysis, stimulation and testing and enumerates their individual functions. The document contains a short overview about additional application areas and cross-area functions.

Product information and technical data for CANalyzer and the LIN and FlexRay options are presented in separate documents.
1 Introduction to CANalyzer.MOST

MOST, the bus system for on-board infotainment applications, is now available in three variants that are also known as speed grades:

- MOST25, which is based on transmission by fiber optic conductors, has been implemented in over 100 production vehicle models since its introduction in 2001.
- MOST50, with twice the bandwidth and electrical transmission, has also been in production for years now, and additional vehicles are in planning.
- MOST150 will be introduced to production cars shortly at German OEMs VW, Audi and Daimler.

CANalyzer Option MOST gives you a tool for analyzing, stimulating and testing MOST systems, which is independent of the speed grade. This makes it possible to migrate from one speed grade to the next without any significant training effort.

![Figure 1: Main windows of option MOST](image)

The primary application areas of CANalyzer.MOST are the following:

**Interactive Analyses and Tests**

CANalyzer.MOST supports you in interactive analyses and tests of MOST systems with an easy to operate user interface. In several specialized windows, various aspects of a MOST system are shown in an easy to understand way and can also be influenced online as necessary.

**Automation of ECU Tests**

The integrated CAPL programming language also offers you a way to automate many analysis tasks. Besides increasing efficiency in performing analyses, you also attain high reproducibility of the results. In addition, you can use these analyses in offline mode and apply them to previously recorded log files.
Stimulation
CANalyzer.MOST also offers you a number of functions for stimulating MOST devices or systems.

Without programming effort, the NetworkMaster that is integrated in CANalyzer.MOST lets you properly start up a device for individual device tests.

2 Interactive Analyses and Tests
CANalyzer.MOST lets you analyze all of the MOST data. Along with receiving the control and asynchronous channels, you can also receive synchronous data and MOST150 Ethernet packets (MEP). In addition, you have access to all hardware and network states such as Light & Lock and Configuration Status.

2.1 Analysis
Examples:

- In **MOST State- and Bus Statistics windows** you can see at a glimpse the most important settings and the current state as well as the load of the connected MOST ring.

- In the **Trace window**, you can observe the data sent over the control channel and asynchronous channel in MOST messages. For a clear representation, this data is interpreted with the help of the function catalog. Segmented data transmitted over AMS or the MOST High Protocol can also be displayed with the integrated Combiner. Color highlighting of events based on static properties or dynamic analysis results makes it easier for you to visualize the analysis of communication on the MOST ring. Various search and filter options offered directly in the Trace window can assist you in efficiently finding the desired information from the displayed data.

- The **MOST System Viewer** shows the MOST system with its ring structure and gives you an overview of the distribution of function blocks to your ECUs. Along with various statistical information, you can read off the loads of individual devices on the Retry Indicator.

- The **MOST Central Registry window** shows the contents of the system description that is managed by the NetworkMaster of your system. The current description can be conveniently checked against a reference registry. In addition, the window has a history that also lets you analyze previous states of the system description.

- The **MOST FBBlock Monitor** gives information on the states of ECU applications. The view is built up with each additional piece of information transmitted over the MOST ring, without requiring any configuration effort by the user. But you can also get specific information on application states by setting the relevant notification in your ECU directly from the MOST FBBlock Monitor.

- The **Graphics window** lets you display the response of selected signals over time with flexible zoom and measurement functions. For example, you can directly measure the time it takes from wake-up on the Electrical Control Line (ECL) until the MOST signal is activated or select signals on the application level from the function catalog for display. In addition, your analysis scripts can output the results in the Graphics window.

- You can individually design **panels** with a user-friendly editor, in order to display your analysis results in optimal form online.

![Figure 2: MOST State window shows important settings and the current state of the MOST ring](image-url)
Figure 3: Bus Statistics window shows some important state information and the current load of the system

Figure 4: Trace window with structured parameters display, filter configuration and commented message
Figure 5: MOST System Viewer shows ring structure with distribution of function blocks and statistical information.

Figure 6: MOST Central Registry window compares the registered function blocks with a reference set.
2.2 Stimulation

To interactively influence the MOST system, you have such options as the following:

- The **MOST State window** enables you to directly influence the connected MOST ring, e.g. by waking the system or forcing a ring scan.

- You can use the **MOST Interactive Generator** to send MOST messages and message sequences. Simply select them from the XML function catalog, set the parameters to the desired values and stimulate the ECU application at the press of a button.

- You can create **panels** to control your multimedia devices which let you efficiently perform testing tasks or serve as a prototype for user interfaces.
- The **MOST Stress window** lets you generate bus load on the control and asynchronous channels or stress your system with sequences of unlocks.

![MOST State window](image)

Figure 9: MOST State window allows to directly influence the MOST ring

![MOST Interactive Generator](image)

Figure 10: MOST Interactive Generator based on the function catalog and addressing via the Address Handler
3 Automated Analyses and Stimulation

You can automate analysis of the system with the help of the CAPL programming language. A CAPL node inserted in the measurement setup reacts to MOST messages and system events. For example, it can be used to monitor timings or sequences and compute characteristic communication values. You can have a CAPL program show the results in panels, highlight messages in the Trace window, or write the results to files. Unlike user controlled visual analysis in the Trace window, this process is always reproducible.

In addition to analysis tasks, you can also use CAPL to automate stimulations that need to be exceptionally reproducible or should react to events in your system as quickly as possible. For example, you can automatically start stress functions to check whether your system also behaves correctly in critical situations. Or you can stimulate the MOST ring with programmed message sequences. Previously recorded message sequences can also be fed into the ring with the help of the Replay block.

In offline mode, you can use the same analysis programs to analyze pre-recorded log files. In addition, you can define conditions which immediately interrupt the analysis run when they occur in offline mode. This gives you the option of playing even very large log files and analyzing specific critical situations in the Trace window at your convenience.

4 Other Application Areas

4.1 MOST High Protocol (MHP)

CANalyzer.MOST offers you extensive MHP support:

- The **MHP protocol observer** shows you, even in the case of segmented transmissions, a disassembly of the application data in the Trace window. Moreover, it outputs specific references to protocol violations. In CAPL nodes in the measurement setup, you also have access to the outputs of the Protocol Observer; this lets you automate MHP and application analyses.

- The **automatic MHP receiver** lets you poll extensive ECU data via AMS and receive the response via MHP without having to implement a MHP data sink.
4.2 Access to the Synchronous Channels

CANalyzer.MOST enables access to the synchronous area of MOST. With this access capability CANalyzer.MOST covers a whole series of application cases in the area of streaming of multimedia data. This is described in detail in the application note “MOST Synchronous Channel Access”.

In the case of MOST25, independent of the Synchronous Boundary Control (SBC) that is set, all synchronous channels can be transmitted via USB to the PC, and in the other direction the PC can feed into the ring. In the case of MOST150, selection of the synchronous channels to be transmitted is via the Connection Labels.

5 Gateway Functionality

CANalyzer.MOST is also the right tool for your gateway development. Analysis of gateway propagation times and testing of signal routing are possible without difficulty.

Furthermore, option MOST may be combined with any of the options for CAN, LIN, FlexRay and IP. For example, you can select which bus systems to access according to your precise needs.

The time stamps of the events of all buses are precisely synchronized, and so they reference a common time base.

For example, if MOST is combined with CAN, you can examine the messages of both bus systems in a Trace window in a chronological view and analyze the interrelationships. With analysis scripts, which then also have simultaneous access to CAN and MOST messages and system states, you can define automated start-up times, measure gateway propagation times or verify the signal routing algorithms of your gateway. It is easy to analyze Gateway propagation times and testing of signal routing.
## 6 Feature Matrix

Note: User operation and the range of features offered are largely uniform for MOST25, MOST50 and MOST150, but they may deviate from one another in certain details.

<table>
<thead>
<tr>
<th>MOST Feature</th>
<th>Speed grades</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MOST25</td>
</tr>
<tr>
<td>Control channel</td>
<td></td>
</tr>
<tr>
<td>CMS</td>
<td>Node/Spy</td>
</tr>
<tr>
<td>AMS</td>
<td>yes</td>
</tr>
<tr>
<td>Asynchronous channel</td>
<td>Node/Spy</td>
</tr>
<tr>
<td>Raw packets</td>
<td>yes</td>
</tr>
<tr>
<td>MOST High Protocol (MHP)</td>
<td>yes</td>
</tr>
<tr>
<td>Ethernet channel (MEP)</td>
<td>n.a.</td>
</tr>
<tr>
<td>System States (Light, Lock, System Lock, etc.)</td>
<td>yes¹</td>
</tr>
<tr>
<td>Electrical Control Line (ECL)</td>
<td>n.a.</td>
</tr>
<tr>
<td><strong>Audio/Synchronous channels</strong></td>
<td></td>
</tr>
<tr>
<td>Allocation Table</td>
<td>yes</td>
</tr>
<tr>
<td>LinIn/LineOut</td>
<td>yes</td>
</tr>
<tr>
<td>S/PDIF In/Out</td>
<td>yes</td>
</tr>
<tr>
<td>Streaming from/to PC</td>
<td>yes</td>
</tr>
<tr>
<td>Isochronous channels</td>
<td>n.a.</td>
</tr>
<tr>
<td><strong>Stress</strong></td>
<td></td>
</tr>
<tr>
<td>Bus load: control channel</td>
<td>100%</td>
</tr>
<tr>
<td>Bus load: asynchronous channel</td>
<td>100%</td>
</tr>
<tr>
<td>Bus load: Ethernet channel</td>
<td>n.a.</td>
</tr>
<tr>
<td>Unlock Generator</td>
<td>yes</td>
</tr>
<tr>
<td>Bypass Toggle</td>
<td>no</td>
</tr>
<tr>
<td>Buffer blocking</td>
<td>yes</td>
</tr>
<tr>
<td><strong>Logging</strong></td>
<td></td>
</tr>
<tr>
<td>Control channel, asynchronous channel, Ethernet, system states</td>
<td>BLF, ASC, IMG³, OP2³, CCO³, CC³³</td>
</tr>
<tr>
<td>Synchronous channels</td>
<td>BIN, WAV</td>
</tr>
<tr>
<td><strong>Hardware interface</strong></td>
<td>VN2610</td>
</tr>
</tbody>
</table>

¹ Precise Stable Lock and Critical Unlock are defined in VN2610 and VN2640
² Using CAPL programs with limited bus load generation via the hardware interface
³ Does not contain all channels; for more precise information refer to owner of the proprietary format
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