ETAS EATB V6.2

User Guide

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1 Safety Information

Adhere to the ETAS Safety Advice for EATBV6.2, which is available within the EATB Product. ETAS GmbH cannot be made liable for damage that is caused by incorrect use and not adhering to the safety instructions. Take all information on environmental conditions into consideration before setup and operation (see the documentation of your computer, hardware, etc.).

1.1 Intended Use

The ETAS Analytics Toolbox (EATB) is a tool developed to improve data analysis of time-based data series in the automotive field. EATB supports engineers in the measurement and validation of ECU software and allows graphical visualization and further calculations of measured signals. On the one hand, the focus is on the provision of a uniform and stable user interface that allows the correct evaluation of the measurement data and results. On the other hand, due to the volume of data in the digital automotive industry, a high processing rate of big amount of data must be guaranteed.

1.2 Target Group

This information addresses qualified personnel working in the fields of automobile control unit development and calibration. Specialized knowledge in the areas of embedded systems and simulation is required.

1.3 Classification of Safety Messages

Safety messages warn of dangers that can lead to personal injury or damage to property:

DANGER

DANGER indicates a hazardous situation that, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a hazardous situation that, if not avoided, could result in death or serious injury.

CAUTION

CAUTION indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE indicates a situation that, if not avoided, could result in damage to property.

1.4 Data Protection

If the product contains functions that process personal data, legal requirements of data protection and data privacy laws shall be complied with by the customer. As the data controller, the customer usually designs subsequent processing. Therefore, he must check if the protective measures are sufficient.

1.5 Data and Information Security

To securely handle data in the context of this product, see the next sections about data and storage locations as well as technical and organizational measures.

1.5.1 Data and Storage Locations

The following sections give information about data and their respective storage locations for various use cases.

1.5.1.1 GPS Map

When using the GPS map, GPS data points are not sent to the external data provider, but processed and visualized internally within the tool. Particularly, the following personal data and/or data categories which can be traced to a specific individual is used for the purpose of visualization:

- Measurement Data: GPS data points

When using the GPS map, particularly the following data that can be traced to a specific individual, is sent to the external map data provider (Omniscale GmbH and Stadia Maps Inc.) and used there for the purpose of providing the requested map data, and for detecting and preventing malicious attacks on their infrastructure:

- Communication Data: IP address

1.5.1.2 License Management

When using the ETAS License Manager in combination with user-based licenses that are managed on the FNP license server within the customer's network, the following data are stored for license management purposes:

Data

- Communication data: IP address
- User data: Windows user ID

Storage location

- FNP license server log files on the customer network

When using the ETAS License Manager in combination with host-based licenses that are provided as FNE machine-based licenses, the following data are stored for license management purposes:

Data

- Activation data: Activation ID
  - Used only for license activation, but not continuously during license usage

Storage location

- FNE trusted storage

  C:\ProgramData\ETAS\FlexNet\fne\license\ts

1.5.2 Licensing

A valid license is required to use the software. You can obtain a license in one of the following ways:

- from your tool coordinator
- via the self-service portal on the ETAS website at www.etas.-com/support/licensing
- via the ETAS License Manager

To activate the license, you must enter the Activation ID that you received from ETAS during the ordering process.

For more information about ETAS license management, see the ETAS License Management FAQ or the ETAS License Manager help.

To open the ETAS License Manager help

The ETAS License Manager is available on your computer after the installation of any ETAS software.

1. From the Windows Start menu, select **E** > **ETAS** > **ETAS License Manager**.

   The ETAS License Manager opens.
2. Click in the ETAS License Manager window and press F1.

   The ETAS License Manager help opens.

1.5.3 Technical and Organizational Measures

We recommend that your IT department takes appropriate technical and organizational measures, such as classic theft protection and access protection to hardware and software.

2 Product Overview

The manual evaluation of a number of measurements is very time consuming and prone to error. The ETAS Analytics Toolbox (EATB) can avoid such errors and delivers a report on all given measurements automatically.

EATB allows you to handle a large amount of data and visualize results in different types of charts and tables in a web application. The interactivity of the generated reports provides many useful options and enables you to easily share reports with other users.

The data recorded and uploaded to some storage location on a server can be transferred to EATB. EATB provides a visualization of the relevant information and critical threshold violations.

2.1 Main Features

EATB offers the following features:

- Desktop application
- Automatic generation of HTML evaluation reports and documentations
- Possibility to read and evaluate large amounts of measurements
- Efficient algorithms for data selection, data filtering, and data preparation
- Presentation of results in a variety of chart and table types
- Flexibility through a simple configuration script (Python- or MATLAB-based)
- Automatic error analysis by a diagnostic system and a traffic light system
- Multiple evaluations at the same time
- Queuing to prevent overload
- Configuration Creator for configuring reports, charts, and tables directly in the GUI

2.2 License Variants

- EATB GUI

  User interface supporting the creation of configurations and the generation of reports.

- EATB Worker

  Compact variant of EATB that contains the core application needed to create reports without the UI.

  EATB Worker is available for the following use cases:

  - EATB Worker GUI

    License type that is needed if a report is created using a configuration from the Configuration Creatori.

  - EATB Worker Python

    License type that is needed if a report is created using a Python configuration file.

  - EATB Worker MATLAB

    License type that is needed if a report is created using a MATLAB configuration folder.

  To create several reports at the same time without having to wait until the first one is finished, several EATB Worker licenses are needed. If you want to use Python and MATLAB files in one report, both licenses are required for report creation.

  For more information about EATB Worker, see the EATB_V6.2_Scripting Guide.pdf.

2.3 Basics

2.3.1 Measurement Files

To create a report, you must provide one or more measurement files. EATB reads measurement data with the following file extensions:

- DAT
- MDF 3.x, MDF 4.0, MDF 4.1, and AFF (BLF and DBC)
- TSV, CSV, TXT, and ASCII

  EATB has an auto-detection mechanism that checks the structure of these files and tries to identify the correct parameters and structure. But you can also manually define the structure in the asciiFormat.json file. An example file can be found under C:\Users\UserID\.EATB\config.

If you want to use this option, remove the ".example" extension of the **asciiFormat.json.example** file. Then, make your changes and save the file. Keep the file in this directory. Otherwise, EATB is not able to detect it. If the **asciiFormat.json** file is used, the defined parameters (delimiter, decimal etc.) have the highest priority. EATB uses these parameters to read the values out of your files. If you do not define the structure of the used measurement file in **asciiFormat.json**, then EATB uses the default state so that the first column in your data is considered to be the time vector. If this is not the case, an error message appears. To avoid these error messages, it is recommended to use **asciiFormat.json**.

- *.zip containing files with an extension from above

  If the measurement files are zipped, then EATB unzips the folder in a temporary location. The unzipped files are processed and then deleted. The original *.zip file remains intact. In this case, the MDA path under "Report Info" is pointing to the temporary location. You can then unzip your files and edit the MDA path by entering the new path in order to be able to use the XDA export functionality later. Otherwise, MDA cannot find your measurement files.

By default, EATB uses the MCD Core to read the measurement files.

Note

Do not save MDF 4.x files as DAT files. This can corrupt the reading.

Note

Make sure that the measurements are read in the order they were created. Otherwise, the evaluation is invalid (for example, negative numerator or denominator values in IUMPR tables).

For more information about the available options for measurements, see "EATB Options" on page 71.

2.3.2 Configurations

To create a report, configurations are needed. Configurations allow you to specify all display objects, i.e., charts and tables, to be visualized.

You have the following options to create configurations:

- If you use EATB GUI, you can use the Configuration Creator. It provides an easy but limited option to create configurations. For more information, see "Configuration Creator" on page 53.
- If you use EATB Worker, you have more flexibility to create configurations. You can use Python or MATLAB for your configurations.

  For more information about EATB Worker, see the **EATB_V6.2_Scripting Guide.pdf**.

2.3.3 Report Structure

The report is based on the following hierarchical structure:

- Report
- Chapter
- Section
- Display object (chart or table)
- Child charts / child data

Child charts are displayed in the same chart but contain different data points and can have different settings. The following charts can have child charts: plot, histogram, timeplot, single value bar, and single value line.

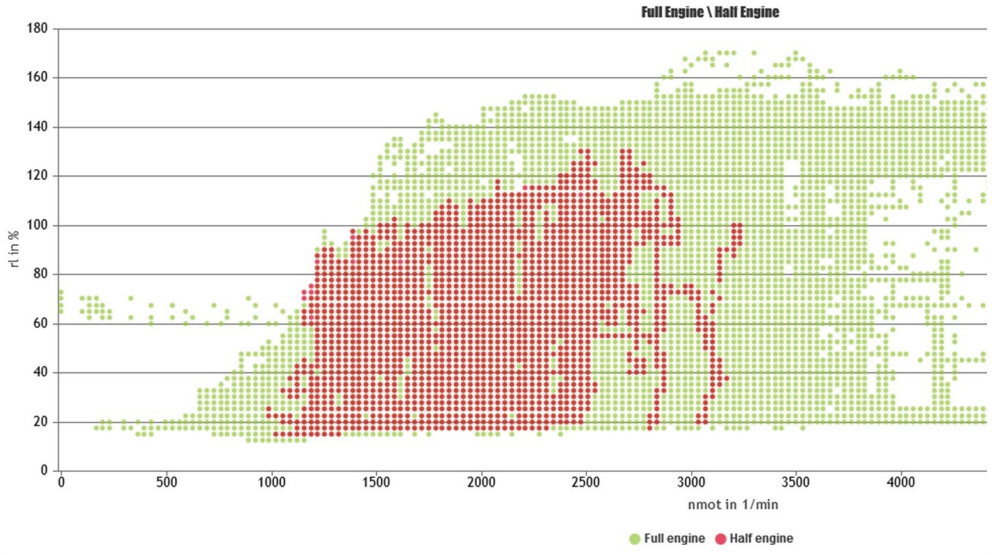
When creating a configuration in the Configuration Creator, see "Creating a Configuration" on page 53. When using the EATB Worker MATLAB, see Configuring Charts and Tables.

2.3.4 Display Objects

A display object is a subunit of a section containing one ore more signals. A display object can either be a chart or table.

2.3.4.1 Plot

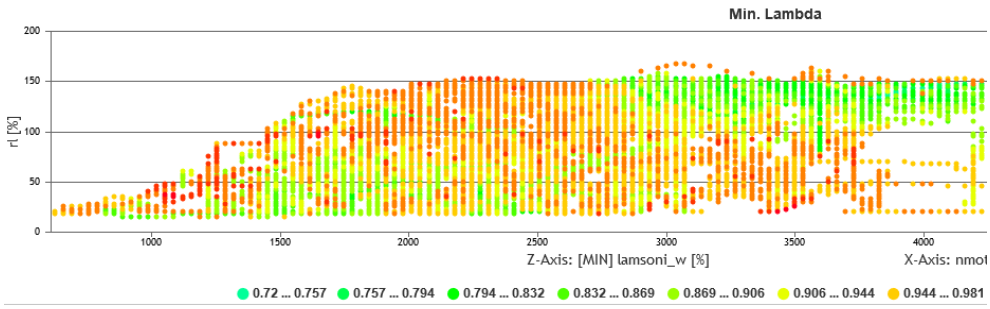
Chart type that represents signals in point clouds, combining two signals and displaying them in dependence. It is also possible to display several signals with different colors in one chart with an associated entry in the legend.



In this example, the engine speed (nmot) is shown on the x axis and the air charge (rl) on the y axis. The plot also has a child shown in red. The red points are the data points when the engine is running in half-engine mode. The green points are the data points when the engine is running in full-engine mode.

2.3.4.2 Scatter

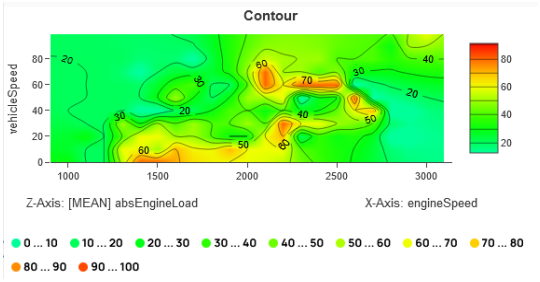
Extension of the chart type plot. In addition to the classical point cloud, a third signal is used for evaluation. The third signal is integrated into the point cloud by a color map and displayed on the z axis.



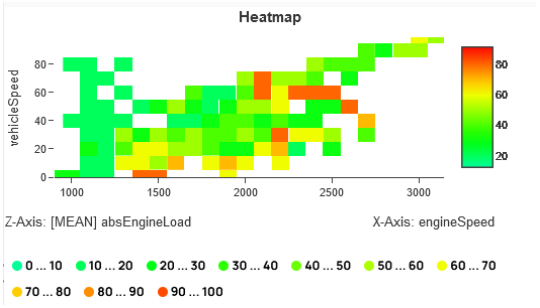
For a given point according to your x and y value, multiple z values can exist. You can specify which z value should be used by defining the display type.

Display Types

- min: Minimum of the corresponding z values
- mean: Mean value of the corresponding z values
- max (default): Maximum of the corresponding z values
- absFrequency: Absolute frequency of the corresponding z values
- relFrequency: Relative frequency of the corresponding z values
- relMeanFrequency: Mean frequency of the corresponding z values
- durationAbs: Absolute duration of all corresponding z values
- contour:

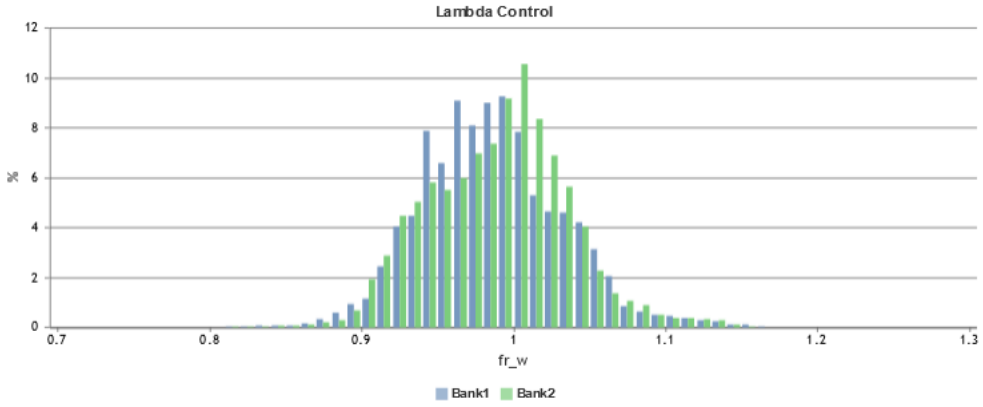


- heatmap:



2.3.4.3 Histogram

Chart type that represents frequency distributions of certain events or values.



Only one signal is allowed as input for the x axis. The y axis can be modified by using display types.

Display Types

- value (default):

  Representation of the frequency distribution of a value in absolute number

- percent:

  Representation of the frequency distribution of a value in percent

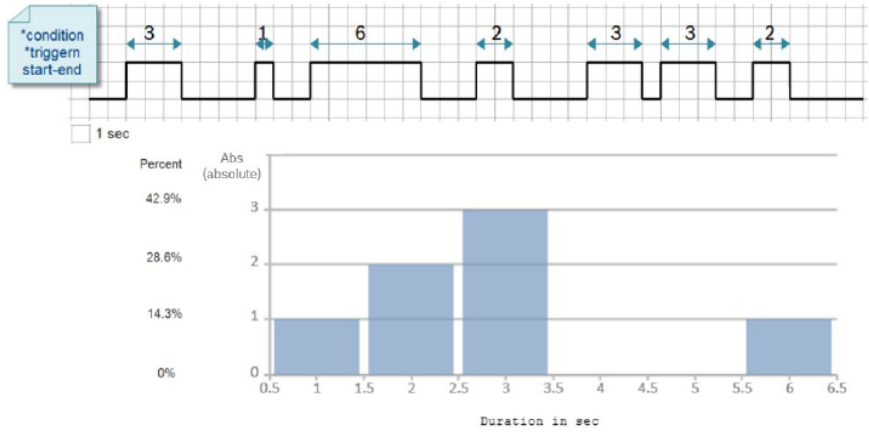
- durationAbs:

  Overview of the duration of a value in absolute number; you must specify at least one condition or two triggers (start+end), otherwise you get the view of value / percent.

– durationPercent:

  Overview of the duration of a defined event shown relative to the data samples selected by the intervals. You must specify at least one condition or two triggers (start+end), otherwise you get the view of value / percent.

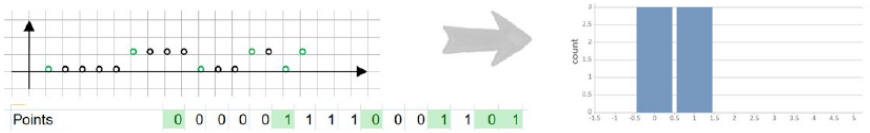
  Example:



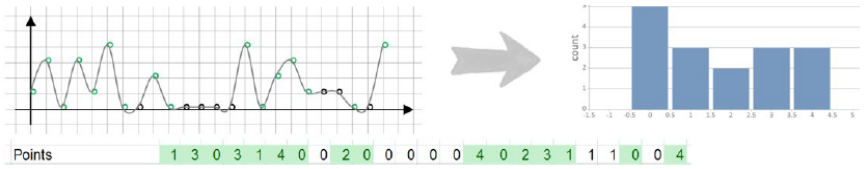
– steps:

  Number of times each value was observed. Continuous segments where the value is consistently present are only counted once.

  Example 1:

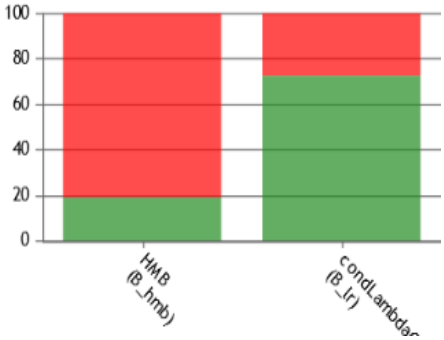


  Example 2:



– bar (for bit signals only):

  Frequency of states to evaluate multiple bit signals; no quantity and range need to be set.



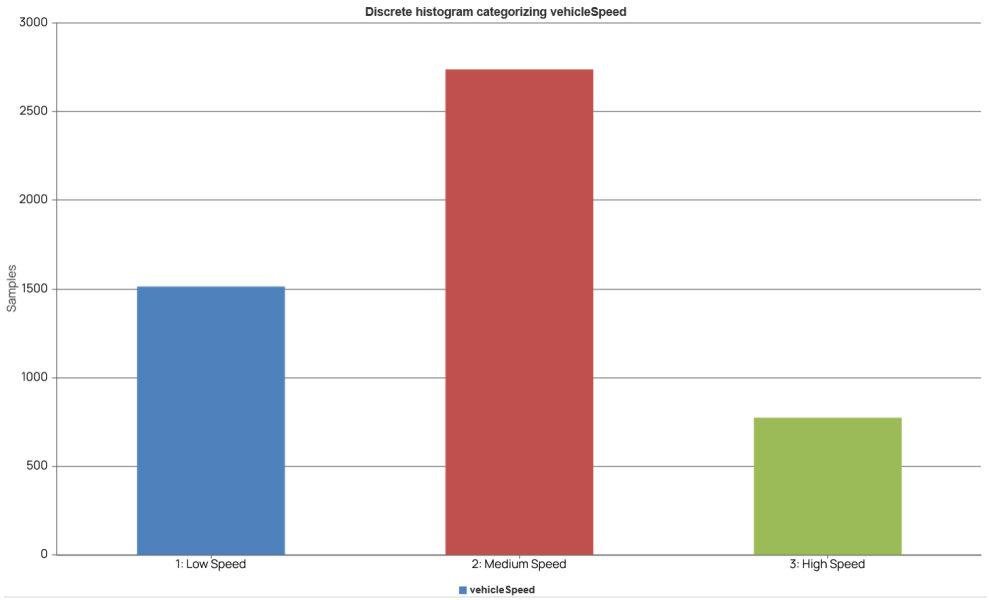
In the generated report, you can switch the display type again.

> **Note**
>
> A subtype of the histogram is "histpie" that represents the data as proportions of a circle. This subtype can only be configured within the EATB APIs.

2.3.4.4 Discrete Histogram

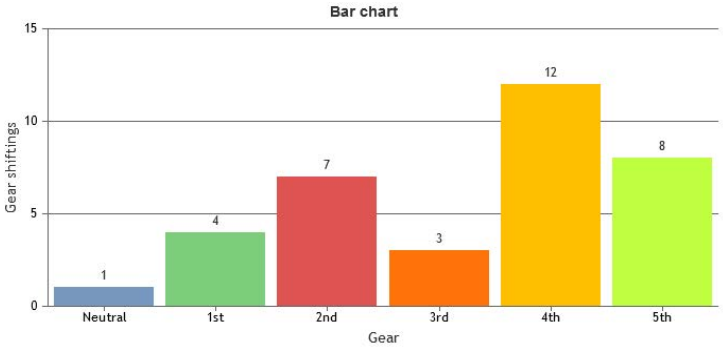
Bar chart that shows the frequency of individual, distinct values in a dataset, rather than grouping them into continuous ranges like a "Histogram" on page 16.

The discrete histogram below displays the distribution of vehicle speed data, categorized into three distinct levels: "1: Low Speed," "2: Medium Speed," and "3: High Speed." The y-axis, labeled "Samples," indicates the count for each category.



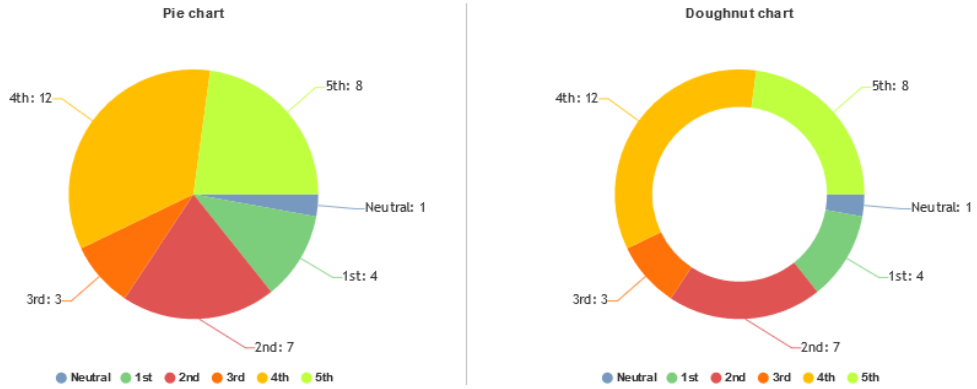
2.3.4.5 Bar

Extension of histogram. This chart type allows to specify the bins on the x axis and the corresponding values of the y axis. This chart type can only be configured within the EATB APIs.



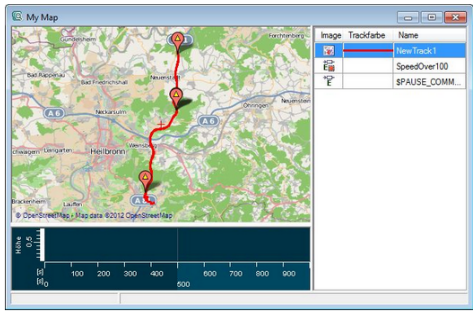
2.3.4.6 Pie

Extension of "histpie" (subtype of histogram). This chart type allows to define the values for each sector. Optionally, the "doughnut" display type can be used. This chart type can only be configured within the EATB APIs.



2.3.4.7 Image

Chart type that allows you to include your own images in the report. This chart type can only be configured within the EATB APIs.



2.3.4.8 Interval

Chart type that represents a segment of a signal whose boundaries are determined by one trigger with duration or one start and one end trigger.

Display Types

- series:

  The x axis shows the index of the samples. The y axis shows the signal values. The start index of the samples for the calculation is the last index from the last measurement + 1.

- stack:

  The x axis shows the index of the samples starting with 1. The y axis shows the signal values.

- minX, minY, meanX, meanY, maxX, maxY:

If only one signal is set for the chart, the x axis shows the samples and the y axis shows the signal values. If two signals are set for the chart, the x axis shows the values of the first signal and the y axis shows the values of the second signal.

- duration:

  The x axis shows the signal values. The y axis shows the durations of found intervals.

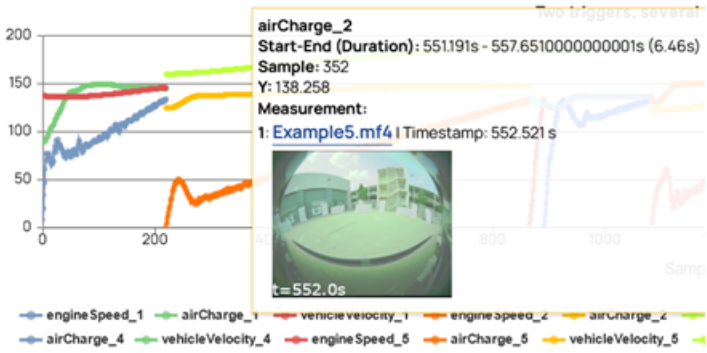
If you use duration or minX, minY, meanX, meanY, maxX, maxY, you get a chart that is similar to a plot. There are two ways for displaying the data: If you specify two signals, the first one is on the x axis and the second one on the y axis. If you specify one signal, the x axis shows individual samples that belong to the individual intervals, respectively.

In the generated report, you can switch between "series" and "stack".

Video Support

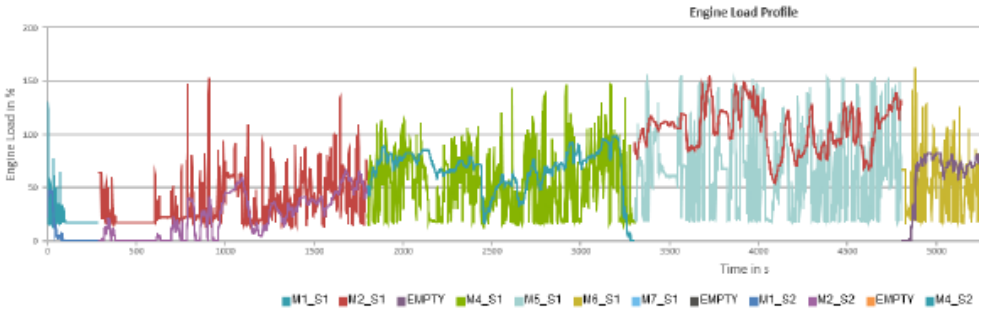
If you have used an environmental camera during measurement recordings, the closest available video information can be shown per timestamp as a screenshot in the tooltip. If multiple videos are available multiple video streams are shown next to each other.

You can enable the video support for timeplots, intervals, and GPS maps. Note that you can only enable videos within the EATB APIs.



2.3.4.9 Timeplot

Chart type that has time as x axis. It plots the signal values on the y axis in dependance on the time when the signal values were measured.



A timeplot requires a considerable amount of memory since a potentially huge amount of data points is stored. It is not recommended to use this chart type for a big measurement set. EATB focuses on extracting the relevant information and hence reducing the original data set. If no prior information is available, MDA can be used to investigate single measurement files and define which analysis should be performed.

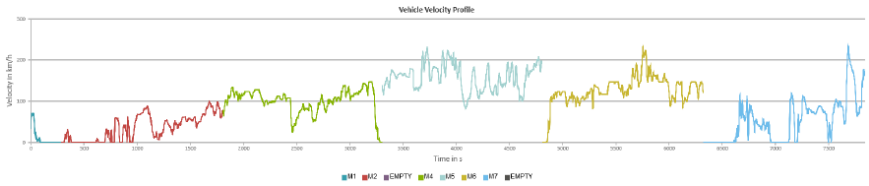
You must provide a quantity value for the time axis. It is recommended to set the quantity as a multiple of the grid. For example, if **grid = 0.003**, then set **quantity = 3.0**. For more information about quantity and grid, see "Calculation Details" on page 37.

Display Types

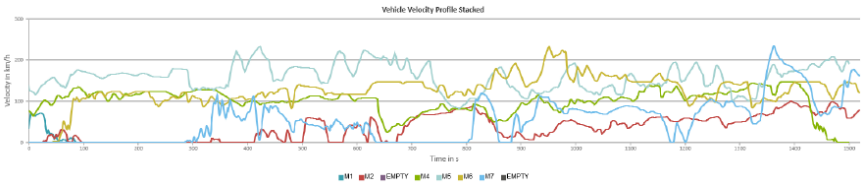
The x axis is the time axis. The y axis shows the signal values. If the display type is "stack", the first sample of every measurements starts with 1.

If there is more than one excerpt in a timeplot, you can select from two display types:

- time: Different excerpts displayed in sequence



- stack: Different excerpts displayed one above the other



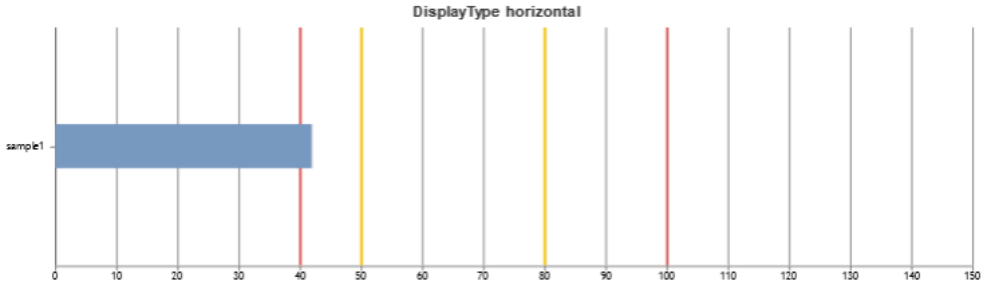
Video Support

If you have used an environmental camera during measurement recordings, the closest available video information can be shown per timestamp as a screenshot in the tooltip. If multiple videos are available multiple video streams are shown next to each other.

You can enable the video support for timeplots, intervals, and GPS maps. Note that you can only enable videos within the EATB APIs.

2.3.4.10 Single Value Bar

Chart type that displays a single value as bar. The bar is just one value, not a class of values. In order to differentiate the thresholds from the bar, the bar is shown rotated to the threshold lines.

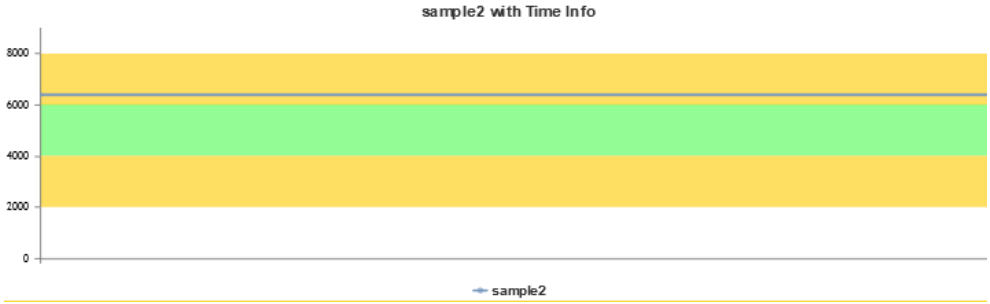


With the display type, you can select how the bar shall be positioned:

- vertical: Vertical single value bar with horizontal thresholds
- horizontal: Horizontal single value bar with vertical thresholds

2.3.4.11 Single Value Line

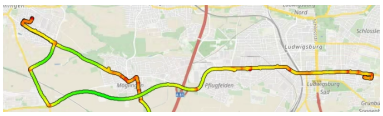
Chart type that displays a single value as line. The thresholds are displayed as ranges. For more information about the ranges, see "Traffic Lights" on page 27.



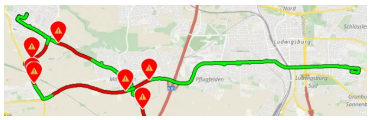
2.3.4.12 GPS Map

Chart type that displays GPS data on an interactive map. Additionally to the longitude and latitude, you can define a third value to visualize how this value changed within the drive. This third value can either be shown as continuous or discrete color gradient. For more information, see "Assigning Signals to the GPS Map" on page 60.

Continuous color gradient



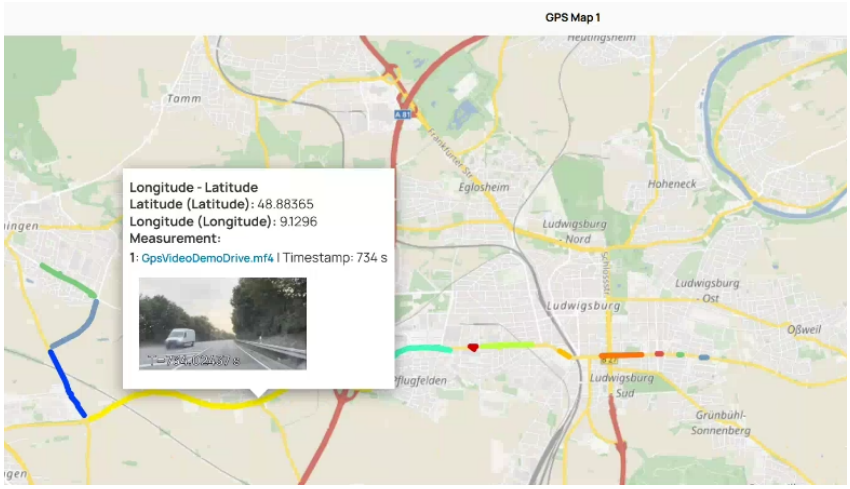
Discrete color gradient



With EATB Worker Python, you can additionally set event markers. For more information, see the "Python Scripting Guide" by clicking .

If you have used an environmental camera during measurement recordings, the closest available video information can be shown per timestamp as a screenshot in the tooltip. If multiple videos are available multiple video streams are shown next to each other.

You can enable the video support for timeplots, intervals, and GPS maps. Note that you can only enable videos within the EATB APIs.



2.3.4.13 MinMax Table

Table type that shows the evaluation of the global maximum and the global minimum of each signal. Additionally, each row shows the associated thresholds and the status of the traffic light. When exceeding a threshold, the affected fields are marked in the appropriate color. If no thresholds are defined for a signal, the traffic light is gray. For more information, see "Traffic Lights" on page 27.

Optionally, conditions and triggers can be defined to select specific intervals of a signal for evaluation. For more information, see "Conditions, Triggers, and Filters" on page 32.

No.	Signal-Id	Signal-Label	Values		Thresholds				Check
			min	max	min	low	high	max	
1	RngMod_trqFltACGeaa	RngMod_trqFltACGeaa	656	1260	22	25	40	2000	
2	engineSpeed	nmot_w	833	1701	100	110	400	1000	
3	zwbas	zwbas	668	931	100	120	1500	20000	
4	Tra_trqDesMin	Tra_trqDesMin	613	1491					

2.3.4.14 IUMPR Table

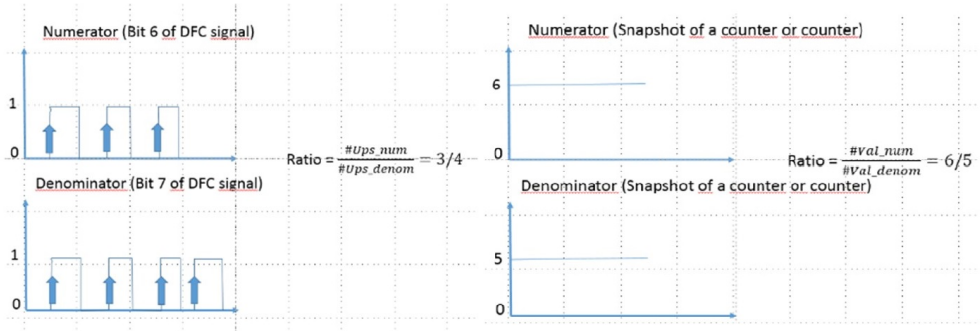
Table type that is used for analyzing DFCs. Each row belongs to one signal and contains the numerator, denominator, the resulting ratio, thresholds, traffic light, and a graphic showing ratio and thresholds.

IUMPR using snapshot measurements

Group	Signal-Id	Num	Denom	Ratio	Thresholds		Check	Ratio and Thresholds
					min	low		
KAT	Ratio_KAT_1	18	18	1	0.336	0.5	●	
KAT	Ratio_KAT_2	18	18	1	0.336	0.5	●	
LSU	Ratio_LSU_1	19	18	1.056	0.336	0.5	●	
LSU	Ratio_LSU_2	18	18	1	0.336	0.5	●	
CAM	Ratio_CAM	33	18	1.833	0.336	0.5	●	
SLS	Ratio_SLS	0	0	7.995	0.336	0.5		
EVAP	Ratio_EVAP	0	0	7.995	0.336	0.5		
LSF	Ratio_LSF_1	19	18	1.056	0.336	0.5	●	
LSF	Ratio_LSF_2	19	18	1.056	0.336	0.5	●	
	Display: cumulative							0 1 2

The numerators and denominators of the ratios can be passed to EATB by two different ways:

- bit: The numerators and denominators of the ratios are stored as bits 6 and 7 of one DFC signal (int8).
- int: The numerators and denominators of the ratios are stored as "counter" signals where the numerator and denominator are counted events and provided in two separate signals.



EATB detects the situation based on the number of signals you provide. Therefore, you cannot mix "bit" and "int".

The following table shows exemplary situations that can appear, where the ratios are set with respect to judicial laws (where defined):

Measurement	**M1**	**M2**	**M3**	**M4**	**M5**	**M6**	**M7**	**M8**
Numerator	0	1	0	1	empty	empty	~=0	10
Denominator	0	0	1	1	empty	~=0	empty	1
Ratio (true I set)	NaN I 7.9-95	Inf I 7.99-5	0 I 0	1 I 1	-- I --	-- I --	-- I --	10 I 7.99-5

Measurement	M1	M2	M3	M4	M5	M6	M7	M8
Status	--	green	red	gree-n	gray	gray	gray	green

In this table, the status "–" means that no traffic light is shown. For more information, see "Traffic Lights" on page 27.

Display Types

- cumulative: One status for all measurements shall be used.
- single: One status per measurement shall be used.

Note that the traffic light on section level is always cumulative. The traffic light colors are set with respect to the following set of rules:

Color	Name	Description
	Gray	Data is missing.
	Green	All ratios are green, i.e. all ratios are above the "low" threshold. No gray, yellow, or red status is in the table.
	Yellow	There is at least one yellow status, i.e. one ratio above the "minimum" and below "low" thresholds. No red status is in the table but gray and green are allowed.
	Red	There is at least one red status, i.e. one ratio below the "minimum" threshold.

In the generated report, you can switch between "cumulative" and "single", i.e., the status of the last measurement.

2.3.4.15 Custom Table

Table type that offers a flexible user-defined layout.

mytable

Name	Value
distance	137km
total distance	36459km
driver	John Brown
check	
Project finished!	

Within **bbCode**, you can format the text in the table as follows:

Formatting	bbCode syntax
Text	[i]some italic text[/i] [b]some bold text[/b] [u]This is underlined text[/u] [s]This is strikethrough text[/s] [quote]This is a quote[/quote] [code]This is some code[/code]
Color	[color=red]This is red text[/color] [color=green]This is green text[/color] [color=blue]This is blue text[/color] [color=yellow]This is yellow text[/color] [color=#123456]This is hex color (#123456) text[/color]
Size	[size=5]This is small text[/size] [size=10]This is normal text[/size] [size=15]This is medium large text[/size] [size=20]This is large text[/size] [size=25]This is extra large text[/size]
Links	[url=https://etas.com/eatb]This is a website link page[/url] [url=mailto:support.de@etas.com]This is an e-mail link [/url] [url=file:///C:/Program%20Files/ETAS/EATB6.2/Documentation]Link to installation directory[/url] that only works for the default installation path of EATB

With respect to reports and configurations, there are the following limitations for this table type:

- To generate a report from a configuration that contains a Custom table, the configuration must also have at least one other chart or table that contains at least one signal. Otherwise, the report cannot be created and an error message is shown.
- If importing a configuration that contains a Custom table as JSON file, the Custom table cannot be imported. You can choose to omit the Custom table and import the configuration without it anyway.

2.3.4.16 DFC Table

Special table type for detecting and reporting the diagnostic fault checks (DFC). Each row contains the DFC value, the file where the status first changed to this DFC value, the time stamp of that change, and the counter of all status changes to this DFC value. This table type can only be configured with the EATB Worker MATLAB license.

DFC values

Value	(First) occurrence in	Timestamp [in s]	(Total) counter
DFC_SCRCtlRmnDstInfo (183)	10-07- .dat	3168.942	3
DFC_SCRCtlRmnDstWrn1 (184)	10-07- .dat	3168.952	1
DFC_EGRVlvCurrLim (562)	10-07- .dat	342.338	2

There are three traffic light statuses:

Color	Name	Description
	Gray	Missing signal(s) in measurement
	Green	No DFC status changes were found (empty table) and measurements contain all required signals.
	Red	At least one DFC status change was found (non-empty table).

2.3.5 Thresholds

Thresholds are used to indicate whether evaluated data is located inside or outside some given range or area. Thresholds are visualized with traffic lights.

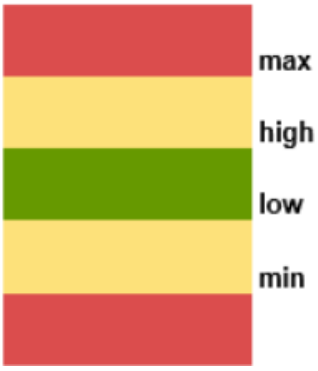
2.3.5.1 Traffic Lights

Traffic lights on all levels of the report structure indicate if a defined threshold has been violated. Based on the traffic lights of each display object, traffic lights on higher levels are calculated automatically.

The traffic light colors are defined as follows:

Icons	Icons (new)	Description
		No thresholds were set or signals were empty.
	✓	No threshold is violated.
		No critical threshold is violated.
		A critical threshold is violated.

The ranges for the colors are defined as follows:



Red range (max): x > max

Yellow range (high): high < x <= max

Green range: low <= x <= high

Yellow range (low): min <= x < low

Red range (min): x < min

> **Note**
>
> Accepted threshold violations are thresholds that have been defined as not critical for the evaluation during report creation. The accepted threshold violations are shown as follows:
>
> Accepted threshold violation in the yellow range: ⚠
>
> Accepted threshold violation in the red range: ⓘ

2.3.5.2 Threshold Types

The following threshold types exist:

- Constant thresholds:

  Threshold type that takes four constants (min, low, high, max) as thresholds. The calculation of the constant threshold is based on the corresponding signal only.

  Constant thresholds can be used with the following chart types:

  - Plot
  - Scatter

    The threshold applies to the signal data and not to the display types (e.g., min, max, mean).
  - Histogram
  - Interval:

    For stack or series display types, the thresholds can only be set on the y axis.
  - Timeplot:

    The thresholds can only be set on the y axis.
  - MinMax table
- Function thresholds:

  Threshold type that takes four MATLAB anonymous functions (min, low, high, max) as thresholds, which define the green, yellow, and red ranges. Two signals are needed to calculate a function threshold: The values of

the first signal (x axis) are used to calculate the threshold values as functions of this signal and to compare the calculated values with the values of the second signal (y axis).

If you use the Configuration Creator, you can only define constant thresholds. For more information, see "Setting Thresholds" on page 61.

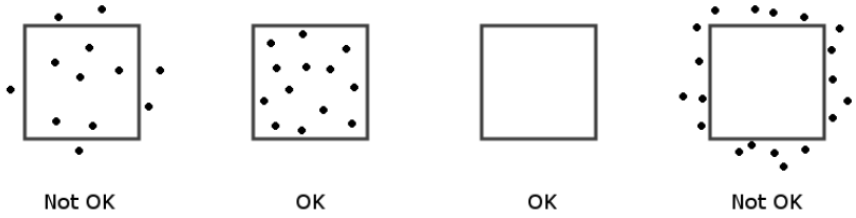
2.3.5.3 Evaluation Behaviors and Tolerance Types

For each threshold, you can define the evaluation behavior and / or the tolerance type. If you combine both, it has an impact on the evaluation.

Evaluation Behaviors

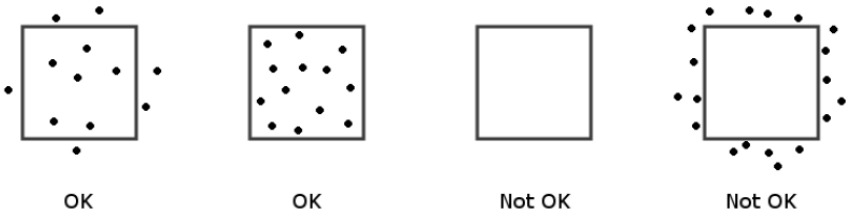
- all:

  As long as at least one point is outside the feasible range, the threshold is violated.



- any:

  As long as at least one point is in the feasible range, the threshold is not violated.



Tolerance Types

You can set the tolerance for the evaluation of traffic lights. In this case, the traffic lights change if the tolerance condition also applies.

> **Note**
>
> The MinMax table does not support any tolerance types.

The following tolerance types are available:

- percent:

  Tolerance type that defines the minimum or maximum percentage of the points that must or may lie inside or outside the feasible range without violating the thresholds.

- time:

  Tolerance type that defines the maximum time in seconds, for which the time series can leave the feasible range continuously, and the thresholds would still be considered as not violated.

- count:

  Tolerance type that defines how many points are allowed to lie inside or outside the feasible range and the thresholds would still be considered as not violated. This evaluation behavior corresponds to percent tolerance but uses the absolute instead of relative point numbers.

> **Note**
>
> For percent and time, the value has to be in quotation marks. For count, it is not allowed to use quotation marks for the value.

Combinations of Evaluation Behaviors and Tolerance Types

The ranges are based on the definition as given in "Traffic Lights" on page 27.

- **"all" without tolerance**

  If all points are in the green range, the traffic light is green.

  If >= 1 points are in the yellow range, the traffic light is yellow.

  If >= 1 points are in the red range, the traffic light is red.

  The red light has the highest priority, then yellow, then green.

- **"all" with percent tolerance, e.g., "10%"**

  The maximum percentage of all charts points that could lie outside of the feasible range and the thresholds still would be considered as not violated.

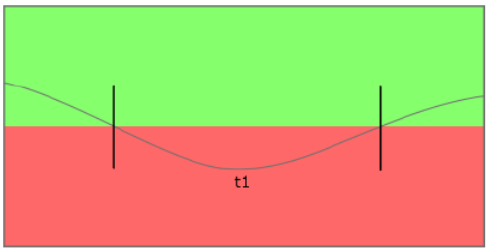
  If >= 90% points are in the green range, the traffic light is green.

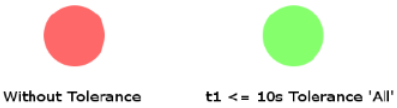
  If < 90% points are in the green range, and >= 90% points in yellow and green range, the traffic light is yellow.

  If < 90% points are in the green and yellow ranges, the traffic light is red.

- **"all" with time tolerance, e.g., "10s"**

  The maximum time in seconds that the time series can leave the feasible area continuously and the thresholds would still be considered as not violated.





If the signal time series enters the yellow range > 10s continuously, the traffic light is yellow.

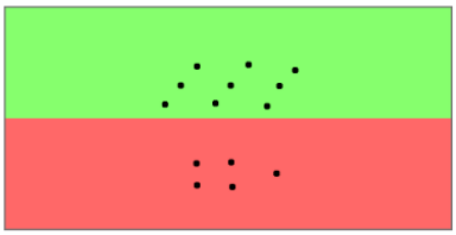
If the signal time series enters the red range > 10s continuously, the traffic light is red.

Otherwise the traffic light is green.

Red light has the highest priority, then yellow, then green.

- **"all" with count tolerance, e.g., 5**

  The maximum signal points are allowed to lie outside of the feasible range and the thresholds would still be considered as not violated.



If < = 5 points are in yellow and red ranges, the traffic light is green.

If > 5 points are in yellow and red ranges and < = 5 points in red range, the traffic light is yellow.

If > 5 points are in the red range, the traffic light is red.

- **"any" without tolerance**

  If all points are in red range, the traffic light is red.

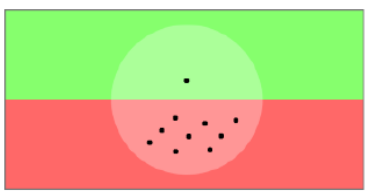
  If >= 1 point are in the yellow range, the traffic light is yellow.

  If >= 1 point are in the green range, the traffic light is green.

  Green light has the highest priority, then yellow, then red.

- **"any" with percent tolerance, e.g., "10%"**

  The minimum percentage of the points which must lie inside of the feasible range so that the thresholds would be considered as not violated.



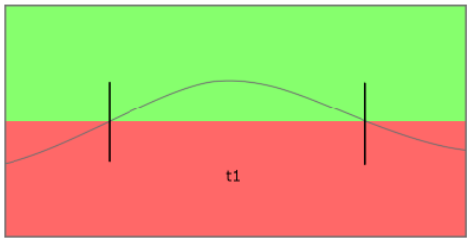
If >= 90% points are in the red range, the traffic light is red.

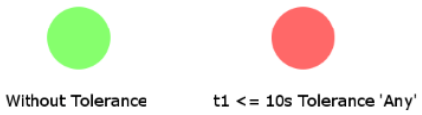
If < 90% points are in the red range and >= 90% points in yellow and red range, the traffic light is yellow.

If < 90% points are in yellow and red ranges, the traffic light is green.

- **"any" with time tolerance, e.g., "10s"**

  The minimum time in seconds that the time series must enter the feasible range continuously and the thresholds would be considered as not violated.





If the signal time series enters the yellow range > 10s continuously, the traffic light is yellow.

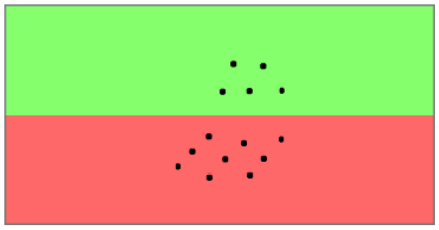
If the signal time series enters the green range > 10s continuously, the traffic light is green.

Otherwise, the traffic light is red.

Green light has the highest priority, then yellow, then red.

- **"any" with count tolerance, e.g., 5**

  The minimum signal points are needed to lie inside of the feasible range so that the thresholds would be considered as not violated.



If <= 5 points are in yellow and green ranges, the traffic light is red.

If > 5 points are in yellow and green ranges and <= 5 points in green range, the traffic light is yellow.

If > 5 points are in the green range, the traffic light is green.

2.3.6 Conditions, Triggers, and Filters

Conditions

Definition: Reduction of the processed signal samples, to only consider samples for which a given condition holds true.

Triggers

Definition: Extraction of a set of relevant measurement file intervals that shall be considered. These intervals can be based upon conditions or events identified through triggers.

Filters

- **Conditional Filter:**

  Definition: Filter type that calculates a binary mask which is used to hide insignificant points. Conditional filters can be applied to measured and calculated signals and the filter results can be plotted.

  - Step Detector: Basic step detection
  - Step Detector Canny: Step detection according to the Canny method
  - Steady MinMax: Basic detection of stationary states with a moving window min / max filter
  - Steady SAM: Detection of stationary states

- **Inline Filter:**

  Definition: Filter type that is based on the time (as used in signal processing). Inline filters are always applied to the plotted signals.

  - BP1: Band pass filter 1st order
  - HP1: High pass filter 1st order
  - PT1: Low pass filter 1st order

Applicability of Conditions, Triggers, and Filters

Only for the display objects listed in the table below, filters, triggers, or conditions are available. All other display objects do not support these options.

Display Object	Condition	Trigger	Filter
Plot	YES	YES	YES
Scatter	YES	YES	YES
Histogram	YES	YES	YES

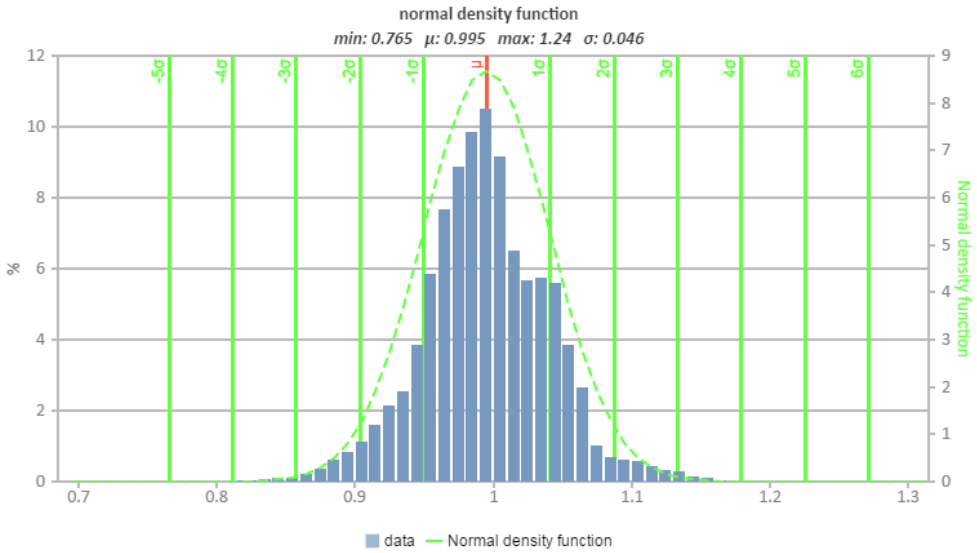
Interval	YES	Only for the definition of the interval (start and end trigger or one duration trigger)	Inline filter only
Timeplot	YES (timestamps not always supported)	NO	Inline filter only (timestamps not always supported)
MinMax	YES (timestamps not always supported)	YES (timestamps not always supported)	YES (timestamps not always supported)

Note

If both, conditions and triggers are defined in the EATB MATLAB API, EATB Worker MATLAB applies the conditions first. Then, the triggers act on the signal data selected by the conditions.

2.3.7 Chart Functions

In plots and histograms, you can use chart functions for statistical analysis. The following example shows the normal density function:



Note that the functions always depend on one specific data series (of the parent or x^{th} child chart).

The following chart functions are available:

Name	Chart Type	Description	Key
Lower boundary	plot	Adds a lower boundary that connects the smallest neighbor y values for each x value.	'lb', 'lower boundary'
Upper boundary	plot	Adds upper boundary that connects the biggest neighbor y values for each x value.	'ub', 'upper boundary'
Avg	plot	Adds an average line between the min and max values as y = ((maxy - miny) / 2) + miny.	'avg'
Weighted avg	plot	Adds a weighted average line between the min and max value according to the number of points as ∑ points(i) * weight(i), where weight (i) = 1 / number of points.	'avgw', 'weighted avg'

+ / - sigma	plot	Adds the sigma values as standard deviations.	'sigma'
normal density function	histogram	Adds the normal density function and sigma-grid.	'ndf', 'normal density function'
Minimum / Average / Maximum	histogram	Shows minimum, maximum, and average of one set of data displayed in the chart.	'minmeanmax', 'min, mean, max'
distribution function	histogram	Adds the cumulative distribution function (range 0...1).	'distribution', distribution function'
Sigma values	histogram	Adds the sigma values as standard deviations.	-
Quartile	histogram	Adds the 25%, median, and 75% quartiles.	'quartile'

In the generated report, you can add these functions to the chart.

If you use the EATB MATLAB API, you can predefine these functions in the configuration by using **tempChart.addChartFunction('')**. In this command, one of the keys in the table above can be used in the quotation marks. When you generate the report, the predefined function is displayed.

2.3.8 Merge Modes

Several evaluations can be merged during the creation of the report. How the evaluations shall be merged can be defined by different merge modes. In the report, you can change this merge mode again.

The following merge modes exist:

- **Split (group same points)**

  Appends the data series. All common points are marked with a different color as a group. You can change the default name of the group ("same").

- **Split**

  Appends the data series. Each report is marked in a different color to distinguish it from the other reports.

- **Combined**

  Merges all points of data series into one. The parent chart is merged with the parent chart, the first child chart is merged with the first child chart and so forth. In the report, you can distinguish the points via the legend (e.g. " Epm_nEng@Report1" and "Epm_nEng@Report2").

Not all display objects support all merge modes. The following table shows the supported merge modes:

Display Object	Split (group same points)	Split	Combined
Plot	YES	YES	YES
Scatter	-	-	YES
Histogram	-	YES	YES
Interval	-	YES	-
Timeplot	-	YES	-
Single Value Bar	-	YES	-
Single Value Line	-	YES	-
MinMax Table	-	YES	YES
IUMPR Table	-	YES	YES
Custom Table	-	YES	-
DFC Table	-	YES	-

Note

Histpie, bar, pie, image, and interval in box-whisker view do not support any merge mode. In a merged report, these charts are shown empty.

2.3.9 Calculation Details

Precision

As EATB is based on MATLAB, the result of the calculation is limited to three digits after the decimal point. In very few cases, this limit can become an issue. If you want more precise data in your report, the recommended workaround is

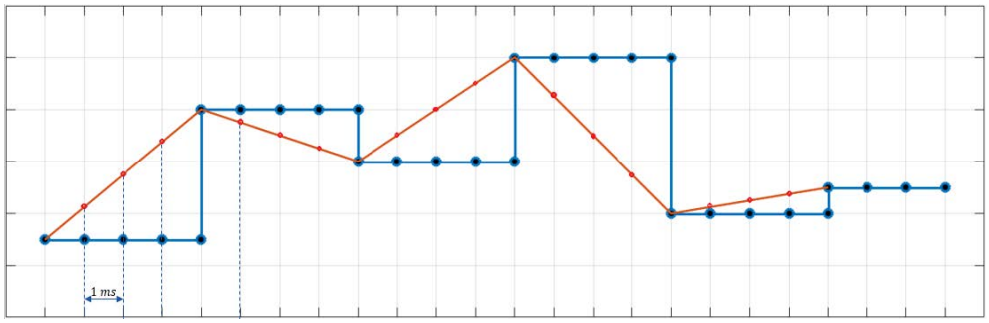
to multiply the result or the signal itself by a factor to shift the decimal point to the right. Otherwise, you can use the **numberOfDecPosInData** parameter. If you increase this number, you get more precise data but larger reports. For more information, see "EATB Options" on page 71.

For time vectors ("interval" and "time" chart types), the smallest unit is micro-seconds.

> **Note**
>
> The precision of EATB is never higher than your specified interpolation grid or quantity values.

Interpolation

For the interpolation, the zero-order hold interpolation (in blue color) is used. The linear interpolation (in red color) cannot be used due to the bit signals.



Signals from different channel groups and with different sample rate cannot be compared and used for calculations due to a dimension mismatch. Therefore, you must specify the interpolation grid before starting an evaluation.

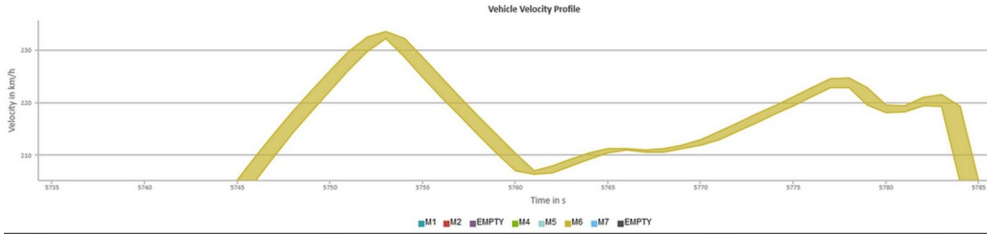
Pay attention when choosing the grid value: If the grid is too small, the calculations take much longer. For grids < 0.01s, limited memory can become an issue. If the grid is too large, some events are not detected. Take into consideration the time rate of the events you are interested in and adjust the grid appropriately.

Quantity

Quantity is defined as the step size of the quantization applied to the corresponding signal. It affects the amount of data in the report. Considering performance and report size, you should always use the highest possible value for the quantization step size. The smallest value that the quantity can take on is always the sample rate. This means that the quantity can be only a value > 0. A quantity of 0 or negative values are not allowed and lead to an error.

Note that grid and quantity are different: Grid affects the interpolation of each signal in all measurements. Quantity is the step size of the quantizer applied to the signals in a chart.

In the following image, a signal over time is depicted and the effect of quantity in timeplots is illustrated. In timeplots, the quantization is applied to the time axis only whereas the values on the y axis are determined differently. Consider the yellow area between the lines. The lines bordering this area represent the minimum and the maximum values over the individual quantization time segments. All points on these time segments that occurred between the minima and maxima are mapped to these two values on the corresponding time segment.



Duplicated Points

All duplicated points in the charts are removed during the calculation to reduce the amount of data. In the report, the tooltip shows the information of the first occurrence of a point.

If several measurement files are used, the point is the first occurrence of all measurement files. Only in case of histograms, you get the first occurrence per measurement file.

2.4 Finding Out More

Help and Manuals

The following documents are stored in the **Documentation** folder (by default under **C:\Program Files\ETAS\EATBx.y**):

- EATB_V6.2_EULA-End_User_License_Agreement.pdf
- EATB_V6.2_Installation_Guide.pdf
- EATB_V6.2_Release_Notes.pdf
- ETAS_Safety_Advice.pdf

In the **User Manual** subfolder, you can find the following documents:

- EATB_V6.2_MATLAB_Scripting Guide.pdf
- EATB_V6.2_User Guide.pdf (this document)

After opening EATB in your browser, you find further information such as the "Python Scripting Guide" by clicking  .

Demo Data

The following demo data are stored in the directory that was defined during the installation:

- **DemoPythonConfigs**:
  Python configuration (*.py) files
- **DemoConfigs**:
  Configuration and functions files (*.m, *.eatb) as well as a DCM file (*.dcm)
- **DemoMeasurements**:
  Measurement files (*.mf4) and meta data files (*.json)
- **UseCaseDemos**:
  Small Python configuration (*.py) files showing specific use cases

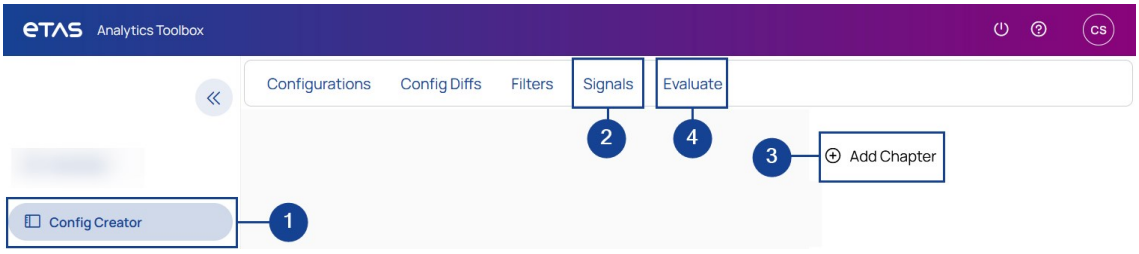
3 Getting Started

Do you want to quickly create your first report to see what you can do with EATB? – Then, perform these three steps to get a first impression:

A. "Defining the Report Structure and Display Objects" below
B. "Creating a New ReportQuickly" on the next page
C. "Using the Report" on the next page

3.1 Defining the Report Structure and Display Objects

To create a report, configurations are needed. Configurations allow you to specify all display objects, i.e., charts and tables, to be visualized.



In EATB GUI, these are the basic steps to create your first configuration:

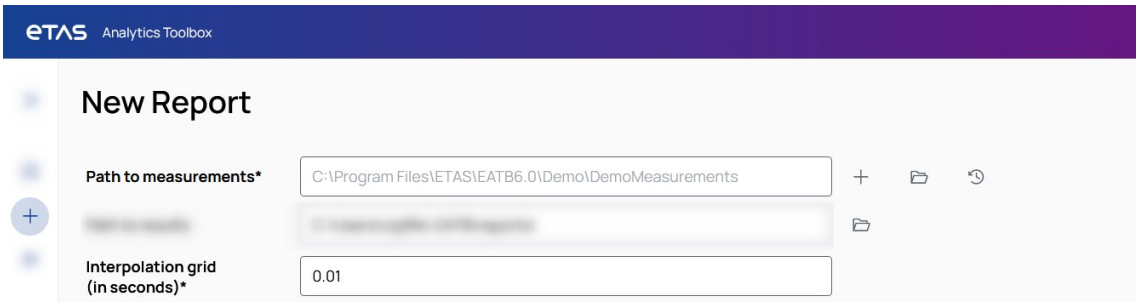
1. In EATB GUI, click **Config Creator**.
2. To import signal labels, click **Signals**.

   You can choose to load the signals from measurements or LAB files. After the loading is done, all signals are displayed. For more information, see "Importing Signals" on page 53.
3. In the **Configuration Creator**, define your report structure:
   i. Click **Add Chapter**.
   ii. Click **Add Section**.
   iii. Click **Add Chart** (see also "Adding Display Objects" on page 54).
   iv. Depending on the display object, assign one or more signals to it (see also "Assigning Signals" on page 60).
   v. Set additional properties. For example, you can set thresholds for signals in a chart (see also "Setting Thresholds" on page 61).
4. To start the new evaluation, click **Evaluate**.

   EATB switches to **New Report.**

Is your configuration ready? – Then, continue with "Creating a New ReportQuickly" on the next page.

3.2 Creating a New ReportQuickly



1. On the **New Report** tab, enter all mandatory information:
   - **Path to measurements**

     Include a path to your measurements folder or to a specific measurement file. You can also click the **+** button to add more measurement paths.
   - **Interpolation grid**

     Specify the interpolation grid that should be used during the calculation. EATB needs this information to synchronize signals from different channel groups. For more information, see "Calculation Details" on page 37.

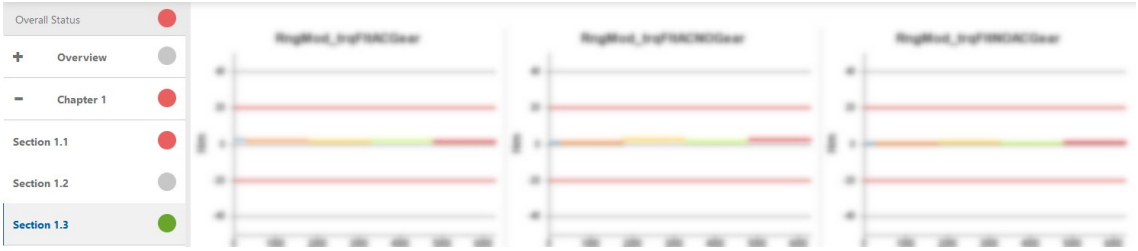
   The configuration that you created previously in the Configuration Creator is automatically displayed and selected. For more information about the optional data fields, see "Creating a New Report" on page 46.
2. To start the evaluation, click **Create**.

   EATB automatically switches to **Report Progress**. All entries are validated. For more information, see "Checking the Status of the Running Report" on page 48.

Was the creation of your report successful? – Then, continue with "Using the Report" below.

3.3 Using the Report

In the report, the structure that you have defined before is shown on the left.

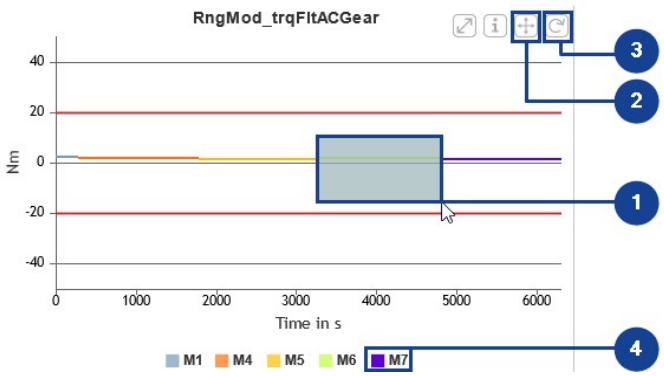


Traffic lights on all levels of the report structure indicate if a defined threshold has been violated. Based on the traffic lights of each display object, traffic lights on higher levels are calculated automatically.

The traffic light colors are defined as follows:

Icons	Icons (new)	Description
		No thresholds were set or signals were empty.
		No threshold is violated.
		No critical threshold is violated.
		A critical threshold is violated.

On the right, the display objects of the currently active section are displayed. Within each chart, these are the main functionalities:

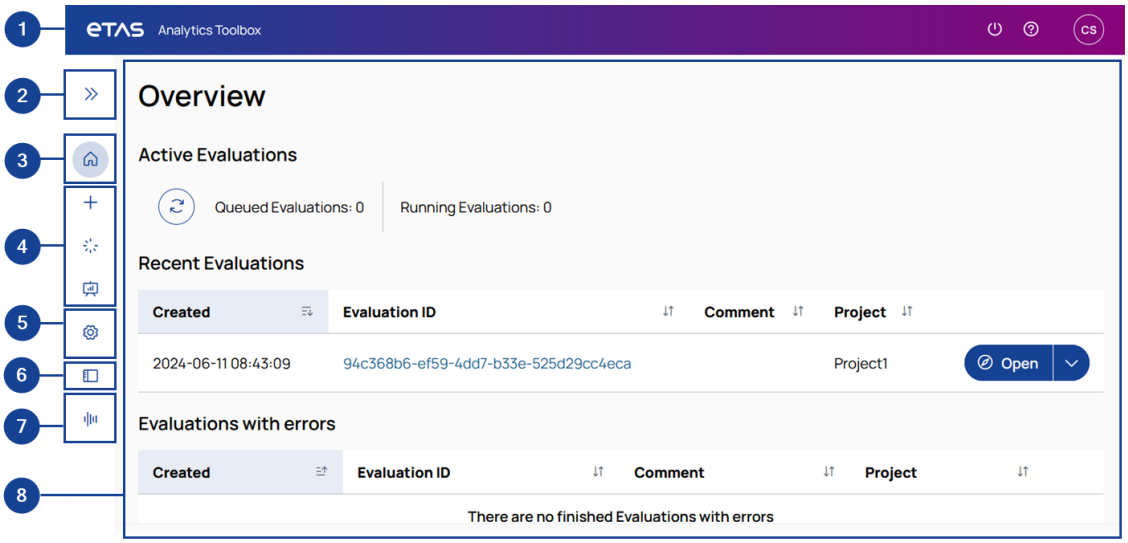


1. **Zooming:** Keep the left mouse button pressed while moving the cursor.
2. **Scrolling:** To switch to the scroll mode, click .
3. **Showing the complete chart again:** Click .
4. **Hiding samples:** Click the corresponding name in the legend.

For more information about all report features, see "EATB Report" on page 77.

4 EATB GUI

EATB GUI is a web interface that supports you to generate and evaluate reports. EATB is launched in your default web browser.



No.	Description
1	Toolbar: Set your user profile, get additional information, or close EATB GUI.
2	Sidebar arrow: Close or open the sidebar view.
3	Overview: Get a quick overview of your reports.
4	Reports: Create a new report, check the report progress, or maintain your created reports.
5	Configurations: Select one of your existing configurations and continue working with it.
6	Configuration Creator: Configure display objects and reports.
7	Signals: Create new signals, import, and export config_signals.csv.
8	Main window: Displays the information that you have selected via the sidebar buttons (numbers 3-7 above).

4.1 Using the Toolbar

Via the toolbar, you can perform the following actions:

To close EATB

- On the toolbar, click  .

  This button terminates the session completely.

Or

- On your web browser, click  .

  If you only close the browser, the session is not terminated. EATB is still running in the background. You can reopen your browser and type **http://-localhost:9231/** to return to EATB. Note that 9231 is the default port value. Depending on your port configuration during the installation of EATB, this value can differ.

To get help and additional information

1. On the toolbar, click  .
2. From the drop-down menu, select the entry of the information that your are interested in.

To set your user profile

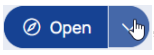
1. On the toolbar, click the icon with the initials, e.g.,  .

   The **Profile** dialog opens.
2. Enter your user information.

   This information can be applied for each new evaluation that you create. For more information, see "Creating a New Report" on the next page.

4.2 Using the Overview

In EATB GUI, click **Overview** to display the status of all your evaluations:

- **Active evaluations**: Shows the workload of the EATB instance. You can see how many jobs are queued and currently executed.
- **Recent evaluations**: Shows the last evaluations that you created. By clicking  , you can perform the actions as described in "Searching and Opening" on page 49.
- **Evaluations with errors**: This table shows evaluations that were not successfully created. Check the log files for further information:
  - C:\Users\UserId\.EATB\x.y.z (application log file)
  - C:\Users\UserId\.EATB\logfiles (report log file)

4.3 Creating a New Report

1. In EATB GUI, click ＋ **New Report**.
2. Enter all mandatory information:
   - **Path to measurements**

     Include a path to your measurements folder or to a specific measurement file. You can also click the **+** button to add additional paths. For more information about the supported file formats, see "Measurement Files " on page 12.
   - **Interpolation grid (in seconds)**

     Specify the interpolation grid that should be used during the calculation. EATB needs this information to synchronize signals from different channel groups. For more information, see "Calculation Details" on page 37.
   - **Configuration**

     To create a report, configurations are needed. Configurations allow you to specify all display objects, i.e., charts and tables, to be visualized.

     Provide at least one path to the configuration via the following fields:
     - **Path to config (Matlab)**

       Include the path to the configuration files created with the EATB MATLAB API.
     - **Path to config (Python)**

       Include the path to the configuration created with the EATB Python API.
     - **Path to project-config**

       If for a project some specific configurations are needed (e.g. system variable, or additional charts), you can add the path to these files.
3. Optionally, you can enter the following information:
   - **Path to results**

     Enter a path to a storage location for your reports. By default, this location is set to your user directory C:\Users\UserID\.EATB.
   - **Employee**

     Add a name to your report or select the checkbox to apply the profile information. Consider that this information is shown in the report.
   - **Company and project**

     Enter company- and project-specific information.
   - **Comment**

     Enter a comment to add more useful information about your project.

- **Path to metadata**

  Include a path to a JSON file (or a directory containing JSON files) that contains your metadata. EATB expects the information as key-value pairs. The maximum permissible file size for a JSON file is 100 kB. The maximum permissible size for all imported JSON files together is 400 kB.

  Alternatively, you can define the path to metadata files in the **config_system.m** or **start.m** configuration files with the following syntax:

  ```
  rb.settings.pathMetaData =
  {'C:\folder1', 'C:\folder2\metadata.json', 'C:\folder3'};
  ```

  To display the metadata in your report, open the finalized report and click  .

- **Configuration from database**

  Select a configuration that you have created in the Configuration Creator before.

- **Path to DCMs**

  Add the path to a DCM file or alternatively to A2L files and HEX files. You can select multiple A2L files and HEX files or define a path to a folder that contains many A2L files and HEX files. Each HEX file must correspond to its A2L file by having the same file name.

For a quick overview, you can use the demo data. For more information, see "Using the Demo Data for a New Report" below.

4. Optionally, add a customized parameter by clicking **Add new attribute**.

   A new empty field appears. Enter a parameter and a value. Only parameters are accepted that are listed in "EATB Options" on page 71. The parameter name must exactly match the EATB Options. You can add as many new attributes as you need.

   If you want to delete a customized parameter, delete the key field and the input field. Empty rows will be ignored.

5. To start the evaluation, click **Create**.

   EATB automatically switches to **Report Progress**. All entries are validated. For more information, see "Checking the Status of the Running Report" on the next page.

4.4 Using the Demo Data for a New Report

You can use the demo data to get a quick overview of all available display objects in EATB. By default, the demo data is stored under C:\Program Files\ETAS\EATBx.y\Demo.

1. In EATB GUI, click + **New Report**.
2. Enter the following information:
   - **Path to measurements**:
     C:\Program Files\ETAS\EATBx.y\Demo\DemoMeasurements.
   - **Path to config (Matlab)**:
     C:\Program Files\ETAS\EATBx.y\Demo\DemoConfigs.
   - **Path to config (Python)**:
     C:\Program Files\ETAS\EATBx.y\Demo\DemoPythonConfigs.
   - **Path to dcms**:
     C:\Program Files\ETAS\EATBx.y\Demo\DemoConfigs.
   - **Path to results**:
     Enter a path to a storage location for your reports. By default, this location is set to your user directory C:\Users\UserID\.EATB.

     Note

     In some cases, you cannot open reports directly from the reports folder due to the security settings of your browser. A notification opens.

     To open your report, drag the result file of your report into the dedicated browser area.
3. Enter all other mandatory settings.
4. To start the report, click **Create**.

   EATB automatically switches to **Report Progress**. All entries are validated. For more information, see "Checking the Status of the Running Report" below.

4.5 Checking the Status of the Running Report

As prerequisite, you have performed the steps as described in "Creating a New Report" on page 46. As soon as you start the report creation there, EATB automatically switches to **Report Progress**.

The creation comprises the following steps:

- **Initialization**
  The job is transferred from the browser to the server.
- **Validation**
  The server validates the specified values of the evaluation. All paths that you have entered are validated.

- **Job queued**
  EATB uses multiple queues for your jobs to prevent an overload of the machine on which EATB is running. You can add multiple jobs. You can also close your browser and open the page later again.
- **Evaluation**
  The evaluation is created.
- **Creating results**
  The metadata and the report preparation are saved.

As soon as the process has successfully finished, the report opens automatically in your browser. Make sure that pop-ups are not blocked.

If a step fails, it is highlighted in red. If a step can be performed but needs your attention, it is highlighted in yellow.

To check the log messages

1. Click the progress bar or the little arrow button.
2. Read the details and correct the errors.

4.6 Maintaining the Created Reports

In EATB GUI, click **Reports** to display the list of created reports. EATB does not allow any multi-user access. Therefore, the reports listed on this page can be created and accessed only by yourself.

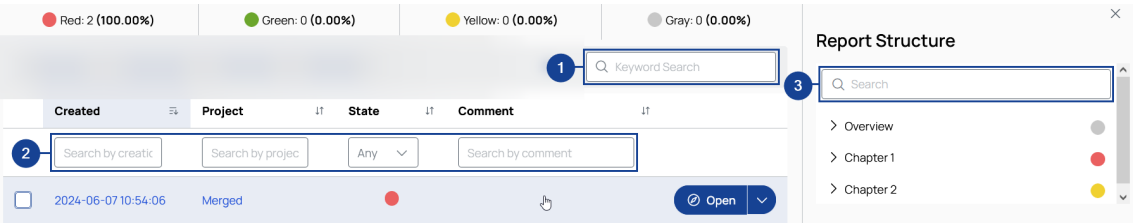
4.6.1 Searching and Opening

In **Last Evaluations**, as soon as you click one of the evaluation listed in the table, the report structure and report information is shown to the right.

You can perform the following actions for each report:

- "To search" below
- "To open a report" on the next page
- "To perform more actions for a report" on the next page

To search



No.	Description
1	Search across all last evaluations via the keyword search (incl. chapter, section, and chart names). The evaluations in which the keyword has been found are displayed in the table. If you want to search within a specific evaluation, click this table entry and proceed with 3.
2	Search per column within the table (Created, Project, State, or Comment).
3	Search within the report structure for chapter, sections, charts.

> **Note**
>
> The traffic lights at the top always display the information (amount and percentage) according to your entered search criteria.

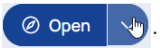
To open a report

1. Click 

.

   The report opens in a separate browser window.

To perform more actions for a report

1. Click 

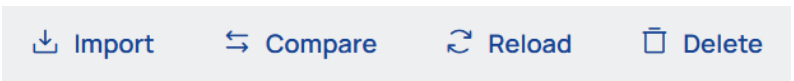
.
2. Select one of the following entries:
   - **Replay**

     Switches the view to **New Evaluation** with the customized settings of the report.
   - **Edit**

     Allows to change the project name and the comment.
   - **Zip Report**
   - **Zip Report including Measurements**
   - **Open Logfile**
   - **Delete Report from Disk**
   - **Delete Report from List**

4.6.2 Importing, Comparing, Reloading, and Deleting

In **Last Evaluations**, you can perform the following actions via the toolbar:



- "To import an existing evaluation" on the next page
- "To compare and merge evaluations" on the next page
- "To reload evaluations" on page 52

– "To delete evaluations" on the next page

To import an existing evaluation

You can import an existing evaluation, for example of other people or EATB instances.

> **Note**
>
> You cannot import reports that have been merged or have been created based on configurations from the Configuration Creator.

1. Click **Import**.
2. Navigate to the report folder and select the evaluationResults.json file.
3. Click **Pick**.

   The imported report is added to the tree view.

To compare and merge evaluations

Only reports created using the same configuration set, can be compared. Make sure that the ranges of the charts to be compared match. Any mismatch of the charts can lead to an error in the merge process.

1. Select at least two evaluations. If you want to select all current evaluations, select the **Created** checkbox.
2. Click **Compare**.

   The merge configuration dialog opens.
3. In **Evaluations and Common**, you can define the default settings for the entire merge process:
   - You can add a comment and project name. Additionally, you can select a merge mode. For more information, see "Merge Modes" on page 36.
   - You can define settings to distinguish the merged evaluations in the report. You can set marker properties (i.e. color, type, and size of the marker). For split mode, you can specify the name for each evaluation that shall be used in the legend as suffix.
4. In **Configure Config-Tree**, you can define the merge settings for each level of the report structure separately by expanding the tree view:
   - You can select a merge mode. By default, the merge mode is inherited. This means, chapters adopt the merge mode that you have selected in step 3 and are automatically set to **like common**. Sections adopt the merge mode of the corresponding chapter and are automatically set to **like parent**.
   - For each display object, you can specify the legend type. By default, **standard** is selected. If you select **Aggregated split**, child charts are not displayed in the legend. After you have opened the report, you can switch to the standard legend again.

You can set marker properties (i.e. color, type, and size of the marker). For split mode, you can specify the name for each evaluation that shall be used in the legend as suffix.

5. In **Start creation**, you can start the merge process by clicking **Create**.

   For some chart types, you can switch the merge mode again after you have opened the report.

To reload evaluations

- The content is refreshed automatically. Additionally, you can reload the content manually by clicking **Reload**.

To delete evaluations

1. Select the evaluations that you want to delete. If you want to select all current evaluations, select the checkbox on the left of the *Search by creation* searchbox  .

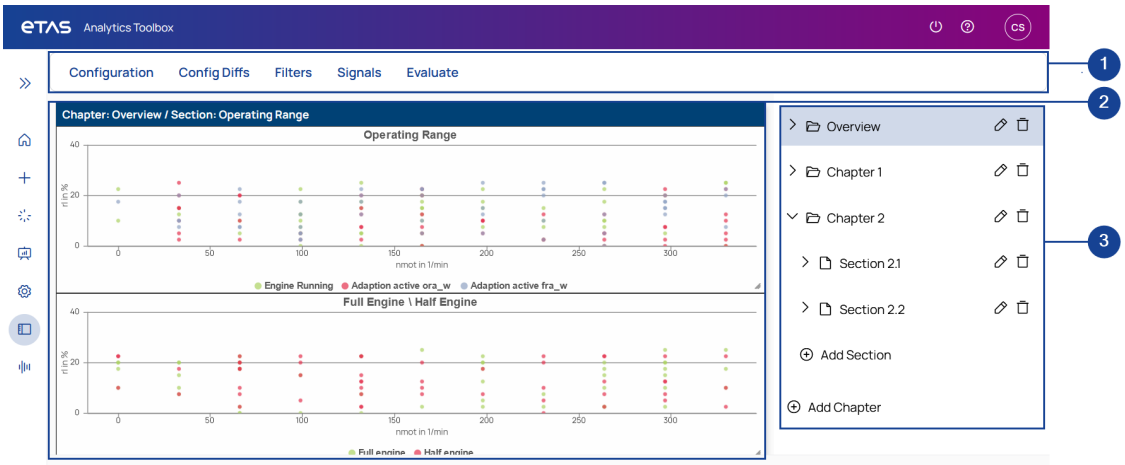
   Next to the *Keyword Search* searchbox, you can see how many evaluations have been selected, e.g.,  . If you click this icon, you can update or clear your selection.

2. In the toolbar above the header, click **Delete**.

> **Note**
>
> The selected reports are deleted permanently. If you want to remove the report from the list but keep it on your disk, use the **Delete Report from List** option as described in "Searching and Opening" on page 49.

4.7 Configuration Creator

In the **Configuration Creator**, you can configure display objects and evaluation reports.



No.	Description
1	Add configurations, Config Diffs, filters, and signals. When your complete configuration including the report structure (see number 2) is finished, you can continue the report creation by clicking **Evaluate**.
2	Define the report structure (chapters, sections, and display objects).
3	Edit the properties of a display object or delete, duplicate, and move display objects.

4.7.1 Creating a Configuration

For creating a report, you need at least one imported measurement with signals, one chapter with one section, and one display object (chart or table). Optionally, you can add filters, calculated signals, more chapters, sections, and display objects.

4.7.1.1 Importing Signals

You can import signals from measurements and LAB files or import calculated signals. Additionally, you can configure the imported signals.

Note that the maximum length of a signal label is 63 characters. If you import a signal with a label exceeding this limit, the additional characters are cut off during the import. If you have two identical signal labels exceeding the limit, the system automatically adds a suffix (e.g. _1, _2) to differentiate them.

Note that only the labels / names of the signals are imported and not the complete values of the signal.

To import signal labels

1. Click **Signals**.
2. Do one of the following:
   - Click **Load from measurement**. Then, select a file and click **Pick**.
   - Click **Load from Lab file**. Select one or more LAB files. Note that the imported LAB file must comply with the standard structure. Otherwise, the file cannot be imported.
   - Click **Load config_signals.csv**. Then, select a file and click **Pick**.
3. Additionally, you can define aliases or calculated signals. For more information, see "Maintaining Signals" on page 68.

4.7.1.2 Adding Filters

For filtering signals, EATB provides a variety of filters, which can be configured to fit your use case. For more information about the filter types, see "Conditions, Triggers, and Filters" on page 32.

To add filters to your configuration

1. Click **Filters**.
2. Click **Add filter**.
3. Enter a filter name. The filter name must not contain blank spaces.
4. Select a filter type and adjust the parameters based on your needs.
5. Click **Save**.

   The filter is added and can be used in your charts.
6. Additionally, you can perform the following actions:
   - To edit a filter, click .
   - To delete a specific filter, click .
   - To delete the complete filter list, click **Clear**.

4.7.1.3 Adding Chapters with Sections

To add chapters with sections

1. Click **Add Chapter**.
2. Insert a name for the chapter. Optionally, you drag and drop the chapter to another position in the tree.
3. Click **Add Section**.
4. Insert a name for the section. Optionally, you drag and drop the chapter to another position in the tree.

4.7.1.4 Adding Display Objects

As a prerequisite, you have added a chapter with a section. For more information, see "Adding Chapters with Sections" above.

To add a display object to a section

1. On section level, click **Add Chart**.

   All available display objects are shown.
2. Select one of the display objects. For more information, see "Display Objects" on page 14.
3. In the **Basic** section of the window, assign the **Chart ID** or **Table ID**. Optionally, you can define the name of the chart title and legend and define the grid. For the grid, you can select one of the following:
   - Inherit global grid (default): The grid value is the same as defined in "Creating a New Report" on page 46.
   - New grid value: Enter a specific grid value for this display object.
   - Inherit grid from signal: Select a measured signal from which the grid value shall be taken. Note that calculated signals cannot be used.

   Note that the grid value cannot be defined for *Image* charts as well as *IUMPR*, *DFC*, and *Custom* tables.
4. Configure the display object depending on your use case.
5. Click **Save**.

   The display object is added. You can resize and change the position of the display object via drag and drop.
6. Add as many display objects as required by starting again from step 1.
7. Click **Save**.
8. Enter a configuration name. Optionally, you can add comments and add tags.
9. To save your configuration to the database, click **Save**.

4.7.1.5 Reusing Objects in Another Configuration

You can reuse earlier created chapters, sections, and display objects (charts and tables). For this purpose, you can select and copy or move the desired objects.

To copy and move chapters, sections, and display objects

1. In the **Configuration Creator**, click **Configurations**.
2. Click **Open**.
3. In the **Config Search** window, you have the following options to find the objects that you want to copy or move:
   - To navigate to the desired object, expand the tree view by clicking the arrows on the left.
   - To search an object by its name, type text in the **Filter...** text field at the top of the window.
   - To search for a specific type of object, use the quick filter buttons below the text field.

4. Select the checkbox next to the desired objects.

   All child objects are automatically selected.

5. In the middle of the window, click **Add**.

   The objects are displayed in the preview on the right. This preview shows the currently open configuration with the appended objects from the template on the left.

6. If you want to change an object's position, drag and drop the object to another location in the preview.

   The future position is indicated by a blue line. Note that objects can only be moved if the new position adheres to the correct structure (chapter, section, and display object).

7. If you want to change your selection, select the checkbox of the specific object in the preview and click **Remove**.

8. To confirm your selection, click **Apply**.

   The selected objects are appended to the currently open configuration.

4.7.1.6 Creating the Report with the Configuration Creator

After saving your configuration, you can generate a report.

To generate a report

1. In the **Configuration Creator**, click **Evaluate**.

   EATB switches to **New Report**.

2. Enter all mandatory information as described in "Creating a New Report" on page 46.

4.7.2 Importing and Exporting Configurations

You can import a **evaluationResults.json** file. This file contains all necessary configuration information for creating a report. It is usually generated after you have run an evaluation with EATB. By default, the file is located in a subfolder in the following directory: C:\Users\UserID\.EATB\reports\evaluationResult_**ProjectName_internal.

You can export configurations either as *.json file or *.m file.

You can perform the following actions:

- "To import a configuration by using the Import button" on the next page
- "To import a configuration by using the Open button" on the next page
- "To import configurations built with EATB versions lower than 4.1" on the next page
- "To export a configuration" on the next page

To import a configuration by using the **Import** button

1. Click **Import**.
2. In the Windows Explorer, navigate to the following directory: C:\Users\UserID\.EATB\reports\evaluationResult_**ProjectName_internal.
3. Select the evaluationResults.json file.
4. Click **Open**.

To import a configuration by using the **Open** button

1. Click **Open**.
2. In **Your reports**, click the download symbol behind the report that you want to import ( ).

   The respective configuration opens in your workspace.

   If the same configuration has been imported already, you are asked if you want to replace or append the current configuration. In the case of appending, already existing chapters are duplicated and an extended name is assigned to them.

To import configurations built with EATB versions lower than 4.1

If you have older reports that you would like to import into the Configuration Creator, then you need the original configuration files (*.m or *.eatb).

1. Prepare a folder with the original configuration files.
2. In EATB GUI, click **New Evaluation**.

   Enter the path to at least one measurement file and the path to the configuration files.
3. Fill in the remaining mandatory fields.
4. Click **Create**.
5. Once the report is generated, go to the Configuration Creator and import the evaluationResults.json file to this report.

To export a configuration

1. Click the **Export** drop-down menu.
2. You can do one of the following:
   - Select **Export to .json (Config Creator)**.
   - Select **Export to .py (Python)**.
   - Select **Export to .m (Matlab)**.

     A *.zip file is exported that contains one *.m file per section having the same name as the corresponding section. The list of signals used in your configurations is exported into the config_signals.csv file containing "signal-ID", "signal-Label", and "Device". Filters are exported into the config_filters.m file. Calculated signals are not exported into a *.m file.
3. Save the export file. It is located at the default location where downloads are stored.

4. Assign a file name and save the file.

   From there, you can copy the file to your desired location. The exported *.m files can be opened and edited in MATLAB.

4.7.3 Charts

In the Configuration Creator, various chart types can be added to a configuration. For more information, see "Display Objects" on page 14.

In the following sections, configuration options that are common for all or most chart types are explained. Depending on the specific chart type, some configuration options, e.g. the number of signals or the available display types, can vary. For the scatter, histogram, timeplot, and interval chart types, you can select the display type from a drop-down menu. For more information, see "Configuring Advanced Chart Properties" on the next page.

The configuration window for each chart type shows a preview of the specific chart. This preview is based on random data and does not show the actual signals. The charts with the actual signals is available only in the report created after evaluation.

4.7.3.1 Editing a Chart

To edit a chart

1. Add a chart as described in "Adding Display Objects" on page 54.
2. When you move the cursor over the chart, you can perform the following actions via the symbols on the right side:
   - To delete the chart, click  .
   - To edit the chart, click  .

     The configuration window opens. You can use the configuration options as described in the following sections.
   - To duplicate the chart, click  .
   - To move the chart to another section by drag and drop, click  .

4.7.3.2 Adding Child Charts

Child charts are displayed in the same chart but contain different data points and can have different settings. The following charts can have child charts: plot, histogram, timeplot, single value bar, and single value line.

To add a child chart

1. In the **Add chart** window or in the **Edit chart** window, click **Add Child**.

   The child chart is added to your configuration. You can add as many child charts as you want to. The main chart and the child charts are visible in

the preview: On the upper left, the main chart and the child charts are listed. The main chart or child chart that is active for configuration is highlighted in black.

2. By using the configuration items on the left, you can configure the active chart.
3. To delete a child chart, select the respective child and click **Delete child**.
4. To save the main chart and its child charts, click **Save**.

4.7.3.3 Configuring Advanced Chart Properties

The **Advanced** configuration item allows you to set the quantization of the signals for the corresponding axes. Additionally, you can select the display type for specific chart types.

To configure advanced chart properties

1. Click the configuration item **Advanced**.
2. Insert the desired quantization for each axis. For more information, see "Quantity" on page 38.
3. For the scatter, histogram, timeplot, and interval chart types, you can select the display type from a drop-down menu.
4. Optionally, assign an axis title.
5. Click **Save**.

4.7.3.4 Configuring Axes

The axes are named as bottom, top, left, and right according to their position. You can set the properties of these axes, e.g. number of axes, alignment, value range, and title. Additionally, you can add axis attributes to adapt the layout by choosing the font, font size, axis thickness, tick length, or logarithmic scaling.

To configure axis properties

1. In the configuration window of the chart, click **Axes**.
2. To extend the menu of the axis that you want to configure, click the black arrow on the left.
3. In "Axis-index", assign the title for the axis and set the minimum and maximum values.
4. To assign a new axis attribute, perform the following steps:
   i. Start writing in the "Axis attribute" text field.

      Depending on your text, a list of attributes appears in a drop-down menu.

   ii. Select the desired axis attribute.

      Each selected attribute is added in the "Axis attribute" column on the

left.

iii. Set the values for the axis attribute.

5. You can add another axis or delete an axis by clicking **Add** or **Remove**.
6. Click **Save**.

4.7.3.5 Assigning Signals

Depending on the chart type, one ore more signals can be added. As a prerequisite, you have imported signals. For more information, see "Importing Signals" on page 53.

To assign signals to a chart

1. In the configuration window of the chart, click **Signals**.
2. Type text in the "X-Axis signal" and "Y-axis signal" fields.

   Depending on your text, a list of the imported signals appears in a drop-down menu.
3. For each axis, select the desired signal.
4. In the "X/Y-Axis (align/index)" field of each axis, select the position of the axis and set its index.
5. Optionally, you can define a color for the axes.
6. Click **Save**.

4.7.3.6 Assigning Signals to the GPS Map

1. Select a longitude and latitude signal.
2. Optionally, you can define a third value as gradient signal. For the gradient signal, select its type:
   i. Continuous

      Define colors for certain values. EATB interpolates the colors in between these point continuously.

   ii. Discrete

      Define colors and the boundaries for which a switch from one color to another shall happen. By that, specific colors are assigned to color ranges. No color interpolation is performed.
3. By clicking the plus or minus button, you can add or remove gradient values and colors.
4. Additionally, select the value type:
   i. Absolute values

      If absolute is selected, the color gradient represents the values specified.

   ii. Relative values

If relative is selected, the color gradient automatically adapts to the min/max values of all data with 0 representing 0% = min value and 1 representing 100% = max value.

5. Click **Confirm**.

4.7.3.7 Setting Thresholds

Thresholds are used to indicate whether evaluated data is located inside or outside some given range or area. Thresholds are visualized with traffic lights. The Configuration Creator supports constant thresholds for which the calculation is based on the corresponding signal only. You must define four constant values for min, low, high, and max. For more information about the ranges, see "Traffic Lights" on page 27.

To set thresholds for signals in a chart

1. Click the **Thresholds** button.

   Depending on the chart type, you can define the following settings for one or more axes.
2. Set the values for **min**, **low**, **high**, and **max**.
3. Each of these values can be enabled or disabled separately. Select the **Enabled?** checkbox accordingly.
4. Optionally, select the tolerance type and enter a value.
5. Select the evaluation behavior.

   For more information, see "Evaluation Behaviors and Tolerance Types" on page 29.
6. Click **Save**.

4.7.3.8 Applying Filters

Filters can only be applied to specific display objects. For more information, see "Conditions, Triggers, and Filters" on page 32.

As a prerequisite, you have imported filters into your configuration. For more information, see "Adding Filters" on page 54.

To apply filters

1. In the configuration window of the chart, click **Filter**.
2. To select a filter, type text in the "Name" field.

   Depending on your text, a list of the imported filters appears in a drop-down menu.
3. Select the desired filter.

   The filter type and parameters are shown.
4. You can add another filter or delete a filter by clicking **+** or **x**.
5. Click **Save**.

4.7.3.9 Applying Conditions

Conditions can only be applied to specific display objects. For more information, see "Conditions, Triggers, and Filters" on page 32.

To set a condition, a signal and a reference value / signal must be defined. Optionally, a time delay for the rising edge[1] and the falling edge[2] can be set. If more than one condition is applied, the conditions are joined by the & operator.

To apply conditions

1. In the configuration window of the chart, click **Conditions**.
2. To set signals, operators and time delays, do the following:
   - Select an operator from the "Operator" drop-down menu.
   - Type text in the "Signal" field and "Reference value / signal" field, respectively.

     Depending on your text, the imported signals are listed in a drop-down menu.
   - Optionally, adjust the "Delay rising edge" and the "Delay falling edge" by clicking the arrows.
3. You can add another condition or delete a condition by clicking **+** or **x**.
4. When at least two conditions exist, you can choose if the conditions shall be joined either with AND or with OR in the **Join** column. In the report, this selection is shown in the **Chart Properties**. For more information, see "To get display object information" on page 79.
5. Click **Save**.

4.7.3.10 Applying Triggers

Triggers can only be applied to specific display objects. For more information, see "Conditions, Triggers, and Filters" on page 32.

To set a trigger, a signal and a reference value / signal must be defined. Optionally, a time offset and / or duration can be set.

If both, conditions and triggers are defined in the EATB MATLAB API,
EATB Worker MATLAB applies the conditions first. Then, the triggers act on the signal data selected by the conditions.

You can use the following trigger types:

- Triggers based on edges: This trigger acts on only one signal.
- Triggers based on conditions: Two signals, or one signal and a value are compared.

---

1) Edge that is defined by every sample for which the previous sample has a higher value.

2) Edge that is defined by every sample for which the previous sample has a lower value.

> **Note**
>
> For the chart types interval, hist, or histpie, two parameters are required for a trigger. You can either define a start trigger in combination with a duration, or you can define a start and stop parameter. If not two parameters are defined for the trigger, the last recording is used as fallback stop trigger.

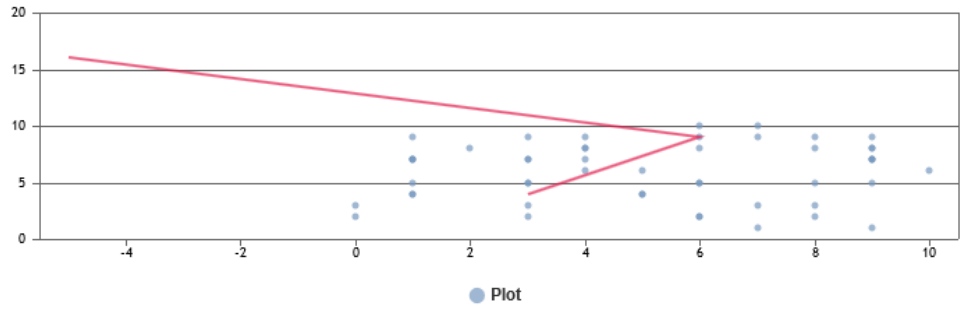
To apply triggers

1. In the configuration window of the chart, click **Triggers**.
2. To set signals, operators and time delays, do the following:
   - Select an entry from the "Operator" drop-down menu.
   - Type text in the "Signal" field and "Reference value / signal" field, respectively.

     Depending on your text, the imported signals are listed in a drop-down menu.
   - Optionally, adjust the time offset and / or the duration by clicking the arrows.
3. You can add another trigger or delete a trigger by clicking **+** or **x**.
3. Click **Save**.

4.7.3.11 Adding Lines

User-defined lines can be added to a chart. Therefore, the coordinates for several points can be set. These points are connected by straight lines.



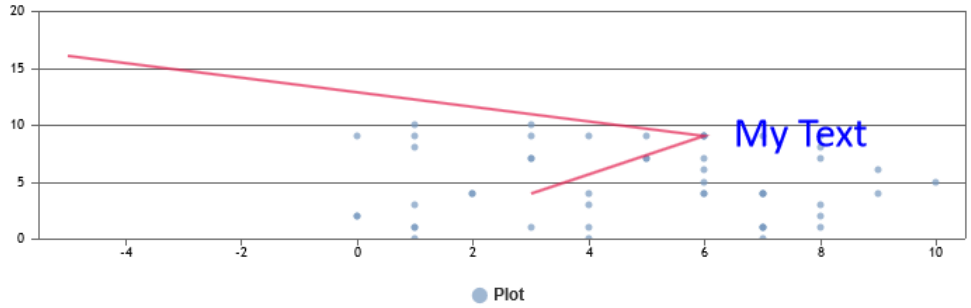
To add user-defined lines

1. Click **Lines**.
2. Click **Edit points**.
3. To define the points that shall be connected, set the values for the coordinates. At least, two pairs of coordinates must be defined.
4. You can add another pair of coordinates or delete a pair of coordinates by clicking **+** or **x**.
5. Click **Save**.

6. Optionally, you can adjust the color of the line.
7. To add more lines, click **+** and edit them.
8. Click **Save**.

4.7.3.12 Adding Text Blocks

You can define text blocks and their positions in a chart.



To add a text block

1. Click **TextBlocks**.
2. Set the values for **X**, **Y**, **Size**.
3. Select a color.
4. Type your text.
5. You can add another text block or delete a text block by clicking **+** or **x**.
6. Click **Save**.

4.7.3.13 Synchronizing Zooming

Zooming between charts can be synchronized. If you zoom into one chart, the others are zoomed, too. You can specify multiple partners and set synchronizations with charts of different sections and chapters. Note that this can influence the performance of zooming and points can be hidden.

After you have opened the report, you can adjust, delete, or extend the zoom synchronization. For more information, see "Zooming and Scrolling" on page 80.

To synchronize zooming

1. Click **Zoom-Synchronisation**.
2. To find the charts that you want to synchronize, type text in the editing field.

   Depending on your text, a list of your chapters with sections and charts opens.
3. Select the charts that you want to synchronize.
4. Click **Save**.

   After the evaluation of your configuration is done, the charts are synchronized in the generated report.

4.7.4 Tables

In the Configuration Creator, various table types can be added to a configuration. For more information, see "Display Objects" on page 14.

4.7.4.1 Adding and Configuring a MinMax Table

For more information about this table type, see "MinMax Table" on page 23.

As a prerequisite, you have imported signals into your configuration. For more information, see "Importing Signals" on page 53. The configuration must also have at least one chapter with one section. For more information, see "Adding Chapters with Sections" on page 54.

To add and configure a MinMax table

1. Click the **+** button on section level and select this table type.
2. Make the following configurations:
   - Click **Basic** and define a table ID in the respective editing field. Optionally, you can define a table title. Click **Save**.
   - To add signals to your table, click **Signals**. To add more signals, click **+**. Signals can be added in the same way as for charts, see "Assigning Signals" on page 60.
   - To add thresholds to the signals in your table, click **Thresholds**. To add more thresholds, click **+**. You can define a threshold for each imported signal. Proceed as described for thresholds in charts, see "Setting Thresholds" on page 61.
   - To add conditions to the signals in your table, click **Conditions**. Proceed as described for conditions in charts, see "Applying Conditions" on page 62.
   - To add triggers to the signals in the table, click **Triggers**. Triggers based on edges and triggers based on conditions are available. Proceed as described for triggers in charts, see "Applying Triggers" on page 62.
3. Click **Save**.

4.7.4.2 Adding and Configuring an IUMPR Table

For more information about this table type, see "IUMPR Table" on page 23.

As a prerequisite, you have imported signals into your configuration. For more information, see "Importing Signals" on page 53. The configuration must also have at least one chapter with one section. For more information, see "Adding Chapters with Sections" on page 54.

To add and configure an IUMPR table

1. Click the **+** button on section level and select this table type.
2. Click **Basic**. Make the following settings:
   - Assign a table ID.
   - Optionally, assign a description.
   - To define the display type, select an entry from the drop-down menu.

     If one status for all measurement shall be used, select **cumulative**. If one status per measurement shall be used, select **single**. Note that the traffic light on section level is always cumulative.
   - To define the signal type, select an entry from the drop-down menu depending on the kind of DFC signals.
3. Click **Save**.
4. Click **Ratio**. Make the following settings:
   - Assign the DFC signals.

     Depending on the selection of either "bit" or "int" as signal type, two or three signals have to be added, respectively. For "bit", add a ratio signal and a bit signal. For "int", add a ratio signal, a nominator signal, and a denominator signal.
   - Assign a group. Input of numbers and / or text is possible.
   - Optionally, you can add a description.
   - To evaluate the signals with respect to traffic light, ratio, and threshold, set the "min" and "low" values.
5. To add more lines and signals for evaluation, click **+**.

   To delete lines and remove signals, click **x**.
6. Click **Save**.

4.7.4.3 Adding and Configuring a Custom Table

For more information about this table type, see "Custom Table" on page 25.

As a prerequisite, you have imported signals into your configuration. For more information, see "Importing Signals" on page 53. The configuration must also have at least one chapter with one section. For more information, see "Adding Chapters with Sections" on page 54.

To add and configure a Custom Table

1. Click the **+** button on section level and select this table type.
2. Click **Basic**.
   - Assign a table ID.
   - Optionally, assign a table title.
3. Click **Header**.
4. To add a row, click **Add row**.

5. To add a further cell, highlight a cell by clicking in the preview above and click **Add cell**.

   The rows and cells are added behind or below the highlighted cell, respectively.
6. To edit a cell, click the respective cell in the preview above. You can define the following settings:
   - In the **Type** field, select **text** or **light**. In the **Value** field, write text or select a traffic light color.
   - In the **Align** field, set the alignment to left, center, or right.
   - In the **Colspan** and **Rowspan** fields, define the width of rows and columns.

   Your settings are visible in the preview.
7. Click **Save**.
8. Click **Rows**.

   You can make the same settings as described for the header in steps 4-7.

4.7.5 Limitations

The Configuration Creator does not provide the full flexibility for configuring reports like it is possible with the EATB WorkerCertain use cases, like certain configurations of charts, are not yet supportedFor these use cases, the evaluation must be based on the **Path to config** options without using the Configuration Creator. For more information, see "Creating a New Report" on page 46.

Only supported charts can be imported to the Configuration Creator. If the report contains unsupported charts, these are detected and a warning is displayed showing a list of the detected unsupported charts. In order to proceed with import, click **Remove and Continue**. All unsupported charts are removed and the import continues.

> **Note**
>
> In case of omitting unsupported charts during the import process, EATB does not change the original evaluationResults.json file.

Currently, the Configuration Creator can be used within the following limitations:

- Only specific chart and table types can be used. For more information, see "Display Objects" on page 14.
- DCM files cannot be used.
- Signals with user-defined MATLAB functions are imported but cannot be used. In case such calculated signals are used in your chart con-

figurations, a warning message is displayed when the evaluation is executed. You can choose to run the evaluation anyway but calculated signals with user-defined MATLAB functions are omitted.

- config_diff.eatb files for calculated signals can only be imported, but not edited.
- Function thresholds[1] are not supported.
- Accepted threshold violations[2] are not supported.
- Thresholds for the display types of an "interval" chart cannot be imported to the Configuration Creator. The information about the thresholds that are related to the imported chart are lost.

4.8 Maintaining Signals

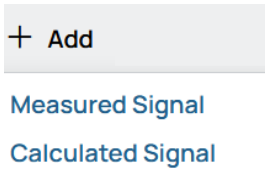
In EATB GUI, click **Signals** to create new signals as well as to import or export signals.

These signals are relevant to configurations created with the Configuration Creator. Configurations created with the EATB Worker are not affected by the signals configured in the Signals.

To add a new signal

You can provide multiple aliases to a given signal ID. This can be helpful if the same signal ID has been measured by different devices.

1. Click **Add**.
2. In the drop-down menu, select **Measured Signal**.



3. In the **Signal ID** field, enter the signal ID for which you want to create an alias .
4. Enter the signal label and the hardware.
5. If you want to addanother alias, click **Add Alias**.
6. Click **Save**.

---

1) As opposed to constant threshold: Threshold type that takes four MATLAB anonymous functions (min, low, high, max) as thresholds, which define the green, yellow, and red ranges. Two signals are needed to calculate a function threshold: The values of the first signal (x axis) are used to calculate the threshold values as functions of this signal and to compare the calculated values with the values of the second signal (y axis).

2) User-defined threshold type that marks previously set thresholds as not critical for the evaluation.

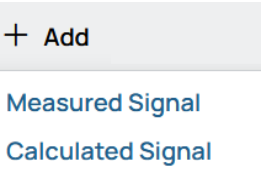
The new signal is added to the signal list. You can quickly display it via the keyword search or by sorting the **Type** column to show measured signals at the top:

7. Via the **Actions** column, you can edit or delete each signal.

> **Note**
>
> The signals from the signal list can be used in charts. Removing used signals can lead to an empty chart when generating a report.

To add a new calculated signal

1. Click **Add**.
2. In the drop-down menu, select **Calculated Signal**.



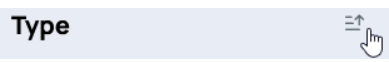
3. In the **Signal ID** field, enter a name for your new calculated signal.
4. Enter the formula. You can use the signal IDs of other measured and calculated signals in your formula.

   You can use the following mathematical functions:

   - sin(x), cos(x), tan(x)
   - abs(x), round(x), ceil(x), floor(x)
   - sqrt(x), exp(x), power(x, y), log(x), log10(x)
   - Constants: e, pi

   All numpy functions are made available by referring to np.<numpy function>. For a list of supported numpy functions in np, see https://numpy.org/doc/2.1/reference/routines.math.html.
5. Add all used signal IDs of the formula either manually or automatically via **Autofill used signals** to the **Used signals** field.
6. Click **Save**.

   The new signal is added to the signal list. You can quickly display it via the keyword search or by sorting the **Type** column to show calculated signals at the top:



   In the Configuration Creator, you can use the calculated signal in the same way as any measured signal.
7. Via the **Actions** column, you can edit or delete each signal.

–

> **Note**
>
> The signals from the signal list can be used in charts. Removing used signals can lead to an empty chart when generating a report.

To make bulk changes

1. Click **Export**.
2. The config_signals.csv is exported and stored in your download folder.
3. Make your changes within the CSV file.
4. To re-import the CSV file with the changed signals, click **Import**.

To delete all signals in the signal list

> **Note**
>
> Note that not only all measured and calculated signals will be deleted but also all their dependencies, i.e., all configurations from the Configuration Creator and all filters.

1. To avoid any data loss, create a copy of the .EATB directory in your user directory first.
2. Click **Clear Signals**.
3. Enter DELETE EVERYTHING into the input field.
4. Click **Clear**.

5 EATB Options

To customize the report, EATB offers additional options. You can set these options in the following places:

- If you want to use an option only for the current evaluation, you can add a new attribute in EATB GUI. For more information, see step 4 in "Creating a New Report" on page 46
- If you want to use an option for all your evaluations, you can use EATB Worker to add the parameter.

5.1 configcreatorconfig

In **start.json**, you can use the **configcreatorconfig** field to point to a configuration file created in the Configuration Creator (***.json**) that shall be executed by EATB Worker.

5.2 comment

In EATB Worker, you can add a comment to your report.

5.3 dbConfigDiffs

dbConfigDiffs (=true or =false)

This option can be used only in the file **start.m** of the p-code (EATB Worker MATLAB). If this option is set to true, the syntax in the **config_diff.m** file can be debugged.

5.4 e-mailOn

This option is currently available only for EATB Worker. If this option is set, then an e-mail is sent to the predefined e-mail address notifying the recipient that the evaluation is done. Additionally, the evaluation's results can be attached to the e-mail (the folder is automatically zipped and attached). The upper limit of the attachment's size is set to 10 MB. If the size of the attachments exceeds the allowed maximum size, only a notification mail is sent.

```
rb.settings.emailOn = true;
rb.settings.emailAddress = {'Max.Mustermann1@etas.com', 'Max.Muster-
mann2@de.bosch.com'};
rb.settings.emailAttachment = true;
```

5.5 ignoreInvalidDataPoints

By default, EATB reads all data points. You can use this option to replace all invalid data points by NaN values. Note that this option slows down the read performance.

You can use the following syntax with EATB Worker in start.m:

```
rb.settings.ignoreInvalidDataPoints = true
```

5.6 ignoreSignalsWithEmptyData

You can use this option to ignore empty signals found in a measurement file. It enables a signal mapping to find the first non-empty existing label. This is only working for MDF-like formats. For example, CSV-like formats always have data for each signal, although the data maybe NaN.

```
ignoreSignalsWithEmptyData(1, 1) logical = true;
```

5.7 includeMeasurements

If the processed measurement files shall be copied to the evaluationResult folder, set this option to 1.

5.8 includeMeasurementBasenamePatterns

This option cannot be used in config_system.m. With this option, you can define which measurement files shall be included based on their file names. You can define a pattern that is applied to the name of the measurement file. Paths and extensions are not considered. If more than one pattern is defined, a logical OR is used to combine all search results.

For advanced user, also regular expressions are supported. Use the syntax with opening and closing '/' to define regular expressions.

Examples:

- ```
  rb.settings.includeMeasurementBasenamePatterns = '_sensorABC';
  % finds all file names containing '_sensorABC' (case-insensitive)
  ```
- ```
  rb.settings.includeMeasurementBasenamePatterns = ['1', '5'];
  % finds all file names containing '1' OR '5'
  ```
- ```
  rb.settings.includeMeasurementBasenamePatterns = '/^Example/';
  % finds all file names starting with 'Example' (case-sensitive)
  ```
- ```
  rb.settings.includeMeasurementBasenamePatterns = '/_sensorABC$/i';
  % finds all file names ending with '_sensorABC' (case-insensitive)
  ```

- rb.settings.includeMeasurementBasenamePatterns = ['7', '/^Example/', '/_sensorABC$/i'];

  % finds all filenames containing '7' OR starting with 'Example' (case sensitive) OR ending with '_sensorABC' (case-insensitive)
- rb.settings.includeMeasurementBasenamePatterns = '/[^57]$/';

  % finds all file names that do NOT end with '5' OR '7'

5.9 useMcdCoreForAllFileFormats

useMcdCoreForAllFileFormats (=0 (default) or =1)

You can use the MCD reader for all file formats. When enabling this option in the start.json file, EATB will use MCD Core to read TSV, CSV, and other ASCII-based files.

You can configure the measurement files using *.ini files located at C:\Program Files\ETAS\McdCore1.6\bin\CorePlugins\Etas.TargetAccess.Targets.MeasureFile.Formats.AsciiConfigurable.

5.10 includeMeasurementExtensions

This option cannot be used in config_system.m. EATB is able to process a variety of file formats as listed in "Measurement Files " on page 12. If your data set contains files of mixed formats, you can restrict the processing to one format, if needed. That means, EATB considers only the files of the specified format and ignores the others. For example, you can use the following syntax with EATB Worker in start.m:

```
rb.settings.includeMeasurementExtensions = {'mf4'} ;
% OR
rb.settings.includeMeasurementExtensions = {'dat'} ;
 % OR
rb.settings.includeMeasurementExtensions = {'zip'} ;
```

5.11 includePathMeasurementsSubdirectories

This option cannot be used in config_system.m. By default, EATB processes only the files contained in the parent folder. Set this option to 1 if the files contained in the subdirectories of the parent folder should also be processed.

5.12 measurementOrder

```
"measurementOrder": "MEASUREMENT_NAME"
```

In EATB GUI or in the **start.json** file, you can specify the sorting order of measurement files. The following values are possible:

- MEASUREMENT_NAME: Default behavior that alphabetically sorts measurement files based upon their name
- CONFIGURATION: The order as provided in the GUI and **start.json**. For mentioned folders, the alphanumerical order is used.
- MEASUREMENT_DATE: The date within the measurement file (not the file system created / last modified date)

5.13 logLevel and commandWindowLevel

The options help you to define the log level and to get more flexibility when debugging the evaluation. They can be used only in the **start.m**. The "LogLevel" option defines the level of information in the log file. The "commandWindowLevel" option defines the level of information in the command window.

The following levels are available:

'ALL', 'TRACE', 'DEBUG', 'INFO', 'WARN', 'ERROR', 'FATAL', 'OFF'

- ALL / 0: all messages printed unfiltered
- TRACE / 1: detailed debug output
- comments DEBUG / 2: general debug output (finding errors)
- INFO / 3: general information (program start, program stop, processing seconds etc.)
- WARN / 4: unexpected situation occurred
- ERROR / 5: error where the exception was caught and the processing was alternatively continued
- FATAL / 7: logging is disabled

Examples:

```
rb.settings.logLevel = 'OFF';
rb.settings.commandWindowLevel = '4';
```

5.14 numberOfDecPosInData

numberOfDecPosInData (integer >0, =3(default))

This is the number of the digits after the decimal point in your report data. If you increase this number, you get more precise data but larger reports. In a default report, three digits after the decimal point are saved. For more information, see "Calculation Details" on page 37.

5.15 optimizeConfigDiffs

optimizeConfigDiffs (=1 (default) or =0)

EATB scans your config_diff and removes the try and catch blocks from the calculation that are not needed to be calculated. If you set optimizeConfigDiffs=0, the optimization is switched off. In this case, the calculation can take a longer time.

5.16 pathProjectConfigs

This option cannot be used in config_system.m. In EATB Worker, you can define the path to your project configurations with this option.

5.17 pathResult

The evaluation's results are stored by default under the user directory C:\Users\UserID\.EATB. This option allows you to define a specific location for your evaluation's results. In EATB GUI, this option is available as an optional field.

For example, you can use the following syntax with EATB Worker:
rb.settings.pathResult = 'C:\myResults' ;

Note that if the defined location is not accessible, EATB uses the default location as a fallback (C:\Users\UserID\.EATB\reports).

5.18 usePhysicalComparisonMethod

This option can be used in start.m or config_system.m. This option allows you to define how ">=" and similar operators work for triggers and conditions. By default, the option is set to "true" (rb.settings.usePhysicalComparisonMethod = true;). This means that the nearest neighbor for "==" operator (physical signals) is used. If you set this option to "false", the MATLAB behavior for "==" operator (discrete signals) is used.

5.19 zipResults

If you have a limited disk space, you can directly zip your evaluationResult folder and save the space. If this option is set to 1 or true, the evaluationResult folder is zipped automatically. The report does not open automatically in your browser when the evaluation is done. Navigate to the storage location, unzip your report, and open it manually. For example, you can use the following syntax with EATB Worker in start.m:

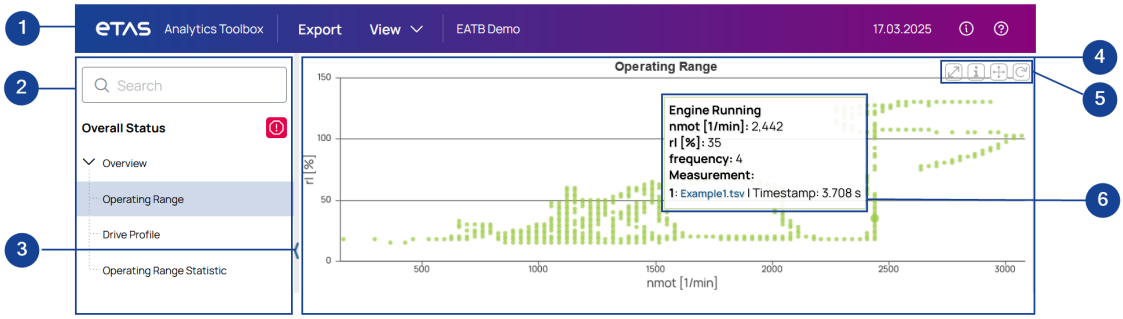
rb.settings.zipResults = 1 ;

5.20 debugWrite

You can enable writing intermediate measurement files using DebugWrite operations. For more information, see the "Python Scripting Guide" by clicking  .

6 EATB Report

The EATB Report allows you to display background information about each display object or hide several data series. Additionally, the traffic light system used to signalize the violation of predefined thresholds helps you to perform a quick validation of the generated display objects.



No.	Description
1	Toolbar: Get general information about the complete report, export the complete report, or adjust the settings for all display objects in the report.
2	Search and tree view: Expand or collapse the structure elements of the report. For more information, see "Report Structure" on page 14.
3	Sidebar arrow: Close or open the sidebar view.
4	Main window: Get detailed information about each display object.
5	Options for display object:
	Open the display object in full screen mode. By using the arrow icon in the right bottom corner of the full screen mode, you can navigate to the next display object.
	Show information about the selected display object.
	Visible only if you have zoomed into the chart before. You can switch between zoom and scroll mode. You always see the button for the mode you are currently not using. For more information, see "Zooming and Scrolling" on page 80.
	Visible only if you have zoomed into the chart before. You can reset the chart to the initial view.
6	Tooltip: Get sample-specific information by hovering the mouse over a chart. For more information, see "Using the Tooltip" on page 82.

6.1 Getting Information about the Report

There are several options how you can get information about the complete report or parts of it:

- "To get general report and measurement information" below
- "To get signal information of all signals in the report" below
- "To get signal information of signals used in a display object" below
- "To get display object information" on the next page
- "To get threshold information" on the next page

To get general report and measurement information

1. In the toolbar of the report, click  .
2. Do one of the following:
   - To display the general report information, select the **Report Info** tab.

     Optionally, you can change the MDA path here. If you use the MDA export functionality, this path is used by MDA to open the exported MDA configuration. For more information, see "Exporting an MDA Configuration" on page 87.
   - To display the measurement information, select the **Measurement Info** tab.

To get signal information of all signals in the report

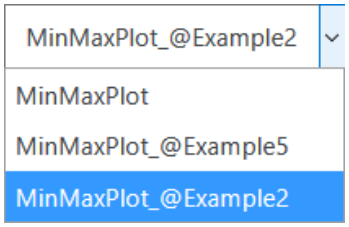
1. In the toolbar of the report, click  .
2. Select the **Signal Info** tab.

   You can search for specific signals and export them. For more information, see "Exporting Signal Information" on page 86.

To get signal information of signals used in a display object

1. In the upper right corner of the display object, click  .
2. Select the **Signal Information** tab.

   If the report has been created based on a merge process from several evaluations, you can select the display object for which the signal information shall be displayed. Click the drop-down menu in the upper right corner showing the selectable items, for example:

   For more information about the merge modes, see "Changing the Merge Mode" on page 83.

To get display object information

1. In the upper right corner of the display object, click  .
2. Select the **Chart Properties** tab.

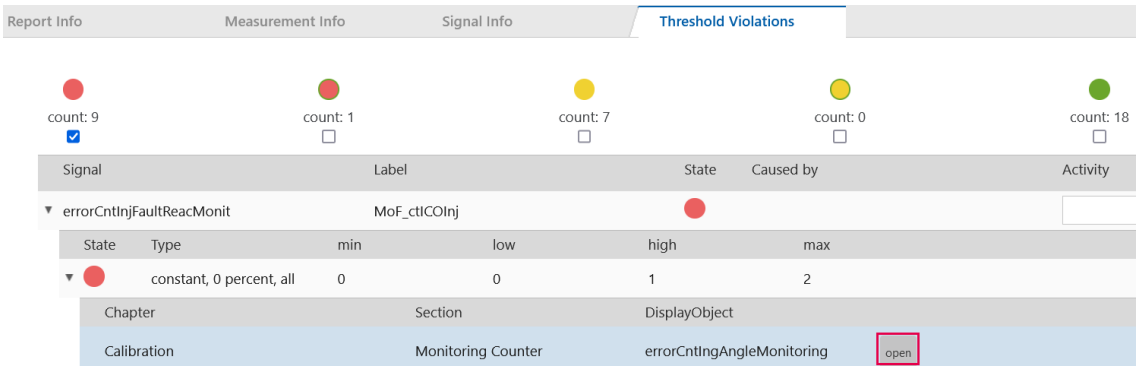
   If the report has been created based on a merge process from several evaluations, you can select the display object for which the signal information shall be displayed. For more information, see step 2 in "To get signal information of signals used in a display object" on the previous page.

To get threshold information

1. In the toolbar of the report, click  .
2. Select the **Threshold Violations** tab.

   All detected threshold violations are shown.
3. At the top, the number of thresholds within a certain range (red, yellow, green) is displayed. You can select the thresholds of a specific range by clicking the checkbox below each range. For more information about the ranges, see "Traffic Lights" on page 27.
4. The tree view, shows the threshold information for each signal. Optionally, you can enter a comment for each signal in the **Activity** field. For example, if a traffic light is red you can describe the activities that should be undertaken to solve the problem.

   Note that you can only edit this field if you have opened the report via the EATB software. If you have opened the report by opening the *.html file of the report in your browser, this option is not available.
5. If you expand the tree view, you get the detailed threshold information of this signal including the definition of the ranges and the threshold type. For more information, see "Threshold Types" on page 28.
6. If you further expand the tree view, the location of the threshold (chapter, section, display object) is shown.
7. If you click the **Open** button in this row, the dialog is closed and the display object is shown in the report.



6.2 Configuring Charts

For charts, you have a various options to configure the visualization and to optimize the view according to your needs. For more information about the chart types and their display types, see "Display Objects" on page 14.

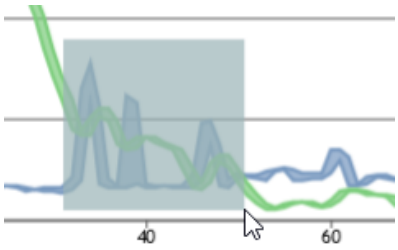
6.2.1 Zooming and Scrolling

You can define a zoom area and synchronize the zooming with other charts. Zooming is possible for the following chart types: plot, scatter, histogram, interval, and timeplot.

To zoom

1. Click into the chart that you want to zoom and keep the left mouse button pressed.
2. Move the mouse cursor.

   A gray rectangle indicates the zoom area.



3. Release the mouse button.

   The defined area is shown in the chart.

4. To show the complete chart again, click  .

To synchronize zooming

1. To zoom into several charts simultaneously, you can synchronize the zooming. Right-click a chart and select **Zoom-Synchronisation** from the context menu.
2. In the **Configure synchronised charts** window, search for the chart that you want to synchronize.

   As soon as you enter your search string a list with possible matches is shown.
3. Select the chart from the list.
4. If you want to add more charts, repeat step 3.
5. Click **Save**.
6. Perform the zooming as described in "To zoom" above.
7. To stop the synchronization, open the **Configure synchronised charts** window again as described in step 1 and remove the synchronized charts from the list.

To scroll in the zoomed view

1. To scroll along the axes in zoomed view, you must switch to the scroll mode. In the upper right corner of the chart, click  .

   The symbol of the mouse pointer changes.
2. Click into the chart and keep the left mouse button pressed while moving the mouse along the axes.

   The chart is scrolled according to your mouse movement.
3. To switch back to the zoom mode, click  .

6.2.2 Adjusting Axes and the Signal Color

You can define the range and interval of each axis and the color of signals in a chart.

To adjust axes and the signal color

1. Right-click the chart and select **View Properties** from the context menu.

   The **Operating Range** window is displayed.
2. You can define the following settings:
   - For each axis, you can enter a value for the minimum and maximum range and the interval.
   - For each signal, you can click the color to the right of the signal and select another color.
3. Close the window.

   The chart is displayed with the defined settings.
4. To show the complete range again, right-click the chart and select **Auto scale** from the context menu.

To define a time offset in a timeplot

1. Right-click the timeplot and select **Time offset** from the context menu.
2. For each signal in the timeplot, you can enter a value for the time offset.
3. Close the window.

   The timeplot is displayed with the defined time offsets.
4. To show the complete time range again, right-click the timeplot and select **Auto scale** from the context menu.

6.2.3 Using the Legend

By default, a legend is displayed below the chart showing the color definition of the represented samples.

To hide and show samples in the chart via the legend

1. To hide the samples, click the corresponding name in the legend.

   The samples are no longer displayed in chart. The name in the legend is displayed in light gray.

2. To show the samples again, click the corresponding name in the legend again.

To hide and show the legend

1. To hide the legend, right-click the chart and select **Toggle Legend** from the context menu.
2. To show the legend again, perform the same actions again as in step 1.

   Alternatively, you can hide or show the legend of all charts in the report via the toolbar: Click View and select an entry from **Legends**.

6.2.4 Using the Tooltip

By default, a tooltip is displayed in the chart.

To show the sample-specific information

1. Hover the mouse over the chart.

   The tooltip shows signal values, the frequency (i.e. the number of overlapping samples), and measurement information of the specific sample.

2. If you move the mouse, the tooltip is updated automatically.

   You can also use the tooltip information for MDA export. For more information, see "Exporting an MDA Configuration" on page 87.

To hide and show the tooltip

1. To hide the tooltip, right-click the chart and select **Toggle Tooltip** from the context menu.
2. To show the tooltip again, perform the same actions again as in step 1.

   Alternatively, you can hide or show the tooltip of all charts in the report via the toolbar: Click View and select an entry from **Tooltips**.

6.2.5 Changing the Display Type

Depending on the chart type, you can change the display type.

To change the display type

1. Right-click the chart and select **Change [CHART TYPE]** from the context menu. The name of the entry contains the respective chart type.
2. Select one of the available display types for this chart.

   The display tape is changed and updated in the axis information.

6.2.6 Using Chart Functions

In plots and histograms, you can use chart functions for statistical analysis.

To use a chart function

1. Right-click the chart and select **Calculate** from the context menu.

   Depending on the chart type, the available chart functions are displayed. For more information about the available chart functions, see "Chart Functions" on page 34.
2. Select one of the chart functions.
3. If several data series are available, you are asked to select one of them.

   The chart function is displayed in the chart and added as axis information.

6.2.7 Changing the Merge Mode

The report that you are working with can be based on several evaluations. In this case, a merge process during creation of the report has taken place and a merge mode was selected. In the report, you can change the merge mode again depending on the specific chart type. For more information, see "Merge Modes" on page 36.

To change the merge mode

1. In a merged report, right-click the chart and select **Change Merge** from the context menu.

   The merge modes that are currently not selected are displayed.
2. Select one of the available merge modes.

   The merge mode is changed.

6.3 Configuring Tables

For tables, you have some options to configure the visualization. For more information about the table types and their display types, see "Display Objects" on page 14.

Depending on the table type, you can do the following:

- For all tables except for the custom table, you can display the specific content of a row by clicking on this row. The content is shown in a separate window.
- For IUMPR tables, you can change the display type. Switch from "cumulative" status to a special "single" status, i.e., the status of the last measurement, by clicking  . If you have selected "cumulative", you can get the numerators, denominator, ratios, and the status for each measurement by clicking into a table row.

– For MinMax tables, you can see in which measurements the "min" value and the "max" value occur by clicking into a table row. Additionally, you can change the merge mode. The same procedure applies as for charts. For more information, see "Changing the Merge Mode" on the previous page.

6.4 Exporting

You can export the complete EATB Report or parts of it in different data formats.

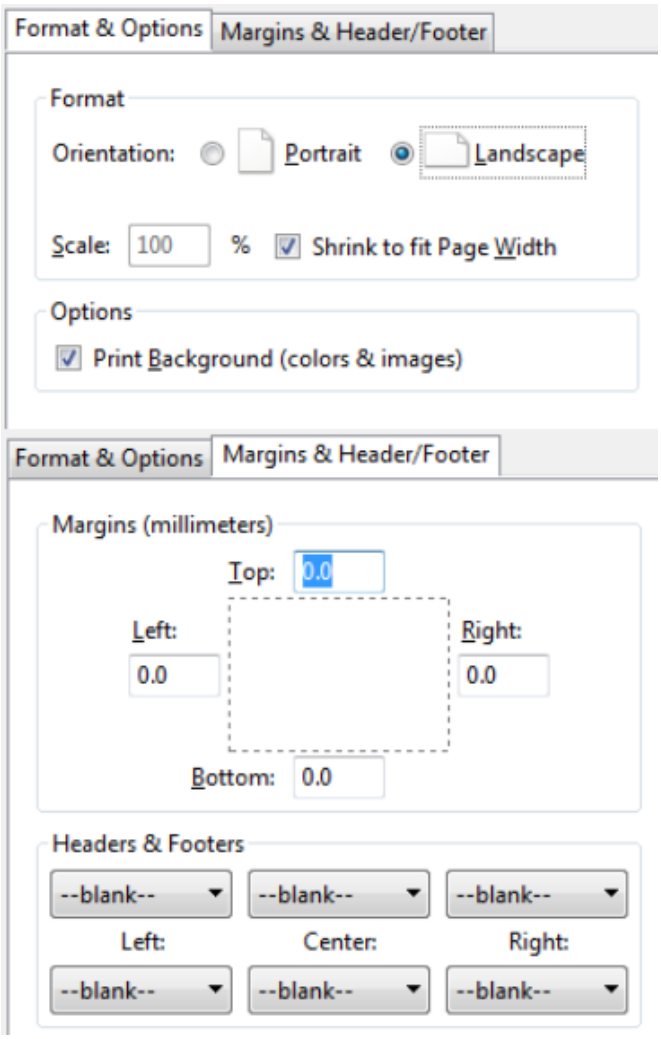
6.4.1 Exporting the Report

You can export the complete report as *.pdf or *.zip.

To export the report

1. In the toolbar of the report, click **Export** .
2. Select the data format:
   - PDF

     You need to have a PDF printer installed. Change the printer settings of your browser as follows:



- Zip

  The *.html file of the report is zipped together with all *.json files.

- Zip all

  Additionally to the *.html file and all *.json files, all measurement files are zipped.

- PPT

  You can select the chapters and sections that shall be exported as slides.

- HTML

  The complete report is exported as *.html file.

The standard dialog for opening files in your browser appears.

3. Open or save the file.

6.4.2 Exporting Signal Information

You can export and save the signal information of all signals or of previously selected signals. The following data formats are currently available: *.csv, *.lab, or *.txt.

To export signal information

1. In the toolbar of the report, click  .
2. Select the **Signal Info** tab.
3. To select the signals that shall be exported, do one of the following:
   - To find a signal in the complete table, type text into the search box above the table.
   - To find a signal in a specific column (for example in the column of the measurement file "M1"), click the column header and enter your text into the column header.

     If you want to clear the search in the columns, click  .
4. Select the data format by clicking on one of the buttons next to the search box:

5. Specify the name of the file.

   The standard dialog for opening files in your browser appears.
6. Open or save the file.

6.4.3 Exporting a Display Object

You can export and save a specific display object. The following data formats are currently available: *.jpg, *.png, or *.csv. When you select *.csv, it is possible to perform a post-processing of the data in Excel.

To export a display object

1. Right-click the display object.
2. In the context menu, click **Save** and select the data format.
3. If you select **as csv**, you must select the data series that shall be exported in the following cases:
   - The report was merged from several evaluations.

     The data series that can be selected depend on the merge mode. For more information, see "Changing the Merge Mode" on page 83.
   - The chart contains child charts.

     For more information about child charts, see "Report Structure" on page 14.

If the exported chart contains child charts or a display type, the name of the exported *.csv file is automatically enhanced by this information. The exported data in the *.csv file depends on the respective display object and display type.

4. The standard dialog for opening files in your browser appears. Open or save the file.

6.4.4 Exporting an MDA Configuration

If you want to analyze signals shown in a display object in further detail, you can export the data as MDA configuration and continue your work with MDA (Measure Data Analyzer) from ETAS.

If you have opened the report via the EATB software, you can choose if you want to create a new *.xda configuration or use an existing *.xda configuration. To use an existing *.xda or *.xdx configuration, you must start the export via the tooltip of the chart. Note that MDA V8.4.1 or a newer version of MDA V8 must be installed on your computer to use this option.

> **Note**
>
> If you want to export videos, you need MDA V8.7 or higher. Additionally, further requirements apply for exporting videos to MDA that are explained int he EATB Scripting Guide.

To start the export via the tooltip of chart

Note that this option applies only to charts and not to tables. The tooltip must be visible. For more information, see "Using the Tooltip" on page 82.

1. In the tooltip, click the file name that is displayed as a link at the bottom next to the timestamp information.
2. If you have opened the report by opening the *.html file of the report in your browser, the standard dialog for opening files in your browser appears. Open or save the *.xda configuration. In this case, you cannot select an *.xdx configuration.
3. If you have opened the report via the EATB software, you can do the following:
   - To create a new *.xda configuration, click **Use default XDA**.

     The standard dialog for opening files in your browser appears. Open or save the file.
   - To use an existing *.xda or *.xdx configuration, click **Use my own MDA configuration**. Navigate to the file location and select the configuration with **Pick**.

MDA V8 is started to open and replace the measurements in the *.xda or *.xdx files. Single measurements are replaced automatically. Multiple measurements must be selected manually via the "Add or Replace Files" dialog in MDA V8. For more information, press **F1** in MDA V8 to open the online help.

To start the export via the MDA Exporter tab

1. Hover the mouse over the display object that you want to export.
2. In the upper right corner of the display object, click  .
3. Select the **MDA Exporter** tab.

   The global attributes and signal information are shown in a table.
4. On the left of the table, click  .

   The standard dialog for opening files in your browser appears.
5. Open or save the file.

7 Troubleshooting

7.1 Troubleshooting for Launching EATB

7.1.1 Prerequisites Are Not Fulfilled

If you use MS Windows, you can perform a setup check. It helps you to ensure that all prerequisites are fulfilled to run EATB.

To perform a setup check

1. Start EATB GUI.
2. In your browser, type **http://localhost:9231/setupcheck**. Note that 9231 is the default port value. Depending on your port configuration during the installation of EATB, this value can differ.
3. If a warning is displayed, adhere to the information about the possible solution to solve the issue.

7.1.2 No MATLAB Runtime Available

The environment variable "PATH" usually has a limited length. If this is reached, the path to the installed MATLAB® Runtime 2024a is not included. Therefore, EATB cannot start.

To include the path to the MATLAB® Runtime 2024a via **start.bat**

1. Open the **start.bat** file from the installation package.
2. Change the path as follows:

```
setlocal
set DIRNAME=%~dp0%
set JAVA_HOME=%DIRNAME%\Softwares\jre11
set MCR_R2022a=C:\Program Files\MATLAB\MATLAB Runtime\v912\runtime\win64;
set PATH=%MCR_R2022a%;%JAVA_HOME%\bin;%PATH%
```

To include the path to the MATLAB® Runtime 2024a manually

1. Go to your environment variables.
2. Click **Add**.
3. Include the path to the MATLAB® Runtime 2024a. It is installed by default under **C:\Program Files\MATLAB\MATLAB Runtime\v9.7\runtime\win64**.
4. Save and restart your computer.

7.1.3 Not Supported HTTPS Connection

EATB supports only HTTP connections. If your company only allows secure connections via HTTPS by default, EATB cannot be started in your web browser automatically. An error message starting with “SSL_ERROR …” or “ERR_SSL …” is displayed.

To start EATB

1. In the address bar of your web browser, change "https" into "http".
2. Press RETURN.

   EATB opens.

> **Note**
>
> Supported web browsers are Mozilla Firefox, Google Chrome, and Microsoft Edge. For more information about the system requirements, see "EATB_V6.2_Installation_Guide.pdf" stored under **Documentation** in the installation folder.

7.1.4 State Error - Factory Not Connected to Core

EATB abborts with the following Java error: **java.lang.IllegalStateException: State Error - Factory not connected to core**.

To change the timeout options

1. Open the **config.client** file:
   - **EATB V6.0 or lower**
     - C:\Program Files\ETAS\EATB6.0\EATBWorker\EATBWorker_mcr\EATBWorker\Libraries\McdCore\bin\x64\config.client
     - C:\Program Files\ETAS\EATB6.0\EATBMat-lab\Libraries\McdCore\bin\x64\config.client

     In earlier EATB versions, the second variant of the file contained in the **pCode.zip**.
   - **EATB V6.1**

     C:\Program Files\ETAS\McdCore1.6\bin\config.client
2. Define the timeout via the following options:
   - StartupTimeout: This option allows you to define the timeout in seconds for waiting for a core response after startup, if the Java Client has configured a session for a private core.
   - IceDiscovery.Timeout: This option specifies the time interval in mil-liseconds to wait for replies to UDP multicast requests.
   - IceDiscovery.RetryCount: This option specifies the maximum number of times sending UDP multicast requests before giving up.

7.1.5 Database Backup

Since EATB 6.1, automated database backups are created in **User-Home/.EATB/{Version}/backup**. Updates are by default created daily for up to 20 days.

To use a backup of the database

1. Terminate the running EATB session completely. On the toolbar, click  .
2. To have an additional backup of the current status, create a copy of the .EATB folder in your user directory, by defaultC:\Users\UserID\.EATB\ and save it in a location of your choice.
3. In the backup folder in your user directory, by default C:\Users\UserID\.EATB\{Version}\backup, unzip the database backup and copy the unzipped file.
4. Replace the database file stored in the db folder, by default C:\Users\UserID\.EATB\{Version}\db.
5. Restart EATB.

7.2 Troubleshooting for Creating Evaluations

7.2.1 Error During License Check

When starting the evaluation, EATB GUI tries to receive the EATB runtime license first. If you are using the EATB developer license, the check for the EATB runtime license leads to an error message at first before the EATB developer license is checked out successfully. You can ignore this error message when using the EATB developer license.

7.2.2 Running Evaluation Is Aborted Due to Cache Issue

If the running evaluation is aborted, the reason can be a cache issue.

To delete the cache

1. Check the error message in "Running Evaluations". The error message can contain one of the following:
   - Unrecognized function or variable 'ctfroot'.
   - The job is no longer active.:
2. Terminate EATB GUI.
3. Delete the mcrCache9.7 cache under C:\Users\<username>\AppData\Local\Temp\<username>.
4. Restart EATB GUI and run the evaluation again.

7.2.3 Running Evaluation Is Aborted Due to Low Disk Space

If the running evaluation is aborted, the reason can be the available disk space.

To check the available disk space

1. Check if enough free disk space is available on your C drive. For this propose, you can perform a setup check. For more information, see "Prerequisites Are Not Fulfilled" on page 89.

2. Provide enough disk space.
3. Restart EATB GUI and run the evaluation again.

7.2.4 Running Evaluation Is Aborted: "Process excited with code 249"

If EATB Worker has been run before as administrator, MATLAB creates a .deploy_lock file which leads to abortion of all subsequent evaluations.

To continue the evaluation

1. Navigate to C:\Program Files\ETAS\EATBx.y\EATBWorker.
2. Delete the .deploy_lock file.
3. Run the evaluation again.

7.3 Troubleshooting for Displaying Reports

7.3.1 Labels in MF4 File(s) not Found

An evaluation was successfully created using the DAT file. But after switching to MDF files, all charts are empty and signals are not found. The cause is that the mdflib does not always provide the measurement technique.

To solve the problem when using only a master

1. Check that you only have a master in your measurements but no slave (rb.setSystem('Master','');).
2. In this case or for solutions that do not use a `config_system`, change the 3rd parameter in addSignal to an empty string.

To solve the problem when using more than one devices

- If you have more than only one device (master and slave for example), convert the MDF files to DAT files. For example, MDA 8 provides this feature.

7.3.2 No Signals Displayed in a Chart or Table

There are several reasons why a chart can be empty.

If the signal is not reliable or missing in the measurement (RED), do the following:

A. Check that the signal is included in the measurement file. After you have opened the report, click  . Select the **Signal Info** tab, and use the search field.

B. Check the hardware ID of the signal (for example \ETKC:1). Check that it is correctly specified in the following:

- Check in config_system.m if you are using something like

  master=rb.getSystem('Master');

  and tempSignals.addSignal('engineSpeed','nmot_w',master); in config_signals.csv.
- Check in config_signals.csv if you are using something like

  tempSignals.addSignal ('engineSpeed','nmot_w','\ETKC:1')

  If it was correct, try it with an empty hardware ID:

  rb.setSystem('Master','');

  and tempSignals.addSignal('engineSpeed','nmot_w','');

C. Check that config_signals.csv and config_system.m were successfully loaded. Go to the log file and search for "INFO: Loading config_system" and "INFO: Loading config_signals"

   If the next log-message starts with ERROR: **********M A T L A B C O D E C H E CK**********, then the file was not read successfully. Fix the error that is logged next.

If the signal is fine (GREEN), do the following:

- Check if a condition, trigger, or filter is set that removed all samples.
- Check the log file. Search for a message starting either with "Could not calculate the chart" or "Error in data reader" and see the information in the next messages.
- Check the solutions B and C as described above for RED status.

7.3.3 Display Object Has a Red Light (With or Without Thresholds)

EATB sets the light to red, if the calculation of the display object fails.

To obtain more information about the error

1. Check the log file under C:\Users\UserId\.EATB\logfiles (report log file).
2. Search for a log message that starts with "Could not calculate".
3. Check the information in the next messages.

8 Contact Information

Technical Support

For details of your local sales office as well as your local technical support team and product hotlines, take a look at the ETAS website:

www.etas.com/hotlines

ETAS offers trainings for its products:

www.etas.com/academy

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9 Glossary

A

accepted threshold violation

User-defined threshold type that marks previously set thresholds as not critical for the evaluation.

C

calculated signal

Signal that can be created based on measured signal(s) and a mathematical operations.

chapter

Largest subunit of a report containing one or more sections.

chart

Display object that shows the signals in graphical representation.

child chart

Chart that is displayed in the same chart as the parent but contains different data points and can have different settings.

condition

Reduction of the processed signal samples, to only consider samples for which a given condition holds true.

conditional filter

As opposed to inline filter: Filter type that calculates a binary mask which is used to hide insignificant points. Conditional filters can be applied to measured and calculated signals and the filter results can be plotted.

config_signals.csv

File used to define measured signals.

configuration

Item that encapsulates the necessary information for creating a report including at least one config_signals file, one chapter with one section and one chart or table.

Configuration Creator

Part of EATB GUI that allows a quick and easy configuration of charts and reports.

constant threshold

As opposed to function threshold: Threshold type that takes four constants (min, low, high, max) as thresholds. The calculation of the constant threshold is based on the corresponding signal only.

count tolerance

Tolerance type that defines how many points are allowed to lie inside or outside the feasible range and the thresholds would still be considered as not violated. This evaluation behavior corresponds to percent tolerance but uses the absolute instead of relative point numbers.

custom table

Table type that offers a flexible user-defined layout.

D

DFC

Abbreviation for diagnostic fault checks.

display object

Subunit of a section containing one ore more signals. A display object can either be a chart or table.

display type

Setting that allows to define the representation of a specific chart type.

E

EATB

Abbreviation for ETAS Analytics Toolbox.

EATB Configuration Encrypter

Component delivered with the installation package to encrypt and convert previously defined *.m files to *.eatb files.

EATB GUI

User interface supporting the creation of configurations and generation of reports.

EATB Worker

Compact variant of EATB that contains only the core application needed to create reports without the UI.

evaluationResults.json

Part of the results generated by the EATB-Core; it contains the structure of the generated report.

extrapolation

Estimation of subsequent results of a simulation/process using information of the present and past results.

F

falling edge

Edge that is defined by every sample for which the previous sample has a lower value.

function threshold

As opposed to constant threshold: Threshold type that takes four MATLAB anonymous functions (min, low, high, max) as thresholds, which define the green, yellow, and red ranges. Two signals are needed to calculate a function threshold: The values of the first signal (x axis) are used to calculate the threshold values as functions of this signal and to compare the calculated values with the values of the second signal (y axis).

G

grid

Sampling time used for interpolation and signal synchronization

H

histogram

Chart type that represents frequency distributions of certain events or values.

I

inline filter

As opposed to conditional filter: Filter type that is based on the time (as used in signal processing). Inline filters are always applied to the plotted signals.

interpolation

Estimation of a value inside a set of data points.

interval

Chart type that represents a segment of a signal whose boundaries are determined by one trigger with duration or one start and one end trigger.

IUMPR table

Table type that is used for analyzing DFCs.

M

MDA

Measure Data Analyzer; ETAS tool that lets users visualize, further process, analyze, and document measurement data.

measured signal

Signal from measurements defined in a config_signals.csv file.

measurement file

File containing measurement data (independent from the actual file format, e.g., MDF).

MinMax table

Table type that shows the evaluation of the global maximum and the global minimum of each signal.

P

percent tolerance

Tolerance type that defines the minimum or maximum percentage of the points that must or may lie inside or outside the feasible range without violating the thresholds.

plot

Chart type that represents signals in point clouds, combining two signals and displaying them in dependence.

Q

quantity

also called sample time; Signal quantification step size for signals in a chart with respect to a defined axis. Recommendation: Quantity should be a multiple of grid for time-based charts.

R

results folder

Folder containing the results of the calculation done by EATB, that means the data points that are visualized in the charts as JSON files and an HTML file of the report.

rising edge

Edge that is defined by every sample for which the previous sample has a higher value.

S

scatter

Extension of the chart type plot. In addition to the classical point cloud, a third signal can be used for evaluation. The third signal is integrated into the point cloud by a color map and displayed on the z axis.

section

Subunit of a chapter containing one or more charts or tables.

signal ID

Signal name as defined by the user (e.g., EngineSpeed).

signal label

Original signal name as defined in the measurement file (e.g., nmot_w)

single value bar

Chart type that displays a single value as bar.

single value line

Chart type that displays a single value as line.

T

table

Display object that shows the signals in tabular representation.

threshold

Limit indicating whether evaluated data is located inside or outside some given range or area. Thresholds are visualized with traffic lights.

time tolerance

Tolerance type that defines the maximum time in seconds, for which the time series can leave the feasible range continuously, and the thresholds would still be considered as not violated.

timeplot

Chart type that has time as x axis. It plots the signal values on the y axis in dependance on the time when the signal values were measured.

tolerance type

Option that allows to set the acceptance criteria to the evaluation of traffic lights.

traffic light

Optical indicator that shows if a threshold is violated or not.

trigger

Extraction of a set of relevant measurement file intervals that shall be considered. These intervals can be based upon conditions or events identified through triggers.

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