# MDA V8 – Functionality Overview Summary of Major Features and Usage Concepts

Functionality Scope based on MDA V8.5.1 and Previous Versions



DRIVING EMBEDDED EXCELLENCE

Summary of Major Features and Usage Concepts (Based on MDA V8.5.1)

#### - Basics

- Docking Windows, Ribbon, Keyboard Support, Meaning of 'Configuration', Error Handling, Customization Possibilities, User Settings
- Measure File Handling
  - Measure File Handling, Export of Measure Data, Time Offset, Textual File Formats
- Signal Handling
  - Variables & Signals, Definition of Display Name, Calculated Signals, Bit Extraction

#### Instruments

- Overview of Instruments, Time Navigation & Synchronization, Oscilloscope, Scatter Plot, Table, Event List, Statistical Data, GPS Map View
- Configuration Handling
  - Configuration Management, Import of MDA V7 Configurations (\*.xda)
- MDA V8 in Combination with other Applications
  - INCA & MDA V7, EHANDBOOK-NAVIGATOR, Command Line Tool 'mdfconvert.exe'

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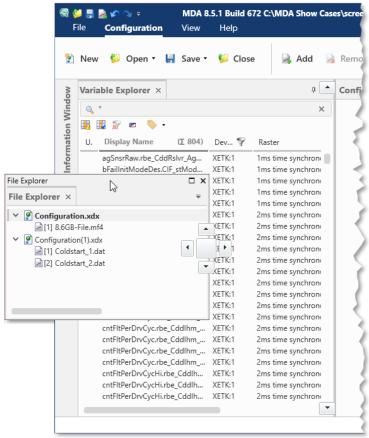
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#### **General Notes**

- MDA V8.5 is the latest product release of the new generation of ETAS' measure data analysis tool
- It combines high performance (even with 'huge' files), and user-friendly operation concepts
- Installation of MDA V8 includes MCD Core\* and DirectX9, and requires 64 bit Windows<sup>®</sup> 8.1 or 10 operating system\*
- Docking Windows Technology
- State-of-the-art technology is used, like Windows ribbon concept, or docking window mechanism, i.e. objects can be positioned at any desired place using drag & drop via the title bar
- Docking windows and other UI elements provide an auto-hide pin 4

#### \* Notes:

- MCD Core is a base component for ETAS tools used for high performance data handling
- For more details about supported Operating Systems see the latest Release Notes document



Ribbon: Get quickly access to frequently used functionalities

- Functionality is structured in ribbons, namely for Configuration, View and Help
- For an efficient usage of the available space the ribbon can be set to auto-hide **\***
- A Quick Access Toolbar enables access to main functionality



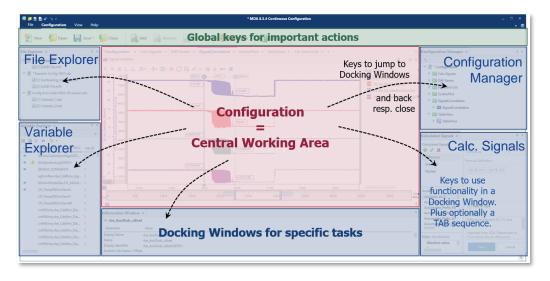
- Within 'Help' ribbon 'Manuals & Videos' provides access to more information about usage of MDA V8
- Within the 'View' ribbon e.g. the start-up language can be set \*
- \* Notes:
- These settings are persisted in 'settings.user' file, and applied when MDA V8 application is re-opened
- A brief overview how to use MDA V8 is given in the video #20 "Basic Introduction"

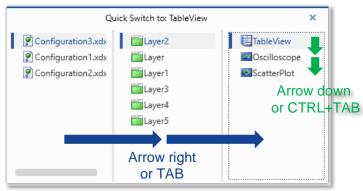
MDA can be operated via mouse and using the keyboard

- Important actions can be done via global short-cuts
- Docking windows are opened, and closed (via Shift+ESC) individually
- Clear indication of focused element
- All hotkeys for supported operations are listed in context menus or at the respective icon
- CTRL+F1 provides an overview of all supported keyboard combinations \*



- 'Quick Switch' window (opens via CTRL+TAB) enables quick navigation between different instruments, layers or even configurations
- \* Note: Pure navigation keys (like arrows down, page up or similar) are not listed





Configuration: Manage even complex display and analysis tasks

- A configuration is the central working place for the display and analysis of measure data
- Layers, instruments and signals assigned to instruments are part of a configuration
- Measure files are linked to configurations
- Within one MDA V8 session several configurations can be opened in parallel
- A configuration description can be given in the Information Window (CTRL+I)
- Unsaved changes to a configuration are indicated by a star
- UNDO (Ctrl+Z) and REDO (Ctrl+Y) are supported for any configuration changes

Important Compatibility Limitations:

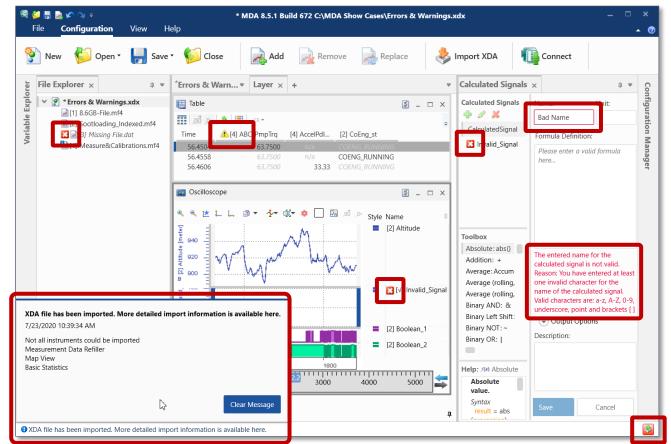
- MDA V8 configurations (\*.xdx) cannot be converted back to and opened in MDA V7.x (\*.xda)
- An MDA V8 version can open configurations created with former MDA V8 versions, but not from newer software versions

*Configuration $\overline{}$ Layer $\times$ Layer(1) $\times$ Layer(2) $+ \leftrightarrow \overline{}$	Configuration M × ♀ ₹	Dis
Configuration I X MDA V8.4.0 Configuration.xdx	<ul> <li>* × ×</li> <li>* Configuration</li> <li>Layer</li> <li>Layer(1)</li> <li>Layer(2)</li> </ul>	Display Name Rules
Information Window × ♀ ▼	<ul> <li>Layer(3)</li> <li>Layer(4)</li> </ul>	Calculated
This is an example for a configuratin description. It can contain up to 10,000 characters. Copy & paste of contents from and into the Information Window is supported using CTRL+C resp. CTRL+V.		ated Signals



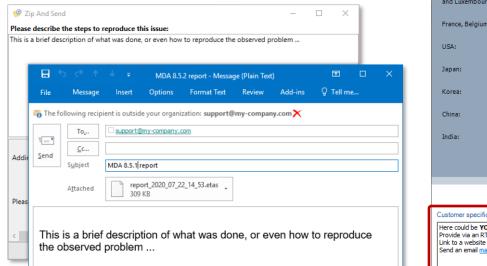
Unexpected situations: MDA V8 informs you when something unusual happens

- In case an activity could not be done as planned, or an object is causing trouble, MDA V8 informs you
- The information usually happens at the location related to the issue, like
  - a warning or error icon is shown at the respective object (like a not supported signal, a missing file etc.)
  - a red frame around a name field
  - a message in the status bar appears (as case of not imported objects)
- Just hover onto the icon and get more details about the issue



Adapt MDA V8 to your company working environment

- Customer specific support
- Support dialog can include customer specific support information
- MDA support dialog can be extended via ,CustomerSupport.rtf' file
- Contents can be plain text, hyperlinks to websites or email addresses
- Default Zip&Send email address
- The default email address used for Zip&Send operation of MDA reports (MDA V8 log files) can be defined to a customer-specific support address



Support	ETV2
MDA 8.5.1 Build 6 Your hotline contact:	/2
Europe (except France, Belgium and Luxembourg):	Phone: +49 711 3423-2315 mcd.support.de@etas.com
France, Belgium, Luxembourg:	Phone: +33 1 75 34 50 68 support fr@etas.com
USA:	Phone: +1-888-382-7462 support.us@etas.com
Japan:	Phone: +81-45-222-0950 inca.hotline.jp@etas.com
Korea:	Phone: +82 31 326 6200 inca.hotline.kr@etas.com
China:	Phone: +86 21 2218 5800 support.cn@etas.com
India:	Phone: +91 80 6783 6555 support in@etas.com
	www.etas.com/hotlines
t.	DRIVING EMBEDDED EXCELLENCE
Customer specific support: Here could be <b>YOUR</b> support informatic Provide via an RTF file your specific sup	port information, like
Link to a website <u>http://www.etas.com</u> Send an email <u>mailto:<support@my-cor< u=""></support@my-cor<></u>	

Note: For more details see MDA V8 Manual -> Customizing the Support Information

Spend less time with configuration as MDA V8 persists automatically your settings

- MDA V8 persists automatically many settings done by the user
  - Application: language, status & appearance of docking windows, paths
  - Per Instrument: default appearance, like background color and others
  - For Signals: color, decimals, connection style, marker symbols, etc.
- Settings are stored in the user specific 'settings.user' file
- These settings are loaded and re-used, when the application is started
- As a result the effort for configuring the tool layout, and signal representation is minimized
- A pre-defined set of settings can be rolled out before the first usage of MDA
- User settings are migrated when a newer version of MDA V8 is used, old setting files are kept as fall-back solution in case a downgrade is required

#### 📕 German 🔚 English Chinese Japanese ✓ Calculated Signals Ctrl+Alt+C French ✓ Configuration Manager Ctrl+F Display Name Rules Ctrl+Alt+V ✓ File Explorer Ctrl+Alt+O Information Window Ctrl+1 Instrument Box Properties Time Offset Variable Explorer Shift+F4

#### Notes:

- For more details about which settings are persisted, and how to roll these out, see MDA Manual chapter 1.3
- Existing settings.user files **must not** be edited externally, as edited files are rejected by MDA V8

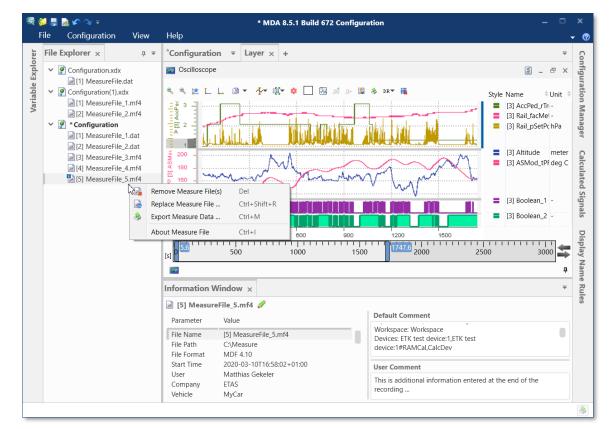
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File Explorer: Manage your files in a clearly arranged way

- In the File Explorer configurations, and the assigned measure files are listed
- A configuration contains a selection of signals and how these are represented; the data for the signals comes from the measure file(s)
- Measure files assigned to a configuration appear underneath the configuration entry
- Each file has a file ID for better identification
- By CTRL+I the file comment and other meta data is shown in the Information Window
- File Explorer provides access for
  - removing, replacing, and
  - exporting or conversion of measure file(s)



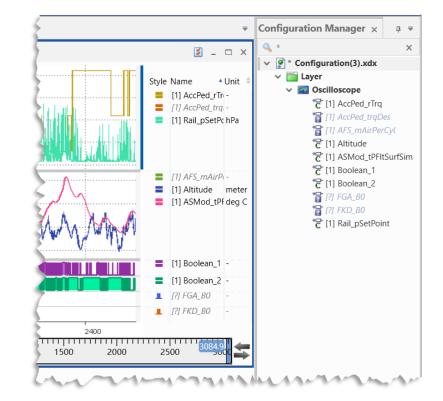
Note: For the basic functionality see video #13 "Files Replace", and video #5 "Files Export"

Improved and consistent handling when input signal is missing

- When removing or replacing a measure file, it might happen that a signal is no longer available
- In MDA V8 missing signals assigned to instruments remain as placeholders until they are available again
- When replacing a measure file an automatic signal mapping is done, based primarily on the signal name and optionally device, and raster
- Any signal(s) which cannot be mapped automatically remain in the configuration, but without data displayed (so-called 'no-match' case)
- 'No-match' signals are shown by the grey italic font style

#### Notes:

- A no-match situation caused by a missing measure file is indicated by the file ID entry [?]
- Removing a specific no-match signal only is done directly in the instrument or in the Configuration Manager
- To clean-up a configuration from all no-match signals, a context menu entry in the Configuration Manager exists
- If the input signal of a Calculated Signal is in no-match state, it needs to be removed manually



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Export Measure Data: Create your own measure file

- Using 'Export Measure Data' Allows to create a new measure file\*, including any MDF file format conversions
- 'Export Measure Data' dialog can be opened from
  - the File Explorer context menu by selecting the measure file to be exported resp. converted
  - the Variable Explorer context menu by multi-selecting signals, even from different files, and incl. calc. signals
  - an oscilloscope, scatter plot or table instrument toolbar for the signals in the selected instrument
- A progress view provides information about the export process, and allows to cancel the export

	Export Measure Data
Signal(s):	143 signal(s) selected from D:\Export_Files\Measure_File_01.dat
Time Range [s]:	Start: 0 End: 3084.9421
File Format	DXL •
File Path	D:\Export_Files\Measure_File_09_Export.dxl Browse
Summary	♥ No issues found during validation. Please proceed.
	Export Cancel
_	
~	C:\Export_Files_Folder\Measure-File-05-Export.dxl
~~	C\Export_Files_Folder\Measure-File-04-Export_dxl Cancel Remove finished element
~~	C\Export_Files_Folder\Measure-File-03-Export.dxl Remove all finished elements
~~	C:\Export_Files_Folder\Measure-File-02-Export.tsv
~	C\Export_Files_Folder\Measure-File-01-Export.dat

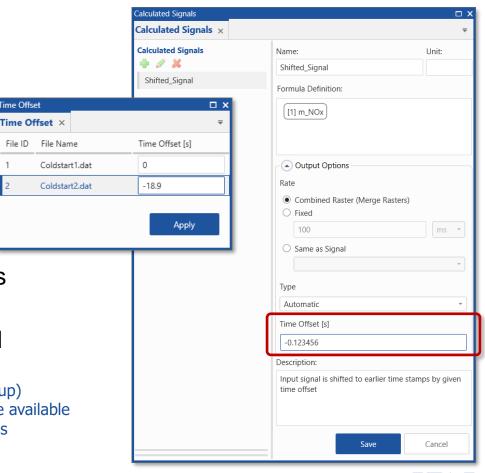
- \* Notes:
- For a short demo see video #5 "Files Export"
- In case a time offset was applied to a measure file or a signal, the exported signals will have the offset included
- MDA V8.5 supports numeric data and enumerations completely, for mdf V3.x also data type strings

Synchronization of measure data by applying a 'Time Offset' on file level and signal level

ime Offset

File ID

- To compare measure data, often a time offset needs to be applied to synchronize the recorded data
- MDA V8 enables to apply time offsets
  - for complete measure files, i.e. all signals of the file are shifted accordingly
  - for individual signals, by using Calculated Signals functionality Output Options \*
- A time offset for files is applied to the data basis, and effects any 'consumer' of the data, e.g. calculated signals are calculated based on the shifted data
- When exporting measure data any time offset is included
- \* Notes:
- Time offset for file and individual signal is handled in cumulative manner (i.e. sums up)
- Time stamps of an input signal remain unchanged, i.e. original and shifted signal are available
- Calculated Signals toolbox functionality "Delay\_Signal()" supports only positive values
- How to apply a time offset for a file or a signal is shown in video #18 "Time Offset"



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Teach MDA V8 to support your own customer-specific ASCII file formats

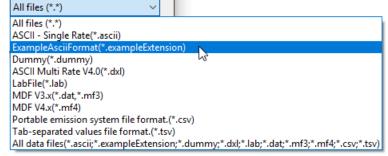
- MDA V8 supports additional (ASCII based) measure files formats by an easy-to-create configuration (\*.ini) file, which defines how to read & write textual files, like \*.csv
- An example incl. a description for such an \*.ini file is provided in the folder

%ProgramData%\ETAS\MDA\8.x\CorePlugins\

Etas.TargetAccess.Targets.MeasureFile.Formats.AsciiConfigurable \*

- The measure file extension should be unique
- A clear structure of header and data blocks is needed
- All signals must be available in the same raster
- When starting MDA, all available \*.ini files are loaded, and respective file formats are supported (Read & Write)

📄 examp	leAsciiFormat.ini 🔀
1	; Here is an example of Configurable ASCII Format configuration.
2	; All configuration files located in "AsciiConfigurations" folder
3	; (including all sub folders) will be scanned during loading.
4	; File should be saved as UTF-8
5	
6	; One configuration file could contains more than one configuration.
7	; File configuration is defined by file extension. Extension should be a
8 9	; All configurations except of the first one with identical file extend
10	; Format readable name is defined in []
11	[ExampleAsciiFormat]
12	
13	; Extension of files which are supported by format.
14	; Mandatory. Should not be empty or combination of special symbols (spa-
15	; Identical extensions:
16	; ".exampleExtension"
17	; "exampleExtension"
18	; .exampleExtension
19	; exampleExtension
20	extension=".exampleExtension"
21	
22	; Delimiter which is used to separate values in the rows.
23	; Mandatory. Should not be empty.
24	; If it's some special symbol (tab, space, etc.) it should be quoted.
25	delimiter=","
26 27	" "ero-beter now index of the "ov" that contains the signal ames
All file	
All files	(**)



<sup>\*</sup> Note: New folder name introduced in MDA V8.5.1.

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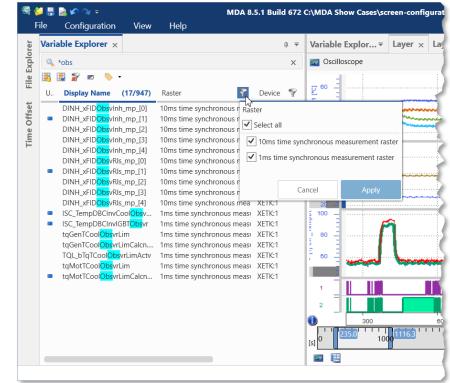
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Variable Explorer: Experience the new performance

- The Variable Explorer is a tabular view for selection of signals showing signal name and meta data
- To shrink the entries in the list to the relevant ones, filtering is done via:
  - Search field for variable name
  - Funnel icons in the column header (e.g. Raster  $\mathbb{Y}$
  - Icon to filter used and not used entries
- Columns to be shown is customizable 🔜, and columns can be reordered \*
- Columns at left can be excluded from scrolling ('Freeze' ] )\*
- Signals are assigned to an instrument via drag & drop onto a layer tab, or into an existing instrument

\* Notes:

- For a basic introduction see video #2 "Signals Selection"
- These settings are persisted in 'settings.user' file, and used when Variable Explorer is opened



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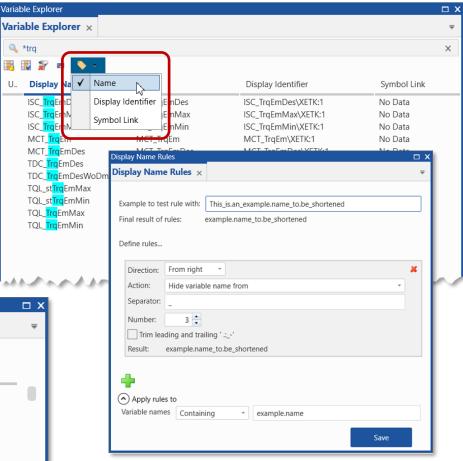
Define how a variable's or signal's name shall be displayed

- In an MDF file alternative variable names can be given, like Display Identifier or Symbol Link
- The name type to be used in MDA UI can be defined in Variable Explorer
- Additionally MDA V8 allows to shrink the display name to the relevant part to be shown e.g. in instruments
  - An arbitrary number of rules can be combined
  - The target group of variables for which the rules shall be applied is definable
- Information Window shows all kinds of available names for a variable / signal

Information Window		□ X
Information Window $\times$		$\overline{\mathbf{v}}$
∼ ISC_TrqEmDes		
Parameter	Value	
Display Name Name Display Identifier Symbol Link Name / Offset Description	ISC_TrqEmDes ISC_TrqEmDes ISC_TrqEmDes\XETK:1	

🔍 \*trq

U..



Easy-to-use Calculated Signals management

- Calculated signals enable to derive information which is not accessible directly in the recorded measure data
- A new user-friendly Calculated Signals editor supports easy-to-read and -to-understand formulas
- Within very few steps a new calculated signal is defined, and ready to use instantly
- High-performance of the underlying calculation engine
- Duplicate, edit or rename an existing calculated signal within the same configuration
- Copy & paste calculated signals across configurations
- For toolbox operators a Tooltip and the Help window show at least a brief description of the arguments
- Display, export etc. can be done as for recorded signals

Calculated Signals			□ ×	
Calculated Signals ×			₹	
Calculated Signals		Name:	Unit:	
🖶 🖉 🗶		DrivenDistance	km	
Average_Speed		5 1 5 6 2		
DrivenDistance		Formula Definition:		
HighAltitude		Accumulate_Prefix_Integ	ral([1] VehV_v))/3600	
Toolbox				
If-Then-Else: ?				
Integral (from beginning): Accumulate_Prefix_Integr	al ()			
Integral (rolling, time based): Accumulate_Rolling_In	Reg Calculate	s the integral value for a sig	gnal from the beginning u	ip to the current sam
Inverse Cosine: acos ()	Syntax			
		Accumulate_Prefix_Integral(e	xpression)	
	Argument result	t(s)		
Help: /(x) Integral (from beginning)		egral value over expression fr	rom the beginning up to the	e current sample.
Calculates the integral value for a signal from t beginning up to the current sample.	capicoon			
Syntax	The sig	nal to be integrated.		
result = Accumulate Prefix Integral(expression)		Integral of the vehicle spe	ad divided by seconds	
Argument(s)		per hour to get the value		
result		· · · · · · · · · · · · · · · · · · ·		
The integral value over expression from the beg	jinning up to			
the current sample.				
expression				
The signal to be integrated.		Save	Cancel	

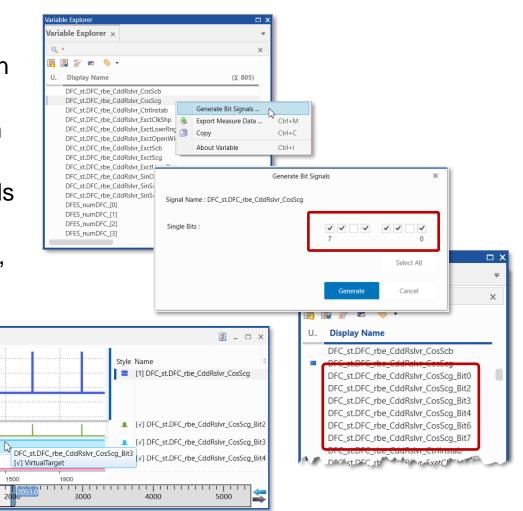
Note: For basic usage see video #4 "Calculated Signals", more details and examples are given in the Online Help and MDA V8 manual

Quick and simple way to extract bits signals

- When for a block of bit signals the masking information is not given in the measure file, within MDA V8's Variable Explorer the needed individual bit signals can be extracted easily and guickly
- In the background the corresponding calculated signals are created. If desired, it can be renamed
- Generated bit signals can be used as ordinary signals, i.e. assigned to any instrument, used as input for calculated signals, and exported ன Bit Traces into new measure files 100



- Generation of Bit Signals is **not** supported for signals with verbal computation method ("Enumerations")
- An example is shown in video #16 "Extracting Bits"



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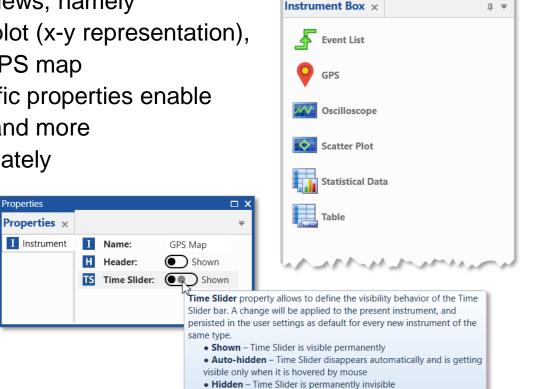
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Instrument Box: Get an overview of all possible instruments

- MDA V8 provides six different instruments i.e. data views, namely an oscilloscope (comparable to INCA V7), a scatter plot (x-y representation), a table, an event list, a statistics instrument, and a GPS map
- To use the screen more efficiently, instruments specific properties enable e.g. to show or hide instrument header, Time Slider and more

Properties

- Changes are applied to the active instrument immediately
- Several Properties for instruments and signals are persisted automatically in the file\* 'settings.user' and are re-used when creating a new instance of the instrument or signal (like e.g. oscilloscope background color, signal curve color, decimals for values, and several others)

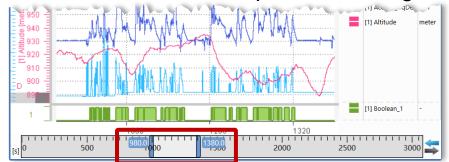


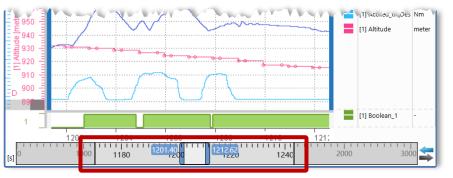
- \* Notes:
- Properties with default character are listed in the MDA V8 Manual Chapter 1.3 'User Settings'.
- File 'settings.user' is stored here: C:\Users\username \AppData\Local\ETAS\MDA\8.x \

-

Instrument and Time Slider: Display relevant information quickly

- At the bottom of an oscilloscope a Time Slider is shown for an overview of the complete time range of all measure files assigned to the present configuration [11 Altitud
- Time Slider allows quick navigation through measure data and time range
- Scrolling, zooming\* and synchronization of instruments can be done from here
- In case of deep zooming the mode switches automatically into Magnifier mode, i.e. the visual range is represented on a magnified scale for better orientation
- For quick navigation in magnifier mode, scrolling of the magnified scale is enabled
- Show/Hide behavior of Time Slider can be defined within the Properties window of each instrument
- \* Notes:
- For a brief demo see video #3 "Instruments Zoom & Synchronization"
- For symmetric zooming use the left mouse button plus CTRL key

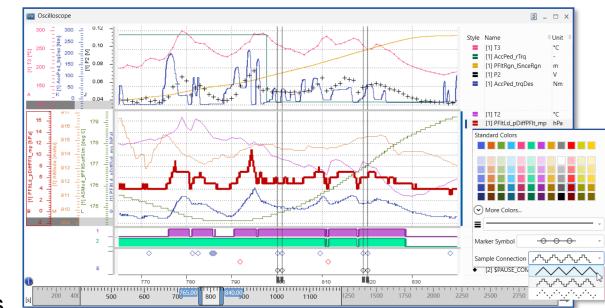




FTAS

Oscilloscope: One instrument for several views

- The oscilloscope of MDA V8.4 offers:
  - Strips for analog or boolean signals
  - One 'Event Strip' for event signals
  - Analog signals can share the same axis
  - Axis range adaptations are done directly via mouse or via axes options
  - The color icon allows to set for
     each signal several settings for display (like color, markers, kind of connection) \*
- The icon bar supports frequently used actions e.g. zoom-to-fit, cursors, taking screenshots, or export data



#### \* Notes:

- For scrolling of value axes or the time axis use the left mouse button, plus CTRL key for zooming or right mouse button
- See the different videos about the oscilloscope instrument to learn more about its possibilities (#8 "Strips", #9 "Axes", #10 "Cursors")
- Most of these settings are persisted in 'settings.user' file, and used when the signal is re-selected for an oscilloscope

Oscilloscope cursors: Several modes for efficient analysis

- Cursors are created easily using CTRL+R
- Cursor behavior can be defined by settings \*
  - Cursor movement along time or samples
  - Show or hide signal values \*
  - 'Anchoring' the cursor to keep it in the visible range
- When instruments are synchronized, an anchored synchronization cursor a indicates the time stamp which is used to align all instruments
- In synchronization mode cursors are created, and moved as done in the master instrument



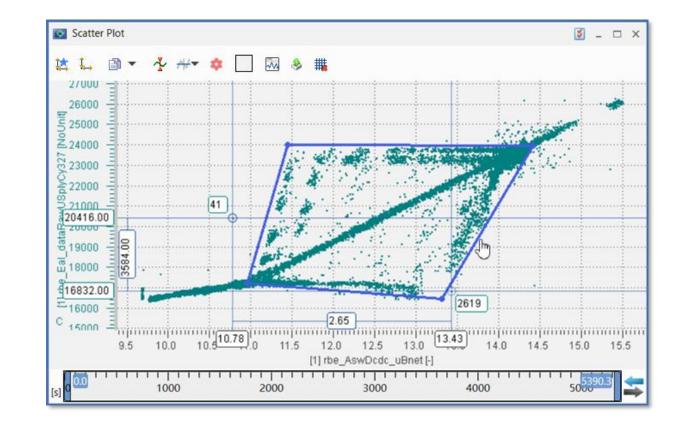
#### \* Notes:

- These settings are persisted in 'settings.user' file, and applied when a new cursor is created
- Especially for indexed files, the value shown for a signal is first an indexed value, indicated by ~, as soon as the accurate value is available, the indicator disappears automatically

Scatter Plot: Fast analysis of sample distribution and signal relation

- To focus on time-independent sample distribution or on signal relation the instrument 'Scatter Plot' is provided
- Per strip one signal is drawn across another signal on the x axis
- Cross-hair cursors are supported
- Scatter plot can be time-synchronized with other instruments via Time Slider \*
- Border lines can be created graphically





#### \* Note:

- For a basic introduction see video #12 "Scatter Plot"
- Scatter Plot does not support synchronization of cursors and configuration of signal settings so far

Table: User friendly instrument for detailed analysis

- Table instrument of MDA V8 shows accurate data for samples, and it combines functionality of MDA V7 table and measure data refiller (MDR) view
- Enumerations and Events are displayed as strings
- By a simple click onto the 'Fill empty cells' button (III), data is interpolated step-wise to fill cells for which no recorded values are available \*
- Columns (except time) can be re-ordered via drag&drop
- Decimals for time stamps and signal values can be set  $^{\ast}$
- Synchronization with other instruments is supported, and synchronization time is indicated by a blue line
- Data can be exported to e.g. \*.tsv (tab separated values) file format for a fast reuse in Excel®

- These settings are persisted in 'settings.user' file, and applied when a new table instrument is created
- For a brief introduction see video #11 "Table Basics"

📘 Table						<b>×</b> –	
♦ →0, 50,	🔛 dr 🕶					÷	[s]
Time s	[1] flgC XETK:1 -	[1] CIF_Tem XETK:1 -	[1] TDC_TrqE XETK:1 -	[1] rbe_A XETK:1 -	[1] dataR XETK:1 Hex	[1] rbe_Asw XETK:1 Bin	Ŭ
2,544.8593	1	59.125	144.0625	FALSE	8590	0000 0001	20
2,544.8598	1	59.125	144.0625	TRUE	8590	0000 0001	2000
2,544.8598	1	59.125	59.125		9430	0000 0001	
2,544.8603	1	E 0 1 0 5	The value is interp	olated.	9430	0000 0001	
2,544.8613	7	59.125	144.0625	TRUE	9430	0000 0001	25
2,544.8618	7	59.125	144.0625	TRUE	6060	0000 0001	2544.8
2,544.8623	7	59.125	144.0625	TRUE	6060	0000 0001	
2,544.8633	7	59.125	144.0625	TRUE	6060	0000 0001	
2,544.8638	7	59.125	144.0625	TRUE	8C90	0000 0001	
2,544.8643	1	59.125	144.0625	TRUE	8C90	0000 0001	
2,544.8653	7	59.125	144.0625	TRUE	8C90	0000 0001	
2,544.8658	1	59.125	144.0625	TRUE	93D0	0000 0001	
2,544.8663	7	59.125	144.0625	TRUE	93D0	0000 0001	
2,544.8673	7	59.125	144.0625	TRUE	93D0	0000 0001	
2,544.8678	7	59.125	144.0625	TRUE	6070	0000 0001	4
2,544.8683	7	59.125	144.0625	TRUE	6070	0000 0001	4000
2,544.8693	7	59.125	144.0625	TRUE	6070	0000 0001	
2,544.8698	1	59.125	144.0625	FALSE	6070	0000 0001	
2,544.8698	1	59.125	144.0625	FALSE	8CD0	0000 0001	-

Statistics: Quick access to statistical data even in synchronized mode

- For numeric signals, recorded or calculated ones, basic statistical data can be displayed
- Columns to be displayed can be selected via III icon \*
- Columns' order can be set using drag & drop \*
- Statistical data is based on the time range defined by the Time Slider
- In synchronization mode update of data happens based on the time range set in the synchronization master instrument, e.g. an oscilloscope
- Copy (CTRL+C) includes all columns of selected rows and column header

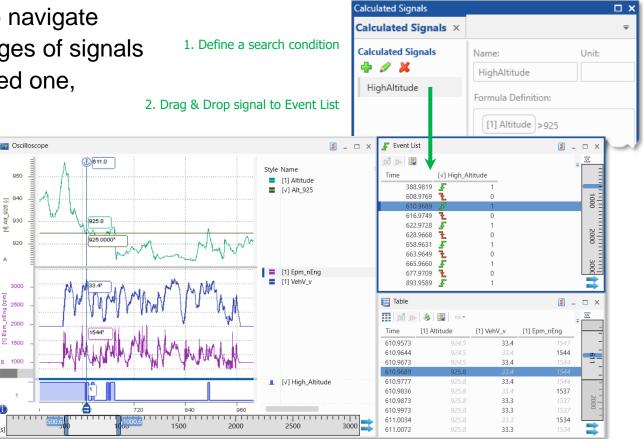
📷 Statistical Data				🔰 _ 🗆 X
əo. 5o. 🔚				÷
Signal	Unit	Minimum	Maximum	Standard Deviation
[1] AccPed_rTrq	-	1.30	3.10	0.53
[1] ASMod_tPFltSurfSim	deg C	147.76	194.16	14.24
[1] Boolean_1	-	0	1	0
[1] Boolean_2	-	0	1	0
🍳 [1] CoEng_st	-	-	-	-
The signal '[1] CoEng_st' is not a nume	eric or logic	signal4.9	121.6	29.0
Please use a numeric or logic signal.		-12.6	125.8	30.5
[1] PFltLd_pDiffSot_mp	hPa	24	66	6
<ul><li>[1] PFltPOp_numGearDeb</li></ul>	-	1	3	1
[1] PFltPOp_rAPPFlt	%	0.00	66.89	11.82
[1] PFltPOp_stEngPOp	-	0	3	1
[1] PFltRgn_ISnceRgn	m	211412	216264	1500
[1] PthSet_trqInrSet	Nm	0.0	126.6	25.9
<ul><li>[1] Rail_facMeUnCtlPCor_mp</li></ul>	-	1.0	1.0	0.0
[1] T2	°C	40.985	46.500	1.230
[1] T3	°C	144.18	380.50	50.75
[1] Tra_numGearDes	-	0.0	3.0	1.2
[s] <b>250.0</b> 500 1000	15	15.0 2000		500 300C

\* Note: These settings are persisted in 'settings.user' file, and applied when a new statistics instrument is created

Event List: Get quickly a complete list of status changes for Boolean signals

- The Event List instrument is provided to navigate quickly between events and value changes of signals
- Any signal can be used, either a recorded one, or a calculated signal
- After adding the event / signal to the event list, only time stamps having a status change are listed
- Synchronization with other instruments is supported, just double-click the next entry in the Event List view

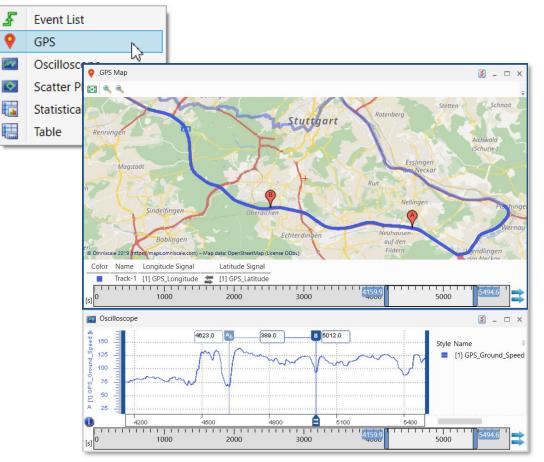
Note: See example in video #15 "Event Navigation"



(Oscilloscope and table for visualization of synchronization only)

GPS view: Visualize directly the track of your test drive

- When longitude and latitude information is available in a measure file, a track can be displayed in a map
- Automatically the GPS map instrument identifies longitude and latitude based on signal names, alternatively a manual assignment is possible
- Zooming and scrolling the map is supported
- Time range can be defined using the time slider
- In synchronized mode cursors are shown and moved corresponding to the master instrument



Note: For a basic introduction see video #17 "GPS Map"

Summary of Major Features and Usage Concepts (Based on MDA V8.5.1)

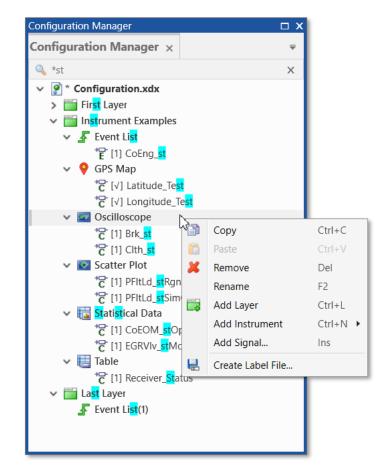
- Basics
  - Docking Windows, Ribbon, Keyboard Support, Meaning of 'Configuration', Error Handling, Customization Possibilities, User Settings
- Measure File Handling
  - Measure File Handling, Export of Measure Data, Time Offset, Textual File Formats
- Signal Handling
  - Variables & Signals, Definition of Display Name, Calculated Signals, Bit Extraction
- Instruments
  - Overview of Instruments, Time Navigation & Synchronization, Oscilloscope, Scatter Plot, Table, Event List, Statistical Data, GPS Map View
- Configuration Handling
  - Configuration Management, Import of MDA V7 Configurations (\*.xda)
- MDA V8 in Combination with other Applications
  - INCA & MDA V7, EHANDBOOK-NAVIGATOR, Command Line Tool 'mdfconvert.exe'

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Configuration Manager: Get quickly an overview of your configuration

- The Configuration Manager shows a hierarchical representation of the configuration, i.e. layers, instruments, and signals
- Search functionality (CTRL+F) for all kind of objects
- Within one configuration drag & drop of signals (move or copy), or instruments (move only) is supported
- Copy & Paste of layers, instruments, and signals even across configurations within one MDA V8 session
- Renaming and removing of layer and instruments
- Adding of layers and instruments
- Clean-up from configuration node for no-match signals
- Creation of label files (\*.lab) for reuse in e.g. INCA

Note: Some basic aspects are presented in video #6 "Configuration Management"



Configuration: Reuse configurations created with MDA V7.x

- Configurations from INCA and MDA V7.x (\*.xda files) can be imported into an MDA V8 configuration
- Oscilloscopes, scatter plots and tables are recreated with its signals, and settings
- When importing an \*.xda file from MDA V7.x each instrument is maximized on its individual layer using the instrument's name as layer name
- Import of an INCA \*.xda file results in one layer
- Calculated Signals are imported (from \*.xda and \*.xcs files) except e.g. not supported functions
- A message for not imported objects is shown in the status bar of MDA V8

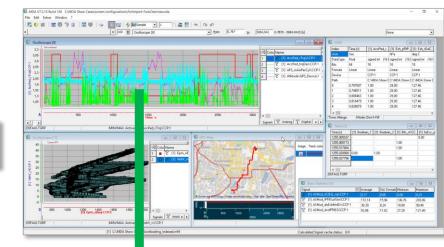
Notes:

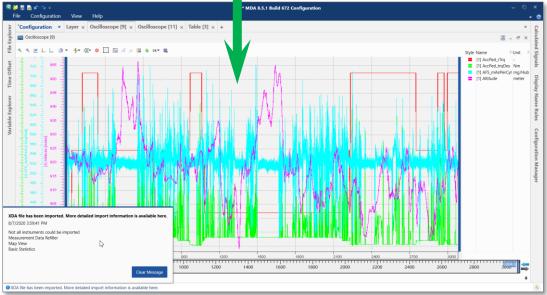
- For a brief demo see video #6 "Configuration Management"
- MDA V8 configurations (\*.xdx) can not be converted back to \*.xda
- Time Offsets defined in MDA V7 can not be imported

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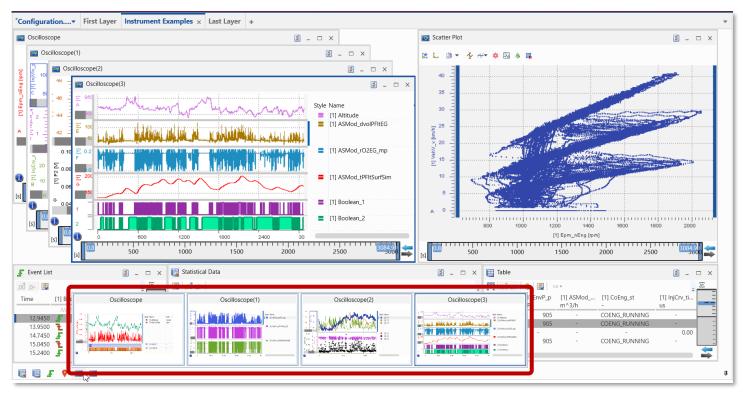




ETV2

Layer Preview: Navigate quickly between different instruments

- On each layer in the task bar instrument type symbols are shown
- A preview allows to identify and to navigate quickly between diverse instruments
- The currently active instrument is highlighted by a blue frame
- Clicking onto an instrument preview brings it to the front and into the visible area
- To navigate quickly via keyboard between instruments, layers, or configurations use CTRL+TAB



Summary of Major Features and Usage Concepts (Based on MDA V8.5.1)

- Basics
  - Docking Windows, Ribbon, Keyboard Support, Meaning of 'Configuration', Error Handling, Customization Possibilities, User Settings
- Measure File Handling
  - Measure File Handling, Export of Measure Data, Time Offset, Textual File Formats
- Signal Handling
  - Variables & Signals, Definition of Display Name, Calculated Signals, Bit Extraction
- Instruments
  - Overview of Instruments, Time Navigation & Synchronization, Oscilloscope, Scatter Plot, Table, Event List, Statistical Data, GPS Map View
- Configuration Handling
  - Configuration Management, Import of MDA V7 Configurations (\*.xda)

#### - MDA V8 in Combination with other Applications

- INCA & MDA V7, EHANDBOOK-NAVIGATOR, Command Line Tool 'mdfconvert.exe'

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Handling in combination with INCA V7.x and MDA V7.x

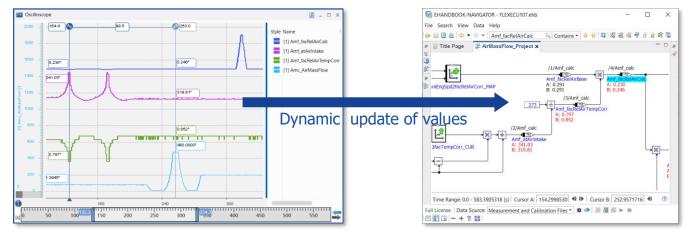
- Usage of MDA V8 requires a valid license, which is covered by a INCA V7.2 or MDA V7.2 license
- MDA V8.x and MDA V7.x can be installed and used in parallel without any negative effects
- INCA V7.x has a user option for the MDA version to be opened (User Options -> General)
  - MDA V8.x will be opened, and the just recorded measure file will be loaded. Depending on the INCA user settings an \*.xda file is generated and imported into MDA V8.
     If MDA V8 is already open, the measure file of the active configuration will be replaced.
- When using MDA V8 in combination with INCA V7, for performance reasons it is recommended to use 'Standard' indexing (User Options → Experiment → Measure → General)

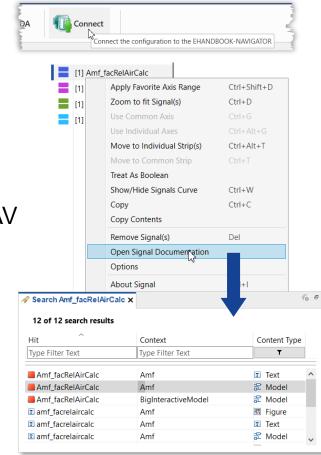
sure	Autostart	Experiment	Hardware	Hex Files	Autocommit	Import / Export
~ ~	General	Limited EMU RAM	Calibration Session Lo	og Path	ASAM-2MC editor	Data exchange
gs	Option		Value			
0	Use Encoding	when reading the ASAP2	? file <>			
	ASAM-MCD 3	MC interface version	ASAP3			
	MDA version		MDA V8.5 (C:	Program Files	TAS\MDA8.5\mda.exe)	~
			MDA V8.5 (C:	Program Files\El	AS\MDA8.5\mda.exe)	
	<		MDA V7.2 (C:	Program Files (x	B6)\ETAS\MDA7\MDA\r	nda.exe) 나
	tions	the MDA version to be use				
	tions	YT-Oscilloscope Measure table Mo	XY-Oscilloscope	Measurement Do Oscilloscope (o		DF header preset ascope (outdated)
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Note: Snapshot Recording requires a combination of MDA V8.4.1 and INCA V7.3.0 (or higher), and recording in MDF V4.x file format

Combined usage of MDA V8 and EHANDBOOK-NAVIGATOR

- Ribbon entry to connect MDA V8 with interactive documentation tool EHANDBOOK-NAVIGATOR (V7.x required, V8.x preferred)
- In connection mode with a documentation container (\*.ehb)
  - A search for a signal can be triggered from MDA
  - Measure data can be displayed in interactive models and function overviews shown in EHANDBOOK-NAVIGATOR
  - A cursor movement in MDA updates automatically values in EHB-NAV





Command Line Tool for Data Conversion and Extraction

 Together with MDA V8 'mdfconvert.exe' tool is installed, which can be used independently from MDA V8 for format conversion and extraction of subsets of signals and time

C:\Windows\System32\cmd.exe

crosoft Windows [Version 6.1.7601]

ltering defective signals defective signals removed

ting file name to "D:\Export File.dat"

- 'mdfconvert.exe' can be integrated easily into scripting solutions
- Supported file formats are:
  - any \*.mdf format version
  - textual format \*.dxl (ASCII Multi Rate V4.0,
    - i.e. channel groups are listed separately)
  - tab separated value format
    - (\*.tsv, for numeric signals only,

validating Format "MDF 3" tely)
Details
Complete: 100%
Finished

(c) 2009 Microsoft Corporation. All rights

FAS\MDA8.1\McdCore>MdfConvert.exe -s D:\MeasFile 09.mf4 -d D:\Export File.dat -f mdf330

one combined time line and completely filled value columns)

#### Notes:

- Numeric data and enumerations are supported completely, for mdf V3.x also data type strings
- For mf4 signals of data type EVENT an option enables to post-add the events to the newly generated file

# Thank you for using MDA V8



DRIVING EMBEDDED EXCELLENCE